EXHIBIT 1

DECLARATION OF J. CHRISTOPHER CARRAWAY IN SUPPORT
OF DEFENDANT MICROSOFT'S MOTION TO STAY PROCEEDINGS PENDING
COMPLETION OF THE REEXAMINATION OF THE PATENTS-IN-SUIT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent No: 6,347,997

Currently in Litigation Styled:
Anascape, Ltd. v. Microsoft Corporation and Nintendo of America, Inc.,
No: 9:06-CV-06-00158-RC (E.D. Tex.)

Issued: February 19, 2002

Filed: May 10, 2000

Applicant: Brad A. Armstrong

Title: Analog Controls Housed with Electronic Displays

Request for *Inter Partes* Reexamination of Patent

MAIL STOP *INTER PARTES* REEXAMINATION
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Sir:

Reexamination under 35 U.S.C. §§ 311-316 and 37 C.F.R. § 1.902 *et seq.* is requested of claims 32 through 37 of United States Patent No. 6,347,997 ("the '997 Patent" or "the Patent" attached as Exhibit 1.) The '997 Patent issued on February 19, 2002, to Brad A. Armstrong. The Requester is Microsoft Corporation ("Requester"). This is a new reexamination request ("Request"). The '997 Patent has not been previously reexamined.

In accordance with 37 C.F.R. § 1.985, Requester hereby provides notice that the '997 Patent is asserted against Microsoft in litigation styled Anascape, Ltd. v. Microsoft Corporation, and Nintendo of America, Inc., 06-CV-00158-RC, in the United States District Court for the Eastern District of Texas (the "Litigation").

Requester respectfully submits that, on the basis of previously uncited prior art patents and/or publications, as well as previously cited patents and/or publications being presented in a new light in this Request, substantial new questions regarding the patentability of claims 32-37 of the '997 Patent exist. This reexamination request satisfies the requirements of C.F.R. § 1.915(b), as follows.

37 C.F.R. § 1.915(b)(1): Reexamination of claims 32-37 of the '997 Patent is requested.

37 C.F.R. § 1.915(b)(2): This reexamination request is based on the prior art references listed in Section I.

37 C.F.R. § 1.915(b)(3): A statement of each substantial new question of patentability is presented in Section IV. A detailed explanation of the pertinency and manner of applying the prior art to each claim element in the requested claims is provided in claim charts attached to this Request in Appendices A-D.

37 C.F.R. § 1.915(b)(4): Copies of the references relied upon as well as certified English language translations of pertinent parts of all non-English language documents, are attached as Exhibits 2-12.

37 C.F.R. § 1.915(b)(5): A copy of the entire '997 Patent is included at Exhibit 1. Additionally, a copy of the List of Prior Art Cited by Applicant filed during the prosecution of the '997 Patent is attached as Exhibit 13. Copies of the terminal disclaimers filed by Applicant are attached as Exhibit 14.

37 C.F.R. § 1.915(b)(6): A certification of service of this reexamination request on the purported patent owner is provided on the last page of this reexamination request.

37 C.F.R. § 1.915(b)(7): Requester certifies that this is a new reexamination request, and that therefore the estoppel provisions of 37 C.F.R. § 1.907 do not prohibit this Request.

37 C.F.R. § 1.915(b)(8): Requester, identified above, is the real party in interest to this reexamination request.

I. STATEMENT IDENTIFYING THE PRIOR ART REFERENCES ESTABLISHING SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY PURSUANT TO 37 C.F.R. § 1.915(b)(2)

The following references, alone or in combination, present substantial new questions of patentability, *e.g.*, anticipation under 35 U.S.C. § 102 and/or obviousness under 35 U.S.C. § 103, as to at least claims 32-37 of the '997 Patent:

Exhibit 2[1]	Kazuhiro **Matsumoto**, Japanese Patent Application Publication No. S61-103836, published July 2, 1986 (hereinafter "Matsumoto") (Ex. 2 includes a certified English translation in accordance with 37 C.F.R. § 1.510(b)(3));
Exhibit 3	Yasuhi **Kawashima** *et al.*, Japanese Patent Application Publication No. S62-82090, published December 4, 1989 (hereinafter "Kawashima") (Ex. 3 includes a certified English translation in accordance with 37 C.F.R. § 1.510(b)(3));
Exhibit 4	Richard **Kramer**, U.S. Pat. No. 5,164,697, issued November 17, 1992 (hereinafter "Kramer");
Exhibit 5	Yoshihiro **Inoue** *et al*, U.S. Pat. No. 5,207,426, issued May 4, 1993 (hereinafter "Inoue");
Exhibit 6	Hitoshi **Furukawa** *et al.*, Japanese Patent Application Laid-Open Disclosure No. H5-87760, published November 26, 1993 (hereinafter "**Furukawa '760**") (Ex. 6 includes a certified English translation in accordance with 37 C.F.R. § 1.510(b)(3));
Exhibit 7	Hitoshi **Furukawa**, Japanese Patent Application Laid-Open Disclosure No. H05-326217, published December 10, 1993 (hereinafter, "**Furukawa '217**") (Ex. 7 includes a certified

[1] Pursuant to 37 C.F.R. § 1.915(b)(4), a certified English translation is included for this and all other foreign language references.

English translation in accordance with 37 C.F.R. § 1.510(b)(3));

Exhibit 8 Kerry **O'Mara**, U.S. Pat. No. 5,510,812, issued April 23, 1996 (hereinafter "O'Mara");

Exhibit 9 Michael J. **Padula** et al., U.S. Patent No. Re. 34,095, issued October 13, 1992 (hereinafter "Padula");

Exhibit 10 Masayuki **Mitsuhashi** et al., U.S. Pat. No. 4,766,271, issued August 23, 1988 (hereinafter "Mitsuhashi").

Exhibit 11 Atsunori **Himoto** et al., European Patent Application EP 0 835676 A1, published April 15, 1998 (hereinafter "Himoto").

Exhibit 12 Craig **Thorner**, et al., U.S. Pat. No. 5,669,818, issued September 23, 1997 (hereinafter "Thorner").

II. ARMSTRONG FAMILY OF PATENTS BASED ON VARIABLE-CONDUCTANCE SWITCHES

A. Armstrong Patents

The '997 Patent applicant, Mr. Armstrong, has filed a large number of patent applications and received a number of patents based on the same non-patentable subject matter of pressure-sensitive variable-conductance switches for game controllers. Twelve of these patents are asserted against Requester in the Litigation. Requester has already filed reexamination requests on Patent Nos. 5,999,084 and 6,102,802. Requester intends to file reexamination requests on each of the twelve patents identified below. The following table lists these twelve patents and indicates (in **bold**) the patent that is the subject of this request:

U.S. Pat. No.	Application	Filed	Issued	Reexam	Reexam No.
5,999,084	09/106,825	Jun. 29, 1998	Dec. 7, 1999	Dec. 15, 2006	TBD
6,102,802	08/942,450	Oct. 1, 1997	Aug. 15, 2000	Dec. 13, 2006	90/008,373
6,135,886	09/122,269	Jul. 24, 1998	Oct. 24, 2000	-	-
6,208,271	09/148,806	Sep. 4, 1998	Mar. 27, 2001	-	-
6,222,525	08/677,378	Jul. 15, 1996	Apr. 24, 2001	-	-
6,343,991	09/510,572	Feb. 22, 2000	Feb. 5, 2002	-	-

6,344,791	09/599,095	Jun. 21, 2000	Feb. 5, 2002	-	-
6,347,997	09/568,662	May 10, 2000	Feb. 19, 2002	Jan. 12, 2007	TBD
6,351,205	09/455,821	Dec. 6, 1999	Feb. 26, 2002	-	-
6,400,303	09/815,898	Mar. 22, 2001	Jun. 4, 2002	-	-
6,563,415	09/955,838	Sep. 18, 2001	May 13, 2003	-	-
6,906,700	09/715,532	Nov. 16, 2000	Jun. 14, 2005	-	-

To the extent permissible, Requester requests that the reexaminations of this Patent and the other eleven patents asserted against Requester in the Litigation be handled by the same Examiner or group of Examiners.

B. Related Prosecution

In addition to the issued patents, Mr. Armstrong and/or Anascape Ltd. (as the purported owner of the referenced patents and applications) has a number of pending and abandoned patent applications that purport to relate to or claim priority (in whole or in part) to the patents identified above and/or their related applications, including at least the following applications:

09/455,521	10/437,395	11/240,330
09/710,557	10/773,025	11/240,331
09/721,848	11/150,412	11/240,349
09/729,753	11/240,112	11/240,374
09/733,435	11/240,158	11/241,330
09/733,468	11/240,309	11/241,455
09/893,292	11/240,326	11/241,478
10/028,071	11/240,327	11/241,617
10/042,027	11/240,329	11/241,618

III. DETAILED EXPLANATION UNDER 37 C.F.R. § 1.915(b)(3):

Pursuant to 37 C.F.R. § 1.915(b)(3), Requester provides below (and in the claim chart mappings in Appendices A-D) "[a] statement pointing out each substantial new question of patentability based on the cited patents and printed publications, and a detailed explanation of the pertinency and manner of applying the patents and printed publications to every claim for which reexamination is Requested."

A. Legal Standards For Reexamination

As with *ex parte* reexaminations, a Request for an *inter parties* reexamination is appropriately granted where the Requester demonstrates the existence of a substantial new question of patentability for at least one claim of the patent. *See* Manual of Patent Examining Procedure (MPEP), Section 2642(I). Section 2642(I) sets forth the standard for this determination (emphasis in original):

> A prior art patent or printed publication raises a substantial question of patentability where there is a substantial likelihood that a reasonable Examiner would consider the prior art patent or printed publication **important** in deciding whether or not the claim is patentable. If the prior art patents and/or publications would be considered important, then the Examiner should find "a substantial new question of patentability" unless the same question of patentability has already been decided as to the claim in a final holding of invalidity by the Federal court system or by the Office in a previous examination.

Here, the cited art raises substantial new questions of patentability under 35 U.S.C. § 102 and/or 35 U.S.C. § 103.

Patents and/or printed publications already cited/considered in an earlier concluded examination may also raise substantial new questions of patentability where such patents/printed publications are being presented or viewed in a new light, or in a different way, as compared with their use or understanding in earlier concluded examination(s), and are submitted as invalidating prior art references based on new arguments and/or

interpretations contained in the reexamination Request. *See* MPEP § 2642(II)(A), citing *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351 (Bd. Pat. App. & Inter. 1984).

Additionally, admissions made in the patent file or statements placed in the court record may be considered in conjunction with prior art patents or printed publications. *See* MPEP § 2617. Requester summarizes below and includes for reference copies of statements regarding the field of the invention, as well as stated reasons for patentability made by the patentee during prosecution of the subject patent. Also included are statements made in the specification and/or claims of related patents to which the '997 Patent claims priority, or for which a terminal disclaimer has been filed in the '997 Patent.[2]

Finally, consistent with initial examinations, the scope given to claim language during reexamination is broad: "During reexamination, claims are given the broadest reasonable interpretation consistent with the specification and limitations in the specification are not read into the claims. (*In re Yamamoto*, 211 F.2d 1569, 222 USPQ 934 (Fed. Cir. 1984))." MPEP § 2258.I.G.

B. Overview Of The Applicant's Admissions Regarding His Claims And The State Of The Prior Art

While the claims of the '997 Patent naturally are the primary focus of this Request, the systems described in the patent's specification, as well as the prosecution history of the patent and the text of related patents provide important context for those claims. Thus, this section summarizes the '997 Patent's description of its alleged invention, as well as the applicant's statements of reasons for allowability of the challenged claims. The patent (and thus the below summary) describes features that it does not recite in the challenged claims.

1. After Rejection Of His Original Claims, Applicant Stated That His New Claims Were Allowable Based On A "Novel And Inventive Arrangement" Of Elements He Acknowledged Already Existed

The '997 Patent, filed May 10, 2000, identifies the primary features contained therein as already existing in the prior art: "Displays, housings, electronics and analog output buttons do exist in the prior art. The present invention, however, does not exist in the prior art . . . ." ('997 Patent, Col. 1, lines 56-58.)

On March 15, 2001, the Examiner rejected all of applicant's original claims. In filing new claims on August 14, 2001, Applicant claimed that the alleged invention of these new claims was a "novel and inventive arrangement [of previously existing elements] not taught or suggested by the prior art." (Exhibit 17, '997 Prosecution History, August 14, 2001 Amendment A, page 14.)

a) Applicant Claims That His Alleged Invention Combines An Electronic Visual Display With Other Elements

The '997 Patent's title is "Analog Controls Housed with Electronic Displays." Applicant claims that the alleged "novel and inventive arrangement" of the '997 Patent is

> an electronic device, which may take many forms as herein disclosed, but **all including a combination of a electronic visual display in or on a housing**, electronic circuitry in the housing, and including at least one human user depressiblc surface with associated analog pressure-sensitive element for output of a signal of variable value utilized by the circuitry to control or manipulate a function(s) of the device."

'997 Patent, Col. 1, line 63 – Col 2, line 3. (emphases added throughout this Request.)

Further, the Summary of the Invention states:

> An object of the present invention is to provide **an electronic device including a combination of an electronic visual**

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[2] In citing to these references, Requester does not admit that applicant's priority claims to related applications are proper.

> **display in or on a housing, electronic circuitry in the housing, and at least one analog sensor comprising a finger or thumb depressible surface with associated analog pressure-sensitive element for output of a signal of variable value utilized by the circuitry to manipulate one or more functions of the electronic device at varied rates**, the manipulation in some manner indicated on the display at least at the time the user is pressing the depressible surface . . .

'997 Patent, Col. 2, lines 34-43, emphasis added.

b) Claims 32 Through 37 Do Not Include The Claimed Inventive Combination Of An Electronic Visual Display In A Housing With Other Elements

Claims 32 through 37 form the subject of this Request. These claims, originally filed in the post-rejection amendment as Claims 54 – 59, do not disclose any electronic visual display in or on a housing containing electronic circuitry and finger-depressible pressure-sensitive variable-conductance sensor(s). Therefore, these claims lack the very inventive feature applicant claims is disclosed in the '997 Patent as a necessary part of his invention.

2. Examiner Allowed Applicant's New Claims After Applicant Stated That There Was A Lack Of Pressure-Sensitive Variable-Conductance Controls In The Prior Art

All of applicant's original claims in the application underlying the '997 Patent were rejected by the Examiner. In a telephonic interview conducted after Examiner initially rejected all 22 of the original claims in the '997 Patent application, which recited an "analog pressure-sensitive element," applicant apparently indicated that he believed there was a "long-felt need in the art" for "**variable-conductance pressure-sensitive controls**," and that there existed an "absence of such controls before his invention." (Exhibit 16, '997 Prosecution History, May 4, 2001 Interview Summary.) Applicant subsequently cancelled all original claims and filed new ones, including the claims now under consideration.

Following the applicant's submission of new claims for consideration, in a subsequent interview, Examiner stated that new claim 54 (later issued as claim 32 in the '997 Patent) "did not include the patentable material regarding the pressure-sensitive variable-conductance sensors." (Exhibit 19, '997 Prosecution History, September 4, 2001 Interview Summary.) Despite this omission, the applicant argued that independent claim 54 was patentable over the prior art "because of the **claimed tactile feedback**" (*Id.*) Examiner stated that this would require a further search. (*Id.*)

Subsequently, as a condition for allowance, Examiner amended claim 54 to add a "pressure-sensitive variable-conductance" limitation to the analog sensor disclosed therein. (Exhibit 18, '997 Prosecution History, August 31, 2001 Notice of Allowability, pg. 2.) Examiner's stated reasons for allowance were that the "prior art could not alone or in combination anticipate or make obvious the claimed elements in combination with a pressure-sensitive variable-conductance sensor." (*Id*., pg. 3.)

C. Detailed Description Of The Prior Art Setting Forth The Same Structure Applicant Claimed Was A "Novel and Inventive Combination"

1. Background On Pressure-Sensitive Variable-Conductance Sensors

Sensors with pressure-sensitive variable-conductance layers to generate analog electrical output have been known for years. U.S. Patent 6,102,802, of which the '997 Patent is a continuation in part, points to U.S. Pat. No. 3,806,471 to Mitchell (hereinafter, "Mitchell"), issued in 1974, for Mitchell's disclosure of pressure-sensitive variable conductance material. (Exhibit 21, U.S. Pat. No. 6,102,802 to Brad A. Armstrong (hereinafter, the "'802 Patent"), Col. 6, lines 49-65.) Mitchell disclosed pressure-sensitive variable-conductance materials that "utilize volumetric dispersions of at least one type of particulate material that is at least partially conductive in nature and is disposed within a

predetermined volume of relatively small depth." (Exhibit 20, U.S. Pat. No. 3,806,417 to R. J. Mitchell at Col. 2, lines 58-62.)

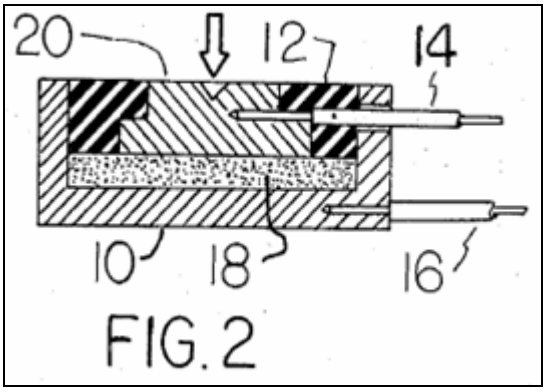

Fig. 1 – Pressure-Sensitive Variable-Conductance Transducer Disclosed by Mitchell

Figure 2 of the Mitchell patent (reproduced here in Fig. 1) illustrates a side-view of a pressure responsive transducer. Material 18 is partially conductive, so that when pressure is exerted on material 18, electrical resistance to current flow between electrode 10 and electrode 20 is reduced. (*Id*. at Col. 5, line 57 – Col. 6, line 35.) "The electrical current is regulated by the force sensitive material 18, in response to the amount of force applied to the material." (*Id*. at Col. 6, lines 27-30.)

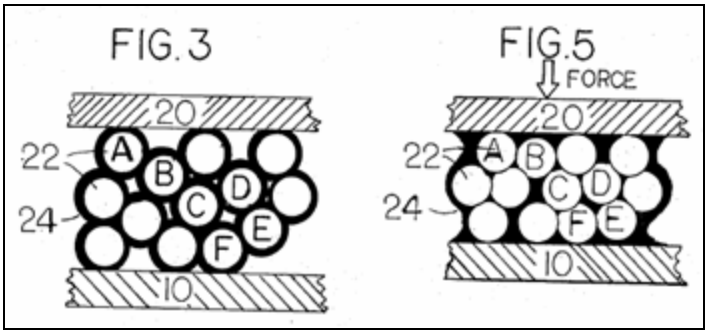

Fig. 2 – Structure of Pressure-Sensitive Variable-Conductance Material in Mitchell

Figures 3 and 5 of the Mitchell patent (reproduced above in Fig. 2) illustrate the structure of material 18, in which tungsten carbide particles 22 are confined within an elastomeric binder 24. (*Id*. at Col. 7, lines 11-26.) When force is applied, the tungsten

carbide particles 22 are forced closer together increasing the electrical flow paths through the material.

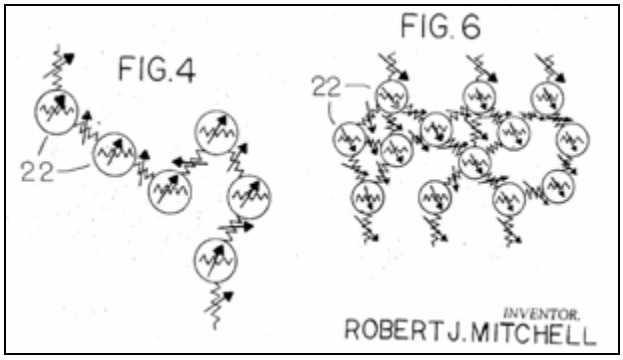

Fig. 3 – Illustration Showing Increased Number of Current Flow Paths With Pressure

Figures 4 and 6 of the Mitchell patent (reproduced above in Fig. 3) illustrate the relative number of current flow paths through material 18 with no force applied (Fig. 4) and with pressure applied. (*Id*. at Col. 7, line 26 through Col. 8, line 2.) Under load, Fig. 6 illustrates that the increased number of current flow paths through material 18, along with other effects, cause a reduction in resistance to current flow. (*Id*.) In this way, the Mitchell patent discloses how pressure-sensitive variable-conductance materials are used to vary electrical current in response to pressure variations.

Mitchell also identifies numerous types of materials that are can be used to make thin pressure-sensitive variable-conductance layers. (*Id*. at Col. 8, lines 3-33, Col. 11, lines 16-34, Col. 12, line 58 through Col. 15, line 60.) Thus, sensors with pressure-sensitive variable-conductance layers to generate analog electrical output were disclosed by Mitchell in 1974.

2. The Matsumoto Prior Art

Applying tactile feedback to a variable-conductance pressure-sensitive switch was not a novel concept at the time of the filing of the application leading to the '997 Patent. It was disclosed over a decade earlier by Kazuhiro Matsumoto *et al.* in Japanese patent application,

entitled "Variable resistance switch," that was published as Publication No. S61-103836 on July 2, 1986. Matsumoto discloses a pressure-sensitive variable resistance switch of which the on/off switching can be easily recognized through the feeling of pressure on a fingertip and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed. (Matsumoto, pg. 1.)

To operate the variable resistance switch 10, a push button 1 is pressed down so that its bottom end pushes an elastic electro-conductive curved plate 3 downward. This results in a change state in the curved plate, and a "click action." (*Id.* at pg. 7.) When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between terminals 4C and 4D, as shown in Figure 4. (*Id.*)

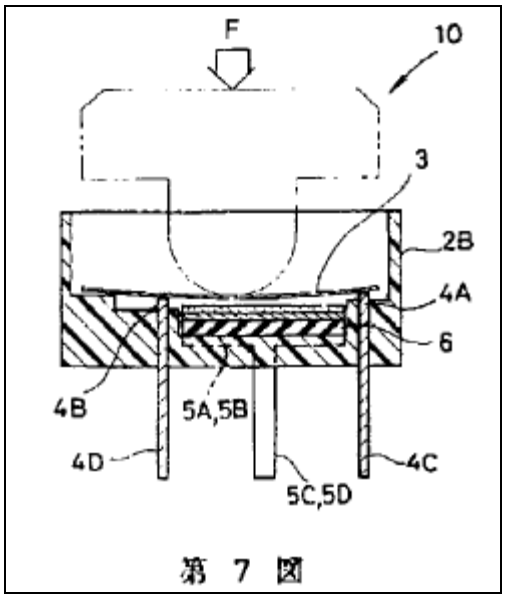

Fig. 4 – Tactile Feedback Click Action Disclosed by Matsumoto

Following this tactile feedback, the push button 1 may be further pressed, causing the electro-conductive curved plate 3 to curve downward, contacting the bridge electrode 7, and

compressing the pressure-sensitive electro-conductive rubber 6. (*Id.*) The resistance through the thickness of the pressure-sensitive electro-conductive rubber 6 is reduced, which allows the current to flow. In this state, the variable resistance switch 10 is at its start point. Further pressure from the user's fingertip further compresses the pressure-sensitive electro-conductive rubber 6 and reduces resistance between terminals 5C and 5D, as shown in Figure 5, below. (*Id.* at pg. 8.)

Once pressure is released, the resistance through the thickness reaches an infinite value, nullifying the conductivity between the terminals 5C and 5D. (*Id.*) Then, the electro-conductive curved plate 3 pushes up the push-button 1 and returns to its no load state so that it is no longer in contact with electrode 4B, eliminating conductivity entirely. (*Id.*)

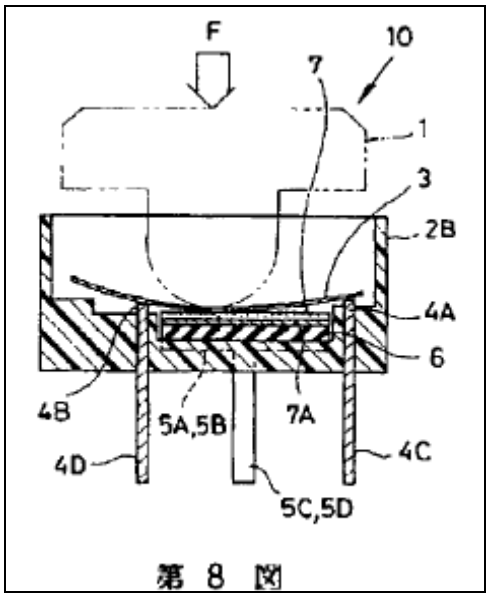

Fig. 5 – Pressure-Sensitive Variable-Resistance With Further Applied Pressure

Thus, over a decade before Armstrong filed his first patent application, Matsumoto had already disclosed a pressure-sensitive variable-conductance switch employing tactile feedback to signal when the switch was activated.

3. The Kawashima Prior Art

Three years after Matsumoto was published, on December 4, 1989, Yasushi Kawashima, a named inventor on the original Matsumoto application, had published as Publication No. S62 – 82090 his Japanese patent application, entitled "Game Control Decide Equipped with Pressure-Sensitive Rubber Switch." In it, Kawashima discloses utilizing a pressure-sensitive variable-resistance switch in a game controller for varying "the firing of missiles or pistols in a TV game." (Kawashima, Cols. 1 – 2.)

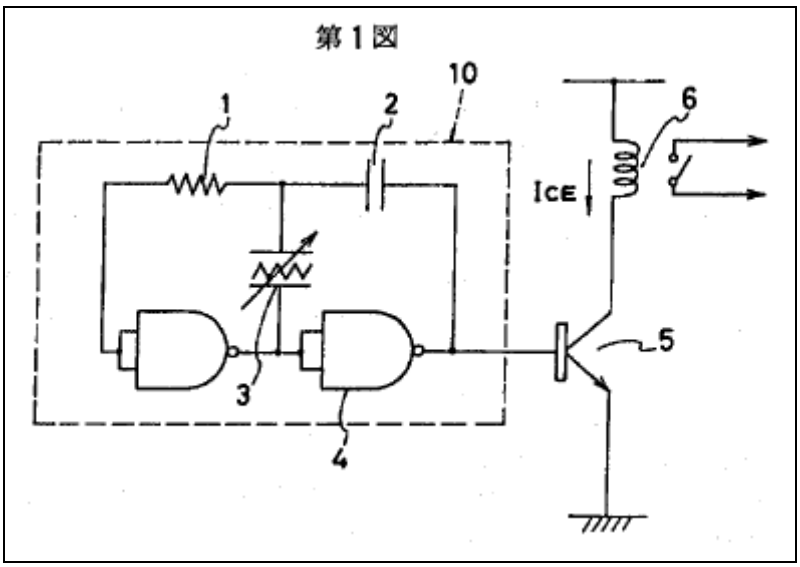

Fig. 6 – Control Circuit Diagram for a Pressure-Sensitive Variable-Resistance Switch in a Video Game Controller Disclosed by Kawashima.

Kawashima states that prior art game controllers used an on/off switch in firing missiles or pistols in a TV game while using variable resistors for "cursor movements." (*Id.* at Col. 1.) Kawashima discloses using a resistor 1, a capacitor 2, and a switch using pressure-sensitive conductance rubber 3 whose resistance changes with pressing force, an "IC such as a NAND circuit" 4 and variable frequency oscillation circuit 10. (*Id.* at Col. 3.) In addition, he discloses a relay drive transmitter 5 and a relay 6 in an output circuit controlled by the frequency oscillation circuit. (*Id.*; *see also* Figure 6.)

The frequency of the oscillation circuit 10 is a function of the resistance value of the pressure-sensitive conductive rubber switch and the capacity of capacitor 2. (Kawashima, Col. 3.) Thus, the greater the pressure applied to the pressure-sensitive material, the lower the resistance, thus varying the output.

> Because this device utilizes a pressure-sensitive conductive rubber whose resistance value changes with pressing force in a game control device with an output circuit which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber is controlled by this oscillation circuit. The opening and closing of the cycle switch of a game controller can then be controlled freely by the pressing force from the finger of the user, so it will allow the use of new techniques in playing computer games and elevate the appeal of games.

(Kawashima, Col. 4.) Kawashima disclosed putting this switch in the form of an individual button on a video game controller to allow greater control over game action, such as firing pistols or missiles. (*Id.*, Cols. 1 – 2, 4; *see also* Figure 7, above.)

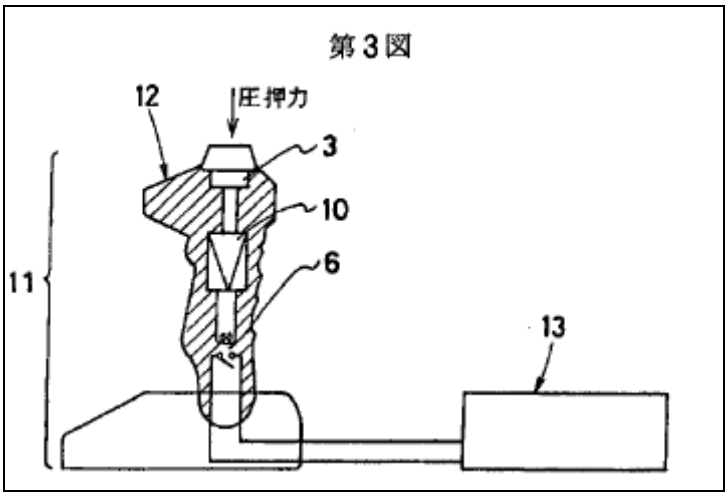

Fig. 7 – Pressure-Sensitive Variable-Resistance Switch Employed in a Game Controller disclosed in Kawashima.

Thus, Kawashima disclosed the use of a pressure-sensitive variable-resistance switch in a computer game controller to modify on-screen activity, such as firing missiles, based on varying levels of applied finger pressure to a single button.

4. The Kramer Prior Art

Use of pressure-sensitive variable-conductance material to generate variable analog output from a button on an "Input Keyboard for an Electronic Appliance in Entertainment Electronics" in response to variable pressure applied to the button was disclosed in U.S. Pat. No. 5,164,697 to Richard Kramer, issued on November 17, 1992. The Kramer invention, as the patent title suggests, was directed generally to an input keyboard for an electronic appliance in entertainment electronics. (Kramer, Col. 1, lines 8-10). Kramer also describes providing tactile feedback for the user, referring to prior art devices with pushbuttons for on-off switches having rubber domes, to produce a snap effect. (*Id*. at Col. 1, lines 10-43.)

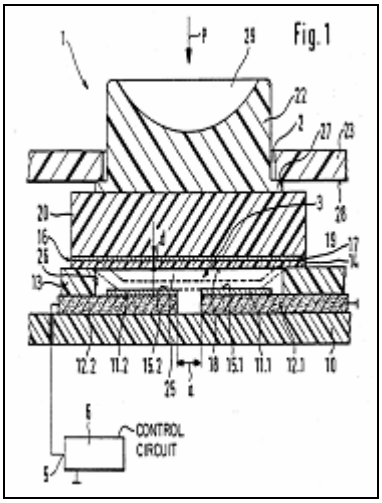

Fig. 8 – Pressure-Sensitive Variable-Conductance Switch Disclosed by Kramer

The Kramer invention improved on the prior art by disclosing "pushbutton switching devices in an input keyboard that can be used to produce not only a switching process but also an adjustment process and will not appreciably complicate the manufacturing process of

such an input keyboard." (*Id*. at Col. 1, lines 45-51.) The Kramer invention generates a variable output by utilizing a thin carbonized plastic foil with an electrical resistance that varies with the pressure applied to the button. (*Id*. at Col. 1, line 51 through Col. 2, line 41.)

Figure 1 of Kramer shows a cross-section of the pressure-sensitive variable-conductance pushbutton (reproduced above in Fig. 8) which depicts a pushbutton 22, a carbonized plastic foil 14, and conductors 12.1 and 12.2. (*Id*. at Col. 3, line 39 through Col. 5, line 35.) Depressing the pushbutton causes the carbonized plastic foil 14 to come into contact with the contact linings 11.1 and 11.2 (shown by the dotted line in the figure) creating a bridging resistance between conductors 12.1 and 12.2 through the carbonized plastic foil 14. (*Id*.) The resistance of the carbonized plastic foil 14 diminishes linearly as the pressure on the pushbutton increases. (*Id*.)

Kramer further disclosed a tactile click to be felt by the user upon actuation of the adjustment process, said feedback to be felt by the finger of the user: "At the positions corresponding to the various pushbuttons of the remote control transmitter, rubber domes are formed in the contact mat to act as spring elements. These rubber domes produce a snap effect upon depression of the pushbutton." (Kramer, Col. 1, lines 28-33.) Kramer goes on to state that this snap effect takes place immediately prior to the time that the pressure-dependent adjustment function takes place: "the rubber dome bears against the printed circuit board and upon depression of the appropriate pushbutton 22, will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable." (*Id.* at Col. 5, lines 43-48.)

Kramer, thus, in 1992 disclosed a controller with a pushbutton having a variable output that is proportional to the pressure applied to the pushbutton, with a dome cap providing an active break-over threshold tactile feedback to the user.

5. The Inoue Prior Art

U.S. Pat. No. 5,207,426 to Inoue, and assigned to Nintendo, entitled "Controller for a Game Machine," issued on May 4, 1993. While Inoue does not disclose pressure-sensitive variable-conductance sensors, it does disclose other typical features of video game controllers that existed well before the application for the '997 Patent. Figure 1 of the Inoue patent is reproduced here in Fig. 9, below.

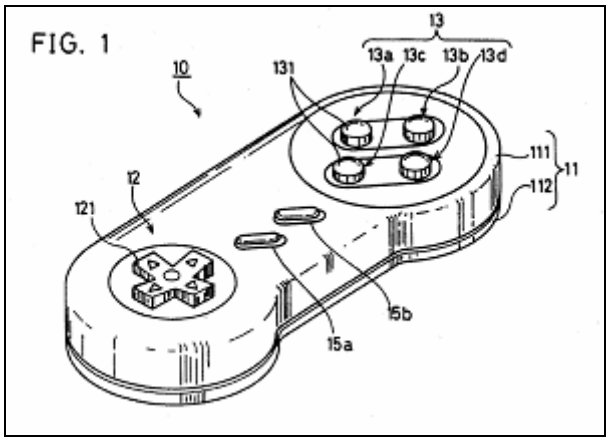

Fig. 9 – Video Game Controller Disclosed by Inoue

As shown in the figures, Inoue discloses a video game controller with a cross-shaped key 121 on the left side and various other control buttons, including buttons located on the right side of the controller, such that the video game can be played by holding the controller in two hands.

6. The Furukawa '760 Prior Art

Specific application of known pressure-sensitive variable-conductance materials in a controller for controlling video game imagery on a display was disclosed by Hitoshi

Furukawa in his Japanese patent application, entitled "Pressure-Sensing Switch," that was published as Publication No. 5-87760 on November 26, 1993. Furukawa '760 discloses a video game controller configured to be held in two hands with depressible buttons on the left and right hand sides of the controller as shown in Figure 1 of the publication (reproduced below in Fig. 10)

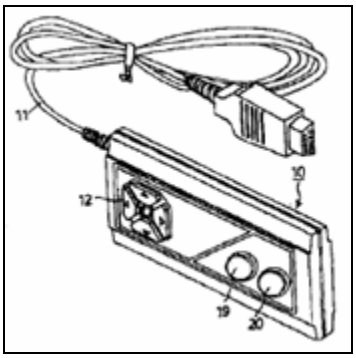

Fig. 10 – Furukawa '760 Video Game Controller With Pressure Sensing Switches

Furukawa '760 discloses a button with a dome cap, that it describes as a moving part 30 mounted on a substrate 5 as shown in Fig. 2 of the publication (reproduced below as Fig. 11) (Furukawa '760, Abstract, ¶ 9).

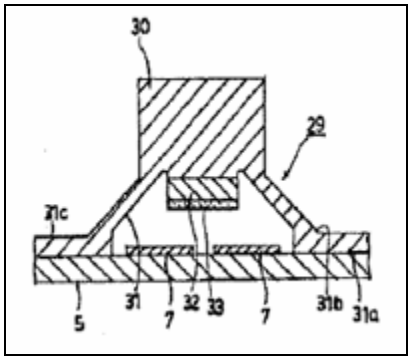

Fig. 11 – Furukawa '760 Pressure-Sensitive Variable-Resistance Game Controller Button

On the underside of moving part 30, there is a conductive portion 33 whose resistance changes with the pressing force on the button. (*Id*. at ¶ 10.) When the button is pressed, the moving part 30 comes into electrical contact with fixed contacts 7 and 7 of a wiring pattern

on the substrate 5. (*Id*. at ¶ 9.) Due to the pressure-sensitive characteristics of the conductive part 33, varying the pressing force on the button will vary the electrical resistance through conductive part 33 between fixed contacts 7 and 7, thereby generating variable electrical output in response to varying physical pressure on the video game button. (*Id*. at ¶¶ 9-10.)

It is generally known--and applicant previously admitted--that the dome cap structures used in most existing game controllers produce break-over threshold tactile feedback: "Elastomeric injection molded dome-cap momentary-On switches (sensors) are well known and widely used in the prior art as switches incorporated in such common host devices as . . . **electronic game control devices such as game pads for Nintendo, Sony and Sega game consoles** . . . most but not all **elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback.** This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced." (Exhibit 22, U.S. Pat. No. 6,135,886 to Brad A. Armstrong (hereinafter, the "'886 Patent"), Col. 1, lines 20-25, 58-64.)[3]

Furukawa '760 describes employing its pressure-sensitive variable conductance switch in existing prior art game controllers. Given applicant's admission regarding the tactile feedback function of the dome caps that already existed in these controllers, the dome

[3] The '886 Patent is a continuation-in-part of the same parent application to which the '997 Patent claims priority, and is the subject of a terminal disclaimer in the '997 Patent (see Exhibit 14).

cap of Furukawa ‘760 would implicitly produce a break-over threshold tactile snap to the finger of the user pressing a button on a video game controller.

As Furukawa ‘760 describes, the variable output based on variable pressure applied to a button on a video game controller can be used, for example, to change the speed of a character’s movement on a display, according to the amount of pressure applied to the button. (Furukawa ‘760, ¶ 10.)

The example embodiment described in Furukawa ‘760 discloses a cross shaped key (the buttons configured in a north-south-east-west orientation) as having variable control. (*Id.* at ¶ 9, Fig. 11.) However, the specification notes that the invention is not limited to variable control on the buttons of a cross shaped key. (*Id*.) Indeed, the single claim in Furukawa ‘760 does not limit the location of the pressure-sensing switch in a video-game controller. (*Id.*, claim 1, pg. 2.) Thus, Furukawa ‘760 disclosed using a pressure-sensitive variable-resistance switch to control game imagery, coupled with a dome cap structure, over six years before the ‘997 application was filed

7. <u>The Furukawa ‘217 Prior Art</u>

In his Japanese patent application, entitled “Pressure-Sensitive Variable Resistor,” that was published as Publication No. 5-326217 on December 10, 1993, Hitoshi Furukawa disclosed pressure-sensitive variable-conductance sensors in “keyboards and the like.” Similar to Mitchell, *supra*, Furukawa ‘217 discloses mixing carbon black and graphite with a silicon rubber and molding it. (Furukawa ‘217, Abstract) to form a pressure-sensitive variable resistor 1.

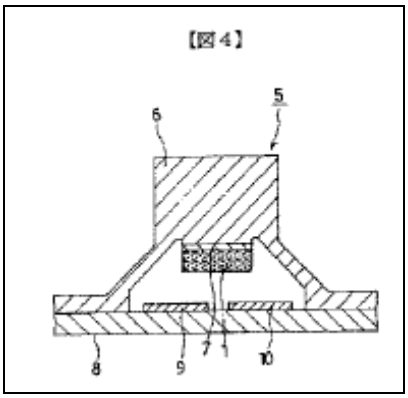

Fig. 12 – Pressure-Sensitive Variable-Resistance Button Disclosed by Furukawa '217

Furukawa '217 discloses a button with a dome cap, that it describes as a rubber key top 6 mounted on a circuit board 8 as shown in Fig. 4 of the publication (reproduced above as Fig. 12) (Furukawa '217, ¶ 10.) On the underside of the rubber key top 6, there is a pressure-sensitive variable resistor 1 whose resistance changes with the pressing force on the button. (*Id*.) An electro-conductive layer 7 is provided between the pressure-sensitive variable resistor 1 and the rubber key top 6. (*Id.*)

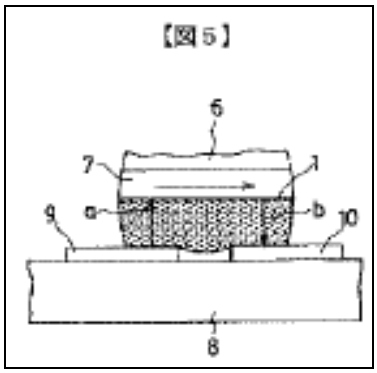

Fig. 13 – An Illustration Showing the Electrical Path Through the Variable-Resistance Pressure-Sensitive Switch In Furukawa '217

When the button is pressed, the pressure-sensitive variable resistor 1 attached to the rubber key top 6 via the electro-conductive layer 7 comes into electrical contact with secure contact points 9 and 10 on circuit board 8, as shown in Fig. 5 of the publication (reproduced above as Fig 13.) (Furukawa '217, ¶ 10.) This electrical contact establishes a circuit

between the secure contact points 9 and 10 via anisotropic electro-conductive paths a and b of the pressure-sensitive variable resistor 1 and the electro-conductive layer 7 above it. (*Id.*)

Due to the pressure-sensitive characteristics of the pressure-sensitive variable resistor 1, varying the pressing force on the button will vary the electrical resistance, thereby generating variable electrical output in response to varying physical pressure on the button. When contact pressure is low, the variable resistor's resistance is high. (*Id.*) The resistance is reduced as the rubber key top 6 button is pressed down further and contact pressure is increased. (*Id.*)

Furukawa '217 discloses that with additional applied pressure to the button, the contact pressure between carbon powder particles is increased, establishing anisotropic conductivity between the electrodes and the electro conductive layer. (*Id.* at ¶ 9.) Thus, Furukawa '217 expressly discloses a sensor that changes conductivity based on pressure applied in a given direction. While this change in conductivity is accomplished through the same variable resistance material disclosed in Furukawa '760, Furukawa '217 makes clear that it is teaching variable-conductance based on applied pressure. (Furukawa '217, ¶ 8.)

Furukawa '217 further discloses using the pressure-sensitive variable-conductance switch in a computer keyboard to control "scroll rate, cursor moving speed, and character reaction speed in computer games . . . according to the intention of the user." (*Id.* at ¶ 11.) Because of the way in which computer keyboards are laid out, Furukawa '217 inherently discloses use of a single human finger as an input for this device.

Finally, as set forth in the discussion of Furukawa '760, above, applicant admits that most elastomeric injection molded dome caps produce a break-over threshold tactile

feedback to the finger of a user. ('886 Patent, Col. 1, lines 58-64.)[4] He further acknowledges that such switches are "well known and widely used in the prior art as switches incorporated in such common host devices as . . . controls for televisions and stereos, and in electronic game control devices such as game pads for Nintendo, Sony and Sega game consoles, and some computer keyboards." ('886 Patent, Col. 1, lines 20 – 25.) Furukawa '217 discloses employing its pressure-sensitive variable-conductance switch in the buttons of such devices. Thus, these buttons too would implicitly produce a break-over threshold tactile feedback to the finger of a user. Additionally, Furukawa '217 explicitly discloses that changes in resistance are accompanied by tactile feedback to the user, described as "operational feeling." (Furukawa '217, ¶ 5.) Thus, Furukawa '217 both implicitly and explicitly discloses tactile feedback to the finger of a user.

8. <u>The O'Mara Prior Art</u>

Use of pressure-sensitive variable-conductance material to generate variable analog output from a button on a controller for electronic games was disclosed in U.S. Pat. No. 5,510,812 to Kerry O'Mara et al., entitled "Piezoresistive Input Device," issued on April 23, 1996.

[4] The '886 Patent is a continuation-in-part of the same parent application to which the '997 Patent claims priority, and is the subject of a terminal disclaimer in the '997 Patent (see Exhibit 14).

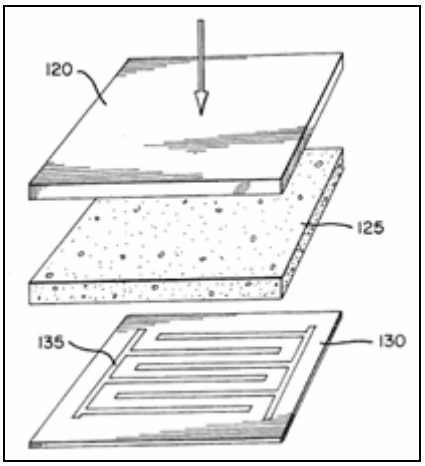

Fig. 14-Pressure-Sensitive Variable-Conductance Switch Disclosed by O'Mara

The O'Mara patent uses the term "piezoresistive" to refer to electrically conductive material with a resistance that varies with the amount of pressure applied—in other words—a pressure-sensitive variable-conductance material. (O'Mara, Col. 3, lines 44-50.) At the time of the O'Mara patent, pressure-sensitive variable-conductance material suitable for use in video game controllers was readily available from commercial suppliers. For example, "force sensitive resistors" were available commercially from Interlink Corp. (*Id*. at Col. 6, lines 34-42) and "conductive foam" was available from The Fredericks Company. (*Id*. at Col. 6, lines 42-47.)

O'Mara disclosed that a pushbutton on a video game controller could be constructed using pressure-sensitive variable-conductance material, as shown in Figure 6 of the patent (reproduced above in Fig. 14) (*Id*. at Col. 7, lines 46-50). Such a switch would simply be constructed utilizing a non-conductive plate or actuator 120, a conductive foam 125 and a base with a plurality of open circuit traces. (*Id*. at Col. 7, lines 27-35.) The electrical resistance (conversely the conductivity) of the conductive foam 125 varies with the pressure

applied to the plate 120. (*Id*. at Col. 7, lines 2-9, Col. 7, lines 27-51.)[5] The conductive foam thus provides an electrical path that bridges the interleaved open circuit traces 135 in which the conductivity varies with the pressure applied to the plate 125. (*Id*.) Accordingly, O'Mara disclosed a pressure-sensitive variable-conductance pushbutton for a game controller. (*Id*.)

O'Mara also disclosed a four-way rocker switch utilizing four pressure-sensitive sensors, located in a north-south-east-west orientation. (*Id*. at Col. 3, lines 10-58.) Pressure applied by a user's fingers to a rocker switch provides improved directional control over prior art rockers. (*Id*.) Each of the four piezoresistive sensors "provides an analog output related to the magnitude of the force applied to the element." (*Id*. at Col. 3, lines 50-52.) O'Mara thus disclosed a four-way rocker switch with pressure-sensitive variable-conductance sensor to provide directional input to control imagery of a video game that varies with the pressure applied by a fingertip. (*Id*. at Col. 3, lines 10-58.)

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[5] While applicant apparently claimed that the cited prior art (including O'Mara) lacked pressure-sensitive variable-conductance sensors, this is inaccurate. (See Exhibit 16, '997 Prosecution History, May 4, 2001 Interview Summary.) While O'Mara discloses variable resistance rather than variable conductivity, U.S. Patent 5,999,084 to Brad A. Armstrong, to which applicant filed a terminal disclaimer in the '997 Patent, includes a claim disclosing "pressure-sensitive variable-conductance material is variable in terms of electrical resistivity, the electrical resistivity of said pressure-sensitive analog variable-conductance material lowering with received force thereon." (Exhibit 24, U.S. Pat. No. 5,999,084 to Brad A. Armstrong (hereinafter, the "'084 Patent"), Claim 8, Col. 13, lines 36-39.) Thus, variable resistivity is a form of variable conductance.

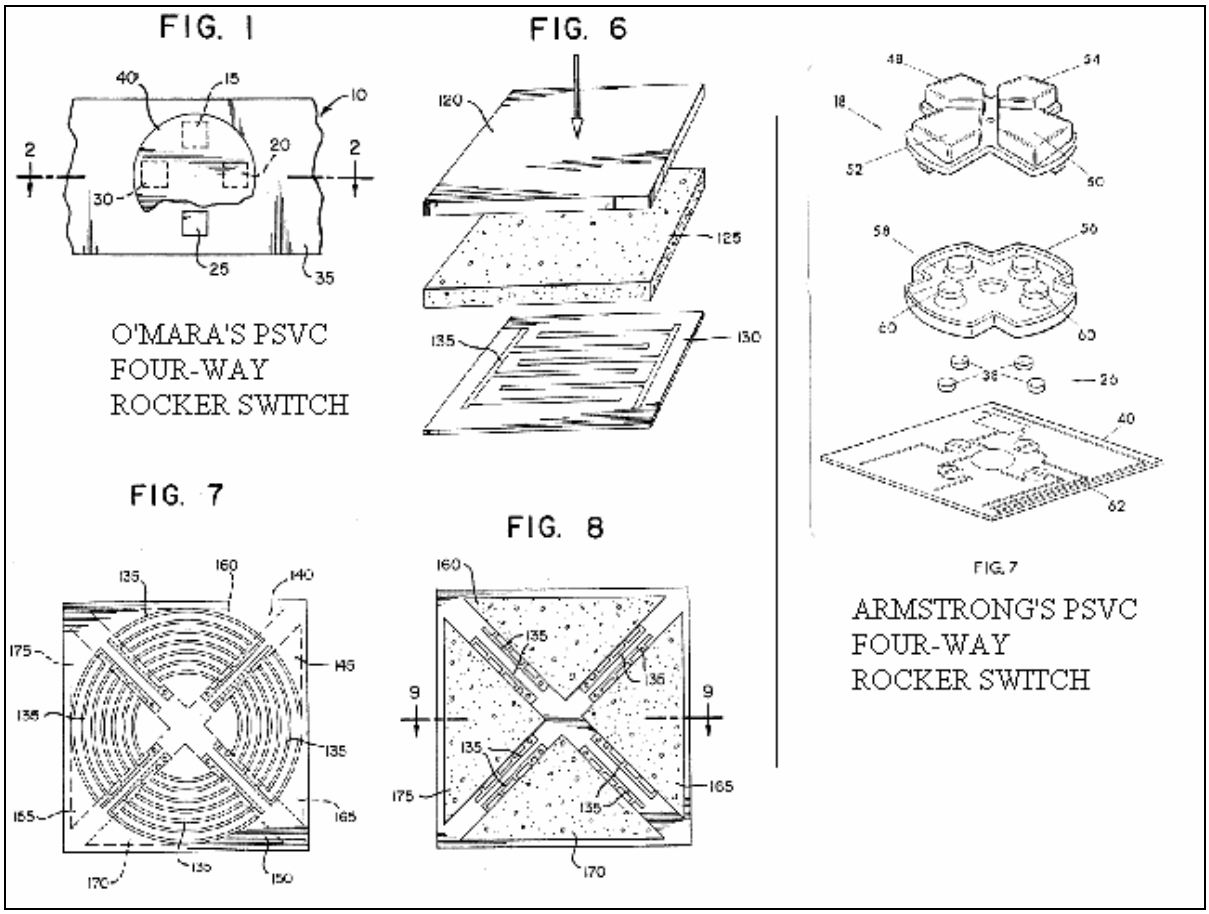

Fig. 15 – Comparison Between O'Mara's Pressure-Sensitive Variable-Resistance Four-Way Rocker Structure and Similar Structure Claimed In The '997 Patent

A comparison between the O'Mara pressure-sensitive variable-conductance button and the '997 Patent pressure-sensitive variable-conductance button (see Fig. 15, above) demonstrates similar structure and functionality between O'Mara (published in 1996) and the '997 Patent (applied for in 2000.) Both have a four-way rocker switch (O'Mara, Col. 3, lines 16 refers to it as a "directional control pad or disk") placed over four separate sets of circuit traces (*Compare* O'Mara, Fig. 1 *with* '997 Patent, Fig. 7); both have four separate pressure-sensitive variable-conductance elements (*compare* O'Mara, Figs. 6 and 8 *with* '997 Patent, Fig. 7) disposed over the four sets of circuit traces (*compare* O'Mara, Fig. 7 *with* '997 Patent, Fig. 7.)

Pressure applied to each of the four directions on the rocker switch in both embodiments will cause the pressure-sensitive variable-conductance material to contact circuit traces, creating an electrical connection whose resistance varies with varying pressure. (*Compare* O'Mara, Col. 3, lines 50 – 52 *with* '997 Patent, Col. 2, lines 5 – 8 and Col. 7, lines 52 – 55.) Both describe a pressure-sensitive switch in a video game controller with an analog output representational of the amount of pressure applied.

In sum, more than a year before the parent application for the '997 Patent was filed, more than four years before the '997 application itself was filed, and before the filing of any application to which priority is allegedly claimed, O'Mara disclosed a video game controller having pressure-sensitive variable-resistance material in buttons and a four-way rocker switch, providing analog output varying in relation to the physical pressure applied by a user's fingers on the switches/buttons.

9. The Padula Prior Art

U.S. Reissue Patent No. Re. 34,095, entitled "Digitizer Stylus with Pressure Transducer," issued to Michael Padula on October 13, 1992 (the original patent issued November 22, 1988). Padula discloses a stylus that uses a pressure-sensitive variable-conductance sensor to automatically activate the stylus when its tip is pressed against a digitizer tablet. (Padula, Abstract.)

As is shown in Padula's Figure 1, reproduced below, the stylus includes a pen refill 2 in-part within the stylus housing, but having a tip extending through a hole in the nose cap portion 6 of the housing. As shown in Figure 3 below, the opposite end of the pen refill 2 is received by a refill interface plug 12. A plunger 20 is located on the opposite side of the refill interface plug 12 from the pen refill 2, i.e., to the left of the refill interface plug 12 in Figure 3. A force sensitive resistant (FSR) transducer 26 is located to the left of the plunger

20. The FSR transducer includes a pressure-sensitive variable-conductance material with a resistance that decreases as pressure is increased. (Padula, Col. 8, lines 1-12.) Thus, when the tip of the pen refill 2 is pressed against a digitizer pad, it in turn presses against the refill interface plug 12, the plunger 20, and the FSR transducer 26 to vary the resistance of the FSR transducer, and thereby produce a variable output signal. (Padula, Col. 6, lines 26-44; Col. 8, lines 1-18.)

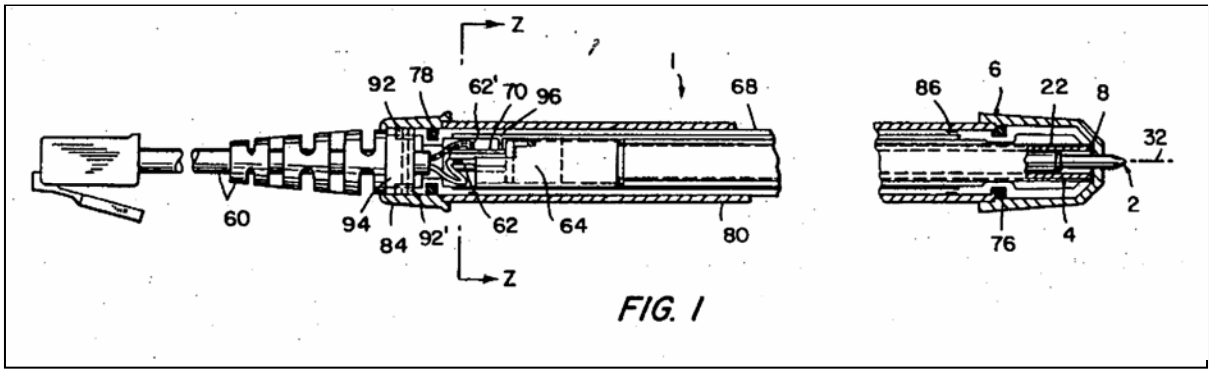

Fig. 16 – Padula's Stylus with a Pressure-Sensitive Variable-Conductance Sensor

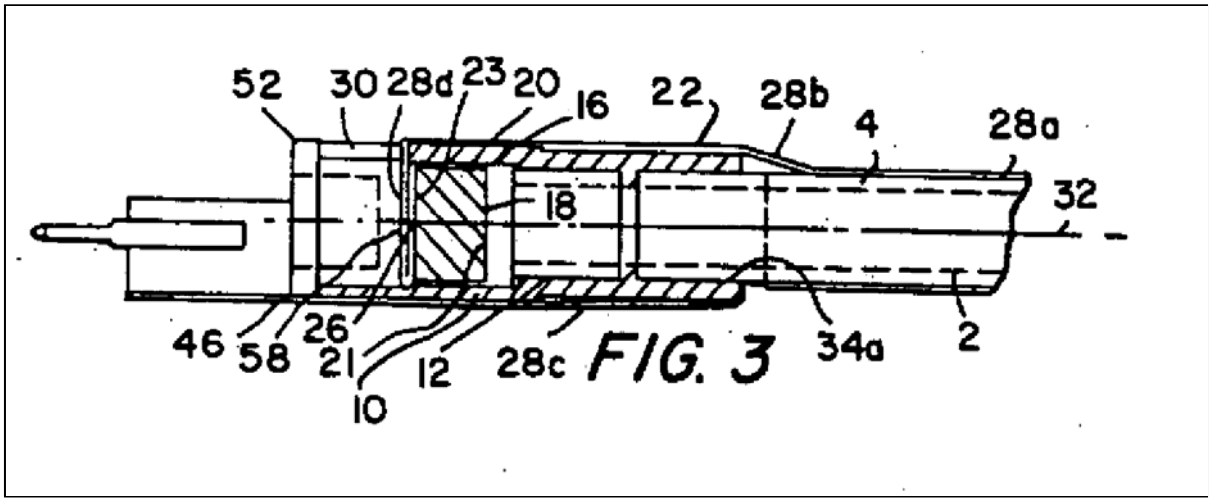

Fig. 17 – Padula's Variable-Resistance Sensor

Padula also refers to Figure 12 therein (reproduced below) to describe an embodiment that includes a snap-through dome cap located between the refill interface plug 12 and the plunger 20 to provide the user with a tactile feedback when the sensor is activated:

> FIG. 12 indicates another embodiment of a pressure transducer in which a layer 100 of flexible material, for example, a thin sheet of silver or other metal, formed with a dome 102 is positioned between, for example, the refill interface plug 12 and the plunger 20. The dome 102 is surrounded by a planar annular portion 106 which is seated on the radial end face of refill interface plug 12. When a predetermined pressing force is applied to the dome by refill interface plug 12 and plunger 20, the dome undergoes reversible collapse. The metal dome is designed so that the collapse of the bubble takes place at a pressure which is substantially equal to the pressure at which the processing of data from the stylus is enabled, as previously described. The ***snap action during collapse of the dome*** can be sensed by the stylus user, providing a definite tactile feedback indicating to the user that the digitizing apparatus has switched from the disabled state to the enabled state. When pressure is removed from the stylus tip, the dome snaps back to its original undeformed state, ready for the next operation.

(Padula, Col. 9, lines 12-32, emphasis added.)

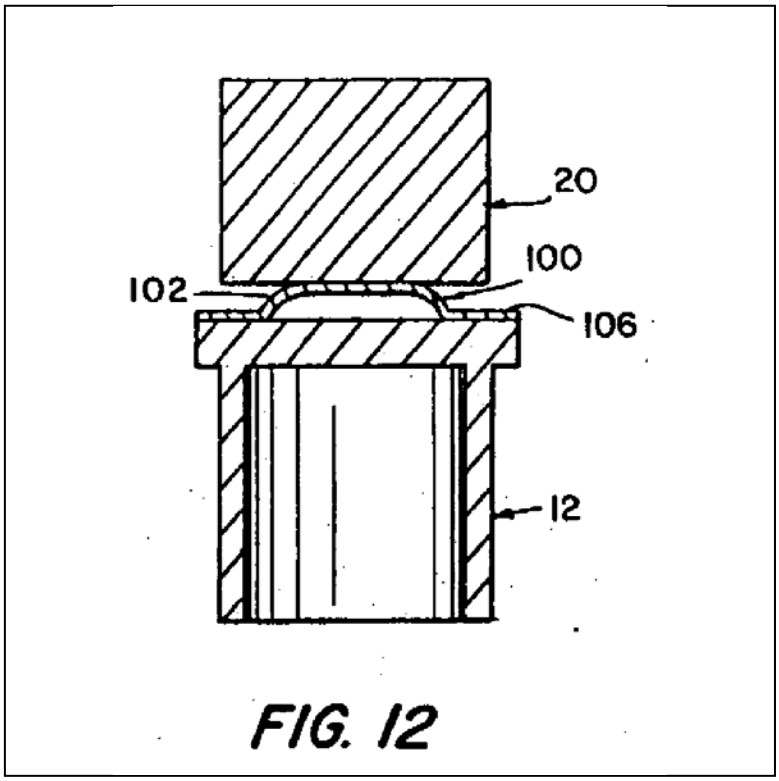

Fig. 18 – Padula's Metallic Snap-Through Dome Cap

Thus, Padula disclosed a pressure-sensitive variable-conductance sensor with snap-through metallic dome cap to provide tactile feedback years before the '997 Patent was filed.

10. The Mitsuhashi Prior Art

U.S. Pat. No. 4,766,271, entitled "Elastomer-Made Push Button Switch Covering Member," issued to Masayuki Mitsuhashi et al. on August 23, 1988. Mitsuhashi discloses that a metallic dome cap may be used within an operating switch to provide tactile feedback upon actuation of the switch.

11. The Himoto Prior Art

European Patent Application No. EP 0 835 676 A1, entitled "Multidirectional Operating Switch and Multidirectional Operating Apparatus Using the Same," was filed by Atsunori Himoto et al. on February 21, 1997 and was published on April 15, 1998. Himoto discloses providing vibration feedback to the user of a video game through the video game controller, in order to provide a more realistic gaming experience.

12. The Thorner Prior Art

U.S. Pat. No. 5,669,818, entitled "Seat-Based Tactile Sensation Generator," issued to Craig Thorner et al. on September 23, 1997. Thorner discloses utilizing a motor and shaft with an offset weight attached thereto as a system for providing vibration tactile feedback to the user of a video game.

D. The References Alone And In Combination Raise Substantial New Questions Of Patentability

1. The Majority Of The References In This Request Were Either Uncited Or Not Relied Upon By The Examiner

Matsumoto, Kawashima, Furukawa '217, Padula, Mitsuhashi, Himoto and Thorner were neither cited in the record by the Examiner nor cited by applicant during prosecution of the '997 Patent application. While Kramer and Furukawa '760 were cited in the record, they were not relied on by the Examiner, and it is not clear to what extent the Examiner considered them.

The Patent Office did consider and rely on Inoue as part of an obviousness analysis in initially rejecting the parent application to the '997 Patent. However, Inoue was neither relied upon in the context of the other references in this Request during prosecution of the parent application, nor was it cited during prosecution of the '997 Patent application.

The Examiner did rely on O'Mara in view of various references not included in this Request in rejecting all of applicant's original claims in the '997 Patent for obviousness. However, those claims were all cancelled by applicant. It is not clear to what extent the Examiner considered O'Mara for its features as a pressure-sensitive variable-conductance analog sensor after applicant claimed following the Examiner's initial rejection of applicant's claims that the prior art lacked for pressure-sensitive variable-conductance analog sensors. (*See* Section III.B.2., above.)

2. The Prior Art (Both Cited And Uncited) Discloses Those Features Applicant Claimed Constituted His Invention

a) The Very Art The Examiner Cited In Rejecting Applicant's Original Claims Disclosed The "Pressure-Sensitive Variable Conductance" Feature Applicant Apparently Indicated the Prior Art Lacked

O'Mara, which was cited by the Examiner in his rejection of all of applicant's original claims, specifically discloses pressure-sensitive variable-conductance controls. As acknowledged by the Examiner, O'Mara discloses "controlling data on a screen (including game data) . . . generating a signal for a display device, the signal being proportional to the pressure applied." (Exhibit 15, '997 Prosecution History, March 15, 2001 Office Action Summary, pg. 5.) The method by which O'Mara generates a signal for a display device, and thus controls data on a screen, is through the use of piezoresistive (variable resistance) materials to vary imagery based on analog output relating to the pressure applied to a button or other input device through a single finger of a user. (O'Mara, Col. 2, lines 27-42.)

Similarly, Furukawa ‘760 and Kramer, cited by applicant but not relied upon by the Examiner, disclose the very variable-conductance controls the applicant indicated were lacking in the prior art and on the basis of which the Examiner granted the patent. Additionally, several other references, including Matsumoto, Kawashima, and Furukawa ‘217 disclose this same feature. This demonstrates that the prior art did not lack for pressure-sensitive variable-conductance analog sensor controls at the time Mr. Armstrong filed the application underlying the ‘997 Patent.

b) Numerous Prior Art References Disclose Tactile Feedback Associated With A Pressure-Sensitive Variable-Conductance Analog Sensor, The Other Feature Or Combination Applicant Claimed Was Novel

In seeking to respond to Examiner’s statement that the ‘997 Patent’s claim 54 (and therefore its dependents) lacked for patentable material, applicant claimed that the prior art did not include “the claimed tactile feedback.” To the contrary, numerous references cited to the Examiner included this tactile feedback in a pressure-sensitive variable-conductance sensor, including O’Mara, Furukawa ‘760, and Kramer. Uncited references Furukawa ‘217, Matsumoto and Padula similarly disclose such tactile feedback.

In fact, the applicant himself admitted that tactile feedback existed in prior art game controllers: In the specification for the ‘886 Patent, for which applicant filed a terminal disclaimer during prosecution of the ‘997 patent, applicant admits that “most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced.” (‘886 Patent, Col. 1, lines 58-64.)

The prior art references contained herein, coupled with applicant's own admissions, demonstrate the presence of pressure-sensitive variable-conductance game controllers offering tactile feedback in the art at the time that applicant claimed that this combination constituted his invention.

Additionally, means for providing active tactile feedback, other than rubber elastomeric dome caps to users in video games, either through the use of metallic dome caps, or through vibration means such as a motor and offset weight, was previously disclosed in the Mitsuhashi, Himoto and Thorner references.

c) The Furukawa '760 Reference Has Already Formed The Basis For A Final Rejection Of Claims Similar To Those In The '997 Patent, Which Were Subsequently Abandoned by Applicant

While Furukawa '760 was never relied upon during prosecution of the '997 Patent application, it was later considered by the Patent Office in rejecting claims similar to those found in the '997 Patent.

On December 21, 2001, Mr. Armstrong filed U.S. Utility Appl. Num. 10/028,071 (the "'071 Application"), a continuation in-part application claiming priority for common matter to the '802 Patent application, the same application to which the '997 Patent claims priority. In Office Actions dated March 11, 2002 and October 31, 2002, the latter constituting a final rejection, the Examiner cited Furukawa '760, along with other references as rendering obvious numerous claims in that patent which were similar to those contained in the '802 Patent. Specifically, Examiner found that "[Furukawa] discloses a pressure-sensitive analog sensor that produces a signal proportional to the pressure applied to the sensor." (Exhibit 25, '071 Application, March 11, 2002 Office Action, p. 3.) Subsequently, applicant abandoned the '071 application.

3. Applicant's Priority Claims Are Improper As To Claims 32 through 37 - The Only Claims Addressed In This Request

a) Applicant Is Not Entitled To Claim Priority To The '802 Patent For "Tactile Feedback"

The '997 Patent claims priority to the '802 Patent application as a continuation-in-part. Without acknowledging that the '997 Patent is entitled to claim priority for any of its claims, at least claims 32-37 are not entitled to claim priority to the '802 Patent application, because they are not "supported" by the earlier application in the manner required by 35 U.S.C. §§ 112 and 120.

Claim 32 and its dependent claims 33 through 37 of the '997 Patent require "means for providing tactile feedback to the finger." ('997 Patent, Col. 14, line 33.) The '802 Patent application makes no mention of tactile feedback and does not specifically disclose any means for providing tactile feedback to the finger. For at least this reason, claims 32-37 (the only claims forming the subject of this reexamination) are not entitled to claim priority to the '802 Patent.

Therefore, while the majority of prior art cited in this request would qualify as prior art regardless of any priority claim, even those few patents (namely the Himoto and Thorner references) which were issued after the '802 Patent application was filed will not be disqualified as prior art on the basis of the '802 Patent's filing date, because claims 32-37 are not entitled to claim priority to the '802 Patent.

b) Applicant Also Is Not Entitled To Claim Priority To The '525[6] Patent For "Active Tactile Feedback"

Applicant also claims priority to and incorporates by reference the '525 Patent for its discussion of "pressure-sensitive analog sensors with break-over and active tactile feedback and the like described therein." ('997 patent, Col. 5, lines 6-9.) Applicant includes "means for active tactile feedback" as a specific limitation in claims 34 and 36 of the '997 Patent. However, a detailed review of the '525 Patent reveals no disclosure of a specific means for providing active tactile feedback sufficient to support such a claim limitation pursuant to 35 U.S.C. § 112. Therefore, for at least claims 34 and 36, Applicant is not entitled to claim priority to the '525 Patent, or to any priority date before May 10, 2000, the date the '997 patent application was filed.

Therefore, the Himoto and Thorner references, despite being published after the date that the '525 Patent application was filed, are nonetheless prior art for claims 34 and 36, as applicant is not entitled to claim the '525 Patent application's priority date for at least these claims. Indeed, claims 34 and 36 are not entitled to any priority date before May 10, 2000, the date that the '997 Patent application was filed. For this reason, the Himoto and Thorner references may be used as 102(b) references against at least the '997 Patent's claims 34 and 36.

c) All Prior Art Cited In This Request Predates The Applications Forming The Basis For Applicant's Remaining Priority Claims

Applicant also attempts to claim priority to a number of other provisional and non-provisional patent applications. However, the earliest of these (other than those mentioned

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[6] Enclosed is U. S. Patent No. 6,222,525 to Brad A. Armstrong as Exhibit 23.

above) was filed on October 6, 1998, and postdates the latest prior art reference cited in this request. For this reason, none of applicant's alleged claims of priority would be early enough to avoid any of the prior art cited in this request.

4. The References Alone, And In Combination, Raise Substantial Questions Of Patentability Under Sections 102 and 103

The Matsumoto, Kawashima, Kramer, Inoue, Furukawa '760, Furukawa '217, O'Mara, Mitsuhashi and Padula references were each published before the filing of any patent application to which the '997 Patent claims priority. The remaining references were issued or published more than one year before the '997 patent application was filed.

Furukawa '760, Furukawa '217, Matsumoto, Kawashima, Kramer and O'Mara each disclose the use of pressure-sensitive variable-conductance analog sensors to generate a varying analog electrical signal in proportion to the pressure applied. Furukawa '760, Kawashima and O'Mara specifically disclose the use of this pressure-sensitive variable-conductance sensor technology in video game controllers, while Furukawa '217 and Kramer more generically describe its use in a remote keyboard for an electronic entertainment appliance. Each of these could be considered a "device for controlling imagery."

Additionally, Matsumoto, Kramer, Furukawa '760, Furukawa '217, O'Mara and Padula all disclose pressure-sensitive variable conductance switches and/or sensors with structures that either are explicitly given as providing tactile feedback or would inherently provide tactile feedback to the user. Four of the above six references disclose employing this structure in a game controller or related entertainment electronics device. Additional references, including Mitsuhashi, Himoto, and Thorner, disclose alternative means for providing tactile feedback which might be considered active tactile feedback.

As set forth above, and explained in more detail below, these features applicant claimed were novel aspects of his alleged invention were all well-known in the art by the time that the later-filed '997 Patent claimed a device for controlling imagery with pressure-sensitive variable-conductance sensors. Accordingly, a reasonable Examiner would consider these references important in determining patentability of the '997 Patent claims. As shown in more detail below, the Matsumoto, Kawashima, Kramer, Inoue, Furukawa '760, Furukawa '217, O'Mara, Padula, Mitsuhashi, Himoto and Thorner references render claims 32 through 37 of the '997 patent invalid under sections 102 and 103.

IV. THE REFERENCES AS APPLIED TO '997 PATENT CLAIMS 32-37 RAISE SUBSTANTIAL NEW QUESTIONS OF PATENTABILITY

The Matsumoto, Kawashima, Kramer, Inoue, Furukawa '760, Furukawa '217, and O'Mara references raise substantial new questions of patentability for claims 32-37 of the '997 patent for the reasons identified in the following sections, and in the appendices referenced therein.

A. Rejections Under 35 U.S.C. 102(b)[7]

The following is a quotation of 35 U.S.C. § 102(b), which forms the basis for all anticipation rejections:

> A person shall be entitled to a patent unless . . . .
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States . . . .

1. Furukawa '760

Claims 32-37 of the '997 Patent are anticipated by **Furukawa '760**. Furukawa '760 discloses a device for controlling video game imagery with multiple pressure-sensitive

[7] The relied upon references may be prior art under other provisions of Section 102 as well.

variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. The pressure-sensitive variable resistance device comprises a dome cap button which is capable of providing tactile feedback to the finger. Furukawa '760 discloses that the use of these buttons is not limited to any particular location, and claims the use of such a pressure-sensitive button in any location.

A claim chart that provides the specific applicability of Furukawa '760 to each element of the claims is provided in Appendix A.

2. O'Mara

Claims 32 and 33 of the '997 Patent are anticipated by **O'Mara**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device.

A claim chart that provides the specific applicability of O'Mara to each element of the claims is provided in Appendix B.

3. Furukawa '217

Claims 32-37 of the '997 Patent are anticipated by **Furukawa '217**. Furukawa '217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to operational feeling from applied force, as a result of anisotropic conductivity, and causes representative varying of imagery. A dome-cap shaped structure also provides operational feeling to the operator applying pressure with a fingertip.

Furukawa '217 discloses that these sensors may be placed in scroll keys on a computer keyboard, which are well-known to be in the right-hand side of a keyboard controller, and which may be operated by either a user's thumb or fingers.

A claim chart that provides the specific applicability of Furukawa '217 to each element of the claims is provided in Appendix C.

B. Rejections Under 35 U.S.C. 103

The following is a quotation of 35 U.S.C. § 103(a), which forms the basis of all obviousness rejections:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Furukawa '760

Claims 32-37 of the '997 Patent are obvious over **Furukawa '760**. Furukawa '760 generically describes pressure-sensing switches activated by pressing with a fingertip for video game controllers without limitation as to location. Furukawa includes one embodiment in which it describes four separate pressure-sensitive sensors on the left hand side of the controller, but explains that the invention is not limited to this. Having a pressure-sensitive button on the right hand area is an obvious variation of Furukawa '760 because mere rearrangement of the location of switches would be an obvious design choice (*See* MPEP § 2144.04.VI.C.) requiring no technological insight. *See Dystar Textilefarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). Having such switches activated by a thumb is inherent in the controller disclosed in Furukawa '760. (*See*

MPEP § 2112. ("The express, implicit, and inherent disclosure of a prior art reference may be relied up on in the rejection of claims under 35 U.S.C. § 102 or 103."))

A claim chart that provides the specific applicability of Furukawa '760 to each element of the claims is provided in Appendix A.

2. Furukawa '760 In View Of Kramer

Claims 32-37 of the '997 Patent are obvious over **Furukawa '760 in view of Kramer**. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Kramer discloses the use of a dome cap providing tactile feedback to the finger in association with pressure-sensitive variable-conductance sensors. Kramer discloses the use of a snap-through break-over threshold tactile feedback dome cap as part of a pressure-sensitive variable-conductance sensor as an improvement on existing controllers entertainment electronics. It would have been obvious to combine Furukawa '760 and Kramer because of the nature of the problem to be solved: a person seeking to design a pressure-sensitive variable-conductance switch for varying imagery that included tactile feedback would have looked at known pressure-sensitive switches with the necessary properties.

The specific applicability of Furukawa '760 combined with Kramer to each element of the claims is provided in a claim chart in Appendix A.

3. Furukawa '760 In View Of Mitsuhashi

Claims 34 and 36 are obvious over **Furukawa '760 in view of Mitsuhashi**. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Mitsuhashi describes

the use of a metallic dome cap structure to provide a high click ratio and active tactile feedback. It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '760, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and Furukawa '760 disclosed such a rubber-push-button switch.

The specific applicability of Furukawa '760 combined with Mitsuhashi to each element of the claims is provided in a claim chart in Appendix A.

4. Furukawa '760 In View Of Padula

Claims 34 and 36 are obvious over **Furukawa '760 in view of Padula**. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Padula discloses the use of a metallic dome cap providing tactile feedback to the finger in association with pressure-sensitive variable-conductance sensors. It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in Furukawa '760, because Padula describes improvements to pressure-sensitive switches, and Furukawa '760 disclosed a pressure-sensitive switch.

The specific applicability of Furukawa '760 combined with Padula to each element of the claims is provided in a claim chart in Appendix A.

5. Furukawa '760 In View Of Himoto

Claims 34 and 36 are obvious over **Furukawa '760 in view of Himoto**. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from

the sensors and causes representative varying of imagery. Himoto discloses incorporating a vibration unit in a video game controller to provide an active tactile feedback to the finger of a user. It would have been obvious to combine Himoto with Furukawa '760, because both Himoto and Furukawa '760 describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller.

The specific applicability of Furukawa '760 combined with Himoto to each element of the claims is provided in a claim chart in Appendix A.

6. Furukawa '760 In View Of Thorner

Claims 34 and 36 are obvious over **Furukawa '760 in view of Thorner**. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Thorner discloses that a localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight. It would have been obvious to combine Thorner with Furukawa '760, because Thorner describes adding vibration tactile feedback to existing video game systems and Furukawa '760 was an existing video game system.

The specific applicability of Furukawa '760 combined with Thorner to each element of the claims is provided in a claim chart in Appendix A.

7. Furukawa '760 In View Of Kramer And Inoue

Claim 37 of the '997 Patent is obvious over **Furukawa '760 in view of Kramer and Inoue**. It would have been obvious to combine Furukawa '760 and Kramer as described above. Inoue discloses a specific video game controller which uses numerous individual

buttons, including buttons on the right side of the controller, to cause representative varying of imagery. It would have been obvious to combine Inoue with Furukawa '760 and Kramer because a person seeking to design an improved device for varying imagery, such as a video game controller, would necessarily look at the structure of existing similar devices for varying imagery. It would have been obvious, therefore, to combine the teachings of Furukawa '760 and Kramer in the particular layout of Inoue.

The specific applicability of Furukawa '760 combined with Kramer and Inoue to each element of the claim is provided in a claim chart in Appendix A.

8. O'Mara

Claims 32 and 33 of the '997 Patent are obvious over **O'Mara**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device.

A claim chart that provides the specific applicability of O'Mara to each element of the claims is provided in Appendix B.

9. O'Mara In View Of Kramer

Claims 32-37 of the '997 Patent are obvious over **O'Mara in view of Kramer**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device. Kramer discloses a break over threshold tactile feedback pressure-sensitive variable resistance sensor for use in an entertainment electronics keyboard

to provide improved tactile feedback to the finger of the user upon actuation of analog control. It would have been obvious to combine O'Mara and Kramer because O'Mara and Kramer each describe improvements to existing entertainment electronics devices/controllers employing analog output. It would have been obvious, therefore, to combine the teachings of Kramer and O'Mara to provide a pressure-sensitive variable-conductance analog input device for controlling imagery that had pressure-sensitive sensors and tactile feedback.

The specific applicability of O'Mara combined with Kramer to each element of the claims is provided in a claim chart in Appendix B.

10. O'Mara In View Of Mitsuhashi

Claims 34 and 36 are obvious over **O'Mara in view of Mitsuhashi**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device. Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and active tactile feedback. It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in O'Mara, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and O'Mara disclosed such a rubber-push-button switch.

The specific applicability of O'Mara combined with Mitsuhashi to each element of the claims is provided in a claim chart in Appendix B.

11. O'Mara In View Of Padula

Claims 34 and 36 are obvious over **O'Mara in view of Padula**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device. Padula discloses the use of a metallic dome cap providing tactile feedback to the finger in association with pressure-sensitive variable-conductance sensors. It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in O'Mara, because Padula describes improvements to pressure-sensitive switches, and O'Mara disclosed a pressure-sensitive switch.

The specific applicability of O'Mara combined with Padula to each element of the claims is provided in a claim chart in Appendix B.

12. O'Mara In View Of Himoto

Claims 34 and 36 are obvious over **O'Mara in view of Himoto**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device. Himoto discloses incorporating a vibration unit in a video game controller to provide an active tactile feedback to the finger of a user. It would have been obvious to combine Himoto with O'Mara, because both Himoto and O'Mara describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller.

The specific applicability of O'Mara combined with Himoto to each element of the claims is provided in a claim chart in Appendix B.

13. O'Mara In View Of Thorner

Claims 34 and 36 are obvious over **O'Mara in view of Thorner**. O'Mara discloses use of pressure-sensitive variable-conductance analog sensors connected to circuitry which reads from the sensors varying analog values related to changing resistance based on applied force, and causes representative varying of imagery in a device for controlling imagery. O'Mara also discloses that a pad and spring provide mechanical resistance or "feel" to the device. Thorner discloses that a localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight. It would have been obvious to combine Thorner with O'Mara, because Thorner describes adding vibration tactile feedback to existing video game systems and O'Mara was an existing video game system.

The specific applicability of O'Mara combined with Thorner to each element of the claims is provided in a claim chart in Appendix B.

14. O'Mara In View Of Kramer And Inoue

Claim 37 of the '997 Patent is obvious over **O'Mara in view of Kramer and Inoue**. It would have been obvious to combine O'Mara and Kramer as described above. Inoue discloses a specific video game controller which uses numerous individual buttons, including buttons on the right side of the controller, to cause representative varying of imagery. It would have been obvious to combine O'Mara and Kramer with Inoue because O'Mara and Kramer each describe improvements to existing entertainment electronics devices/ controllers and Inoue was one such device/controller. It would have been obvious, therefore, to combine the teachings of Kramer and O'Mara in the particular layout of Inoue.

The specific applicability of O'Mara combined with Kramer and Inoue to each element of the claims is provided in a claim chart in Appendix B.

15. Furukawa '217

Claims 32-37 of the '997 Patent are obvious over **Furukawa '217.** Furukawa '217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to operational feeling from applied force, as a result of anisotropic conductivity, and causes representative varying of imagery. A dome-cap shaped structure also provides operational feeling to the operator applying pressure with a fingertip. Furukawa '217 discloses that these sensors may be placed in scroll keys on a computer keyboard, which are well-known to be in the right-hand side of a keyboard controller, and which may be operated by either a user's thumb or fingers. Having a pressure-sensitive button on the right hand area is an obvious variation of Furukawa '217 because mere rearrangement of the location of switches would be an obvious design choice (*See* MPEP § 2144.04.VI.C.) requiring no technological insight. *See Dystar Textilefarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). Having such switches activated by a thumb is inherent in the controller disclosed in Furukawa '217. (*See* MPEP § 2112 ("The express, implicit, and inherent disclosure of a prior art reference may be relied up on in the rejection of claims under 35 U.S.C. § 102 or 103.”))

A claim chart that provides the specific applicability of Furukawa '217 to each element of the claims is provided in Appendix C.

16. Furukawa '217 In View Of Matsumoto

Claims 32-37 of the '997 Patent are obvious over **Furukawa '217 in view of**

Matsumoto. Furukawa ‘217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to operational feeling from applied force, as a result of anisotropic conductivity, and causes representative varying of imagery. A dome-cap shaped structure also provides operational feeling to the operator applying pressure with a fingertip. Matsumoto discloses a break over threshold tactile feedback pressure-sensitive variable resistance sensor. It would have been obvious to combine Matsumoto with Furukawa ‘217 due to the nature of the problem to be solved: one looking to employ a pressure-sensitive variable resistance switch in a display controller, such as the one disclosed in Furukawa ‘217, would necessarily have looked to existing pressure-sensitive variable resistance switches with desirable properties, such as tactile feedback. Matsumoto disclosed just such a switch. Thus it would have been obvious to combine the two references.

The specific applicability of Furukawa ‘217 combined with Matsumoto to each element of the claims is provided in a claim chart in Appendix C.

17. Furukawa ‘217 In View Of Kramer

Claims 32-37 of the ‘997 Patent are obvious over **Furukawa ‘217 in view of Kramer.** Furukawa ‘217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to applied force, and causes representative varying of imagery. A dome-cap shaped rubber contact structure also provides operational feeling to the operator applying pressure with a fingertip. Kramer discloses a break over threshold tactile feedback pressure-sensitive variable resistance analog sensor utilizing a dome cap in an

entertainment electronics keyboard to provide improved tactile feedback to the finger of the user upon actuation of analog control. It would have been obvious to combine Furukawa '217 and Kramer because of the nature of the problem to be solved: namely, to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics. Because both Furukawa '217 and Kramer are similar input devices for entertainment electronics, it would be obvious to combine them to solve the problem.

The specific applicability of Furukawa '217 combined with Kramer to each element of the claims is provided in a claim chart in Appendix C.

18. Furukawa '217 In View Of Mitsuhashi

Claims 34 and 36 are obvious over **Furukawa '217 in view of Mitsuhashi**. Furukawa '217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to applied force, and causes representative varying of imagery. A dome-cap shaped rubber contact structure also provides operational feeling to the operator applying pressure with a fingertip. Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and active tactile feedback. It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '217, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and Furukawa '217 disclosed such a rubber-push-button switch.

The specific applicability of Furukawa '217 combined with Mitsuhashi to each element of the claims is provided in a claim chart in Appendix C.

19. Furukawa '217 In View Of Padula

Claims 34 and 36 are obvious over **Furukawa '217 in view of Padula**. Furukawa '217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to applied force, and causes representative varying of imagery. A dome-cap shaped rubber contact structure also provides operational feeling to the operator applying pressure with a fingertip. Padula discloses the use of a metallic dome cap providing tactile feedback to the finger in association with pressure-sensitive variable-conductance sensors. It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in Furukawa '217, because Padula describes improvements to pressure-sensitive switches, and Furukawa '217 disclosed a pressure-sensitive switch.

The specific applicability of Furukawa '217 combined with Padula to each element of the claims is provided in a claim chart in Appendix C.

20. Furukawa '217 In View Of Himoto

Claims 34 and 36 are obvious over **Furukawa '217 in view of Himoto**. Furukawa '217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to applied force, and causes representative varying of imagery. A dome-cap shaped rubber contact structure also provides operational feeling to the operator applying pressure with a fingertip. Himoto discloses incorporating a vibration unit in a video game controller to provide an active tactile feedback to the finger of a user. It would have been

obvious to combine Himoto with Furukawa ‘217, because both Himoto and Furukawa ‘217 describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller.

The specific applicability of Furukawa ‘217 combined with Himoto to each element of the claims is provided in a claim chart in Appendix C.

21. Furukawa ‘217 In View Of Thorner

Claims 34 and 36 are obvious over **Furukawa ‘217 in view of Thorner**. Furukawa ‘217 discloses use of pressure-sensitive variable-conductance analog sensors in a device for controlling imagery, connected to circuitry which reads varying analog values from the sensors based on changes in resistance through a structure providing anisotropic conductivity corresponding to applied force, and causes representative varying of imagery. A dome-cap shaped rubber contact structure also provides operational feeling to the operator applying pressure with a fingertip. Thorner discloses that a localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight. It would have been obvious to combine Thorner with Furukawa ‘217, because Thorner describes adding vibration tactile feedback to existing video game systems and Furukawa ‘217 was an existing video game system.

The specific applicability of Furukawa ‘217 combined with Thorner to each element of the claims is provided in a claim chart in Appendix C.

22. Furukawa ‘217 In View Of Matsumoto And Kramer

Claims 35 through 37 of the ‘997 Patent are obvious over **Furukawa ‘217 in view of Matsumoto and Kramer**. It would have been obvious to combine Furukawa ‘217 and

Matsumoto as described above. Kramer discloses a break over threshold tactile feedback pressure-sensitive variable resistance sensor utilizing a dome cap in an entertainment electronics keyboard to provide improved tactile feedback to the finger of the user upon actuation of analog control. It would have been obvious to combine Furukawa '217 and Matsumoto with Kramer because of the nature of the problem to be solved: namely to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics. Because Furukawa '217, Matsumoto and Kramer are similar pressure-sensitive input devices for entertainment electronics, it would be obvious to combine them to solve the problem.

The specific applicability of Furukawa '217 combined with Matsumoto and Kramer to each element of the claim is provided in a claim chart in Appendix C.

23. Kawashima In View Of Matsumoto

1) Claim 32 of the '997 patent is obvious over **Kawashima in view of Matsumoto**. Kawashima discloses the use of a pressure-sensitive variable resistance analog switch in a game control device for varying imagery. Kawashima was also a named inventor on the earlier-filed Matsumoto patent application, which discloses a pressure-sensitive variable resistance switch providing active tactile feedback upon actuation and subsequent variable resistance based on applied pressure from a finger. It would be obvious to employ the pressure-sensitive switch disclosed in Matsumoto in the game control of Kawashima to provide useful tactile feedback upon actuation of the pressure-sensitive switch disclosed therein.

The specific applicability of Kawashima combined with Matsumoto to each element of the claim is provided in a claim chart in Appendix D.

24. Kawashima In View Of Furukawa '760

Claims 32-37 of the '997 patent are obvious over **Kawashima in view of Furukawa '760.** Kawashima discloses the use of a pressure-sensitive variable resistance analog switch in a game control device for varying imagery. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Furukawa '760 also discloses a dome cap-type device that is structured to provide tactile feedback to the finger of the user. It would have been obvious to combine Furukawa '760 with Kawashima because of the nature of the problem to be solved: a person seeking to design a pressure-sensitive variable-conductance switch for varying imagery that included tactile feedback would have looked at known pressure-sensitive variable-conductance analog switches with the necessary properties employed in controllers for varying imagery to solve the problem.

The specific applicability of Kawashima combined with Furukawa '760 to each element of the claims is provided in a claim chart in Appendix D.

25. Kawashima In View Of Kramer

Claims 32-36 of the '997 Patent are obvious over **Kawashima in view of Kramer**. Kawashima discloses the use of a pressure-sensitive variable resistance analog switch in a game control device for varying imagery. Kramer discloses a break over threshold tactile feedback pressure-sensitive variable resistance sensor for use in an entertainment electronics keyboard to provide improved tactile feedback to the finger of the user upon actuation of analog control. It would have been obvious to combine Kawashima and Kramer because Kawashima and Kramer each describe improvements to existing entertainment electronics devices/controllers employing analog output. It would have been obvious, therefore, to

combine the teachings of Kawashima and Kramer to provide a pressure-sensitive variable-conductance analog input device for controlling imagery that had pressure-sensitive sensors and tactile feedback.

The specific applicability of Kawashima combined with Kramer to each element of the claims is provided in a claim chart in Appendix D.

26. Kawashima In View Of Himoto

Claims 34 and 36 are obvious over **Kawashima in view of Himoto**. Kawashima discloses the use of a pressure-sensitive variable resistance analog switch in a game control device for varying imagery. Himoto discloses incorporating a vibration unit in a video game controller to provide an active tactile feedback to the finger of a user. It would have been obvious to combine Himoto with Kawashima, because both Himoto and Kawashima both describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller.

The specific applicability of Kawashima combined with Himoto to each element of the claims is provided in a claim chart in Appendix D.

27. Kawashima In View Of Thorner

Claims 34 and 36 are obvious over **Kawashima in view of Thorner**. Kawashima discloses the use of a pressure-sensitive variable resistance analog switch in a game control device for varying imagery. Thorner discloses employing a motor and offset weight to provide an active vibration tactile feedback to a user playing a video game. It would have been obvious to combine Thorner with Kawashima, because Thorner describes adding vibration tactile feedback to existing video game systems and Kawashima was an existing video game system.

The specific applicability of Kawashima combined with Thorner to each element of the claims is provided in a claim chart in Appendix D.

28. Kawashima In View Of Matsumoto And Padula

Claims 34 and 36 of the '997 patent are obvious over **Kawashima in view of Matsumoto and Padula**. It would have been obvious to combine Kawashima and Matsumoto as described above. Padula discloses using a metallic dome cap in a pressure-sensitive variable-conductance analog sensor system to provide tactile feedback to the user. It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch and electro-conductive curved plate disclosed in Matsumoto, because Padula describes using metallic dome caps in pressure-sensitive switches to improve tactile feedback, and Matsumoto disclosed achieving similar improvements to tactile feedback by installing an electro-conductive curved plate. One wishing to improve tactile feedback, as disclosed in Padula, would consider substituting one structure (the electro-conductive plate) for another (a metallic dome cap) to achieve the desired results.

The specific applicability of Kawashima combined with Matsumoto and Padula to each element of the claims is provided in a claim chart in Appendix D.

29. Kawashima In View Of Furukawa '760 And Mitsuhashi

Claims 34 and 36 of the '997 patent are obvious over **Kawashima in view of Furukawa '760 and Mitsuhashi**. It would have been obvious to combine Kawashima and Furukawa '760 as described above. Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and active tactile feedback. It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '760, because Mitsuhashi describes replacing rubber-made push-button switches in game controllers with metallic "diaphragm" dome caps to

improve tactile feedback, and Kawashima and Furukawa '760 discloses placing rubber push-button switches in game controllers.

The specific applicability of Kawashima combined with Furukawa '760 and Mitsuhashi to each element of the claims is provided in a claim chart in Appendix D.

30. Kawashima In View Of Matsumoto And Furukawa '760

Claims 32-37 of the '997 patent are obvious over **Kawashima in view of Matsumoto and Furukawa '760.** It would have been obvious to combine Kawashima and Matsumoto as described above. Furukawa '760 discloses a device for controlling video game imagery with pressure-sensitive variable-conductance analog sensors connected to circuitry which reads varying analog values from the sensors and causes representative varying of imagery. Furukawa '760 also discloses a dome cap-type device that is structured to provide tactile feedback to the finger of the user. It would have been obvious to combine Furukawa '760 with Kawashima and Matsumoto because of the nature of the problem to be solved: a person seeking to design a pressure-sensitive variable-conductance switch for varying imagery with tactile feedback, as disclosed in Matsumoto, would have looked at known pressure-sensitive variable-conductance analog switches with the necessary properties and existing controllers for varying imagery employing such pressure-sensitive variable-conductance analog switches.

The specific applicability of Kawashima combined with Matsumoto and Furukawa '760 to each element of the claims is provided in a claim chart in Appendix D.

V. CONCLUSION

The '997 Patent applicant patented an architecture that had been published more than five years earlier. As demonstrated above, the prior art – art either not previously reviewed or not previously relied upon by the Office – plainly anticipates or renders obvious Claims 32

through 37 of the '997 patent, and raises substantial new questions of patentability.

Accordingly, Microsoft respectfully requests that this Request be granted.

Respectfully submitted,

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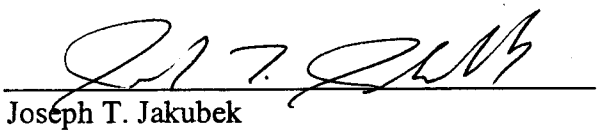
By 
Joseph T. Jakubek
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Certificate of Service in Compliance With 37 C.F.R. § 1.915(b)(6)

The undersigned hereby certifies that true and correct copies of the following:

(1) Request for *Inter Partes* Reexamination of Patent Transmittal Form; and

(2) Request for *Inter Partes* Reexamination, including Exhibits 1-26 and Appendices A-D,

were served (via first-class mail) on the purported owner of the patent at the last address of record:

Anascape, Ltd.
16487 Joseph Road
Tyler, Texas 75707

and on counsel for Anascape, Ltd. in the litigation (via first-class mail):

Luke Fleming McLeroy
Theodore Stevenson, III
McKool Smith - Dallas
300 Crescent Court, Suite 1500
Dallas, TX 75201

In accordance with 37 C.F.R. § 1.915(b)(6), on the 12th day of January, 2007.

Respectfully submitted,

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Appendix A - Furukawa '760, Alone and in Combination

As shown in detail in the following table, claims 32-37 of the '997 Patent are anticipated by Furukawa '760. Claims 32-37 are also obvious over Furukawa '760. Claims 32-37 are also obvious over Furukawa '760 in view of Kramer. Claims 34 and 36 are also obvious over Furukawa '760 in view of any and/or each of the following: Mitsuhashi, Padula, Himoto and/or Thorner. Additionally, Claim 37 is obvious over Furukawa '760 in view of Kramer and Inoue.

Element #	Claim #	Claim	Corresponding Features in Prior Art
1.	**32.**	A device for controlling imagery, comprising:	Furukawa '760. As for claim 32, Furukawa '760 discloses a device for controlling imagery. (Furukawa '760, Abstract, Figure 1, ¶¶ 7, 8, 10, 12.) Specifically, Furukawa '760 describes that employing the disclosed switch in a video game controller will allow the operator to **"freely control the operation of the character of the video game".** (Furukawa '760, ¶ 7.) Furukawa '760 states that "Fig. 1 illustrates a controller 10, which is connected to a video game machine (not shown) via a cable 11". (Furukawa '760, Fig. 1, ¶ 8.) Furukawa '760 further describes that the cross shaped key on "controller 10 is used for **vertically and horizontally moving characters on the screen".** (Furukawa '760, ¶ 8.) Furukawa '760 also states that "the speed of the character's movement changes according to the magnitude of the pressing force applied by a fingertip" and that "the operation of the character in a video game can be freely controlled by the pressing force applied by the fingertip of the operator". (Furukawa '760, ¶ 10.) Furukawa '760 states that the advantage of such control is that "the operator's intentions can be **directly reflected on the operation of the character"** in the video game. (Furukawa '760, ¶ 12.)
2.		pressure-sensitive variable-conductance analog sensor for creating a varying analog value according to varying depression applied by a finger of a user to	Furukawa '760 discloses a variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor. (Furukawa '760, Abstract, ¶¶ 1, 6, 7, 10.) Specifically, Furukawa '760 describes "a pressure sensitive switch in which electrical resistance can be changed by altering the pressing force on the moving

Element #	Claim #	Claim	Corresponding Features in Prior Art
		said analog sensor;	part of a rubber contact". (Furukawa '760, ¶ 1.) Furukawa '760 explains that the pressure-sensitive switch includes "a conductive part whose resistance changes with a pressing force". (Furukawa '760, ¶ 7.) Furukawa '760 states that "the electrical resistance of the conductive part affixed to the undersurface of the moving contact changes according to the degree of the pressing force when the operator presses the moving part of the switch, **thereby changing the signal from the controller, and allowing the operator to freely control the operation of the character in the video game**". (Furukawa '760, ¶ 7 (emphasis added).) Furukawa '760 further states that "**the pressing force applied by the fingertip on each pressing part of the cross shaped key 12 changes the electrical resistance through conductive part 33, whose resistance changes according to the pressing force**," thus allowing variable control of a video game character (Furukawa '760, ¶ 10.)
3.		associated with said analog sensor is means for providing tactile feedback to the finger;	Furukawa '760 discloses an analog sensor associated with means for providing tactile feedback to the user's finger. (Furukawa '760, Fig. 1-2, ¶¶ 9-10.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "**most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback.** This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa '760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). These "rubber contact" structures are also disclosed in Furukawa '760, Fig. 1 as being incorporated into a pre-existing game controller, in which use of such

Element #	Claim #	Claim	Corresponding Features in Prior Art
			elastomeric dome caps were well-known. (Furukawa '760, Fig. 1.) Furukawa '760 further states that "**moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31**" (Furukawa '760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying pressing force on the button with "**a fingertip**". (Furukawa '760, ¶ 10.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 would have implicitly provided tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".); see also MPEP § 2112.III ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '760 to provide a tactile feedback. Alternatively, Furukawa '760 in view of Kramer. Kramer discloses a means for providing tactile feedback. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing tactile feedback to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48.) It would have been obvious to combine Furukawa '760 and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '760 and Kramer are similar input devices for entertainment

Element #	Claim #	Claim	Corresponding Features in Prior Art
			electronics.
4.		circuitry connected to said analog sensor, said circuitry for reading a varying analog value from said analog sensor and causing representative varying of imagery.	Furukawa '760 discloses circuitry connected to the sensor for reading a varying analog value and causing varying representative varying of imagery. (Furukawa '760, Fig. 1, ¶ 7, 8.) Specifically, Furukawa '760 discloses output cable 11 for outputting signals to a video game machine that generates video game images, such as video game characters. (Furukawa '760, Fig. 1, ¶¶ 7-8.) As stated in Furukawa '760, "the electrical resistance of the conductive part affixed to the undersurface of the moving contact changes according to the degree of the pressing force when the operator presses the moving part of the switch, **thereby changing the signal from the controller, and allowing the operator to freely control the operation of the character in the video game**". (Furukawa '760, ¶ 7 (emphasis added).)
5.	**33.**	33. A device according to claim 32 wherein said analog sensor is a first analog sensor, said device further includes a second analog sensor, said second analog sensor connected to said circuitry for causing variable control of the imagery.	Furukawa '760. As for claim 33, Furukawa '760 discloses a device with at least two analog sensors connected to circuitry for causing variable control of imagery. (Furukawa '760, Fig. 1, ¶¶ 7-9.) Specifically, as stated in Furukawa '760, "the electrical resistance of the conductive part affixed to the undersurface of the moving contact changes according to the degree of the pressing force when the operator presses the moving part of the switch, **thereby changing the signal from the controller, and allowing the operator to freely control the operation of the character in the video game**". (Furukawa '760, ¶ 7 (emphasis added).) Furukawa '760 specifically discloses placing analog sensors below each of the four directional sections of a cross key in a game controller (Furukawa '760, Fig. 1, ¶ 7), each of which is attached to the output circuit to control a direction of the game character in one direction, allowing for a user's "vertically and horizontally moving characters on the screen". (Furukawa '760, ¶ 8.) Furukawa '760 also states that additional sensors may be used in other locations on the controller, other than in the cross keys: "Although in this embodiment the rubber contact of cross shaped key 12 is discussed, it is not limited to this". (Furukawa '760, Fig. 1, ¶ 9.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Furukawa '760 discloses four separate buttons beneath the four directions of the cross-key in order to capture movement in each of the cardinal directions. Additionally, including multiple analog sensors adds nothing to the claim, as applicant claims no new and unexpected result derived from including multiple sensors, as opposed to a single analog sensor. (See MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".))
6.	**34.**	A device according to claim 33 wherein said means for providing tactile feedback comprises means for active tactile feedback.	Furukawa '760. As for claim 34, Furukawa '760 discloses a means for "active tactile feedback", namely a dome cap. (Furukawa '760, Fig. 2, ¶¶ 9-10.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and active tactile feedback and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa '760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '760 further states that "moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31" (Furukawa '760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying pressing

Element #	Claim #	Claim	Corresponding Features in Prior Art
			force on the button with "a fingertip". (Furukawa '760, ¶ 10.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 would have implicitly provided a means for "active tactile feedback". (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".); see also MPEP § 2112.III ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '760 to provide "active tactile feedback". Alternatively, Furukawa '760 in view of Kramer. As for Claim 36, Kramer discloses a "means for providing active tactile feedback". (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the dome cap described in Kramer would have implicitly provided a "means for active tactile feedback". (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".); see also MPEP § 2112.III ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".))
			It would have been obvious to combine Furukawa '760 and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '760 and Kramer are similar input devices for entertainment electronics.
			Alternatively, Furukawa '760 in view of Mitsuhashi. As for claim 34, Mitsuhashi discloses a "means for active tactile feedback". (Mitsuhashi, Figs, 7 and 8, Col. 1, lines 48-58, Col. 2, lines 54-66.)
			Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Mitsuhashi.
			Specifically, Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and "active tactile feedback": "**A solution for the above mentioned problem is obtained by the use of a resilient diaphragm made of a metal such as German silver, phosphor bronze, stainless steel and the like** in a downwardly concave configuration as a movable contact member facing the fixed contact points therebelow and coming into contact therewith when pressed down. **Such a resilient metal-made diaphragm member can give a considerably good touch of clicking with a click ratio as high as 46.7%** by the reversal of the curvature at a certain point in the course of increase of the pushing load". (Mitsuhashi, Col. 1, lines 48-58.)
			Mitsuhashi further describes the metallic "diaphragm" dome cap shown in its Figs. 7 and 8: "FIG. 7 illustrates a vertical cross sectional view of a conventional diaphragm type push button switch composed of a surface panel sheet 21 bearing

Element #	Claim #	Claim	Corresponding Features in Prior Art
			a pushing head 22 on the lower surface thereof and mounted on a printed circuit board 23 having a pair of fixed contact points 24 and a metal-made downwardly concave diaphragm 25 having resilience between the pushing head 22 and the circuit board 23 as held by a holder piece 26. When the surface panel sheet 21 is depressed with a finger tip at a position just above the pushing head 22 as is illustrated in FIG. 8, the curvature of the diaphragm 25 is clickingly reversed to give a considerably high click ratio even with a low pushing stroke". (Mitsuhashi, Figs. 7 and 8, Col. 2, lines 54-66.) It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '760, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and Furukawa '760 disclosed such a rubber-push-button switch. Alternatively, Furukawa '760 in view of Padula. As for claim 34, Padula discloses a "means for active tactile feedback." (Padula, Abstract, Fig. 12, Col. 9, lines 12-31.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Padula. Specifically, Padula discloses that: "A **collapsible dome of metal is arranged to provide tactile feedback** to the user when the predetermined force is obtained". (Padula, Abstract.) Padula further describes the metallic dome cap: "FIG. 12 indicates another embodiment of a pressure transducer in which a layer 100 of flexible material, for example, a thin sheet of silver or other metal, formed with a dome 102 is positioned between, for example, the refill interface plug 12 and the plunger 20. The dome 102 is surrounded by a planar annular portion 106 which is seated on

Element #	Claim #	Claim	Corresponding Features in Prior Art
			the radial end face of refill interface plug 12. When a predetermined pressing force is applied to the dome by refill interface plug 12 and plunger 20, the dome undergoes reversible collapse. **The metal dome is designed so that the collapse of the bubble takes place at a pressure which is substantially equal to the pressure at which the processing of data from the stylus is enabled, as previously described. The snap action during collapse of the dome can be sensed by the stylus user, providing a definite tactile feedback indicating to the user that the digitizing apparatus has switched from the disabled state to the enabled state.** When pressure is removed from the stylus tip, the dome snaps back to its original undeformed state, ready for the next operation". (Padula, Fig. 12, Col. 9, lines 12-31, emphasis added.) It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in Furukawa '760, because Padula describes improvements to pressure-sensitive switches, and Furukawa '760 disclosed a pressure-sensitive switch. Alternatively, Furukawa '760 in view of Himoto. As for claim 34, Himoto discloses a "means for active tactile feedback". (Himoto, Figs. 12 and 15, ¶ 57, Col. 16, lines 38-58.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Himoto. Specifically, Himoto discloses "An expansion unit (70) including a vibration unit (75) is connected, whereby a vibration is given to the controller body (10) to make a shooting game more realistic". (Himoto, ¶ 57.) Himoto states that "[a]n expansion unit 70 shown in FIGs 12 and 15 adds the function of giving vibrations to the controller body 10. The expansion unit 70 which adds the vibration function includes a connector 71 to be connected to the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			expansion connector 26 of the controller body 10 just as the standard expansion unit 30 is, and a connector 73 to be connected to a connector 202 of the game apparatus body 200 is provided on the end of a connection cable 72. An electric power source 76 for giving vibrations is disposed in the connection cable 72. The expansion unit 70, includes a control computer 74 for the general control, and the control computer 74 includes a vibration unit 75 for giving vibrations. The vibration unit 75 is actuated in response to a command signal from the game apparatus body 200 or the controller body 10 and gives vibrations to the controller body 10. Vibrations are thus given to the controller body 10 from the vibration unit 75, whereby vibrations are given upon shooting, and realistic games can be enjoyed". (Himoto, Figs. 12 and 15, Col. 16, lines 38-58.) It would have been obvious to combine Himoto with Furukawa '760, because both Himoto and Furukawa '760 describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller. Alternatively, Furukawa '760 in view of Thorner. As for claim 34, Thorner discloses a "means for active tactile feedback". (Thorner, Abstract, Col. 2, lines Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Thorner. Specifically, Thorner discloses "a seat-based tactile sensation generator capable of producing tactile sensation to a video game player corresponding to activity portrayed in a video game . . . **Each actuator or group of actuators interacts with the player and is individually activated to produce a localized tactile sensation, e.g., an impact or vibration, corresponding to the action portrayed**

Element #	Claim #	Claim	Corresponding Features in Prior Art
			by the video game as it occurs". (Thorner, Abstract.) Thorner discloses that the localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight: "each actuator in said plurality of actuators is an **electric motor having a shaft with an offset weight attached thereto**". (Thorner, Claim 6, Col. 9, lines 58-60.) While Thorner describes placing the tactile sensation means in a seat for players playing arcade video games, it would have been obvious to place the means for vibration in a controller for a player playing a home video game. Thorner further discloses that the electric motors may be enclosed in a housing. (Thorner, Claim 7, Col. 9, lines 61-62.) Thorner further describes the function of the tactile vibration actuators: "More specifically, the actuators are **motors with offset weights that vibrate a player's body in a specified pattern and intensity, or solenoids that provide jolting effects".** (Thorner, Col. 2, lines 3-5.) It would have been obvious to combine Thorner with Furukawa '760, because Thorner describes adding vibration tactile feedback to existing video game systems and Furukawa '760 was an existing video game system.
7.	**35.**	A device according to claim 33 wherein said means for providing tactile feedback comprises a resilient dome cap supplying a break-over threshold tactile feedback to the finger.	Furukawa '760. As for claim 35, Furukawa '760 discloses a resilient dome cap supplying a break-over threshold tactile feedback to the finger. (Furukawa '760, Fig. 2, ¶¶ 9-10.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa '760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			'802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '760 further states that "moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31" (Furukawa '760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying pressing force on the button with "a fingertip". (Furukawa '760, ¶ 10.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 inherently would have included a break-over threshold tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".); see also MPEP § 2112.III ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '760 to provide a break-over threshold tactile feedback. Alternatively, Furukawa '760 in view of Kramer. As for claim 35, Kramer discloses a means for providing break-over threshold tactile feedback to the finger. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48.) It would have been obvious to combine Furukawa '760 and Kramer because the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '760 and Kramer are similar input devices for entertainment electronics.
8.	**36.**	A device according to claim 35 wherein said means for providing tactile feedback also comprises active tactile feedback.	Furukawa '760. As for Claim 36, see element 6, above. Alternatively, obvious in view of Furukawa '760. As for Claim 36, see element 6, above. Alternatively, Furukawa '760 in view of Kramer. As for Claim 36, see element 6, above. Alternatively, Furukawa '760 in view of Mitsuhashi. As for Claim 36, see element 6, above. Alternatively, Furukawa '760 in view of Padula. As for Claim 36, see element 6, above. Alternatively, Furukawa '760 in view of Himoto. As for Claim 36, see element 6, above. Alternatively, Furukawa '760 in view of Thorner. As for Claim 36, see element 6, above.
9.	**37.**	A device according to claim 36 wherein said first analog sensor and said second analog sensor are activated by thumb depressible single individual buttons located in a right-hand area of a housing.	Furukawa '760. As for claim 37, Furukawa '760 discloses a first analog sensor and a second analog sensor activated by single individual thumb-depressible buttons located in the right hand area of a housing. (Furukawa '760, Fig. 1, ¶¶ 7-9.) Furukawa '760 specifically discloses placing analog sensors below each of the four directional sections of a cross key in a game controller (Furukawa '760, Fig. 1, ¶ 7), each of which is attached to the output circuit to control a direction of the game character in one direction, allowing for a user's "vertically and horizontally moving characters on the screen". (Furukawa '760, ¶ 8.) Furukawa '760 also states that additional sensors may be used in other locations on the controller, other than in the cross keys: "Although in this embodiment the rubber contact of cross shaped key 12 is discussed, it is not limited to this". (Furukawa '760, Fig. 1, ¶ 9.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Furukawa ‘760 also includes a figure showing a controller with multiple depressible individual “trigger keys” (buttons) on the right side of the controller. (Furukawa ‘760, Fig. 1, ¶ 9.) Because Furukawa ‘760 expressly states that the use of pressure-sensitive sensors is not limited to the cross-shaped key 12, and the only other places for such switches are in the individual buttons on the right side of the controller (Furukawa ‘760, Fig. 1), Furukawa ‘760 necessarily discloses the use of its pressure-sensitive switches with the individual buttons on the right side of the controller, the only other place they could possibly be. (See MPEP § 2112, (“The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103”.)) Alternatively, having a pressure-sensitive button in the right hand area is an obvious variation of Furukawa ‘760 because mere rearrangement of the location of switches would be an obvious design choice. (See MPEP § 2144.04.VI.C.) Additionally, including multiple buttons on the right side of controller adds nothing to the claim element, as applicant claims no new and unexpected result derived from including multiple buttons. (See MPEP § 2144.04.VI.B. (“Mere duplication of parts has no patentable significance unless a new and unexpected result is produced”.)) Thus, it would have been obvious to take the pressure-sensitive buttons disclosed in Furukawa ‘760 and place them beneath the “trigger keys” on the controller shown in Furukawa ‘760, Fig. 1. One familiar with the prior art video game controllers would understand that these keys inherently are designed to be depressible by a thumb of a user, as opposed to a finger, based on the way such a controller is held by the user. Thus, including thumb-depressible buttons on the right hand side would have been obvious. (See MPEP § 2112.) Alternatively, Furukawa ‘760 in view of Inoue. As for claim 37, Furukawa ‘760 and Inoue disclose a first analog sensor and a second analog sensor activated by single individual thumb-depressible buttons located in the right hand area of a housing. (Inoue, Figs. 1 and 6; Furukawa ‘760, Fig. 1, ¶¶ 5, 7-9.) Specifically, Inoue discloses multiple single individual buttons in a right hand area of a housing to be depressed by a user’s thumb. (Inoue, Figs. 1 and 6.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Furukawa '760 specifically discloses placing analog sensors below each of the four directional sections of a cross key in a game controller (Furukawa '760, Fig. 1, ¶ 7), each of which is attached to the output circuit to control a direction of the game character in one direction, allowing for a user's "vertically and horizontally moving characters on the screen". (Furukawa '760, ¶ 8.) Furukawa '760 also states that additional sensors may be used in other locations on the controller, other than in the cross keys: "Although in this embodiment the rubber contact of cross shaped key 12 is discussed, it is not limited to this". (Furukawa '760, Fig. 1, ¶ 9.) It would have been obvious to combine Furukawa '760 with Inoue because Furukawa '760 explicitly refers to improvements for existing game controllers (Furukawa '760, ¶ 5) and Inoue was such a game controller.

Appendix B - O'Mara, Alone and in Combination with Kramer and/or Inoue

As shown in detail in the following table, claims 32-33 of the '997 patent are anticipated by O'Mara. Claims 32-33 are also obvious over O'Mara. Additionally, claims 32-37 are obvious over O'Mara in view of Kramer. Claims 34 and 36 are also obvious over O'Mara in view of any and/or each of the following: Mitsuhashi, Padula, Himoto and/or Thorner. Finally, Claim 37 is obvious over O'Mara in view of Kramer and Inoue.

Element #	Claim #	Claim	Corresponding Features in Prior Art
10.	**32.**	A device for controlling imagery, comprising:	O'Mara. As for claim 32, O'Mara discloses a device for controlling imagery (See *e.g.*, O'Mara, Abstract, Col. 2, lines 10-12). Specifically, O'Mara describes a piezoresistive input device which serves as a "novel input device for computers or electronic games which uses piezoelectric elements to sense input from a user". (O'Mara, Col. 2, lines 10-12.) An electronic game controller would inherently control imagery on a game display. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Alternatively, it would have been obvious to use the invention of O'Mara to control imagery, since video game controllers typically control imagery, and O'Mara teaches modifying existing video game controllers.
11.		pressure-sensitive variable-conductance analog sensor for creating a varying analog value according to varying depression applied by a finger of a user to said analog sensor;	O'Mara discloses a variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor (O'Mara, Col. 2, lines 10-12, Col. 3, lines 39-58, Col. 6, lines 34-42, Col. 7, lines 49-50, Col. 8, lines 42-45, Figs. 1-5, 7-9). Specifically, O'Mara discloses a piezoelectric element, such as a force sensitive resistor, to sense pressure applied to a button (O'Mara, Col. 2, lines 10-12, Figs. 1-5, 7-9) and provide "an analog output related to the magnitude of the force applied". (O'Mara, Col. 3, lines 51-53.) O'Mara further discloses that this device may be used as an analog push-button. (O'Mara, Col.7, lines 49-50, Col. 8, lines 42-45.) It would have been understood that analog pushbuttons are employed by fingertip depression from a user. Alternatively, it would have been obvious to use the sensor of O'Mara with pressure applied by a finger, since buttons in video game controllers typically are

Element #	Claim #	Claim	Corresponding Features in Prior Art
			actuated by a user's fingertips, and O'Mara teaches modifying existing video game controller buttons.
12.		associated with said analog sensor is means for providing tactile feedback to the finger;	O'Mara discloses a means for providing tactile feedback (O'Mara, Col. 4, lines 31-33.) Specifically, O'Mara discloses "[B]oth pad 50 and spring 60 are used to provide mechanical resistance or 'feel' to the device 10 as the user applied force to disk 40". (O'Mara, Col. 4, lines 31-33.) This "feel" would provide a tactile feedback to the user. Thus, O'Mara inherently discloses tactile feedback. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Alternatively, O'Mara in view of Kramer. Kramer discloses a means for providing tactile feedback (Kramer, Col. 5, lines 40-48). Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48.) It would have been obvious to combine O'Mara and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both O'Mara and Kramer are similar input devices for entertainment electronics.
13.		circuitry connected to said analog sensor, said circuitry for reading a varying analog value from said analog sensor and causing representative varying of imagery.	O'Mara discloses circuitry connected to an analog sensor to read a varying analog value and to cause representative varying of imagery: (O'Mara, Col. 1, lines 40 – 44, Col. 2, lines 10-11, O'Mara, Col. 2, lines 48 -51, Col. 3, lines 50 -52, Col. 7, lines 49 – 51, Col. 8, lines 42-45.) Specifically, O'Mara describes a piezoresistive input device which serves as a "novel input device for computers or electronic games". (O'Mara, Col. 2, lines 10-11.) O'Mara claims a device comprising an "**output circuit connected to said at least four piezoresistive elements**, said output circuit **providing signals representative of said sensed force**". (O'Mara, Claim 6, Col. 8, lines 43-45,

Element #	Claim #	Claim	Corresponding Features in Prior Art
			emphasis added.) O'Mara's output signals vary with applied force, and are contrasted with simple on/off switches that only provide digital output; the O'Mara switches provide an output signal representative of the magnitude of the applied force. (O'Mara, Col. 1, lines 40 – 44.) "As the conductive foam is compressed, it will complete the circuit of the circuit traces and **provide an output voltage varying with the compression of the foam**". (O'Mara, Col. 2, lines 48 -51, emphasis added.) O'Mara states that "[e]ach piezoresistive element 15-30 provides an **analog output related to the magnitude of the force applied** to the element 15-30". (O'Mara, Col. 3, lines 50 -52, emphasis added.) Additionally, O'Mara states that his structure "can be used by itself as an (sic) piezoresisitive input device such as an **analog** push-button for a computer or an electronic game controller". (O'Mara, Col. 7, lines 49 – 51, emphasis added.) Thus, the output from the disclosed circuit attached to the sensors is analog. Given the use of the input from the controller (namely for computers or electronic games), this signal would inherently be used to control imagery. An electronic games controller would inherently control imagery on a game display. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Alternatively, it would have been obvious to use the invention of O'Mara to control imagery, since video game controllers typically control imagery, and O'Mara teaches modifying existing video game controllers.
14.	**33.**	33. A device according to claim 32 wherein said analog sensor is a first analog sensor, said device further includes a second analog sensor, said second analog sensor connected to said circuitry for causing variable control of the imagery.	O'Mara. As for claim 33, O'Mara discloses a device with at least two analog sensors connected to circuitry for causing variable control of imagery (O'Mara, Col. 3, lines 50 -52, Col. 7, lines 49 – 51, Col. 8, lines 43-45.): Specifically, O'Mara claims a device comprising an "**output circuit connected to said at least four piezoresistive elements**, said output circuit **providing signals representative of said sensed force**". (O'Mara, Claim 6, Col. 8, lines 43-45, emphasis added.) O'Mara states that "[e]ach piezoresistive element 15-30 provides an **analog**

Element #	Claim #	Claim	Corresponding Features in Prior Art
			output related to the magnitude of the force applied to the element 15-30". (O'Mara, Col. 3, lines 50 -52, emphasis added.) Additionally, O'Mara states that his structure "can be used by itself as an (sic) piezoresisitive input device such as an **analog** push-button for a computer or an electronic game controller". (O'Mara, Col. 7, lines 49 – 51, emphasis added.) Thus, the output from the disclosed circuit attached to the sensors is analog. Alternatively, even if O'Mara is viewed as disclosing a single analog sensor, the addition of a second sensor adds nothing to the claim, as applicant claims no new and unexpected result derived from including multiple sensors. (See MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".))
15.	**34.**	A device according to claim 33 wherein said means for providing tactile feedback comprises means for active tactile feedback.	O'Mara in view of Kramer. As for claim 34, Kramer discloses a means for providing "active tactile feedback". (Kramer, Col. 5, lines 40-48.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and active tactile feedback and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) Based on the applicant's disclosure of a dome cap as the supposed means for providing "active tactile feedback", it is proper to conclude that the Kramer dome cap has the same function, property or characteristic. (See MPEP § 2112.III. ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale

Element #	Claim #	Claim	Corresponding Features in Prior Art
			should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".)) It would have been obvious to combine O'Mara and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both O'Mara and Kramer are similar input devices for entertainment electronics. Alternatively, O'Mara in view of Mitsuhashi. As for claim 34, Mitsuhashi discloses a "means for active tactile feedback". (Mitsuhashi, Figs., 7 and 8, Col. 1, lines 48-58, Col. 2, lines 54-66.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Mitsuhashi. Specifically, Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and "active tactile feedback": "**A solution for the above mentioned problem is obtained by the use of a resilient diaphragm made of a metal such as German silver, phosphor bronze, stainless steel and the like** in a downwardly concave configuration as a movable contact member facing the fixed contact points therebelow and coming into contact therewith when pressed down. **Such a resilient metal-made diaphragm member can give a considerably good touch of clicking with a click ratio as high as 46.7%** by the reversal of the curvature at a certain point in the course of increase of the pushing load". (Mitsuhashi, Col. 1, lines 48-58, emphasis added.) Mitsuhashi further describes the metallic "diaphragm" dome cap shown in its Figs. 7 and 8: "FIG. 7 illustrates a vertical cross sectional view of a conventional diaphragm type push button switch composed of a surface panel sheet 21 bearing a pushing head 22 on the lower surface thereof and mounted on a printed circuit board 23 having a pair of fixed contact points 24 and a metal-made downwardly

Element #	Claim #	Claim	Corresponding Features in Prior Art
			concave diaphragm 25 having resilience between the pushing head 22 and the circuit board 23 as held by a holder piece 26. When the surface panel sheet 21 is depressed with a finger tip at a position just above the pushing head 22 as is illustrated in FIG. 8, the curvature of the diaphragm 25 is clickingly reversed to give a considerably high click ratio even with a low pushing stroke". (Mitsuhashi, Figs. 7 and 8, Col. 2, lines 54-66.) It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in O'Mara, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and O'Mara disclosed such a rubber-push-button switch. Alternatively, O'Mara in view of Padula. As for claim 34, Padula discloses a "means for active tactile feedback". (Padula, Abstract, Fig. 12, Col. 9, lines 12-31.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Padula. Specifically, Padula discloses that: "A **collapsible dome of metal is arranged to provide tactile feedback** to the user when the predetermined force is obtained". (Padula, Abstract, emphasis added.) Padula further describes the metallic dome cap: "FIG. 12 indicates another embodiment of a pressure transducer in which a layer 100 of flexible material, for example, a thin sheet of silver or other metal, formed with a dome 102 is positioned between, for example, the refill interface plug 12 and the plunger 20. The dome 102 is surrounded by a planar annular portion 106 which is seated on the radial end face of refill interface plug 12. When a predetermined pressing force is applied to the dome by refill interface plug 12 and plunger 20, the dome

Element #	Claim #	Claim	Corresponding Features in Prior Art
			undergoes reversible collapse. **The metal dome is designed so that the collapse of the bubble takes place at a pressure which is substantially equal to the pressure at which the processing of data from the stylus is enabled, as previously described. The snap action during collapse of the dome can be sensed by the stylus user, providing a definite tactile feedback indicating to the user that the digitizing apparatus has switched from the disabled state to the enabled state.** When pressure is removed from the stylus tip, the dome snaps back to its original undeformed state, ready for the next operation". (Padula, Fig. 12, Col. 9, lines 12-31, emphasis added.) It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in O'Mara, because Padula describes improvements to pressure-sensitive switches, and O'Mara disclosed a pressure-sensitive switch. Alternatively, O'Mara in view of Himoto. As for claim 34, Himoto discloses a "means for active tactile feedback". (Himoto, Figs. 12 and 15, ¶ 57, Col. 16, lines 38-58.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Himoto. Specifically, Himoto discloses "An expansion unit (70) including a vibration unit (75) is connected, whereby a vibration is given to the controller body (10) to make a shooting game more realistic". (Himoto, ¶ 57.) Himoto states that "[a]n expansion unit 70 shown in FIGs 12 and 15 adds the function of giving vibrations to the controller body 10. The expansion unit 70 which adds the vibration function includes a connector 71 to be connected to the expansion connector 26 of the controller body 10 just as the standard expansion unit 30 is, and a connector 73 to be connected to a connector 202 of the game

Element #	Claim #	Claim	Corresponding Features in Prior Art
			apparatus body 200 is provided on the end of a connection cable 72. An electric power source 76 for giving vibrations is disposed in the connection cable 72. The expansion unit 70, includes a control computer 74 for the general control, and the control computer 74 includes a vibration unit 75 for giving vibrations. The vibration unit 75 is actuated in response to a command signal from the game apparatus body 200 or the controller body 10 and gives vibrations to the controller body 10. Vibrations are thus given to the controller body 10 from the vibration unit 75, whereby vibrations are given upon shooting, and realistic games can be enjoyed". (Himoto, Figs. 12 and 15, Col. 16, lines 38-58.) It would have been obvious to combine Himoto with O'Mara, because both Himoto and O'Mara describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller. Alternatively, O'Mara in view of Thorner. As for claim 34, Thorner discloses a "means for active tactile feedback". (Thorner, Abstract, Col. 2, lines 3-5, Col. 9, lines 58-62.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Thorner. Specifically, Thorner discloses "a seat-based tactile sensation generator capable of producing tactile sensation to a video game player corresponding to activity portrayed in a video game . . . **Each actuator or group of actuators interacts with the player and is individually activated to produce a localized tactile sensation, e.g., an impact or vibration, corresponding to the action portrayed by the video game as it occurs".** (Thorner, Abstract, emphasis added.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Thorner discloses that the localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight: "each actuator in said plurality of actuators is an **electric motor having a shaft with an offset weight attached thereto**". (Thorner, Claim 6, Col. 9, lines 58-60, emphasis added.) While Thorner describes placing the tactile sensation means in a seat for players playing arcade video games, it would have been obvious to place the means for vibration in a controller for a player playing a home video game. Thorner further discloses that the electric motors may be enclosed in a housing. (Thorner, Claim 7, Col. 9, lines 61-62.) Thorner further describes the function of the tactile vibration actuators: "More specifically, the actuators are **motors with offset weights that vibrate a player's body in a specified pattern and intensity, or solenoids that provide jolting effects".** (Thorner, Col. 2, lines 3-5, emphasis added.) It would have been obvious to combine Thorner with O'Mara, because Thorner describes adding vibration tactile feedback to existing video game systems and O'Mara was an existing video game system.
16.	**35.**	A device according to claim 33 wherein said means for providing tactile feedback comprises a resilient dome cap supplying a break-over threshold tactile feedback to the finger.	O'Mara in view of Kramer. As for claim 35, Kramer discloses a means for providing break-over threshold tactile feedback to the finger. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine O'Mara and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both O'Mara and Kramer are similar input devices for entertainment electronics.
17.	**36.**	A device according to claim 35 wherein said means for	O'Mara in view of Kramer. As for Claim 36, see element 15, above.

Element #	Claim #	Claim	Corresponding Features in Prior Art
		providing tactile feedback also comprises active tactile feedback.	Alternatively, O'Mara in view of Mitsuhashi. As for Claim 36, see element 15, above. Alternatively, O'Mara in view of Padula. As for Claim 36, see element 15, above. Alternatively, O'Mara in view of Himoto. As for Claim 36, see element 15, above. Alternatively, O'Mara in view of Thorner. As for Claim 36, see element 15, above.
18.	**37.**	A device according to claim 36 wherein said first analog sensor and said second analog sensor are activated by thumb depressible single individual buttons located in a right-hand area of a housing.	O'Mara. As for claim 37, O'Mara discloses a first analog sensor and a second analog sensor activated by thumb depressible single individual buttons located in a right side area of a housing (O'Mara, Col. 1, line 5 through Col. 2, line 26, Col. 2, lines 10-12, Col. 7, lines 47-51.) Specifically, O'Mara discloses multiple analog sensors associated with pushbuttons on a four-way rocker switch. (O'Mara, Col. 1, line 5 through Col. 2, line 26), O'Mara further discloses a single analog pushbutton for a computer or an electronics game controller, without limitation as to location. (O'Mara, Col. 7, lines 47-51.) O'Mara discloses the use of the invention in existing prior art game controllers (O'Mara, Col. 2, lines 10-12) without limitation as to location. As applicant admitted in the '997 Patent, the existing controllers had single depressible buttons in the right-hand area of a housing ('997 Patent, Figs. 2 and 15). It would have been obvious to combine O'Mara with the existing controllers applicant admitted existed in the prior art at the time of filing the '997 Patent application because O'Mara explicitly refers to improvements for existing video game controllers and applicant admits that such controllers existed, and that they had buttons located within the right side of a housing. It is generally known that buttons for a handheld video game controller, such as those displayed in the '997 Patent, are thumb-depressible. Thus, O'Mara implicitly disclosed thumb-depressible buttons on the right-hand side of a video game controller. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".))

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Alternatively, having a pressure-sensitive button in the right hand area of a controller is an obvious variation of O'Mara because the simple arrangement of switches in the right hand area of an existing video game controller (where placing the switches in the controller itself was disclosed) would be an obvious design choice. (See MPEP § 2144.04.VI.C.) Additionally, including multiple buttons on the right side of controller adds nothing to the claim element, as applicant claims no new and unexpected result derived from including multiple buttons. (See MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".)) Thus, it would have been obvious to take the pressure-sensitive buttons disclosed in O'Mara and place them beneath buttons on the right hand side of an existing game controller. One of ordinary skill would understand that existing game controller keys were inherently designed to be depressible by a thumb of a user, as opposed to a finger, based on the way such a controller is held by the user. Thus, O'Mara inherently discloses thumb-depressible buttons. (See MPEP § 2112.) Alternatively, O'Mara in view of Inoue. As for claim 37, O'Mara and Inoue disclose a first analog sensor and a second analog sensor activated by single individual thumb-depressible buttons located in the right hand area of a housing. (Inoue, Figs. 1 and 6; O'Mara, Col. 1, line 5 through Col. 2, line 26, Col. 2, lines 10-12, Col. 7, lines 47-51.) Specifically, Inoue discloses multiple single individual buttons in a right hand area of a housing to be depressed by a user's thumb. (Inoue, Figs. 1 and 6.) O'Mara discloses multiple analog sensors associated with pushbuttons on a four-way rocker switch. (O'Mara, Col. 1, line 5 through Col. 2, line 26), O'Mara further discloses a single analog pushbutton for a computer or an electronics game controller, without limitation as to location. (O'Mara, Col. 7, lines 47-51.) O'Mara discloses the use of the invention in existing prior art game controllers (O'Mara, Col. 2, lines 10-12) without limitation as to location. It would have been obvious to combine O'Mara with Inoue because O'Mara explicitly refers to improvements for existing game controllers and Inoue was

Element #	**Claim #**	**Claim**	**Corresponding Features in Prior Art**
			such a game controller.

Appendix C - Furukawa '217, Alone and in Combination with Matsumoto and/or Kramer

As shown in detail in the following table, claims 32-37 of the '997 Patent are anticipated by Furukawa '217. Claims 32-37 are also obvious over Furukawa '217. Further, claims 32-37 are obvious over Furukawa '217 in view of Matsumoto. Claims 32-37 are also obvious over Furukawa '217 in view of Kramer. Claims 34 and 36 are also obvious over Furukawa '217 in view of any and/or each of the following: Mitsuhashi, Padula, Himoto and/or Thorner. Finally, Claims 35-37 are also obvious over Furukawa '217 in view of Matsumoto and Kramer.

Element #	Claim #	Claim	Corresponding Features in Prior Art
19.	**32.**	A device for controlling imagery, comprising:	Furukawa '217. As for claim 32, Furukawa '217 discloses a device for controlling imagery (Furukawa '217, ¶¶ 3, 11) Specifically, Furukawa '217 states that the present invention may be useful in computer "motion keys and scroll keys . . . to adjust the analogue operation rate according to the intention of the operator". (Furukawa '217, ¶ 3.) It is well-known that computer motion keys and scroll keys are connected to a display. Furukawa '217 further describes employing the disclosed switch in a computer keyboard to allow that "the scroll rate**, cursor moving speed, and character reaction speed in computer games** can be fully controlled according to the intention of the user". (Furukawa '217, ¶ 11, emphasis added.) Both cursors and video game characters are examples of imagery to be controlled by the device disclosed in Furukawa '217.
20.		pressure-sensitive variable-conductance analog sensor for creating a varying analog value according to varying depression applied by a finger of a user to said analog sensor;	Furukawa '217 discloses a variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor (Furukawa '217, Abstract, Figs. 3-5, ¶¶ 1, 3, 5, 7, 8, 10.) Specifically, Furukawa '217 describes "a pressure-sensitive variable resistor . . . when the key top 6 is pressed down, the pressure-sensitive variable resistor 1 abuts secure contact points 9 and 10. The contact pressure between carbon powder particles is increased by the applied pressure and anisotropic conductivity is established between the secure contact points 9 and 10 and the electroconductive layer 7. **The resistance of the pressure-sensitive variable resistor 1 is changed according to the applied pressure** so that the voltage between the secure contact points 9 and 10 can be manually and arbitrarily controlled". (Furukawa '217, Abstract, emphasis added.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Furukawa '217 describes the scope of the invention as including a "variable resistor". (Furukawa '217, ¶ 1.) Furukawa '217 explains that a problem to be overcome by the invention is to provide "keys and switches . . . with a function to **adjust the analogue operation rate according to the intention of the operator".** (Furukawa '217, ¶ 3, emphasis added.) Furukawa '217 states that variable resistor yields "changes in resistance corresponding to operational feeling". (Furukawa '217, ¶ 5.) Furukawa '217 further states that "[a]n electro-conductive substance such as carbon powder mixed in the elastic rubber material normally exhibits low contact pressure between the electro-conductive substances, yielding high electric resistance. When the elastic rubber is pressured on both sides, the elastic rubber is deformed by the stress and has increased contact pressure between the electro-conductive substances in the stress direction, decreasing the resistance and establishing anisotropic conductivity in the stress direction. **The resistance is changed in proportion to the stress.** The change in load stress is easily translated to the change in resistance". Thus allowing variable analog control of a cursor or video game character based on the applied pressure. (Furukawa '217, ¶ 7, emphasis added.) Furukawa '217 also describes that when stress is applied to either side of the resistor 1, "the contact mode of the carbon powder in the stress direction is changed and anisotropic conductivity in the arrowed direction is established". (Furukawa '217, ¶ 8.) Finally, Furukawa '217 discloses that "**When the rubber key top 6 is pressed down**, the pressure-sensitive variable resistor 1 makes contact with two secure contact points 9 and 10 on a circuit board 8 as shown in Fig. 5, establishing a circuit between the two secure contact points 9 and 10 via anisotropic electro-conductive paths a and b of the pressure-sensitive variable resistor 1 and the electro-conductive layer 7 above it. **When the contact pressure is low, the pressure-sensitive variable resistor 1 has high resistance. The resistance is reduced as the rubber key top 6 is further pressed down and the contact pressure is increased".** (Furukawa '217, ¶ 10, emphasis added.) Because Furukawa '217 describes application on computers, the buttons being variably depressed would inherently be pressed by "a finger of a user". (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".))

Element #	Claim #	Claim	Corresponding Features in Prior Art
21.		associated with said analog sensor is means for providing tactile feedback to the finger;	Furukawa '217 discloses an analog sensor associated with means for providing tactile feedback to the user's finger. (Furukawa '217, Fig. 4, ¶ 5.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '217 discloses a dome-shaped rubber key top 6 formed of an attached elastic rubber material with an electro-conductive layer 7 whose resistance varies with applied pressure. (Furukawa '217, Fig. 4.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '217 further states the variable resistor yields "changes in resistance **corresponding to operational feeling**". (Furukawa '217, ¶ 5, emphasis added.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber key top "dome cap" described in Furukawa '217 would have implicitly provided tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".); see also MPEP § 2112.III ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '217 to provide a tactile feedback. Alternatively, Furukawa '217 in view of Matsumoto. Matsumoto discloses an analog sensor associated with means for providing tactile feedback to the user's finger. (Matsumoto, Figs. 4-6, pgs. 1-2, 6 – 7, 9.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2, emphasis added.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg. 6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig. 7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, pg. 7, emphasis added.) Matsumoto also states that: "**[t]he operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further pressing the push button, he/she can control the change in resistance between the terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Furukawa '217 due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance

Element #	Claim #	Claim	Corresponding Features in Prior Art
			switch in a video game controller, such as the one disclosed in Furukawa '217, would necessarily have looked to existing pressure-sensitive variable resistance switches with desirable properties, such as tactile feedback. Matsumoto disclosed just such a switch. Thus it would have been obvious to combine the two references. Alternatively, Furukawa '217 in view of Kramer. Kramer discloses a means for providing tactile feedback. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine Furukawa '217 and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '217 and Kramer are similar input devices for entertainment electronics.
22.		circuitry connected to said analog sensor, said circuitry for reading a varying analog value from said analog sensor and causing representative varying of imagery.	Furukawa '217 discloses circuitry connected to the sensor for reading a varying analog value and causing varying representative varying of imagery. (Furukawa '217, ¶ 3, 11.) Specifically, Furukawa '217 states that the present invention may be useful in computer "motion keys and scroll keys . . . to adjust the analogue operation rate according to the intention of the operator". (Furukawa '217, ¶ 3.) It is well-known that computer motion keys and scroll keys are connected to a display. Furukawa '217 further states that "[W]hen the rubber key top 6 is pressed down, the pressure-sensitive variable resistor 1 **makes contact with two secure contact points 9 and 10 on a circuit board 8 as shown in Fig. 5, establishing a circuit between the two secure contact points 9 and 10** via anisotropic electro-conductive paths a and b of the pressure-sensitive variable resistor 1 and the electro-conductive layer 7 above it. When the contact pressure is low, the pressure-sensitive variable resistor 1 has high resistance. The resistance is reduced as the rubber key top 6 is further pressed down and the contact pressure is increased". (Furukawa '217, ¶ 10, emphasis added.) Furukawa '217 further describes employing the disclosed switch in an "**oscillation circuit**" where the oscillation frequency is controlled by the applied pressure from the user, and in

Element #	Claim #	Claim	Corresponding Features in Prior Art
			modifying "hardware and software" in a computer keyboard to allow that "the scroll rate, cursor moving speed, and character reaction speed in computer games can be fully controlled according to the intention of the user". (Furukawa '217, ¶ 11, emphasis added.) Both cursors and video game characters are examples of imagery to be controlled by the device disclosed in Furukawa '217.
23.	**33.**	33. A device according to claim 32 wherein said analog sensor is a first analog sensor, said device further includes a second analog sensor, said second analog sensor connected to said circuitry for causing variable control of the imagery.	Furukawa '217. As for claim 33, Furukawa '217 discloses a device with at least two analog sensors connected to circuitry for causing variable control of imagery. (Furukawa '217, Fig. 1, ¶¶ 7-9.) Specifically, Furukawa '217 states that the present invention may be useful in computer "motion keys and scroll keys . . . **to adjust the analogue operation rate according to the intention of the operator**". (Furukawa '217, ¶ 3, emphasis added.) It is well-known that computer motion keys and scroll keys are connected to a display, and that there are multiple such keys on a computer keyboard. Furukawa '217 further describes employing the disclosed switch in "the scroll keys and cursor motion keys of a computer keyboard a computer keyboard" to allow that "the scroll rate, **cursor moving speed, and character reaction speed in computer games can be fully controlled** according to the intention of the user". (Furukawa '217, ¶ 11, emphasis added.) Thus, Furukawa '217 inherently discloses multiple analog sensors connected to circuitry for causing variable control of imagery. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Additionally, including multiple analog sensors adds nothing to the claim, as applicant claims no new and unexpected result derived from including multiple sensors, as opposed to a single analog sensor. (See MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".))
24.	**34.**	A device according to claim 33 wherein said means for providing tactile feedback comprises means for active tactile feedback.	Furukawa '217. As for claim 34, Furukawa '217 discloses a means for "active tactile feedback". (Furukawa '217, Fig. 4, ¶ 5.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and active tactile feedback and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing

Element #	Claim #	Claim	Corresponding Features in Prior Art
			"active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '217 discloses a dome-shaped rubber key top 6 formed of an attached elastic rubber material with an electro-conductive layer 7 whose resistance varies with applied pressure. (Furukawa '217, Fig. 4.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '217 further states the variable resistor yields "changes in resistance **corresponding to operational feeling**". (Furukawa '217, ¶ 5, emphasis added.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber key top "dome cap" described in Furukawa '217 would have implicitly provided "active tactile feedback" to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '217 to provide an "active tactile feedback". Alternatively, Furukawa '217 in view of Matsumoto. As for claim 34, Matsumoto discloses an analog sensor associated with "means for providing active tactile feedback" to the user's finger. (Matsumoto, Figs 4 – 6, pgs. 1-2, 6 – 7, 9.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and active tactile feedback and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2, emphasis added.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg. 6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig. 7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, Fig. 7, pg. 7, emphasis added.) Matsumoto also states that: "**[t]he operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further pressing the push button, he/she can control the change in resistance between the terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Furukawa '217 due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance

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			switch in a video game controller, such as the one disclosed in Furukawa '217, would necessarily have looked to existing pressure-sensitive variable resistance switches with desirable properties, such as tactile feedback. Matsumoto disclosed just such a switch. Thus it would have been obvious to combine the two references. Alternatively, Furukawa '217 in view of Kramer. As for Claim 34, Kramer discloses a "means for providing active tactile feedback". (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine Furukawa '217 and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '217 and Kramer are similar input devices for entertainment electronics. Alternatively, Furukawa '217 in view of Mitsuhashi. As for claim 34, Mitsuhashi discloses a "means for active tactile feedback". (Mitsuhashi, Figs. 7 and 8, Col. 1, lines 48-58, Col. 2, lines 54-66.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Mitsuhashi. Specifically, Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and "active tactile feedback": "**A solution for the above mentioned problem is obtained by the use of a resilient diaphragm made of a metal such as German silver, phosphor bronze, stainless steel and the like** in a downwardly concave configuration as a movable contact member facing the fixed contact points therebelow and coming into contact

Element #	Claim #	Claim	Corresponding Features in Prior Art
			therewith when pressed down. **Such a resilient metal-made diaphragm member can give a considerably good touch of clicking with a click ratio as high as 46.7%** by the reversal of the curvature at a certain point in the course of increase of the pushing load". (Mitsuhashi, Col. 1, lines 48-58, emphasis added.) Mitsuhashi further describes the metallic "diaphragm" dome cap shown in its Figs. 7 and 8: "FIG. 7 illustrates a vertical cross sectional view of a conventional diaphragm type push button switch composed of a surface panel sheet 21 bearing a pushing head 22 on the lower surface thereof and mounted on a printed circuit board 23 having a pair of fixed contact points 24 and a metal-made downwardly concave diaphragm 25 having resilience between the pushing head 22 and the circuit board 23 as held by a holder piece 26. When the surface panel sheet 21 is depressed with a finger tip at a position just above the pushing head 22 as is illustrated in FIG. 8, the curvature of the diaphragm 25 is clickingly reversed to give a considerably high click ratio even with a low pushing stroke". (Mitsuhashi, Figs. 7 and 8, Col. 2, lines 54-66.) It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '217, because Mitsuhashi describes replacing rubber-made push-button switches with metallic "diaphragm" dome caps to improve tactile feedback, and Furukawa '217 disclosed such a rubber-push-button switch. Alternatively, Furukawa '217 in view of Padula. As for claim 34, Padula discloses a "means for active tactile feedback". (Padula, Abstract, Fig. 12, Col. 9, lines 12-31.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Padula. Specifically, Padula discloses that: "A **collapsible dome of metal is arranged to provide tactile feedback** to the user when the predetermined force is obtained". (Padula, Abstract, emphasis added.) Padula further describes the metallic dome cap: "FIG. 12 indicates another embodiment of a

Element #	Claim #	Claim	Corresponding Features in Prior Art
			pressure transducer in which a layer 100 of flexible material, for example, a thin sheet of silver or other metal, formed with a dome 102 is positioned between, for example, the refill interface plug 12 and the plunger 20. The dome 102 is surrounded by a planar annular portion 106 which is seated on the radial end face of refill interface plug 12. When a predetermined pressing force is applied to the dome by refill interface plug 12 and plunger 20, the dome undergoes reversible collapse. **The metal dome is designed so that the collapse of the bubble takes place at a pressure which is substantially equal to the pressure at which the processing of data from the stylus is enabled, as previously described. The snap action during collapse of the dome can be sensed by the stylus user, providing a definite tactile feedback indicating to the user that the digitizing apparatus has switched from the disabled state to the enabled state.** When pressure is removed from the stylus tip, the dome snaps back to its original undeformed state, ready for the next operation". (Padula, Fig. 12, Col. 9, lines 12-31, emphasis added.) It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch disclosed in Furukawa '760, because Padula describes improvements to pressure-sensitive switches, and Furukawa '760 disclosed a pressure-sensitive switch. Alternatively, Furukawa '217 in view of Himoto. As for claim 34, Himoto discloses a "means for active tactile feedback". (Himoto, Figs. 12 and 15, ¶ 57, Col. 16, lines 38-58.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Himoto. Specifically, Himoto discloses "An expansion unit (70) including a vibration unit (75) is connected, whereby a vibration is given to the controller body (10) to make a shooting game more realistic". (Himoto, ¶ 57.) Himoto states that "[a]n expansion unit 70 shown in FIGs 12 and 15 adds the function of giving vibrations to the controller body 10. The expansion unit 70 which adds the vibration

Element #	Claim #	Claim	Corresponding Features in Prior Art
			function includes a connector 71 to be connected to the expansion connector 26 of the controller body 10 just as the standard expansion unit 30 is, and a connector 73 to be connected to a connector 202 of the game apparatus body 200 is provided on the end of a connection cable 72. An electric power source 76 for giving vibrations is disposed in the connection cable 72. The expansion unit 70, includes a control computer 74 for the general control, and the control computer 74 includes a vibration unit 75 for giving vibrations. The vibration unit 75 is actuated in response to a command signal from the game apparatus body 200 or the controller body 10 and gives vibrations to the controller body 10. Vibrations are thus given to the controller body 10 from the vibration unit 75, whereby vibrations are given upon shooting, and realistic games can be enjoyed". (Himoto, Figs. 12 and 15, Col. 16, lines 38-58.) It would have been obvious to combine Himoto with Furukawa '217, because both Himoto and Furukawa '760 describe making improvements to existing computer games, and one looking to improve existing computer games would therefore consider both references in designing an improved controller for computer games. Alternatively, Furukawa '217 in view of Thorner. As for claim 34, Thorner discloses a "means for active tactile feedback". (Thorner, Abstract, Col. 2, lines 3-5, Col. 9, lines 58-62.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Thorner. Specifically, Thorner discloses "a seat-based tactile sensation generator capable of producing tactile sensation to a video game player corresponding to activity portrayed in a video game . . . **Each actuator or group of actuators interacts with the player and is individually activated to produce a localized tactile sensation, e.g., an impact or vibration, corresponding to the action portrayed by the video game as it occurs".** (Thorner, Abstract, emphasis added.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Thorner discloses that the localized tactile sensation vibration to be felt by the user may be created through use of a motor and offset weight: "each actuator in said plurality of actuators is an **electric motor having a shaft with an offset weight attached thereto**". (Thorner, Claim 6, Col. 9, lines 58-60, emphasis added.) While Thorner describes placing the tactile sensation means in a seat for players playing arcade video games, it would have been obvious to place the means for vibration in a controller for a player playing a home video game. Thorner further discloses that the electric motors may be enclosed in a housing. (Thorner, Claim 7, Col. 9, lines 61-62, emphasis added.) Thorner further describes the function of the tactile vibration actuators: "More specifically, the actuators are **motors with offset weights that vibrate a player's body in a specified pattern and intensity, or solenoids that provide jolting effects".** (Thorner, Col. 2, lines 3-5, emphasis added.) It would have been obvious to combine Thorner with Furukawa '217, because Thorner describes adding vibration tactile feedback to existing video game systems and Furukawa '217 was an existing video game system.
25.	**35.**	A device according to claim 33 wherein said means for providing tactile feedback comprises a resilient dome cap supplying a break-over threshold tactile feedback to the finger.	Furukawa '217. As for claim 35, Furukawa '217 discloses a resilient dome cap supplying a break-over threshold tactile feedback to the finger. (Furukawa '217, Fig. 2, ¶¶ 9-10.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '217 discloses a dome-shaped rubber key top 6 formed of an attached elastic rubber material with an electro-conductive layer 7 whose resistance varies with applied pressure. (Furukawa '217, Fig. 4.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '217 further states the variable resistor yields "changes in resistance

Element #	Claim #	Claim	Corresponding Features in Prior Art
			corresponding to operational feeling". (Furukawa '217, ¶ 5, emphasis added.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber key top "dome cap" described in Furukawa '217 inherently would have included a break-over threshold tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Alternatively, given applicant's admissions regarding the prevalence of tactile feedback in dome caps, it would have been obvious to construct the dome-shaped structure disclosed in Furukawa '217 to provide a break-over threshold tactile feedback. Alternatively, Furukawa '217 in view of Matsumoto. As for claim 35, Matsumoto discloses an analog sensor associated with a resilient dome cap for supplying a break-over threshold tactile feedback to the user's finger. (Matsumoto, Figs. 4 – 6, pgs. 1-2, 6 – 7, 9.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and "active tactile feedback" and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2, emphasis added.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg.

Element #	Claim #	Claim	Corresponding Features in Prior Art
			6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig. 7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, Fig. 7, pg. 7, emphasis added.) Matsumoto also states that: "[t]**he operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further pressing the push button, he/she can control the change in resistance between the terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Furukawa '217 due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance switch in a video game controller, such as the one disclosed in Furukawa '217, would necessarily have looked to existing pressure-sensitive variable resistance switches with desirable properties, such as tactile feedback. Matsumoto disclosed just such a switch. Thus it would have been obvious to combine the two references. Alternatively, Furukawa '217 in view of Kramer. As for claim 35, Kramer discloses a means for providing break-over threshold tactile feedback to the finger. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine Furukawa '217 and Kramer because the nature of

Element #	Claim #	Claim	Corresponding Features in Prior Art
			the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Furukawa '217 and Kramer are similar input devices for entertainment electronics.
26.	**36.**	A device according to claim 35 wherein said means for providing tactile feedback also comprises active tactile feedback.	Furukawa '217. As for claim 36, see element 24, above. Alternatively, obvious in view of Furukawa '217. As for claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Matsumoto. As for claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Kramer. As for Claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Mitsuhashi. As for Claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Padula. As for Claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Himoto. As for Claim 36, see element 24, above. Alternatively, Furukawa '217 in view of Thorner. As for Claim 36, see element 24, above.
27.	**37.**	A device according to claim 36 wherein said first analog sensor and said second analog sensor are activated by thumb depressible single individual buttons located in a right-hand area of a housing.	Furukawa '217. As for claim 37, Furukawa '217 discloses a first analog sensor and a second analog sensor activated by single individual thumb-depressible buttons located in the right hand area of a housing. (Furukawa '217, ¶¶ 3, 11.) Specifically, Furukawa '217 states that the present invention may be useful in computer "motion keys and scroll keys . . . to adjust the analogue operation rate according to the intention of the operator". (Furukawa '217, ¶ 3.) It is well-known that computer motion keys and scroll keys are single individual buttons able to be depressed by a finger or thumb, and that these keys are frequently (if not always) located in the right hand area of the keyboard housing. Thus, Furukawa '217 inherently described placing analog keys on the right side of a housing. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Furukawa '217 further describes employing the disclosed switch in "scroll keys and cursor motion keys of a computer keyboard" to allow that "the scroll rate, cursor moving speed, and character reaction speed in computer games can be fully controlled according to the intention of the user". (Furukawa '217, ¶ 11.) Again, it is well-known that these keys are typically located in the right hand area of computer keyboard housing, and that they may be

Element #	Claim #	Claim	Corresponding Features in Prior Art
			depressed by a finger or thumb, and that they would also constitute individual buttons. Thus, Furukawa '217 implicitly discloses the claimed feature of thumb-depressible analog keys on the right side of a housing. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) Additionally, including multiple analog sensors adds nothing to the claim, as applicant claims no new and unexpected result derived from including multiple sensors, as opposed to a single analog sensor. (See MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".)) Alternatively, having a pressure-sensitive button in the right hand area is an obvious variation of Furukawa '217 because mere rearrangement of the location of switches would be an obvious design choice. (See MPEP § 2144.04.VI.C.) Thus, it would have been obvious to take the pressure-sensitive buttons disclosed in Furukawa '217 and place them in the right side of a controller. One of ordinary skill would understand that these keys are implicitly depressible either by a thumb or a finger of a user, as opposed to a finger, based on the way such a controller is utilized by the user. (See MPEP § 2112.)

Appendix D - Kawashima in combination

As shown in detail in the following table, Claim 32 of the '997 patent is obvious over Kawashima in view of Matsumoto. Claims 32-37 of the '997 Patent are also obvious over Kawashima in view of Furukawa '760. Furthermore, Claims 32-36 of the '997 Patent are obvious over Kawashima in view of Kramer. Additionally, Claims 34 and 36 are also obvious over Kawashima in view of any of the following: 1) Himoto; 2) Thorner; 3) Matsumoto and Padula; 4) Furukawa '760 and Himoto. Finally, Claims 32-37 are obvious over Kawashima in view of Matsumoto and Furukawa '760.

Element #	**Claim #**	**Claim**	**Corresponding Features in Prior Art**
28.	**32.**	A device for controlling imagery, comprising:	Kawashima. As for claim 32, Kawashima discloses a device for controlling imagery (Kawashima, Title, Fig. 3, Cols. 1, 2, 4) Specifically, Kawashima's title is "Game control device equipped with pressure-sensitive conductive rubber switch". Kawashima states that the present invention may be useful as a "**game control device for a personal computer".** (Kawashima, Col. 1, emphasis added.) It is well-known that games for a personal computer are controlled on a display. Kawashima further describes employing the disclosed switch as a button atop a computer joystick (Kawashima, Fig. 3) to control functions that were previously controlled by an on/off switch only, such as "firing missiles or pistols in a TV game". (Kawashima, Col. 1.) Kawashima states that the present invention overcomes the previous difficulty with on/off switches that "would turn on only once if pressed once [which was a] drawback when someone wanted to launch a missile". (Kawashima, Col. 2.) Rather than relying on an on/off switch to fire pistols or launch missiles, Kawashima discloses a switch signal which can be "freely controlled by the pressing force from the finger of the user, so it **will allow the use of new techniques in playing computer games and elevate the appeal of the games**". (Kawashima, Col. 4, emphasis added.)
29.		pressure-sensitive variable-conductance analog sensor for creating a varying analog value	Kawashima discloses a variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor (Kawashima, Title, Fig. 1, Cols. 1-4.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
		according to varying depression applied by a finger of a user to said analog sensor;	Specifically, Kawashima's title is "Game control device equipped with pressure-sensitive conductive rubber switch". Kawashima discloses that "a pressure-sensitive rubber is used whose resistance value changes with the pressing force on the switch of the above game control device and an **output circuit is provided which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber, is controlled by this oscillation circuit".** (Kawashima, Col. 1, emphasis added.) Specifically, Kawashima describes a manner of overcoming the use of digital on/off switches in the prior art: "**The functions of this On/Off switch were simplistic because it would turn on only once if pressed once**, and it was a drawback when someone wanted to launch a missile. [Purpose of the Device] **Because it was conceived with a focus on such existing problems, an object of this device is to provide a game control device equipped with a pressure-sensitive conductive rubber switch that is able to elevate the appeal of the game by designing a switch for a computer game controller so that it is capable of opening and closing an output circuit with a given frequency** by utilizing a variable frequency oscillation circuit with pressure-sensitive conductive rubber". (Kawashima, Col. 2, emphasis added.) Kawashima states that "The oscillation frequency of the above variable frequency oscillation circuit 10 is then **determined by the resistance value of the pressure-sensitive conductive rubber switch** 3 and the capacity of capacitor 2". (Kawashima, Col. 3, describing Fig. 1, emphasis added.) Kawashima further states that "this device utilizes a pressure-sensitive conductive rubber whose **resistance value changes with pressing force in a game control** device for a personal computer and is provided with an output circuit which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber, is controlled by this oscillation circuit in the manner described above, the opening and closing cycle of the switch **signal of a game controller can be freely controlled by pressing force from the finger of the user".** (Kawashima, Col. 4, emphasis added.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
30.		associated with said analog sensor is means for providing tactile feedback to the finger;	Kawashima in view of Matsumoto. Matsumoto discloses an analog sensor associated with means for providing tactile feedback to the user's finger. (Matsumoto, Figs. 4 – 6, pgs. 1-2, 6 – 7, 9.) Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg. 6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig. 7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, Fig. 7, pg. 7, emphasis added.) Matsumoto also states that: "**The operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further pressing the push button, he/she can control the change in resistance between the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Kawashima due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance switch in a video game controller, such as the one disclosed in Kawashima, would necessarily have looked to existing pressure-sensitive switches with desirable properties, such as tactile feedback. Matsumoto was just such a switch. Kawashima, in fact, was a named inventor on the earlier Matsumoto patent application for the variable resistance switch. Thus it would have been obvious to combine the two references. Alternatively, Kawashima in view of Kramer. As for claim 34, Kramer discloses a means for providing tactile feedback to the finger of a user. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine Kawashima and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Kawashima and Kramer disclose the use of such materials in input devices for entertainment electronics. Alternatively, Kawashima in view of Furukawa '760. Furukawa '760 discloses an analog sensor associated with means for providing tactile feedback to the user's finger. (Furukawa '760, Fig. 1-2, ¶¶ 9-10.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No.

Element #	Claim #	Claim	Corresponding Features in Prior Art
			6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa '760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). These "rubber contact" structures are also disclosed in Furukawa '760, Fig. 1 as being incorporated into a pre-existing game controller, in which use of such elastomeric dome caps were well-known. (Furukawa '760, Fig. 1.) Furukawa '760 further states that "**moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31**" (Furukawa '760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying pressing force on the button with "a fingertip". (Furukawa '760, ¶ 10, emphasis added.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 would have implicitly provided tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control.
31.		circuitry connected to said analog sensor, said circuitry for reading a varying analog value from said analog sensor and causing representative varying of imagery.	Kawashima discloses circuitry connected to the sensor for reading a varying analog value and causing varying representative varying of imagery. (Kawashima, Figs. 1-2, Cols. 1-4.) Specifically, Kawashima discloses that the output from the pressure-sensitive button can be used with a disclosed oscillation circuit to affect the rate of opening and closing of a switch signal to control action in a computer game, such as firing

Element #	Claim #	Claim	Corresponding Features in Prior Art
			a pistol or missile. Kawashima discloses that "a pressure-sensitive rubber is used whose resistance value changes with the pressing force on the switch of the above game control device and an **output circuit is provided which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber, is controlled by this oscillation circuit".** (Kawashima, Col. 1, emphasis added.) Specifically, Kawashima describes a manner of overcoming the use of digital on/off switches in the prior art: "**The functions of this On/Off switch were simplistic because it would turn on only once if pressed once**, and it was a drawback when someone wanted to launch a missile. [Purpose of the Device] **Because it was conceived with a focus on such existing problems, an object of this device is to provide a game control device equipped with a pressure-sensitive conductive rubber switch that is able to elevate the appeal of the game by designing a switch for a computer game controller so that it is capable of opening and closing an output circuit with a given frequency** by utilizing a variable frequency oscillation circuit with pressure-sensitive conductive rubber". (Kawashima, Col. 2, emphasis added.) Kawashima states that "The oscillation frequency of the above variable frequency oscillation circuit 10 is then **determined by the resistance value of the pressure-sensitive conductive rubber switch** 3 and the capacity of capacitor 2". (Kawashima, Col. 3, describing Fig. 1, emphasis added.) Kawashima further states that "this device utilizes a pressure-sensitive conductive rubber whose **resistance value changes with pressing force in a game control** device for a personal computer and is provided with an output circuit which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber, is controlled by this oscillation circuit in the manner described above, the opening and closing cycle of the switch **signal of a game controller can be freely controlled by pressing force from the finger of the user".** (Kawashima, Col. 4, emphasis added.) Alternatively, Kawashima in view of Furukawa '760. Furukawa '760 discloses a

Element #	Claim #	Claim	Corresponding Features in Prior Art
			variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor (Furukawa '760, Abstract, ¶¶ 1, 6, 7, 10.) Specifically, Furukawa '760 describes "a pressure sensitive switch in which electrical resistance can be changed by altering the pressing force on the moving part of a rubber contact". (Furukawa '760, ¶ 1.) Furukawa '760 explains that the pressure-sensitive switch includes "a conductive part whose resistance changes with a pressing force". (Furukawa '760, ¶ 7.) Furukawa '760 states that "the electrical resistance of the conductive part affixed to the undersurface of the moving contact changes according to the degree of the pressing force when the operator presses the moving part of the switch, **thereby changing the signal from the controller, and allowing the operator to freely control the operation of the character in the video game**". (Furukawa '760, ¶ 7, emphasis added.) Furukawa '760 further states that "the pressing force applied by the fingertip on each pressing part of the cross shaped key 12 changes the electrical resistance through conductive part 33, whose resistance changes according to the pressing force," thus allowing variable control of a video game character (Furukawa '760, ¶ 10.) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control.
32.	**33.**	33. A device according to claim 32 wherein said analog sensor is a first analog sensor, said device further includes a second analog sensor, said second analog sensor connected to said circuitry for causing variable control of the imagery.	Kawashima discloses a variable-conductance analog sensor that creates a varying analog value according to varying depression applied by a finger of a user to said analog sensor (Kawashima, Title, Fig. 1, Cols. 1-4.) Specifically, Kawashima's title is "Game control device equipped with pressure-sensitive conductive rubber switch". Kawashima discloses that "a pressure-sensitive rubber is used whose resistance value changes with the pressing force on the switch of the above game control device and an **output circuit is provided which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive**

Element #	Claim #	Claim	Corresponding Features in Prior Art
			rubber, is controlled by this oscillation circuit". (Kawashima, Col. 1, emphasis added.) Specifically, Kawashima describes a manner of overcoming the use of digital on/off switches in the prior art: "**The functions of this On/Off switch were simplistic because it would turn on only once if pressed once**, and it was a drawback when someone wanted to launch a missile. [Purpose of the Device] **Because it was conceived with a focus on such existing problems, an object of this device is to provide a game control device equipped with a pressure-sensitive conductive rubber switch that is able to elevate the appeal of the game by designing a switch for a computer game controller so that it is capable of opening and closing an output circuit with a given frequency** by utilizing a variable frequency oscillation circuit with pressure-sensitive conductive rubber". (Kawashima, Col. 2, emphasis added.) Kawashima states that "The oscillation frequency of the above variable frequency oscillation circuit 10 is then **determined by the resistance value of the pressure-sensitive conductive rubber switch** 3 and the capacity of capacitor 2". (Kawashima, Col. 3, describing Fig. 1, emphasis added.) Kawashima further states that "this device utilizes a pressure-sensitive conductive rubber whose **resistance value changes with pressing force in a game control** device for a personal computer and is provided with an output circuit which, along with connecting a variable frequency oscillation circuit to this pressure-sensitive conductive rubber, is controlled by this oscillation circuit in the manner described above, the opening and closing cycle of the switch **signal of a game controller can be freely controlled by pressing force from the finger of the user".** (Kawashima, Col. 4, emphasis added.) Additionally, including multiple sensors adds nothing to the claim element, as applicant claims no new and unexpected result derived from including multiple sensors. (*See* MPEP § 2144.04.VI.B. ("Mere duplication of parts has no patentable significance unless a new and unexpected result is produced".)) Alternatively, it would have been obvious to add additional buttons (with sensors)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			to the controller disclosed in Kawashima. Alternatively, Kawashima in view of Furukawa '760. As for claim 33, Furukawa '760 discloses a device with at least two analog sensors connected to circuitry for causing variable control of imagery. (Furukawa '760, Fig. 1, ¶¶ 7-9.) Specifically, as stated in Furukawa '760, "the electrical resistance of the conductive part affixed to the undersurface of the moving contact changes according to the degree of the pressing force when the operator presses the moving part of the switch, **thereby changing the signal from the controller, and allowing the operator to freely control the operation of the character in the video game**". (Furukawa '760, ¶ 7, emphasis added.) Furukawa '760 specifically discloses placing analog sensors below each of the four directional sections of a cross key in a game controller (Furukawa '760, Fig. 1, ¶ 7), each of which is attached to the output circuit to control a direction of the game character in one direction, allowing for a user's "**vertically and horizontally moving characters on the screen**". (Furukawa '760, ¶ 8, emphasis added.) Furukawa '760 also states that additional sensors may be used in other locations on the controller, other than in the cross keys: "Although in this embodiment the rubber contact of cross shaped key 12 is discussed, it is not limited to this". (Furukawa '760, Fig. 1, ¶ 9.) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control.
33.	**34.**	A device according to claim 33 wherein said means for providing tactile feedback comprises means for active tactile feedback.	Kawashima in view of Matsumoto. As for claim 34, Matsumoto discloses an analog sensor associated with means for providing "active tactile feedback" to the user's finger. (Matsumoto, Figs. 4 – 6, pgs. 1-2, 6 – 7, 9.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and "active tactile feedback" and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome

Element #	Claim #	Claim	Corresponding Features in Prior Art
			cap. (Exhibit 22, '525 Patent.) This resilient dome cap produces a clicking sensation upon activation by the user's finger similar to the clicking disclosed in Matsumoto. Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2, emphasis added.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg. 6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig. 7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, Fig. 7, pg. 7, emphasis added.) Matsumoto also states that: "**[t]he operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further

Element #	Claim #	Claim	Corresponding Features in Prior Art
			pressing the push button, he/she can control the change in resistance between the terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Kawashima due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance switch in a video game controller, such as the one disclosed in Kawashima, would necessarily have looked to existing pressure-sensitive switches with desirable properties, such as tactile feedback. Matsumoto was just such a switch. Kawashima, in fact, was a named inventor on the earlier Matsumoto patent application for the variable resistance switch. Thus it would have been obvious to combine the two references. Alternatively, Kawashima in view of Kramer. As for claim 34, Kramer discloses a "means for providing active tactile feedback". (Kramer, Col. 5, lines 40-48.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and "active tactile feedback" and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) Based on the applicant's disclosure of a dome cap as the supposed means for providing "active tactile feedback", it is proper to conclude that the Kramer dome cap has the same function, property or characteristic. (See MPEP § 2112.III. ("Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed in the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103 . . . . This same rationale should also apply to product, apparatus, and process claims claimed in terms of

Element #	Claim #	Claim	Corresponding Features in Prior Art
			function, property or characteristic”.)) It would have been obvious to combine Kawashima and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input devices providing feedback to the user for use in entertainment electronics, and both Kawashima and Kramer disclose the use of such materials in input devices for entertainment electronics. Alternatively, Kawashima in view of Furukawa ‘760. As for claim 34, Furukawa ‘760 discloses a “means for active tactile feedback”, namely a dome cap. (Furukawa ‘760, Fig. 2, ¶¶ 9-10.) It is not clear from the ‘997 Patent specification what applicant means by “active tactile feedback”. Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for “break-over and “active tactile feedback” and the like described therein.” However, upon review, the ‘525 Patent fails to set forth any specific means for providing “active tactile feedback” other than possibly a dome cap. (Exhibit 22, ‘525 Patent.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the ‘997 Patent includes a terminal disclaimer that “most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced”. (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa ‘760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa ‘760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the “dome cap” Armstrong disclosed in the ‘802 Patent, the parent of the ‘997 Patent application. (See ‘802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa ‘760 further states that “**moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31**” (Furukawa ‘760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying

Element #	Claim #	Claim	Corresponding Features in Prior Art
			pressing force on the button with "a fingertip". (Furukawa '760, ¶ 10, emphasis added.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 would have implicitly provided a means for "active tactile feedback". (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control. Alternatively, Kawashima in view of Himoto. As for claim 34, Himoto discloses a "means for active tactile feedback". (Himoto, Figs. 12 and 15, ¶ 57, Col. 16, lines 38-58.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Himoto. Specifically, Himoto discloses "An expansion unit (70) including a vibration unit (75) is connected, whereby a vibration is given to the controller body (10) to make a shooting game more realistic". (Himoto, ¶ 57.) Himoto states that "[a]n expansion unit 70 shown in FIGs 12 and 15 adds the function of giving vibrations to the controller body 10. The expansion unit 70 which adds the vibration function includes a connector 71 to be connected to the expansion connector 26 of the controller body 10 just as the standard expansion unit 30 is, and a connector 73 to be connected to a connector 202 of the game apparatus body 200 is provided on the end of a connection cable 72. An electric

Element #	Claim #	Claim	Corresponding Features in Prior Art
			power source 76 for giving vibrations is disposed in the connection cable 72. The expansion unit 70, includes a control computer 74 for the general control, and the control computer 74 includes a vibration unit 75 for giving vibrations. The vibration unit 75 is actuated in response to a command signal from the game apparatus body 200 or the controller body 10 and gives vibrations to the controller body 10. Vibrations are thus given to the controller body 10 from the vibration unit 75, whereby vibrations are given upon shooting, and realistic games can be enjoyed". (Himoto, Figs. 12 and 15, Col. 16, lines 38-58.) It would have been obvious to combine Himoto with Kawashima, because both Himoto and Kawashima describe making improvements to existing video game controllers, and one looking to improve existing controllers would therefore consider both references in designing an improved controller. Alternatively, Kawashima in view of Thorner. As for claim 34, Thorner discloses a "means for active tactile feedback". (Thorner, Abstract, Col. 2, lines 3-5, Col. 9, lines 58-62.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be is the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification.' *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Thorner. Specifically, Thorner discloses "a seat-based tactile sensation generator capable of producing tactile sensation to a video game player corresponding to activity portrayed in a video game . . . **Each actuator or group of actuators interacts with the player and is individually activated to produce a localized tactile sensation, e.g., an impact or vibration, corresponding to the action portrayed by the video game as it occurs".** (Thorner, Abstract, emphasis added.) Thorner discloses that the localized tactile sensation vibration to be felt by the

Element #	Claim #	Claim	Corresponding Features in Prior Art
			user may be created through use of a motor and offset weight: "each actuator in said plurality of actuators is an **electric motor having a shaft with an offset weight attached thereto**". (Thorner, Claim 6, Col. 9, lines 58-60, emphasis added.) While Thorner describes placing the tactile sensation means in a seat for players playing arcade video games, it would have been obvious to place the means for vibration in a controller for a player playing a home video game. Thorner further discloses that the electric motors may be enclosed in a housing. (Thorner, Claim 7, Col. 9, lines 61-62, emphasis added.) Thorner further describes the function of the tactile vibration actuators: "More specifically, the actuators are **motors with offset weights that vibrate a player's body in a specified pattern and intensity, or solenoids that provide jolting effects".** (Thorner, Col. 2, lines 3-5, emphasis added.) It would have been obvious to combine Thorner with Kawashima, because Thorner describes adding vibration tactile feedback to existing video game systems and Kawashima was an existing video game system. Alternatively, Kawashima in view of Matsumoto and Padula. As for claim 34, Padula discloses a "means for active tactile feedback". (Padula, Abstract, Fig. 12, Col. 9, lines 12-31.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Padula. Specifically, Padula discloses that: "A **collapsible dome of metal is arranged to provide tactile feedback** to the user when the predetermined force is obtained". (Padula, Abstract, emphasis added.) Padula further describes the metallic dome cap: "FIG. 12 indicates another

Element #	Claim #	Claim	Corresponding Features in Prior Art
			embodiment of a pressure transducer in which a layer 100 of flexible material, for example, a thin sheet of silver or other metal, formed with a dome 102 is positioned between, for example, the refill interface plug 12 and the plunger 20. The dome 102 is surrounded by a planar annular portion 106 which is seated on the radial end face of refill interface plug 12. When a predetermined pressing force is applied to the dome by refill interface plug 12 and plunger 20, the dome undergoes reversible collapse. **The metal dome is designed so that the collapse of the bubble takes place at a pressure which is substantially equal to the pressure at which the processing of data from the stylus is enabled, as previously described. The snap action during collapse of the dome can be sensed by the stylus user, providing a definite tactile feedback indicating to the user that the digitizing apparatus has switched from the disabled state to the enabled state.** When pressure is removed from the stylus tip, the dome snaps back to its original undeformed state, ready for the next operation". (Padula, Fig. 12, Col. 9, lines 12-31, emphasis added.) Kawashima discloses employing a pressure-sensitive switch such as the one disclosed in Matsumoto, in a video game controller. It would have been obvious to combine the two references for the reasons set forth above. It would have been obvious to combine the metallic dome cap described in Padula with the pressure-sensitive switch and electro-conductive curved plate disclosed in Matsumoto, because Padula describes using metallic dome caps in pressure-sensitive switches to improve tactile feedback, and Matsumoto disclosed achieving similar improvements to tactile feedback by installing an electro-conductive curved plate. One wishing to improve tactile feedback, as disclosed in Padula, would consider substituting one structure (the electro-conductive plate) for another (a metallic dome cap) to achieve the desired results. <u>Alternatively, Kawashima in view of Furukawa '760 and Mitsuhashi</u>. As for claim 34, Mitsuhashi discloses a "means for active tactile feedback". (Mitsuhashi, Figs. 7 and 8, Col. 1, lines 48-58, Col. 2, lines 54-66.) Because the '997 Patent does not disclose any other structure for providing "active tactile feedback" besides possibly a rubber elastomeric dome cap providing break-over threshold tactile feedback, it is appropriate to conclude then

Element #	Claim #	Claim	Corresponding Features in Prior Art
			that the "means for active tactile feedback" claimed in the '997 Patent, if anything, can only be the resilient dome cap. This is the "broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000.) M.P.E.P. § 2258.I.G. M.P.E.P. § 2258.I.G. If so, such feedback could be provided through the use of a metallic dome cap, as disclosed in Mitsuhashi. Specifically, Mitsuhashi describes the use of a metallic dome cap structure to provide a high click ratio and "active tactile feedback": "**A solution for the above mentioned problem is obtained by the use of a resilient diaphragm made of a metal such as German silver, phosphor bronze, stainless steel and the like** in a downwardly concave configuration as a movable contact member facing the fixed contact points therebelow and coming into contact therewith when pressed down. **Such a resilient metal-made diaphragm member can give a considerably good touch of clicking with a click ratio as high as 46.7%** by the reversal of the curvature at a certain point in the course of increase of the pushing load". (Mitsuhashi, Col. 1, lines 48-58, emphasis added.) Mitsuhashi further describes the metallic "diaphragm" dome cap shown in its Figs. 7 and 8: "FIG. 7 illustrates a vertical cross sectional view of a conventional diaphragm type push button switch composed of a surface panel sheet 21 bearing a pushing head 22 on the lower surface thereof and mounted on a printed circuit board 23 having a pair of fixed contact points 24 and a metal-made downwardly concave diaphragm 25 having resilience between the pushing head 22 and the circuit board 23 as held by a holder piece 26. When the surface panel sheet 21 is depressed with a finger tip at a position just above the pushing head 22 as is illustrated in FIG. 8, the curvature of the diaphragm 25 is clickingly reversed to give a considerably high click ratio even with a low pushing stroke". (Mitsuhashi, Figs. 7 and 8, Col. 2, lines 54-66.) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control. It would have been obvious to combine the metallic dome cap described in Mitsuhashi with the pressure-sensitive switch disclosed in Furukawa '760, because Mitsuhashi describes replacing rubber-made push-button switches in

Element #	Claim #	Claim	Corresponding Features in Prior Art
			game controllers with metallic "diaphragm" dome caps to improve tactile feedback, and Kawashima and Furukawa '760 discloses placing rubber push-button switches in game controllers.
34.	**35.**	A device according to claim 33 wherein said means for providing tactile feedback comprises a resilient dome cap supplying a break-over threshold tactile feedback to the finger.	Kawashima in view of Matsumoto. As for claim 35, Matsumoto discloses an analog sensor associated with a resilient dome cap for supplying a break-over threshold tactile feedback to the user's finger. (Matsumoto, Figs. 4 – 6, pgs. 1-2, 6 – 7, 9.) It is not clear from the '997 Patent specification what applicant means by "active tactile feedback". Applicant attempts to incorporate his prior-issued patent, U.S. Pat. No. 6,222,525, for "break-over and "active tactile feedback" and the like described therein." However, upon review, the '525 Patent fails to set forth any specific means for providing "active tactile feedback" other than possibly a dome cap. (Exhibit 22, '525 Patent.) This resilient dome cap produces a clicking sensation upon activation by the user's finger similar to the clicking disclosed in Matsumoto. Specifically, Matsumoto discloses a variable resistance switch where "**switching can be easily recognized through the feeling of pressure on a fingertip** and the resistance between two terminals can be changed depending on how much the push button of the switch is pressed". (Matsumoto, pg. 1, emphasis added.) According to Matsumoto, "[t]he purpose of the present invention is to resolve the above problems with the prior art variable resistance switch and to provide an **excellent variable resistance switch in which a switchover point (click point) is provided in the middle of the stroke of the push button** so that the operator clearly recognizes switching from the off-state to the on state in the course of the pressing operation". (Matsumoto, pg. 2, emphasis added.) Matsumoto states that "[w]hen pressed at the center of the generating line 8 on the concave surface side with a force indicated by arrow F, **the concave surface is elastically deformed and changes its orientation in the click action.** The generating line 8 changes its orientation orthogonally to a generating line 9 shown in Fig. 6. (Matsumoto, Figs. 5-6, pg. 6, emphasis added.) Matsumoto further states that "the push button 1 is pressed down so that its bottom end presses the elastic electro-conductive curved plate 3 downward. With

Element #	Claim #	Claim	Corresponding Features in Prior Art
			this pressing, the elastic electro-conductive curved plate 3 changes its state from the one in which the longitudinal ends are curved upward to the other in which the transverse ends are curved upward via a flat state. **This is a click action.** When the elastic electro-conductive curved plate 3 undergoes the click action described above, it makes contact with the electrode 4B below it and establishes a conductive path between the terminals 4C and 4D, as shown in Fig.7. **In this state, the variable resistance switch 10 of the present invention is at the switch-on point".** (Matsumoto, Fig. 7, pg. 7, emphasis added.) Matsumoto also states that: "**[t]he operator pressing the push button 1 can easily recognize the establishment of conductivity (ON) through the feeling of pressure between the terminals 4C and 4D of the switch as a result of the change in shape of the elastic electro-conductive curved pate 3.** By further pressing the push button, he/she can control the change in resistance between the terminals 5C and 5D". (Matsumoto, pg. 9, emphasis added.) It would have been obvious to combine Matsumoto with Kawashima due to the nature of the problem to be solved. One looking to employ a pressure-sensitive variable resistance switch in a video game controller, such as the one disclosed in Kawashima, would necessarily have looked to existing pressure-sensitive switches with desirable properties, such as tactile feedback. Matsumoto was just such a switch. Kawashima, in fact, was a named inventor on the earlier Matsumoto patent application for the variable resistance switch. Thus it would have been obvious to combine the two references. Alternatively, Kawashima in view of Kramer. As for claim 34, Kramer discloses a resilient dome cap providing break-over threshold tactile feedback to the finger of a user. (Kramer, Col. 5, lines 40-48.) Specifically, Kramer discloses a snap-through dome cap for providing "active tactile feedback" to the user which is break-over threshold, namely, "the rubber dome bears against the printed circuit board 10 and, upon depression of the appropriate pushbutton 22, **will first actuate a switching process with a snap effect and subsequently permit pressure-dependent adjustment of a function variable**". (Kramer, Col. 5, lines 40-48, emphasis added.) It would have been obvious to combine Kawashima and Kramer because the nature of the problem to be solved is to find useful pressure-sensitive input

Element #	Claim #	Claim	Corresponding Features in Prior Art
			devices providing feedback to the user for use in entertainment electronics, and both Kawashima and Kramer disclose the use of such materials in input devices for entertainment electronics. Alternatively, Kawashima in view of Furukawa '760. As for claim 35, Furukawa '760 discloses a resilient dome cap supplying a break-over threshold tactile feedback to the finger. (Furukawa '760, Fig. 2, ¶¶ 9-10.) It is generally known, and admitted by applicant in a related earlier-filed patent for which the '997 Patent includes a terminal disclaimer that "most but not all elastomeric injection molded dome caps when depressed produce a soft snap which is a user discernable tactile feedback. This tactile feedback occurs when the dome-cap is depressed beyond a given point; the point being where a mechanical threshold is crossed and the tactile snap is produced". (U.S. Pat. No. 6,135,886 to Brad A. Armstrong, Col. 1, lines 58-64.) Specifically, Furukawa '760 discloses a dome-shaped rubber contact 29 formed of an elastic rubber material with a conductive portion 33 whose resistance varies with pressure attached. (Furukawa '760, Fig. 2.) These constitute a resilient dome cap associated with a pressure-sensitive variable-conductance material. Indeed, they are strikingly similar to the "dome cap" Armstrong disclosed in the '802 Patent, the parent of the '997 Patent application. (See '802 Patent, Col. 6, lines 9-10, Figs. 7-8). Furukawa '760 further states that "**moving part 30 is lowered while being resisted by the elastic bias of elastic leg part 31**" (Furukawa '760, ¶ 9.) This elastic bias would be felt as a mechanical resistance by the user, who is applying pressing force on the button with "a fingertip". (Furukawa '760, ¶ 10.) Thus, given applicant's admission regarding prior art elastomeric dome caps, it is consistent with applicant's description of the prior art that the rubber contact "dome cap" described in Furukawa '760 inherently would have included a break-over threshold tactile feedback to the finger of the user. (See MPEP § 2112, ("The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103".)) It would have been obvious to combine Kawashima with Furukawa '760 as both disclose advantageous use of pressure-sensitive variable resistance rubber

Element #	Claim #	Claim	Corresponding Features in Prior Art
			switches in existing prior art game controllers to achieve greater game control.
35.	**36.**	A device according to claim 35 wherein said means for providing tactile feedback also comprises active tactile feedback.	Kawashima in view of Matsumoto. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Kramer. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Furukawa '760. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Himoto. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Thorner. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Matsumoto and Padula. As for claim 36, see element 33, above. Alternatively, Kawashima in view of Furukawa '760 and Mitsuhashi. As for claim 36, see element 33, above.
36.	**37.**	A device according to claim 36 wherein said first analog sensor and said second analog sensor are activated by thumb depressible single individual buttons located in a right-hand area of a housing.	Kawashima in view of Furukawa '760. As for claim 37, Furukawa '760 discloses a first analog sensor and a second analog sensor activated by single individual thumb-depressible buttons located in the right hand area of a housing. (Furukawa '760, Fig. 1, ¶¶ 7-9.) Furukawa '760 specifically discloses placing analog sensors below each of the four directional sections of a cross key in a game controller (Furukawa '760, Fig. 1, ¶ 7), each of which is attached to the output circuit to control a direction of the game character in one direction, allowing for a user's "vertically and horizontally moving characters on the screen". (Furukawa '760, ¶ 8.) Furukawa '760 also states that additional sensors may be used in other locations on the controller, other than in the cross keys: "Although in this embodiment the rubber contact of cross shaped key 12 is discussed, it is not limited to this". (Furukawa '760, Fig. 1, ¶ 9.) Furukawa '760 also includes a figure showing a controller with multiple depressible individual "trigger keys" (buttons) on the right side of the controller. (Furukawa '760, Fig. 1, ¶ 9.)

Element #	Claim #	Claim	Corresponding Features in Prior Art
			Because Furukawa ‘760 expressly states that the use of pressure-sensitive sensors is not limited to the cross-shaped key 12, and the only other places for such switches are in the individual buttons on the right side of the controller (Furukawa ‘760, Fig. 1), Furukawa ‘760 necessarily discloses the use of its pressure-sensitive switches with the individual buttons on the right side of the controller, the only other place they could possibly be. (See MPEP § 2112, (“The express, implicit, and inherent disclosure of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. § 102 or 103”.)) Alternatively, having a pressure-sensitive button in the right hand area is an obvious variation of Furukawa ‘760 because mere rearrangement of the location of switches would be an obvious design choice. (See MPEP § 2144.04.VI.C.) Additionally, including multiple buttons on the right side of controller adds nothing to the claim element, as applicant claims no new and unexpected result derived from including multiple buttons. (See MPEP § 2144.04.VI.B. (“Mere duplication of parts has no patentable significance unless a new and unexpected result is produced”.)) Thus, it would have been obvious to take the pressure-sensitive buttons disclosed in Furukawa ‘760 and place them beneath the “trigger keys” on the controller shown in Furukawa ‘760, Fig. 1. One familiar with the prior art video game controllers would understand that these keys inherently are designed to be depressible by a thumb of a user, as opposed to a finger, based on the way such a controller is held by the user. Thus, including thumb-depressible buttons on the right hand side would have been obvious. (See MPEP § 2112.) It would have been obvious to combine Kawashima with Furukawa ‘760 as both disclose advantageous use of pressure-sensitive variable resistance rubber switches in existing prior art game controllers to achieve greater game control.