EXHIBIT A

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
95/000,230	04/19/2007	6563415	6620-76454-12	7142

7590 01/31/2008

Brad A. Armstrong
P.O. BOX 2048
Carson City, NV 89702

EXAMINER

ART UNIT	PAPER NUMBER

DATE MAILED: 01/31/2008

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKETED FOR: 2/29/08

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OFFICE ACTION IN* INTER PARTES *REEXAMINATION	**Control No.** 95/000,230 + 95/000224	**Patent Under Reexamination** 6563415	
	Examiner James Menefee	**Art Unit** 3992	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address. --

Responsive to the communication(s) filed by:
Patent Owner on _____
Third Party(ies) on _____

RESPONSE TIMES ARE SET TO EXPIRE AS FOLLOWS:

For Patent Owner's Response:
1 MONTH(S) from the mailing date of this action. 37 CFR 1.945. EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.956.
For Third Party Requester's Comments on the Patent Owner Response:
30 DAYS from the date of service of any patent owner's response. 37 CFR 1.947. NO EXTENSIONS OF TIME ARE PERMITTED. 35 U.S.C. 314(b)(2).

All correspondence relating to this inter partes reexamination proceeding should be directed to the **Central Reexamination Unit** at the mail, FAX, or hand-carry addresses given at the end of this Office action.

This action is not an Action Closing Prosecution under 37 CFR 1.949, nor is it a Right of Appeal Notice under 37 CFR 1.953.

PART I. THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892
2. ☐ Information Disclosure Citation, PTO/SB/08
3. ☐ _____

PART II. SUMMARY OF ACTION:

1a. ☒ Claims 1-24 are subject to reexamination.
1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled.
3. ☐ Claims _____ are confirmed. [Unamended patent claims]
4. ☐ Claims _____ are patentable. [Amended or new claims]
5. ☒ Claims 1-24 are rejected.
6. ☐ Claims _____ are objected to.
7. ☐ The drawings filed on _____ ☐ are acceptable ☐ are not acceptable.
8. ☐ The drawing correction request filed on _____ is: ☐ approved. ☐ disapproved.
9. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119 (a)-(d). The certified copy has: ☐ been received. ☐ not been received. ☐ been filed in Application/Control No 95000230.
10. ☐ Other _____

INTER PARTES REEXAMINATION OFFICE ACTION

This is an *inter partes* reexamination of United States Patent No. 6,563,415 ("the '415 patent"). This proceeding is a merger of 95/000,224 and 95/000,230.

Citations

JP S61-103836 (translation with Request) (herein "Matsumoto").

JP S61-100844 (translation with Request) (herein "Kaneko").

GB 1 412 298 (herein "Knox").

U.S. Patent No. 5,164,697 to Kramer (herein "Kramer").

JP 5-87760 (translation with Request) (herein "Furukawa").

The admitted prior art from the '415 patent (herein "APA").

U.S. Patent No. Re. 34,095 to Padula et al. (herein "Padula").

U.S. Patent No. 5,046,739 to Reichow (herein "Reichow").

Mason, Switch Engineering Handbook (McGraw-Hill 1993) (herein "Mason").

Request for Reexamination in 95/000,224 (herein "'224 Request").

Request for Reexamination in 95/000,230 (herein "'230 Request").

Time for Reply/Extensions of Time

Litigation has been stayed for the purpose of conducting this proceeding. The shortened statutory period for reply is therefore set at one month. See MPEP 2662(L).

Extensions of time under 37 CFR 1.136(a) will not be permitted in *inter partes* reexamination proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to the patent owner in a reexamination proceeding. Additionally, 35 U.S.C. 314(c) requires that *inter partes* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.937). Patent owner extensions of time in *inter partes* reexamination proceedings are provided for in 37 CFR 1.956. Extensions of time are not available for third party requester comments, because a comment period of 30 days from service of patent owner's response is set by statute. 35 U.S.C. 314(b)(3).

Notification of Other Proceedings

The patent owner is reminded of the continuing responsibility under 37 CFR 1.985(a), to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving the '415 patent throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP § 2686 and 2686.04.

Statutory Basis for Rejections - 35 USC §§ 102 & 103

The rejections presented herein are based on the following statutory sections.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> 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 application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) 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 negatived by the manner in which the invention was made.

Listing of Rejections Proposed in the Requests

The following are the grounds of rejection proposed in the Requests that were found by the examiner to raise a SNQ in the orders granting reexamination. The proposed grounds of rejections that were found not to raise a SNQ are not listed and will not be discussed further.

Ground 1. Claims 1-2 and 7-10 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Matsumoto. See '224 Request pp. 29-34.

Ground 2. Claim 17 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Matsumoto. See '230 Request pp. 28-29.

Ground 3. Claim 18 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Matsumoto. See '224 Request pp. 35-36.

Ground 4. Claim 19 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Matsumoto. See '224 Request p. 36.

Ground 5. Claims 1-2 and 7-10 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Kaneko. See '224 Request pp. 37-41.

Ground 6. Claim 17 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Kaneko. See '230 Request pp. 29-30.

Ground 7. Claim 18 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Kaneko. See '224 Request pp. 42-43.

Ground 8. Claim 19 is unpatentable under 35 U.S.C. 102(b) as being anticipated by Kaneko. See '224 Request pp. 43-44.

Ground 9. Claims 9-10, 13-15, and 17-19 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Knox. See '230 Request pp. 31-33.

Ground 10. Claims 1-2, 4-5, 7-9, 11, 13-15, 17-18, 20-21, and 23-24 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Kramer. See '230 Request pp. 34-46.

Ground 11. Claims 1-2, 7-10, and 18-19 are unpatentable under 35 U.S.C. 103(a) as being obvious over Matsumoto in view of APA. See '230 Request pp. 59-70.

Ground 12. Claims 1-2, 7-10, and 18-19 are unpatentable under 35 U.S.C. 103(a) as being obvious over Kaneko in view of APA. See '230 Request pp. 71-80.

Ground 13. Claim 3 is unpatentable under 35 U.S.C. 103(a) as being obvious over Kramer in view of Padula and Reichow. See '230 Request pp. 80-81.

Ground 14. Claims 6, 10, 12, 16, 19, and 22 are unpatentable under 35 U.S.C. 103(a) as being obvious over Kramer in view of Padula. See '230 Request pp. 81-83.

Ground 15. Claims 1-2, 7-10, and 18-19 are unpatentable under 35 U.S.C. 103(a) as being obvious over Furukawa in view of Mason. See '230 Request pp. 87-103.

Ground 16. Claims 4-5, 11, and 19-20 are unpatentable under 35 U.S.C. 103(a) as being obvious over Kramer in view of Furukawa. See '230 Request pp. 103-104.

Analysis of Rejections Proposed in the Requests

Grounds 1-4:

Claims 1-2, 7-10, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto.

Claim 1:

Matsumoto discloses:

A pressure-sensitive variable-conductance analog sensor with tactile feedback actuatable by a single human finger, comprising;

Matsumoto discloses a pressure-sensitive variable-conductance analog sensor with tactile feedback, as will be apparent from the discussion of the limitations below. Matsumoto discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 359.

a housing; electrically highly conductive elements at least in-part within said housing; a depressible actuator retained by said housing and in-part exposed external to said housing for depression by a single human finger;

Matsumoto shows in the figures housing 2A,2B, at least two conductive elements fixed to said housing and in-part within said housing (5A and 5B are electrodes within the housing, which also have portions 5C,5D located external to the housing, as seen in Fig. 4), and a depressible actuator 1 retained by the housing and in-part exposed external to the housing for depression by a single finger. See p. 362 for discussion of these elements.

a resilient snap-through dome-cap positioned within said housing and depressible with force from said actuator applied to said dome-cap to cause said dome-cap to snap-through and create a snap-through tactile feedback detectable by the finger depressing the actuator; and

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the

'415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

pressure-sensitive variable-conductance material positioned within said housing, said pressure-sensitive variable-conductance material electrically positioned as a variably conductive element between said highly conductive elements, said pressure-sensitive variable-conductance material further positioned for receiving force applied to said dome-cap.

Matsumoto discloses pressure-sensitive electro-conductive rubber 6 that is located within the housing and electrically between the elements 5A,5B. The element is positioned for receiving force applied via pushbutton 1 and thus dome cap 3, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance.

The rejection of this claim <u>is adopted</u> for essentially the same the reasons set forth in the Request.

Claim 2:

The rejection of this claim <u>is adopted</u> for the reasons set forth in the Request. See '224 Request p. 30, which is incorporated by reference herein.

Claim 7:

Matsumoto discloses:

An improved momentary-On snap-through switch

Matsumoto discloses a switch that provides both on/off switching and variable resistance. See p. 359 last par.; p. 369 1st par. It is therefore an improvement on the momentary-On type which simply turns on and off by the pressing and release of the button, as described in the specification of the '415 patent. See col. 2 lines 14-17.

of the type having a housing;

Matsumoto shows in the figures housing 2A,2B.

a resilient snap-through tactile feedback dome-cap positioned within said housing;

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

a depressible actuator retained by said housing and in-part exposed external to said housing for being depressed by a single human finger;

Depressible actuator 1 is retained by the housing and in-part exposed external to the housing as seen in Figs. 3-4. The actuator is depressed by a single human finger as indicated at p. 359 (discussing how a user feels pressure "on a fingertip" upon actuation).

wherein the improvement comprises: analog structuring within said housing for creating a variable electrical output representational of variable depression of said actuator.

Matsumoto discloses pressure-sensitive electro-conductive rubber 6. When the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 8:

The rejection of this claim is adopted for the reasons set forth in the Request. See '224 Request p. 32, which is incorporated by reference herein.

Claim 9:

Matsumoto discloses:

An improved analog sensor of the type

Matsumoto discloses an analog sensor as will be apparent from the discussion below.

having at least two highly conductive electrical elements operationally connected to pressure-sensitive analog structure; a depressible actuator in-part exposed to be depressible toward said pressure-sensitive analog structure for supplying an analog electrical output according to depression of said actuator;

There are at least two electrically conductive elements 5A,5B,5C,5D. Matsumoto discloses pressure-sensitive electro-conductive rubber 6 that is located within the housing and electrically between the elements 5A,5B. Actuator 1 is in-part exposed to be depressible toward the pressure-sensitive rubber. Rubber 6 is positioned for receiving force applied via pushbutton actuator 1 and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance. Thus, the variable-conductance material is operationally connected between the above noted electrodes.

wherein the improvement comprises: a resilient snap-through dome-cap positioned to provide tactile feedback through said actuator to a human user's thumb depressing said actuator.

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. The fingertip could of course be a thumb. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 10:

The rejection of this claim is adopted for the reasons set forth in the Request. See '224 Request p. 34, which is incorporated by reference herein.

Claim 17:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 28-29, which are incorporated by reference herein.

Claim 18:

Matsumoto discloses **wherein said second means comprises a dome-cap structure, and another snap-through threshold tactile feedback is discernable upon activation of said first means.**

The second means in Matsumoto is the curved plate 3 that provides snap-through threshold tactile feedback and is a dome-cap. Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent; as it occurs upon pressing of the actuator, which also presses the variably conductive rubber 6, the tactile feedback is discernable upon activation of the first means.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

The rejection of this claim <u>is adopted</u> for essentially the same the reasons set forth in the Request.

Claim 19:

The rejection of this claim <u>is adopted</u> for the reasons set forth in the Request. See '224 Request p. 36, which is incorporated by reference herein.

<u>Grounds 5-8:</u>

Claims 1-2, 7-10, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaneko.

Claim 1:

Kaneko discloses:

A pressure-sensitive variable-conductance analog sensor with tactile feedback actuatable by a single human finger, comprising;

Kaneko discloses a pressure-sensitive variable-conductance analog sensor with tactile feedback, as will be apparent from the discussion of the limitations below. Kaneko discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 402.

a housing; electrically highly conductive elements at least in-part within said housing; a depressible actuator retained by said housing and in-part exposed external to said housing for depression by a single human finger;

Kaneko shows in the figures housing 2,5, at least two conductive elements fixed to said housing and in-part within said housing (4A and 4B are electrodes within the housing, which also have portions 7A,7B located external to the housing, as seen in Figs. 1-2), and a depressible actuator 1 retained by the housing and in-part exposed external to the housing for depression by a single finger. See p. 405 for discussion of these elements.

a resilient snap-through dome-cap positioned within said housing and depressible with force from said actuator applied to said dome-cap to cause said dome-cap to snap-through and create a snap-through tactile feedback detectable by the finger depressing the actuator; and

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, p. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Thus, given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

pressure-sensitive variable-conductance material positioned within said housing, said pressure-sensitive variable-conductance material electrically positioned as a variably conductive element between said highly conductive elements, said pressure-sensitive

variable-conductance material further positioned for receiving force applied to said dome-cap.

Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is located within the housing and electrically between the elements 4A,4B. The element is positioned for receiving force applied via pushbutton 1 and thus dome cap 3, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor because the electro-conductive rubber has a resistance that will vary with the applied force in an analog manner, yielding a gradual change in resistance across the output terminals 7A,7B as noted on p. 408 and p. 402 last par.

The rejection of this claim <u>is adopted</u> for essentially the same the reasons set forth in the Request.

Claim 2:

The rejection of this claim <u>is adopted</u> for the reasons set forth in the Request. See '224 Request pp. 36-37, which are incorporated by reference herein.

Claim 7:

Kaneko discloses:

An improved momentary-On snap-through switch

Kaneko discloses a switch that provides both on/off switching and variable resistance. See p. 402 last par.; p. 408. It is therefore an improvement on the momentary-On type which simply turns on and off by the pressing and release of the button, as described in the specification of the '415 patent. See col. 2 lines 14-17.

of the type having a housing;

Kaneko shows in the figures housing 2,5.

a resilient snap-through tactile feedback dome-cap positioned within said housing;

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, p. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Thus, given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

a depressible actuator retained by said housing and in-part exposed external to said housing for being depressed by a single human finger;

Depressible actuator 1 is retained by the housing and in-part exposed external to the housing as seen in Figs. 1-2. The actuator is depressed by a single human finger as indicated at p. 402 (discussing how a user feels pressure "on a fingertip" upon actuation).

wherein the improvement comprises: analog structuring within said housing for creating a variable electrical output representational of variable depression of said actuator.

Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is depressed upon pressing of the actuator 1. When the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor because the electro-conductive rubber has a resistance that will vary with the applied force in an analog manner, yielding a gradual change in resistance across the output terminals 7A,7B as noted on p. 408 and p. 402 last par.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 8:

The rejection of this claim is adopted for the reasons set forth in the Request. See '224 Request p. 39-40, which is incorporated by reference herein.

Claim 9:

Kaneko discloses:

An improved analog sensor of the type

Kaneko discloses an analog sensor as will be apparent from the discussion below.

having at least two highly conductive electrical elements operationally connected to pressure-sensitive analog structure; a depressible actuator in-part exposed to be depressible toward said pressure-sensitive analog structure for supplying an analog electrical output according to depression of said actuator;

There are at least two electrically conductive elements 4A,4B,7A,7B. Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is located within the housing and electrically between the elements 4A,4B. Actuator 1 is in-part exposed to be depressible toward the pressure-sensitive rubber. Rubber 6 is positioned for receiving force applied via pushbutton actuator 1 and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable electrical output, i.e. an analog output, of the sensor because the electro-conductive rubber has a resistance that will vary with the applied force in an analog manner, yielding a gradual change in resistance across the output terminals 7A,7B as noted on p. 408 and p. 402 last par. Thus, the variable-conductance material is operationally connected between the above noted electrodes.

wherein the improvement comprises: a resilient snap-through dome-cap positioned to provide tactile feedback through said actuator to a human user's thumb depressing said actuator.

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, p. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. The fingertip could of course be a thumb. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Thus, given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 10:

The rejection of this claim is adopted for the reasons set forth in the Request. See '224 Request p. 41, which is incorporated by reference herein.

Claim 17:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 29-30, which are incorporated by reference herein.

Claim 18:

Kaneko discloses **wherein said second means comprises a dome-cap structure, and another snap-through threshold tactile feedback is discernable upon activation of said first means.**

The second means in Kaneko is the curved plate 3 that provides snap-through threshold tactile feedback and is a dome-cap. Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, p. 405-406. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent; as it occurs upon pressing of the actuator, which also presses the variably conductive rubber 6, the tactile feedback is discernable upon activation of the first means.

The above discussion does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Thus, given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 19:

The rejection of this claim is adopted for the reasons set forth in the Request. See '224 Request pp. 43-44, which are incorporated by reference herein.

Ground 9:

Claims 13-14, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Knox. The proposed rejections of claims 9-10, 15, and 18-19 as being anticipated by Knox are not adopted as explained below.

Claims 9, 15, and 18:

The proposed rejections of claims 9, 15, and 18, see '230 Request pp. 31-33, are not adopted.

Each of these claims requires a resilient snap-through dome-cap that provides tactile feedback. The Request indicates that this limitation is met by Knox's dome-like key 3, cross-members 10, and metal spring. See, e.g., '230 Request p. 31. The examiner disagrees.

In the claim, the terms "resilient" and "snap-through" modify the dome-cap grammatically. It is apparent from the language that it is the dome-cap itself that must have these features, not, as the Request suggests, that the dome-cap may merely cover over other resilient and snap-through elements. This interpretation is further clear from the specification of the '415 patent; while the examiner does not use the specification to limit the claims, it is telling that in all instances it is the dome-cap itself that is resilient and provides snap-through tactile feedback. In light of the language of the claim, the examiner takes this limitation to mean that the dome-cap must itself be resilient and provide snap-through tactile feedback.

The only element of Knox that could conceivably be the dome-cap is the dome-like key 3. There is no indication, however, that this element is resilient or provides a snap-through action, or provides tactile feedback. Indeed, if this element itself provided a snap-through tactile feedback action, there would be no need for Knox to include the spring that performs this same action. Thus, since a resilient snap-through dome-cap that provides tactile feedback is not included in Knox, Knox cannot anticipate these claims.

Claim 10:

The proposed rejection of claim 10, see '230 Request p. 31, is not adopted. The claim depends on claim 9, therefore the rejection is not adopted for the same reasoning as for that claim, as described above.

Further, even if Knox included a snap-through dome-cap, claim 9 requires that such a dome-cap be metallic. The Request proposes that dome-like key 3 of Knox is the claimed dome-cap. There is no disclosure in Knox that these elements are metallic. The Request instead alleges that the claim limitation is met because Knox discloses a metal spring can be included to act against the key. It is apparent, however, that a spring is not a dome-cap, therefore the inclusion of the metal spring is not a disclosure that the dome-cap itself is metallic. As the limitation of claim 10 is not found in Knox, the proposed rejection is not adopted.

Claim 13:

Knox discloses:

An analog sensor, comprising;

Knox discloses an analog sensor as described in the next limitation.

means for varying electrical resistance for providing a varying output representational of varying depressive input by a single human finger;

Knox includes pressure sensitive material 14 that provides a varying electrical resistance depending on applied pressure, for providing a varying output representing the amount of pressure applied to the key via cap 8. See Knox p. 3 lines 86-128. The change of resistance is continuous as shown in Figs. 9A-9B and therefore the key/sensor can be said to act in an analog nature. The keys are for a telephone and therefore it is inherent that cap 8, which provides the varying depressive input when it is pressed with varying force, is pressed by a single human finger.

and a depressible resilient snap-through tactile element, when depressed said tactile element creating a tactile feedback detectable by the single finger.

Knox discloses that "each key can be arranged to act against a metal spring so that a snap-action and an audible 'click' is obtained on depressing the key." Knox p. 4 lines 30-33. A spring is necessarily depressible and resilient, and due to the "snap-action" is further deemed to be a "snap-through" element. A spring additionally necessarily will provide an opposing force when it is depressed, thereby creating a tactile feedback that is detectable by a finger pushing the key.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 14:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 32, which is incorporated by reference herein.

Claim 17:

Knox discloses:

An analog sensor, comprising:

Knox discloses an analog sensor as described below.

an actuator moveable by only a single human finger;

Knox discloses in Fig. 3 actuator 8 that is a key for a telephone and is therefore moveable by a single finger.

responsive to movement of said actuator is first means for varying electrical resistance and providing a varying electrical output of said sensor;

Knox includes pressure sensitive material 14 that provides a varying electrical resistance depending on applied pressure, for providing a varying output representing the amount of pressure applied to the key via cap 8. See Knox p. 3 lines 86-128. The change of resistance is continuous as shown in Figs. 9A-9B and therefore the key/sensor can be said to act in an analog nature.

and responsive to movement of said actuator is second means for providing a snap-through threshold tactile feedback detectable upon deactivation of said first means, said snap-through tactile feedback detectable by the single human finger.

Knox discloses that "each key can be arranged to act against a metal spring so that a snap-action and an audible 'click' is obtained on depressing the key." Knox p. 4 lines 30-33. A spring is necessarily depressible and resilient, and due to the "snap-action" is further deemed to be a "snap-through" element. A spring additionally necessarily will provide an opposing force when it is depressed, thereby creating a tactile feedback that is detectable by a finger pushing the key.

This limitation is in means-plus-function format, and therefore is construed to cover the corresponding structure defined in the specification of the '415 patent, and equivalents thereof. See 35 U.S.C. 112 6th ¶. The examiner finds that Knox's spring is an equivalent to the structures described in the specification. The element performs the same function specified in the claim as described above. The specification, while only describing dome-caps to provide the function, does not exclude springs. Indeed, the '415 patent in dependent claim 18 explicitly recites this element as a dome-cap, implying that the element of claim 17 is meant to cover structures other than dome caps. The spring produces substantially the same result as the dome-cap as it provides user discernable tactile feedback. The spring can be said to perform in substantially the same way, because it provides such feedback due to the simple mechanical operation of the element, its physical change simply due to being depressed. All of these factors lead the examiner to conclude that the spring is an equivalent to the structure in the specification for the purpose of rejecting this claim.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 19:

The proposed rejection of claim 19, see '230 Request pp. 33, is not adopted. The claim depends on claim 18, therefore the rejection is not adopted for the same reasoning as for that claim, as described above. Further, the claim requires that the dome-cap be metallic. This limitation is found to be lacking in Knox, as described above with respect to claim 10. The rejection is therefore not adopted for each of these reasons.

Ground 10:

Claims 1-2, 4-5, 7-9, 11, 13-15, 17-18, 20-21, and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kramer.

Claim 1:

Kramer discloses:

A pressure-sensitive variable-conductance analog sensor with tactile feedback actuatable by a single human finger, comprising;

Kramer discloses in Fig. 1 a pressure-sensitive variable-conductance analog sensor with tactile feedback, as will be apparent from the discussion of the limitations below. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human finger.

a housing; electrically highly conductive elements at least in-part within said housing; a depressible actuator retained by said housing and in-part exposed external to said housing for depression by a single human finger;

Kramer shows housing 23, col. 3 line 42, at least two conductive elements 11.1, 11.2, col. 3 line 44, that are at least in part within the housing, and depressible actuator 22 that is retained by the housing at lower portion 27 and in-part exposed external to the housing for depression by a finger, col. 3 lines 44-51.

a resilient snap-through dome-cap positioned within said housing and depressible with force from said actuator applied to said dome-cap to cause said dome-cap to snap-through and create a snap-through tactile feedback detectable by the finger depressing the actuator;

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This rubber dome is necessarily resilient because it is rubber and provides a snap effect, and the providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

and pressure-sensitive variable-conductance material positioned within said housing, said pressure-sensitive variable-conductance material electrically positioned as a variably conductive element between said highly conductive elements, said pressure-sensitive variable-conductance material further positioned for receiving force applied to said dome-cap.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and will receive force applied to the dome cap. The element is further a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature as in the preamble. The element is located electrically between the conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed).

The rejection of this claim <u>is adopted</u> for essentially the same the reasons set forth in the Request.

Claim 2:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 35-36, which are incorporated by reference herein.

Claim 4:

Kramer discloses:

An improved analog sensor actuated by a single human finger, the sensor providing a variable output used for controlling an electronic game;

Kramer's device is a sensor in the same sense as the device of the '415 patent. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human finger.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and is a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature as in the preamble. The element is located electrically between the conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed) and its variable resistance provides a varying output through these elements.

Kramer's device is for controlling entertainment electronics, see title. The examiner finds that this meets the claimed "electronic game." The term "game" is not explicitly defined in the specification, therefore it is given its plain meaning and is given its broadest reasonable interpretation in light of the specification. See MPEP 2111. The examiner notes the first definition of "game" in Merriam-Webster's Collegiate Dictionary, 10th Ed., is "an activity engaged in for diversion or amusement." Similarly, "entertainment" is defined as "the act of entertaining;" "entertaining" has the synonym "diverting," while "entertain" has the synonym "amuse." Thus, each of these words is drawn to an act or activity involving diversion or amusement, and the terms appear to be synonymous. It is further noted that alternatively rejections based on obviousness are also provided in this action for claims having this limitation, see for example Grounds 14 and H below.

wherein the improvement comprises: snap-through structuring for providing a snap-through tactile feedback to the finger.

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

The rejection of this claim <u>is adopted</u> for essentially the same the reasons set forth in the Request.

Claim 5:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 37, which is incorporated by reference herein.

Claim 7:

Kramer discloses:

An improved momentary-On snap-through switch of the type having

Kramer improves on momentary-On type snap-through switches. The switch will be off when the actuator is not depressed (i.e. heavy lines of Fig. 1 rather than the dashed lines when depressed). Compare '415 patent col. 2 lines 14-17 (describing this feature as yielding momentary-On operation).

a housing;

Kramer shows housing 23, col. 3 line 42.

a resilient snap-through tactile feedback dome-cap positioned within said housing;

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This rubber dome is necessarily resilient because it is rubber and provides a snap effect, and the providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

a depressible actuator retained by said housing and in-part exposed external to said housing for being depressed by a single human finger;

Kramer discloses depressible actuator 22 that is retained by the housing at lower portion 27 and in-part exposed external to the housing, col. 3 lines 44-51. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human finger.

wherein the improvement comprises: analog structuring within said housing for creating a variable electrical output representational of variable depression of said actuator.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and will receive force applied to the dome cap. The element is further a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator, providing a variable electrical output representational of variable depression of the actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 8:

The rejection of this claim is adopted for the reasons set forth in the Request. See '230 Request pp. 38-39, which are incorporated by reference herein.

Claim 9:

Kramer discloses:

An improved analog sensor of the type having

Kramer discloses in Fig. 1 an analog sensor, as will be apparent from the discussion of the limitations below.

at least two highly conductive electrical elements operationally connected to pressure-sensitive analog structure;

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. The element 16 is further a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator, providing a variable electrical output representational of variable depression of the actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature as in the preamble. The element is operationally connected to two electrically conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed).

a depressible actuator in-part exposed to be depressible toward said pressure-sensitive analog structure for supplying an analog electrical output according to depression of said actuator;

Kramer includes pushbutton 22 that is an actuator that is retained above and thus relatively to said variable-conductance material, and is depressible toward and transfers externally applied force onto said variable-conductance material. See col. 5 lines 4-8 (noting contact pressure on the variable-conductance material comes from the operating pressure on pushbutton 22). It is this force that causes the variable conductivity of the element 16 described above, therefore this depression of the actuator causes the supplying of the analog output according to the depression of the actuator.

wherein the improvement comprises: a resilient snap-through dome-cap positioned to provide tactile feedback through said actuator to a human user's thumb depressing said actuator.

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This rubber dome is necessarily resilient because it is rubber and provides a snap effect, and the providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user. As the snap effect occurs upon pressing of the actuator, which thereby provides pressure onto the variable-conductance material, the tactile feedback is provided upon actuation of the pressure-sensitive variable-conductance material.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 11:

Kramer discloses:

An improved pressure-sensitive analog sensor providing an electrically varying output, said varying output used for controlling an electronic game, the varying output representational of varying depressive input by a single human thumb,

Kramer's device is a sensor in the same sense as the device of the '415 patent. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human thumb.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and is a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in a pressure-sensitive analog nature as in the preamble. The element is located electrically between the conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed) and its variable resistance provides an electrically varying output through these elements representational of the depressive input from the thumb pressing the key 22.

Kramer's device is for controlling entertainment electronics, see title. The examiner finds that this meets the claimed "electronic game" for the same reasons described above under this Ground in rejecting claim 4.

wherein the improvement comprises: a depressible resilient snap-through tactile element, upon depression said tactile element creates a tactile feedback detectable by the single thumb.

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This rubber dome is necessarily resilient because it is rubber and provides a snap effect, and the providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claim 13:

Kramer discloses:

An analog sensor, comprising: means for varying electrical resistance for providing a varying output representational of varying depressive input by a single human finger;

Kramer's device is a sensor in the same sense as the device of the '415 patent. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human finger.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and is a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature as in the preamble. The element is located electrically between the conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed) and its variable resistance provides a varying output through these elements representational of varying input by a finger pressing the key 22. The element 16 therefore meets the means claimed.

and a depressible resilient snap-through tactile element, when depressed said tactile element creating a tactile feedback detectable by the single finger.

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This rubber dome is necessarily resilient because it is rubber and provides a snap effect, and the providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claims 14-15, 17, and 18:

The rejection of these claims are adopted for the reasons set forth in the Request. See '230 Request pp. 41-44, which are incorporated by reference herein.

Claim 20:

Kramer discloses:

An improved analog sensor of a type actuated by a single human finger, the sensor providing an analog variable electrical output used for controlling an electronic game;

Kramer's device is a sensor in the same sense as the device of the '415 patent. As the sensor is a pushbutton for an input keyboard, see Abstract, it is necessarily actuatable by a single human finger.

Kramer discloses countercontact 16 comprising conducting layer 17 and carbonized plastic foil 14. Col. 3 lines 55-58. This element is located within the housing and is a pressure-sensitive variable-conductance material, as its conductivity is altered relative to received force applied to the pushbutton actuator. Col. 4 line 63 – col. 5 line 8. The resistance of the element diminishes linearly with pressure, col. 5 lines 2-3, therefore Kramer's sensor acts in an analog nature as in the preamble. The element is located electrically between the conductive elements 11.1, 11.2 as seen in the dashed lines of Fig. 1 (indicating the device with the pushbutton depressed) and its variable resistance provides a varying output through these elements.

Kramer's device is for controlling entertainment electronics, see title. The examiner finds that this meets the claimed "electronic game" for the same reasons described above under this Ground in rejecting claim 4.

wherein the improvement comprises: means for providing a user discernable snap-through threshold tactile feedback to the finger, said user discernable snap-through threshold tactile feedback is provided on deactuation of the variable electrical output used for controlling the electronic game.

Kramer discloses this in col. 5 lines 36-51. Namely, Kramer discloses that in an embodiment not illustrated that the spring element may be attached to the ceiling of a rubber dome that, upon actuation of actuator 22, actuates a switching process with a snap effect to allow pressure dependent adjustment. This providing of a snap effect is deemed to be "snap-through" as recited in the claim. Kramer also notes the spring member 20 "convey[s] to [the user] the feeling of increasing pressure as the operational displacement of the pushbutton becomes greater." Col. 5 lines 34-36. The combination of this conveyance of increasing pressure along with the snap effect of the dome will create a tactile feedback to the user.

When force is removed from the actuator the switch will turn off, therefore this is deactuation of the variable output. At the same time, when the force is removed, the snap effect will occur again as the rubber dome goes back to its original state. It is inherent that the dome returning to the original state will provide a snap effect. The dome mechanically snaps-through from its original to its inverted state; it will necessarily, due to this mechanical operation, provide the same snap when going from the inverted state back to the original state.[1]

The rejection of this claim is adopted for essentially the same the reasons set forth in the Request.

Claims 21, 23, and 24:

The rejection of these claims are adopted for the reasons set forth in the Request. See '230 Request pp. 45-46, which are incorporated by reference herein.

[1] See Mason for evidence that this is inherent. Mason teaches similar switches that provide snap-through tactile feedback by mechanical snap-through action of a dome cap. Mason's switches inherently provide snap-through tactile feedback both during actuation and deactuation. Fig. 11.6 shows the force deflection curves for various snap-through tactile feedback switches. The force deflection curve is a graph of force applied to the actuator of the switch versus deflection, or displacement of the actuator when pressed. See p. 1.49 and Fig. 1.20. As seen in the Fig. 11.6 graphs, tactile feedback will occur in both directions: going from left to right on the graph during depression, and going from right to left on the graph during release. As Mason's switches are the same type and provide snap-

Ground 11:

Claims 1-2, 7-10, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of APA.

As described above in Grounds 1, 3, and 4, Matsumoto is found to anticipate each of these claims, essentially as proposed in the '224 Request. The '230 Request, however, proposed the present rejection instead; the '230 Request did not allege that Matsumoto discloses the dome-cap limitation found in all of these claims, instead combining Matsumoto with APA to teach this limitation. Ground 11 is thus provided merely as an alternative to Grounds 1, 3, and 4, although the examiner believes those rejections to be sufficient.

Matsumoto discloses the limitations of these claims as described above in the anticipation rejections. Insofar as Requester perceives, Matsumoto may not disclose the dome-cap as claimed, instead showing curved plate 3. APA, however, describes in Fig. 3 that such a dome-cap 16 was known in the art. See col. 1 line 67 – col. 2 line 20; col. 5 line 60 – col. 6 line 25. There is no appreciable difference between the APA dome-cap 16 and the dome-cap 16 of the claimed invention. It would have been obvious to a person of ordinary skill in the art to use APA's dome-cap in place of Matsumoto's curved plate, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Matsumoto contained a sensor that differs from the claimed device only in that a dome-cap would be substituted for a curved plate to reach the claimed invention. The substituted dome-cap and its functions are known in the art, as APA teaches the substituted

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through tactile feedback in the same way, Kramer's switch will also necessarily perform in a similar way in accordance with a force deflection curve, and will also provide tactile feedback in both directions.

dome-cap and its function. A person of ordinary skill in the art could have used APA's dome-cap rather than Matsumoto's curved plate, and the results would have been predictable. The dome-cap and the curved plate are located in substantially the same location, perform substantially the same function, and provide substantially the same result in each of the respective devices. Each is located between the actuator and the variably conductive material, each provides a snap-through click action upon the actuator being depressed, and each provides tactile feedback to the user due to such action. APA further details exactly how the dome-cap operates, and as the devices are similar a person of ordinary skill in the art would expect the dome-cap to operate in a similar fashion when substituted for the curved plate of Matsumoto. The result of the combination therefore would have been predictable. In light of the above findings, an obviousness rejection based on the combination of Matsumoto and APA is appropriate.

The rejections of these claims are adopted with modified rationale.

Ground 12:

Claims 1-2, 7-10, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko in view of APA.

As described above in Grounds 5, 7, and 8, Kaneko is found to anticipate each of these claims, essentially as proposed in the '224 Request. The '230 Request, however, proposed the present rejection instead; the '230 Request did not allege that Kaneko discloses the dome-cap limitation found in all of these claims, instead combining Kaneko with APA to teach this limitation. Ground 12 is thus provided merely as an alternative to Grounds 5, 7, and 8, although the examiner believes those rejections to be sufficient.

Kaneko discloses the limitations of these claims as described above in the anticipation rejections. Insofar as Requester perceives, Kaneko may not disclose the dome-cap as claimed, instead showing curved plate 3. APA, however, describes in Fig. 3 that such a dome-cap 16 was known in the art. See col. 1 line 67 – col. 2 line 20; col. 5 line 60 – col. 6 line 25. There is no appreciable difference between the APA dome-cap 16 and the dome-cap 16 of the claimed invention. It would have been obvious to a person of ordinary skill in the art to use APA's dome-cap in place of Kaneko's curved plate, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kaneko contained a sensor that differs from the claimed device only in that a dome-cap would be substituted for a curved plate to reach the claimed invention. The substituted dome-cap and its functions are known in the art, as APA teaches the substituted dome-cap and its function. A person of ordinary skill in the art could have used APA's dome-cap rather than Kaneko's curved plate, and the results would have been predictable. The dome-cap and the curved plate are located in substantially the same location, perform substantially the same function, and provide substantially the same result in each of the respective devices. Each is located between the actuator and the variably conductive material, each provides a snap-through click action upon the actuator being depressed, and each provides tactile feedback to the user due to such action. APA further details exactly how the dome-cap operates, and as the devices are similar a person of ordinary skill in the art would expect the dome-cap to operate in a similar fashion when substituted for the curved plate of Kaneko. The result of the combination therefore would have been predictable. In light of the above findings, an obviousness rejection based on the combination of Kaneko and APA is appropriate.

The rejections of these claims are adopted with modified rationale.

Ground 13:

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Padula, and further in view of Reichow.

Kramer discloses the limitations of parent claims 1 and 2 as described above in the discussion of Ground 10. Kramer does not disclose that the housing is plastic and that the dome-cap is metallic. Kramer discloses the dome-cap as rubber and is silent as to the housing material. Padula and Reichow teach these features as follows.

Padula describes a variable conductance sensor with tactile feedback. Padula shows a pen refill 2 as seen in Fig. 1 retained by the housing. When the tip is pressed it is depressed and axially displaced relative to the housing. Col. 4 lines 55-57. This action exerts pressure onto plunger 20 and plug 46, transferring the pressure from the tip to these inner portions, and therefore into pressure sensitive material 26 that is between these portions. The material 26 becomes conductive with increasing force, and will connect electrodes 24f,24g, which in turn connect terminals 24d,24e, which in turn connect the soldered coaxial cable connections, providing a variably conductive path between the conductive elements. See col. 5 lines 18-21, 51-54, col. 8 lines 1-18, Fig. 9. Padula discloses at Fig. 12 and col. 9 lines 12-31 that there may be a flexible metallic material in the shape of a dome, i.e. a resilient dome-cap, between the plug 12 and plunger 20. The dome is positioned such that when enough force is applied to the stylus for enabling the device the dome undergoes reversible collapse, a "snap action" that provides "a definite tactile feedback" to the user. The dome snaps back to the original position when pressure is removed. Thus the dome-cap of Padula is provided for the same purpose as the dome-cap of Kramer—to provide a snap effect that provides tactile feedback to the user so she can tell when the device is enabled. It would have been obvious to a person of ordinary skill in the art to use Padula's metallic dome-cap in place of Kramer's rubber dome-cap, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kramer contained a sensor that differs from the claimed device in that a metallic dome-cap would be substituted for a rubber dome-cap to reach the claimed invention. The substituted dome-cap and its functions are known in the art, as Padula teaches the substituted dome-cap and its function. A person of ordinary skill in the art could have used Padula's dome-cap rather than Kramer's, and the results would have been predictable. Each dome-cap is located in substantially the same location, performs substantially the same function, and provides substantially the same result in each of the respective devices. Each is located between the actuator and the variably conductive material, each provides a snap-through click action upon the actuator being depressed, and each provides tactile feedback to the user due to such action. Padula details exactly how the dome-cap operates, and as the devices are similar a person of ordinary skill in the art would expect the dome-cap to operate in a similar fashion when substituted for the dome-cap of Kramer. The result of the combination therefore would have been predictable. In light of the above findings, combining Kramer and Padula to meet this limitation is appropriate.

Reichow describes a game controller as in for example Fig. 6. Reichow teaches that such controllers are typically made of plastic. Col. 1 lines 23-25. Reichow does not discuss sensors similar to the claimed invention or Kramer, but the buttons of the controller must necessarily be switches in order to effectuate the operation of the device, i.e. for the pushing of the buttons to have some effect. While not relied upon in this rejection, see for example Furukawa Figs. 1-2, showing a switch that is included in the button of a game controller like Reichow's controller. Reichow's plastic controller can therefore be considered to be the housing of a switch, similar to the housing of Kramer's switch. It would have been obvious to a person of ordinary skill in the art to use plastics as the housing material, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kramer contained a sensor that differs from the claimed device in that a plastic housing would be substituted for Kramer's generic housing. The substituted plastic housing and its function were known in the art, as Reichow teaches that plastic housings were conventionally used for switches. A person of ordinary skill in the art could have made the sensor housing of such plastics, and the results of this substitution would have been predictable. Plastics are so widely known that their manufacture would have been simple to the skilled artisan, particularly in this case where it is disclosed by Reichow that such sensors are "commonly" made of such materials. Further, the result of the combination would have been predictable to a person of ordinary skill in the art. Again, as use of such plastics for housings is so typical, the skilled artisan need only look at such typical devices to see how the plastic housing would operate. And since plastics are so well known, the skilled artisan would understand that their use would provide certain features, such as protection of the inner workings of the device, and prevention of electrical conduction between the inner electrical components and the housing. The examiner finds that the use of plastics for the housing would have been entirely predictable to a person of ordinary skill in the art. In light of the above findings, combining Kramer and Reichow to meet this limitation is appropriate.

The combination of Kramer, Padula, and Reichow therefore meets all of the limitations of claim 3. The rejection of this claim is adopted with modified rationale.

Ground 14:

Claims 6, 10, 12, 16, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Padula.

Kramer discloses the limitations of the parent claims as described above in the discussion of Ground 10. Kramer does not disclose that the dome-cap is metallic, instead disclosing it as rubber. Padula teaches that a dome-cap in a variable conductance sensor may be metallic, and there is a rationale to combine these references to meet this limitation. This teaching and rationale is discussed in Ground 13 above, which is incorporated by reference herein.

The rejections of these claims are adopted with modified rationale.

Ground 15:

Claims 1, 4-5, 7, 9, 11, 13-15, 17-18, 20-21, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa in view of Mason.

The proposed rejections of claims 2 and 8 as obvious over Furukawa and Mason are not adopted as explained below.

Claim 1:

Furukawa discloses

A pressure-sensitive variable-conductance analog sensor . . . actuatable by a single human finger, comprising;

Furukawa discloses such a sensor as will be apparent from the discussion below. The sensor is used in an electronic game controller as shown in Fig. 1, and therefore is actuatable by a single human finger.

a housing; electrically highly conductive elements at least in-part within said housing; a depressible actuator retained by said housing and in-part exposed external to said housing for depression by a single human finger;

Furukawa shows a housing, the game controller itself that is shown in Fig. 1. Note that Furukawa's switch itself (as shown in Fig. 2) is located in a button of the game controller as described in ¶ [0009]: the switch is located beneath key 12 and is therefore in the housing. Thus contacts 7 of the switch are at least in-part within the housing. These contacts are electrically highly conductive elements as they are a wiring pattern on the substrate 5. The key 12 is a depressible actuator that is inherently retained by the housing (because it does not fall out of or come loose from the housing) and is in-part exposed external to the housing as seen in the figure for depression by a single human finger of a user playing the game. See ¶ [0010].

a resilient . . . dome-cap positioned within said housing and depressible with force from said actuator applied to said dome-cap . . .;

Furukawa Fig. 2 shows dome-cap 30,31; as described above the switch of Fig. 2 is within the housing. The dome-cap is resilient as it is rubber and elastic, see ¶ [0009]. This type of switch is a "dome-cap" as it has been recognized in the art as such. See Mason Fig. 11.5(a) (showing "Key Top" that has the same basic shape as Furukawa's switch; the caption of the figure refers to these as "dome shapes").

and pressure-sensitive variable-conductance material positioned within said housing, said pressure-sensitive variable-conductance material electrically positioned as a variably conductive element between said highly conductive elements, said pressure-sensitive variable-conductance material further positioned for receiving force applied to said dome-cap.

Furukawa in Fig. 2 and ¶¶ [0009]-[0010] describes part 33 within the housing that receives force applied to the dome-cap and when pressed will be electrically positioned between conductive elements 7. Material 33 has a resistance that changes according to pressing force and therefore is a pressure-sensitive variable-conductance material. The material and sensor act in an analog nature providing an analog output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

Furukawa does not disclose that the sensor has tactile feedback, that the dome-cap is a snap-through type and force applied to the dome-cap causes the dome-cap to snap-through and create a snap-through tactile feedback detectable by the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claims 2 and 8:

The proposed rejections of claims 2 and 8, see '230 Request pp. 89 and 92-93, are not adopted. The claims require that the resistivity of the pressure-sensitive variable-conductance material is variable and lowers when increased force is applied. While Furukawa discloses that the resistance of this material is variable, Furukawa does not disclose that the resistance lowers with increased force; Furukawa is silent as to *how* the resistance varies, and Mason does not in any way provide this missing feature.

The Request does not allege that the references explicitly teach the limitation, but instead claims it is inherent. See '230 Request p. 89 ("[R]esistance would necessarily have lowered as force applied to the actuator was increased."). In support of this statement the Request cites to a different reference by Furukawa that does show this feature. This, however, is not sufficient to show inherency. Just because other references, even those quite similar to Furukawa, show the resistance lowering with applied force, does not mean that this must necessarily be the case in Furukawa. One can envision a material that is highly conductive and then increases in resistivity as increased force is applied, thus one cannot say that the limitation is necessarily present in Furukawa. The examiner therefore declines to make this rejection.

Claim 4:

Furukawa discloses:

An improved analog sensor actuated by a single human finger, the sensor providing a variable output used for controlling an electronic game;

Furukawa describes a sensor that is a part of a video game controller as shown in Fig. 1 and controls the electronic game as described in ¶ [0010]. The sensor is located within a button of the controller as described in ¶ [0009], and therefore is actuated by a single human finger. It is an analog sensor due to the inclusion of variable-conductance material 33, which has a resistance that changes according to pressing force. The material and sensor act in an analog nature providing an analog output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

wherein the improvement comprises: snap-through structuring for providing a snap-through tactile feedback to the finger.

Furukawa shows dome-cap 30,31 as discussed above in rejecting claim 1, but does not disclose snap-through structuring for providing snap-through tactile feedback to the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claim 5:

The rejection of this claim is adopted for the reasons set for in the Request, see '230 Request p. 91, which is incorporated by reference herein.

Claim 7:

Furukawa discloses:

An improved momentary-On snap-through switch of the type having a housing;

Furukawa discloses a momentary-On switch, as its electrical connection is released when the depression of the switch is released. See ¶ [0009] last sentence; compare '415 patent col. 2 lines 14-17 (describing this feature as yielding momentary-On operation). When combined with Mason as explained below it will be a snap-through switch. Furukawa shows a housing, the game controller itself that is shown in Fig. 1.

a resilient snap-through tactile feedback dome-cap positioned within said housing;

Furukawa's switch itself (as shown in Fig. 2) is located in a button of the game controller of Fig. 1 as described in ¶ [0009], therefore elements 30,31 are within the housing. Furukawa shows resilient dome-cap 30,31 as discussed above in rejecting claim 1, but does not disclose snap-through tactile feedback. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

a depressible actuator retained by said housing and in-part exposed external to said housing for being depressed by a single human finger;

The key 12 is a depressible actuator that is inherently retained by the housing (because it does not fall out of or come loose from the housing) and is in-part exposed external to the housing as seen in Fig. 1 for depression by a single human finger of a user playing the game. See ¶ [0010].

wherein the improvement comprises: analog structuring within said housing for creating a variable electrical output representational of variable depression of said actuator.

Furukawa describes variable-conductance material 33, which has a resistance that changes according to pressing force from the actuator and thus is an analog structuring for creating a variable electrical output representational of variable depression of the actuator. The sensor acts in an analog nature providing an analog output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

The rejection of this claim <u>is adopted</u> for essentially the same reasons set forth in the Request.

Claim 9:

Furukawa discloses:

An improved analog sensor of the type having at least two highly conductive electrical elements operationally connected to pressure-sensitive analog structure; a depressible actuator in-part exposed to be depressible toward said pressure-sensitive analog structure for supplying an analog electrical output according to depression of said actuator;

Furukawa discloses an analog sensor including a housing, the game controller itself that is shown in Fig. 1. There are contacts 7 that are electrically highly conductive elements as they are a wiring pattern on the substrate 5. The contacts are operationally connected to pressure-sensitive analog structure 33 as this element connects the contacts upon depression. Material 33 has a resistance that changes according to pressing force. The key 12 is a depressible actuator that is in-part exposed from the controller to be depressible toward the pressure-sensitive analog structure 33. The material and sensor act in an analog nature providing an analog electrical output according to depression of the actuator, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch. See ¶¶ [0009]-[0010].

wherein the improvement comprises: a resilient snap-through dome-cap positioned to provide tactile feedback through said actuator to a human user's thumb depressing said actuator.

Furukawa shows resilient dome-cap 30,31 as discussed above in rejecting claim 1, but does not disclose it is of snap-through type for providing tactile feedback to a thumb pressing the actuator. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claim 11:

Furukawa discloses:

An improved pressure-sensitive analog sensor providing an electrically varying output, said varying output used for controlling an electronic game, the varying output representational of varying depressive input by a single human thumb,

Furukawa describes a sensor that is a part of a video game controller as shown in Fig. 1 and controls the electronic game as described in ¶ [0010]. The sensor is located within a button of the controller as described in ¶ [0009], and therefore is actuated by a single human thumb. It is an analog sensor due to the inclusion of variable-conductance material 33, which has a resistance that changes according to pressing force. The material and sensor act in an analog nature providing an analog output that is a varying output representational of varying depressive input of the thumb, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

wherein the improvement comprises: a depressible resilient snap-through tactile element, upon depression said tactile element creates a tactile feedback detectable by the single thumb.

Furukawa shows depressible and resilient dome-cap 30,31 as discussed above in rejecting claim 1, but does not disclose that it is a tactile element creating tactile feedback to the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

The rejection of this claim <u>is adopted</u> for essentially the same reasons set forth in the Request.

Claim 13:

Furukawa discloses:

An analog sensor, comprising; means for varying electrical resistance for providing a varying output representational of varying depressive input by a single human finger;

Furukawa describes a sensor that is a part of a video game controller as shown in Fig. 1 and controls the electronic game with a varying output representational of varying depressive input as described in ¶ [0010]. The sensor is located within a button of the controller as described in ¶ [0009], and therefore is actuated by a single human finger. It is an analog sensor due to the inclusion of variable-conductance material 33, which has a resistance that changes according to pressing force. The material 33 is thus a means for varying electrical resistance for providing a varying output representational of varying depressive input. The sensor acts in an analog nature providing an analog output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

and a depressible resilient snap-through tactile element, when depressed said tactile element creating a tactile feedback detectable by the single finger.

Furukawa shows depressible and resilient dome-cap 30,31 as discussed above in rejecting claim 1, but does not disclose that it is a tactile element creating tactile feedback to the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claim 14:

The rejection of this claim is adopted for the reasons set forth in the Request, see '230 Request p. 97, which is incorporated by reference herein.

Claim 15:

Furukawa and Mason teach **an actuator positioned between the single human finger and said tactile element, and said tactile element is a dome-cap.** The key 12 of Furukawa's controller is an actuator that is positioned between the finger and the remainder of the sensor, including the tactile element. The tactile element is a dome-cap as shown in Mason in rejecting parent claim 13 above. The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claim 17:

Furukawa discloses:

An analog sensor, comprising:

Furukawa discloses such a sensor as will be apparent from the discussion below.

an actuator moveable by only a single human finger;

Furukawa shows key 12 that is a depressible actuator; it is a part of the controller shown in Fig. 1 and is for depression by a single human finger of a user playing the game. See ¶ [0010].

responsive to movement of said actuator is first means for varying electrical resistance and providing a varying electrical output of said sensor;

Furukawa in Fig. 2 and ¶¶ [0009]-[0010] describes part 33 that has a resistance that changes according to pressing force and therefore is a means for varying electrical resistance and provides a varying electrical output of the sensor for providing varying control of a character in a video game. The material and sensor act in an analog nature providing an analog output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

and responsive to movement of said actuator is second means for providing a snap-through threshold tactile feedback detectable upon deactivation of said first means, said snap-through tactile feedback detectable by the single human finger.

Furukawa shows depressible and resilient dome-cap 30,31 that is responsive to movement of the actuator, as discussed above in rejecting claim 1, but does not disclose that it is a tactile element creating tactile feedback to the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

Note that Mason's switches inherently provide snap-through tactile feedback both during actuation and deactuation. Fig. 11.6 shows the force deflection curves for various snap-through tactile feedback switches. The force deflection curve is a graph of force applied to the actuator of the switch versus deflection, or displacement of the actuator when pressed. See p. 1.49 and Fig. 1.20. As seen in the Fig. 11.6 graphs, tactile feedback will occur in both directions: going from left to right on the graph during depression, and going from right to left on the graph during release.

The rejection of this claim <u>is adopted</u> for essentially the same reasons set forth in the Request.

Claim 18:

As described above, after the combination of Furukawa and Mason, Mason's means for providing tactile feedback is a dome-cap and snap-through tactile feedback will be discernable in both directions, i.e. upon actuation of the variable conductance material. The rejection of this claim <u>is adopted</u> for essentially the same reasons as set forth in the Request.

Claim 20:

Furukawa discloses:

An improved analog sensor of a type actuated by a single human finger, the sensor providing an analog variable electrical output used for controlling an electronic game;

Furukawa describes a sensor that is a part of a video game controller as shown in Fig. 1 and controls the electronic game as described in ¶ [0010]. The sensor is located within a button of the controller as described in ¶ [0009], and therefore is actuated by a single human finger. It is an analog sensor due to the inclusion of variable-conductance material 33, which has a resistance that changes according to pressing force. The material and sensor act in an analog nature providing an analog variable electrical output, as the resistance varies with pressure and the output, for example controlling the speed of a character of a video game, also varies with pressure applied to the switch.

wherein the improvement comprises: means for providing a user discernable snap-through threshold tactile feedback to the finger, said user discernable snap-through threshold tactile feedback is provided on deactuation of the variable electrical output used for controlling the electronic game.

Furukawa shows depressible and resilient dome-cap 30,31 that is responsive to movement of the actuator, as discussed above in rejecting claim 1, but does not disclose that it is a tactile element creating tactile feedback to the finger. Mason teaches similar switches that do provide tactile feedback via a snap-through dome-cap where force applied to the dome-cap causes snap-through tactile feedback. See p. 11.5 and Fig. 11.5 describing similar switches; see also p. 11.14 and Table 11.8 noting the "snap" of such switches. These switches thus provide snap-through tactile feedback. Mason also notes that switches having tactile feedback are often of great importance, particularly in cases where the user needs to recognize that the switch has indeed been actuated. See pp. 1.48-.49. Thus, it would have been obvious to one skilled in the art to utilize the snap-through tactile feedback dome-caps of Mason in the Furukawa device so that the user would have an indication that the switch has been pressed.

Note that Mason's switches inherently provide snap-through tactile feedback both during actuation and deactuation. Fig. 11.6 shows the force deflection curves for various snap-through tactile feedback switches. The force deflection curve is a graph of force applied to the actuator of the switch versus deflection, or displacement of the actuator when pressed. See p. 1.49 and Fig. 1.20. As seen in the Fig. 11.6 graphs, tactile feedback will occur in both directions: going from left to right on the graph during depression, and going from right to left on the graph during release.

The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claim 21:

As described above, after the combination of Furukawa and Mason, Mason's means for providing tactile feedback provides discernable snap-through tactile feedback in both directions, i.e. upon actuation of the variable conductance material. The rejection of this claim is adopted for essentially the same reasons set forth in the Request.

Claims 23-24:

The rejections of these claims are adopted for the reasons set forth in the Request. See '230 Request p. 103, which is incorporated by reference herein.

Ground 16:

Claims 4-5, 11, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Furukawa. The proposed rejection of claim 19 as being obvious over Kramer in view of Furukawa is not adopted.

Claims 4-5, 11, and 20:

As described above in Ground 10, Kramer is found to anticipate each of these claims, essentially as proposed in the '230 Request. The '230 Request, however, proposed the present rejection in the alternative, alleging that even if Kramer does not disclose the device for use with an electronic game as claimed, the claims are obvious in light of Furukawa. Ground 16 is thus provided merely as an alternative to Ground 10, although the examiner believes those rejections to be sufficient.

Kramer discloses the limitations of these claims as described above in the anticipation rejections. Insofar as Requester perceives, Kramer may not disclose that the output of the device is used for controlling an electronic game, as claimed. Furukawa shows similar sensors that are used for controlling an electronic game. See the discussion of Ground 13 above rejecting claim 4. It would have been obvious to a person of ordinary skill in the art to use Kramer's sensor in

Furukawa's electronic game controller, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art included a device that differs from the claimed device because Furukawa's game controller does not use the precise sensor as claimed. The substituted sensor was known in the art as described in Kramer, which describes such a sensor and its function. A person of ordinary skill in the art could have made the device using Kramer's sensor in place of Furukawa's sensor, and the results of this substitution would have been predictable. Each of the sensors are of similar structure and provide similar functions, as seen in comparing Kramer Fig. 1 with Furukawa Fig. 2; each includes a portion that is depressed so that a variably conductive material will connect two contacts, such that a variable output is received based on the amount of depression. It would seem totally predictable to one skilled in the art that the Kramer sensor could be substituted into the Furukawa device and provide this similar function as the purpose of the Kramer sensor is not altered. Further, a person of ordinary skill in the art already knows how the Kramer device will operate and how it would be made (because such is disclosed in Kramer), therefore it would have been predictable to one skilled in the art how to make and operate the device after making this substitution. Based on the above, the examiner finds that the use of Kramer's sensor in place of Furukawa's sensor for controlling an electronic game would have been entirely predictable to a person of ordinary skill in the art, and therefore an obviousness rejection based on this combination is appropriate.

The rejections of these claims are adopted with modified rationale.

Claim 19:

The proposed rejection of claim 19, see '230 Request pp. 103-104, is not adopted. The Request states that Kramer discloses the limitations of claim 19, but provides Furukawa only for the teaching that Kramer's device may be used in an electronic game controller, as described above. Claim 19, however, has no requirement of use in an electronic game, and Kramer does not meet the other limitations of this claim, the requirement that the dome-cap be metallic. See the discussion of Ground 14 above, where Kramer is combined with Padula to reject claim 19 due to Kramer lacking a metallic dome cap. Perhaps the inclusion of this claim was merely a typographical error, but the examiner declines to guess as to what the Requester meant and goes only by the listed claims. As there is no basis in Kramer or Furukawa for a metallic dome-cap, this proposed rejection is not adopted.

Listing of Rejections Proposed By the Examiner

Ground A: Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of APA.

Ground B: Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko in view of APA.

Ground C: Claims 4-6, 11-12, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Furukawa.

Ground D: Claims 4-6, 11-12, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko in view of Furukawa.

Ground E: Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto.

Ground F: Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaneko.

Ground G: Claims 3, 6, 10, 12, 16, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of APA.

Ground H: Claims 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Furukawa.

Ground I: Claims 6, 12, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Furukawa, and further in view of APA.

Discussion of Rejections Proposed By the Examiner

<u>Ground A:</u>

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of APA.

Matsumoto discloses the limitations of parent claims 1-2, as described above in the Requester's proposed rejections Ground 1. Matsumoto further discloses as in claim 3 that the dome-cap is metallic. See p. 364 (curved plate 3 is phosphor bronze). Matsumoto is silent as to the material of the housing, therefore does not disclose as in claim 3 that the housing is formed of plastic. APA describes a sensor similar to that of Matsumoto where the housing is made of plastics. Col. 5 lines 8-15; col. 1 lines 39-40. The '415 patent applicant therefore admitted that it was conventional in the art for the housing of such sensors to be made of plastics. It would have been obvious to a person of ordinary skill in the art to use plastics as the housing material, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Matsumoto contained a sensor that differs from the claimed device only in that a plastic housing would be substituted for Matsumoto's generic housing. The substituted plastic housing and its function were known in the art, as APA teaches that such housings were conventionally used for similar sensors. A person of ordinary skill in the art could have made the sensor housing of such plastics, and the results of this substitution would have been predictable. Plastics are so widely known that their manufacture would have been simple to the skilled artisan, particularly in this case where it is disclosed by APA that such sensors are "typically" made of such materials. Further, the result of the combination would have been predictable to a person of ordinary skill in the art. Again, as use of such plastics for housings is so typical, the skilled artisan need only look at such typical devices to see how the plastic housing would operate. And since plastics are so well known, the skilled artisan would understand that their use would provide certain features, such as protection of the inner workings of the device, and prevention of electrical conduction between the inner electrical components and the housing. The examiner finds that the use of plastics for the housing would have been entirely predictable to a person of ordinary skill in the art. In light of the above findings, an obviousness rejection based on the combination of Matsumoto and APA is appropriate.

Ground B:

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko in view of APA.

Kaneko discloses the limitations of parent claims 1-2, as described above in the Requester's proposed rejections Ground 5. Kaneko further discloses as in claim 3 that the dome-cap is metallic. See p. 406 (curved plate 3 is phosphor bronze). Kaneko is silent as to the material of the housing, therefore does not disclose as in claim 3 that the housing is formed of plastic. APA describes a sensor similar to that of Kaneko where the housing is made of plastics. Col. 5 lines 8-15; col. 1 lines 39-40. The '415 patent applicant therefore admitted that it was conventional in the art for the housing of such sensors to be made of plastics. It would have been obvious to a person of ordinary skill in the art to use plastics as the housing material, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kaneko contained a sensor that differs from the claimed device only in that a plastic housing would be substituted for Kaneko's generic housing. The substituted plastic housing and its function were known in the art, as APA teaches that such housings were conventionally used for similar sensors. A person of ordinary skill in the art could have made the sensor housing of such plastics, and the results of this substitution would have been predictable. Plastics are so widely known that their manufacture would have been simple to the skilled artisan, particularly in this case where it is disclosed by APA that such sensors are "typically" made of such materials. Further, the result of the combination would have been predictable to a person of ordinary skill in the art. Again, as use of such plastics for housings is so typical, the skilled artisan need only look at such typical devices to see how the plastic housing would operate. And since plastics are so well known, the skilled artisan would understand that their use would provide certain features, such as protection of the inner workings of the device, and prevention of electrical conduction between the inner electrical components and the housing. The examiner finds that the use of plastics for the housing would have been entirely predictable to a person of ordinary skill in the art. In light of the above findings, an obviousness rejection based on the combination of Kaneko and APA is appropriate.

Ground C:

Claims 4-6, 11-12, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto in view of Furukawa.

Regarding claim 4, Matsumoto discloses: **An improved analog sensor actuated by a single human finger, the sensor providing a variable output . . .;**

Matsumoto discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable output, i.e. an analog variable output, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance. Matsumoto discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 359.

wherein the improvement comprises: snap-through structuring for providing a snap-through tactile feedback to the finger.

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied by a finger to the pushbutton 1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Matsumoto does not disclose that the sensor's output is for controlling an electronic game. Furukawa shows similar sensors that are used for controlling an electronic game. See the discussion of Ground 13 above rejecting claim 4. It would have been obvious to a person of ordinary skill in the art to use Matsumoto's sensor in Furukawa's electronic game controller, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art included a device that differs from the claimed device because Furukawa's game controller does not use the precise sensor as claimed. The substituted sensor was known in the art as described in Matsumoto, which describes such a sensor and its function. A person of ordinary skill in the art could have made the device using Matsumoto's sensor in place of Furukawa's sensor, and the results of this substitution would have been predictable. Each of the sensors are of similar structure and provide similar functions, as seen in comparing Matsumoto Fig. 3 with Furukawa Fig. 2; each includes a portion that is depressed so that a variably conductive material will connect two contacts, such that a variable output is received based on the amount of depression. It would seem totally predictable to one skilled in the art that the Matsumoto sensor could be substituted into the Furukawa device and provide this similar function as the purpose of the Matsumoto sensor is not altered. Further, a person of ordinary skill in the art already knows how the Matsumoto device will operate and how it would be made (because such is disclosed in Matsumoto), therefore it would have been predictable to one skilled in the art how to make and operate the device after making this substitution. Based on the above, the examiner finds that the use of Matsumoto's sensor in place of Furukawa's sensor for controlling an electronic game would have been entirely predictable to a person of ordinary skill in the art, and therefore an obviousness rejection based on this combination is appropriate.

Regarding claim 5, Matsumoto discloses **wherein said analog sensor is a pressure-sensitive analog sensor and said single human finger is a single human thumb.** As noted above Matsumoto's sensor output depends on the applied pressure, thus it is pressure-sensitive. Matsumoto's finger applying pressure to the actuator may be the thumb.

Regarding claim 6, Matsumoto discloses **wherein said snap-through structuring includes a metallic dome-cap.** Page 364 discloses curved plate 3 as phosphor bronze. The above discussion of the snap-through structuring (in rejecting claim 4) does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

Regarding claim 11, Matsumoto discloses: **An improved pressure-sensitive analog sensor providing an electrically varying output, said varying output . . . , the varying output representational of varying depressive input by a single human thumb,**

Matsumoto discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. The sensor is thus pressure-sensitive. The change of resistance allows for a variable electrical output, i.e. an analog varying output representational of varying depressive input, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance. Matsumoto discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 359. The finger can be a thumb.

wherein the improvement comprises: a depressible resilient snap-through tactile element, upon depression said tactile element creates a tactile feedback detectable by the single thumb.

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied by a finger to the pushbutton 1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts, allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Matsumoto does not disclose that the output of the sensor is for controlling an electronic game. Furukawa teaches this feature and there is a reason to combine the references, as described above under this Ground in rejecting claim 4.

Regarding claim 12, Matsumoto discloses **wherein said snap-through tactile element is metallic.** Page 364 discloses curved plate 3 is phosphor bronze.

Regarding claim 20, Matsumoto discloses: **An improved analog sensor of a type actuated by a single human finger, the sensor providing an analog variable electrical output . . .;**

Matsumoto discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable electrical output, i.e. an analog variable electrical output, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance. Matsumoto discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 359.

wherein the improvement comprises: means for providing a user discernable snap-through threshold tactile feedback to the finger, said user discernable snap-through threshold tactile feedback is provided on deactuation of the variable electrical output . . . .

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent. When force is removed from the actuator the switch will turn off (because the resistivity of the rubber 6 will return to its infinite level as noted on p. 366), therefore this is deactuation of the variable output. At the same time, when the force is removed, the curved plate will return to its original state, as also noted on p. 366. It is inherent that the curved plate returning to the original state will provide a user discernable snap-through tactile feedback. The curved plate mechanically snaps-through from its original to its inverted state; it will necessarily, due to this mechanical operation, provide the same snap when going from the inverted state back to the original state.[2]

The above discussion does not show the curved plate as a "dome-cap;" the claim does not require a dome-cap, but the specification describes the means as a dome-cap therefore this is covered by the claim. Comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

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[2] See Mason for evidence that this is inherent. Mason teaches similar switches that provide snap-through tactile feedback by mechanical snap-through action of a dome cap. Mason's switches inherently provide snap-through tactile feedback both during actuation and deactuation. Fig. 11.6 shows the force deflection curves for various snap-through tactile feedback switches. The force deflection curve is a graph of force applied to the actuator of the switch versus deflection, or displacement of the actuator when pressed. See p. 1.49 and Fig. 1.20. As seen in the Fig. 11.6 graphs, tactile feedback will occur in both directions: going from left to right on the graph during depression, and going from right to left on the graph during release. As Mason's switches are the same type and provide snap-through tactile feedback in the same way, Matsumoto's switch will also necessarily perform in a similar way in accordance with a force deflection curve, and will also provide tactile feedback in both directions.

Matsumoto does not disclose that the output of the sensor is for controlling an electronic game. Furukawa teaches this feature and there is a reason to combine the references, as described above under this Ground in rejecting claim 4.

Regarding claim 21, Matsumoto discloses **wherein another user discernable snap-through threshold tactile feedback is provided on actuation of the variable electrical output used for controlling the electronic game.** As described throughout Matsumoto, the user discernable snap-through tactile feedback occurs upon pressing of the actuator 1, i.e. upon actuation of the variable electrical output. See p. 365 (click action upon pressing of the actuator to the on point, which leads to pressing of the variably conductive rubber 6).

Regarding claim 22, Matsumoto discloses **wherein said means includes a metallic dome-cap.** Page 364 discloses curved plate 3 as phosphor bronze, and is a dome-cap as described above under this Ground in rejecting claim 20.

Regarding claim 23, Matsumoto discloses **wherein said analog sensor is a pressure-sensitive analog sensor, and the single human finger is a single human thumb.** As noted above Matsumoto's sensor output depends on the applied pressure, thus it is pressure-sensitive. Matsumoto's finger applying pressure to the actuator may be the thumb.

Ground D:

Claims 4-6, 11-12, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko in view of Furukawa.

Regarding claim 4, Kaneko discloses: **An improved analog sensor actuated by a single human finger, the sensor providing a variable output . . .;**

Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable output, i.e. an analog variable output, of the sensor because the resistance of the electro-conductive rubber will vary with the applied force in an analog manner, yielding a gradual change in resistance across output terminals 7A,7B as noted on p. 408 and p. 402 last par. Kaneko discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 402.

wherein the improvement comprises: snap-through structuring for providing a snap-through tactile feedback to the finger.

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, pp. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied by a finger to the pushbutton 1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Kaneko does not disclose that the sensor's output is for controlling an electronic game. Furukawa shows similar sensors that are used for controlling an electronic game. See the discussion of Ground 13 above rejecting claim 4. It would have been obvious to a person of ordinary skill in the art to use Kaneko's sensor in Furukawa's electronic game controller, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art included a device that differs from the claimed device because Furukawa's game controller does not use the precise sensor as claimed. The substituted sensor was known in the art as described in Kaneko, which describes such a sensor and its function. A person of ordinary skill in the art could have made the device using Kaneko's sensor in place of Furukawa's sensor, and the results of this substitution would have been predictable. Each of the sensors are of similar structure and provide similar functions, as seen in comparing Kaneko Fig. 3 with Furukawa Fig. 2; each includes a portion that is depressed so that a variably conductive material will connect two contacts, such that a variable output is received based on the amount of depression. It would seem totally predictable to one skilled in the art that the Kaneko sensor could be substituted into the Furukawa device and provide this similar function as the purpose of the Kaneko sensor is not altered. Further, a person of ordinary skill in the art already knows how the Kaneko device will operate and how it would be made (because such is disclosed in Kaneko), therefore it would have been predictable to one skilled in the art how to make and operate the device after making this substitution. Based on the above, the examiner finds that the use of Kaneko's sensor in place of Furukawa's sensor for controlling an electronic game would have been entirely predictable to a person of ordinary skill in the art, and therefore an obviousness rejection based on this combination is appropriate.

Regarding claim 5, Kaneko discloses **wherein said analog sensor is a pressure-sensitive analog sensor and said single human finger is a single human thumb.** As noted above Kaneko's sensor output depends on the applied pressure, thus it is pressure-sensitive. Kaneko's finger applying pressure to the actuator may be the thumb.

Regarding claim 6, Kaneko discloses **wherein said snap-through structuring includes a metallic dome-cap.** Page 406 discloses curved plate 3 as phosphor bronze. The above discussion of the snap-through structuring (in rejecting claim 4) does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

Regarding claim 11, Kaneko discloses: **An improved pressure-sensitive analog sensor providing an electrically varying output, said varying output . . . , the varying output representational of varying depressive input by a single human thumb,**

Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. The sensor is thus pressure-sensitive. The change of resistance allows for a variable electrical output, i.e. an analog varying output representational of varying depressive input, of the sensor because the resistance of the electro-conductive rubber will vary with the applied force in an analog manner, yielding a gradual change in resistance across output terminals 7A,7B as noted on p. 408 and p. 402 last par. Kaneko discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 402. The finger can be a thumb.

wherein the improvement comprises: a depressible resilient snap-through tactile element, upon depression said tactile element creates a tactile feedback detectable by the single thumb.

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, pp. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied to the pushbutton 1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Kaneko does not disclose that the output of the sensor is for controlling an electronic game. Furukawa teaches this feature and there is a reason to combine the references, as described above under this Ground in rejecting claim 4.

Regarding claim 12, Kaneko discloses **wherein said snap-through tactile element is metallic.** Page 406 discloses curved plate 3 is phosphor bronze.

Regarding claim 20, Kaneko discloses: **An improved analog sensor of a type actuated by a single human finger, the sensor providing an analog variable electrical output . . .;**

Kaneko discloses pressure-sensitive electro-conductive rubber 6 that is positioned for receiving force applied via pushbutton 1, and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable electrical output, i.e. an analog variable electrical output, of the sensor because the resistance of the electro-conductive rubber will vary with the applied force in an analog manner, yielding a gradual change in resistance across output terminals 7A,7B as noted on p. 408 and p. 402 last par. Kaneko discusses feeling pressure "on a fingertip" when the sensor is actuated, therefore it is actuatable by a single human finger. P. 402.

wherein the improvement comprises: means for providing a user discernable snap-through threshold tactile feedback to the finger, said user discernable snap-through threshold tactile feedback is provided on deactuation of the variable electrical output . . . .

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, pp. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied to the pushbutton 1 (i.e. actuator) it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent. When force is removed from the actuator the switch will turn off (because the resistivity of the rubber 6 will return to its infinite level as noted on p. 408), therefore this is deactuation of the variable output. At the same time, when the force is removed, the curved plate will return to its original state, as also noted on p. 408. It is inherent that the curved plate returning to the original state will provide a user discernable snap-through tactile feedback. The curved plate mechanically snaps-through from its original to its inverted state; it will necessarily, due to this mechanical operation, provide the same snap when going from the inverted state back to the original state.[3]

The above discussion does not show the curved plate as a "dome-cap;" the claim does not require a dome-cap, but the specification describes the means as a dome-cap therefore this is covered by the claim. Comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 3 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

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[3] See Mason for evidence that this is inherent. Mason teaches similar switches that provide snap-through tactile feedback by mechanical snap-through action of a dome cap. Mason's switches inherently provide snap-through tactile feedback both during actuation and deactuation. Fig. 11.6 shows the force deflection curves for various snap-through tactile feedback switches. The force deflection curve is a graph of force applied to the actuator of the switch versus deflection, or displacement of the actuator when pressed. See p. 1.49 and Fig. 1.20. As seen in the Fig. 11.6 graphs, tactile feedback will occur in both directions: going from left to right on the graph during depression, and going from right to left on the graph during release. As Mason's switches are the same type and provide snap-through tactile feedback in the same way, Kaneko's switch will also necessarily perform in a similar way in accordance with a force deflection curve, and will also provide tactile feedback in both directions.

Kaneko does not disclose that the output of the sensor is for controlling an electronic game. Furukawa teaches this feature and there is a reason to combine the references, as described above under this Ground in rejecting claim 4.

Regarding claim 21, Kaneko discloses **wherein another user discernable snap-through threshold tactile feedback is provided on actuation of the variable electrical output used for controlling the electronic game.** As described throughout Kaneko, the user discernable snap-through tactile feedback occurs upon pressing of the actuator 1, i.e. upon actuation of the variable electrical output. See pp. 407-408 (click action upon pressing of the actuator to the on point, which leads to pressing of the variably conductive rubber 6).

Regarding claim 22, Kaneko discloses **wherein said means includes a metallic dome-cap.** Page 406 discloses curved plate 3 as phosphor bronze, and is a dome-cap as described above under this Ground in rejecting claim 20.

Regarding claim 23, Kaneko discloses **wherein said analog sensor is a pressure-sensitive analog sensor, and the single human finger is a single human thumb.** As noted above Kaneko's sensor output depends on the applied pressure, thus it is pressure-sensitive. Kaneko's finger applying pressure to the actuator may be the thumb.

<u>Ground E:</u>

Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto.

Regarding claim 13, Matsumoto discloses: **An analog sensor, comprising; means for varying electrical resistance for providing a varying output representational of varying depressive input by a single human finger;**

Matsumoto discloses pressure-sensitive electro-conductive rubber 6. The element is positioned for receiving force applied via pushbutton 1 (that is pushed by the finger), and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 365-366. This change of resistance allows for a variable electrical output representative of the varying depressive input, i.e. an analog output thus it is an analog sensor, of the sensor as noted at p. 368 1st par., where it is described that the switch can not only turn a motor on/off, but can also control the motor speed by varying the resistance.

and a depressible resilient snap-through tactile element, when depressed said tactile element creating a tactile feedback detectable by the single finger.

Matsumoto describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 4-5, p. 363. This element has "spring-like properties" and therefore is resilient. P. 364. When force is applied by a finger to the pushbutton 1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 365. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 359; see also p. 360 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Regarding claim 14, Matsumoto discloses **wherein said analog sensor is a pressure-sensitive analog sensor.** As noted in rejecting claim 13, the output of the sensor varies with applied pressure to pushbutton 1, therefore the device is pressure-sensitive.

Regarding claim 15, Matsumoto discloses **further including an actuator positioned between the single human finger and said tactile element, and said tactile element is a dome-cap.** As seen in Fig. 3, actuator 1 will be between the finger that pushes it and the tactile element 3 that is inside the sensor.

The above discussion of the tactile element (in rejecting claim 13) does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Matsumoto Fig. 5, the Matsumoto curved plate appears to be directly the opposite of a dome-cap. But Matsumoto additionally discloses that the curved plate may be a dome-cap. On page 364, Matsumoto states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig. 5 with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Matsumoto disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Matsumoto can properly be called a dome-cap as claimed.

Regarding claim 16, Matsumoto discloses **wherein said dome-cap is metallic.** See p. 364 (curved plate 3 is phosphor bronze).

Ground F:

Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaneko.

Regarding claim 13, Kaneko discloses: **An analog sensor, comprising; means for varying electrical resistance for providing a varying output representational of varying depressive input by a single human finger;**

Kaneko discloses pressure-sensitive electro-conductive rubber 6. The element is positioned for receiving force applied via pushbutton 1 (that is pushed by the finger), and when the rubber 6 is pressed the resistance is reduced relative to the received force. This operation is discussed at pp. 407-408. This change of resistance allows for a variable electrical output representative of the varying depressive input, i.e. an analog output thus it is an analog sensor, of the sensor as because the electro-conductive rubber has a resistance that will vary with the applied force in an analog manner, yielding a gradual change in resistance across output terminals 7A,7B as noted on p. 408 and p. 402 last par.

and a depressible resilient snap-through tactile element, when depressed said tactile element creating a tactile feedback detectable by the single finger.

Kaneko describes curved plate 3 with longitudinal ends curved upward so that it is concave facing the top of the device. See Figs. 3-4, p. 405-406. This element has "spring-like properties" and therefore is resilient. P. 406. When force is applied by a finger to the pushbutton

1 it presses and inverts the plate so ends that were curved upward are now curved downward, producing a "click action." P. 407. In this way the "switching can be easily recognized through the feeling of pressure on a fingertip." P. 402; see also p. 403 discussing this click point that allows the user to clearly recognize the switching. This type of action, where the curved plate inverts allowing the user to recognize the change in pressure through the click point is deemed to be snap-through tactile feedback in the same sense as shown in the '415 patent.

Regarding claim 14, Kaneko discloses **wherein said analog sensor is a pressure-sensitive analog sensor.** As noted in rejecting claim 13, the output of the sensor varies with applied pressure to pushbutton 1, therefore the device is pressure-sensitive.

Regarding claim 15, Kaneko discloses **further including an actuator positioned between the single human finger and said tactile element, and said tactile element is a dome-cap.** As seen in Fig. 1, actuator 1 will be between the finger that pushes it and the tactile element 3 that is inside the sensor.

The above discussion of the tactile element (in rejecting claim 13) does not show the curved plate as a "dome-cap" as claimed; indeed, comparing element 16 of the '415 patent figures with element 3 Kaneko Fig. 3, the Kaneko curved plate appears to be directly the opposite of a dome-cap. But Kaneko additionally discloses that the curved plate may be a dome-cap. On page 406, Kaneko states: "In this embodiment, the elastic electro-conductive curved plate 3 has the longitudinal ends curved upward. However, the longitudinal ends curved downward yield the same click action." Thus, imagining the curved plate 3 as shown in Fig.

3with the ends curved downward rather than curved upward, one can see that the plate 3 will look identical to element 16 shown in the '415 patent. Given this Kaneko disclosure, the ends may be curved downward and since the element will seemingly be the same as that of the '415 patent, providing similar click action with the same shape, this embodiment of Kaneko can properly be called a dome-cap as claimed.

Regarding claim 16, Kaneko discloses **wherein said dome-cap is metallic.** See p. 406 (curved plate 3 is phosphor bronze).

Ground G:

Claims 3, 6, 10, 12, 16, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of APA.

Kramer discloses the limitations of parent claims 1-2, 4-5, 9, 11, 17-18, and 20-21 as described above in the Requester's proposed rejections Ground 10. Kramer does not teach that the dome-cap is metallic as in these claims, or further that the housing is formed of plastic as in claim 3. Kramer discloses the dome-cap is rubber and is silent as to the material of the housing.

Regarding claim 3, APA describes a sensor similar to that of Kramer where the housing is made of plastics. Col. 5 lines 8-15; col. 1 lines 39-40. The '415 patent applicant therefore admitted that it was conventional in the art for the housing of such sensors to be made of plastics. It would have been obvious to a person of ordinary skill in the art to use plastics as the housing material, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kramer contained a sensor that differs from the claimed device in that a plastic housing would be substituted for Kramer's generic housing. The substituted plastic housing and its function were known in the art, as APA teaches that plastic housings were conventionally used for similar sensors. A person of ordinary skill in the art could have made the sensor housing of such plastics, and the results of this substitution would have been predictable. Plastics are so widely known that their manufacture would have been simple to the skilled artisan, particularly in this case where it is disclosed by APA that such sensors are "typically" made of such materials. Further, the result of the combination would have been predictable to a person of ordinary skill in the art. Again, as use of such plastics for housings is so typical, the skilled artisan need only look at such typical devices to see how the plastic housing would operate. And since plastics are so well known, the skilled artisan would understand that their use would provide certain features, such as protection of the inner workings of the device, and prevention of electrical conduction between the inner electrical components and the housing. The examiner finds that the use of plastics for the housing would have been entirely predictable to a person of ordinary skill in the art. In light of the above findings, the combination of Kramer and APA is appropriate.

Regarding claims 3, 6, 10, 12, 16, 19, and 22, APA describes a sensor with tactile feedback in Fig. 3 including dome-cap 16. The dome-cap is resilient and metallic and provides tactile feedback to the user when she presses the actuator with her finger. See col. 1 lines 43-46; col. 1 line 67 – col. 2 line 20; col. 5 lines 32-36; col. 5 line 60 – col. 6 line 16. Thus the dome-cap of APA is provided for the same purpose as the dome-cap of Kramer—to provide a snap effect that provides tactile feedback to the user so she can tell when the device is enabled. It would have been obvious to a person of ordinary skill in the art to use APA's metallic dome-cap in place of Kramer's rubber dome-cap, as this is merely a simple substitution of one known element for another to yield predictable results. See MPEP 2141; 2143(B).

The prior art in Kramer contained a sensor that differs from the claimed device in that a metallic dome-cap would be substituted for a rubber dome-cap to reach the claimed invention. The substituted dome-cap and its functions are known in the art, as APA teaches the substituted dome-cap and its function. A person of ordinary skill in the art could have used APA's dome-cap rather than Kramer's, and the results would have been predictable. Each dome-cap is located in substantially the same location, performs substantially the same function, and provides substantially the same result in each of the respective devices. Each is located between the actuator and the electrical connection that occurs from pressing the actuator, each provides a snap-through click action upon the actuator being depressed, and each provides tactile feedback to the user due to such action. APA details exactly how the dome-cap operates, and as the devices are similar a person of ordinary skill in the art would expect the dome-cap to operate in a similar fashion when substituted for the dome-cap of Kramer. The result of the combination therefore would have been predictable. In light of the above findings, combining Kramer and APA to meet this limitation is appropriate. Thus, all of the limitations of these claims are taught by Kramer and APA and the claims are rejected over this combination.

Ground H:

Claims 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Furukawa.

Kramer discloses the limitations of these claims as described above in the Requester's proposed rejections Ground 10. Alternatively, as in Ground 16 above, insofar as Requester perceives Kramer could be said to lack the teachings of using the sensor output for controlling an electronic game. Furukawa supplies this missing teaching and it would have been obvious to one skilled in the art to combine Kramer and Furukawa to meet these claims. The reasoning is the same as that provided above in the Requester's proposed rejections Ground 16.

Ground I:

Claims 6, 12, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Furukawa, and further in view of APA.

Kramer and Furukawa teach the limitations of parent claims 4-5, 11, and 20-21 as described above in the Requester's proposed rejections Ground 16, as well as in Ground H of this section. Neither of these references teach that the dome-cap is metallic, instead teaching the dome-cap is rubber. APA supplies this missing teaching and it would have been obvious to one skilled in the art to combine these references to meet the claims. The reasoning is the same as the reasoning supplied for combining Kramer and APA to meet these limitations, provided above in Ground G, which is incorporated by reference herein.

NOTICE RE PATENT OWNER'S CORRESPONDENCE ADDRESS

Effective May 16, 2007, 37 CFR 1.33(c) has been revised to provide that:

The patent owner's correspondence address for all communications in an *ex parte* reexamination or an *inter partes* reexamination is designated as the correspondence address of the patent.

> *Revisions and Technical Corrections Affecting Requirements for Ex Parte and Inter Partes Reexamination*, 72 FR 18892 (April 16, 2007)(Final Rule)

The correspondence address for any pending reexamination proceeding not having the same correspondence address as that of the patent is, by way of this revision to 37 CFR 1.33(c), automatically changed to that of the patent file as of the effective date.

This change is effective for any reexamination proceeding which is pending before the Office as of May 16, 2007, including the present reexamination proceeding, and to any reexamination proceeding which is filed after that date.

Parties are to take this change into account when filing papers, and direct communications accordingly.

In the event the patent owner's correspondence address listed in the papers (record) for the present proceeding is different from the correspondence address of the patent, it is strongly encouraged that the patent owner affirmatively file a Notification of Change of Correspondence Address in the reexamination proceeding and/or the patent (depending on which address patent owner desires), to conform the address of the proceeding with that of the patent and to clarify the record as to which address should be used for correspondence.

Telephone Numbers for reexamination inquiries:

Central Reexam Unit (CRU)	(571) 272-7705
Reexamination Facsimile Transmission No.	(571) 273-9900

Conclusion

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be an Action Closing Prosecution (ACP), will be governed by 37 CFR 1.116(b) and (d), which will be strictly enforced. Patent owner is reminded that any proposed amendments must comply with 37 CFR 1.530(d)-(k). If new claims are presented excess claim fees will be required. 37 CFR 1.20(c).

37 CFR 1.943(b) requires that "[r]esponses by the patent owner and written comments by the third party requester shall not exceed 50 pages in length, excluding amendments, appendices of claims, and reference materials such as prior art references." This page limit will be strictly enforced.

All correspondence relating to this *inter partes* reexamination proceeding should be directed:

By **U.S. Postal Service Mail** to:

Mail Stop *Inter Partes* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand to: Customer Service Window
Randolph Building
401 Dulany St.
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Reexamination Legal Advisor or Examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

Signed:

James Menefee
Primary Examiner
Central Reexamination Unit 3992
(571) 272-1944

January 29, 2008

Conferees:

OPQA

CRU 3992