

Exhibit 4



Initial Review
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Commissioner of Patents and Trademarks,
Washington, D. C. 20231
Box AF

URGENT, RESPONSIVE TO FINAL ACTION

Attention Patent Examiner: A. Hill, GAU 2617

Re: Patent Application of Brad A. Armstrong

Serial No.: 07/847,619 Filed: 03/05/92

Appl. Title: 6 DEGREES OF FREEDOM CONTROLLER WITH
CAPABILITY OF TACTILE FEEDBACK

Applicant's Address:

Brad A. Armstrong
848 Inyo St.
Chico, CA, 95926

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IN RESPONSE TO THE OFFICE ACTION OF 08/10/95, PAPER #1777 MADE FINAL

Sir:

REMARKS:

This is responsive to the Outstanding Revised Office Action of 08/10/95 and made final. A CERTIFICATE OF EXPRESS MAILING is on page 62 attached hereto.

Included herewith is the small entity of \$375.00 fee per 1.17(r) in accordance with 37 C.F.R. 1.129 (a) for a "Filing of a First submission after final rejection". This is Applicant's first submission after final, and the above specified application qualifies under 37 C.F.R. 1.129(a) to have the finality of the Outstanding Office Action withdrawn and the herein amendments entered and acted upon per 37 C.F.R. 1.129(a), and so it is requested this response be treated per 37 C.F.R. 1.129(a). There are no prior amendments or responses that have not yet been entered.

After the entering of this amendment there will be four independent claims and not more than 20 total claims, and thus a fee in the amount of \$39.00 is included for one independent claim

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in excess of three independent claims.

A petition for a two month extension of time under 37 CFR 1.136 (a) and the \$190.00 fee therefor is hereto attached for responding to the outstanding office action of 08/10/95.

A check in the amount of \$604.00 is hereto attached for the 37 C.F.R. 1.129(a) fee, the 37 CFR 1.136 (a) fee, and the one independent claim in excess of three independent claims.

Would the Examiner please amend the application as herein requested, and read and consider the herein remarks. Reexamination of the application and claims after entering of this amendment, in view of the remarks is requested. Allowance of the claims is respectfully solicited, as the invention is believed to clearly advance the art in a patentable manner. "All" of the herein remarks are directed toward and only toward the "patentability" of the invention and the issues at hand surrounding the patentability of the invention. Applicant has made every attempt in this response to be brief, while still responding to each objection and grounds for rejection raised by the Examiner in the Revised Office Action of 08/10/95. The amendments and remarks of this response are the best effort of Applicant to place the application in condition for allowance, and any assistance the Examiner can offer toward this end would be deeply appreciated.

In the past, Applicant has made every attempt within his capabilities to put the application in condition for allowance, however the Examiner still objects to some terminology used in the claims. If after the entering of this amendment, objections to the specification or claims still exists, would the Examiner please give constructive assistance in all cases wherein the Examiner believes he could improve specific terms.

Specifically regarding page 1 of the Office Action of 08/10/95: It has been noted claims 12-22 are rejected yet pending.

Specifically regarding the "Part III DETAILED ACTION" beginning on page 2 of the Office Action of 08/10/95 with "Response to Amendment" and the paragraphs under point "1.": The revised Office Action dated 08/10/95 has been carefully studied. The withdrawal by Supervisory Examiner Peng of the finality of the Office Action mailed 05/11/95 paper No. 13 as stated in paper 14 because the Office Action of 05/11/95 should have been more detailed has been noted. It is believed the revised Office Action of 08/10/95 is intended to completely replace the Office Action of 05/11/95, although this is not positively stated in any Office paper, since only the finality of the Office Action of 05/11/95 has been withdrawn as stated in paper No. 14 and again in paper No. 17. In any case, the Office Action of 05/11/95 includes essentially all of the objections and grounds for rejection which are stated in the revised Office Action of 08/10/95, only the Office Action of 08/10/95 is substantially more detailed and lengthy, and additionally introduces 35 U.S.C. 102 grounds for rejection which were not stated as grounds for rejection in the 05/11/95 Office Action even though the claims 12-22 have not been amended since their submission on 06/03/94. Applicant is upset the 35 U.S.C 102 grounds of rejection were applied "piecemeal" in the Office Action of 08/10/95, as such grounds were not applied in the Office Action of 05/11/95 or the earlier office action of 09/28/94 paper #8 when no amendments to the claims were made between the initial submission of claims 12-22 on 06/03/94 and the Office Action of 08/10/95. However, this response addressing the objections and grounds for rejection stated in the highly detailed Office Action of 08/10/95 is considered to fully address all of the objections and grounds for rejection stated in the less detailed Office Action of 05/11/95,

and to fully address all of the objections and grounds for rejection stated in the Office Action of 08/10/95.

Henceforth unless otherwise specifically stated, the terms "Office Action" used herein refers to the Office Action date mailed 08/10/95, paper No. 17.

Specifically regarding page 2 of the Office Action, and the paragraphs under point "2." "Specification" and bridging pages 3, 4 and 5: The quotation of the first paragraph of 35 U.S.C 112 and the objection to the specification as not now supporting the invention as claimed in claims 12-22 has been noted. All of the terms in the pending claims which the Examiner states are not supported by the originally filed specification have been noted. Applicant believes that the term "means" may be utilized in the claims even when not used in the specification, thus Applicant will continue to use means clauses in the claims where appropriate. The vast majority of the claim terms which the Examiner objects to in the pending claims as not being supported in the original specification are believed to be terms having the addition of the allowable term "means", or are readily ascertainable very slight variations or synonyms of words or word strings from the originally filed specification, or terms which are very strongly implied in the specification and supported in the originally filed drawings and thus easily ascertained in meaning in the original version of the application. The Examiner seems to be stating that the terms in the claims must in all cases be found absolutely precisely quoted in the specification in order to be "clearly ascertainable" in meaning in the claims. Applicant strongly objects to being held to standards of claim writing which far exceed those required of patent attorneys by other Patent Examiners, and respectfully requests that the Examiner grant a broader assumption of the "reader's" capabilities as to readily ascertaining meanings of claim terms which are not "precise quotes" from the specification. Those

skilled in the art do have significant knowledge in this field as is evidenced by the prior art of record, as some concepts within the scope of the present invention are known and understood by those skilled in the art, and this is not an admission that Applicant's invention is known to those skilled in the art. Applicant believes those skilled in the art would be able to clearly and readily ascertain the meaning of most of the words in the claims that the Examiner states are unsupported in the specification. The Examiner has repeatedly cited terms which he has clearly read out of context and thus states the meanings of the claim terms cannot be ascertained from the specification. Clearly, many terms if isolated from the claims, taken out of context, and placed in a vacuum absent any words before or after the isolated term would be rendered meaningless in their relationship to the claimed invention from which the term or terms have been isolated. In addition and for example, on page 3 of the Office Action the Examiner states "exposed handle" as used in the claims is unsupported in the originally filed specification. This objection by the Examiner is not at all appreciated by Applicant. It is abundantly clear that the "exposed handle" is properly supported in the specification as originally filed. Please see the drawing Figs. 1, 2, 3A, 3B, 6, 7 and 9 wherein each of these drawings clearly shows a handle, the handle being called a "handle" in the written portion of the original disclosure, and the handle not once being shown covered or hidden in any of the drawings by anything, and thus clearly exposed, and the handle by its very nature and as stated in the writing being for grasping by the human hand and thus at least exposed to the point of being graspable by the hand to allow hand inputs in the balance of the controller. Thus, it is beyond Applicant's comprehension as to how the Examiner is "honestly" finding lack of support in the specification for the claim term "exposed handle". Applicant grants the Examiner that the terms "exposed handle" are not precisely quotable from the original disclosure, but are readily and clearly ascertainable in meaning

from the original disclosure. Thus, again, Applicant objects to being held to standards of claim writing which far exceed those required of patent attorneys by other Patent Examiners, and respectfully requests the Examiner grant a broader assumption of those skilled in the art being able to readily and clearly ascertaining meanings of claim terms which are not precise quotes from the specification. Applicant believes the "reader" would be able to easily ascertain the meaning of most of the words in the claims that the Examiner states are unsupported in the specification, however, with Applicant always wishing to advance the application in the quickest way possible toward patent allowance, Applicant does not traverse the grounds of objection, and has noted each and every claim term the Examiner states is unsupported by the specification, and in amending the claims, Applicant will diligently pursue utilizing terms more in line with those words used in the specification, and will amend the specification without adding any new material so that each and every term of each and every claim will have what is hoped to be clear antecedent basis to the Examiner.

On page 4 of the Office Action immediately following the extremely long list of claim terms said to not be supported in the specification, and specifically regarding the statement in the Office Action on page 4 starting with

"And since applicant argues in the response filed 01/11/95 (e.g. on page 5, lines 11-13, 17-70 and 21-31 of said response, at the least) that the invention embodies numerous features which are clearly not set forth in and supported by the specification as originally filed, such as the sensors being radio wave sensors, optical sensors, etc.,..." (end quote);

It is not at all appreciated that the Examiner is misconstruing Applicant's remarks. The following are quotations from Applicant's response of 01/11/95 which show the Examiner is taking Applicant's statement clearly out of context and misconstruing them. From Applicant's response of 01/11/95, page

5, lines 8-31: "Would the Examiner please read page 22 of Applicant's specification describing a variety of sensors which are clearly proportional sensors, not simply on/off switches. These numerous known types of proportional sensors and others commonly known and not cited, output variable signals indicating positional information. Many of these sensors manipulate or provide varying resistance and or voltages. Also please review Applicant's drawings, and particularly Figs. 11c, 11d, 11e, 11f, 11g and 11h which show proportional sensors. Additionally, optical sensors and potentiometers of many types can also function in Applicant's invention, as they are so well known and common that those skilled in the art do not need to be told how to apply sensors they commonly utilize. There is a central off or null position in Applicant's controller with some "play" about this center off or null position so that the controller is not excessively sensitive in view of the range of control of the average or normal human hand, and this is where sensors "may" not be activated. Within this center off or null and "play" region, is where sensors "may" not be activated. If no sensors are activated, then it would be indicated that the controller is centered or in the central off or null position. Outside of the center null position or area, sensors will be outputting positional information as to the current position of the controller." (end of quote)

In the above quotation, please note the sentence "Additionally, optical sensors and potentiometers of many types can also function in Applicant's invention". Please note "can also function in Applicant's invention". It is very clear from Applicant's originally filed specification that the present invention is not dependant upon any one type of sensor being used, and in fact in the originally filed specification, it is clearly stated, and Applicant quotes from page 4 second to last line thereof bridging page 5 of the specification: "While the prior art is dependant upon specific types of sensors, this invention can be constructed with sensors as inexpensive as

simple electrical contacts or as sophisticated as a manufacturer desires."

Applicant's pending claims utilize "sensor means" or the like because the invention was never intended to be dependant upon any one type of sensor, but in fact is structured to be able to utilize many types of sensors, and this is and continues to be but one major advantage of the present invention. Furthermore Applicant does describe many types of sensors in the specification, and the Examiner has identified seven types of sensors which the Examiner states are clearly supported by the originally filed specification, see page 6 of the Office Action and point "4" thereon wherein the Examiner lists seven sensor types (a) through (g). Applicant does not view his invention as limited to any one particular sensor type. The use of the claim terms "sensor means" and the like is fully supported in the originally filed disclosure.

Thus the Examiner statement in the Office Action on page 4 starting with

"And since applicant argues in the response filed 01/11/95 (e.g. on page 5, lines 11-13, 17-70 and 21-31 of said response, at the least) that the invention embodies numerous features which are clearly not set forth....." is wholly unsupported and inaccurate.

Regarding page 5 of the Office Action and point "3." thereon stating claims 12-22 are rejected under 35 U.S.C 112, second paragraph: This has been read and carefully considered.

Regarding page 6 of the Office Action and point "4." thereon stating claims 12-22 are rejected under 35 U.S.C 112, second paragraph: This has been read and carefully considered. As addressed briefly above, Applicant's pending claims utilize "sensor means" because the invention was never intended to be dependant upon any one type of sensor, but in fact is structured to be able to utilize many types of sensors.

It is hoped that the Examiner is not telling Applicant that Applicant cannot use the term "sensor means" or "means for sensing" and the like in Applicants claims because Applicant has only specifically described seven different types of sensors in the specification. If this is what the Examiner is trying to tell Applicant in point "4" of the Office Action, Applicant is extremely upset, as no other patent applicants are held to such strict standards by other Patent Examiners.

Question: Is the Examiner stating that Applicant cannot use the term "sensor means" or "means for sensing" and the like in Applicant's claims, unless Applicant wishes a sure rejection of those claims, due to Applicant having only specifically described seven different types of sensors in the original specification? Applicant needs to know the answer to the above question so that during the continued prosecution of this application in the future, if Applicant desires to use "sensor means" or "means for sensing" and the like in his claims, whether such terms are likely to be acceptable or objected to the Examiner. Applicant is sincerely concerned about this issue and requests clarification. Thank you.

Regarding page 7 bridging pages 8, 9, 10, 11, 12 and 13 of the Office Action and point "5." thereon stating claims 12-22 are rejected under 35 U.S.C 112, second paragraph: This has been read and carefully considered. Applicant respectfully and strongly disagrees with the Examiner's definition of the phrase "in communication with" as requiring information such as language, or computer bit streams or electrical information to be sent such as by a radio transmitter or the like, however, in amending the claims all occurrences in all applicable claims of "in communication with" will be deleted and replaced with some other phrase in order to advance the application and claims toward allowability.

Regarding page 8 of the Office Action part of point "5."

wherein the Examiner asks about "said member" in lines 8 and 11 of claim 12: The term "said member" is believed to be most clear in claim 12. It is clearly the "movably retained member", since no other "member" has been introduced into the claim prior to the next two uses of "said member" in lines 4-5 following the introduction of "movably retained member". Clearly, based on the lack of complaint on the part of the Examiner regarding the two occurrences of "said member" in line 4-5 of the claim, the Examiner must know "said member" in the claim means "movably retained member". "linkage member" is introduced in line 7 of the claim, and then thereafter always referred to as "said linkage member". After the introduction of "movably retained member" in lines 2-3 of the claim, it is always thereafter referred to as "said member". The introduction of the terms in question appears proper in claim 12, and the use thereof thereafter is consistent, although after the introduction of "movable retained member" it is further used in a slightly shorten version as "said member" as an attempt to keep the claim short and thus easily readable. Thus Applicant is frustrated with the Examiner's apparent inability to make such distinctions in the clearly written claims. However, Applicant does not wish to traverse the grounds for rejection since Applicant believes the application and claims will be advanced toward allowance more quickly simply by amending the claims in an attempt to overcome this grounds for rejection. The claims will be appropriately amended to overcome the rejection.

Additionally, on page 8 of the Office Action, Applicant has noted the Examiner's statement pertaining the Examiner having in the past not requested "permission" to amend the claims. Applicant is and was very much aware of the Examiner not requesting "permission" to amend the claims. Applicant has in past responses simply been trying to get the Examiner to not simply stop at critiquing terms in the claims, but to critique the terms and then provide constructive suggestions in all case

when the Examiner believes he knows of improved terminology per the requests of the M.P.E.P. of patent examiners. Such constructive assistance from the Examiner following a critiquing of a term is believed to be requested by the PTO in the M.P.E.P. whenever possible and without regard as to whether the Examiner sees patentable material in the application or not. Otherwise Applicant is believed to be allowed to use his own terms provided they are reasonable and ascertainable in their meaning. Applicant requests specific constructive assistance from the Examiner whenever possible.

Regarding page 8 bridging page 9 of the Office Action wherein "support means" of claim 12 line 13 of the claim is addressed relative to "linkage support means" set forth in line 9 of the claim: Clearly "linkage support means" is introduced into claim 12 in line 9 of the claim (note the lack of a "the" or "said" in front of "linkage support means"), and then thereafter "linkage support means" is consistently recited as "said linkage support means". The lack of a "said" or of a "the" in front of a means clause or any feature being introduced for the first time into a claim is believed normally an indication the means clause or feature is being introduced into the claim. After introduction of the means clause or feature into the claim, normally a "said" or a "the" is inserted in front of additional uses of the same means clause or feature in the given claim to allow the reader to distinguish that which is being introduced from that which has already been introduced. Thus, clearly "support means" is introduced into claim 12 in line 13, and then thereafter is consistently recited as "said support means".

Question: Is Applicant wrong about the use of "said" or "the" in claims as stated above? An answer to this question would be helpful to Applicant in future prosecution of this application.

Applicant is not traversing the 35 U.S.C. 112 grounds for rejection as this might slow movement of the application and claims toward allowance, but is clearly having a difficult time in writing claims which the Examiner is able to understand, and desires the Examiner understand Applicant's logic behind the style or format of Applicant's claims so that once the Examiner understands the claims, then the Examiner will be able to see that the claims patentably distinguish over the prior art. Appropriate amendment to all appropriate claims to overcome this rejection will be herein made.

Regarding page 9 of the Office Action and the claim 12 line 14 occurrence of "a theoretical point": this has been read and carefully considered. All occurrences in all appropriate claims regarding the "theoretical point" will be appropriately amended to overcome the rejection.

Regarding page 9 of the Office Action and the claim 12 lines 20-21 and "said support means": this has been considered and the claims will be appropriately amended in all appropriate cases to overcome the rejection.

Regarding page 9 of the Office Action and the claim 12 line 23 occurrence of "said member": this has been considered and all appropriate claims will be appropriately amended to overcome the rejection.

Regarding page 9 of the Office Action and the claim 12 lines 25-26 and specifically the use of "said linkage support means for rendering said linkage member substantially non-tiltable relative to said member": this has been considered and all applicable claims will be appropriately amended to overcome the rejection. The Examiner has started his quotation of "said linkage support means for rendering" in the middle of a recitation, and thus that which is quoted by the Examiner is quoted out of context, and

apparently has been read out of context by the Examiner. Applicant believes that if "said linkage support means for rendering said linkage member substantially non-tiltable relative to said member" were read in context with the wording occurring before and after that which has been quoted, that such language would be quite clear. However, Applicant does not wish to traverse the grounds for rejection since Applicant believes the application will be advanced toward allowance more quickly simply by amending the claims to overcome this grounds for rejection.

Regarding page 10 of the Office Action and the claim 12 line 26 and specifically "said member": this has been considered and all applicable claims will be appropriately amended to overcome the rejection.

Regarding page 10 of the Office Action and the claim 12 line 29 and specifically "said member": this has been considered and all applicable claims will be appropriately amended to overcome the rejection.

Regarding page 10 of the Office Action and the claim 12 lines 33-35 and specifically "base means, sensor means": Applicant had intended "sensor means" to have been on the next line down and substantially indented to clearly separate it from "base means". Applicant apparently failed to install a hard right command in word processing between "base means" and "sensor means", and thus the terms were mistakenly ran together on the same line. The Examiner is thanked for his pointing to this error. This will be appropriately amended in all applicable claims to overcome the rejection.

Regarding page 10 of the Office Action and the claim 13 line 2 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 10 of the Office Action and the claim 13 lines 2-3 and specifically "said member": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 11 of the Office Action and the claim 13 line 3 and specifically "said member": as mentioned above, this will be appropriately amended in all appropriate claims to overcome the rejection.

Regarding page 11 of the Office Action and the claim 14 lines 2-3 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 11 of the Office Action and the claim 14 line 3 and specifically "said member": as mentioned above, this will be appropriately amended in all appropriate claims to overcome the rejection.

Regarding page 11 of the Office Action and the claim 17 line 5 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 11 of the Office Action and the claim 17 line 8 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 11 of the Office Action and the claim 17 line 12 and specifically the occurrence of "a theoretical point": this has been read and considered. All occurrences in all appropriate claims regarding the theoretical point will be appropriately amended to overcome the rejection.

Regarding page 11 bridging page 12 of the Office Action and

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the claim 17 lines 20-22 and specifically the occurrence of "said shaft support means....relative to said member": The comments by the Examiner have been considered, and appropriate amendments to the claims in which this occurs will be made to overcome the rejection.

Regarding page 12 of the Office Action and the claim 17 line 28 regarding "base means, sensor means": This will be appropriately amended in all applicable claims to overcome the rejection.

Regarding page 12 of the Office Action and the claim 20 line 10 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 12 of the Office Action and the claim 20 line 13 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 12 of the Office Action and the claim 20 line 17 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 12 of the Office Action and the claim 20 line 20 and specifically "in communication with": as mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 12 of the Office Action and the claim 20 line 25 and specifically the occurrence of "a theoretical point": this has been read and considered. All occurrences in all appropriate claims regarding the theoretical point will be appropriately amended to overcome the rejection.

Regarding page 13 of the Office Action and the claim 20 lines 34-35 and specifically "in communication with": as

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mentioned above, this will be appropriately amended to overcome the rejection.

Regarding page 13 of the Office Action and the claim 20 lines 37-39 and the lack of antecedent basis for "said shaft support means....relative to said plate member": The comments by the Examiner have been considered, and appropriate amendments to the claims in which this occurs will be made to overcome the rejection.

Regarding page 13 of the Office Action and the point "6." thereon regarding the 35 U.S.C. 112 deficiencies set forth, and the statement that the claims are accorded their most reasonable interpretation consistent with the specification for evaluation with respect to the prior art. The entire point "6." and been carefully read and considered. Applicant strongly disagrees that the claims 12-22 are "grossly indefinite" as stated by the Examiner, however under amendment herein, Applicant will amend the claims to the best of his abilities in an attempt to satisfy the Examiner.

Regarding page 14 of the Office Action and the point "7." quoting the appropriate paragraphs of 35 U.S.C. 102: This has been read and carefully considered.

Regarding page 14 bridging pages 15, 16 and 17 of the Office Action and the point "8." regarding the 35 U.S.C. 102 (b) rejection applied to non-amended claims 12-14 and 17 for the first time since the claims were entered on 06/03/95 as being anticipated by Dzholdasbekov et al (GB 2,240,614), henceforth Dzholdasbekov; the Examiner's comments have all been carefully read and considered. Most addressing of the prior art will be made after amendment of the claims, however, the rejection of claims 12-14 and 17 under 35 U.S.C. 102(b) as being anticipated by Dzholdasbekov is inappropriate and should not have been

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applied. Clearly the handle 2 of Dzholdasbekov is not resolvable into positions about "said three axes", the three axes being mutually perpendicular to one another, and intersecting one another within the handle, with the three degrees of freedom of rotation which is detected by "pick-ups" being about these three axes.

The Dzholdasbekov handle 2 is resolvable in three degrees of freedom, but not by being detected or tracked by "pick-ups" about three axes defining a point defined by the three axes being mutually perpendicular to one another and intersecting one another within the handle of Dzholdasbekov. And so the Dzholdasbekov structure is completely different than that claimed in Applicant's claims 12-14 and 17. The Dzholdasbekov handle 2 includes a thumbwheel for one degree of rotational freedom, and thus this aspect of a separate thumbwheel proves that the Dzholdasbekov handle 2 is not resolvable about three sensed axes, (sensed by "pick-ups") but rather handle 2 is only resolvable about two axes.

Regarding page 17 bridging pages 18, 19 and 20 of the Office Action and the point "9." regarding the 35 U.S.C. 102 (b) rejection of claims 12-14 and 17 as being anticipated by King (US 4,555,960), henceforth King: the Examiner's comments have all been carefully read and considered. Most addressing of the prior art will be made after amendment of the claims, however, the 35 U.S.C. 102(b) rejection of claims 12-14 and 17 as being anticipated by King is inappropriate and should not have been made, in that Applicant's claims 12-14 and 17 specify a handle support shaft as being non-tiltable, and the shaft of King which supports the spherical handle of King tilts and must tilt in order for the King controller to operate. The tilting shaft of King is a major and significant structurally different arrangement than that of Applicant's claims 12-14 and 17, thus the 35 U.S.C. 102(b) rejection of claims 12-14 and 17 in view of King is inappropriate because King does not describe or

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anticipate that which Applicant claims in claims 12-14 and 17. Additionally, although the Examiner has gone to great lengths attempting to show that King includes horizontally moving members which move in the first and second horizontal linear degrees of freedom somewhat correlating with the arching handle movements of King on the first and second horizontal linear degrees of freedom, the Examiner is reaching, as these aspects do not exist in the King device or in the King disclosure. King includes nothing similar to Applicant's sliding-plate-linear-conversion structure or means.

Regarding page 20 of the Office Action and the point "10." quoting the appropriate paragraphs of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in the Office Action: This has been read and carefully considered by Applicant. Applicant strongly disagrees the present invention is obvious as claimed in claims 12-22 or in the new or amended claims presented in this response.

Regarding page 20 bridging page 21 of the Office Action and the point "11" regarding the 35 U.S.C. 103 rejection of claims 15 and 18 as being unpatentable over Dzholdasbakov as applied to claims 12-14 and 17 previously, and further in view of IBM Technical Disclosure Bulletin Vol. 32, No. 9B, henceforth IBM: the Examiner's comments have all been carefully read and considered. Applicant strongly disagrees the present invention is obvious, as neither of these prior art references include a handle resolvable and sensed as it is resolved about three axes intersecting one another mutually perpendicular at a point within a handle to provided three degrees of freedom of "sensed" rotation about these three axes. Addressing of the prior art will be made after amendment of the claims.

Regarding page 22 bridging page 23 of the Office Action and the point "12" regarding the 35 U.S.C. 103 rejection of claims

15-16 and 18-19 as being unpatentable over King as applied to claims 12-14 and 17 previously, and further in view of IBM: the Examiner's comments have all been carefully read and considered. Applicant strongly disagrees the present invention is obvious, as neither of these references includes anything similar in structure to Applicant's sliding-plate-linear-conversion means. Addressing of the prior art will be made after amendment of the claims.

Regarding page 23 of the Office Action and the point "13" regarding the "alternative" of the discussion of Dzholdasbekov and King with reference to claims 12-19: The Examiner's comments have all been carefully read and considered, and it is apparent from the Examiner's comments on page 24 that the Examiner is for some reason unable to precisely determine the structure of Dzholdasbekov regarding handle rotations, and this brings to question as to why the Examiner made the 35 U.S.C. 102(b) rejection of Applicant's claims over Dzholdasbekov as addressed above. The Dzholdasbekov device appears clearly detailed in the Dzholdasbekov disclosure, and does not describe Applicant's invention of claims 12-14 and 17 as stated earlier in the Office Action. King's device is also clearly detailed in the King disclosure, and does not include anything similar to Applicant's sliding-plate-linear-conversion means as alleged in point 9 on page 17 of the Office Action. The Examiner is however correct that King's handle is resolvable in three degrees of rotation about a point within the King spherical handle. Applicant strongly disagrees the present invention is obvious as speculated in points 13 and 14 of the Office Action.. Addressing of the prior art will be made after amendment of the claims.

Regarding page 24 bridging pages 25, 26 and 27 of the Office Action and the point "14": Point 14 has been carefully read and considered, and has at least in part been addressed above in regards to point 13 of the Office Action. Applicant would like to

state that Dzholdasbekov clearly does not provide three rotational signals for rotations about three axes which meet at a theoretical point in the handle. In point 14 of the Office Action it is clear that the Examiner is picking and choosing features at random simply based on whether the features exist or do not exist in the art, and clearly the Examiner is acting as though the mere existence of some feature in the art suggests its combination with other features which can be shown to merely exist in the art, without any suggestion to combine the shown features more than their mere existence. Applicant's agrees some features of Applicant's invention may be individually shown to exist within the prior art, but the suggestion that the features of the prior art be combined precisely along the teachings of Applicant's disclosure in order to receive the many benefits provided by the claimed combination is not suggested and is not obvious. Comparison of the prior art will be made after amendments to the claims so that the amended claims may be compared to the prior art.

Regarding page 28 bridging page 29 of the Office Action and the point "15": Point 15 has been carefully read and considered. Applicant strongly disagrees the present invention is obvious, however comparison of the prior art will be made after amendments to the claims so that the amended claims may be compared to the prior art.

Regarding page 29 bridging pages 30 and 31 of the Office Action and the point "16": Point 16 has been carefully read and considered. Applicant strongly disagrees the present invention is obvious. Comparison of the prior art will be made after amendments to the claims so that the amended claims may be compared to the prior art.

Regarding page 31 bridging page 32 of the Office Action and the point "17": Point 17 has been carefully read and considered.

Comparison of the prior art will be made after amendments to the claims so that the amended claims may be compared to the prior art.

Regarding page 32 bridging pages 33, 34, 35, 36, 37, 38 and 39 of the Office Action and the point "18": Point 18 has been carefully read and very carefully considered. Applicant has read the statement that Applicant is encouraged to place greater emphasis on the particular issues raised in the Office action when formulating any future responses. Applicant has never intended to ever raise or address any issue that in Applicant's opinion was not directly related to issues raised by the Patent Office or issues which directly focused on the patentability of the invention and movement of the application and claims toward allowance. All of the Examiner's remarks regarding said 01/11/95 response have been read and carefully considered. Although Applicant does not agree with many of the remarks and grounds for rejection made by the Examiner, Applicant does deeply appreciate the Examiner taking the time and effort to respond in detail to Applicant's 01/11/95 response.

On page 33 of the Office Action the Examiner states "the application has been processed in a timely manner".
Question: Does this mean that the Examiner did not process a first office action on any non-special application that had a filing date later than the present application filing date during the 27 plus month wait from the filing date to the first office action of the present application ?

On page 33 the Examiner states "the application contains no allowable subject matter". Applicant does not understand why the Examiner makes this statement, when in an earlier telephone interview that was not made of record by the Examiner or by Applicant, the Examiner stated the application did contain allowable subject matter, and the subject matter if incorporated

into a claim would be held allowable. The Examiner stated Applicant should incorporate one particular type of sensor into a claim to overcome the grounds of rejection pertaining to prior art, in order to have at least one claim allowed. Applicant told the Examiner that the invention was not dependant upon any one particular type of sensor. Does this statement by Applicant regarding the fact that his invention is not dependant upon any one particular type of sensor make the allowable subject matter disappear? Applicant's originally filed specification stated the invention was not dependant upon one particular sensor, and thus it must be assumed the Examiner understood this when he made his statement pertaining to allowable subject matter. What is going on here?

On page 39 of the Office Action the Examiner states "Applicant's amendments necessitated the new grounds of rejection": Applicant questions what amendments the Examiner is speaking about. Claims 12-22 were submitted 06/03/94 and were rejected over the prior art ONLY under 35 U.S.C. 103 and not 35 U.S.C. 102 in the Office Action of paper 8. Again in the now withdrawn paper #13, claims 12-22 were rejected relative to the prior art only under 35 U.S.C. 103. Claims 12-22 were not amended since their submission, were not amended in Applicant's response filed 01/11/95, and were not amended in any telephone interview between the Examiner and Applicant as stated by the Examiner on page 33 of the present Office Action paper #17 where the Examiner states Applicant's response of 01/11/95 contained no "amendatory material", and NOW all of a sudden, the claims 12-22 are rejected under 35 U.S.C 102. What is going on here? What "amendments" necessitated the "new ground for rejection" stated in the present Office Action of 08/10/95 ?? Applicant does not understand how by the Examiner's admission no amendments were made to claims 12-22, and yet these "amendments" which were not made, and thus do not exist, have necessitated moving the ground for rejection from 35 U.S.C. 103 ONLY relative to the

prior art, to now being rejected under 35 U.S.C. 102 over the same prior art that was of record and known to the Examiner when he first rejected the claims 12-22 only under 35 U.S.C. 103 relative to the prior art.

Is the Examiner angry with Applicant and trying to take-out aggression to the harm of Applicant and Applicant's application? If the Examiner cannot honestly say this is not the case, would the Examiner please be so kind as to withdraw from this application in the name of fairness?. Thank you.

Specifically in reference to page 40 of the Office Action and the point "21." information regarding Applicant's right to Appeal to the Board of Patent Appeals: Applicant appreciates this information but does not intend to Appeal because Applicant believes that once the claims are clearly understandable to the Examiner, and the Examiner fully understands the prior art, that the claims will be found patentable. Again, any constructive assistance from the Examiner that the Examiner can and is willing to lend would be deeply appreciated. As the Examiner will see with continued reading, rights to Applicant's invention has been eagerly sought by at least one of the largest computer input device manufacturing and sales companies in the world, and with offers exceeding one million dollars. Thus this application is very important to Applicant, and the novel invention that advances the art is perceived as having great value by those skilled in the art working for the at least one of the largest computer input device manufacturing and sales companies in the world.

Regarding the Examiner's comment in the Office Action referring to Applicant as being unfamiliar with the patent process: Applicant has not in the past, and does not now claim to be an "expert" in the very complex process of patenting. Applicant is reasonably sure that very few human beings, if any,

know and understand "all" laws and rules, and court decisions defining the laws and rules pertaining to the patenting process, since codes 35 and 37, and the M.P.E.P constitute thousands of pages, not to mention the many court decisions pertaining to interpretations and the application of the laws. Applicant apologizes for any hardships Applicant's lack of being a patent law expert may have caused the Examiner. Applicant is doing the best he can, and believes that considering the application was examined after filing indicates that the application must have met all of the requirements for a proper patent application filing at the U.S. Patent and Trademark Office, thus indicating a degree of familiarity with the patenting process.

Comparison of the prior art will be made after amendments to the claims so that the amended and new claims may be compared to the prior art.

AMENDMENTS

Amendments in the claims:

Cancel claims ~~12-22~~; and insert in the appropriate location the following new claims presented for examination.

123. A hand-operated controller allowing six degrees of freedom of hand input force into a single handle for conversion of the hand input force into electrical output signals, said controller comprising;

stationary base means including a first portion of said base means and a horizontally positioned second portion of said base means for supporting

sliding-plate-linear-conversion means for moving within a horizontal first linear degree of freedom and a horizontal second linear degree of freedom of said six degrees of freedom and for actuating

linear sensor means for sensing positions of said sliding-

1

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plate-linear-conversion means within the horizontal first and second linear degrees of freedom and for producing electrical output signals related to sensed positions of said sliding-plate-linear-conversion means;

said sliding-plate-linear-conversion means sandwiched between said first portion of said base means and said horizontally positioned second portion of said base means and thereby restrained against upward and downward movement;

a shaft coupled to said sliding-plate-linear-conversion means to move with said sliding-plate-linear-conversion means at least in the horizontal first and second linear degrees of freedom;

said shaft having

said single handle on an upper end of said shaft to allow all of said six degrees of freedom of hand input force to be applied to said controller through said single handle;

means for transferring horizontal linear hand input force applied to said single handle directionally correspondingly to the horizontal first and second linear degrees of freedom into directionally corresponding horizontal linear force against said shaft, whereby with said shaft being coupled at least in the horizontal first and second linear degrees of freedom to said sliding-plate-linear-conversion means, the shaft can transfer horizontal linear force applied to said single handle into said sliding-plate-linear-conversion means so as to move said sliding-plate-linear-conversion means in the horizontal first and second linear degrees of freedom in a substantially identical direction as the direction of the horizontal linear hand input force applied to said single handle;

means for allowing said single handle to be rotatable in three separate degrees of rotational freedom about a single point defined by an intersection of three mutually perpendicular axes within said single handle, whereby three degrees of rotational freedom of said six degrees of freedom are provided;

rotational force sensor means for sensing rotational force

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against said single handle in any of said three degrees of rotational freedom, and for producing electrical output signals related to sensed rotational force against said single handle,

means for allowing said single handle to be moved vertically upward and downward in a third linear degree of freedom of said six degrees of freedom by vertical hand input force against said single handle,

up and down movement sensor means for sensing upward and downward movement of said single handle in said third linear degree of freedom and for producing electrical output signals related to sensed upward and downward movement of said single handle.

²
24. A controller in accordance with claim ~~23~~¹ further including

spatial isolation means in association with said linear sensor means, said rotational force sensor means and said up and down movement sensor means.

³
25. A controller in accordance with claim ~~24~~² wherein said linear sensor means is more narrowly defined as an independent first sensor and an independent second sensor each associated with the horizontal first linear degree of freedom;

and further,

an independent third sensor and an independent fourth sensor each associated with the horizontal second linear degree of freedom;

the independent first through fourth sensors each being separate and distinct from one another.

⁴
26. A controller in accordance with claim ~~25~~³ wherein said rotational force sensor means is more narrowly defined as six independent sensors each separate and distinct from one another, and each separate and distinct from said independent

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first through fourth sensors.

⁶
~~27~~. A controller in accordance with claim ~~26~~⁴ wherein said up and down movement sensor means is more narrowly defined as two independent sensors each separate and distinct from one another, separate and distinct from said six independent sensors, and separate and distinct from said independent first through fourth sensors.

⁴⁸
~~28~~. A controller in accordance with claim ~~27~~⁵ wherein said independent first through fourth sensors, and said six independent sensors and said two independent sensors all jointly comprise twelve sensors each being separate and distinct from one another;

each separate and distinct sensor of said twelve sensors is an electricity manipulating sensor each capable of manipulating electricity independently of the other sensors of said twelve sensors.

⁷⁵
~~29~~. A controller in accordance with claim ~~28~~⁶ wherein said twelve sensors are each electrical contact switches.

⁸⁰
~~30~~. A controller in accordance with claim ~~29~~⁷ wherein each switch of the twelve electrical contact switches is an open switch closeable with force applied thereto.

⁹
~~31~~. A controller in accordance with claim ~~30~~⁸ further including tactile feedback means for providing vibration which can be felt through said single handle.

¹⁰
~~32~~. A hand-operated controller allowing six degrees of freedom of hand inputs for conversion of the hand inputs into twelve orthogonal outputs each dependant upon hand inputs, with the twelve orthogonal outputs each represented by an electrical output signal each produced by one of twelve separate sensors

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attached to said controller, with each of said sensors associated one said sensor per each orthogonal output of said twelve orthogonal outputs, said controller comprising;

a stationary base for supporting

sliding-plate-linear-conversion means movably sandwiched between a first portion and a second portion of said base; said sliding-plate-linear-conversion means movable in a first linear degree of freedom and in a second linear degree of freedom of said six degrees of freedom for actuating

a first four sensors of said twelve separate sensors;

said first four sensors mounted within said base;

said first four sensors including a move-forward sensor associated with

a first output of said twelve orthogonal outputs;

said first four sensors including a move-back sensor associated with

a second output of said twelve orthogonal outputs;

said first four sensors including a move-right sensor associated with

a third output of said twelve orthogonal outputs;

said first four sensors including a move-left sensor associated with

a fourth output of said twelve orthogonal outputs;

said sliding-plate-linear-conversion means sandwiched between said first portion and said second portion of said base so that said sliding-plate-linear-conversion means is moveable exclusively horizontally to and from actuation of each of the sensors of said first four sensors;

a shaft; said shaft having a lower end and an upper end;

the lower end of said shaft coupled to said sliding-plate-linear-conversion means so that said shaft is coupled with said sliding-plate-linear-conversion means to move in the first and second linear degrees of freedom so that linear horizontal movements of said shaft can be translated into linear horizontal movements of said sliding-plate-linear-conversion means to move

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said sliding-plate-linear-conversion means to and from actuation of each of the sensors of said first four sensors;

a handle on said upper end of said shaft, said handle manipulable by human hand inputs for applying all of said six degrees of freedom of hand inputs into said controller;

means for allowing said handle to be rotatable in three degrees of rotational freedom about a single point defined by an intersection of three mutually perpendicular axes within said handle, whereby three degrees of rotational freedom of said six degrees of freedom are provided;

a second four sensors of said twelve separate sensors, said second four sensors mounted within said handle and associated with at least two rotational degrees of freedom of said three degrees of rotational freedom;

said second four sensors including a turn-up sensor associated with

a fifth output of said twelve orthogonal outputs;

said second four sensors including a turn-down sensor associated with

a sixth output of said twelve orthogonal outputs;

said second four sensors including a turn clockwise sensor associated with

a seventh output of said twelve orthogonal outputs;

said second four sensors including a turn counter-clockwise sensor associated with

an eighth output of said twelve orthogonal outputs;

said controller including a turn-right sensor associated with

a ninth output of said twelve orthogonal outputs; said ninth output associated with a third degree of rotational freedom separate from said two rotational degrees of freedom;

said controller including a turn-left sensor associated with

a tenth output of said twelve orthogonal outputs; said tenth output associated with said third degree of rotational freedom;

means for allowing said handle to be moved vertically up and

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down in a third linear degree of freedom separate from the first and second linear degrees of freedom of said six degrees of freedom;

said controller including a move down sensor and a move up sensor each associated with said third linear degree of freedom of said six degrees of freedom;

said move down sensor associated with an eleventh output of said twelve orthogonal outputs; said move up sensor associated with a twelfth output of said twelve orthogonal outputs.

10. A controller in accordance with claim 10 wherein each sensor of said twelve separate sensors is an electrical contact switch with the contacts in an open position and being closeable with force.

11. A controller in accordance with claim 11 further including spatial isolation means in association with each switch of the twelve switches.

12. A controller in accordance with claim 12 further including tactile feedback means for providing vibration which can be felt through said handle.

13. A hand-operated controller allowing six bi-directional degrees of freedom of hand input force into a single handle, said controller comprising; said single handle movably supported by means for converting hand input force applied in any direction to said single handle into movement of said single handle in a direction substantially identical to the hand input force direction and relative to a stationary support base of said controller; whereby linear hand input force against said single handle absent rotational

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force can move said single handle purely linearly, and rotational hand input force against said single handle absent linear force can move said single handle purely rotationally;

linear sensor means for sensing only linear movement of said single handle and producing electrical output signals indicative of linear hand input force direction against said single handle;

rotational sensor means for sensing only rotational movement of said single handle and producing electrical output signals indicative of rotational hand input force direction against said single handle.

¹⁵
37. An improved hand operated controller of the type allowing six degrees of bi-directional freedom of hand inputs for conversion of the hand inputs into electrical outputs;

wherein the improvement comprises the use of a separate and distinct sensor for each direction of each bi-directional degree of freedom of said six degrees of freedom; whereby twelve separate and distinct sensors are utilized for converting hand inputs into said electrical outputs.

¹⁶
38. An improved six degree of freedom controller in accordance with claim ¹⁵ wherein each sensor of the twelve sensors is an electrical contact switch.

¹⁷
39. An improved six degree of freedom controller in accordance with claim ¹⁶ further including tactile feedback means for providing vibration to be felt by a hand operating said controller.

¹⁸
40. A controller in accordance with claim ¹⁷ further including

spatial isolation means in association with each switch of the twelve switches.

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Amendments to the specification:

On page 3 of the specification, under the heading "Objects and Advantages", line 24 following "Virtual "action".", please insert the following as sentences:

As will become appreciated with reading detailed descriptions explaining structures in accordance with the present invention and with an examination of the drawings, in order to ideally intuitively manipulate objects and/or navigate a viewpoint such as within a three-dimensional Virtual Reality display or like computer display using a hand-input full six degrees of freedom controller, it is desirable to use a hand input controller which allows all of the six degrees of freedom to all be input directly into the controller through a single handle. Additionally, a truly intuitive 6-DOF controller having all inputs through the single handle is one which allows the hand inputs against the handle to move the controller handle and also preferably the object (or viewpoint) on the display only (exclusively or purely) in the direction of the hand input force against the handle. For example, if the user viewing a selected object wishes to rotate the object clockwise, then the user would ideally need only apply clockwise rotational force to the handle, and ideally the handle and preferably the object would both only rotate clockwise, not moving linearly or about another axis in some direction not intended by the user which would be confusing to the user. Such a relationship of the handle and preferably also the object of the display moving only in the direction of hand input force against the handle would ideally be true for all of the six degrees of freedom. To be truly intuitive, i.e., not confusing to the user, the direction of the hand input force against the handle moves the handle and preferably also the object of the display only in the direction of the force applied to the handle, and to provide such a controller is an object of the present invention. A truly intuitive full six degrees of freedom controller essentially, at least from one view point, allows a

direct link between the user's mind, hand, 6-DOF controller and object or viewpoint in the display. ✓

On page 4, line 12 between "eliminates" and "error" please insert --potential--.

On page 4, line 15 between "signals" and the "." (period), please insert --which might otherwise be caused by the vibration of the tactile feedback falsely triggering sensors--.

On page 4, line 20 between "outputs" and the "." (period), please insert --or electrical output signals--

On page 4, line 21 between "orthogonal" and "outputs", please insert --mechanical--.

On page 4, line 21 after "outputs,", please insert --wherein twelve sensors are preferably used, one sensor per each of the twelve orthogonal mechanical outputs,--.

On page 4, line 22 after "components.", please insert the sentences --The twelve orthogonal mechanical outputs equal a first, a second, a third, a fourth on up through a twelfth mechanical output, with these representing and corresponding to the twelve orthogonal movements of true and full six degrees of freedom bidirectionally of three mutually perpendicular axes. The advantages of mechanically translating full 6-DOF into twelve orthogonal mechanical outputs of the controller are numerous, and include ease in applying a separate sensor to each of the twelve outputs, and applying spatial sensor isolation means to each of the twelve sensors, which in turn provides forgiveness for human hand inaccuracies and further allows ease in effective use of substantial vibration as tactile feedback without falsely triggering sensors. Another advantage of mechanically

translating full 6-DOF into twelve orthogonal mechanical outputs is that it allows for a much wider range of sensor types to be utilized, including very inexpensive open/close contact switches or many other types of more sophisticated sensors.--

On page 6, line 4 between "movement" and the "." (period), please insert ~~-~~of the handle relative to a stationary base or support base--.

On page 6, line 16 following "three dimensions.", please insert the following sentences: ~~-~~As those skilled in the art understand, true full six degrees of freedom inherently includes three linear degrees of freedom and three rotational degrees of freedom, with these being simplistically described as two horizontal linear degrees of freedom perpendicular to one another, and a third linear degree of freedom being a vertical linear degree of freedom wherein the horizontal first and second linear degrees of freedom are mutually perpendicular to the third linear degree of freedom, and with the first, second and third linear degrees of freedom being describable in terms of three axes all mutually perpendicular to one another and intersecting one another at a point. The three rotational degrees of freedom inherent to true full 6-DOF are rotations about or within these three mutually perpendicular axes. Also inherent to true full 6-DOF is the ability to move along linearly (translationally) and about (rotationally) these three mutually perpendicular axes bidirectionally and orthogonally. In the above simplistic description using the terms "horizontal" and "vertical" axes of the 6-DOF, the horizontal and vertical hypothetical positioning would be most commonly used and assumed here on Earth when manipulating an object or viewpoint of a display, however these three mutually perpendicular axes may of course be tilted from horizontal and vertical as would be the case in outer space.--

On page 6, line 25, between "embodiment" and the ".", please

insert --and showing one single handle above the base--.

On page 10, line 18 between "sensor" and "is", please insert --, being a separate and distinct sensor,--. The amended sentence should read: "Each sensor, being a separate and distinct sensor, is distinctly associated with....".

On page 10, line 19 between "orthogonal" and "output", please insert --mechanical--.

On page 11, line 3, after "sensor 184.", please insert the sentences --The move forward, move back, move right, and move left sensors may singularly or jointly be referred to as linear sensors, linear force sensors, linear sensing means, linear force sensing means, or linear position sensors or linear position sensor means, as these first four sensors are used to sense the positions, and with some types of useful sensors, the force against also, of sliding-plate-linear-conversion means as it moves in a horizontal first linear degree of freedom, and in a horizontal second linear degree of freedom of the six degrees of freedom. Sliding-plate-linear-conversion means moves exclusively horizontally as determined by it being sandwiched between first and second portions of the base assembly 214 as will become more appreciated with continued reading.--

C7

On page 11, line 5 after "shelf 216", please insert --, preventing downward movement,--.

On page 11, line 8 following "actuator 352.", please insert --The top 215e and retaining shelf 216 of base assembly 214 may be called or referred to as first and second portions respectively, and in figure 2 it can be seen that top 215e is parallel to horizontal retaining shelf 216 and is thus horizontal also. Thus it can be ascertained from the drawings and the additional descriptions that sliding-plate-linear-conversion

C8

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means is sandwiched horizontally and that plates 350 and 352 exclusively slide or move horizontally within the first and second horizontal linear degrees of freedom to actuate the first four linear sensors 178, 180, 182 and 184.--

On page 11, line 24, between "Shaft 102" and "extends", please insert --, or at least a lower end thereof,--.

On page 11, line 27 (last line), between "224," and "a move up sensor", please insert --two independent sensors 186, 188,--

On page 12, line 2, after "sensor 188.", please insert --From drawing figures 1 and 2, and from this disclosure as a whole, it can be appreciated that shaft 102 is coupled to sliding-plate-linear-conversion means or the sliding actuator plates assembly 348 to move with sliding-plate-linear-conversion means at least in the horizontal first and second linear degrees of freedom. It can also be ascertained from the drawings and from these writings that shaft 102 is not operably tiltable, or in other words is not significantly or substantially tiltable since such tilting in this particular embodiment is not needed to actuate any of the twelve sensors, and would lead to a far less intuitive six degree of freedom controller as will become more appreciated with continued reading. In Fig. 2, shaft 102 is shown non-tiltably supported by an engagement of significant length with lower shaft guide 224 and with lesser sliding plate actuator 352 of sliding-plate-linear-conversion means for example, and both of these engagements allow vertical sliding of shaft 102 in this example, and thus some clearance between the parts is required for the sliding, and the clearance theoretically might allow an insignificant amount of tilting of shaft 102, being undetectable by the eye and hand, but such clearance should be maintained very small to eliminate any detectable or operable tilting of shaft 102 for all practical purposes. In other words, significant tilting of shaft 102 in this embodiment is highly undesirable.--

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On page 13, line 13, between "four" and "sensors", insert --rotational or rotational force--.

On page 13, line 14 following "actuator 354.", insert --In this embodiment it can be appreciated from the previous descriptions and the drawings that six independent rotational force or movement sensors are used to sense rotations or rotational force within the three, i.e. first, second and third rotational degrees of freedom of movement or force against the single handle 100, the single handle 100 being shown in drawing figures 1 and 2. It can also be appreciated six independent linear force or linear position sensors are used to sense linear movement or force of or against the single handle 100, i.e., first and second linear sensors for the first horizontal linear degree of freedom which the handle 100 and sliding-plate-linear-conversions means moves within; a third and fourth linear sensor for the second horizontal linear degree of freedom which the handle 100 and sliding-plate-linear-conversions means moves within, and a fifth and sixth sensor for the vertical or third linear degree of freedom along which handle 100 can move relative to base assembly 214.--

On page 14, line 8 between "along" and "the", please insert --or about--.

On page 14, line 17 between "directly" and "to", please insert --and correspondingly--.

On page 14, line 23 between "184." and "If", please insert --It is clear in the drawing figures 1 and 2, and from the above descriptions that shaft 102 is coupled to move with sliding-plate-linear-conversion means at least in the first and second horizontal linear degrees of freedom, and thus hand input force applied linearly against handle 100 corresponding to the first

and second horizontal linear degree of freedom is transferred into shaft 102 and into said sliding-plate-linear-conversion means to move sliding-plate-linear-conversion means in the direction of the force applied by hand to handle 100.--

On page 16, line 4, change "gooves" to --grooves--.

On page 20, line 15, change "form" to --from--.

On page 21, line 11, between "sensor" and "was", insert ~~]~~which is a normally open snap switch closeable with force applied thereto as indicated in the drawings,--.

REMARKS

In the above amendments to the claims and specification, no

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new material has been added. No information has been added which was not in or very strongly and clearly implied in the writing or clearly shown in the drawings in the originally filed disclosure. No new physical properties, new uses, etc., have been added, thus no new matter has been added.

With the cancellation of claims 12-22, and the careful writing of the new claims 23-40, and with the amendments to the specification, the objection to the specification and claims under 35 U.S.C. 112 first paragraph is respectfully solicited to be withdrawn.

The new claims 23-40 are directed toward the embodiments essentially of drawing Figs. 1-8, 10 and 11; mostly toward the embodiment of Figs. 1-5, and not toward the inferior embodiment shown in Fig. 9.

The rejection of claims under 35 U.S.C. 102 over Dzholdasbekov is respectfully requested to be withdrawn and not applied or re-applied in view of the new claims 23-40, because Dzholdasbekov does not describe the invention per 35 U.S.C. 102 as currently claimed in any of the claims 23-40, and for the following specific reasons: There is no "point" within the Dzholdasbekov handle wherein three mutually perpendicular axes intersect one another, with sensors being applied to detect handle movement about each of these three axes as recited in independent claims 23, 32 and the claims which depend thereon whether directly or indirectly. The Examiner's comments pertaining to Dzholdasbekov and the theoretical point on page 15 part (d) of the Office Action has been considered, however is it clear from the Dzholdasbekov disclosure that there is no "point", real or theoretical, in the Dzholdasbekov handle wherein the three rotational axes which are monitored with pick-ups intersect one another mutually perpendicular to one another. The Dzholdasbekov shaft supporting the handle clearly is structured

to orbit about axis 23. Additionally, the thumbwheel 25 of Dzholdasbekov constitutes a second component other than a "single handle" as recited in the present claim 36 which must be manipulated to achieve three rotational degrees of freedom. With the Dzholdasbekov device, it is clear that the handle 2 is not resolvable in three "picked-up" or detected or sensed degrees of rotational freedom about a single point defined by three mutually perpendicular axes which intersect one another within the handle 2. Thus, the Dzholdasbekov disclosure does not describe the present claimed invention of claims 23-32, and thus the claims should not be rejected under 35 102 (b) over Dzholdasbekov based on the handle rotational aspects (in the least) as discussed above.

Additionally, the Dzholdasbekov device, as may best be understood from drawing figure 3 in conjunction with the writing of Dzholdasbekov, has an inherent design flaw due to the eccentric attachment of the shaft which supports and connects handle 2 to the rotary module 4. The shaft is shown cross sectioned in Fig. 3. It can be ascertained that if a translational move was desired straight toward the top of the drawing page, one would push on handle 2 and thus the shaft toward the top of the page. But in doing so, if the rotary module 4 rotated easily enough, before any translational motion or force could be applied to one of the lower translational module, the handle and shaft would "swing" toward the top of the page, rotating module 4 about axis 23, and the unintended rotation would be picked-up by rotary pick-up 24 and thus unwanted output signals would be sent to the "manipulator". Conversely and still with reference to the Dzholdasbekov Fig. 3, if one wanted to input counter-clockwise rotation within axis 23 to be picked-up through module 4 by pick-24, and the module 4 did not rotate easily, as in the first scenario, then if handle 2 and the supporting shaft were pushed to the forward and counter-clockwise direction, then since module 4 in this case does not rotate freely, then translational motion will be input, and

undesirably so, into the top translational module 5 which will be detected by the linear pick-up and sent to the "manipulator". Either way, with the Dzholdasbekov module 4 rotating easily or not so easily, the off-center placement of the support shaft for the handle on the rotary module 4 renders the controller inherently inaccurate and subject to either sending unwanted signal to the "manipulator" or to requiring two hands to operate, i.e., one hand on the handle 2, and the other hand grasping translational modules or rotary module 4 to prevent the unwanted movement and signals which would otherwise be caused during certain manipulations of the controller handle. The Dzholdasbekov handle 2 does not rotate in axis 23, it orbits or "swings" about the axis 23, and this is an entirely different arrangement than the present claimed design.

The use of a separate handle or thumbwheel 25 in Dzholdasbekov for one of the degrees of rotational freedom is an entirely different structural arrangement than that of the present claimed invention. Thus, the Dzholdasbekov device is significantly structurally different than the claimed invention, thereby rendering a 35 U.S.C. 102 rejection of the present claims in view of Dzholdasbekov inappropriate. Likewise, Dzholdasbekov does not anticipate structuring a single handle to be resolvable about three mutually perpendicular axes intersecting one another within the handle, said three mutually perpendicular axes being the three "sensed" or detected axes, thus Dzholdasbekov does not anticipate the structure of the present claims, and thus a 35 U.S.C. 103 obvious rejection of the present claims in view of Dzholdasbekov alone would be inappropriate. Dzholdasbekov does not provide a "single handle" through which all of six bi-directional degrees of hand input are applied to the 6-DOF controller, and for this reason, in the least, the claims should not be rejection over Dzholdasbekov under 35 U.S.C. 102 or 103.

Claims 26-30, 32-35, 37-40 are patentable over Dzholdasbekov because Dzholdasbekov neither uses or anticipates the use of 12

separate and distinct sensors as claimed. Dzholdasbekov does not suggest the many benefits to be gained by the use of 12 separate and distinct sensors in a 6-DOF controller. The very narrow claims of 30-31, 33-35, 38-40 all describe structuring not shown or anticipated by Dzholdasbekov or any other prior art reference for that matter, and thus these claims should be found allowable. It should be noted Dzholdasbekov does not use or anticipate a single 6-DOF handle, twelve orthogonal mechanical outputs, twelve separate sensors, tactile feedback means, and spatial isolation means in a 6-DOF controller.

It should be noted that the Dzholdasbekov disclosure clearly teaches that "this is the way to build a 6-DOF controller", not indicating to those skilled in the art that the Dzholdasbekov structuring for achieving the three degrees of rotational freedom has significant shortcomings as described above, and thus Dzholdasbekov provides no reason or incentive for those skilled in the art to change the handle rotational arrangement along the lines as is presently claimed. This teaching away in Dzholdasbekov from using a single handle rotatable about a single point within the handle defined by the intersection of three mutually perpendicular axes, and sensing the rotations of the single handle about the three axes is a significant teaching away from the present claimed structural combination of claims 23 and 32, and teaches away from suggesting that a handle such as in King or Menahem should be applied to the sliding plate structure of Dzholdasbekov or Frank et al for that matter. Thus a combination of the teachings of Dzholdasbekov in view of King, Frank et al and Menahem would not render claims 23 and 32 obvious under 35 U.S.C. 103.

Claims 23-35 are patentable over King because King does not utilize or anticipate anything similar to the sliding-plate-linear-conversion means of the present claims, (in the least). There is simply no support for the Examiner's contention that

King includes something similar to a sliding-plate-linear-conversion means, and thus claims 23-35 should not be rejected under 35 U.S.C. 102 in view of King, because King clearly does not describe the claimed structural combination per 35 U.S.C 102. Something similar to Applicant's sliding-plate-linear-conversion means is shown in the Frank et al patent and in the Dzholdasbekov disclosure, but is clearly not used or anticipated by King, and so claims 23-35 are not described in King or rendered obvious by King alone because King does not use or anticipate sliding-plate-linear-conversion means, in the least, and does not anticipate the claimed structural combination and the benefits to be gained thereby. The Examiner's comments directed toward trying to show that King includes something similar to sliding-plate-linear-conversion means has been noted, but pivotally connected and restrained, and rotatably moving members, clearly moving in arcing rotations by no means constitutes "sliding-plate-linear-conversion means" which is limited to only linear movement and that linear movement is only within a horizontal plane with no vertical movement allowed. In contrast, the King member -48- cannot move or slide horizontally, as it is secured at stationary block -46- with pivot point -110- so that member -48- cannot move or slide horizontally, but can only move vertically pivoting about pivot point -110- in an arch or radius. This structuring in King is entirely different and completely unrelated to Applicant's "sliding-plate-linear-conversion means".

It should be noted at this time that King, like Dzholdasbekov, Frank et al, Kley, Menahem and IBM, and/or any of the other prior art of record for that matter, does not use or anticipate 12 sensors to sense the 12 orthogonal movements of bi-directional six degrees of freedom; does not anticipate and cannot use (by its structuring) tactile feedback vibration means, and spatial isolation means on 12 sensors with tactile feedback means in a 6-DOF controller.

Claims 23-36 are patentable over King alone because, from another view point, horizontal linear input force against the King spherical handle causes King's handle to move in an arc, as is discussed repeatedly and in detail in the King disclosure, no matter how perfectly straight and horizontal the input force against the handle. This causes the King device to be confusing and non-intuitive as the handle arcs (orbital rotation) with pure linear horizontal input against the handle. This arcing in the King handle is due to the lack of anything similar to "sliding-plate-linear-conversion means". King does not suggest any structure or structural combination to solve this problem in the King controller, as King clearly states to those skilled in the art that there is no problem with this arching of the handle, and thereby not giving any reason for those skilled in the art to modify the King device along the lines of that which is presently claimed in claims 23 and 32. Please see King column 4 lines 1-17, and 55-62, and column 5 lines 32-34, and figure 1, 2 and 4. King states clearly that the arcing of the King handle is not a problem, and thus needs, by strong implication in the very least, no changes to solve this problem, and thus King teaches away from suggesting to those skilled in the art that sliding-plate-linear-conversion means such as is shown in Dzholdasbekov and also in Frank et al should be applied to a shaft supported handle rotatable about a single point in three rotational degrees of freedom in a 6-DOF controller. This clear teaching away from that of claims 23 and 32 in King renders a rejection of these claims under 35 U.S.C. 103 over King alone, or King in view of Dzholdasbekov, and further in view Frank et al and Menahem inappropriate.

Menahem describes a handle which rotations about a center point in three degrees of rotation, but does not teach or suggest a 6-DOF controller having sliding-plate-linear-conversion means.

Frank et al (henceforth Frank) describes sliding-plate-linear-conversion means absent a rotating handle.

Claims 37-40 is patentable over King because King does not use or anticipate the use and benefits of 12 independent sensors as presently claimed. King does not suggest the many benefits to be gained by the use of 12 separate and distinct sensors as claimed. Thus King does not describe the claimed structure of these claims per 35 U.S.C 102, and King does not anticipate the structuring and the benefits per 35 U.S.C 103, thus these claims are allowable over King alone, and are also allowable over any and all combinations of references of the prior art of record.

Dzholdasbekov alone is structured significantly different than that which is claimed in all of the claims 23-40, and thus a 35 U.S.C. 102 rejection of any of these claims over Dzholdasbekov alone would be inappropriate. Dzholdasbekov alone is structured significantly different than that which is claimed in all of the claims 23-40, and Dzholdasbekov alone does not anticipate or suggest that which is claimed in claims 23-40, and thus a 35 U.S.C. 103 rejection of any of these claims over Dzholdasbekov alone would be inappropriate. If the Examiner sees a suggestion in Dzholdasbekov suggesting the structural combination of any of the present claims, would the Examiner please indicate precisely which lines in Dzholdasbekov suggests the present claimed structures.

King alone is structured significantly different than that which is claimed in all of the claims 23-40, and thus a 35 U.S.C. 102 rejection of any of these claims over King alone would be inappropriate. King alone is structured significantly different than that which is claimed in all of the claims 23-40, and King alone does not anticipate or suggest that which is claimed in claims 23-40, and

thus a 35 U.S.C. 103 rejection of any of these claims over King alone would be inappropriate. If the Examiner sees a suggestion in King suggesting the structural combination of any of the present claims, would the Examiner please indicate precisely which lines in King suggests the present claimed structures.

There is no suggestion in the combination of King and Dzholdasbekov that a 6-DOF controller would be improved by utilizing sliding-plate-linear-conversion means supporting a shaft-supported single handle, the single handle being rotatable about a single point within said handle, the point being defined by the intersection of three mutually perpendicular axes, and rotation of the single handle about these three axes being sensed by sensors. Further, there is no suggestion in the combination of King and Dzholdasbekov that a 6-DOF controller would be improved by utilizing a separate and distinct sensor for each direction of each of the bi-directional 6 degrees of freedom, and that further improvements could be made by applying tactile feedback means to such 6-DOF controller, and that even further improvements and advantages could be made to such a 6-DOF controller by the application of spatial isolation means all in combination as is called for in some of the present narrower dependant claims. The addition of IBM to the combination of King and Dzholdasbekov still does not suggest this very advantageous combination as recited in many of the narrower present dependant claims. This use of 12 separate and distinct sensors in a 6-DOF controller provides many benefits, and opens the door so to speak to the application of several other substantially advantageous and non-anticipated novel means in such a 6-DOF controller.

There is no suggestion in the combination of King and Dzholdasbekov that a 6-DOF controller would be improved by utilizing sliding-plate-linear-conversion means supporting a shaft-supported handle, the handle being rotatable about a single point within said handle, the point being defined by the

intersection of three mutually perpendicular axes; and further, that this 6-DOF controller would be improved by utilizing a separate and distinct sensor for each direction of each of the bi-directional 6 degrees of freedom, and even further as in the present claims 30, 33, that such a 6-DOF controller would be even further improved by the application of tactile feedback means, and even further as in the claims 31, 35 with spatial isolation means applied in association with each of the sensors. In other words, there is no way that King alone, Dzholdasbekov alone, or King in view of Dzholdasbekov describes or suggests the invention of claims 23-40, and particularly many of the present narrow dependant claims such as 25-31, 33-35, and 38-40, as the benefits provided by the structuring of the present claims as detailed in the present specification.

The inventive structural combination recited in claim 23, is essentially the combination of sliding-plate-linear-conversion means within a stationary base, supporting a shaft-supported single handle, the single handle being rotatable in three degrees of rotational freedom about a single point within said handle, the point being defined by the intersection of three mutually perpendicular axes; with three linear degrees of freedom also being provided, wherein all of the six degrees of freedom input may be applied into the controller through said single handle. This novel structure provides MAJOR significant useful improvements and benefits in a 6-DOF controller. To combine these features as in claim 23 to obtain the clear and numerous benefits of such a combination in a 6-DOF controller is not suggested by King alone, Dzholdasbekov alone, by a combination of King in view of Dzholdasbekov, or by any reasonable combination of the related prior art of record.

An advantage of the structural combination of features of claim 23 is the inclusion of mechanically translating full 6-DOF into twelve orthogonal mechanical outputs of the controller which

leads to the further advantage of ease in applying a separate sensor to each of the twelve outputs; the advantage of ease in applying spatial sensor isolation means to each of the sensors, which in turn provides the advantage of forgiveness for human hand inaccuracies in all 6 degrees for freedom and which also further allows the advantage of being able to use substantial vibration as tactile feedback without falsely triggering sensors. Another advantage of mechanically translating full 6-DOF into twelve orthogonal mechanical outputs as in claim 23 is that it allows for a much wider range of sensor types to be utilized, including very inexpensive open/close contact switches, or many other types of more sophisticated sensors.

The invention of claim 23 achieves far more than a combination which any or all of the prior art references suggest, expressly or by any reasonable implication.

The Examiner's attention is respectfully called to the decision of In re Sernaker of the Court of Appeals for the Federal Circuit, at 217 USPQ 1, 5, 6 (Fed. Cir. 1983):

We may assume, for purposes of this decision, that all the prior art references in this case are sufficiently related to one another and to a related and common art, that the hypothetical person skilled in the art must be presumed to be familiar with all of them. That being so, the next questions are (a) whether a combination of the teachings of all or any of the references would have suggested (expressly or by implication) the possibility of achieving further improvements by combining such teachings along the line of the invention in suit, and (b) whether the claimed invention achieved more than a combination which any or all of the prior art

references suggested, expressly or by reasonable implication.

If the Examiner believes that such a structure as recited in claim 23 is suggested, or the benefits thereof are suggested within any of the prior art alone or in combination, would the Examiner please quote the lines which would suggest or lead one skilled in the art to want to make such a combination in order to achieve such benefits list above.

The Court of Appeals for the Federal Circuit has reiterated the proscription of the Patent and Trademark Office aggregating references in the absence of a teaching or suggestion supporting the combination. The Court of Appeals for the Federal Circuit has specifically required that teachings of references are properly combined only if there is some suggestion or incentive in the prior art to do so. Thus, as brought out more specifically in *ACS Hospital Systems v. Montefiore Hospital*, 221 USPQ 929,933:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. The prior art of record fails to provide any such suggestion or incentive. Accordingly, we hold that the court below erred as a matter of law in concluding that the claimed invention would have been obvious to one of ordinary skill in the art under section 103.

Again, if the Examiner believes that such a structure as recited in claim 23 is suggested, or the benefits thereof are suggested within any of the prior art alone or in combination, would the Examiner please quote the lines which would suggest or lead one skilled in the art to want to make such a combination in order to achieve such benefits list above.

The inventive structure of claim 23 is not suggested in a combination of King in view of Dzhholdabekov, and further in view of Menahem, Frank et al and Kley.

If the Examiner believes that such a structure as recited in claim 23 is suggested, or the benefits thereof are suggested within the combination of King in view of Dzhholdabekov, and further in view of Menahem, Frank et al, Kley, and Colston, would the Examiner please direct Applicant to the particular lines within these disclosures which would direct one skilled in the art to want to make such a combination, and further wherein the suggestion is in such detail that one skilled in the art would not have to utilize inventive skill to structurally combine the structural features as claimed in the present claim 23.

Again, Applicant does not believe that the mere existence of features located scattered throughout the prior art references constitutes, by the mere existence of such scattered features, any suggestion to make combinations of the features. Applicant believes there must exist within the prior art references, and relatively clearly so, suggestions of significant benefits to be gained by making a combination of such features. The benefits gained by the combination of features in claim 23 are not within the references of the combination of King in view of Dzhholdabekov, and further in view of Menahem, Frank et al, Kley, and Colston to support a 35 U.S.C. 103 obviousness rejection, and thus allowance of claim 23 and the claims dependant thereupon is solicited.

The combination of features of claim 32, and thus the claims 33-35 dependant thereon, is not described by any single prior art reference of record, and is not suggested by any reasonable combination of prior art references of record, and thus allowance of claims 32-35 is solicited, as claim 32 provides an almost equal number of unanticipated advantages as described above for claim 23.

The combination of features of claim 36 is not described by any single prior art reference of record, and is not suggested by any reasonable combination of prior art references of record, and thus allowance of claim 36 is solicited.

The combination of features of claim 37, and thus the claims 38-40 dependant thereon, is not described by any single prior art reference of record, and is not suggested by any reasonable combination of prior art references of record, and thus allowance of claims 37-40 is solicited.

From the above, it should now be clearly appreciated that the combination of King in view of Dzholdasbekov, and further in view of Menahem, and Frank et al, or Dzholdasbekov in view of King, and further in view of Menahem and Frank et al, does not suggest to those skilled in the art that which is presently claimed in claims 23 and 32(in the least), as the combination of the teachings of these two primary references is away from the structural combination as claimed in claims 23, 32, not toward such a structural combination.

Additionally, the Examiner is respectfully requested to view and examine the narrower dependant claims as if they are independent claims. Although Applicant strongly believes that each of the independent claims 23, 32, 36, 37 recites clearly novel structural combinations thus escaping any possible 35 U.S.C

102 and 103 rejection based on the prior art of record, the narrower dependant claims when treated properly by the Examiner, may be when appropriate, objected to but otherwise allowable should the independent claim on which any of the dependant claims depend, whether directly or indirectly be rejected. Such treatment of dependant claims is believed to be the normal practice at the PTO, and there has in past been no clear indication of the Examiner treating Applicant's dependant claims as such, and thus again, the Examiner is requested to treat the dependant claims properly, as some of them, such as claims 26-30, 33-35, 39-40 for example, are quite narrow and specific, and are very clearly not suggested or anticipate by any reasonable combination of the prior art of record.

The Examiner has in the past clearly been picking and choosing from a number of prior art references in an effort to aggregate different elements in an attempt to simulate Applicant's claimed structure. It is improper to do such picking and choosing unless there is some suggestion within the references themselves that they be so aggregated. The Court of Appeals for the Federal Circuit and the Patent Office's own Board of Appeals have clearly indicated that such an aggregation of references is improper.

The Examiner's attention is respectfully called to the decision of *In re Sernaker* of the Court of Appeals for the Federal Circuit, at 217 USPQ 1, 5, 6 (Fed. Cir. 1983):

We may assume, for purposes of this decision, that all the prior art references in this case are sufficiently related to one another and to a related and common art, that the hypothetical person skilled in the art must be presumed to be familiar with all of them. That being so, the next questions are (a) whether a combination of the teachings of all or any of the references would have

suggested (expressly or by implication) the possibility of achieving further improvements by combining such teachings along the line of the invention in suit, and (b) whether the claimed invention achieved more than a combination which any or all of the prior art references suggested, expressly or by reasonable implication.

* * *

Certainly the board pointed to no prior art that separately suggested expressly or by implication a three-element combination made up in this way.

..... Without some express or implied suggestion, we cannot assume that one of ordinary skill in the art would have found it obvious to mate the transfer print with this pattern...The lesson of this case appears to be that prior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantages to be derived from combining their teachings.

Applicant's claimed invention of claims 23-40 clearly achieves far more than a combination which any or all of the prior art references suggest, expressly or by reasonable implication. Again, claims 23-40 clearly achieve far more than a combination which any or all of the prior art references suggest, expressly or by reasonable implication. For but one example, Applicant's structural combination clearly achieves "more than a combination which any or all of the prior art references suggested", as recited in claim 36 which provides novel structuring in a 6 degree of freedom controller affording the potential of pure and full separation of control along and about

any of the three mutually perpendicular axes, wherein "pure rotation" may be achieved absent any linear movement, and "pure linear movement" may be achieved absent any rotation.

The Court of Appeals for the Federal Circuit has reiterated the proscription of the Patent and Trademark Office aggregating references in the absence of a teaching or suggestion supporting the combination. The Court of Appeals for the Federal Circuit has specifically required that teachings of references are properly combined only if there is some suggestion or incentive in the prior art to do so. Thus, as brought out more specifically in *ACS Hospital Systems v. Montefiore Hospital*, 221 USPQ 929,933:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. The prior art of record fails to provide any such suggestion or incentive. Accordingly, we hold that the court below erred as a matter of law in concluding that the claimed invention would have been obvious to one of ordinary skill in the art under section 103.

The Court of Appeals for the Federal Circuit considered the question of aggregation of references in connection with a court appeal in *Panduit Corporation v. Dennison Manufacturing Co.*, 227 U.S.P.Q. 337, and reiterated the requirement that the prior art must provide either a teaching or a suggestion of the claimed invention in order to provide a proper basis for rejection of claims under 35 U.S.C. 103 by the Patent Office.

"In the present case, for example, there

is no way that one skilled in the art in 1961 and 1968 (necessarily unaided by knowledge of the patents in suit and Caveney's testimony) would find in the prior art either a teaching or a suggestion of the claimed inventions."

There is no "teaching or suggestion of the claimed inventions" in the prior art of King, Dzholdasbekov, Frank, Kley and IBM or any reasonable combination of any of the prior art of record.

The Court of Appeals for the Federal Circuit, in the Panduit Corp. case, has specifically required that, in resolving the question of nonobviousness, the Examiner must consider each and all of the references in their entirety, including if the references teach away from the claimed invention in determining whether there is any suggestion therein of the combination claimed.

" Three fundamental errors resulted from a disregard of the decisional parameters governing the proper evaluation of prior art. The first, as above indicated, was the picking and choosing of 'teeth,' 'ledges,' 'hinges,' either absent from the prior art references or there disclosed in entirely distinct form, characteristics, and relationships. It must be remembered that the Examiner is required to consider references in their entireties, i.e., including those portions that would argue against obviousness.

The Examiner has clearly neglected to consider the portions of the references which argue against obviousness and teach away from the present invention. In the prior art, particularly the primary references of King and Dzholdasbekov, the Examiner must consider each of the references in their entirety, including if

the references teach away from the claimed invention in determining whether there is any suggestion therein of the combination claimed. Clearly both King and Dzholdasbekov alone and combined teach away from Applicant's invention rather than suggesting Applicant's inventive combined structure, and by failing to acknowledge such of King's teachings against the combination, the Examiner is failing to follow the clear mandates of the Court of Appeals for the Federal Circuit.

The Patent Office policy is clearly to follow these mandates. Thus, in the decision of the Patent and Trademark Office Board of Patent Appeals and Interferences, Ex parte Clapp, 227 USPQ 972, that Honorable Board specifically followed the mandate by requiring that either the references must expressly or impliedly suggest the claimed combination, or the Examiner must present a convincing line of reasoning as to why an artisan (routinier) would have found the claimed combination to have been obvious in light of the teachings of the references. In the present case, the Examiner repeatedly states that features shown in the reference suggest particular intricate combinations along the lines of Applicant's invention, and applicant simply does not see such suggestion in these references.

The Patent Office Board of Appeals more particularly concurred with the Court of Appeals for the Federal Circuit that it is improper for an Examiner to selectively pick and choose elements or concepts from various references to arrive at a claimed invention by using hindsight gained from his knowledge of Applicant's claims as a guide. Thus, where, as in the present case, the Examiner cites references respectively showing different elements but barren of any teaching or suggestion in the references that they be combined in the manner of the claims, such aggregation of references does not properly support a rejection of the claims.

The Board of Appeals further specifically negated the use of simplicity and hindsight as criteria for resolving the issue of obviousness under Sec. 103. It is respectfully submitted that,

in the present case, the Examiner is going directly contrary to the Board's clear edict in this regard and is aggregating references without any basis for such aggregation found or suggested therein, and utilizing hindsight gained from his knowledge of applicant's invention as the sole basis for such aggregation, and, thus it is respectfully submitted that the claims are clearly allowable over the most stringent requirements of 35 USC 103.

It is respectfully requested that all claims 23-40 be held allowable over the prior art of record.

SECONDARY CONSIDERATIONS

The Examiner is requested to consider the following as it is believed very relevant because of the number of high dollar offers to acquire rights to Applicant's invention, particularly that which is claimed in claims 23, 32, 36 and 37. The offers exceed one million U.S. dollars and are from very large and well known companies that have employees who are without question skilled in this art. Applicant's invention is perceived as being very novel, advancing the art significantly, and of substantial commercial value by those skilled in the art as will be herein shown.

Since the inception of Court of Appeals for the Federal Circuit in 1982, the court has clearly increased the evidentiary importance of secondary considerations of nonobviousness. Clearly commercial success, long felt need, failure of others, etc., must be taken into account when the question of obviousness verses nonobviousness exists. The CAFC has completely abandoned the much earlier Supreme Court's view that such evidence is useful merely to tip the balance in close cases; in many Federal Circuit cases, secondary considerations are more determinative of nonobviousness than is prior art.

The Examiner's attention is directed to the Federal Circuit

case of *Alco Standard Corp. v. Tennessee*, 808 F.2d 1490 (Fed. Cir. 1986), cert. dismissed, 483 U.S. 1052 (1987), where the patent at issue was for an apparatus and method of testing turbine rotors in electrical generators for flaws or cracks. The district court had held the patent nonobvious, supporting its prior art examination with evidence of commercial success, long-felt need, and failure of others. The Federal Circuit admitted that the prior art indicated that the patent was obvious, nonetheless, it affirmed the holding of validity, reasoning that the strong evidence of secondary considerations was sufficient to outweigh the prior art determination. Thus, under the section 103 analysis, the Federal Circuit actually views secondary considerations as more dispositive than the prior art determination, at least when the secondary considerations constitute especially persuasive evidence of nonobviousness.

The Examiner's attention is additionally directed to the Federal Circuit case of *In W.L. Gore & Associates v. Garlock, Inc.*, (721 F.2d. 1540 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984), where the court stated:

"The objective evidence of nonobvious, i.e., the "indicia" of Graham (Supreme Court "*Graham v. John Deere*")... may in a given case be entitled to more weight or less, depending on its nature and its relationship to the merits of the invention. It may be the most pertinent, probative, and revealing evidence available to aid in reaching a conclusion on the obvious/nonobvious issue. It should when present always be considered as an integral part of the analysis."

The Federal Circuit has repeated these views in many subsequent cases, emphasizing that secondary considerations, if present, are always relevant under section 103, and must always be given evidentiary weight before reaching a decision on the obvious/nonobvious issue. In several cases the Federal Circuit has vacated or reversed district court holdings of invalidity for

obviousness because the trial court failed to consider evidence of secondary considerations. *Simmons Fastener Corp. v. Illinois Tool Works, Inc.* is illustrative. (739 F.2d 1573 (Fed. Cir. 1984), cert. denied, 471 U.S. 1065 (1985)). In the district court, Simmons brought a declaratory judgment action asking the court to declare a patent for a screw anchor used to fasten shelves to the inside of a refrigerator invalid. The parties stipulated that the invention had achieved substantial commercial success. In reaching its holding of obviousness, however, the district court did not consider this evidence, reasoning that the Graham prior art analysis produced a clear showing of obviousness. The Federal Circuit agreed that the prior art may have indicated a conclusion of obviousness, but it nevertheless reversed the district court, concluding that the strong evidence of commercial success established nonobviousness despite the prior art analysis.

The above in no way constitutes an admission by Applicant that the prior art of record indicates in any way that the claimed invention is obvious, but rather this addressing of the secondary considerations will just further support the fact that the claimed invention is non-obvious, and that the claims should all be held allowable.

The foregoing discussion of secondary considerations such as commercial success is particularly relevant in this case since there have been a number of high dollar offers to acquire rights to Applicant's invention each exceeding one million U.S. dollars and from very large and well known companies that have employees who are without question skilled in this art. Those skilled in this art judged Applicant's invention substantially as is currently claimed as being very novel, advancing the art significantly, and of substantial commercial value.

The Examiner's attention is directed toward exhibit A which is a NONDISCLOSURE AGREEMENT sign between Applicant and Logitech,

a California company who has very large world wide sale of computer controller.

The Examiner's attention is now directed toward exhibit B which is a three page letter to Applicant and Applicant's business associate "Steve". This three page letter is an offer by Logitech to purchase rights to Applicant's invention. Please read if carefully and note the "Scenario One" and "Scenario Two" offers.

The two offers were never, as of yet, accepted by Applicant, and during negotiations with Logitech, Logitech apparently misunderstood and believed rights had been or would be acquired to Applicant's invention, and took it upon themselves to build and sell Applicant's invention substantially as claimed. This product is called "Cyberman". A flyer on "Cyberman" was submitted in Applicant's response of 06/03/94. Well over 70,000 units of "Cyberman" were sold in a very brief period of time for approximately \$100.00 per unit street price. Applicant requested Logitech to no longer make and sell Applicant's invention, and they complied with Applicant's wishes. Applicant received a royalty check for \$40,000.00 shown in exhibit C.

Applicant is contractually bound against disclosing any further details pertaining to the "Cyberman" product.

Clearly Logitech, and Logitech's counsel being Townsend and Townsend, a major intellectual properties law firm comprised of hundreds of patent lawyers, believed Applicant's invention was novel, advanced the art significantly, and was or is of substantial commercial value. The consumers who purchased the Cyberman thought the product was of value.

The Examiner's attention is now directed toward the letter marked exhibit D, which is directed to my business associate

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Steve Bowman from Key Tronic. This letter is an offer to acquire rights to Applicant's invention, with the anticipation of Applicant receiving multi-millions of dollars annually for his invention rights. Please read this letter and consider it carefully. This is after review of the pending patent application, after review by those skilled in the art at Key Tronic, and professional review by the intellectual property law firm of Wells, St. John of Spokane Washington.

Clearly, professional opinion was and/ or is that the present invention is of substantial commercial value.

Due to a lack of a timely first office action on the present application, Applicant was unable to come to a full agreement with Key Tronic.

It is hereby requested the application and claims being reexamined in view of this response, and that all claims be found allowable. Thank you.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, 1.56(a).

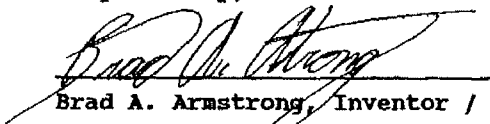
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may

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jeopardize the validity of the application or any patent issued thereon.

Respectfully;



Date: *January 10, 1996*

Brad A. Armstrong, Inventor / Applicant

Applicant's current phone number is (916) 342-5342

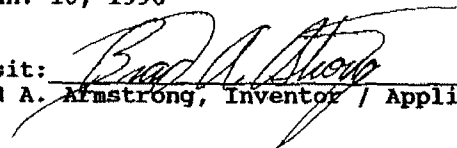
CERTIFICATE OF EXPRESS MAILING

Commissioner of Patents and Trademarks
Washington, D. C. 20231

I hereby certify that this complete response to the outstanding Office Action of 08/10/95 is being deposited with the United States Postal Service as **EXPRESS MAIL**, article number EG313952649US with sufficient postage paid in an envelope addressed to: Commissioner of Patents and Trademarks, Washington,

D. C. 20231, on this date: Jan. 10, 1996

Signature of one making deposit:


Brad A. Armstrong, Inventor / Applicant

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DEC 03 '92 18:12 510-795-7496 LOGITECH EXEC OFF

P.2

Exhibit A

NONDISCLOSURE AGREEMENT

Logitech Inc. ("RECIPIENT"), a corporation organized under the laws of the State of California with an address at 6505 Kaiser Drive, Fremont, CA 94555, wishes to receive from Brad Armstrong, an individual having his principal place of business at 6630 Arabian Circle, Granite Bay, California 95661 ("DISCLOSER") and DISCLOSER wishes to furnish to RECIPIENT certain confidential and proprietary information contained in DISCLOSER's patent application entitled SIX DEGREE OF FREEDOM CONTROLLER WITH CAPABILITY OF TACTILE FEEDBACK. ("INFORMATION") for the sole purpose of allowing RECIPIENT to evaluate the INFORMATION and following such an evaluation, to evaluate RECIPIENT'S interest in pursuing a licensing relationship with DISCLOSER. RECIPIENT is not currently developing a mechanical 3D controller device; DISCLOSER acknowledges, however, that RECIPIENT is currently involved in the development and acquisition of technologies similar to those embodied in the INFORMATION and that RECIPIENT shall not, by the execution of this Agreement, be prevented or otherwise hindered in the continued development and acquisition of such technologies. In consideration of receiving the INFORMATION, RECIPIENT agrees to be bound by the terms of this Agreement.

RECIPIENT agrees to maintain the INFORMATION in confidence, will use at least the same degree of care to maintain the INFORMATION secret as it uses in maintaining as secret its own proprietary, confidential and trade secret information, but always at least a reasonable degree of care, will use the INFORMATION only for the above purpose unless hereafter agreed to in writing by the parties hereto. However, RECIPIENT will have no obligation with respect to any portion of the INFORMATION which (1) was known to it prior to receipt, directly or indirectly, of such portion from RECIPIENT, (2) is lawfully obtained by it from a third party under no obligation of confidentiality, direct or indirect, or (3) is or becomes known or available without any act or failure to act by it.

RECIPIENT will not disclose any portion of the INFORMATION to any person except those of its employees having a need to know such portion in order to accomplish the sole purpose stated above.

This Agreement is effective as of the date first written below, under the laws of the State of California and will terminate two (2) years thereafter.

DISCLOSER:

Brad Armstrong

By *Brad Armstrong*

Name *Brad Armstrong*

Title *An Individual*

Date *12/4/92*

LOGITECH:

Logitech, Inc.

By *Hank Moran*

Name *HANK MORAN*

Title *CHIEF OPERATING OFFICER*

Date *12/3/92*



December 17, 1992

Exhibit B

By Facsimile

Mr. Brad Armstrong
Director of Research and Development

Mr. Steven Bowman
President
Global Devices
6630 Arabian Circle
Granite Bay, CA 95746

Dear Brad and Steve:

It is with pleasure that I write to you to set forth the outline of what I hope will be an agreement between you (individually and as Global Devices) and Logitech. Obviously, the final agreement between us will depend on our being able to agree upon the wording in the final written contract and upon approval and consent by the Logitech Board. This letter is but the first, albeit important, step in that process.

We at Logitech have been favorably impressed by your technology, both the global controller and the concept of the global navigator, as I hope you know by now. We feel that, although the market is young, the future is bright, and many opportunities will open in the future for both of us if we can reach agreement satisfactory to both of us, and go forward to commercialize the technology.

However, as you also know, here at Logitech we have in place an extensive period of product development and testing, tied to phases controlled by our Product Approval Committee (PAC). Therefore, our ability to offer commitment at this stage is tied to PAC approval at the various phases.

In addition, the level of commitment we are willing to offer is tied to the issue of whether we obtain exclusive rights to commercialize your product. I understand that you may not wish Logitech to have these rights, and therefore I have prepared two different scenarios for your consideration, depending on whether we obtain exclusive rights to the technology or not.

But before I get to the numbers, I would like to set forth some general terms that would apply regardless of whether we obtain exclusive rights.

General Terms

- The products that we have discussed, and that Logitech desires to market, are the global controller and the global navigator, as covered in your patent application.
- Logitech will have worldwide rights to develop, manufacture, market and sell these products under our own label.
- Logitech will pay Global Devices a royalty per unit, outlined below.
- Logitech plans to spend significant resources (within our discretion) developing these products. Logitech then will manufacture and market them in various markets, including the entertainment and workstation markets. Global Devices will further develop the concept of the global navigator.
- Logitech will own everything that it develops in its development process, and Global Devices will continue to own the base technology licensed to Logitech under the agreement.

Logitech Inc.
6505 Kaiser Drive
Fremont, CA 94555
Phone 510-795-8500
Telex 757411
fx 510-792-8901

- Global Devices will do software development and deliver software meeting specifications that I provide. This development will occur in the month after we enter into the agreement, and no additional moneys will be paid by Logitech for this. I don't anticipate that you will find the work I have in mind to be a problem.
- Global Devices will deliver 10 to 50 prototypes to Logitech, for which Logitech will pay \$100 per unit, to be delivered according to the schedule to be set forth in the agreement.
- Global Devices will give patent and other proprietary rights representations and indemnifications. Logitech will control the patent process, including decisions on where to patent the technology abroad. Logitech will undertake the costs of the patent prosecution process, but will offset the amounts spent for patent prosecution against future royalty amounts owing by Logitech to Global Devices.
- If the patent application is denied, or if third parties have proprietary rights or patents that supersede the rights that Global Devices is granting Logitech in the agreement, with the result that Logitech's rights are limited or Logitech must pay royalties to the third party, then Logitech's royalty obligation will terminate.
- Even if Logitech's rights are non-exclusive, Global Devices will agree not to license the technology to Microsoft, and possibly other competitors to be further specified, during the term of the contract.
- The term of the contract will be five years (unless earlier terminated as provided in the agreement).
- The contract will contain standard terms and provisions for licenses, including a "most favored customer" pricing provision limiting your ability to sell rights in the future on more favorable terms than those in our agreement. In addition, the contract will contain standard confidentiality provisions.
- Global Devices will have its attorneys work with Margaret Wynne, Logitech's General Counsel, to come to an agreement satisfactory to both parties, setting forth in better detail the terms discussed here.

Now, to the numbers. Obviously, these numbers are interrelated, so if one were to change, then all may change.

Scenario One -- Logitech acquires Exclusive Rights to the Technology

Royalty Rate per Unit	4% of price to Logitech's customer	
Cap on Royalties	\$1,250,000	
Upfront Royalty	\$150,000, to be paid as provided below under "Allocation". This amount will be offset in the future against the initial royalties owing by Logitech to Global Devices at that time.	
Allocation of Upfront Royalty	Tied to signing of agreement and to PAC phases*:	
	\$25,000	Signing of Agreement
	\$50,000	Entry into Development Phase
	\$75,000	Entry into Qualification Phase

Scenario Two – Logitech acquires Non-exclusive Rights to the Technology

Royalty Rate per Unit	2.5% of price to Logitech's customer	
Cap on Royalties	\$1,000,000	
Upfront Royalty	\$100,000, to be paid as provided below under "Allocation". This amount will be offset in the future against the initial royalties owing by Logitech to Global Devices at that time.	
Allocation of Upfront Royalty	Tied to signing of agreement and to PAC phases*:	
	\$15,000	Signing of Agreement
	\$35,000	Entry into Development Phase
	\$50,000	Entry into Qualification Phase

*The PAC phases are part of Logitech's internal process. The decision to enter into the next PAC phase is entirely within Logitech's discretion. In the event Logitech decides not to enter into the next PAC phase, it will so notify Global Devices. In such event, Logitech's rights, if exclusive, will immediately become non-exclusive.

As we discussed, the next step is for you to evaluate the terms suggested here. Then, let's get together tomorrow, as we have planned, to discuss how I arrived at these numbers. I believe that, when you have heard my thoughts on this, you will agree that this is the foundation of a good agreement for both of us.

In closing, let me say that I have enjoyed our various meetings and discussions, and I look forward to a long and successful relationship with Global Devices.


Very truly yours,



James Barnes
3D Business Unit Manager

cc: Pierluigi Zappacosta, Logitech
Margaret Wynne, Logitech

LOGITECH, INC. 6505 Kaiser Drive, Fremont, CA 94555 (510) 795-8500

DATE:		VENDOR NO.		VENDOR		105457	
VOUCHER I.D.	TYPE	INVOICE NO.		DATE	GROSS	DISCOUNT	NET AMOUNT
		ORIG. INVOICE NO./REF.					
		101494	101494	40,000.00	0.00	40,000.00	
TOTALS 							40,000.00

~~Brad Armstrong~~

Exhibit C



Exhibit D

P.O. Box 14687
Spokane, WA 99214-0687
USA

Telephone 509/928-8000
Facsimile 509/927-5248

January 8, 1993

Mr. Steven Bowman
President
Global Devices
6630 Arabian Circle
Granite Bay, CA 95661

Dear Steven:

Further to our conversation in Spokane this last Wednesday, you will find attached:

1. Outline of Joint Venture structure
2. Proforma earning statement for joint venture company

We have given a great deal of thought to ownership of NEWCO, and percentage of profit participation for you and Key Tronic Corporation. It should be noted that all of the funds for this undertaking are being entirely provided by Key Tronic. Additionally, the Company will be committing substantial organization and some facilities to this project. It is a risk which will be borne by Key Tronic. For these and other reasons, I would like to discuss with you personally, we propose ownership in NEWCO be divided 30% to you and 70% to Key Tronic. If the attached proforma statement, which incorporated your thoughts on market opportunity is achieved, the third year return as a 30% owner of our joint company would be running approximately \$3 million annually. Looking at the opportunities we reviewed at our meeting, it seems to us at KT that a considerably sharper ramp-up is possible. There is a window of opportunity that we should take advantage of, including incorporating the three-dimensional control in keyboards. In respect to assisting you financially, we would certainly consider some immediate capital to you on an agreement possibly along the lines you suggested in Spokane.

Steve, I will look forward to hearing your comments and hopefully, to proceed on a project which will provide substantial return to both you and ourselves.

Best personal regards,


Stanley Hiller
Chief Executive Officer