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(71) Applicant (for all designated States except US): IMMERSION CORPORATION [US/US]; 801 Fox Lane, San Jose, CA 95131 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): HAYWARD, Vincent [FR/CA]; 2277 Harvard, Montreal, Québec H4A 2W1 (CA).

(74) Agent: RITCHIE, David; Thelen Reid & Priest LLP, P.O. Box 640640, San Jose, CA 95164-0640 (US).

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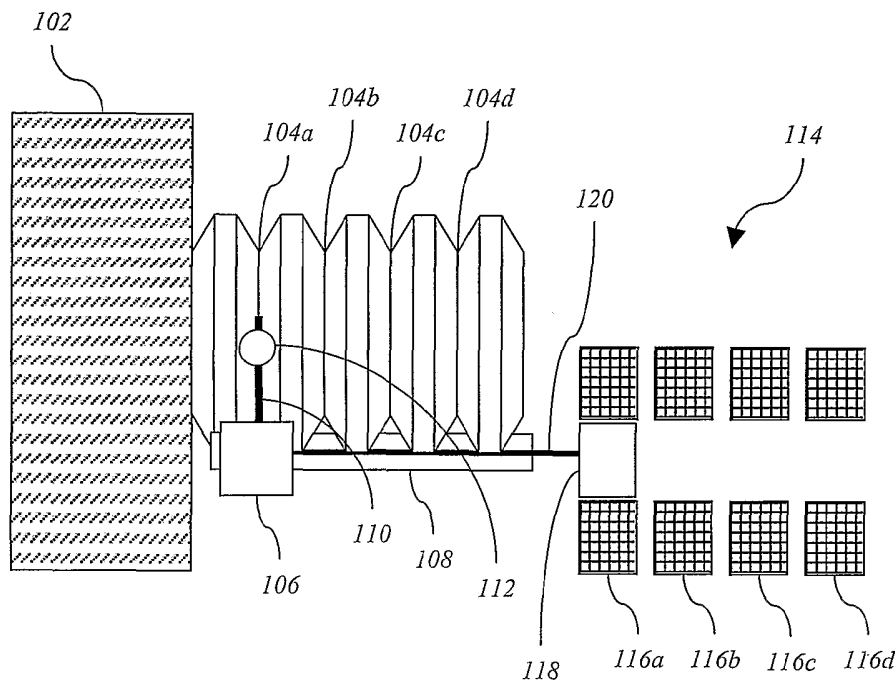
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(88) Date of publication of the international search report:  
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[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR LOW POWER HAPTIC FEEDBACK



(57) Abstract: Systems and methods for low power consumption haptic feedback are described. In one described system, a device comprises a manipulandum and a haptic effect generator in communication with the manipulandum. The actuator is operable to provide a first haptic profile associated with a first mechanical configuration and a second haptic profile associated with a second mechanical configuration. The device also comprises an actuator in communication with the haptic effect generator, which is operable to switch the haptic effect generator between the first haptic profile and the second haptic profile.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/017377

<p><b>A. CLASSIFICATION OF SUBJECT MATTER</b> G06F3/00</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>												
<p><b>B. FIELDS SEARCHED</b></p> <p>Minimum documentation searched (classification system followed by classification symbols) G06F</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EP0-Internal</p>												
<p><b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b></p> <table border="1"> <thead> <tr> <th>Category °</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>EP 0 789 321 A (LUCENT TECHNOLOGIES INC) 13 August 1997 (1997-08-13) column 3, line 49 - column 4, line 44; figures 2A,2B</td> <td>1,11,33, 38</td> </tr> <tr> <td>X</td> <td>EP 1 217 496 A (ALPS ELECTRIC CO., LTD) 26 June 2002 (2002-06-26)  paragraphs [0007] - [0009] paragraphs [0036] - [0046]; figure 1</td> <td>1-11, 16-21, 31-35, 37,38</td> </tr> </tbody> </table>			Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	A	EP 0 789 321 A (LUCENT TECHNOLOGIES INC) 13 August 1997 (1997-08-13) column 3, line 49 - column 4, line 44; figures 2A,2B	1,11,33, 38	X	EP 1 217 496 A (ALPS ELECTRIC CO., LTD) 26 June 2002 (2002-06-26)  paragraphs [0007] - [0009] paragraphs [0036] - [0046]; figure 1	1-11, 16-21, 31-35, 37,38	
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<p><input type="checkbox"/> Further documents are listed in the continuation of box C.      <input checked="" type="checkbox"/> Patent family members are listed in annex.</p>												
<p>° Special categories of cited documents :</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier document but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier document but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
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"P" document published prior to the international filing date but later than the priority date claimed												
<p>Date of the actual completion of the international search <b>1 November 2005</b></p>		<p>Date of mailing of the international search report <b>17. 01. 2006</b></p>										
<p>Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016</p>		<p>Authorized officer <b>Mouton, B</b></p>										

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/017377

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11, 16-21, 31-35, 37, 38

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11,16-21,31-35,37,38

device comprising an actuator for providing two haptic profiles,  
characterised in that  
each haptic profile is determined by a channel, and the active haptic profile is selected by moving a follower configured to follow the first or the second channel.

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2. claims: 12-15,26-30

device comprising an actuator for providing two haptic profiles,  
characterised in that  
the device comprises a manipulandum having a hole, and that the active haptic profile is selected by moving a pin through the hole from a position below the surface to a position above the surface.

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3. claims: 22-25,36

device comprising an actuator for providing two haptic profiles, the haptic profile being determined by a friction exerted by a brake,  
characterised in that  
the friction parameter is selectable by turning a screw.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/017377

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
EP 0789321	A	13-08-1997	DE 69705753 D1	30-08-2001
			DE 69705753 T2	25-04-2002
			JP 9231000 A	05-09-1997
			US 5914705 A	22-06-1999
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