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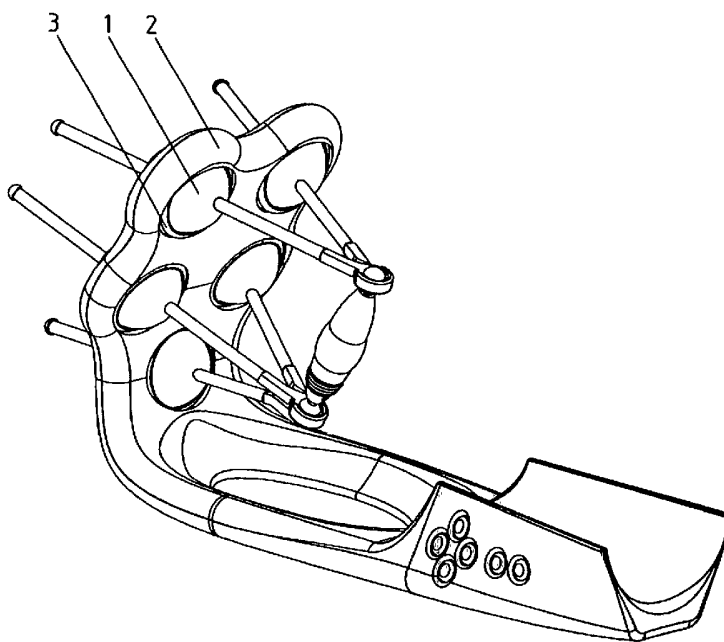
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- Published:  
— with international search report

[Continued on next page]

(54) Title: HAPTIC INPUT DEVICE



(57) Abstract: A haptic input device comprises a hexapod or pentapod parallel linkage mechanism with force feedback effected by proportional control of magneto-restrictive fluid brakes constraining the measurement of the struts of the mechanism, through their base nodes. In the pentapod version of the haptic data input device, a haptic stylus is employed which includes an annular compliant feature that can be squeezed and whose squeeze pressure can be monitored.



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**(88) Date of publication of the international search report:**  
18 September 2003

*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/GB 01/04768

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G06F3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 12357 A (IMMERSION HUMAN INTERFACE CORP) 3 April 1997 (1997-04-03)	1,2
Y	page 17, line 31 -page 18, line 2; claim 1; figure 6	3-14
Y	US 4 961 267 A (HERZOG KLAUS) 9 October 1990 (1990-10-09) claim 1; figure 6	3-7
Y	US 5 816 372 A (CATANZARITE DAVID M ET AL) 6 October 1998 (1998-10-06) claim 1; figures 1,5	8-14
A	US 4 811 608 A (HILTON JOHN A) 14 March 1989 (1989-03-14) claim 1; figures 2,4	1-14
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance  
 "E" earlier document but published on or after the international filing date  
 "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)  
 "O" document referring to an oral disclosure, use, exhibition or other means  
 "P" document published prior to the international filing date but later than the priority date claimed

"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  
 "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  
 "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.  
 "&" document member of the same patent family

Date of the actual completion of the international search

28 January 2003

Date of mailing of the international search report

25. 04 2003

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 01/04768

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 143 505 A (BURDEA GRIGORE C ET AL) 1 September 1992 (1992-09-01) claim 1; figure 4 ---	1-14
A	US 5 573 088 A (DANIELS JOHN J) 12 November 1996 (1996-11-12) claim 1; figure 22 ---	1-14
A	US 5 107 080 A (ROSEN MICHAEL J) 21 April 1992 (1992-04-21) claim 1; figures 1,4 -----	1-14

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 01/04768

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

1-14

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: 1-14

Haptic stylus connected to a parallel link mechanism.

2. Claims: 15-18

Stylus for a haptic device with feature which squeeze pressure can be monitored

3. Claims: 19-22

Stylus for a haptic device with annular control button that can be moved axially.

4. Claims: 23-30

Control of a haptic stylus in relationship to a CAD feature.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/04768

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Information on patent family members

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