

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference J1125BPCT	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2018/048998	International filing date (<i>day/month/year</i>) 31 August 2018 (31-08-2018)	(Earliest) Priority Date (<i>day/month/year</i>) 7 September 2017 (07-09-2017)
Applicant APPLE INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed
 a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant
 the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant
 the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

- as suggested by the applicant
 as selected by this Authority, because the applicant failed to suggest a figure
 as selected by this Authority, because this figure better characterizes the invention

b. none of the figures is to be published with the abstract

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Box No. 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 No. 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 fees, this Authority did not invite payment of additional fees.

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.:

1-12

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

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International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G02B27/01 G02C3/00
ADD.
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)
G02B G02C

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 practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 106 054 391 A (SHANGHAI LEWO INFORMATION TECH CO LTD) 26 October 2016 (2016-10-26)	1,7,9
Y	abstract; figures 1,2	3,6-8,10
A	paragraphs [0014], [0015]	11
X	JP 2009 111512 A (CANON KK) 21 May 2009 (2009-05-21)	1,2,4,5, 12
Y	abstract; figures 1,3	3,6-8,10
A		11
Y	CN 107 076 995 A (SZ DJI TECHNOLOGY CO LTD) 18 August 2017 (2017-08-18) figures 1-4	3
Y	JP H09 179061 A (OLYMPUS OPTICAL CO) 11 July 1997 (1997-07-11) paragraphs [0060], [0062] - [0064]	6-8
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Further documents are listed in the continuation of Box C.

See patent family 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 application or patent 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 5 December 2018	Date of mailing of the international search report 30/01/2019
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Elflein, Wilhelm
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International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 9 128 283 B1 (HEINRICH MITCHELL JOSEPH [US] ET AL) 8 September 2015 (2015-09-08) column 9, lines 42-57; claim 12; figures 1B,5	10
X,P	----- US 2018/046147 A1 (AGHARA SANJAY R [IN] ET AL) 15 February 2018 (2018-02-15) paragraphs [0046], [0053], [0064]	1,2,4,5, 7-9,12
A,P	----- US 2017/277254 A1 (OSMAN STEVEN [US]) 28 September 2017 (2017-09-28) abstract paragraph [0063]; figures 5-7 -----	11

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Information on patent family members

International application No PCT/US2018/048998

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
CN 106054391	A	26-10-2016		NONE	

JP 2009111512	A	21-05-2009	JP	5004751 B2	22-08-2012
			JP	2009111512 A	21-05-2009

CN 107076995	A	18-08-2017	CN	107076995 A	18-08-2017
			WO	2018058276 A1	05-04-2018

JP H09179061	A	11-07-1997		NONE	

US 9128283	B1	08-09-2015		NONE	

US 2018046147	A1	15-02-2018	US	2018046147 A1	15-02-2018
			WO	2018031209 A2	15-02-2018

US 2017277254	A1	28-09-2017	US	2017276943 A1	28-09-2017
			US	2017277254 A1	28-09-2017

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-12

A head-mounted display, having a housing, a headband and an headband adjustment mechanism responsive to a control signal generated by a feedback component, and an eye tracking system that is operable to measure motion of the housing relative to the eyes of the user, wherein the control signal is based in part on the motion of the housing relative to the eyes of the user (i.e. the combination of features of claims 1 and 10).

2. claims: 13-15

A head-mounted display, having a housing, a headband and an headband adjustment mechanism responsive to a control signal generated by a feedback component, wherein the adjustment mechanism includes a variable volume structure that changes fit of the headband relative to the head of the user by volumetric expansion or volumetric contraction (i.e. the combination of features of independent claim 13).

3. claims: 16-18

A method for adjusting a head-mounted display, comprising: loosening a headband upon detecting user contact with a first location and a second location on the housing; and tightening the headband upon detecting cessation of user contact with the first location or the second location on the housing (i.e. the combination of features of independent claim 16).

4. claims: 19-23

A head-mounted display, having a housing, a headband and a support to extend over a head of the user, having a first portion that is connected to the housing, a second portion that is adjustably connected to the first portion, and a third portion that is adjustably connected to the second portion, wherein the third portion defines a free end for the support assembly that is free from connection to the housing (i.e. the combination of features of independent claim 19).
