

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MLEAP-235WO		FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US20/15735	International filing date (<i>day/month/year</i>) 29 January 2020 (29.01.2020)	(Earliest) Priority Date (<i>day/month/year</i>) 01 February 2019 (01.02.2019)	
Applicant MAGIC LEAP, 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 4 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 43.6bis(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. 12A
 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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US20/15735

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:

-Please See Supplemental Page-

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 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.:
Group I: Claims 1-15

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US20/15735

A. CLASSIFICATION OF SUBJECT MATTER

IPC - G02B 6/00, 6/24, 6/26, 6/10, 27/01, 27/0101, 27/00; G02F 1/00, 1/1343, 1/1333, 1/133; (2020.01)

CPC - G02B 6/00, 6/24, 6/26, 6/10, 27/0172, 27/017, 27/01, 27/0101, 27/00; G02F 1/00, 1/134309, 1/1343, 1/1333, 1/133, 1/13, 1/01; G06T 19/006, 19/00, 15/00

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)

See Search History document

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

See Search History document

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

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/0275350 A1 (MAGIC LEAP, INC.) 27 September 2018; figures 14B, 18B, 18C; paragraphs [0132], [0135], [0137], [0174]-[0176]	1-3, 5-11, 13, 14
---		---
Y		4, 12, 15
Y	EP 0 063 447 A1 (MINNESOTA MINING AND MANUFACTURING COMPANY) 27 October 1982; paragraph [0023]	4, 12, 15
A	US 2013/0322810 A1 (ROBBINS, S.) 05 December 2013; see entire document	1-15
A	US 2015/0002528 A1 (BOHN, D. et al.) 01 January 2015; see entire document	1-15

 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

"D" document cited by the applicant in the international application

"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

23 March 2020 (23.03.2020)

Date of mailing of the international search report

22 MAY 2020

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-8300

Authorized officer

Shane Thomas

Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US20/15735

-Continued from Box III--

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-15 are directed towards a display system comprising: a first absorptive optical filter.

Group II: Claims 16-33 are directed towards a display system comprising: a second waveguide structure and laterally displacing a second in-coupling optical element.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I are at least a first absorptive optical filter transmissive to light of a first range of wavelengths and absorptive to light of wavelengths different from the first range of wavelengths; and a first in-coupling optical element configured to receive light transmitted through the first absorptive optical filter, which are not present in Group II.

The special technical features of Group II are at least a second waveguide assembly comprising: a second waveguide having a first major surface and a second major surface; and a second in-coupling optical element configured to receive a second incoming beam of light; wherein the second in-coupling optical element is configured to in-couple into the second waveguide light, from the second incoming beam of light, having a second wavelength range, wherein the first in-coupling optical element and the second in-coupling optical element are laterally displaced relative to one another by 5- 50% of a shortest width of the first and second in-coupling optical elements, as seen in a top-down view, which are not present in Group I.

The common technical features of Groups I and II are a display system comprising: a stack of waveguides comprising: a first in-coupling optical element configured to receive light; a first waveguide having a first major surface and a second major surface, wherein the first in-coupling optical element is configured to in-couple light of the first range of wavelengths into the first waveguide, which are previously disclosed by US 2018/0275350 A1 to MAGIC LEAP, INC (hereinafter "MAGICLEAP").

MAGIC LEAP discloses a display system comprising: a stack of waveguides comprising: a first in-coupling optical element configured to receive light; a first waveguide having a first major surface and a second major surface, wherein the first in-coupling optical element is configured to in-couple light of the first range of wavelengths into the first waveguide.

Since the common technical features are previously disclosed by the MAGIC LEAP reference, these common features are not special and so Groups I-II lack unity.