

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 14100P0048PCT		<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US 19/65101	International filing date ( <i>day/month/year</i> ) 06 December 2019 (06.12.2019)	(Earliest) Priority Date ( <i>day/month/year</i> ) 07 December 2018 (07.12.2018)	
Applicant AVEGANT CORP.			

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. 1A

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

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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:

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 searched, the appropriate additional search fees must be paid.

Group I: Claims 1-18 are directed to an image steering system.

Group II: Claims 19 are directed to a magnetic counter-balancer for piezoelectric display.

--see extra 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 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.:  
1-18

**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.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC - G02B 26/08; G02B 27/00; G02B 27/01; G06F 3/01; H04N 13/365 (2020.01)

CPC - G02B 26/08; G02B 27/00; G02B 27/01; G03B 21/142; H04N 13/30; G06 F3/011; G06 F3/013; H04N 13/365

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	WO 2018/019831 A1 (OPTOTUNE AG) 01 February 2018 (01.02.2018) entire document, especially Pg. 37, ln 1-3; Pg. 45, ln 9-11; Pg. 45, 28-33; Pg. 46, ln 23-28; Pg. 80, ln 32- Pg. 81, ln 1-2; Pg. 45, ln 2-8; Pg. 47, ln 11-15	1, 5, 6, 8-10, 14, 15, 17, 18
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Y		2-4, 7, 11-13, 16
Y	US 2018/0284451 A1 (AVEGANT CORP.) 04 October 2018 (04.10.2018) entire document, especially para [0070], [0061], [0002], [0040]	2-4, 11-13
Y	US 2008/0015553 A1 (ZACHARIAS) 17 January 2008 (17.01.2008) entire document, especially para [0087], [0022], [0193]	7, 16
A	US 2016/0363841 A1 (SEIKO EPSON CORPORATION) 15 December 2016 (15.12.2016) entire document	1-18
A	US 2013/0208330 A1 (FUJIFILM CORPORATION) 15 August 2013 (15.08.2013) entire document	1-18

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

16 March 2020

Date of mailing of the international search report

08 APR 2020

Name and mailing address of the ISA/US

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## INTERNATIONAL SEARCH REPORT

International application No.

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Continuation of Box No. III -- Observations where unity of invention is lacking

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:

**Special Technical Features**

Group I includes the special technical feature of a position element to position an image generated by the display element the position element comprising: steerable element; an X-axis controller to pivot the steerable element around an Xaxis; a Y-axis controller to pivot the steerable element around a Yaxis; flexible arms supporting the moveable display element; a controller to pivot the steerable element around the axis-using the flexible arm, wherein a movement of the steerable element is such that a user does not perceive motion; such that the steerable element has a range of motion that enables the steerable display to be positioned and repositioned at a plurality of locations within a field of view of the user, not included in the other Groups.

Group II includes the special technical feature of two pivots around which the display element can move in all directions; piezo-electric elements to drive the pivots, to move the display element; magnets and associated magnetic sensors to determine a position of the display element; wherein a position of the magnets counterbalances the piezo electric elements, such that the display element is balanced in weight, not included in the other groups.

**COMMON TECHNICAL FEATURES**

The only technical feature shared by Groups I-II that would otherwise unify the groups, is a steerable display system comprising: a moveable display element. However, this shared technical feature does not represent a contribution over prior art, because the shared technical feature is disclosed by WO 2018/019831 A1 to Optotune AG (hereinafter Optotune).

Optotune discloses a steerable display system (Pg. 37, In 1-3- Furthermore, according to an embodiment of the optical device according to the present invention, the plate member can be a rigid prism for steering of a light beam and particularly changing an angle of incoming light; Pg. 101, In 4-8- Typical applications include... head-up displays, head-mounted displays, digital cameras, mobile phone cameras, virtual reality displays, augmented reality displays...) comprising: a moveable display element (Pg. 45, In 9-11- Fig. 2 shows in conjunction with the schematic representation of Fig. 1 an embodiment of an optical device 1 according to the invention that allows to tilt a transparent member 55 in 2D between a first and a second position...; Pg. 45, 24-25- Of course, in all embodiments of the present invention one may also use a plate member 55 that is not transparent, but forms a mirror).

As the common features were known in the art at the time of the invention, they cannot be considered special technical features that would otherwise unify the groups.

Therefore, Groups I-II lack unity under PCT Rule 13.