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(54) Title: OPTICAL SYSTEMS WITH MULTIPLE LIGHT ENGINES FOR FOVEATION

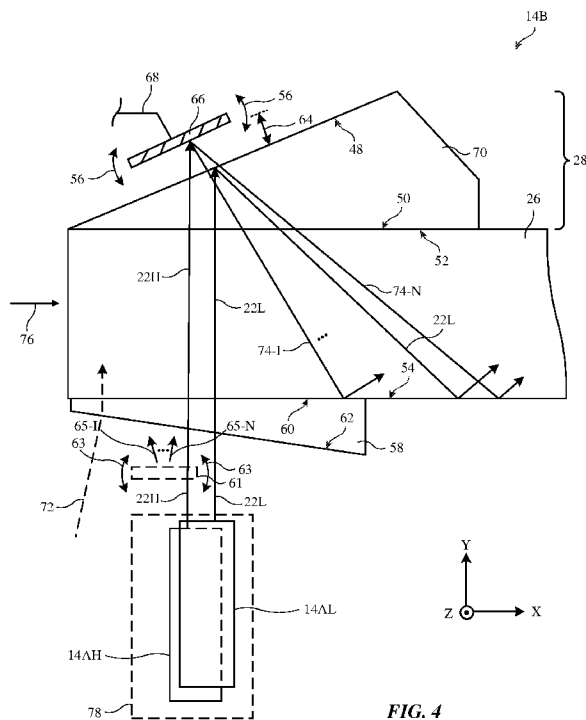


FIG. 4

(57) Abstract: An electronic device may provide foveated images at an eye box. The device may have a first display module that produces a low resolution portion of the image and a second display module that produces a high resolution portion of the image. A reflective input coupling prism may be mounted to a waveguide. A steering mirror may overlap the prism. The mirror may receive the high resolution portion through the waveguide and the prism. The mirror may reflect the high resolution portion back into the waveguide and may be adjusted to shift a location of the high resolution portion within the image. For example, the steering mirror may adjust the position of the high resolution portion to align with the gaze direction at the eye box. A reflective surface of the prism may reflect the low resolution portion of the image into the waveguide.



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER INV. G02B27/00 G02B27/01 G02B27/10 G02B26/08 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				
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	US 2018/275410 A1 (YEOH IVAN LI CHUEN [US] ET AL) 27 September 2018 (2018-09-27) figure 43	1-7, 9, 10, 12		
A	figure 43	8, 11, 13-18		

A	US 9 983 413 B1 (VARJO TECH OY [FI]) 29 May 2018 (2018-05-29) figure 2	1-18		

A	US 2018/324332 A1 (KONTTORI URHO [FI] ET AL) 8 November 2018 (2018-11-08) figure 3	1-18		

A	WO 2018/100239 A1 (VARJO TECH OY [FI]) 7 June 2018 (2018-06-07) figure 5A	1-18		

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<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</td> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> See patent family annex.</td> </tr> </table>			<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> See patent family annex.
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> 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	Date of mailing of the international search report			
27 October 2021	11/01/2022			
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 Serbin, Jesper			

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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.
A	WO 2016/027442 A1 (SEIKO EPSON CORP [JP]) 25 February 2016 (2016-02-25) figure 8 -----	11, 13

INTERNATIONAL SEARCH REPORT

International application No.
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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.:

1-18

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-18

Coupling light into a waveguide

2. claims: 19, 20

Liquid crystal steering element

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2021/041278

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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