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Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

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(54) Title: INCREASING AN AREA FROM WHICH RECONSTRUCTION FROM A COMPUTER GENERATED HOLOGRAM MAY BE VIEWED

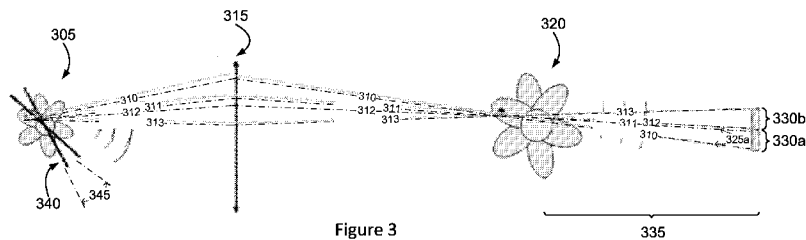


Figure 3

(57) Abstract: A method of enlarging an observation window (330) from which the reconstruction (35,305) from a Computer Generated Hologram (CGH) may be viewed, including reproducing a CGH, and shifting a location of an exit pupil or observation window (330a, 330b) of an optical system reproducing the CGH (10,15,20,25). A method of increasing a viewing angle from which the reconstruction (35,305,705) from a Computer Generated Hologram (CGH) may be seen, including producing a plurality of instances (714,715,716) of a CGH, projecting each one of the instances in a different direction so that a first exit pupil of a first instance is close to a second exit pupil of a second instance. An optical system including a plurality of exit pupils associated with a plurality of optical components, further including a light deflector for jittering a location of a first exit pupil so as to increase an overlap of the first exit pupil with a second exit pupil. Related apparatus and methods are also described.



INTERNATIONAL SEARCH REPORT

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| International application No PCT/IL2013/050648 |
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| A. CLASSIFICATION OF SUBJECT MATTER INV. G03H1/22 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) G03H | | |
| 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 | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 2011/128555 A1 (ROTSCHILD CARMEL [IL] ET AL) 2 June 2011 (2011-06-02) cited in the application | 1-15, 17, 21-25, 33, 35-41, 43, 44 |
| Y | paragraphs [0397] - [0551]; figures 1, 2, 4-16 | 16, 18-20, 34, 42 |
| X | ----- FUKAYA N ET AL: "EYE-POSITION TRACKING TYPE ELECTRO-HOLOGRAPHIC DISPLAY USING LIQUIDCRYSTAL DEVICES", ASIA DISPLAY, XX, XX, 1 January 1995 (1995-01-01), page 963/964, XP002940561, | 1, 2, 5, 8, 9, 14-18, 20-25, 33-39, 41, 43, 44 |
| Y | the whole document ----- | 16, 18-20, 34, 42 |
| -/-- | | |
| <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 | "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 | |
| "E" earlier application or patent but published on or after the international filing date | "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 | |
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| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family | |
| "P" document published prior to the international filing date but later than the priority date claimed | | |
| Date of the actual completion of the international search | Date of mailing of the international search report | |
| 13 March 2014 | 25/03/2014 | |
| 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 Noirard, Pierre | |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2013/050648

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.:

1-25, 33-44

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/IL2013/050648

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| A | "aperture stop, field stop, entrance pupil, exit pupil" In: Hecht E.: "Optics", 1998, Addison Wesley, XP002715216, ISBN: 0201304252 pages 173-177, paragraph [5.3.2]; figures 5.37,5.38 ----- | 1-25, 33-44 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IL2013/050648

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date | |
|--|------------------|-------------------------|------------------|------------|
| US 2011128555 | A1 | 02-06-2011 | CN 102150072 A | 10-08-2011 |
| | | | CN 103529554 A | 22-01-2014 |
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| | | | EP 2304491 A1 | 06-04-2011 |
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| | | | KR 20110028524 A | 18-03-2011 |
| | | | US 2011128555 A1 | 02-06-2011 |
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| | | | WO 2010004563 A1 | 14-01-2010 |
| ----- | | | | |

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-25, 33-44

Method of and apparatus for enlarging a viewing window in which [the holobject reconstructed from] a CGH may be viewed, wherein the method/apparatus comprises means for [re]producing [a holobject from] a CGH; and further comprises active means for temporally deflecting (or moving/jittering/scanning) a direction of projection of the exit pupil of the CGH; thereby allowing configurable increase of the viewing window.

2. claims: 26-32, 45-50

Method of and apparatus for enlarging a viewing window in which [the holobject reconstructed from] a CGH may be viewed, wherein the method/apparatus comprises means for [re]producing [a holobject from] a CGH; and further comprises to simultaneously project a plurality of instances of a CGH, thereby allowing a simple and simultaneous reproduction of a holobject in a larger composite viewing window.
