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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/834,431	04/29/2004	Leonid Glebov	UCF-424CIP	6624

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EXAMINER	
ANGEBRANNDT, MARTIN J	

ART UNIT	PAPER NUMBER
1756	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/834,431	GLEBOV ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/29/04 & 4/29/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/29/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The for the instant claims, the claims are accorded the filing date of the instant application as there are limitation not disclosed in the prior applications. Further, the 10/665339 application does not describe laser deflection, so the applicant cannot assert disclosure back to 09/750708 as continuity of the disclosure of this subject matter has not been maintained.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,2,4,5,11,12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Efimov et al. '104 and Bramley '486.

Efimov et al. '104 teaches the recording of a bragg grating using the interferences of beams from a 325 nm HeCd laser, which is thermally developed at between 500 and 650 degrees C [0059-0060,0089]. The recording of gratings in PTR glass discs and the use of these to deflect a beam is disclosed. The pivoting, (but not rotation/spinning) of the disks is disclosed [0108-0015]. Figure 8a shows deflection by diffraction of the transmitted light to other gratings and figure 8b shows deflection by diffractive reflection of the light to another grating. The diffraction efficiency is more than 93%

Bramley '486 teaches the scanning of light using two diffraction gratings and these are rotated about and axis perpendicular to the light incident upon them (figure 5).

It would have been obvious to one skilled in the art to skilled in the art to modify the embodiments of figure 8a of Efimov et al. '104 by using a rotational motion of the gratings as shown figure 5 of Bramley '486 with a reasonable expectation of forming a useful scanner and

scanning linear patterns based upon the description of scanning in both these embodiments and/or it would have been obvious to modify the embodiment of figure 5 of Bramley '486 by using PTR gratings of Efimov et al. '104 to gain their high diffraction efficiency with a reasonable expectation of success based upon the description of scanning in both these embodiments.

4. Claims 1,2,4,5,11,12 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Efimov et al. '104 and Broome et al. '831.

Broome et al. '831 in figure 3 teaches where the discs are tilted for reflective to the next element (6/3-9)

It would have been obvious to one skilled in the art to skilled in the art to modify the embodiments of figure 8b of Efimov et al. '104 by using a rotational motion of the gratings as shown figure 3 of Broome et al. '831 with a reasonable expectation of forming a useful scanner and scanning linear patterns based upon the description of scanning in both these embodiments and/or it would have been obvious to modify the embodiment of figure 3 of Broome et al. '831 by using PTR gratings of Efimov et al. '104 to gain their high diffraction efficiency with a reasonable expectation of success based upon the description of scanning in both these embodiments.

5. Claims 1,2,4,5 and 11-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Efimov et al. '104 and either of Bramley '486 or Broome et al. '831, further in view of Efimov et al., "High-efficiency Bragg Gratings in Photothermorefractive glass", Appl. Opt., Vol. 38(4) pp. 619-627 (02/1999).

Efimov et al., "High-efficiency Bragg Gratings in Photothermorefractive glass", Appl. Opt., Vol. 38(4) pp. 619-627 (02/1999) describes a photosensitiove glass including 0.01 parts Ag and 0.01 CeO_2. (page 620/right column). Gratings were formed in slabs of this glass having dimensions of 5mm x 5mm x 2 mm using a two beam process, followed by heating at 520 degrees C. (page 621/left column and page 625, properties of Bragg gratings).

To address the embodiments not rendered obvious above, but bounded by the claims, the examiner cites Efimov et al., "High-efficiency Bragg Gratings in Photothermorefractive glass", Appl. Opt., Vol. 38(4) pp. 619-627 (02/1999) and holds that it would have been obvious to one skilled in the art to modify the processes and articles resulting from the combination of Efimov et al. '104 with either of Bramley '486 or Broome et al. '831 by use other known heat development, such as that disclosed by Efimov et al., "High-efficiency Bragg Gratings in Photothermorefractive glass", Appl. Opt., Vol. 38(4) pp. 619-627 (02/1999) with a reasonable expectation of forming a useful

6. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Efimov et al. '104 and either of Bramley '486 or Broome et al. '831, further in view of Araujo et al. '404, Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975), Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) and Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998).

Araujo et al. '404 teaches the heating of the glasses to 450-650 degrees C is disclosed in table I and the use of mercury arc lamps as the light darkening source and various lasers

including krypton ion lasers operating at 480, 531 and 570 nm as the bleaching light source is taught in table II. The darkening of the glass is disclosed as causing color center formation (9/56-10/16). The treatment of the bistable photochromic glass to make the images stable is disclosed. (16/61-17/11).

Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975) describes the exposure of a color center forming glass to gamma or UV radiation to form color centers, followed by the decolorization using 632.8 nm (HeNe) interferometric exposure to form a hologram followed by heating.

Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) describes the use of multiphoton processes to form a crossed waveguide in a glass substrate shown in figure 1. The laser pulses are 120 fs. (page 92). The process involves laser damage to cause the refractive index changes (page 91/right column).

Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998) teaches a photosensitive glass including 0.01 parts Ag and 0.01 CeO_2. (page 567). The exposure of the glass to UV light causes absorption in the visible (figure 1b and 1c) and the development is by heating at 520 degrees C for 1 hour (page 567). The formation of holographic gratings in these materials is disclosed (566) . The sensitivity of the materials to laser damage using a 532 nm laser is illustrated in figures 2 and 3. The use of these in scanning is disclosed on page 575 in the first answer.

To address the embodiments not rendered obvious above, but bounded by the claims, the examiner cites Araujo et al. '404, Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975), Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) and Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998) and holds that it would have been obvious to one skilled in the art to modify the processes and articles resulting from the combination of Efimov et al. '104 with either of Bramley '486 or Broome et al. '831 by use other known heat development, such as that disclosed by Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998) and using the UV exposure to sensitize the PTR glass to a visible laser as taught by Araujo et al. '404, Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975) and Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998) and a 532 nm ND laser to write the gratings Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975) with a reasonable expectation of forming useful gratings based upon the teachings of Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975) and the teachings of Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) realting to the formation of gratings using laser damage such as that discussed

by Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998).

7. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Efimov et al. '104 and either of Bramley '486 or Broome et al. '831, combined with Araujo et al. '404, Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975), Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) and Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998), further in view of Metlitsky et al. '904 and Bryngdahl et al., 'Laser beam scanning using computer generated holograms', Appl. Opt. Vol. 15(1) pp. 183-194.

Metlitsky et al. '904 teach the use of two mirrors to produce scanning of laser beams as illustrated in figure 1. The formation of various scanning patterns, such as those shown figures 2-11 by changing the angles or relative rate of rotation of the mirrors

Bryngdahl et al., 'Laser beam scanning using computer generated holograms', Appl. Opt. Vol. 15(1) pp. 183-194 (01/1976) teaches the use of computer generated holograms in scanning and on pages 184 describes the equivalence of refractive, reflective and diffraction optical elements in scanning systems.

To address the embodiments not rendered obvious above, but bounded by the claims, the examiner cites Metlitsky et al. '904 and Bryngdahl et al., 'Laser beam scanning using computer generated holograms', Appl. Opt. Vol. 15(1) pp. 183-194 and holds that it would have been obvious to modify the embodiments rendered obvious by the combination of Efimov et al. '104

and either of (Bramley '486 or Broome et al. '831),with Araujo et al. '404, Bukharev et al., "Recording of holograms on radiation color centers in glass", Pis'ma v Zhurnal Tekhnicheskoi Fiziki Vol. 1(21) pp. 975-7 (1975), Hirao et al., "Writing Waveguides and Gratings in Silica and Related Materials by a Femtosecond Laser", J. Non-Crystal. Sol., Vol. 239 pp 91-95 (1998) and Efimov et al., "laser induced damage of photo-thermo-refractive glasses for optical holographic element writing", Proc. SPIE 3578 (10/1998) by using grating patterns which do not result in linear scanning of the beam but result in helical, trepanning or rotational Lissajous patterns, such as those illustrated in figure 10 of the instant application and/or figures 2-11 of Metlitsky et al. '904 with a reasonable expectation of success based upon the disclosure of the equivalence of diffraction and reflective optical elements in scanning by Bryngdahl et al., 'Laser beam scanning using computer generated holograms', Appl. Opt. Vol. 15(1) pp. 183-194 (01/1976).

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cook et al. '028 and Wyant 'Rotating diffraction grating laser beams scanner', Appl. Opt., Vol. 14(5) pp. 1057-1058 (05/1975) teach canning with gratings.

Debenedictis et al. '184, Johnson '263, Treadwell et al., '976, Peng '167 and Grossman et al. '403 teach scanning using reflective or refractive rotating elements.

Glebov et al. 'Interaction of photo-thermo-refractive glass with nanosecond pulses at 532 nm', Proc. SPIE Vol. 5273, pp. 396-401 (06/2004) teach a preexposure to sensitize the glass to the visible, followed by a holographic exposure s at 532 nm, but is not prior art due to common inventorship.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

8/20/2007