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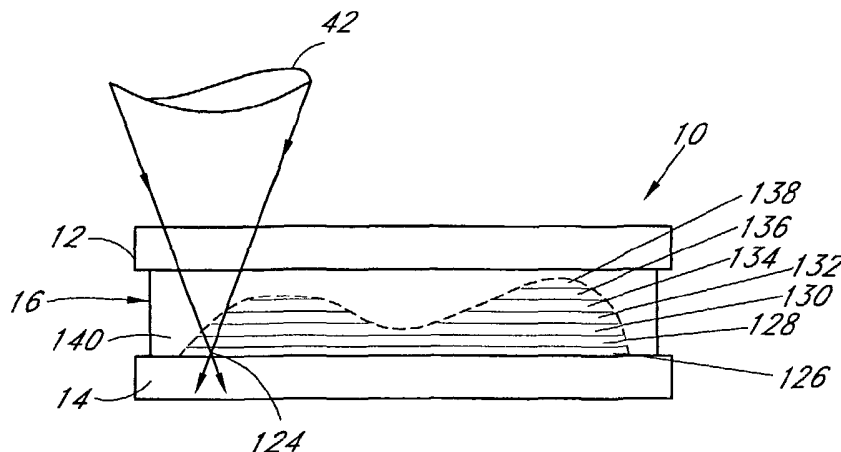
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[Continued on next page]

(54) Title: APPARATUS AND METHOD OF FABRICATING A COMPENSATING ELEMENT FOR WAVEFRONT CORREC-  
TION USING SPATIALLY LOCALIZED CURING OF RESIN MIXTURES



(57) Abstract: An optical wavefront correction plate incorporates a unique, three-dimensional spatial retardation distribution utiliz-  
ing the index of refraction change of resin mixture in its cured state. The optical wave plate comprises a pair of transparent plates,  
containing a layer of a monomers and polymerization initiators, such as resin mixture. This resin mixture exhibits a variable index  
of refraction as a function of the extent of its curing. Curing of the resin mixture may be made by exposure to light, such as ultravi-  
olet light, and may be varied across and through the surface of the resin mixture to create a particular and unique three-dimensional  
wavefront retardation profile. The optical wave plate provides improved performance in large area mirrors, lenses, telescopes, mi-  
croscopes, and ophthalmic diagnostic systems.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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26 August 2004

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/27936

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G02B3/00 B29D11/00 G02B27/00 G02B5/30 G02C7/02

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)

IPC 7 G02B B29D G02C

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 practical, 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	<p>US 2002/080464 A1 (BRUNS DONALD G) 27 June 2002 (2002-06-27)</p> <p>paragraph [0008]; figures 1-3 paragraph [0013]; figure 7 paragraph [0044] -----</p>	<p>1-9, 15-18, 30,31</p>

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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 document 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

18 March 2004

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 03/27936

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
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.:

1-8, 9-11, 15-18, 30, 31

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ 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: 1-8, 9-11, 15-18, 30, 31

1.1. claims: 1-8, 15-18, 30

wavefront correcting element, its production by spatially  
localized curing of resin mixtures and its employment in  
improving optical instruments or elements

1.2. claims: 9-11, 31

apparatus for manufacturing the wavefront correcting element  
comprising a scanning unit  
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2. claims: 12-14

apparatus for manufacturing the wavefront correcting element  
comprising a fibre ora fibre bundle  
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3. claims: 19-29

manufacturing ophthalmic lenses comprising the wavefront  
correcting element  
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4. claims: 32-34

arrangement of curing locations in the manufacturing process  
of the wavefront correcting element  
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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/27936

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002080464 A1	27-06-2002	US 2003003295 A1	02-01-2003
		US 2003143391 A1	31-07-2003
		US 2002110639 A1	15-08-2002
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