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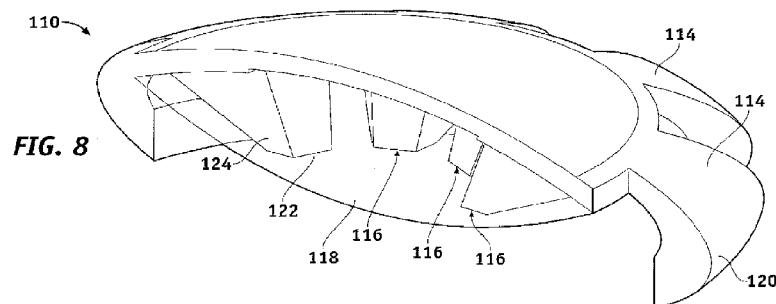
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(54) Title: ACCOMMODATING INTRAOCULAR LENSES



(57) Abstract: An intraocular lens is disclosed, with an optic that changes shape in response to a deforming force exerted by the zonules of the eye. A haptic (50, 60, 70, 90, 100, 110, 130, 150, 170) supports the optic around its equator and couples the optic to the capsular bag of the eye. Certain haptic features improve the accommodative performance of the haptic, such that compressive/tensile forces may be more efficiently transferred from the haptic to optic. Furthermore, certain aspects also provide enhanced bag-sizing capability so that the IOL better fits within the capsular bag.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/039858

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F2/16

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)

A61F

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.
A	US 2008/161913 A1 (BRADY DANIEL G [US] ET AL BRADY DANIEL G [US] ET AL) 3 July 2008 (2008-07-03) cited in the application paragraph [0055] paragraph [0059] - paragraph [0083] paragraph [0097] - paragraph [0118]; figures 1-28	1,2
X	DE 199 51 148 A1 (TECHNOMED GES FUER MED UND MED [DE]) 19 April 2001 (2001-04-19) the whole document ----- -/--	15,16



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

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

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INTERNATIONAL SEARCH REPORT

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.
X	US 2001/004708 A1 (NAGAI HIDENOBU [JP]) 21 June 2001 (2001-06-21) paragraph [0001] paragraph [0009] - paragraph [0011] paragraph [0017] paragraph [0057] - paragraph [0063] paragraph [0068]; figures 3,20e,21a,31,32 -----	15-18
X	EP 0 478 929 A1 (IPP INTELLECTUAL PROPERTY PROT [CH]) 8 April 1992 (1992-04-08) column 3, line 49 - column 4, line 47 column 5, line 32 - column 6, line 17 column 6, line 45 - line 49; figures 1-3,5 -----	15-18
A	US 2007/213817 A1 (ESCH VICTOR [US] ET AL) 13 September 2007 (2007-09-13) paragraph [0040] - paragraph [0074]; figures 3A-6D -----	1
A	US 2006/111776 A1 (GLICK ROBERT E [US] ET AL) 25 May 2006 (2006-05-25) paragraph [0058] - paragraph [0062]; figure 3 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/039858

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.:
1-5, 15-18
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.:

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: 1-5

An intraocular lens for implantation into a capsular bag of an eye, comprising: an adjustable central optic having an axial thickness through the center thereof; and a haptic partly embedded within the adjustable optic comprised of a central plate on one side of the optic midplane and a plurality of legs radiating outward therefrom, each leg having outermost convex curves to conform to the capsular bag, and a circular array of teeth that project from the central plate generally in axial directions and across the optic midplane, the teeth being embedded in the optic, whereby the haptic is configured to transmit forces to alter at least one of the shape and the thickness of the adjustable optic.

2. claims: 6-10

An intraocular lens for implantation into a capsular bag of an eye, comprising: an adjustable central optic having an axial thickness through the center thereof; and a haptic partly having a pair of curved plate-like members that sandwich the optic therebetween, each curved plate-like member having a concave face toward the optic and a convex face away from the optic and a plurality of legs that extend outward along generally the same curvature to contact the capsular bag, wherein the legs of the curved plate-like members are interwoven so as to present alternating axially-spaced legs to support the inside of the capsular bag, whereby the haptic is configured to transmit forces to alter at least one of the shape and the thickness of the adjustable optic.

3. claims: 11-14

An intraocular lens for implantation into a capsular bag of an eye, comprising: an adjustable central optic having an axial thickness through the center thereof; a haptic partly embedded within the adjustable optic and having a plurality of legs radiating outward therefrom at angles to the optic midplane to form two circumferential and axially-spaced arrays of haptic leg ends to contact the capsular bag; and a circular ring in the optic midplane sized to contact the capsular bag at its midplane, whereby the haptic is configured to transmit forces to alter at least one of the shape and the thickness of the adjustable optic.

A two-piece IOL system comprising the above-mentioned optic and a PCO ring.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

4. claims: 15-18

An adjustable capsular ring for preventing posterior capsule opacification, comprising: a flexible ring body having an opening, wherein the ring body comprises a first end and a second end at the opening, wherein the first end comprises multiple ratchet teeth and the second end comprises a mating sleeve, wherein the multiple ratchet teeth are capable of coupling with the mating sleeve such that ring can be adjustably sized to fit a periphery of a capsular bag.

5. claims: 19-21

An intraocular lens for implantation into a capsular bag of an eye, comprising: an adjustable central optic having an axial thickness through the center thereof; and a plurality of haptics having inner ends connected to the adjustable optic and radiating outward therefrom; an inflatable outer ring engaging outer ends of the haptics for adjusting the radial position of the haptics, whereby the haptic is configured to transmit forces to alter at least one of the shape and the thickness of the adjustable optic.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/039858

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