AMENDED CLAIMS
received by the International Bureau on 26 June 2014 (26.06.2014)

CLAIMS:

1. A device to expand the pupil of the eye comprising a strand of resilient material having multiple pupil margin engaging portions, said strand being formed as a continuous ring with straight sides joined by corner portions, said corner portions constituting the pupil margin engaging portions (**55, 56, 57** and **58**) are formed by a first acute bend (**59**), second return bend (**60**), and a third acute bend (**61**) of the strand, and are characterised in that all three bends are in a single plane and form a notch (**56**) in the same plane having an outward opening (**62**), and the sides constituting the support elements (**48**, **49**, **50** and **51**) are characterised in that they form outward flanges that are entirely in a single plane, alternate notches (**55, 56, 57** and **58**) and flanges (**48**, **49**, **50** and **51**) are in the same plane as the entire device and enclose a space (**66**), and are characterised in that the pupil margin (**67**) and adjacent iris pass through the plane of the device and straddle across this plane at the notches (**Fig. 6, 71** and **74**).
2. The device of claim 1 wherein said continuous ring has a joint (**54**).
3. The device of claim 1 wherein said continuous ring has no joint (**Fig. 14**).
4. The device of any one of claims 2 and 3, wherein said continuous ring has a polygonal shape, having at least four sides and four corners.
5. The device of claim 4, wherein said ring is shaped as a rectangle.
6. The device of claim 4, wherein said ring is shaped as a square (**47, Fig 5**).
7. The device of claim 4, wherein said ring is shaped as a hexagon (**Fig 14**).
8. A device to expand the pupil of the eye comprising a strand of resilient material having multiple pupil margin engaging portions characterised in that the said strand being formed as a discontinuous ring (**78**) with two blunt ends (**79** and **80**) and five straight sides (**81**, **82**, **83**, **84** and **85**), sides being joined by corner portions which are internally obtuse angled, the corner portions (**87, 88, 89** and **90**) and end portions (**86** and **91**) constituting the pupil margin engaging portions are formed by a first acute bend, second return bend, and a third acute bend of the strand, and are characterised in that all three bends are in a single plane and form a notch in the same plane having an outward

opening and characterised in that the said sides constituting the support elements form outward flanges (**81**, **82**, **83**, **84** and **85**) that are entirely in a single plane, alternate notches (**86, 87, 88, 89, 90** and **91**) and flanges (**81**, **82**, **83**, **84** and **85**) are in the same plane as the entire device and enclose a space (**92**) closed on five sides by the device and open on one side, and are characterised in that the pupil margin (**67**) and adjacent iris pass through the plane of the device and straddle across this plane at the notches (**Fig. 12**).

9. The device of claim 8 wherein the angle at the first corner (**87**) and the fourth corner (**90**) are equal to each other, the angles at the second corner (**88**) and third corner (**89**) are equal to each other, and the first side (**81**) and the fifth side (**85**) are parallel to each other, the distance between first pupil margin engaging portion (**86**) and sixth pupil margin engaging portion (**91**) is equal to the distance between second pupil margin engaging portion (**87**) and fifth pupil margin engaging portion (**90**), both distances being 120 percent of the length of the third side (**83**) (**Fig. 11**).
10. The device of claim 8 wherein the angle at the first corner (**87**) and the fourth corner (**90**) are equal to each other, the angles at the second corner (**88**) and third corner (**89**) are equal to each other, and the first side (**81**) and the fifth side (**85**) are unparallel to each other in a manner that the distance between first pupil margin engaging portion (**86**) and sixth pupil margin engaging portion (**91**) is 110 percent of the distance between second pupil margin engaging portion (**87**) and fifth pupil margin engaging portion (**90**), the distance between second pupil margin engaging portion (**87**) and fifth pupil margin engaging portion (**90**) is 120 percent of length of the third side (**83**).
11. The device of any one of claims 5, 6, 7, 9 and 10 wherein the pupil margin engaging corner portions (**105**, **106**, **107** and **108**) are formed by three loops of the strand in the same plane as the device and a notch is formed in the same plane by an inward loop (**117**) between two outward protruding closed loops (**115** and **116**), limbs of each outward loop being in contact with each other.
12. The device of any one of claims 5, 6, 7, 9 and 10, wherein the pupil margin engaging corner portions (**127, 128, 129,** and **130**) are formed by three loops

of the strand in the same plane as the device and a pair of adjacent notches are formed in the same plane by a first inward loop followed by a second outward closed loop and a third inward loop of the strand (**127, 128, 129,** and **130**), limbs of the second outward loop being in contact with each other.

13. The device of any one of claims 5, 6, 7, 9, 10, 11 and 12, wherein said ring has one or more positioning holes or eyelets on the notches (**99**), side elements (**98**) or ends.
14. The device of any one of claims 5, 6, 7, 9, 10, 11, 12 and 13, wherein said ring is configured to adapt one or more selected configurations from a folded, extended or deformed configuration (**figures 8, 9 and 10**).

CLAIMS

1. A device for enlarging a pupil of an eye during surgery, the eye including an iris and the pupil including a pupillary margin adjacent the iris, the device comprising:

a ring at least partially enclosing a central space and having at least three flanges defining a plane, including a first flange, a second flange and a third flange, a first corner portion connectively disposed between said first flange and said second flange and forming first receiving means for receiving a first portion of the pupillary margin, and a second corner portion connectively disposed between said second flange and said third flange and forming second receiving means for receiving a second portion of the pupillary margin, said first corner portion and said second corner portion extending into said central space,

said first corner portion including a first blind end, a first limb connecting said first flange to said first blind end on one side thereof, and a second limb connecting said second flange to said first blind end on an opposite side thereof so as to form said first receiving means, and wherein said first receiving means includes a first notch sized and shaped to receive the first portion of the pupillary margin such that the iris passes over said first flange and said first limb and under said second limb and said second flange, and

said second corner portion including a second blind end, a third limb connecting said second flange to said second blind end on one side thereof, and a fourth limb connecting said third flange to said second blind end on an opposite side thereof so as to form said second receiving means, and wherein said second receiving means includes a second notch sized and shaped to receive the second portion of the pupillary margin such that the iris passes under said second flange and said third limb and over said fourth limb and said third flange.

2. The device of Claim 1, wherein said first notch and said second notch are contained within said plane.

3. The device of Claim 2, wherein said ring is closed.

4. The device of Claim 3, further comprising a fourth flange, a third corner portion connectively disposed between said third flange and said fourth flange and forming third receiving means for receiving a third portion of the pupillary margin, and a fourth corner portion connectively disposed between said fourth flange and said first flange and forming fourth receiving means for receiving a fourth portion of the pupillary margin, said third corner portion and said fourth corner portion extending into said central space,

said third corner portion including a third blind end, a fifth limb connecting said third flange to said third blind end on one side thereof, and a sixth limb connecting said fourth flange to said third blind end on an opposite side thereof so as to form said third receiving means, and wherein said third receiving means includes a third notch sized and shaped to receive the third portion of the pupillary margin such that the iris passes over said third flange and said fifth limb and under said sixth limb and said fourth flange, and

said fourth corner portion including a fourth blind end, a seventh limb connecting said fourth flange to said fourth blind end on one side thereof, and an eighth limb connecting said first flange to said fourth blind end on an opposite side thereof so as to form said fourth receiving means, and wherein said fourth receiving means includes a fourth notch sized and shaped to receive the fourth portion of the pupillary margin such that the iris passes under said fourth flange and said seventh limb and over said eighth limb and said first flange.

5. The device of Claim 4, wherein said first blind end, said second blind end, said third blind end and said fourth blind end have a generally arcuate shape.

6. The device of Claim 4, wherein said third notch and said fourth notch are contained within said plane.

7. The device of Claim 6, wherein said ring is made from a resiliently flexible strand such that said ring is moveable between an undeformed state and a deformed state.

8. The device of Claim 7, wherein said ring assumes a generally rectangular configuration when it is in its said undeformed state, and wherein said ring

assumes a generally rhomboidal configuration when it is in its said deformed state.

9. The device of Claim 8, wherein said generally rhomboidal configuration is selected so as to facilitate insertion of said ring into the eye.

10. The device of Claim 7, wherein said ring is manually moveable from its said undeformed state to its said deformed state, and wherein said ring automatically returns to its said undeformed state from its said deformed state.

11. The device of Claim 3, further comprising a fourth flange, a third corner portion connectively disposed between said third flange and said fourth flange and forming third receiving means for receiving a third portion of the pupillary margin, a fifth flange, a fourth corner portion connectively disposed between said fourth flange and said fifth flange and forming fourth receiving means for receiving a fourth portion of the pupillary margin, a sixth flange, a fifth corner portion connectively disposed between said fifth flange and said sixth flange and forming fifth receiving means for receiving a fifth portion of the pupillary margin, and a sixth corner portion connectively disposed between said sixth flange and said first flange and forming sixth receiving means for receiving a sixth portion of the pupillary margin, said third corner portion, said fourth corner portion, said fifth corner portion and said sixth corner portion extending into said central space,

said third corner portion including a third blind end, a fifth limb connecting said third flange to said third blind end on one side thereof, and a sixth limb connecting said fourth flange to said third blind end on an opposite side thereof so as to form said third receiving means, and wherein said third receiving means includes a third notch sized and shaped to receive the third portion of the pupillary margin such that the iris passes over said third flange and said fifth limb and under said sixth limb and said fourth flange, and

said fourth corner portion including a fourth blind end, a seventh limb connecting said fourth flange to said fourth blind end on one side thereof, and an eighth limb connecting said fifth flange to said fourth blind end on an opposite

side thereof so as to form said fourth receiving means, and wherein said fourth receiving means includes a fourth notch sized and shaped to receive the fourth portion of the pupillary margin such that the iris passes under said fourth flange and said seventh limb and over said eighth limb and said fifth flange,

said fifth corner portion including a fifth blind end, a ninth limb connecting said fifth flange to said fifth blind end on one side thereof, and a tenth limb connecting said sixth flange to said fifth blind end on an opposite side thereof so as to form said fifth receiving means, and wherein said fifth receiving means includes a fifth notch sized and shaped to receive the fifth portion of the pupillary margin such that the iris passes over said fifth flange and said ninth limb and under said tenth limb and said sixth flange,

said sixth corner portion including a sixth blind end, an eleventh limb connecting said sixth flange to said sixth blind end on one side thereof, and a twelfth limb connecting said first flange to said sixth blind end on an opposite side thereof so as to form said sixth receiving means, and wherein said sixth receiving means includes a sixth notch sized and shaped to receive the sixth portion of the pupillary margin such that the iris passes under said sixth flange and said eleventh limb and over said twelfth limb and said first flange.

12. The device of Claim 11, wherein said first blind end, said second blind end, said third blind end, said fourth blind end, said fifth blind end and said sixth blind end have a generally arcuate shape.

13. The device of Claim 11, wherein said third notch, said fourth notch, said fifth notch and said sixth notch are contained within said plane.

14. The device of Claim 13, wherein said ring is made from a resiliently flexible strand such that said ring is moveable between an undeformed state and a deformed state.

15. The device of Claim 14, wherein said ring assumes a generally regular hexagonal configuration when it is in its said undeformed state, and wherein said ring assumes a generally nonregular hexagonal configuration when it is in its said deformed state.

16. The device of Claim 15, wherein said generally nonregular hexagonal configuration is selected so as to facilitate insertion of said ring into the eye.

17. The device of Claim 14, wherein said ring is manually moveable from its said undeformed state to its said deformed state, and wherein said ring automatically returns to its said undeformed state from its said deformed state.

18. The device of Claim 3, wherein said second flange includes a first portion proximate said first corner portion and including a first end distal said first corner portion, a second portion proximate said second corner portion and including a second end distal said second corner portion, and a joint connectively disposed between said first end of said first portion and said second end of said second portion.

19. The device of Claim 2, wherein said ring is opened.

20. The device of Claim 19, further comprising a fourth flange and a fifth flange, a third corner portion connectively disposed between said third flange and said fourth flange and forming third receiving means for receiving a third portion of the pupillary margin, and a fourth corner portion connectively disposed between said fourth flange and said fifth flange and forming fourth receiving means for receiving a fourth portion of the pupillary margin, said third corner portion and said fourth corner portion extending into said central space,

said third corner portion including a third blind end, a fifth limb connecting said third flange to said third blind end on one side thereof, and a sixth limb connecting said fourth flange to said third blind end on an opposite side thereof so as to form said third receiving means, and wherein said third receiving means includes a third notch sized and shaped to receive the third portion of the pupillary margin such that the iris passes over said third flange and said fifth limb and under said sixth limb and said fourth flange,

said fourth corner portion including a fourth blind end, a seventh limb connecting said fourth flange to said fourth blind end on one side thereof, and an eighth limb connecting said fifth flange to said fourth blind end on an opposite

side thereof so as to form said fourth receiving means, and wherein said fourth receiving means includes a fourth notch sized and shaped to receive the fourth portion of the pupillary margin such that the iris passes under said fourth flange and said seventh limb and over said eighth limb and said fifth flange,

said first flange has a first free end portion opposite said first corner portion, said first free end portion forming fifth receiving means for receiving a fifth portion of the pupillary margin, said first free end portion including a fifth blind end, a ninth limb connecting said first flange to said fifth blind end on one side thereof, and a tenth limb on an opposite side thereof so as to form said fifth receiving means, and wherein said fifth receiving means includes a fifth notch sized and shaped to receive the fifth portion of the pupillary margin such that the iris passes over said first flange and said ninth limb and under said tenth limb, and

said fifth flange having a second free end portion opposite said fourth corner portion, said second free end portion forming sixth receiving means for receiving a sixth portion of the pupillary margin, said second free end portion including a sixth blind end, an eleventh limb connecting said fifth flange to said sixth blind end on one side thereof, and a twelfth limb on an opposite side thereof so as to form said sixth receiving means, and wherein said sixth receiving means includes a sixth notch sized and shaped to receive the sixth portion of the pupillary margin such that the iris passes over said fifth flange and said eleventh limb and under said twelfth limb.

21. The device of Claim 20, wherein said first blind end, said second blind end, said third blind end and said fourth blind end have a generally arcuate shape.

22. The device of Claim 20, wherein said third notch, said fourth notch, said fifth notch and said sixth notch are contained within said plane.

23. The device of Claim 22, wherein said ring is made from a resiliently flexible strand such that said ring is moveable between an undeformed state and a deformed state.

24. The device of Claim 23, wherein said ring is manually moveable from its said undeformed state to its said deformed state, and wherein said ring automatically returns to its said undeformed state from its said deformed state.

25. The device of Claim 1, further comprising a plurality of positioning holes or notches in the flanges of the said ring, each of said positioning holes or notches being dimensioned to receive an instrument to facilitate manipulation of said ring within the eye.

26. A method for enlarging a pupil of an eye during surgery, the eye including an iris and the pupil including a pupillary margin adjacent the iris, the method including:

making an incision in the eye;

inserting a device through the incision, the device including a ring at least partially enclosing a central space and having at least three flanges defining a plane, including a first flange, a second flange and a third flange, a first corner portion connectively disposed between said first flange and said second flange and forming first receiving means for receiving a first portion of the pupillary margin, and a second corner portion connectively disposed between said second flange and said third flange and forming second receiving means for receiving a second portion of the pupillary margin, said first corner portion and said second corner portion extending into said central space, said first corner portion including a first blind end, a first limb connecting said first flange to said first blind end on one side thereof, and a second limb connecting said second flange to said first blind end on an opposite side thereof so as to form said first receiving means, and wherein said first receiving means includes a first notch sized and shaped to receive the first portion of the pupillary margin such that the iris passes over said first flange and said first limb and under said second limb and said second flange, and said second corner portion including a second blind end, a third limb connecting said second flange to said second blind end on one side thereof, and a fourth limb connecting said third flange to said second blind end on an opposite side thereof so as to form said second receiving means, and wherein said second

receiving means includes a second notch sized and shaped to receive the second portion of the pupillary margin such that the iris passes under said second flange and said third limb and over said fourth limb and said third flange;

engaging the first portion of the pupillary margin with said first notch;

engaging the second portion of the pupillary margin with said second notch so as to push the second portion of the pupillary margin apart from the first portion of the pupillary margin and thereby reversibly, temporarily enlarge the pupil; and tucking said first and thirds flanges under the pupillary margin and iris.

27. The method of Claim 26, wherein said ring is made from a resiliently flexible strand such that said ring is moveable between an undeformed state and a deformed state, and wherein said step of inserting said device includes moving said ring from its said undeformed shape to its said deformed shape.

28. The method of Claim 26, wherein said step of inserting said device includes the use of a forceps, said forceps being sized and shaped to pass through the incision in the eye while engaging said device.

29. The method of Claim 26, wherein said step of inserting said device includes the use of a delivery device.

30. The method of Claim 29, wherein said step delivery device is an injector.

31. The method of Claim 26, further comprising the steps of disengaging said device from the pupillary margin and iris, and removing said device from the eye.

32. The method of Claim 31, wherein said steps of disengaging and removing said device include the use of a forceps.