Gregory K. Nelson, Esq., CSB No. 203029
Chandler G. Weeks, Esq., CSB No. 245503
WEEKS, KAUFMAN, NELSON & JOHNSON
462 Stevens Avenue, Suite 310
Solana Beach, CA 92075
Telephone: (858) 794-2140
Facsimile: (858) 794-2141
Email: office@wknjlaw.com

Attorneys for Plaintiff

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

OAKLEY, INC., a Washington corporation,

Plaintiff,

vs.

BUSHNELL, INC., a Delaware corporation

Defendant.

Case No: 09CV0808 WQH NLS

COMPLAINT FOR PATENT INFRINGEMENT

JURY TRIAL

Plaintiff OAKLEY, INC. (hereinafter referred to as "Oakley") hereby complains of Defendants BUSHNELL, INC. (hereinafter referred to as "Bolle") and alleges as follows:

JURISDICTION AND VENUE

1. Jurisdiction over this action is founded upon 15 U.S.C. § 1121, and 28 U.S.C. §§ 1331 and 1338.

2. Venue is proper under 28 U.S.C. §§ 1391(b) and (c) and 28 U.S.C. § 1400(b). The Defendant sold infringing products in this district and has directed sales and marketing efforts toward this district.

… … …

… … …

THE PARTIES

3. Plaintiff Oakley is a corporation organized and existing under the laws of the State of Washington, having its principal place of business at One Icon, Foothill Ranch, California, 92610 and doing business within this judicial district.

4. Oakley is informed and believes, and thereupon alleges that Defendant Bushnell, Inc. is a Delaware corporation doing business at 9200 Cody, Overland Park, Kansas, 66214, and doing business under the brand name Bolle.

FACTUAL BACKGROUND

5. As early as 1985, Oakley has been and continues to be actively engaged in the manufacture and sale of high quality sport sunglasses under various product lines. Oakley is the manufacturer and retailer of several lines of sunglasses, including its "M Frame®", "Half Jacket®", and "Flak Jacket®" sunglass lines.

6. Oakley is the owner by assignment of U.S. Patent No. 5,387,949, duly and lawfully issued on February 7, 1995, describing and claiming the invention entitled "Eyeglass Connection Device", which protects the described and claimed technology, that is embodied by Oakley's "Zero", "Half Jacket" and "Flak Jacket" lines of eyeglasses. A correct copy of U.S. Patent No. 5,387,949 is attached hereto as Exhibit 1.

7. Oakley is informed and believes, and thereupon alleges that Defendant Bolle, is selling sunglasses that copy the claimed technology of Oakley's U.S. Patent No. 5,387,949. In particular, Oakley alleges that Bolle's "Warrant" and "Shift" eyewear models embody the subject matter claimed in Oakley's patent referred to above without any license thereunder and thereby infringes this patent. Oakley is informed and believes, and based thereon, alleges that Defendant, Bolle sold infringing sunglasses to various distributors, retailers, and retail customers, including within this judicial district.

8. Oakley is the owner by assignment of U.S. Patent No. 5,208,614 duly and lawfully issued on September 30, 1997, describing and claiming the invention entitled "Concavely Indented Lenses For Eyewear" protecting the technology for an improved eyeglass lens for sunglasses. A true copy of U.S. Patent No. 5,208,614 is attached hereto as Exhibit 2.

9. Oakley is informed and believes, and thereupon alleges that the Defendant is selling eyewear that infringes U.S. Patent No. 5,208,614 of Oakley. Oakley alleges that Bolle's "Microedge", "Edge", and "Marksman" eyewear models embody the subject matter claimed in Oakley's U.S. Patent No. 5,208,614, without any license thereunder and is thereby infringing the patent. Oakley is informed and believes and based thereon alleges that Bolle sold infringing sunglasses to various distributors, retailers, and retail customers, including within this judicial district.

10. Oakley is the owner by assignment of U.S. Patent No. 5,137,342 duly and lawfully issued on August 11, 1992, describing and claiming the invention entitled "Eyewear Traction Device" protecting the technology for an improved earstem and traction device for sunglasses. A true copy of U.S. Patent No. 5,137,342 is attached hereto as Exhibit 3.

11. Oakley is the owner by assignment of U.S. Patent No. 5,054,903 duly and lawfully issued on October 8, 1991, describing and claiming the invention entitled "Eyewear Traction Device" protecting the technology for an improved earstem and traction device for sunglasses. A true copy of U.S. Patent No. 5,054,903 is attached hereto as Exhibit 4.

12. Oakley is informed and believes, and thereupon alleges that Bolle sold eyeglasses that infringe U.S. Patent Nos. 5,137,342 and 5,054,903 of Oakley. Oakley alleges that Bolle's "Clutch", "Microedge", "Score", "Edge", and "Marksman" eyewear models embody the subject matter claimed in Oakley's U.S. Patent Nos. 5,137,342 and 5,054,903 without any license thereunder and is thereby

infringed these patent. Oakley is informed and believes and based thereon alleges that Defendant, Bolle sold infringing sunglasses to various distributors, retailers, and retail customers.

13. Oakley's U.S. Patent Nos. 5,137,342 and 5,054,903 expired October 8, 2008. Nonetheless, Oakley is informed and believes, and thereupon alleges, that Bolle made, used, imported, offered for sale and/or sold the "Clutch", "Microedge", "Score", "Edge", and "Marksman" eyewear models prior to the expiration of these patents, without license from Oakley.

14. Oakley is the owner by assignment of U.S. Design Patent No. D354,968, duly and lawfully issued on January 31, 1995, describing and claiming the invention entitled "Eyeglass Lens," which is embodied by the *M-Frame* eyeglass, made and sold by Oakley. A correct copy of U.S. Design Patent No. D354,968 is attached hereto as Exhibit 5.

15. Oakley is informed and believes, and thereupon alleges that Bolle is selling eyewear that copies the design of the D354,968 patent of Oakley. Specifically, Oakley alleges that Bolle's "Score" eyewear model, sold by Defendant, embodies the subject matter claimed in Oakley's design patent referred to above without any license thereunder and is thereby infringing said patent. Oakley is informed and believes and based thereon alleges that Defendant, Bolle sold infringing sunglasses to various distributors, retailers, and retail customers.

16. Defendant has received written notice of Oakley's proprietary rights in its patents by way of this lawsuit. Further, Defendant has received constructive notice of Oakley's patents as Oakley caused its patents to be placed plainly on the product and/or packaging. Despite actual and constructive knowledge, Defendant continues to infringe Oakley's patent rights. On information and belief, such infringement by Defendant must have been willful and wanton.

17. Oakley is informed and believes and thereupon alleges that the sale of the unauthorized, infringing eyewear has resulted in lost sales, has reduced the

business and profit of Oakley, and has greatly injured the general reputation of Oakley due to the inferior quality of the copies, all to Oakley's damage in an amount not yet fully determined.

18. The exact amount of profits realized by Defendant as a result of its infringing activities, are presently unknown to Oakley, as are the exact amount of damages suffered by Oakley as a result of said activities. These profits and damages cannot be accurately ascertained without an accounting.

FIRST CLAIM FOR RELIEF
Patent Infringement (U.S. Patent No. 5,387,949)

19. The allegations of paragraphs 1 through 18 are repled and realleged as though fully set forth herein.

20. This is a claim for patent infringement, and arises under 35 U.S.C. §§ 271 and 281.

21. Jurisdiction is founded upon 28 U.S.C. §§ 1331 and 1338.

22. Oakley is the owner of U.S. Patent No. 5,387,949, which protects technology for an eyeglass connection embodied by Oakley's "Half Jacket" and "Flak Jacket" products, among others. A true and correct copy of U.S. Patent No. 5,387,949 is attached hereto as Exhibit 1. By statute, the patent is presumed to be valid and enforceable under 35 U.S.C. § 282.

23. Defendant, through its agents, employees and servants, manufactured, imported, offered to sell, and sold, without any rights or license, eyewear that falls within the scope and claim contained in U.S. Patent No. 5,387,949, including but not limited to those set out above.

24. Oakley is informed and believes and thereupon alleges that Defendant has willfully infringed upon Oakley's exclusive rights under the '949 patent, with full notice and knowledge thereof. Defendant sold or is selling such infringing sunglasses, has refused to cease the sale thereof, and will continue to do so unless restrained therefrom by this court, all to the great loss and injury of Oakley.

25. Oakley is informed and believes and thereupon alleges that Defendant has derived, received, and will continue to derive and receive from its acts of infringement, gains, profits and advantages in an amount not presently known to Oakley. By reason of these acts of infringement, Oakley has been, and will continue to be, greatly damaged.

26. Defendant will continue to infringe U.S. Patent No. 5,387,949 to the great and irreparable injury of Oakley, for which Oakley has no adequate remedy at law unless the Defendant is enjoined by this court.

SECOND CLAIM FOR RELIEF
Patent Infringement (U.S. Patent No. 5,208,614)

27. The allegations of paragraphs 1 through 18 are repled and realleged as though fully set forth herein.

28. This is a claim for patent infringement, and arises under 35 U.S.C. §§ 271 and 281 against Defendant.

29. Jurisdiction is founded upon 28 U.S.C. §§ 1331 and 1338.

30. Oakley is the owner of U.S. Patent No. 5,208,614 claiming an concavely indented lens for eyewear. A true and correct copy of U.S. Patent No. 5,208,614 is attached hereto as Exhibit 2. By statute, the patent is presumed to be valid and enforceable under 35 U.S.C. § 282.

31. Defendant, through its respective agents, employees and servants, manufactured, imported, used, offered for sale, and/or sold, without any rights or license, eyeglasses that fall within the scope and claim contained in U.S. Patent No. 5,208,614.

32. Oakley is informed and believes and thereupon alleges that Defendant has willfully infringed upon Oakley's exclusive rights under said patent, with full notice and knowledge thereof. Defendant sold or is selling such infringing sunglasses, has refused to cease the sale thereof, and will continue to do so unless restrained therefrom by this court, all to the great loss and injury of Oakley.

33. Oakley is informed and believes and thereupon alleges that Defendant has derived, received and will continue to derive and receive from its acts of infringement, gains, profits and advantages in an amount not presently known to Oakley. By reason of these acts of infringement, Oakley has been, and will continue to be, greatly damaged.

34. Defendant will continue to infringe U.S. Patent No. 5,208,614 to the great and irreparable injury of Oakley, for which Oakley has no adequate remedy at law unless the Defendant is enjoined by this court.

THIRD CLAIM FOR RELIEF
Patent Infringement (U.S. Patent No. 5,137,342)

35. The allegations of paragraphs 1 through 18 are repled and realleged as though fully set forth herein.

36. This is a claim for patent infringement, and arises under 35 U.S.C. §§ 271 and 281 against Defendant Bolle.

37. Jurisdiction is founded upon 28 U.S.C. §§ 1331 and 1338.

38. Oakley is the owner of U.S. Patent No. 5,137,342 claiming an improved earstem and traction device for sunglasses, which is now expired. A true and correct copy of U.S. Patent No. 5,137,342 is attached hereto as Exhibit 3. By statute, the patent is presumed to be valid and enforceable under 35 U.S.C. § 282.

39. Defendant, through its respective agents, employees and servants, manufactured, imported, used, offered for sale and/or sold, without any rights or license, eyeglasses that fall within the scope and claim contained in U.S. Patent No. 5,137,342 during the life of the patent.

40. Oakley is informed and believes, and thereupon alleges, that Defendant has willfully infringed upon Oakley's exclusive rights under the '342 patent, with full notice and knowledge thereof. Defendant sold such infringing sunglasses, to the great loss and injury of Oakley.

41. Oakley is informed and believes, and thereupon alleges, that

Defendant, has derived and received from its acts of infringement, gains, profits and advantages in an amount not presently known to Oakley. By reason of these acts of infringement, Oakley has been greatly damaged.

FOURTH CLAIM FOR RELIEF
Patent Infringement (U.S. Patent No. 5,054,903)

42. The allegations of paragraphs 1 through 18 are repled and realleged as though fully set forth herein.

43. This is a claim for patent infringement, and arises under 35 U.S.C. §§ 271 and 281 against Defendant.

44. Jurisdiction is founded upon 28 U.S.C. §§ 1331 and 1338.

45. Oakley is the owner of U.S. Patent No. 5,054,903 claiming an improved earstem and traction device for sunglasses, which is now expired. A true and correct copy of U.S. Patent No. 5,054,903 is attached hereto as Exhibit 4. By statute, the patent is presumed to be valid and enforceable under 35 U.S.C. § 282.

46. Defendant, through its respective agents, employees and servants, manufactured, imported, used, offered for sale, and/or sold, without any rights or license, sunglasses which fall within the scope and claim contained in U.S. Patent No. 5,054,903.

47. Oakley is informed and believes, and thereupon alleges, that Defendant has willfully infringed upon Oakley's exclusive rights under said patent, with full notice and knowledge thereof. Defendant sold such infringing sunglasses, to the great loss and injury of Oakley.

48. Oakley is informed and believes, and thereupon alleges, that Defendant, has derived and received from its acts of infringement, gains, profits and advantages in an amount not presently known to Oakley. By reason of these acts of infringement, Oakley has been greatly damaged.

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... ...
... ...

FIFTH CLAIM FOR RELIEF
Patent Infringement (U.S. Patent No. D354,968)

49. The allegations of paragraphs 1 through 18 are repled and realleged as though fully set forth herein.

50. This is a claim for patent infringement, and arises under 35 U.S.C. §§ 271 and 281 against Defendant.

51. Jurisdiction is founded upon 28 U.S.C. §§ 1331 and 1338.

52. Oakley is the owner of U.S. Patent No. D354,968, which protects the design and ornamentation of an eyeglass lens embodied and marketed by Oakley as part of the name "M Frame". A true and correct copy of U.S. Patent No. D354,968 is attached hereto as Exhibit 5. By statute, the patent is presumed to be valid and enforceable under 35 U.S.C. § 282.

53. Defendant, through its respective agents, employees and servants, manufactured, imported, used, offered for sale, and/or sold, without any rights or license, eyeglasses that fall within the scope and claim contained in U.S. Patent No. D354,968.

54. Oakley is informed and believes and thereupon alleges that Defendant has willfully infringed upon Oakley's exclusive rights under the '968 patent, with full notice and knowledge thereof. Defendant sold and is selling such infringing sunglasses, and will continue to do so unless restrained therefrom by this court, all to the great loss and injury of Oakley.

55. Oakley is informed and believes and thereupon alleges that Defendant has derived, received, and will continue to derive and receive from its acts of infringement, gains, profits and advantages in an amount not presently known to Oakley. By reason of these acts of infringement, Oakley has been, and will continue to be, greatly damaged.

56. Defendant will continue to infringe U.S. Patent No. D354,968 to the great and irreparable injury of Oakley, for which Oakley has no adequate remedy

at law unless said Defendant is enjoined by this court.

WHEREFORE, Plaintiff Oakley, Inc. prays as follows:

1. That Defendant be adjudicated to have infringed Oakley's U.S. Patent Nos. 5,387,949, 5,208,614, 5,137,342, 5,054,903, D354,968, and that the patents are valid, enforceable, and owned by Oakley;

2. That Defendant, its agents, servants, employees, and attorneys and all persons in active concert and participation with them, be forthwith preliminarily and thereafter permanently enjoined from making, using or selling any eyewear which infringe United States Patent Nos. 5,387,949, 5,208,614, D354,968;

3. For an assessment and award of damages against Defendant Bolle in an amount no less than lost profits, reasonable royalty, or Defendant's profits derived from its infringement of Plaintiff's patent rights, pursuant to 35 U.S.C. §§ 284 and 289;

4. For an order requiring Defendant to deliver up and destroy all infringing eyewear;

5. That an award of reasonable costs, expenses, and attorney's fees be awarded against Defendant pursuant to 35 U.S.C. § 285;

6. That Defendant be directed to file with this court and serve upon Oakley within 30 days after the service of the injunction, a report in writing under oath, setting forth in detail the manner and form in which Defendant has complied with the injunction; and

7. For such other relief as the Court may deem appropriate.

DATED: 4/16/09

WEEKS, KAUFMAN, NELSON & JOHNSON

GREGORY K. NELSON
Attorney for Plaintiff, Oakley, Inc.

JURY DEMAND

Plaintiff Oakley, Inc. hereby requests a trial by jury in this matter.

DATED: 4/16/09

WEEKS, KAUFMAN, NELSON & JOHNSON

GREGORY K. NELSON
Attorney for Plaintiff, Oakley, Inc.

EXHIBIT 1

US005387949A

United States Patent [19]

Tackles

[11] Patent Number: 5,387,949

[45] Date of Patent: Feb. 7, 1995

[54] **EYEGLASS CONNECTION DEVICE**

[75] Inventor: **George Tackles**, Lake Elsinore, Calif.

[73] Assignee: **Oakley, Inc.**, Irvine, Calif.

[21] Appl. No.: **825,476**

[22] Filed: **Jan. 29, 1992**

[51] **Int. Cl.**[6] **G02C 5/14**

[52] **U.S. Cl.** **351/121**; 351/44; 351/110; 351/140

[58] **Field of Search** 351/121, 110, 111, 140, 351/41, 158, 153, 141, 142, 149, 44

[56] **References Cited**

U.S. PATENT DOCUMENTS

Re. 17,994	3/1931	Emons .	
D. 150,924	9/1948	Bright .	
D. 182,459	4/1958	Eisler .	
D. 187,394	3/1960	Moeller .	
D. 293,450	12/1987	Jannard .	
D. 324,394	3/1992	Jannard .	
D. 331,587	12/1992	Jannard et al. .	
916,109	3/1909	Cook .	
946,596	1/1910	Cook .	
1,987,702	1/1935	Nerney	351/110
2,192,092	2/1940	Miller, Jr. .	
2,362,725	11/1944	Slotsky	351/140
2,397,243	3/1946	Cooper, Jr. .	
2,482,664	9/1949	Gagnon .	
2,534,655	12/1950	Baratelli .	
2,571,704	10/1951	Gilden	351/140
2,607,919	8/1952	Stegeman .	
2,770,806	11/1956	Moeller .	
2,825,267	3/1958	Gagnon	351/110
3,066,573	12/1962	Moeller .	
3,156,756	11/1964	Seaver .	
3,233,249	2/1966	Baratelli et al. .	
3,517,393	6/1970	Beauchef .	
3,756,704	9/1973	Marks .	
3,838,914	10/1974	Fernandez .	
4,523,819	6/1985	Dianitsch et al. .	
4,674,851	6/1987	Jannard .	
4,730,915	3/1988	Jannard .	
4,824,233	4/1989	Jannard .	
4,951,322	8/1990	Lin .	

FOREIGN PATENT DOCUMENTS

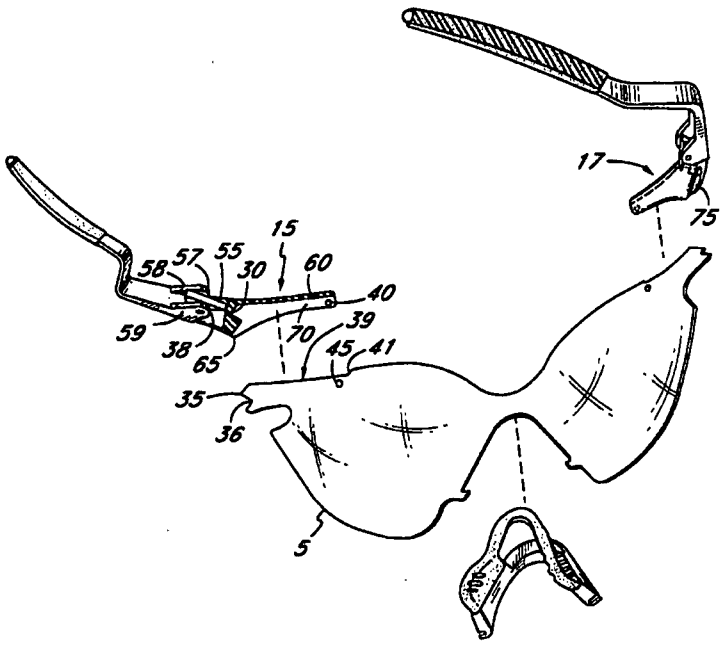
3413827	8/1985	Germany .
62-2093	12/1983	Japan .
61-41069	1/1986	Japan .

Primary Examiner—William L. Sikes
Assistant Examiner—Hung Xuan Dang
Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear

[57] **ABSTRACT**

Disclosed is a connector for use in connecting a lens to an earstem, comprising a main body which contains a hinge end and a lens receiving end. The connector contains a channel for receiving a portion of the lens. The pivot end of the channel contains a recess whereas the locking end of the channel contains a projection. The hinge end of the connector is attached to the earstem by a releasable pin connection. The lens is connected to the connector by inserting a lens into the channel where the lens is pivoted at the pivot end and then the connector is snapped down to cover over the top edge of the lens. Variations, component parts, and a wire frame dual lens detachable component system are also disclosed.

18 Claims, 3 Drawing Sheets



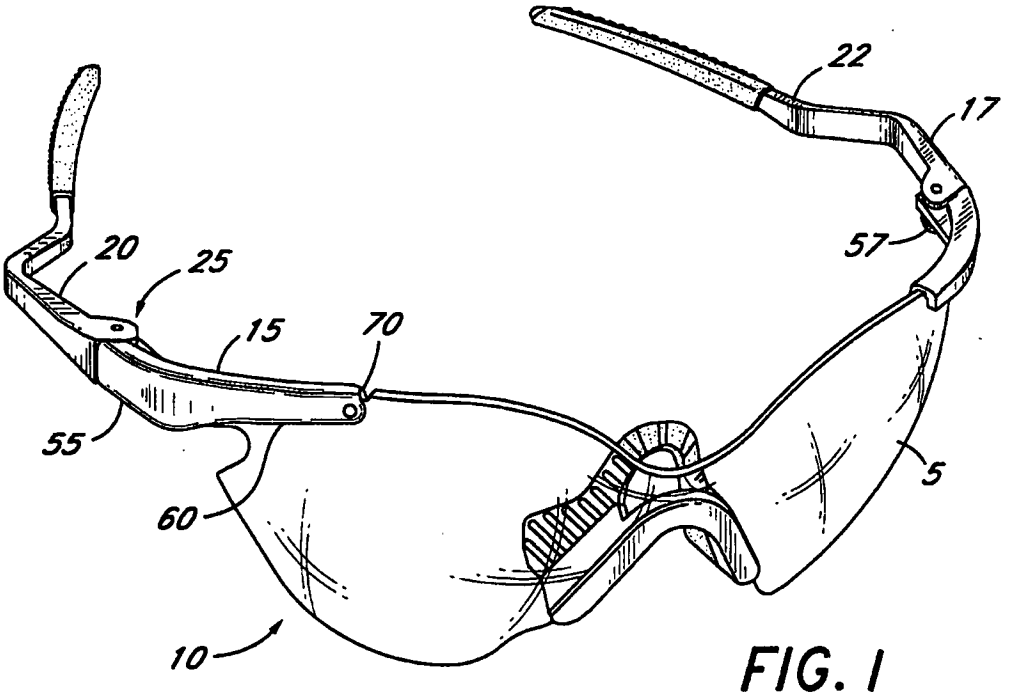


FIG. 1

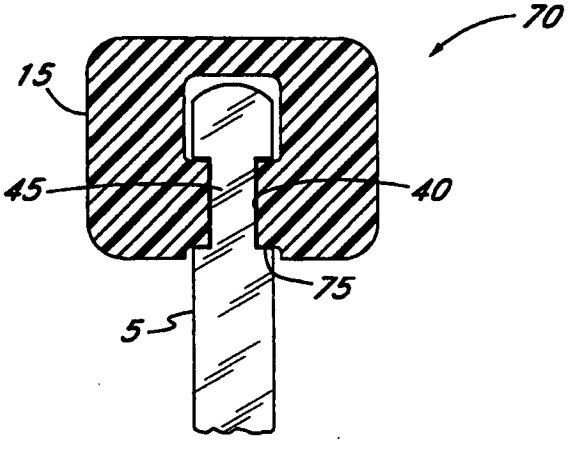


FIG. 4

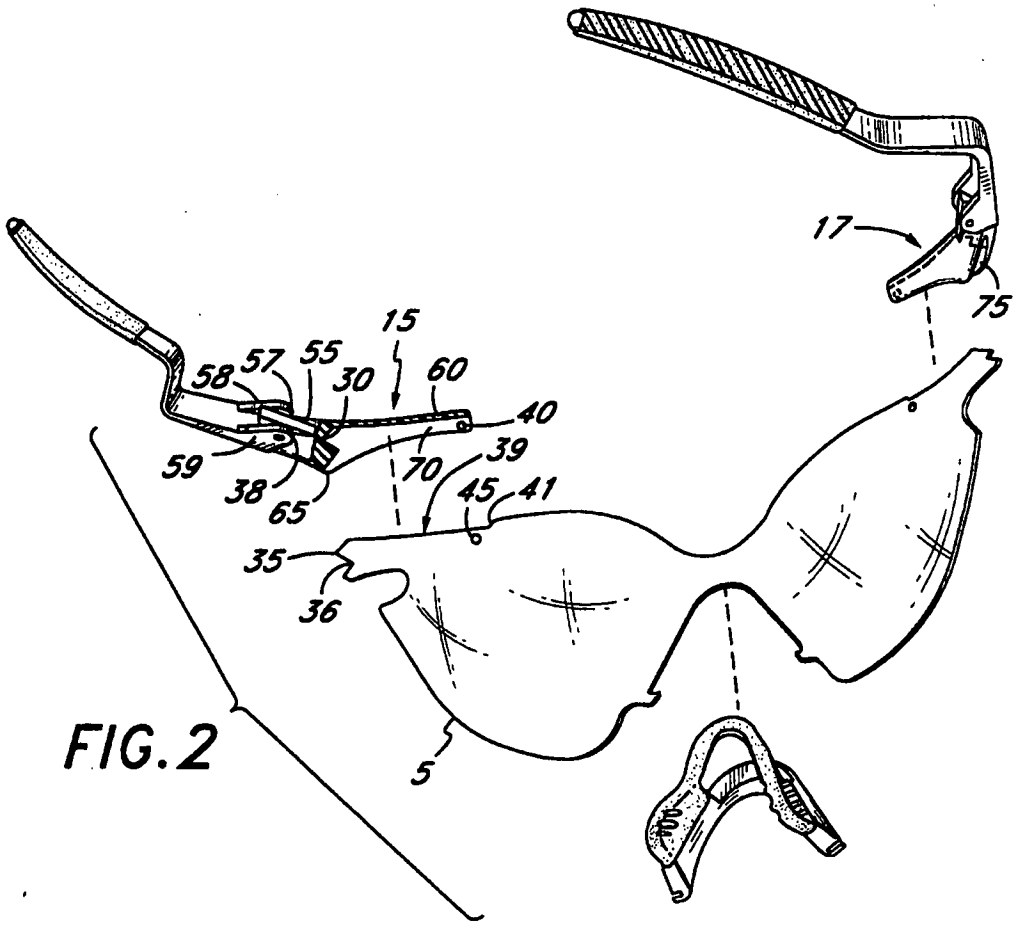


FIG. 2

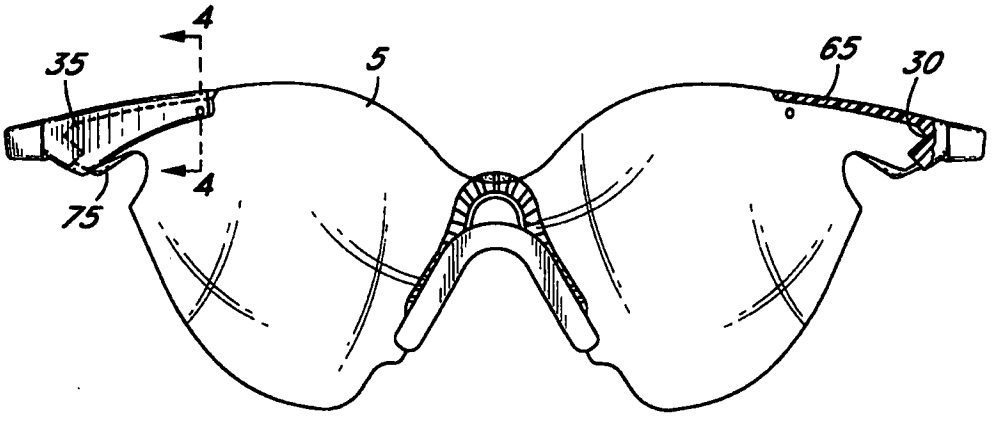


FIG. 3

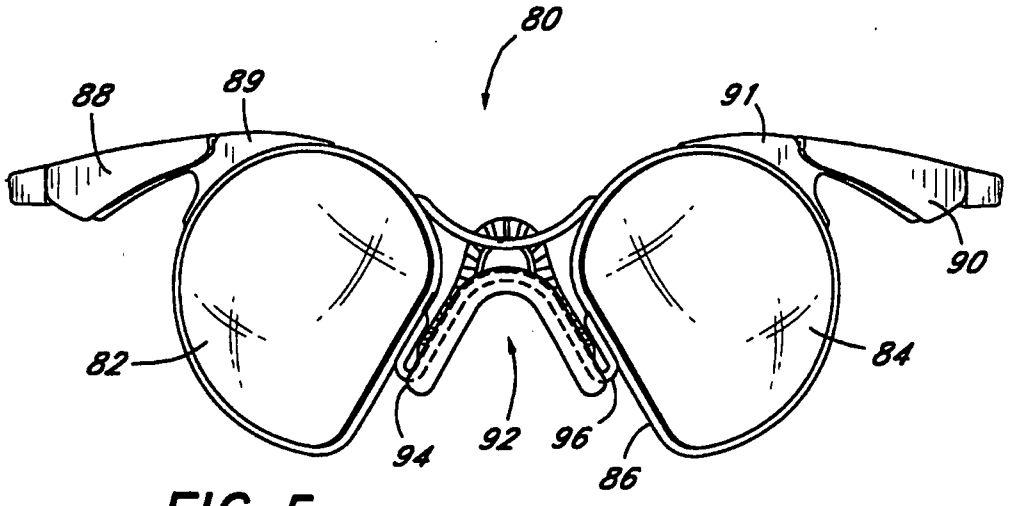


FIG. 5

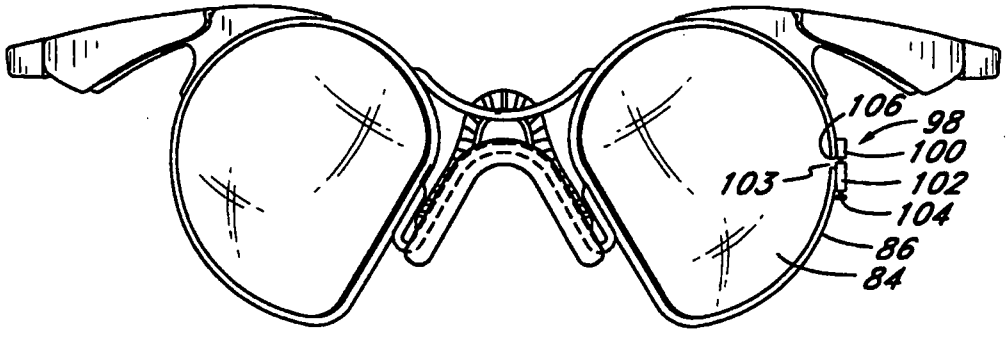


FIG. 6

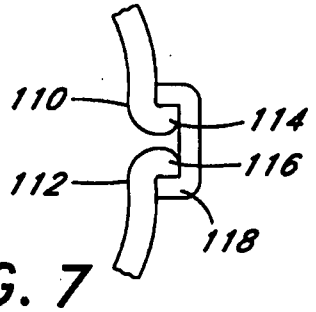


FIG. 7

EYEGLASS CONNECTION DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a connector for connecting an eyeglass lens to an earstem. The connector enables the user to interchange different earstems with different lenses, thus creating different color or configuration combinations.

This invention can be used with any shape of lens or earstem that is designed to accept the connector. In addition, the connector of the present invention is useable with both dual lens and unitary lens eyeglass systems. The connector is easily attachable and removable from the top, side or bottom edge of the lens, yet provides a sturdy connection when locked into position.

Unitary lens eyeglasses having interchangeable lenses are known in the art. See, for example, U.S. Pat. Nos. 4,824,233 and 4,867,550, both to James H. Jannard. The upper frame in these prior devices generally comprises a bar extending across the top edge of the lens and connecting to both earstems.

In order to switch lenses, the top edge of the new lens typically has a complementary shape to a slot extending the length of the upper frame. Thus, the shape of the top edge of the lens was generally dictated by the unique shape of the frame.

Thus, there remains a need for a connector that allows for the quick and easy interchange of earstems or lenses that will be secure when in the locked position, but that minimizes the need for structural correspondence between the edge of the lens and the lens contacting portion of the frame, and which does not require a frame along the entire top edge of the lens.

SUMMARY OF THE INVENTION

There has been provided, in accordance with one aspect of the present invention, an eyeglass connection device that connects the earstem to the lens, which enables the user to interchange the lens or earstem. There are two connectors in a standard eyeglass assembly, each connecting an earstem to the lens. Thus, one may change both earstems or either one of them.

The connector comprises a main body having a lateral end a medial end, and a lens receiving channel extending from the medial end in the direction of the lateral end. A first interlock structure is provided in the lateral end of the channel, and a second interlock structure is spaced apart from the lateral end of the channel.

Preferably, the first interlock structure comprises a locking surface for engaging a corresponding locking surface on a lens for resisting vertical upward motion of the lateral end of the connector with respect to the lens. The locking surface on the first interlock structure preferably comprises a ramped edge of a projection on the connector. The projection is preferably integrally molded on the connector, and extends within the channel in the medial direction.

The second interlock structure comprises a locking surface for releasably engaging a corresponding locking surface on the lens. Preferably, the second interlock structure comprises at least one projection within the channel for engaging a recess in the lens. More preferably, the second interlock structure comprises first and second projections on the connector extending towards each other from opposite sides of the channel for engaging opposing recesses in the lens. Alternatively, the second interlock structure comprises at least one recess

in the channel for receiving at least one projection on the lens.

In accordance with a further aspect of the present invention, there is provided a sunglass comprising a unitary transparent lens adapted to extend in a curved pane in the path of the wearer's left and right eye fields of vision, said lens having at least one connector extending along a portion of an edge of the lens, the connector having an elongated slot formed therein to removably receive a portion of the edge of the lens.

At least one projection is provided on the lens to interlock within a recess on the connector at a first end of the connector. A locking surface is provided on the connector, spaced apart from the recess, for releasably engaging a locking surface on the lens.

Preferably, the connector extends no more than about one-third of the way across the top edge of the lens. More preferably, the connector extends no more than about one-fifth of the way across the top of the lens. Alternatively, the connector extends along at least a portion of either the lateral edge of the lens or the bottom edge of the lens. In a further alternative, the connector connects to a flange or other extension of a frame for the lens.

In accordance with a further aspect of the present invention, there is provided a method of removably securing an earstem to a lens or frame in a pair of eyeglasses of the type having a right and left lens region, a nose piece and right and left earstems. The right and left lens regions are generally defined by a horizontal axis which extends from side to side throughout the left and right lens regions, and which is longer than a vertical axis which extends generally perpendicular to the horizontal axis.

The method comprises the steps of providing a frame or lens having a first and a second interlock structure thereon, and providing a connector having a slot therein for receiving the lens, said connector having a first and second complementary interlock structure thereon.

The connector is advanced along the horizontal axis until the first interlock structure of the connector is in contact with the first interlock structure on the lens. The second interlock structure on the connector is thereafter rotated downward, generally along the vertical axis, until the second interlock structure on the connector engages the second interlock structure on the lens.

In accordance with a further aspect of the present invention, there is provided a lens for assembly using the connectors of the present invention into an eyeglass of the type suitable for participation in active sports such as biking, skiing and the like.

The lens comprises a unitary pane having an upper edge and a lower edge, the lower edge having a nose piece opening formed therein for cooperating with the connectors and earstems to mount the lens on the nose of the wearer. The nose piece opening has an upper extremity, and the distance separating the upper extremity of the nose piece and the upper edge of the pane being defined as **D1**, and the distance separating the upper edge of the pane and the lower edge of the pane is defined as **D2**. **D1** is in the range between about $\frac{1}{2}$ inch and 1-$\frac{3}{4}$ inches, and **D2** is in the range of from about 1$\frac{1}{4}$ inches to about 2$\frac{3}{4}$ inches.

The lens has an arcuate cross-sectional configuration in a horizontal direction from a first lateral end to a

second lateral end, having an arc length within the range of from about 5-½ inches to about 7 inches.

At least one lateral interlock structure is provided in the upper lateral region of the lens, and at least one medial interlock structure is spaced apart from the lateral interlock structure by no more than about one-half of the arc length of the lens.

Further objects, features and advantages of the present invention will become apparent in the detailed description of the preferred embodiments which follows, when considered together with the attached figures and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective view of a connection device of the present invention as part of an eyewear system;

FIG. 2 is a partial exploded view of the eyewear of FIG. 1, including a partial cut away view of a connection device;

FIG. 3 is a front elevational view of eyewear including connection devices of the present invention, with one connection device in partial cut away view; and

FIG. 4 is a cross-sectional view of a connection device of the present invention taken along line 4—4 of FIG. 3.

FIG. 5 is a front elevational view of a further embodiment of the present invention.

FIG. 6 is a front elevational view of a further embodiment of the present invention.

FIG. 7 is a partial elevational view of a frame closure lock in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, there is disclosed in accordance with one aspect of the present invention a unitary lens 5 connected to earstems 20, 22 via connectors 15, 17 to form an eyeglass system 10.

The eyeglass system 10 may comprise either a dual lens system or a unitary lens system. Dual lens systems are well known in the art of prescription glasses, and include a separate right lens and left lens held in place in front of the range of vision of the wearer's right and left eyes by a conventional frame. See, e.g., FIG. 5.

The unitary lens systems utilize a single lens extending throughout both the wearer's left eye and right eye fields of vision. Unitary lenses having a variety of configurations which may be used in combination with the present invention are known in the art. For example, unitary lenses having a configuration which defines a portion of the surface of a cylinder are disclosed in U.S. Pat. No. 4,859,048 to James H. Jannard, which is incorporated herein by reference. Unitary lenses having a configuration which defines a portion of the surface of a toroid are disclosed in U.S. Pat. No. 4,867,550 to James H. Jannard, which is also incorporated herein by reference. In addition, unitary lenses having a configuration which defines a portion of the surface of a sphere, a frusto conical or other geometrical configuration can also be utilized in combination with the connectors of the present invention.

Since both connectors 15, 17 and both earstems 20, 22 are preferably mirror images, respectively, reference will be made to only one connector 15 and one earstem 20 herein. Referring to FIG. 1, connector 15 comprises a hinge end 55 and a lens receiving end 60.

In the illustrated embodiment, the connector 15 has a lens receiving channel 75 that starts from the lens receiving end 60 and extends through at least a part of the length of the connector 15. The channel 75 has a locking end 70 located at the lens receiving end 60 of the connector 15, and a pivot end 65. See FIG. 2. The terms "locking end" and "pivot end" are used only as descriptive terms for the functioning of the illustrated embodiment, and not as a limitation on the scope of the invention.

The length of the connector 15 and channel 75 can be varied depending upon the desired contact area between the connector 15 and the connector contacting surface 39 of lens 5. Typically, each connector will extend no more than about half way across the top of the lens 5 in a top mount embodiment. Preferably, each connector will extend no more than about a third of the way across lens 5 thereby leaving at least about a third of the upper lens edge exposed. More preferably, connector 15 will extend no more than about one fifth of the arc length of lens 5. Thus, in a lens having an arc length of about 6 inches, each connector contacting surface 39 will have a length within the range of from about ⅝ inches to about 1-¼ inches.

Preferably, the medial end of the connector contacting surface 39 is defined by a ramp or shoulder 41 corresponding to the thickness of the back wall of the channel 75 so that the upper edge of the installed connector 15 and lens 5 form a generally smooth transition.

Alternatively, the connector 15 can readily be adapted to extend along the lateral edge or bottom edge of the lens 5. In these embodiments, the connector will be releasably retained on the lens by two or more cooperating locking surfaces, as will be discussed in connection with the top mount embodiment, infra.

The hinge end 55 of connector 15 is connected to the earstem 20 via a pin connection 25. In the illustrated embodiment, a flange 57 extends from the main body of the connector 15, and is provided with a pin or recess to cooperate with corresponding structure on the earstem for pivotably securing the earstem 20. The pin connection 25 allows the earstem 20 to be folded inward toward the lens 5 so that the eyeglass 10 will take a more compact shape.

In general, flange 57 is adapted for removable insertion between a pair of generally parallel extensions 58 and 59 on the hinge end of the earstem 20. See, e.g., FIG. 2. Flange 57 in the illustrated embodiment is provided with a pair of opposing pins extending in opposite directions therefrom. Each pin is received in a recess or bore in the corresponding extension 58 or 59. These components are preferably molded or formed from a plastic material that will permit the extensions 58 and 59 to be separated slightly to releasably snap over the pins on flange 57.

Alternatively, the relationships of these components can be reversed in a variety of ways. For example, pins can be provided extending towards each other from the opposing inside surfaces of the extensions 58 and 59 to be received by a bore in the flange 57. The pin connection 25 will not be further described since variations will be readily understood by one of skill in the art in view of the disclosure herein.

Referring to FIG. 2, the lens 5 is provided with a first locking structure such as tooth 35, spaced apart from a second locking structure such as indent 45. The tooth 35 defines a recess 36 on the bottom side thereof for receiv-

ing an interlocking structure such as extension **38** on the connector **15**.

Although illustrated as an extension **38** on the connector **15** for engaging a recess **36** on the lens, any of a variety of complementary surface structures on the lens and connector will accomplish the inventive connection. In general, the first locking structure comprises a structure on the lens having a locking surface for resisting vertical upward movement of a corresponding locking surface on the connector **15**. This may be accomplished by cooperating projections and indents having a variety of configurations, including interlocking "teeth" pins and recesses, beads and grooves and the like, as will become apparent to one of skill in the art in view of the present disclosure.

For example, the upper edge **39** of the connector receiving portion of the lens **5** can be provided with a plurality of bumps or projections extending generally transversely to the local plane of the lens. Alternatively, a continuous raised bead can extend along the edge **39** of the lens **5**. In this embodiment, the inner surface of the channel **75** is provided with at least one recess for cooperating with the raised lens structure to provide a secure friction or interference fit. Installation can then be accomplished by sliding the lens axially into a slot on the connector having a "T" or functionally similar type cross section. Thus, the first and second locking structure can merge into a continuation of the same structure. The connector can additionally be permanently adhered to the lens such as by solvent based adhesives or heat; however, the two components remain removably secured in the preferred embodiment.

Referring to FIGS. **3** and **4**, the second locking structure at medial end **70** of the channel **75** contains at least one interlocking structure such as projection **40**. The projection **40** snaps into the indent **45** of the lens **5** when the connector **15** is locked into position.

There may be one indent **45** extending partially or completely through the lens, or two located on opposite sides of the lens **5**. Indent **45** can take the form of a circular hole, elongate slot, shelf or shoulder formed beneath a ramp or otherwise, as long as a surface is provided for cooperating with the corresponding structure on lens **5** to produce a friction or interference fit.

Accordingly, there may be one projection **40** or there may be two or more located on opposing sides of the interior of the channel **75**. The projection **40** can be of any shape generally as long as it has an interference fit with the corresponding locking structure on the lens, such as indent **45**. The projection **40** can extend partway or even all the way along the length of the channel **75** in the form of a ridge, as has been discussed. In this embodiment, the first and second locking structures may be merged into a single elongate or repeating structure. The projection **40** is illustrated as located slightly above the bottom edge of the connector **15**, but it can be located exactly on the bottom edge.

As will be apparent in view of the disclosure herein, the interlock structure on the lens cooperates with the corresponding interlock structure on the connector to produce an interference fit which resists both upward rotation of the connector about the tooth **35**, and also lateral motion of the connector **15** with respect to the lens **5**.

To attach the connector **15** to the lens **5**, the tooth **35** of the lens **5** is advanced into the recess **30** of the connector **15** while the longitudinal axis of connector **15** is angled slightly above parallel to surface **39**, so that the lens receiving end **60** is positioned above the connector receiving edge **39** of the lens **5**. Once the tooth **35** is positioned in the recess **30**, the lens receiving end **60** of the connector **15** can be pivoted down and snapped onto the top edge of the lens **5**. The projection **40** of the connector **15** will advance into the indent **45** of the lens **5** to provide an interference fit. Removal is accomplished by the same steps in reverse. Removing the projection **40** from the indent **45** is accomplished by plastic deformation of the material utilized in making the connector **15** as the lens receiving end **60** is rotated upward about the tooth **35**.

The order of attachment of the first and second locking structures will depend upon the particular embodiment. For example, if the medial locking structure comprises a projection and recess which are roughly mirror images of the lateral locking structure, either the medial or the lateral end of the connector can be set first.

The connector **15** is preferably molded as an integral unit from any of a variety of plastics conventionally used for detachable component sunglass frames. Alternatively, the slot **75** can be milled as a post molding step. In a unitary lens embodiment, the lens is preferably injection molded from polycarbonate or other conventional material and cut or ground to produce the appropriate profile.

Since the connector **15** is attached to the lens **5** at only a relatively small portion of the top, side or bottom edge of lens **5**, the shape of the top edge of the lens may be varied without regard to the shape of an upper frame. This can be advantageous in a variety of circumstances, such as for uses in which it is desirable to minimize obstacles to the range of vision at the upper portion of the lens.

For example, bicyclists tend to look through the uppermost portion of the lens and can be distracted or limited by an upper frame. In addition, the range of vision for each eye at the top of the field of vision does not necessarily follow a uniform curve having a continuous single radius. Thus, positioning a single arcuate upper frame sufficiently high that it optimizes the field of view can result in the use of unnecessary lens and frame material in regions where it extends beyond the upper range of vision.

By eliminating the need for a full upper frame, the present invention permits contouring of the upper edge of the lens in a manner that minimizes weight while maximizing protection of the wearer's full field of vision, and at the same time retaining all of the advantages of rapid interchangeability of components without the use of tools.

Referring to FIG. **5**, there is disclosed a further embodiment in accordance with the present invention. A wire frame pair of eyeglasses **80** is disclosed, having a right lens **82** and a left lens **84** disposed in a wire frame **86**. In a preferred embodiment, lenses **82** and **84** are removably disposed in the frame **86** to permit selective interchanging of lenses, as will be discussed.

Wire frame **86** is provided with a right mounting flange **89** and left mounting flange **91** for receiving connectors **88** and **90**, respectively. Preferably, connectors **88** and **90** are removably secured to flanges **89** and **91**, in the same manner as has been discussed in connection with FIGS. **1–4**, supra.

Flanges **89** and **91** may be constructed of any of a variety of materials having sufficient structural strength to accomplish the intended function. However, in a preferred embodiment, the flanges **89** and **91** comprise a

metal which is bondable to the metal used for the construction of the frame **86**. A wide variety of metals are known in the art which may be utilized for the present purposes, including titanium, aluminum, nickel silver alloys, stainless steel, brass and various non-metal composites. These metals or other materials may be drawn into wire, or stamped from sheet stock, or otherwise molded or formed to create a frame **86** which may then be secured such as by soldering or brazing to flanges **89** and **91**, which are preferably stamped from sheet stock, and thereafter provided with any desired curvature.

Preferably, the wire frame glasses **80** are provided with a nose piece **92** having a slot **94** extending along the upper surface thereof to receive a nose piece connector wire or flange **96**. The nose piece connector wire **96** is preferably secured to the remainder of frame **86** by conventional brazing or soldering techniques. The foregoing construction permits the user interchangeability of nose pieces onto the wire frame **86**, with the nose piece releasably retained in position by friction or interference fit structures, as will be apparent to one of skill in the art.

In accordance with a further embodiment of the detachable component wire frame glasses **80** of the present invention, there is provided a means for removably retaining the lenses **82** and **84** within the wire frame **86**. Referring to FIG. **6**, there is disclosed a lens **84** mounted in a frame **86** which has been provided with a frame closure lock **98**. Closure lock **98** may be provided at any location along the perimeter of lens **84**, such as on the lateral end as illustrated, on a medial surface, or at the connection point between the frame **86** and the flange **91**.

The closure lock **98** in the embodiment illustrated in FIG. **6** comprises a threaded barrel **100** secured to the frame **86**. Threaded barrel **100** is axially aligned with a tubular sleeve **102** secured to an adjacent portion of frame **86**. A discontinuity or space **103** is provided in the frame **86** between the threaded barrel **100** and sleeve **102**, as will be understood by one of skill in the art.

A screw **104** extends axially through the sleeve **102** and into the threaded barrel **100**. Tightening or loosening screw **104** will draw adjacent ends **106** and **108** of frame **86** towards each other or away from each other, thereby reducing or enlarging the circumference of the frame **86** which encircles lens **84**.

In this manner, the circumference of frame **86** can be enlarged to release the lens **84** so that it may be interchanged with another lens having different refractive properties or different color densities or other design configurations.

A variety of alternative embodiments based upon the axially aligned barrel embodiment are contemplated herein. For example, the sleeve **102** or a flange need only have a sufficient axial length to support the screw **104**. The screw **104** may be a conventional threaded machine screw, or may be a modified rod having one or more radially outwardly extending projections or a medical luer lock configuration.

A rod having a "T" shaped distal end can be inserted into a keyway in the opposing barrel, and rotation of the rod through an angle, e.g., of about 90° will move the "T" structure out of alignment with the keyway to prevent retraction of the rod. In general, any locking structure which involves a rod or pin which is rotatable from a first, aligned position to permit axial insertion into a keyway, and a second, nonaligned position to prevent retraction from the keyway will work.

In any of the foregoing "barrel" embodiments of the closure lock, the closure lock structure can be located at any convenient point around the periphery of the lens. Preferably, the closure lock will be disposed on the posterior side of the flange **91**.

Referring to FIG. **7**, there is disclosed another embodiment of the frame closure lock in accordance with the present invention. In this embodiment, the frame is severed to provide two abutting ends **110** and **112** having a space therebetween. Each of ends **110** and **112** is provided with an outwardly extending projection **114** and **116**, respectively. Once a lens **84** has been disposed within the wire frame **86**, the ends **110** and **112** are manually drawn towards each other, and a retention clip **118** may be snapped over the projections **114** and **116** to retain the frame **86** in its reduced circumference configuration, thereby retaining the lens.

For this purpose, the contact surfaces between the abutment **114**, **116** and the clip **118** are preferably configured in a manner that provides an interference fit to retain the clip **118** in place until the resilience of the clip **118** is overcome, such as by prying with a fingernail or removal tool. The contact surfaces between the clip **118** and abutments **114** and **116** will therefore be angled and toleranced in a manner that provides a sufficient resistance to removal of clip **118** that it will not be likely to come unconnected during normal use. Clip **118** may be constructed from metal, or from any of a wide variety of polymeric materials which are known in the sunglass manufacturing art.

In a variation of the foregoing, the nose piece, nosepiece connector **96** or flange **91** may be configured to function as clip **118**, thereby permitting interchangeability of the lens by removing an eyeglass component. For example, one end **106** of frame **86** can be bonded to flange **91**, and the space **103** provided in the frame at a point adjacent the connection to flange **91**. The other end **108** can then be removably secured to the flange to accomplish the interchangeability of lenses.

The lens **84** and frame **86** may be provided with any of a variety of interlock structures which will become apparent to one of skill in the art in view of the disclosure herein. For example, the outer periphery of lens **84** in one embodiment is provided with a radially inwardly extending channel extending all the way around for receiving a wire frame **86** therein. Tightening of the frame closure lock **98** reduces the circumference of the wire **86** so that it rests in the channel formed around the circumference of the lens **84**. In an alternate embodiment, the lens **84** is provided with a radially outwardly extending flange having the same or a reduced thickness compared to the remainder of the lens. The flange is received within a groove provided around the inside surface of the wire frame **86** to provide an interlock fit.

Thus, there has been provided in accordance with this aspect of the present invention a detachable component system having interchangeable left and right lenses, an interchangeable nose piece and interchangeable connectors for providing hinged support to a pair of removably secured earstems. Although described as a wire frame eyeglass **80**, it is to be understood that the wire **86** can readily be replaced by stamped or rolled metal sheet stock or extruded or molded polymeric materials, which extend outwardly from the contact surface with the lens as far as is practical for a given purpose. For example, in an embodiment intended for use as protective eyewear, the frame **86** preferably extends a relatively large distance from side to side and

from top to bottom to create a "mask" of metal or plastic which will provide sufficient eye protection for the intended application. In this manner, protective prescription lens eyewear may be provided for a wide variety of uses, ranging from surgery, welding, bicycle racing and others.

Although this invention has been described in terms of certain preferred embodiments, other embodiments that are apparent to those of ordinary skill in the art are also within the scope of this invention. Accordingly, the scope of this invention is intended to be limited only by the appended claims.

What is claimed is:

1. A connector for eyeglasses, for connecting one or more earstems to a lens, said connector comprising:
   - a main body with a lateral end and a medial end;
   - a lens receiving channel extending from the medial end in the direction of the lateral end;
   - a first interlock structure in the lateral end of the channel, said first interlock structure comprising a locking surface for engaging a corresponding locking surface on the lens for resisting vertical upward motion of the lateral end of the connector with respect to the lens, said locking surface on the first interlock structure comprising a ramped edge of a projection on the connector; and
   - a second interlock structure spaced apart from the lateral end of the channel.

2. A connector for eyeglasses as in claim 1, wherein the projection is integrally molded on the connector and extends within the channel in the medial direction.

3. A connector for eyeglasses as in claim 1, wherein the second interlock structure comprises a locking surface for releasably engaging a corresponding locking surface on the lens.

4. A connector for eyeglasses as in claim 1, wherein the second interlock structure comprises a projection within the channel for engaging a recess in the lens.

5. A connector for eyeglasses as in claim 4, wherein the second interlock structure comprises first and second projections on the connector extending toward each other from opposite sides of the channel.

6. An eyeglass, comprising a lens, an earstem, and at least one connector as defined in claim 1 for removably connecting the earstem to the lens.

7. A eyeglass as in claim 6, further comprising an earstem pivotally secured to the connector.

8. An eyeglass, comprising a lens, an earstem, and at least one connector as defined in claim 1 for removably connecting the earstem to the lens.

9. Sunglasses, comprising:
   - a unitary transparent lens adapted to extend in the path of the wearer's left and right eye fields of vision; and
   - at least one connector as defined in claim 1 extending along a portion of an edge of said lens, said lens having at least one projection on the lens to interlock with said connector.

10. A sunglass as in claim 9, further comprising a second connector secured to said lens.

11. A sunglass as in claim 9, further comprising an earstem pivotally secured to said connector.

12. A sunglass as in claim 9, wherein said connector extends no more than about one-third of the way across a top edge of the lens.

13. A sunglass as in claim 9, wherein the connector extends no more than about one-fifth of the way across the top edge of the lens.

14. A sunglass as in claim 9, wherein said connector extends along at least a portion of the lateral edge of the lens.

15. A sunglass as in claim 9, wherein said connector extends along at least a portion of the bottom edge of the lens.

16. The connector of claim 1, further comprising an earstem pivotally secured to the connector.

17. A connector for eyeglasses, for connecting one or more earstems to a lens, said connector comprising:
   - a main body with a lateral end and a medial end;
   - a lens receiving channel extending from the medial end in the direction of the lateral end;
   - a first interlock structure in the lateral end of the channel; and
   - a second interlock structure spaced apart from the lateral end of the channel, said second interlock structure comprising a recess in the channel for receiving a projection on the lens.

18. An eyeglass, comprising:
   - a lens, said lens having a connector contacting surface having a projection at a lateral point thereon and a recess at a medial point thereon;
   - an earstem; and
   - at least one connector for connecting one or more earstems to a lens, said connector comprising a main body with a lateral end and a medial end; a lens receiving channel extending from the medial end in the direction of the lateral end; a first interlock structure in the lateral end of the channel; and a second interlock structure spaced apart from the lateral end of the channel, said connector for removably connecting the earstem to the lens.

* * * * *

EXHIBIT 2

US005208614A

United States Patent [19]

Jannard

[11] Patent Number: 5,208,614

[45] Date of Patent: May 4, 1993

[54] **CONCAVELY INDENTED LENSES FOR EYEWARE**

[75] Inventor: **James H. Jannard**, San Juan Capistrano, Calif.

[73] Assignee: **Oakley, Inc.**, Irvine, Calif.

[21] Appl. No.: **620,648**

[22] Filed: **Nov. 30, 1990**

[51] **Int. Cl.**[5] **G02C 7/02**

[52] **U.S. Cl.** **351/41**; 351/158; 351/159

[58] **Field of Search** 351/158, 159, 41, 43, 351/44

[56] **References Cited**

U.S. PATENT DOCUMENTS

289,301	4/1987	Jannard	D16/112
293,450	12/1987	Jannard	D16/112
322,975	1/1992	Bolle	D16/102
4,515,448	5/1985	Tackles	351/41
4,674,851	6/1987	Jannard	351/41
4,779,291	10/1988	Russell	351/41
4,843,655	7/1989	Hegendorfer	2/449

FOREIGN PATENT DOCUMENTS

1249275 11/1959 France .

OTHER PUBLICATIONS

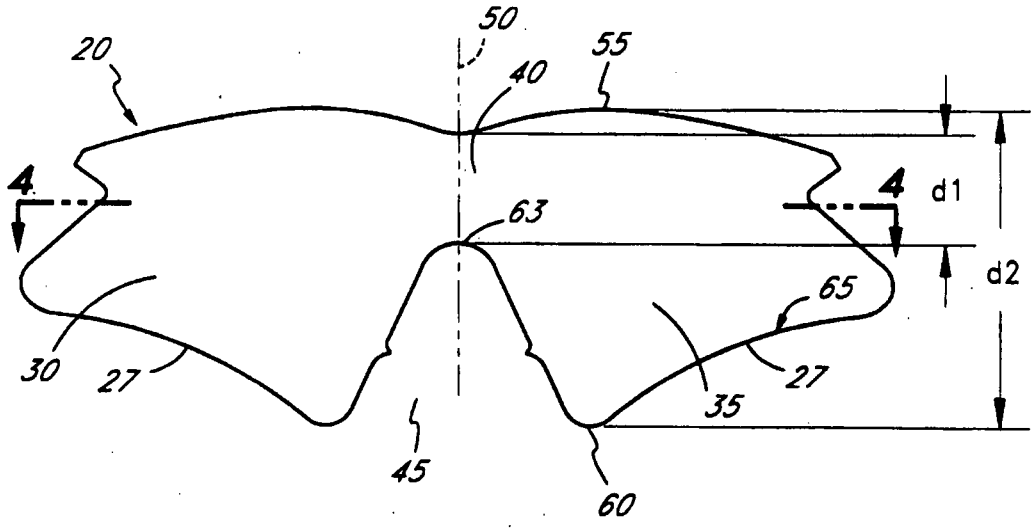
P. 46 of Runner's World, Jul., 1990.

Primary Examiner—Scott J. Sugarman

[57] **ABSTRACT**

Disclosed is an arcuately molded lens for use in active eyewear, having along the bottom edge of each right and left lens regions at least one downwardly concave indented area. The indented area may extend across the entire bottom edge of each lens region or it may only extend along a portion of the lens region. Where there is only one concavity per lens region, it may be placed anywhere along the bottom edge of the lens, near the midpoint, center or periphery. The lens may also have multiple concave indentations along its bottom edge.

25 Claims, 4 Drawing Sheets



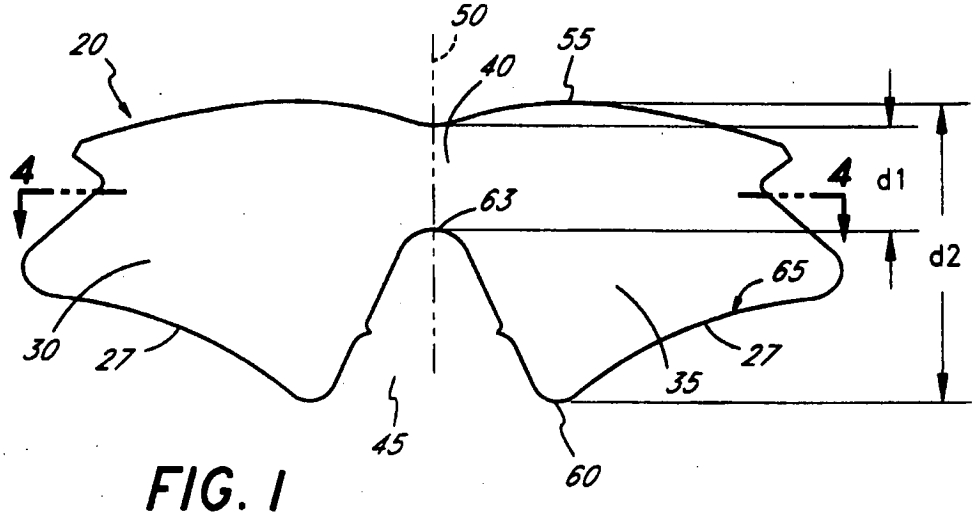

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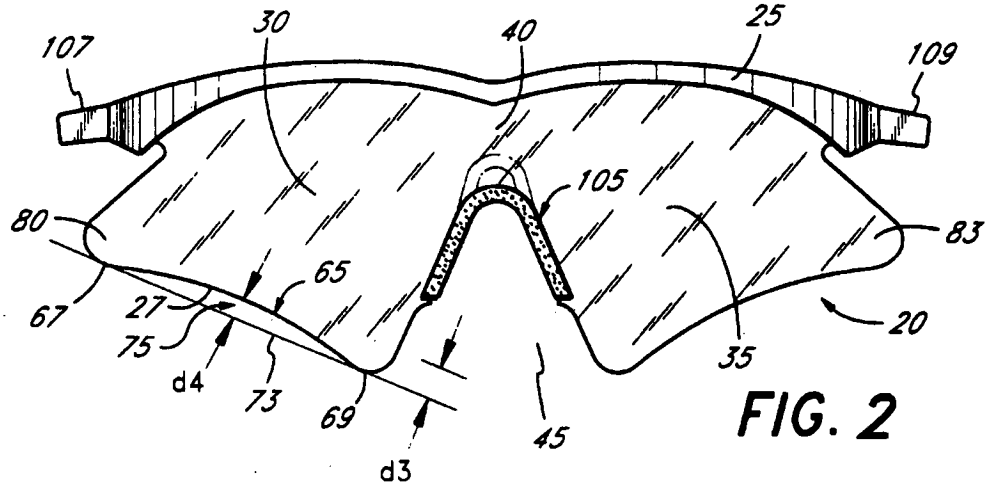
FIG. 1


107
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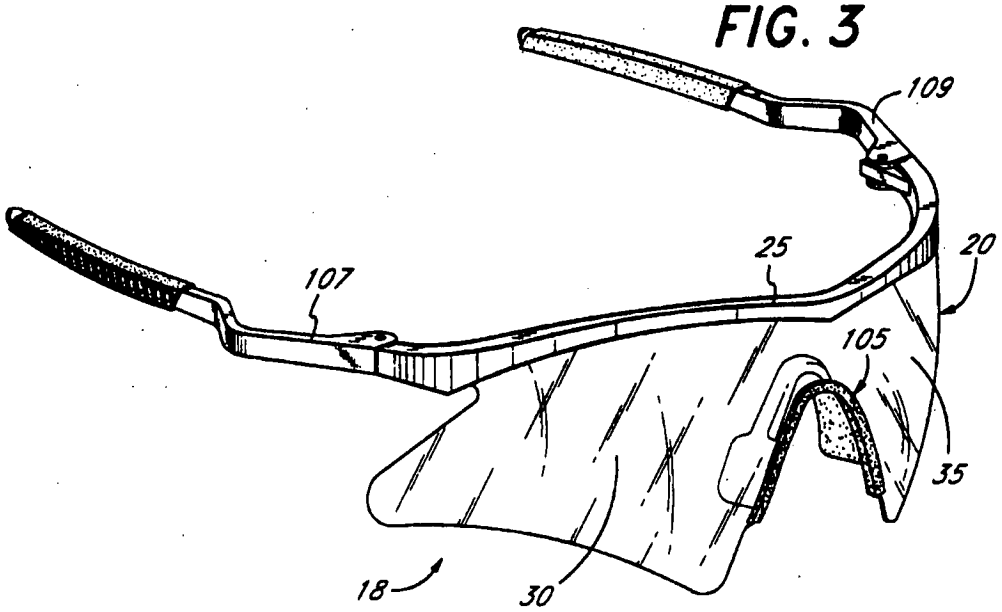
35
20

FIG. 2

FIG. 3



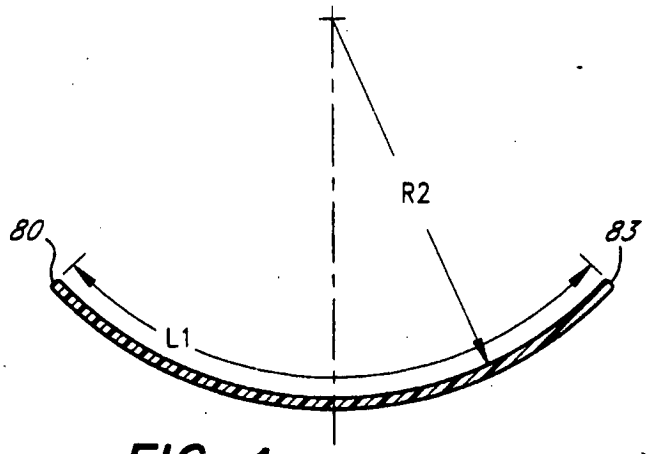


FIG. 4

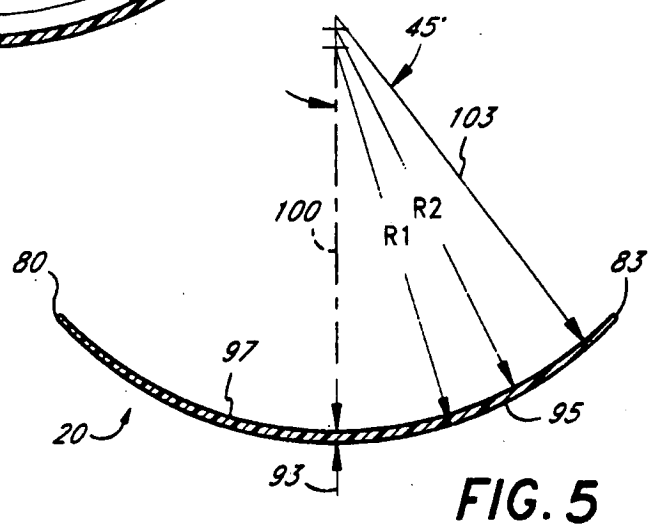


FIG. 5

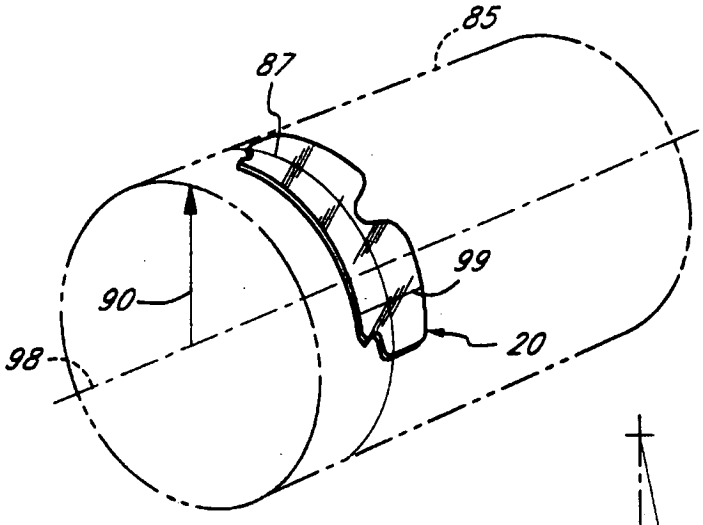


FIG. 6

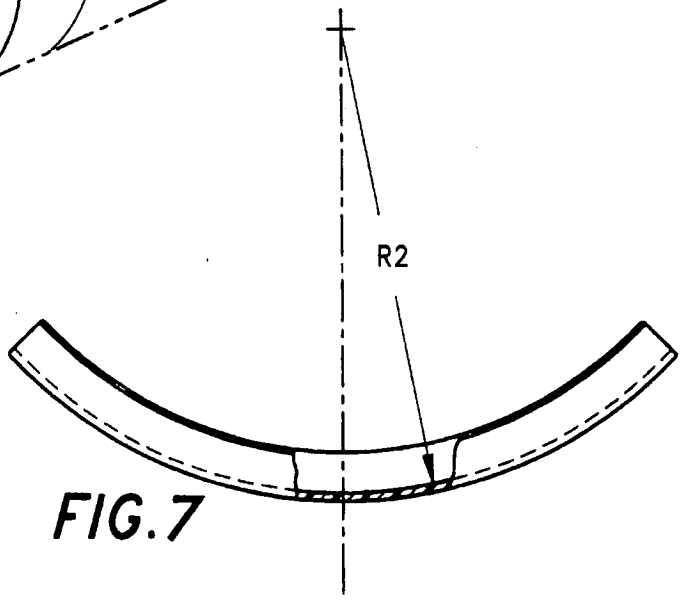


FIG. 7

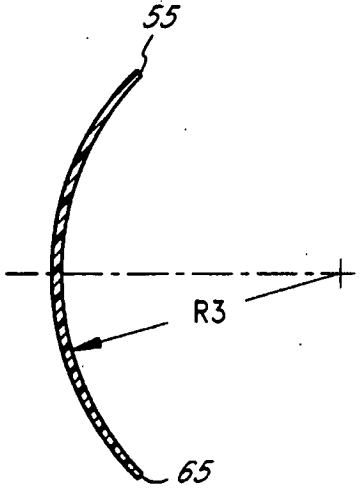


FIG. 8

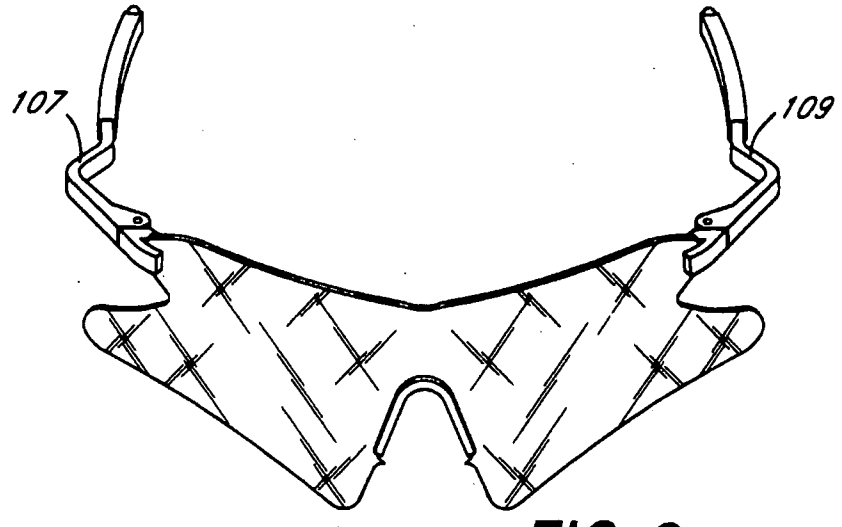


FIG. 9

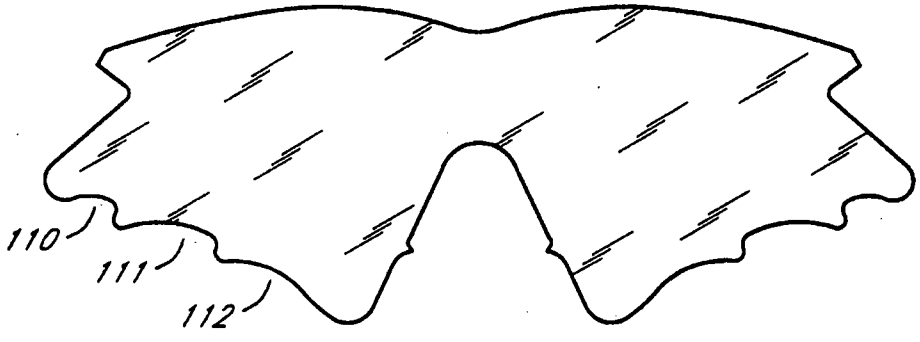


FIG. 10

CONCAVELY INDENTED LENSES FOR EYEWARE

BACKGROUND OF THE INVENTION

This invention relates generally to lenses used in eyewear suitable for active sports, and more particularly, to functional improvements attributable to the shape of the bottom edge of such lenses.

Eyewear typically worn during active sports such as hiking, skiing and bicycle racing is commonly designed to conform closely to the front and sides of the wearer's head. It is advantageous in such low profile eyewear to use arcuately molded lenses. Notwithstanding certain advantages attributable to the close fit, such as peripheral light interception and aerodynamic efficiency, sufficient ventilation may be impaired, resulting in the wearer being uncomfortable and possibly having impaired vision from fogging of the eyewear lenses. Prior efforts to alleviate this problem have been disclosed in U.S. Pat. Nos. 4,859,048 and 4,867,550, but they are by no means exclusive. The present invention offers an additional means to achieve the desired goals of providing comfort and optimum visibility without diminishing the advantages attendant in arcuately formed eyewear used for participation in active sports.

SUMMARY OF THE INVENTION

There has been provided, in accordance with one aspect of the present invention, an arcuately molded lens for use in eyewear suitable for participation in active sports. The lens has a top edge and a bottom edge having a nose opening for mounting the lens on the nose of a wearer and for defining a right and a left lens region. In one embodiment, there is a nose piece disposed in the nose opening. Over the nose opening in the lens there is a bridge portion. The distance separating the lower edge of the bridge portion and the top edge of the lens is defined as d1 and the distance separating the top edge of the lens and the lowest bottom edge of the lens is defined as d2. d1 is in the range of about ¼ inch to 1¾ inches, and d2 is in the range of about 1¼ inches to 3 inches. The lens also has an arcuate horizontal cross sectional configuration, wherein its arc length (L1) is in the range of from about 5 inches to about 7 inches. The bottom edge of each right and left lens region is concavely indented. There may be more than one concave indentation per each lens region. The concavely indented regions have a depth dimension within the range of about 1/32 inch to about 1¼ inches. The sum of the areas of the indentations in a given lens pane in this embodiment may be between approximately 1% and 50% of the remaining area of the surface of that lens pane.

The lens of the present invention has an inner concave surface and an outer convex surface and a thickness there between. The thickness of the lens may be substantially constant throughout or may in at least one portion of each distal region be less than the thickness of the lens in its central region. The thickness of the lens at the midpoint of the central region may taper gradually to a reduced thickness in the distal regions.

In one embodiment of the present invention, the arcuate cross sectional configuration of the lens in its molded condition substantially conforms to the surface of a cylinder. The radius from the axis of the cylinder to an arc defining the inner concave surface of the lens is a substantially constant radius in the range of from about 2¼ inches to about 4¼ inches. The radius of curvature of the lens along a horizontal plane may be defined by R2, and the radius of curvature along a vertical plane through the lens may have a radius defined by R_3, and R_2 may be equal to or less than R_3. In another embodiment, R_2 is in the range of from about two inches to about four inches, and R_3 is greater than or equal to 1.10 R_2.

The lenses of the present invention may be mounted in a pair of eyeglasses, by pivotably attaching a right and a left earstem to each lens region. Alternatively, the lenses of the present invention may be secured to an upper frame, and earstems are pivotably secured to that frame.

In a further embodiment of the present invention, the lenses described above may be adapted to be used in a dual lens eyewear system suitable for participation in active sports.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevational view of a lens of the present invention in a flattened condition;

FIG. 2 is a front elevational view of a lens of the present invention, having a frame attached and showing a measurement of the extent of indentation;

FIG. 3 is a front perspective view showing a lens of the present invention as part of an eyewear system;

FIG. 4 is a section along lines 4—4 of FIG. 1 normal to the vertical axis of the lens, in its normal arcuate configuration.

FIG. 5 is a sectional view like FIG. 4, of a tapered thickness embodiment of the lens of the present invention;

FIG. 6 is a perspective view of an arcuate lens of the present invention shown conforming to the surface of a cylinder;

FIG. 7 is a top plan view of a lens of the present invention with the R_2 radius less than R_3;

FIG. 8 is an elevational sectional view of the non-cylindrical embodiment of the lens illustrated in FIG. 7;

FIG. 9 is a front perspective view of assembled eyewear in accordance with one aspect of the present invention.

FIG. 10 is a front elevational view of a lens of the present invention having more than one concavity per lens pane.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1-3, there has been provided in accordance with one aspect of the present invention a lens 20 for mounting in a frame 25 to form eyewear 18 (FIG. 3), conformed to extend in the path of the wearer's left and right eye fields of vision. In particular, the invention relates to the indented or concave opening downward shape of the lower edge of the lens. The shape of one embodiment of the lens of the present invention is best understood by reference to FIG. 1, which illustrates a relatively smoothly curved, single, concave indentation 27 in each lens pane 30, 35. However, lenses of many other shapes may be envisioned having irregularly shaped indentations or multiple concave indentations for each eye pane (see FIG. 10), which will accrue the advantages of the present invention.

Lenses in accordance with the present invention can be manufactured by any of a variety of processes well

known in the art. Preferably, the lens is injection molded and comprises a relatively rigid and optically acceptable material such as polycarbonate. The indentation **27** can be formed in the molding, cutting, or stamping process used to form the lens, or, preferably, is machined into a previously molded lens blank.

Alternatively, the lens can be stamped or cut from flat sheet stock and bent into a curved configuration. This curved configuration can then be maintained by the use of a relatively rigid, curved frame, or by heating the curved sheet to retain its curved configuration, as is well known in the thermoforming art.

A first eye pane **30** and a second eye pane **35** are located in front of the wearer's right and left eyes, respectively. A bridge portion **40** is provided to merge the first and second eye panes into a single lens. Beneath the bridge **40** there is provided a generally triangular nose opening **45**. In another embodiment, the first and second panes are not merged into a single lens eyewear system, rather they consist of two separate lenses adapted for use in a dual lens system.

It is understood that the eye panes **30** and **35** will, in the preferred embodiment, be essentially mirror images of each other about a central vertical axis **50** (FIG. **1**), and the discussion in connection with one is intended to apply to both. The maximum height d_2 of the lens **20** (see FIG. **1**) of the present invention, measured from the top edge **55** of the lens **20** to the lowest point **60** along the bottom edge **65**, may be varied to optimize aesthetic and functional considerations, but will typically fall within the range of from about 1 to 3 inches, preferably from about 1½ to about 2½ and most preferably between about 1¾ to about 1¾ inches. The height d_1 of the lens **20**, measured from the center of top edge **55** of the lens to the lower edge **63** of the bridge portion **40**, may also vary, but preferably it is within the range of from about ½ inch to ¾ inches and more preferably between about ½ and ¾ inch.

The bottom edge **65** of lens **20** is provided with at least one region **27** which is concave, opening in a downward direction. One embodiment of such a concave region is illustrated in FIG. **2** as extending between the lowest points of the concavity **67** and **69**. As illustrated therein, the bottom edge **65** is concave in relation to an imaginary straight line **73** drawn between relative low points **67** and **69**. Thus, the bottom edge **65** can be seen as diverging away from straight line **73** for a distance d_3 which is greater than zero at at least one point.

Thus, by "concave downward," "indented," "diverging away" and the like terms herein used, it is meant that an imaginary straight line **73** drawn between the two lowest points of a concave indentation **27**, for example **67** and **69**, defines a regular or irregular enclosure having an area **75** of greater than 0 square inches. A lens in which no straight line **73** can be positioned so as to define a closed area **75** thus does not have a "concavity" as intended herein. This is true of continuously convex prior art lenses, in which case the imaginary line **73** can only be drawn as a tangent to some point along the lower edge **65** of the lens. In a lens having a perfectly straight lower edge, line **73** can only be parallel or coextensive with the lower edge **65**, thereby failing to produce a closed space having a positive area **75**.

In a dual lens system, there are two distinct lenses, or lens panes, as is well understood. In connection with single lens systems, the singular terms "eye pane" or "lens pane" herein will refer to precisely half of the area of the overall single lens. Thus, a single lens system will be deemed for the present purpose to be comprised precisely of two equal eye panes.

The extent of the indentation **27** can be characterized in terms of the ratio of the area **75** to the remaining area of the associated eye pane. For example, the area **75** of the concavity preferably is within the range of from about 1% to about 100% of the remaining area of the eye pane. Thus, in the latter instance, the area **75** is precisely the same as the area of the associated eye pane. Preferably, the area of the concavity will be within the range of about 1% to about 30% of the remaining area of the associated eye pane, and more preferably within the range of from about 3% or 4% to about 10% of the area of the associated eye pane.

An alternative way to characterize the indentation **27** in the lens of the present invention is by the depth d_3 thereof along an axis perpendicular to the axis of the imaginary straight line **73**. Since the indentation **27** by definition requires a distance between straight line **73** and the bottom edge **65** of the lens, the depth d_3 can be measured along a perpendicular line drawn between straight line **73** and at least some point along bottom edge **65**. Since the depth d_3 will vary across the length of the concavity, it is convenient to measure the maximum depth d_4 for each concavity. The maximum depth d_4 is the deepest part of the concavity measured by a line drawn perpendicularly to straight line **73**.

In a single concavity embodiment such as illustrated in FIG. **2**, the depth d_4 is generally within the range of from about 1/64 of an inch to about one inch. Preferably, the depth will be in the range of from about 1/32 inch to about ½ inch, and most preferably between about ¼ inch and about 3/16 inch, although in a design for applications where maximizing ventilation is deemed desirable, a minimum depth of at least about 3/16 inch will be used, and a minimum of at least about ¼ inch or even ⅜ inch may be desired.

The ventilation function will be maximized by a combination of factors, as will be understood by one of skill in the art in view of the teachings of this disclosure. For example, a lens with a relatively large vertical coverage of the face will tend to require a deeper d_4 dimension to achieve meaningful ventilation as compared to a relatively vertically narrow lens, the lower edge of which is already generally at or above the cheek bone. In a lens which has multiple concavities along the bottom edge of a single lens pane (FIG. **10**), the depth d_4 of each individual concavity **110**, **111**, **112** will generally be less than the depth d_4 of the concavity in a single concavity lens pane.

The precise geometric profile of the indented regions may vary, and where there are more than one indented region per eye pane, they need not repeat the same shape (see FIG. **10**).

In an embodiment where lower lens edge **65** defining the concave indentation **27** in the lens **20** has a curve of substantially constant radius throughout its arc length between low points **67** and **69**, the radius of curvature is preferably within the range of from about 1 to about 12 inches, or more preferably from about 1½ to about 6 inches.

and contained by the axis **98** (FIG. **6**) of the cylinder defined by the panes. The lens **20** has a horizontal length dimension L_1 (FIG. **4**) between the generally rearwardly extending distal ends **80** and **83** which measures in the range of from about 5 inches to about 7 inches. The lens is further characterized by a radius R_2, detailed infra.

In the preferred embodiment of the present invention, the lens pane, be it single or adapted for use in a dual lens system, is arcuately formed. For example, the embodiments depicted in FIGS. 4, 5 and 6 exhibit cylindrical curvature along the horizontal plane, preferably imparted from the molding process. Note that panes 30 and 35 and distal ends 80 and 83 wrap backwardly or rearwardly to extend in the paths of the wearer's peripheral fields of vision, without such abruptly changing curvature as would distort the light passing through the side wrapping portions of the panes.

FIG. 6 depicts a unitary lens of the present invention substantially conforming to the exterior surface of a cylinder 85. The benefits derived from a cylindrically shaped unitary lens are expounded in U.S. Pat. No. 4,859,048, which is incorporated herein by reference. Thus, one embodiment of the lens of the present invention is preferably provided with a substantially uniform curve, such that a line 87 (FIG. 6) drawn along the surface of the lens 20 in a circumferential direction defines an arc of substantially uniform radius 90. A line 99 drawn along the surface of the lens 20 in an axial direction is substantially parallel to the axis 98 of a cylinder 85.

Although a variety of radii might accrue the advantages of the present invention, the lens is preferably provided with a radius 90 within the range of from about 2½ to about 4½ inches, and preferably within the range of from about 3½ to 4 inches. The foregoing radius dimensions represent the distance from the axis 98 to the interior, concave surface of the lens.

The lens of the present invention may alternatively be curved along each of two substantially perpendicular axes to produce a lens, for example, which conforms to the surface of generally toroidal configuration. Thus, a cross-section of the lens taken along a horizontal plane (not illustrated) midway from the bottom edge 65 of the lens to the top edge 55 will reveal an arcuate cross-sectional configuration, characterized by a first radius dimension R_2 as shown in FIG. 7. Unlike the cylindrical lens, however, a vertical cross-section through the lens reveals a curvature from top edge 55 to bottom edge 65 characterized by a second radius dimension R_3, as shown in FIG. 8. Where R_2 equals R_3, the lens will conform to the surface of a sphere. Where R_2 is less than R_3, the lens will conform to the surface of a toroid. Such toroidal lenses are the subject of U.S. Pat. No. 4,867,550 which is incorporated herein by reference.

The lens of the present invention has sufficient thickness that it is not accurately defined as having only a single radius. Instead, referring to FIG. 5, the lens 20 has a thickness or depth dimension 93 along its entire arc length which causes the arc defined by the outer, convex surface 95 to have an additional radius R_1 to the radius R_2 defined by the inner, concave surface 97 of lens 20. In an embodiment where the lens is of substantially uniform thickness throughout, and the axes are coincident, the radius R_1 of the convex surface 95 is essentially equal to the sum of the radius R_2 of the concave surface 97 and the depth 93 of the lens.

In accordance with another embodiment of the present invention, there has been provided a unitary lens substantially as any of those described above, with one following modification. Referring to the horizontal sectional view illustrated in FIG. 5, there is disclosed a lens 20 defined between an outer convex surface 95, having a radius R_1, and an inner concave surface 97, having a radius R_2. The principal difference from the previously detailed embodiment is that the thickness of the lens 20 at each of the distal ends 80 and 83 is less than the average thickness of the lens at every point intermediate the two distal ends 80 and 83. In addition, the thickness of lens 20 measured at at least one point intermediate the two ends 80 and 83 is greater than the thickness at each of those ends.

The invention can best be understood by reference to FIG. 5, which illustrates the relationship between the lens thickness and angular position along the arc length of a lens. Since the arc length of a lens can be varied considerably, although it is preferably within the range of from about 5½ to 7 inches, reference points will arbitrarily be selected at the centerline 100 and at the 45° line 103. Since the distance from centerline 100 to reference line 103 is ⅛ of 360°, the reference arc length for a radius of 3 inches is about 4.7 inches, which is below the preferred range, thus defining a reference point on the lens.

In accordance with the tapered lens embodiment of the present invention, the thickness of the lens at reference line 103 is preferably from about 40% to about 99% of the thickness at centerline 100. Thus, for example, a lens having a centerline thickness 100 of about 0.060 inches will preferably have a thickness of within the range of about 0.024 to about 0.059 inches at reference line 103, and a thickness near the distal end 83 of the lens within the range of about 0.020 to about 0.055 inch. The thickness of the lens at the midpoint is preferably within the range of from about 0.055 to about 0.070 inch.

Preferably, the thickness of the lens tapers at a substantially even rate from the widest region which is centered about the centerline 100, to narrower regions near each of the distal ends 80 and 83. In this manner, optical distortion is minimized. By even rate it is meant that the taper results from the convergence of an arc defining the outer convex surface 95 of lens 20, and an arc defining the inner concave surface 97 of lens 20, each arc characterized by constant radii R_1 and R_2, respectively. Although the surfaces need not be perfectly uniform arcs, as in the previously discussed embodiment, conformation of the lens surface to a substantially constant radius curve accrues optical advantages. The foregoing may be accomplished in a variety of ways, such as, for example, by making radius R_1 equal to radius R_2 and displacing the center points from each other. Alternatively, radius R_1 may be greater or lesser than radius R_2, so long as the converging geometry results.

In the production lens, of course, the distal ends 80 and 83 are formed Well before the continuation of the arcs defining surfaces 95 and 97 converge. In a cylindrical lens produced in accordance with this embodiment, for example, and having a centerline thickness of approximately 0.060 inches, the thickness at a point proximate either distal end 80 or 83 will generally be within the range of from about 0.040 to about 0.055 inch.

Finally, since a portion of the lens 20 near the distal ends 80 and 83 serves primarily to block peripheral light and is likely outside of the wearer's direct line of vision, it is less important that the radius of curvature be constant in this area. Thus, the lens may be provided with a smooth taper only up to a certain transition point intermediate the reference line 103 in FIG. 5 and the distal end 83. From that transition point until the distal end 83, the lens 20 may be provided with a relatively constant thickness or a taper of a different rate.

Referring to FIG. 3, the lens of the present invention may be provided with a top frame **25** extending along and bounding the upper edge **55** of the lens, and secured by conventional means. Alternatively, the frame can bound the lower edge of the lens, the entire lens, or any other portion of the base as will be evident to those of skill in the art.

Preferably, the lens of the present invention is mounted in eyewear having no lower frame, thereby leaving the lower edge of the lens exposed. This reduces the weight and bulk of the eyewear, and allows maximization of ventilation through concavity **27**. At the same time, the vertical height of the lens can be minimized while still optimizing the vertical field of view without obstruction from the lower frame. The frame advantageously consists of any of a variety of relatively rigid, molded thermoplastic materials which are well known in the art, and may be transparent or dyed any of a variety of colors.

A nosepiece **105** may be provided, as illustrated in FIGS. **2** and **3**, which bounds the pane in the region of the nose opening **45**. The nosepiece **105** preferably comprises a relatively soft elastomeric material having a coefficient of sliding friction that increases when the material is wetted. Such a material is preferably hydrophilic, and tends to retain the eyewear in position on the wearer's upper nose area as the wearer perspires or encounters moisture as during skiing. Also, the preferred material is soft, for comfort. One such material is KRATON G, a product of Shell Oil Company.

Finally, referring to FIGS. **2**, **3** and **9**, eyewear embodying the lens of the present invention are provided with a pair of earstems **107**, **109**. Earstems **107**, **109** may be formed in the same manner as upper frame **25**. Earstems **107**, **109** may be pivotably secured to the lateral ends of an upper frame **25** (FIGS. **2** and **3**) or to a frame which also or alternatively bounds the lower edge of the lens (not illustrated). Earstems **107**, **109** may also be pivotably secured directly to the lens (FIG. **9**) without the use of a conventional frame.

Although this invention has been described in terms of certain preferred embodiments, other embodiments that are apparent to those of ordinary skill in the art are also within the scope of this invention. Accordingly, the scope of this invention is intended to be limited only by the appended claims.

What is claimed is:

1. An arcuately molded lens for eyeglasses for participation in active sports, such as biking and skiing, said lens comprising:

a top edge and a bottom edge, said bottom edge having a nose opening therein for mounting said lens on the nose of a wearer and for defining a right and a left lens region;

said lens having a bridge portion over said nose opening, the distance separating the lower edge of said bridge portion and the top edge of the lens being defined as d_1 and the distance separating the top edge of the lens and the lowest bottom edge of the lens being defined as d_2, wherein d1 is in the range of about ¼ inch to about 1μ inches, and d_2 is in the range of about 1¼ inches to about 3 inches;

said lens having an arcuate horizontal cross sectional configuration, wherein the arc length (L1) of said lens is in the range of from about five inches to about seven inches;

wherein the bottom edge of each of said right and left lens regions is concavely indented, open in the downward direction, with a maximum indentation depth of no less than about 1/16 of an inch.

2. An arcuately molded lens for eyeglasses as in claim **1**, wherein each of said concavely indented regions has a maximum depth within the range of from about 1/16 inch to about ½ inch.

3. An arcuately molded lens for eyeglasses as in claim **1**, wherein at least two concavely indented regions are provided in each of said right and left lens regions.

4. The lens of claim **1**, wherein the sum of the areas of the indentations in any one of said lens regions is between approximately **1%** and **50%** of the remaining area of said lens region.

5. An arcuately molded lens for eyeglasses as in claim **4**, wherein each of said concavely indented regions has a depth within the range of about 1/32 inch to about 1½ inches.

6. A pair of eyeglasses, comprising a right and left earstem pivotably attached to an arcuately molded lens, wherein said lens comprises a top edge and a bottom edge;

said bottom edge having a nose opening therein for mounting said lens on the nose of a wearer and for defining a right and a left lens region;

said lens having a bridge portion over said nose opening, the distance separating the lower edge of said bridge portion and the top edge of the lens being defined as d_1 and the distance separating te top edge of the lens and the lowermost bottom edge of the lens being defined as d_2, wherein d_1 is in the range of ¼ to about 1¾ inches, and d_2 is in the range of about 1¼ inches to about 3 inches,

said lens having an arcuate horizontal cross sectional configuration, wherein the arc length (11) of said lens if in the range of from about five inches to about seven inches,

wherein the bottom edge of each of said right and left lens regions is concavely indented, opnen in the downward direction, with a maximum indentation depth of no less than about 1/16 inch.

7. A pair of eyeglasses as in claim **6**, further comprising an upper frame, wherein said earstems are pivotably secured to said upper frame and said upper frame is secured to said lens.

8. A pair of eyeglasses as in claim **6**, further comprising an upper and a lower frame, wherein said earstems are pivotably secured to said upper frame and said upper frame is secured to said lens.

9. A pair of eyeglasses as in claim **6**, further comprising a frame which surrounds said lens, wherein said earstems are pivotably secured to said frame and said frame is secured to said lens.

10. A lens for eyeglasses, said lens being suitable for participation in active sports, such as biking and skiing, comprising:

an upper edge and a lower edge, said lower edge having a nose piece opening therein for mounting said lens on the nose of a wearer and for defining a right and a left lens region,

said lens having an arcuate horizontal cross sectional configuration in its molded condition,

said lens having an inner concave surface and an outer concave surface and a thickness there between,

wherein the lower edge of each of said right and left lens regions is provided with at least one indentation having a depth no less than about 1/16 inch,

thereby facilitating ventilation below and behind the lens.

11. The lens of claim 10, wherein said arcuate horizontal cross-sectional configuration of said lens is comprised of a central region and a first and second adjacent, distal regions, the thickness of said lens in at least one portion of each of said distal regions being less than the thickness of said lens in said central region.

12. The lens of claim 11, wherein the thickness of said lens at the midpoint of said central region tapers gradually to a reduced thickness in said distal regions.

13. The lens of claim 10, wherein the sum of the areas of said indentations in either of said left or right lens regions is between approximately 1% and 50% of the remaining area of said left of right lens region.

14. The lens of claim 13, wherein no more than one indentation is provided in each of said right and left lens regions.

15. The lens of claim 10, wherein said lens has an arcuate horizontal cross-sectional configuration in its molded condition which substantially conforms to the surface of a cylinder.

16. The lens of claim 15, wherein the radius from the axis of said cylinder to the inner concave surface of said lens is a substantially constant radius in the range of from about 2⅛ inches to about 4⅛ inches.

17. The lens of claim 10, wherein the radius of curvature of said lens along a horizontal plane is defined by R_2, the radius of curvature along a vertical plane through said lens has a radius defined by R_3, and wherein R_2 is equal to or less than R_3.

18. A lens as in claim 17, wherein R_2 is in the range of from about 2 inches to about 4 inches, and R_3 is greater than or equal to 1.10 R_2.

19. A pair of eyeglasses, comprising:

a lens having an upper edge and a lower edge,

said lower edge having a nose piece opening therein for mounting said lens on the nose of the wearer and for defining a right and left lens region,

said lens having an arcuate horizontal cross sectional configuration in its molded condition,

said lens having an inner concave surface and an outer concave surface and a thickness therebetween,

wherein the lower edge of each of said right and left lens regions is provided with at least one indentation having a depth no less than about 1/16 inch, thereby facilitating ventilation below and behind the lens; and

a right and a left earstem pivotably attached to the lens.

20. A pair of eyeglasses as in claim 19, further comprising an upper frame, wherein said earstems are pivotably secured to said upper frame and said upper frame is secured to said lens.

21. A pair of eyeglasses as in claim 19, further comprising a nose piece disposed in the nose piece opening formed on the lower edge of said lens.

22. A pair of eyeglasses as in claim 19, further comprising a frame which surrounds said lens, wherein said earstems are pivotably secured to said frame and said frame is secured to said lens.

23. An eyeglass lens of the type adapted to be used in a dual lens eyewear system suitable for participation in active sports, such as biking and skiing, said lens comprising a top edge and bottom edge wherein the bottom edge of said lens is indented upwardly to form at least one downward facing concavity for facilitating ventilation between the bottom edge of the lens and the face of a wearer when said lens is mounted on a frame to form a pair of eyeglasses.

24. An arcuately molded lens for eyeglasses comprising a top edge and a bottom edge, said bottom edge having a nose piece opening formed therein for mounting said lens on the nose of a wearer and for defining a right and a left lens region, the improvement comprising at least one concave ventilation indentation in the bottom edge of each of said right and left lens regions.

25. An arcuately molded lens for eyeglasses comprising a lens having a top edge and a bottom edge, said bottom edge having a nose piece opening formed therein for mounting said lens on the nose of a wearer and for defining a right and a left lens region, and wherein said lens has a bridge portion over said nose piece opening, the distance separating the lower edge of said bridge portion and the top edge of the lens being defined as d_1 and the distance separating the top edge of the lens and the bottom edge of the lens being defined as d_2, wherein D_1 is in the range of about 178 inch to 1⅜ inches, and d_2 is in the range of about 1½ inches to 2⅜ inches, and said lens has an arcuate cross-sectional configuration, wherein the arc length (L1) of said lens is in the range of from about 5½ inches to 7 inches, the improvement comprising at least one concave ventilation indentation in the bottom edge of each of said right and left lens regions.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,208,614
DATED : May 4, 1993
INVENTOR(S) : James H. Jannard

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 7, line 61, "about 1 * inches, and" should read "about 1-3/4 inches, and".

Column 8, line 29, "lowermost bottom edge" should read "lowest bottom edge".

Column 8, line 32, "of 1/4 to about" should read "of about 1/4 inch to about".

Column 8, line 36, "if in the range" should read "is in the range".

Column 9, line 16, "left of right lens region" should read "left or right lens region".

Column 9, line 39, "of the wearer" should read "of a wearer".

Column 10, line 42, "of about 178 inches" should read "of about 1/2 inch".

Signed and Sealed this

Nineteenth Day of April, 1994

Attest:

Attesting Officer

BRUCE LEHMAN

Commissioner of Patents and Trademarks

EXHIBIT 2 PAGE 11 OF 11

EXHIBIT 3

US005137342A

United States Patent [19]

Jannard et al.

[11] Patent Number: 5,137,342

[45] Date of Patent: * Aug. 11, 1992

[54] **EYEWEAR TRACTION DEVICE**

[75] Inventors: **James H. Jannard**, San Juan Capistrano; **Gregory F. Arnette**, South Laguna Beach, both of Calif.

[73] Assignee: **Oakley, Inc.**, Irvine, Calif.

[*] Notice: The portion of the term of this patent subsequent to Oct. 8, 2008 has been disclaimed.

[21] Appl. No.: **695,683**

[22] Filed: **May 3, 1991**

Related U.S. Application Data

[63] Continuation of Ser. No. 436,474, Nov. 20, 1989, Pat. No. 5,054,903.

[51] **Int. Cl.**[5] **G02S 5/14**

[52] **U.S. Cl.** **351/123**; 351/122; 351/111

[58] **Field of Search** 351/122, 123, 111, 119, 351/121

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,031,771	2/1935	Grier	351/123
2,561,402	7/1951	Nelson .	
2,949,638	8/1960	Butler .	
3,684,356	8/1972	Bates .	
3,741,635	6/1973	Wortman .	
4,074,932	2/1978	Thill	351/123
4,563,066	1/1986	Bononi .	
4,662,729	5/1987	Dobson .	
4,732,465	3/1988	Field .	
4,786,158	11/1988	Barfus-Shanks .	

FOREIGN PATENT DOCUMENTS

62-12123 1/1987 Japan .

Primary Examiner—Paul M. Dzierzynski
Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear

[57] **ABSTRACT**

In eyewear employing temples, a substantially cylindrical elastomeric traction member is disposed in a recessed seat which extends along a length of each temple to provide a contact area between the temple and the head. The traction member and seat may be sized so that the traction member is substantially flush with the adjacent temple or alternatively, the traction member may extend beyond the periphery of the temple. In either configuration, the traction device extends substantially parallel to the length of the temple.

32 Claims, 1 Drawing Sheet

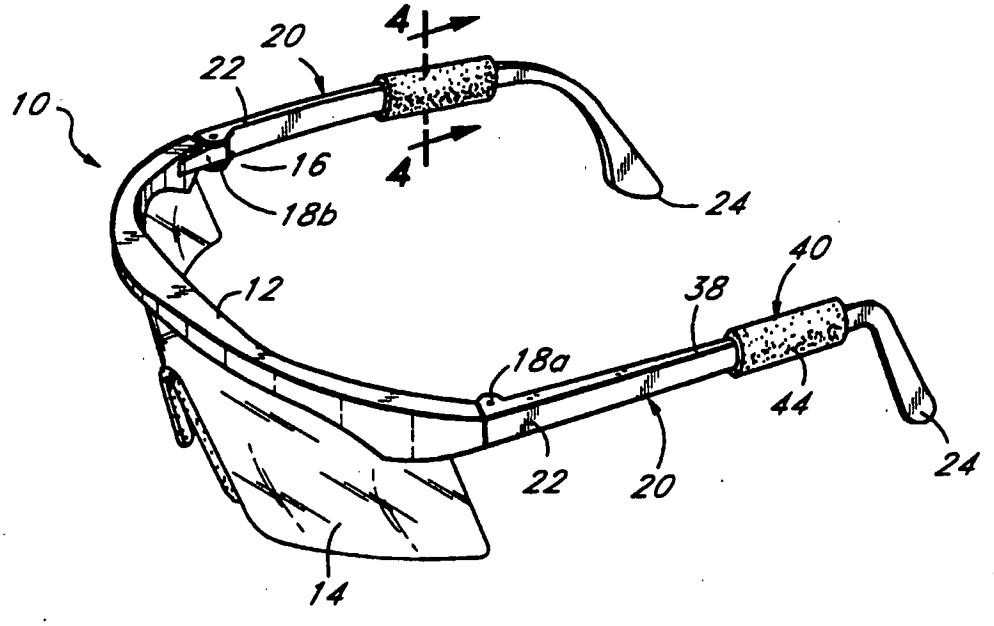


FIG. 1

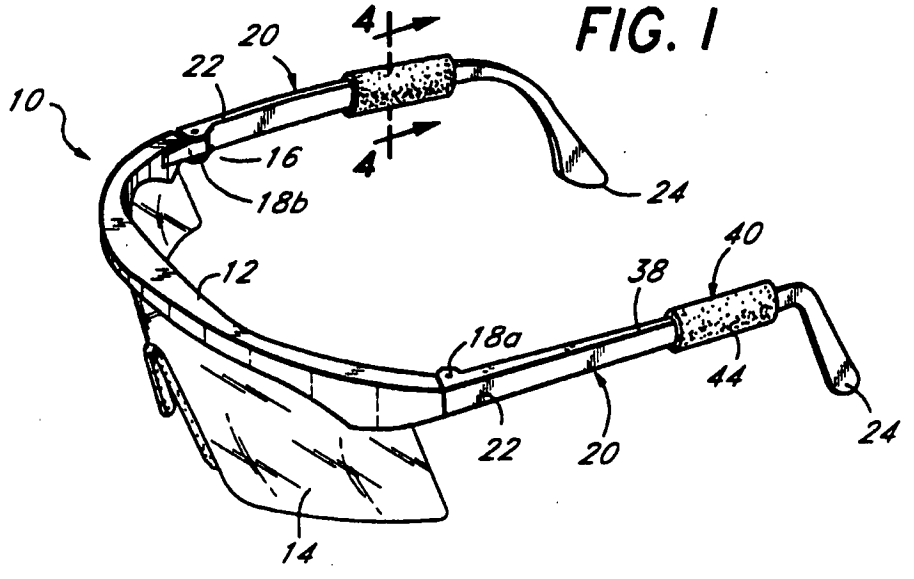
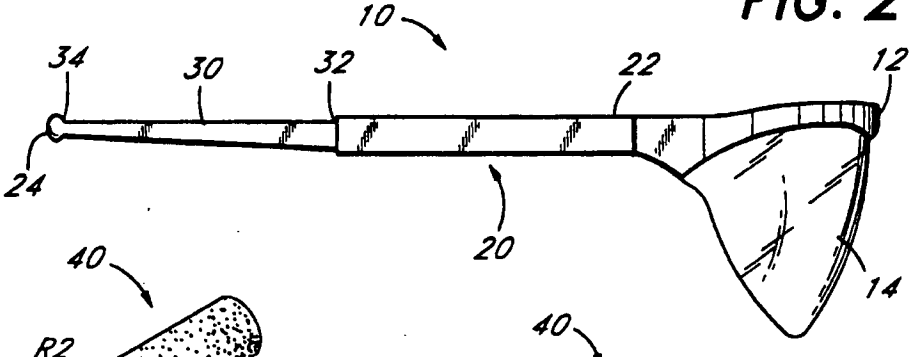


FIG. 2



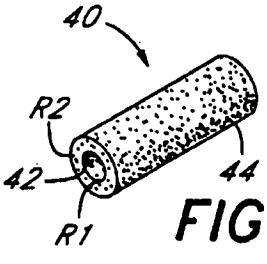


FIG. 3

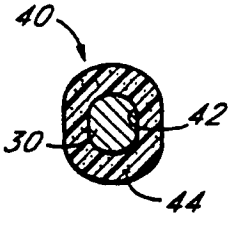


FIG. 4

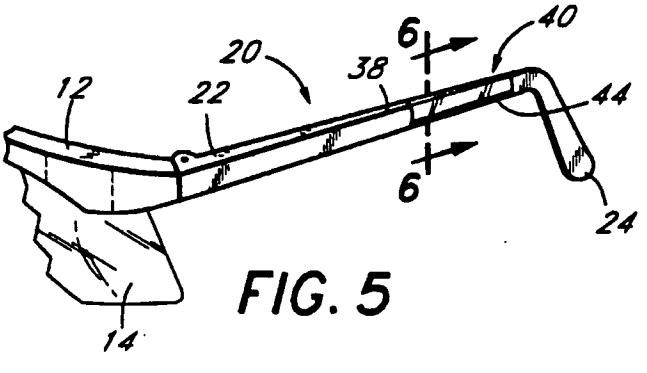
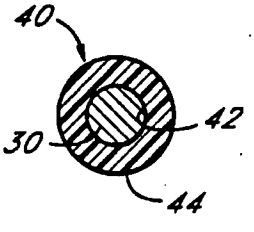


FIG. 5

FIG. 6



EYEWEAR TRACTION DEVICE

This application is a continuation of application Ser. No. 436,474 filed Nov. 20, 1989, now U.S. Pat. No. 5,054,90.

BACKGROUND OF THE INVENTION

The present invention relates to eyewear and, more particularly, to a selectively attachable traction device for improving the retention of the eyewear about the head and a method for using the same.

While corrective lenses are specifically crafted to accommodate the unique vision defects of an individual, the frames used to retain the lenses are typically a standard size and not crafted to conform to the particular contours of an individual's head. Lenses which are employed in filtering eyewear such as sunglasses are also typically retained in stock frames. However, it is virtually impossible to mass produce stock frames which fit every individual's head; therefore, stock frames are constructed to conform to an idealized "standard" adult head.

As a result, such frames often result in a fit which is either too tight or too loose about the head of an individual. A tight fitting frame may cause localized pain and headaches, while a loose fitting frame may allow the eyewear to fall from the head and damage the frame or the lens. This is particularly disadvantageous for protective eyewear such as sunglasses which are to be used in active sports, such as bicycle racing or skiing. Additionally, in the event that corrective lenses vary in weight between the lenses, the uneven weight distribution may cause frames to locally abrade the skin.

A variety of means have been employed to improve the securing of eyewear to the head. These devices have included the use of loose strings which connect the temples of the eyewear around the back of the wearer's head, thereby preventing the glasses from becoming completely displaced from the body. Alternatively, an elastic strap connecting the temples has been employed to engage the wearer's head and secure the eyewear in the desired position.

Perhaps most frequently used, temples have been provided with a hook at the posterior end for engaging the wearer behind the ears. However, due to the significant variation among individuals in the distance from the appropriate position of an eyeglass lens and the back of the ear, the traditional ear hook is frequently either too far back or too far forward of the appropriate position on the wearer's ear. This causes either a painful or irritating friction if the hook is too far forward, or a loose fit if too far back.

The prior attempts to improve the retention of eyewear about the wearer's head have also included the use of rubber or rubber-like plastic boots applied to the free ends of the temples for increasing the friction between the eyeglasses and the head, such as shown in Bates U.S. Pat. No. 3,684,356. The Bates device, however, appears somewhat clumsy and awkward and, therefore, detracts from the appearance of the eyewear. In addition, the Bates device is limited in that it may not be adjusted relative to the eyewear; that is, the closed end of the boot prevents forward adjustment to a more anterior point of contact between the temples and the head, while an unsupported length of boot extending beyond the earpiece is undesirable.

Another prior attempt to improve eyewear retention is disclosed in the Nelson patent (U.S. Pat. No. 2,561,402), which discloses use of relatively complicated fluid chambers at the interface of the free end of the temples and the head. Nelson uses the fluid chambers in an effort to evenly distribute pressure between the temple and the head. As the fluid chambers of Nelson are permanently affixed to the temple in a predetermined orientation, modification for specific individuals is unavailable. In addition, the fluid retained within the chambers adds an undesired weight to the eyewear. Further, even if the fluid chambers were removable, such removal would substantially alter the fit of the eyewear, rendering the eyewear substantially unwearable.

Notwithstanding the foregoing, there remains a need for providing a means of improving the compatibility of eyewear and the wearer so as to improve retention of the eyewear. Preferably, the eyewear retention means will enable one size to comfortably and securely fit a much larger population than can one size eyewear having the traditional ear hook.

A need also exists for a device which improves retention of eyewear without permanently altering the configuration of the eyewear. A further need exists for a retaining device which may be easily disengaged or recombined with the eyewear without drastically changing the functioning or the appearance of the eyewear. In addition to the functional requirements of the traction device, an aesthetic requirement exists so that the device may be employed as a portion of eye wear in either an unobtrusive or distinctive, but attractive, mode.

SUMMARY OF THE INVENTION

There is provided in accordance with one aspect of the present invention an improved eyewear temple of the type for retaining a pair of eyeglasses on the head of the wearer, by extending from the eyeglass frame in a posterior, i.e., distal, direction over the top of the ears of the wearer. The improved eyeglass temple of the present invention permits the elimination of the traditional hook on the posterior end of traditional temples, and allows a single size set of eyewear temples to comfortably and securely fit on a broader cross section of anatomical variations.

The eyeglass temple comprises an elongate eyeglass temple body, having a first proximal end for attaching the temple to the frame of the eyeglasses, and a second end, distal from the first end, for engaging the head of the wearer. Optionally, the first end of the temple is adapted for securing directly to the lens, such as in a single lens eyeglass system. Preferably, the first end on the temple is provided with a means for releasably pivotably engaging the eyeglass lens or eyeglass frame.

A recessed seat is disposed on the elongate temple body, in between the first and second ends, the recessed seat having a smaller cross-sectional area than the cross-sectional area of the temple body adjacent to the seat. Preferably, the recessed seat comprises an annular recess having first and second shoulders at the first and second axial ends thereof. Preferably, the axial length of the annular recess is less than about one-half of the axial length of the temple, and most preferably, less than about one-third the axial length of the temple.

The eyeglass temple is preferably additionally provided with at least one tubular traction member disposed within the recessed seat. The traction member

preferably comprises an elastomeric material which enables radial expansion to fit over the distal end of the temple body, and relaxation back to provide a snug fit within the recess on the temple. The traction member is preferably made from an elastomeric material which exhibits improved retention properties when the material is wet, and, most preferably, the exterior surface of the traction member is provided with friction enhancing structures, such as annular ridges or other patterned textures.

There is provided in accordance with another aspect of the present invention, an improved eyeglass having at least one lens, and a frame for supporting the lens in front of the eyes of the wearer. The eyeglass is further provided with a first and a second temple produced in accordance with the present invention. Preferably, the distal end of the temple is substantially straight, so that the temple does not wrap around behind the ear of the wearer.

Further features and advantages of the present invention will become apparent from the detailed description of preferred embodiments which follow, when taken together with the appended figures and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of eyewear in accordance with one embodiment of the present invention.

FIG. **2** is a side elevational view of a second embodiment of eyewear in accordance with the present invention, with the traction member removed.

FIG. **3** is a perspective view of a traction member in accordance with the present invention.

FIG. **4** is a cross-sectional view taken along line **4**—**4** of FIG. **1**.

FIG. **5** is a perspective view showing an alternative embodiment of the traction member.

FIG. **6** is a cross-sectional view taken along line **6**—**6** of FIG. **5**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As used in the present application, "eyewear" is a general term intended to embrace optical devices containing corrective lenses for defects in vision or lenses for such special purposes as filters for absorbing or blocking portions of the electromagnetic spectrum, providing physical shields for the eyes or making available other physical or optical functions for protective or visual assisting purposes.

As shown in FIG. **1**, eyewear **10** adapted to position a lens in a predetermined orientation relative to the eyes includes a frame **12**, lens **14** and temples **20**. Preferably, the lens **14** is joined to the frame **12** so as to position the lens **14** before the eyes. As shown in FIGS. **1**, **2** and **6**, the temples **20** may be pivotally affixed or joined to the frame **12**. Although the temples **20** are shown in FIG. **1** as pivotally affixed to the frame **12**, the temples **20** may be permanently attached in a predetermined orientation or selectively engageable with the frame **12** without circumventing the scope of the present invention. Alternatively, the frame **12** may be eliminated entirely by securing the temples **20** with or without temple hinges directly to the lens **14** by thermoplastic bonding, adhesives screws or other known fastening means which are suitable for the material of the lens and temples.

As is well known in the art, the frame **12** and temples **20** may be conveniently made of molded plastic or a variety of other materials. The lens **14** may take any of a number of configurations and may be formed of sheet plastic, molded plastic or glass as determined by the application of the lens.

Each temple **20** is defined by a proximal end **22** and a distal end **24** wherein the proximal end **22** is affixed either permanently or detachably to the frame **12**. The permanent attachment of the temples to the frame **12** may be accomplished through molding or thermoplastic bonding. The detachable engagement of the temples **20** and the frame **12** is provided by the use of a snap fit or fasteners including screws or pins, as are known in the art.

Although the earstems shown in FIG. **1** are affixed to the frame **12**, the earstem **20** may be attached directly to the lens **14**. Preferably, the earstems **20** are hingeably attached to the frame **12** or lens **14** and most preferably, hingeably and removably attached, as well known in the art.

As shown in FIG. **1**, in a typical hingeable connection, the frame **12** or lens **14** includes a hinge aperture (not illustrated) extending through a protruding flange **16**. The earstem **20** includes a pair of parallel apertured flanges **18***a*, **18***b* spaced so as to receive the flange **16** of the frame **12** or lens **14** therebetween. The apertures in the earstem **20** are aligned with the apertures of the frame **12** or lens **14** and a pin is inserted so as to permit rotation of the frame **12** or lens **14** relative to the earstem **20**, thereby providing a hingeable connection. In a typically readily detachable hinge, the aperture in the flange **16** of the frame **12** or lens **14** is replaced by an integral pin (not illustrated) which extends away from the flange **16** in opposite directions along the same axis as the aperture. The pinned flange **16** is inserted by deformation between the opposing flanges **18***a*, **18***b* and the integral pin snaps into the aperture on the flanges **18***a*, **18***b*, thereby providing a readily detachable hinge.

As shown in FIGS. **1** and **5**, the distal end **24** may be curved so as to provide loops which are disposed behind the ears when the eyewear is worn. However, as the looped temples shown in FIGS. **1** and **5** may impinge upon the head in undesired locations when employed on heads of different sizes, the looped temples are not well suited to accommodate a wide variety of head sizes. Thus, the preferred embodiment shown in FIG. **2** includes a straight temple which, when used in conjunction with the present invention, provides more universally fitting eyewear and eliminates the traditional ear hook which can cause discomfort or distraction for many wearers.

As shown in FIG. **2**, a recessed seat **30** is disposed intermediate of the proximal and distal ends **22**, **24**. As shown in FIG. **2**, the seat **30** is preferably located adjacent the distal end **24** of the temple **20**, so that the posterior shoulder **34** is substantially coincident with the distal end **24**. However, as will be apparent, if it is desired to extend the temples in a posterior direction well beyond the ears, the distance between posterior shoulder **34** and distal end **24** can be proportionately increased to maintain seat **30** near the ear.

The recessed seat **30** is defined by posterior shoulder **34** and preferably an anterior shoulder **32**, such that the anterior shoulder **32** is disposed between the posterior shoulder **34** and the proximal end **22**. Preferably the cross-sectional dimension of the seat **30** between the anterior and posterior shoulders **32**, **34** is smaller than the cross-sectional dimension of the adjacent temple **20**.

Preferably, the posterior should **34** is a sufficient distance from the anterior shoulder **32** so that at least

one traction member 40 may be retained therebetween. However, the seat 30 may be configured so as to extend substantially the entire length of the temple or alternatively, may extend only a portion of the overall length of the temple. Typically, the seat extends less than about one-half or one-third the length of the temple and is disposed on the posterior portion of the temple.

Although the seat is shown as defined by an anterior shoulder 32 and a posterior shoulder 34, the present invention may be practiced with a seat 30 defined only by a posterior shoulder 34 for preventing unintended axial displacement of the traction member in the posterior direction.

When the seat 30 is defined by only the posterior shoulder 34, the cross-sectional area of the seat may taper from being substantially coincident with an anterior cross-sectional area of the temple to the reduced cross-sectional area at the posterior shoulder 34. The posterior shoulder thereby prevents unintentional axial displacement of the traction member in the posterior direction. Axial displacement of the traction member in the anterior direction is inhibited by the expanding cross-sectional area of the seat in a tapered embodiment, as the seat extends in the anterior direction, or simply by a friction fit in the absence of a taper or an anterior shoulder.

Preferably, the seat 30 is located so that upon operable engagement of the traction member 40 within the seat 30, the traction member 40 provides an interface between the eyewear and the head. That is, the traction member 40 contacts the head.

Referring to FIG. 3, an elongate tubular traction member 40 is shown. In the preferred embodiment, the traction member 40 is formed substantially in the shape of a hollow cylinder having an inner surface 42 of radius R1 and outer surface 44 of radius R2, wherein radius R1 is less than radius R2. Preferably, radius R1 is expandable to permit passage of the distal end 24 of the temple 20 through the interior of the traction member 40 without exceeding the elastic limits of deformation of the traction member 40.

As shown in FIG. 4, the traction member 40 is preferably comprised of a material having sufficient elasticity that the inner surface 42 of the traction member 40 snugly contacts the surface of a seat 30 having an oblong or rectangular cross-section with a cross-sectional area greater than that of R1 in the unexpanded state. Referring to FIG. 6, the inner surface 42 will also preferably conform snugly to the surface of a seat 30 having a substantially circular cross-section.

Other embodiments of the traction member 40 may be employed, such as one having an open rectangular or triangular cross-sectional configuration having a bias so that the open legs of the triangle or rectangle are biased towards one another to tend to form a tubular element. Thus, traction devices can take the form of an elongate body which is split axially along one wall so that it does not form a complete tube. The bias should be sufficient so that the opposing inner surfaces 42 of the traction member 40 cooperatively engage the periphery of the recessed seat 30.

The traction member 40 may be formed by molding or extruding processes, as well known in the art. Preferably, the outer surface 42 is configured to enhance the coefficient of static friction between the eyewear and the head. The outer surface 44 may be formed to exhibit a variety of static friction coefficient enhancing configurations, such as a grid, waffle, or ribbed pattern (not shown). Typically, the outer surface 42 produced by extrusion will exhibit axially oriented patterns, while molded outer surfaces may exhibit axially and/or radially oriented patterns.

As discussed infra, the traction member 40 is preferably formed of an elastomeric material exhibiting sufficient flexibility or elasticity to allow the traction member 40 to expand while being slipped over the temple distal end 24 and to contract back within seat 30 after passing over the distal end.

In a particularly preferred embodiment, the traction member 40 is formed of a relatively soft elastomeric material having a coefficient of sliding friction that increases when the material is wetted. Such a material, sometimes referred to as hydrophilic, tends to enhance retention of the traction member 40 in position on the wearer's head as the wearer perspires or encounters moisture, as during skiing. One suitable material which can be readily molded by conventional techniques is marketed under the name KROTON G TM, a product of the Shell Oil Company.

The traction member 40 may comprise a resilient sponge-like elastomeric material, having a relatively high porosity, as shown in FIGS. 3 and 4. Alternatively, as shown in FIG. 6, the traction member 40 may comprise a substantially solid, i.e., fine or no porosity, yet flexible material. In addition, the traction member 40 may be made of materials having different densities, thereby providing traction members 40 having different weights, which may be employed to counterbalance lenses of differing weights, so as to distribute the weight of the eyewear 10 more evenly about the head.

The length of the traction member 40 is preferably no greater than and most preferably substantially equal to the distance between the anterior and posterior shoulders 32, 34. Although the traction member 40 is illustrated as extending roughly one-third or one-half the overall length of the temple, the traction members 40 within the present invention can extend anywhere from substantially the entire length of the temple 20 to only a relatively small portion thereof, as depending upon the configuration of the seat 30. Alternatively, a plurality of traction members 40 may be axially aligned within the seat 30. The traction members 40 may be selected so that a combined length of the members 40 substantially equals the distance between the anterior and the posterior shoulders 32, 34 or alternatively, the combined axial length of the members 40 may be such that an axial space separates adjacent traction members 40 within the seat.

In assembling the present invention, the traction member 40 is engaged with a temple 20 by passing the distal end 24 of the temple 20 through the tubular passageway within traction member 40. Alternatively, the temple 20 may be detached from the frame 12 or lens 14 and the proximal end 22 may be passed through the tubular passageway of the traction member 40. Therefore, the preferred construction of the traction member 40 which elastically passes over the distal end may be obviated. The traction member 40 is then moved along the temple 20 until the inner surface 42 engages the seat 30. In an embodiment in which the seat 30 has a length substantially equal to the length of the traction member 40, as the traction member 40 is received within the seat 30, further unintended motion along the temple 20 is prevented by engagement of the anterior and posterior shoulders 32, 34 with the traction member 40.

Alternatively, the seat **30** may have a sufficient axial length so as to retain a plurality of traction members **40** between the anterior and posterior shoulders **32, 34**. The use of multiple traction members **40** allows for accommodating fashion considerations as well as high retaining forces for active uses, such as volleyball or basketball. Upon engagement of the traction member **40** within the seat **30**, the outer surface **44** of the traction member **40** may be disposed outside of the periphery of the temple **20**, as shown in FIG. **1** or, alternatively, may be substantially flush with the periphery **38** of the adjacent temple **20**, as shown in FIG. **5**. Traction members are preferably provided having a variety of wall thicknesses, i.e., the difference between R1 and R2. Thus, the wearer can select a flush fitting traction member as illustrated in FIG. **5** or a radially enlarged traction member as illustrated in FIG. **1**, depending upon that wearer's perception of the need for enhanced traction or sleek appearance.

As the majority of the length of the temple **20** in the preferred embodiment is dominated by the periphery of the temple **20** rather than the seat **30**, if the traction members **40** are removed from the temples **20**, the fitting of the eyewear **10** will not be substantially denigrated. However, the length of the traction member **40**, when engaged in the seat **30**, provides a sufficient contact area to increase the resistance to movement of the eyewear **10** relative to the head.

This present invention has been described in detail in connection with the preferred embodiments, but these are examples only and the present invention is not restricted thereto. It will be easily understood by those skilled in the art that other variations and modifications can be easily made within the scope of this invention, which is defined by the following claims.

It is claimed:

1. Improved eyewear, comprising:

at least one temple piece having a recessed seat along a length thereof such that the seat defines a periphery which is smaller than the periphery of the adjacent temple portion, said seat having an axial length of less than about one-half the axial length of the temple; and

at least one substantially tubular traction member disposed within the recessed seat having an inner surface, an outer surface, and a central passageway running axially therethrough, said inner surface removably engaging the periphery of the seat, and said outer surface adapted to provide a contact surface with the head of the wearer.

2. Improved eyewear, comprising:

a frame;

at least one temple having proximal and distal ends and being joined to the frame at the proximal end thereof, having a recessed seat interposed between said proximal and distal ends, said seat having a smaller cross-sectional area than the cross-sectional area of said temple portion adjacent said seat, and said seat having an axial length of less than about one-half of the axial length of the temple; and

a substantially tubular elastomeric traction member having an inner surface and an outer surface, such that the inner surface is adapted to circmferentially contact the temple, and the outer surface is adapted to engage the head of a wearer, wherein the traction member is disposed in the recessed seat region on the temple.

3. An improved eyewear temple for retaining eyeglasses on the head of the wearer and reducing abrasion caused by movement of said eyewear, comprising:

an elongate eyewear temple body;

a first end on the temple for attaching the temple to the frame of the eyeglasses;

a second end on the temple, distal said first end, for engaging the head of the wearer; and

a recessed seat interposed between said first and second ends having a smaller cross-sectional area than that of said temple portion adjacent said seat, said seat being separated from the remainder of said temple by first and second shoulders, such that the axial length of the recessed seat between the first and second shoulders is less than about one-half of the axial length of the temple, said recessed seat being situated toward the distal end of the temple such that at least one substantially tubular traction member removably disposed within the recessed seat can engage the head of the wearer.

4. An eyewear temple as in claim **3**, wherein at least one substantially tubular traction member is disposed within the recessed seat between the first and second shoulders, said member having an inner surface, an outer surface, and a central passageway running axially therethrough, said inner surface removably engaging the periphery of the seat, and said outer surface adapted to provide a contact surface with the head of the wearer.

5. An eyewear temple as in claim **4**, wherein the tubular traction member comprises a resilient elastomeric material.

6. An improved eyewear temple as in claim **5**, wherein said elastomeric material exhibits a coefficient of sliding friction that increases when the material is wetted.

7. An eyewear temple as in claim **5**, wherein the thickness of the traction member is such that the outer surface of the traction member is substantially flush with the periphery of the adjacent portion of the temple.

8. An eyewear temple as in claim **7**, wherein the outer cross-sectional shape of the traction member approximates the outer cross-sectional shape of the adjacent portion of the temple.

9. An eyewear temple as in claim **5**, wherein the traction member extends radially outward beyond the surface of the adjacent portion of the temple.

10. An eyewear temple as in claim **5**, wherein at least one tubular traction member disposed within the recessed seat extends substantially the entire distance between said first and second shoulders of the temple.

11. An eyewear temple as in claim **5**, wherein the traction member is removable and comprises a hollow, elastomeric member adapted to allow elastic radial expansion for sliding over the distal end of said temples and into engagement with said recessed seat.

12. An eyewear temple as in claim **3**, wherein the shoulders extend substantially perpendicularly from the seat.

13. An eyewear temple as in claim **3**, wherein the recessed seat consists of a tapering that extends axially and radially from the distal end of the recessed seat to the proximal end, wherein the cross-sectional area of the seat tapers from the smaller periphery at the distal end to being substantially coincident with the cross-sectional area of the temple at the proximal end of the recessed seat.

14. An eyewear temple as in claim 3, wherein the axial length of the recessed seat extends no more than about one-third the length of the temple.

15. An eyewear temple as in claim 3 further comprising an attachment means on the first end thereof for pivotably removably attaching the temple to an eyeglass frame.

16. An improved eyewear temple for retaining eyeglasses on the head of the wearer and reducing abrasion caused by movement of said eyewear, comprising:

an elongate eyewear temple body, wherein the body is substantially linear through the axial length of the temple;

a first end on the temple for attaching the temple to the frame of the eyeglasses;

a second end on the temple, distal said first end, for engaging the head of the wearer;

a recessed seat interposed between said first and second ends having a smaller cross-sectional area than that of said temple portion adjacent said seat, said seat being separated from the remainder of said temple by first and second shoulders; and

at least one tubular traction member disposed within the recessed seat.

17. An eyewear temple as in claim 16, wherein at least one substantially tubular traction member is disposed within the recessed seat between the first and second shoulders, said member having in inner surface, an outer surface, and a central passageway running axially therethrough, said inner surface removably engaging the periphery of the seat, and said outer surface adapted to provide a contact surface with the head of the wearer.

18. An eyewear temple as in claim 17, wherein the tubular traction member comprises a resilient elastomeric material.

19. An improved eyewear temple as in claim 18, wherein said elastomeric material exhibits a coefficient of sliding friction that increases when the material is wetted.

20. An eyewear temple as in claim 18, wherein the thickness of the traction member is such that the outer surface of the traction member is substantially flush with the periphery of the adjacent portion of the temple.

21. An eyewear temple as in claim 20, wherein the outer cross-sectional shape of the traction member approximates the outer cross-sectional shape of the adjacent portion of the temple.

22. An eyewear temple as in claim 18, wherein the traction member extends radially outward beyond the surface of the adjacent portion of the temple.

23. An eyewear temple as in claim 16, wherein the shoulders extend substantially perpendicularly from the seat.

24. An eyewear temple as in claim 16, wherein the recessed seat consists of a tapering that extends axially and radially from the distal end of the recessed seat to the proximal end, wherein the cross-sectional area of the seat tapers from the smaller periphery at the distal end to being substantially coincident with the cross-sectional area of the temple at the proximal end of the recessed seat.

25. An eyewear temple as in claim 16, wherein the axial length of the recessed seat extends no more than about one-third the length of the temple.

26. An eyewear temple as in claim 16, wherein the axial length of the recessed seat extends no more than about one-half the length of the temple.

27. An eyewear temple as in claim 16, wherein at least one tubular traction member disposed within the recessed seat extends substantially the entire distance between said first and second shoulders of the temple.

28. An eyewear temple as in claim 16, wherein the traction member is removable and comprises a hollow, elastomeric member adapted to allow elastic radial expansion for sliding over the distal end of said temples and into engagement with said recessed seat.

29. An eyewear temple as in claim 16, further comprising an attachment means on the first end thereof for pivotably removably attaching the temple to an eyeglass frame.

30. Improved eyewear, comprising:

at least one temple piece being substantially linear throughout the axial length of the temple and having a recessed seat along a length thereof such that the seat defines a periphery which is smaller than the periphery of the adjacent temple portion; and

at least one substantially tubular traction member disposed within the recessed seat having an inner surface, an outer surface, and a central passageway running axially therethrough said inner surface removably engaging the periphery of the seat, and said outer surface adapted to provide a contact surface with the head of the wearer.

31. Improved eyewear, comprising:

a frame;

at least one temple having proximal and distal ends and being joined to the frame at the proximal end thereof, said temple being substantially linear throughout the axial length of the temple, said temple having a recessed seat interposed between said proximal and distal ends, said seat having a smaller cross-sectional area than that of said temple portion adjacent said seat; and

a substantially tubular elastomeric traction member having an inner surface and an outer surface, such that the inner surface is adapted to circumferentially contact the temple, and the outer surface is adapted to engage the head of a wearer, wherein the traction member is disposed in the recessed seat region on the temple.

32. Improved eyewear having a lens, a frame supporting said lens for positioning the lens before the eyes of a wearer, and first and second temples for securing said eyewear to the head of the wearer, said temples having a proximal end joined to said frame and a distal end spaced from said proximal end, the improvement comprising:

said first and second temples being substantially linear throughout the axial length of the temple member, said temples having disposed between said proximal and distal ends a radially recessed seat having a smaller cross-sectional area than that of said temple portion adjacent said seat; and

at least one traction member releasably secured on said first and second temples within the seat, whereby said traction member frictionally engages the wearer's head.

* * * * *

EXHIBIT 4

United States Patent [19]

Jannard et al.

[11] **Patent Number: 5,054,903**

[45] **Date of Patent: Oct. 8, 1991**

[54] **EYEWEAR TRACTION DEVICE**

[75] Inventors: **James H. Jannard**, San Juan Capistrano; **Gregory F. Arnette**, South Laguna Beach, both of Calif.

[73] Assignee: **Oakley, Inc.**, Irvine, Calif.

[21] Appl. No.: **436,474**

[22] Filed: **Nov. 20, 1989**

[51] **Int. Cl.**[5] **G02C 5/14**

[52] **U.S. Cl.** **351/123**; 351/111; 351/122

[58] **Field of Search** 351/122, 123, 111, 119, 351/121

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,031,771	2/1936	Grier	351/123
2,561,402	7/1951	Nelson .	
2,949,638	8/1960	Butler .	
3,684,356	8/1972	Bates .	
3,741,635	6/1973	Wortman .	
4,074,932	2/1986	Bononi .	
4,563,066	1/1986	Bononi .	
4,662,729	5/1987	Dobson .	
4,732,465	3/1988	Field .	
4,786,158	11/1988	Barfus-Shanks .	

FOREIGN PATENT DOCUMENTS

6212123	1/1987	Japan .

Primary Examiner—Paul M. Dzierzynski

Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear

[57] **ABSTRACT**

In eyewear employing temples, a substantially cylindrical elastomeric traction member is disposed in a recessed seat which extends along a length of each temple to provide a contact area between the temple and the head. The traction member and seat may be sized so that the traction member is substantially flush with the adjacent temple or alternatively, the traction member may extend beyond the periphery of the temple. In either configuration, the traction device extends substantially parallel to the length of the temple.

9 Claims, 1 Drawing Sheet

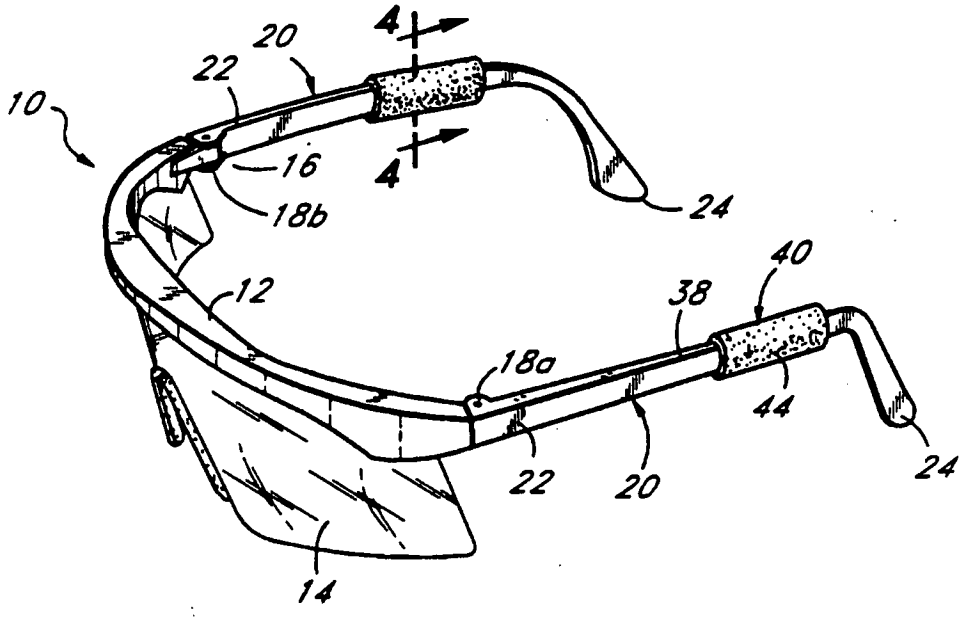


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FIG. 1

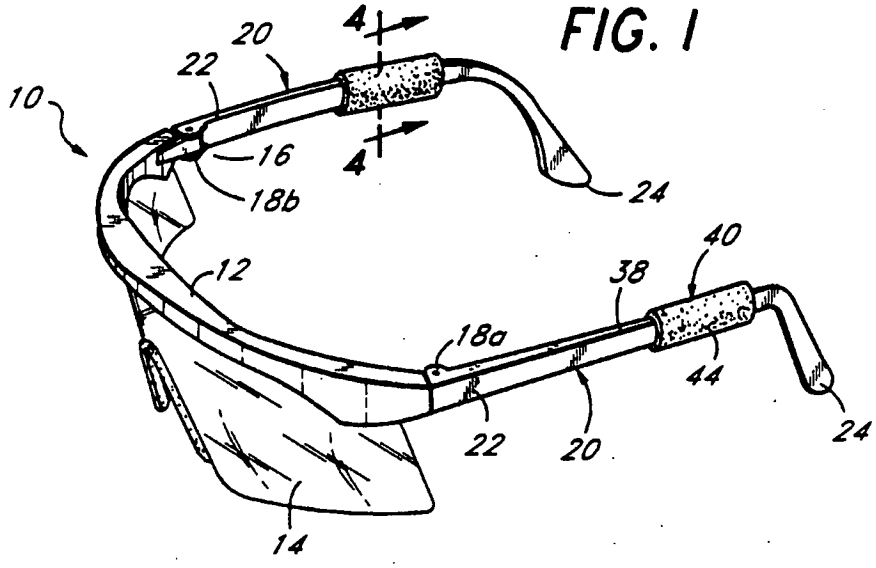
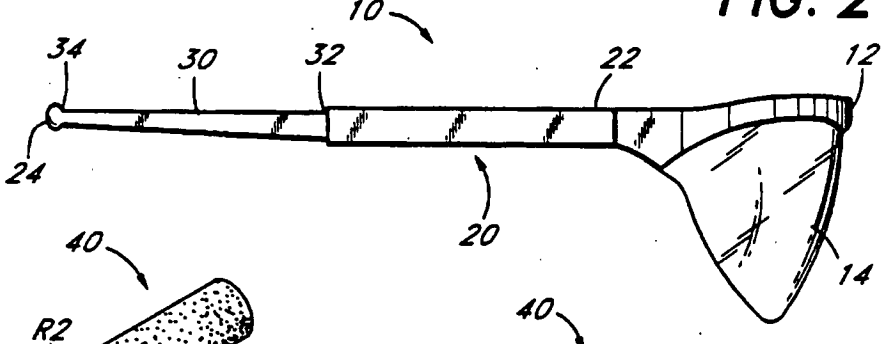


FIG. 2



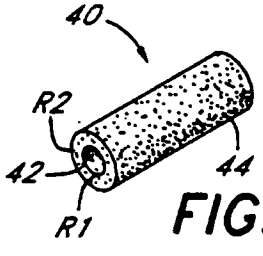


FIG. 3

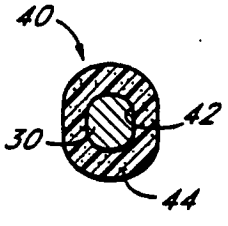


FIG. 4

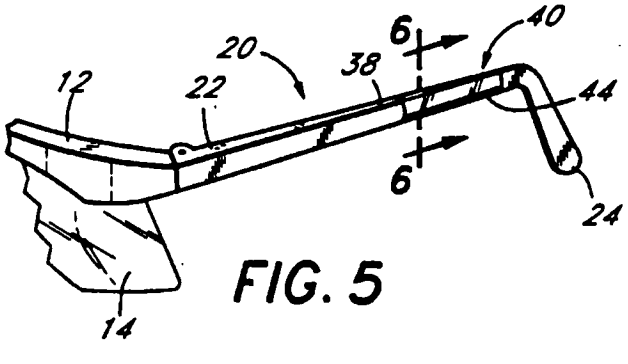
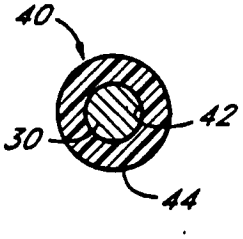


FIG. 5

FIG. 6



EYEWEAR TRACTION DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to eyewear and, more particularly, to a selectively attachable traction device for improving the retention of the eyewear about the head and a method for using the same.

While corrective lenses are specifically crafted to accommodate the unique vision defects of an individual, the frames used to retain the lenses are typically a standard size and not crafted to conform to the particular contours of an individual's head. Lenses which are employed in filtering eyewear such as sunglasses are also typically retained in stock frames. However, it is virtually impossible to mass produce stock frames which fit every individual's head; therefore, stock frames are constructed to conform to an idealized "standard" adult head.

As a result, such frames often result in a fit which is either too tight or too loose about the head of an individual. A tight fitting frame may cause localized pain and headaches, while a loose fitting frame may allow the eyewear to fall from the head and damage the frame or the lens. This is particularly disadvantageous for protective eyewear such as sunglasses which are to be used in active sports, such as bicycle racing or skiing. Additionally, in the event that corrective lenses vary in weight between the lenses, the uneven weight distribution may cause frames to locally abrade the skin.

A variety of means have been employed to improve the securing of eyewear to the head. These devices have included the use of loose strings which connect the temples of the eyewear around the back of the wearer's head, thereby preventing the glasses from becoming completely displaced from the body. Alternatively, an elastic strap connecting the temples has been employed to engage the wearer's head and secure the eyewear in the desired position.

Perhaps most frequently used, temples have been with a hook at the posterior end for engaging the wearer behind the ears. However, due to the significant variation among individuals in the distance from the appropriate position of an eyeglass lens and the back of the ear, the traditional ear hook is frequently either too far back or too far forward of the appropriate position on the wearer's ear. This causes either a painful or irritating friction if the hook is too far forward, or a loose fit if too far back.

The prior attempts to improve the retention of eyewear about the wearer's head have also included the use of rubber or rubber-like plastic boots applied to the free ends of the temples for increasing the friction between the eyeglasses and the head, such as shown in U.S. Pat. No. 3,684,356 to Bates. The Bates device, however, appears somewhat clumsy and awkward and, therefore, detracts from the appearance of the eyewear. In addition, the Bates device is limited in that it may not be adjusted relative to the eyewear; that is, the closed end of the boot prevents forward adjustment to a more anterior point of contact between the temples and the head, while an unsupported length of boot extending beyond the earpiece is undesirable.

Another prior attempt to improve eyewear retention is disclosed in the Nelson patent (U.S. Pat. No. 2,561,402), which discloses use of relatively complicated fluid chambers at the interface of the free end of the temples and the head. Nelson uses the fluid chambers in an effort to evenly distribute pressure between the temple and the head. As the fluid chambers of Nelson are permanently affixed to the temple in a predetermined orientation, modification for specific individuals is unavailable. In addition, the fluid retained within the chambers adds an undesired weight to the eyewear. Further, even if the fluid chambers were removable, such removal would substantially alter the fit of the eyewear, rendering the eyewear substantially unwearable.

Notwithstanding the foregoing, there remains a need for providing a means of improving the compatibility of eyewear and the wearer so as to improve retention of the eyewear. Preferably, the eyewear retention means will enable one size to comfortably and securely fit a much larger population than can one size eyewear having the traditional ear hook.

A need also exists for a device which improves retention of eyewear without permanently altering the configuration of the eyewear. A further need exists for a retaining device which may be easily disengaged or recombined with the eyewear without drastically changing the functioning or the appearance of the eyewear. In addition to the functional requirements of the traction device, an aesthetic requirement exists so that the device may be employed as a portion of eye wear in either an unobtrusive or distinctive, but attractive, mode.

SUMMARY OF THE INVENTION

There is provided in accordance with one aspect of the present invention an improved eyewear temple of the type for retaining a pair of eyeglasses on the head of the wearer, by extending from the eyeglass frame in a posterior, i.e., distal, direction over the top of the ears of the wearer. The improved eyeglass temple of the present invention permits the elimination of the traditional hook on the posterior end of traditional temples, and allows a single size set of eyewear temples to comfortably and securely fit on a broader cross section of anatomical variations.

The eyeglass temple comprises an elongate eyeglass temple body, having a first proximal end for attaching the temple to the frame of the eyeglasses, and a second end, distal from the first end, for engaging the head of the wearer. Optionally, the first end of the temple is adapted for securing directly to the lens, such as in a single lens eyeglass system. Preferably, the first end on the temple is provided with a means for releasably pivotably engaging the eyeglass lens or eyeglass frame.

A recessed seat is disposed on the elongate temple body, in between the first and second ends, the recessed seat having a smaller cross-sectional area than the cross-sectional area of the temple body adjacent to the seat. Preferably, the recessed seat comprises an annular recess having first and second shoulders at the first and second axial ends thereof. Preferably, the axial length of the annular recess is less than about one-half of the axial length of the temple, and most preferably, less than about one-third the axial length of the temple.

The eyeglass temple is preferably additionally provided with at least one tubular traction member disposed within the recessed seat. The traction member preferably comprises an elastomeric material which enables radial expansion to fit over the distal end of the temple body, and relaxation back to provide a snug fit within the recess on the temple. The traction member is

preferably made from an elastomeric material which exhibits improved retention properties when the material is wet, and, most preferably, the exterior surface of the traction member is provided with friction enhancing structures, such as annular ridges or other patterned textures.

There is provided in accordance with another aspect of the present invention, an improved eyeglass having at least one lens, and a frame for supporting the lens in front of the eyes of the wearer. The eyeglass is further provided with a first and a second temple produced in accordance with the present invention. Preferably, the distal end of the temple is substantially straight, so that the temple does not wrap around behind the ear of the wearer.

Further features and advantages of the present invention will become apparent from the detailed description of preferred embodiments which follow, when taken together with the appended figures and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of eyewear in accordance with one embodiment of the present invention.

FIG. **2** is a side elevational view of a second embodiment of eyewear in accordance with the present invention, with the traction member removed.

FIG. **3** is a perspective view of a traction member in accordance with the present invention.

FIG. **4** is a cross-sectional view taken along line **4—4** of FIG. **1**.

FIG. **5** is a perspective view showing an alternative embodiment of the traction member.

FIG. **6** is a cross-sectional view taken along line **6—6** of FIG. **5**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As used in the present application, "eyewear" is a general term intended to embrace optical devices containing corrective lenses for defects in vision or lenses for such special purposes as filters for absorbing or blocking portions of the electromagnetic spectrum, providing physical shields for the eyes or making available other physical or optical functions for protective or visual assisting purposes.

As shown in FIG. **1**, eyewear **10** adapted to position a lens in a predetermined orientation relative to the eyes includes a frame **12**, lens **14** and temples **20**. Preferably, the lens **14** is joined to the frame **12** so as to position the lens **14** before the eyes. As shown in FIGS. **1**, **2** and **6**, the temples **20** may be pivotally affixed or joined to the frame **12**. Although the temples **20** are shown in FIG. **1** as pivotally affixed to the frame **12**, the temples **20** may be permanently attached in a predetermined orientation or selectively engageable with the frame **12** without circumventing the scope of the present invention. Alternatively, the frame **12** may be eliminated entirely by securing the temples **20** with or without temple hinges directly to the lens **14** by thermoplastic bonding, adhesives screws or other known fastening means which are suitable for the material of the lens and temples.

As is well known in the art, the frame **12** and temples **20** may be conveniently made of molded plastic or a variety of other materials. The lens **14** may take any of a number of configurations and may be formed of sheet plastic, molded plastic or glass as determined by the application of the lens.

Each temple **20** is defined by a proximal end **22** and a distal end **24** wherein the proximal end **22** is affixed either permanently or detachably to the frame **12**. The permanent attachment of the temples to the frame **12** may be accomplished through molding or thermoplastic bonding. The detachable engagement of the temples **20** and the frame **12** is provided by the use of a snap fit or fasteners including screws or pins, as are known in the art.

Although the earstems shown in FIG. **1** are affixed to the frame **12**, the earstem **20** may be attached directly to the lens **14**. Preferably, the earstems **20** are hingeably attached to the frame **12** or lens **14** and most preferably, hingeably and removably attached, as well known in the art.

As shown in FIG. **1**, in a typical hingeable connection, the frame **12** or lens **14** includes a hinge aperture (not illustrated) extending through a protruding flange **16**. The earstem **20** includes a pair of parallel apertured flanges **18***a*, **18***b* spaced so as to receive the flange **16** of the frame **12** or lens **14** therebetween. The apertures in the earstem **20** are aligned with the apertures of the frame **12** or lens **14** and a pin is inserted so as to permit rotation of the frame **12** or lens **14** relative to the earstem **20**, thereby providing a hingeable connection. In a typically readily detachable hinge, the aperture in the flange **16** of the frame **12** or lens **14** is replaced by an integral pin (not illustrated) which extends away from the flange **16** in opposite directions along the same axis as the aperture. The pinned flange **16** is inserted by deformation between the opposing flanges **18***a*, **18***b* and the integral pin snaps into the aperture on the flanges **18***a*, **18***b*, thereby providing a readily detachable hinge.

As shown in FIGS. **1** and **5**, the distal end **24** may be curved so as to provide loops which are disposed behind the ears when the eyewear is worn. However, as the looped temples shown in FIGS. **1** and **5** may impinge upon the head in undesired locations when employed on heads of different sizes, the looped temples are not well suited to accommodate a wide variety of head sizes. Thus, the preferred embodiment shown in FIG. **2** includes a straight temple which, when used in conjunction with the present invention, provides more universally fitting eyewear and eliminates the traditional ear hook which can cause discomfort or distraction for many wearers.

As shown in FIG. **2**, a recessed seat **30** is disposed intermediate of the proximal and distal ends **22**, **24**. As shown in FIG. **2**, the seat **30** is preferably located adjacent the distal end **24** of the temple **20**, so that the posterior shoulder **34** is substantially coincident with the distal end **24**. However, as will be apparent, if it is desired to extend the temples in a posterior direction well beyond the ears, the distance between posterior shoulder **34** and distal end **24** can be proportionately increased to maintain seat **30** near the ear.

The recessed seat **30** is defined by posterior shoulder **34** and preferably an anterior shoulder **32**, such that the anterior shoulder **32** is disposed between the posterior shoulder **34** and the proximal end **22**. Preferably, the cross-sectional dimension of the seat **30** between the anterior and posterior shoulders **32**, **34** is smaller than the cross-sectional dimension of the adjacent temple **20**.

Preferably, the posterior should **34** is a sufficient distance from the anterior shoulder **32** so that at least one traction member **40** may be retained therebetween. However, the seat **30** may be configured so as to extend substantially the entire length of the temple or alterna-

tively, may extend only a portion of the overall length of the temple. Typically, the seat extends less than about one-half or one-third the length of the temple and is disposed on the posterior portion of the temple.

Although the seat is shown as defined by an anterior shoulder **32** and a posterior shoulder **34**, the present invention may be practiced with a seat **30** defined only by a posterior shoulder **34** for preventing unintended axial displacement of the traction member in the posterior direction.

When the seat **30** is defined by only the posterior shoulder **34**, the cross-sectional area of the seat may taper from being substantially coincident with an anterior cross-sectional area of the temple to the reduced cross-sectional area at the posterior shoulder **34**. The posterior shoulder thereby prevents unintentional axial displacement of the traction member in the posterior direction. Axial displacement of the traction member in the anterior direction is inhibited by the expanding cross-sectional area of the seat in a tapered embodiment, as the seat extends in the anterior direction, or simply by a friction fit in the absence of a taper or an anterior shoulder.

Preferably, the seat **30** is located so that upon operable engagement of the traction member **40** within the seat **30**, the traction member **40** provides an interface between the eyewear and the head. That is, the traction member **40** contacts the head.

Referring to FIG. **3**, an elongate tubular traction member **40** is shown. In the preferred embodiment, the traction member **40** is formed substantially in the shape of a hollow cylinder having an inner surface **42** of radius R1 and outer surface **44** of radius R2, wherein radius R1 is less than radius R2. Preferably, radius R1 is expandable to permit passage of the distal end **24** of the temple **20** through the interior of the traction member **40** without exceeding the elastic limits of deformation of the traction member **40**.

As shown in FIG. **4**, the traction member **40** is preferably comprised of a material having sufficient elasticity that the inner surface **42** of the traction member **40** snugly contacts the surface of a seat **30** having an oblong or rectangular cross-section with a cross-sectional area greater than that of R1 in the unexpanded state. Referring to FIG. **6**, the inner surface **42** will also preferably conform snugly to the surface of a seat **30** having a substantially circular cross-section.

Other embodiments of the traction member **40** may be employed, such as one having an open rectangular or triangular cross-sectional configuration having a bias so that the open legs of the triangle or rectangle are biased towards one another to tend to form a tubular element. Thus, traction devices can take the form of an elongate body which is split axially along one wall so that it does not form a complete tube. The bias should be sufficient so that the opposing inner surfaces **42** of the traction member **40** cooperatively engage the periphery of the recessed seat **30**.

The traction member **40** may be formed by molding or extruding processes, as well known in the art. Preferably, the outer surface **42** is configured to enhance the coefficient of static friction between the eyewear and the head. The outer surface **44** may be formed to exhibit a variety of static friction coefficient enhancing configurations, such as a grid, waffle, or ribbed pattern (not shown). Typically, the outer surface **42** produced by extrusion will exhibit axially oriented patterns, while molded outer surfaces may exhibit axially and/or radially oriented patterns.

As discussed infra, the traction member **40** is preferably formed of an elastomeric material exhibiting sufficient flexibility or elasticity to allow the traction member **40** to expand while being slipped over the temple distal end **24** and to contract back within seat **30** after passing over the distal end.

In a particularly preferred embodiment, the traction member **40** is formed of a relatively soft elastomeric material having a coefficient of sliding friction that increases when the material is wetted. Such a material, sometimes referred to as hydrophilic, tends to enhance retention of the traction member **40** in position on the wearer's head as the wearer perspires or encounters moisture, as during skiing. One suitable material which can be readily molded by conventional techniques is marketed under the name KRATON G TM, a product of the Shell Oil Company.

The traction member **40** may comprise a resilient sponge-like elastomeric material, having a relatively high porosity, as shown in FIGS. **3** and **4**. Alternatively, as shown in FIG. **6**, the traction member **40** may comprise a substantially solid, i.e., fine or no porosity, yet flexible material. In addition, the traction member **40** may be made of materials having different densities, thereby providing traction members **40** having different weights, which may be employed to counterbalance lenses of differing weights, so as to distribute the weight of the eyewear **10** more evenly about the head.

The length of the traction member **40** is preferably no greater than and most preferably substantially equal to the distance between the anterior and posterior shoulders **32**, **34**. Although the traction member **40** is illustrated as extending roughly one-third or one-half the overall length of the temple, the traction members **40** within the present invention can extend anywhere from substantially the entire length of the temple **20** to only a relatively small portion thereof, as depending upon the configuration of the seat **30**. Alternatively, a plurality of traction members **40** may be axially aligned within the seat **30**. The traction members **40** may be selected so that a combined length of the members **40** substantially equals the distance between the anterior and the posterior shoulders **32**, **34** or alternatively, the combined axial length of the members **40** may be such that an axial space separates adjacent traction members **40** within the seat.

In assembling the present invention, the traction member **40** is engaged with a temple **20** by passing the distal end **24** of the temple **20** through the tubular passageway within traction member **40**. Alternatively, the temple **20** may be detached from the frame **12** or lens **14** and the proximal end **22** may be passed through the tubular passageway of the traction member **40**. Therefore, the preferred construction of the traction member **40** which elastically passes over the distal end may be obviated. The traction member **40** is then moved along the temple **20** until the inner surface **42** engages the seat **30**. In an embodiment in which the seat **30** has a length substantially equal to the length of the traction member **40**, as the traction member **40** is received within the seat **30**, further unintended motion along the temple **20** is prevented by engagement of the anterior and posterior shoulders **32**, **34** with the traction member **40**.

Alternatively, the seat **30** may have a sufficient axial length so as to retain a plurality of traction members **40** between the anterior and posterior shoulders **32**, **34**.

The use of multiple traction members **40** allows for accommodating fashion considerations as well as high retaining forces for active uses, such as volleyball or basketball. Upon engagement of the traction member **40** within the seat **30**, the outer surface **44** of the traction member **40** may be disposed outside of the periphery of the temple **20**, as shown in FIG. **1** or, alternatively, may be substantially flush with the periphery **38** of the adjacent temple **20**, as shown in FIG. **5**. Traction members are preferably provided having a variety of wall thicknesses, i.e., the difference between R1 and R2. Thus, the wearer can select a flush fitting traction member as illustrated in FIG. **5** or a radially enlarged traction member as illustrated in FIG. **1**, depending upon that wearer's perception of the need for enhanced traction or sleek appearance.

As the majority of the length of the temple **20** in the preferred embodiment is dominated by the periphery of the temple **20** rather than the seat **30**, if the traction members **40** are removed from the temples **20**, the fitting of the eyewear **10** will not be substantially denigrated. However, the length of the traction member **40**, when engaged in the seat **30**, provides a sufficient contact area to increase the resistance to movement of the eyewear **10** relative to the head.

This present invention has been described in detail in connection with the preferred embodiments, but these are examples only and the present invention is not restricted thereto. It will be easily understood by those skilled in the art that other variations and modifications can be easily made within the scope of this invention, which is defined by the following claims.

It is claimed:

1. An improved eyewear temple for retaining eyeglasses on the head of the wearer and reducing abrasion caused by movement of said eyewear, comprising:

an elongate eyewear temple body;

a first end on the temple for attaching the temple to the frame of the eyeglasses;

a second end on the temple, distal said first end, for engaging the head of the wearer;

a recessed seat interposed between said first and second ends having a smaller cross-sectional area than that of said temple portion adjacent said seat, said seat being separated from the remainder of said temple by first and second shoulders; and

at least one tubular traction member disposed within the recessed seat.

2. An eyewear temple as in claim **1**, wherein the traction member is removably disposed within the seat.

3. An eyewear temple as in claim **1**, wherein the tubular traction member comprises a resilient elastomeric material.

4. An improved eyewear temple as in claim 3, wherein said elastomeric material exhibits a coefficient of sliding friction that increases when the material is wetted.

5. An eyewear temple as in claim **1**, wherein the traction member extends radially outwardly beyond the surface of the adjacent portion of the temple.

6. An eyewear temple as in claim **1**, wherein the axial length of the seat is less than about one-half of the axial length of the temple.

7. An eyewear temple as in claim **6**, wherein the recessed seat extends no more than about one-third the length of the temple.

8. An eyewear temple as in claim **1**, wherein a single tubular traction member disposed within the recessed seat extends substantially the entire distance between said first and second shoulders.

9. An eyewear temple as in claim **1**, wherein the thickness of the traction member is such that the outer surface of the traction member is substantially flush with the periphery of the adjacent temple.

* * * * *

EXHIBIT 5

US00D354968S

United States Patent [19]

Jannard

[11] **Patent Number: Des. 354,968**

[45] **Date of Patent: ** Jan. 31, 1995**

[54] **EYEGLASS LENS**

[75] Inventor: **James H. Jannard**, San Juan Capistrano, Calif.

[73] Assignee: **Oakley, Inc.**, Irvine, Calif.

[**] Term: **14 Years**

[21] Appl. No.: **18,729**

[22] Filed: **Feb. 14, 1994**

Related U.S. Application Data

[62] Division of Ser. No. 929,266, Aug. 12, 1992, Pat. No. Des. 344,742.

[52] **U.S. Cl.** **D16/101**

[58] **Field of Search** D16/101, 102, 107, 110–112, D16/116–118, 121, 123; 351/44, 56–59, 83, 103, 110; 2/439, 441, 447, 448

[56] **References Cited**

U.S. PATENT DOCUMENTS

D. 230,437	2/1974	Rabuse	D16/101
D. 293,450	12/1987	Jannard	D16/102
D. 328,468	8/1992	Jannard	D16/101
D. 331,763	12/1992	Jannard	D16/101
D. 333,145	2/1993	Jannard	D16/101
4,824,233	4/1989	Jannard	351/44
4,867,550	9/1989	Jannard	351/44
4,951,322	8/1990	Lin	2/439
4,998,815	3/1991	Lin	2/448

Primary Examiner—Bernard Ansher
Assistant Examiner—R. Barkai
Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear

[57] **CLAIM**

The ornamental design for an eyeglass lens, as shown and described.

DESCRIPTION

FIG. **1** is a front perspective view of the eyeglass lens of the present invention;
FIG. **2** is a top plan view of the lens of FIG. **1**;
FIG. **3** is a front elevational view of the lens of FIG. **1**;
FIG. **4** is a bottom plan view of the lens of FIG. **1**;
FIG. **5** is a rear elevational view of the lens of FIG. **1**; and,
FIG. **6** is a left side elevational view of the lens of FIG. 1.

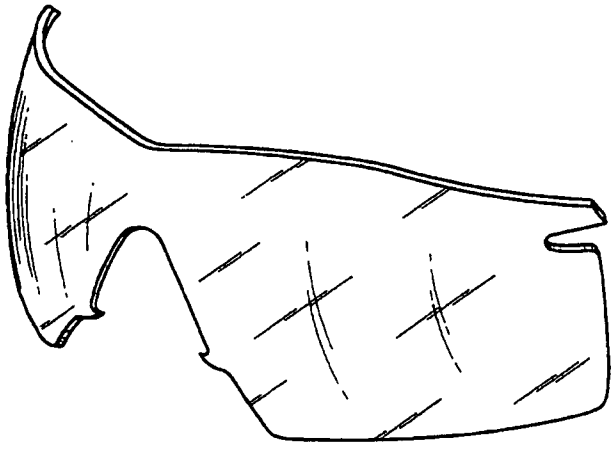


Fig. 1

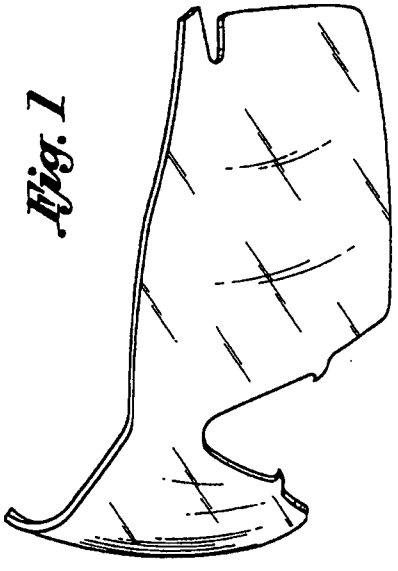


Fig. 6

Fig. 2

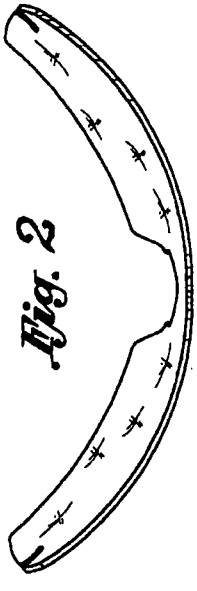


Fig. 3

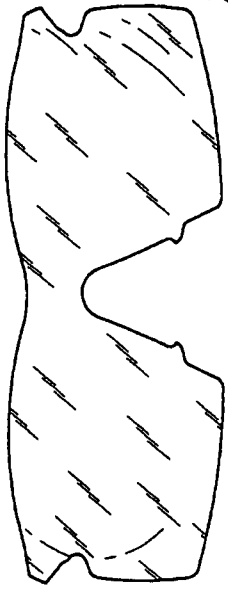
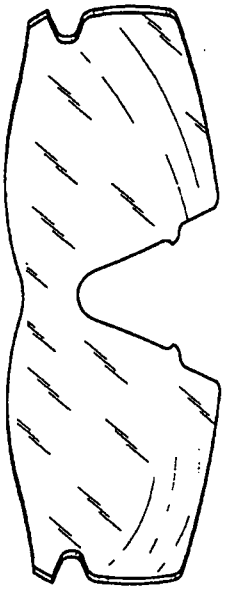


Fig. 4

Fig. 5



JS 44 (Rev. 12/07)

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

FILED
2009 APR 17 PM 2:58
CLERK, U.S. DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
BY: DEPUTY

I. (a) PLAINTIFFS

Oakley, Inc., a Washington corporation

DEFENDANTS

Bushnell, Inc., a Delaware corporation

(b) County of Residence of First Listed Plaintiff: Orange County, CA
(EXCEPT IN U.S. PLAINTIFF CASES)

County of Residence of First Listed Defendant: Shawnee County, KS
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED.

(c) Attorney's (Firm Name, Address, and Telephone Number)

Weeks, Kaufman, Nelson & Johnson
462 Stevens Ave., #310, Solana Bch, CA 92075 (858) 794-2140

Attorneys (If Known)

'09 CV 0808 WQH NLS

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

	PTF	DEF		PTF	DEF
Citizen of This State	☐ 1	☐ 1	Incorporated *or* Principal Place of Business In This State	☐ 4	☐ 4
Citizen of Another State	☐ 2	☐ 2	Incorporated *and* Principal Place of Business In Another State	☐ 5	☐ 5
Citizen or Subject of a Foreign Country	☐ 3	☐ 3	Foreign Nation	☐ 6	☐ 6

IV. NATURE OF SUIT (Place an "X" in One Box Only)

CONTRACT
- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans)
- ☐ 153 Recovery of Overpayment of Veteran's Benefits
- ☐ 160 Stockholders' Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability
- ☐ 196 Franchise

REAL PROPERTY
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

TORTS

PERSONAL INJURY
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers' Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury

PERSONAL INJURY
- ☐ 362 Personal Injury - Med. Malpractice
- ☐ 365 Personal Injury - Product Liability
- ☐ 368 Asbestos Personal Injury Product Liability

PERSONAL PROPERTY
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

CIVIL RIGHTS
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/ Accommodations
- ☐ 444 Welfare
- ☐ 445 Amer. w/Disabilities - Employment
- ☐ 446 Amer. w/Disabilities - Other
- ☐ 440 Other Civil Rights

PRISONER PETITIONS
- ☐ 510 Motions to Vacate Sentence

Habeas Corpus:
- ☐ 530 General
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

FORFEITURE/PENALTY
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 R.R. & Truck
- ☐ 650 Airline Regs.
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

LABOR
- ☐ 710 Fair Labor Standards Act
- ☐ 720 Labor/Mgmt. Relations
- ☐ 730 Labor/Mgmt.Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Empl. Ret. Inc. Security Act

IMMIGRATION
- ☐ 462 Naturalization Application
- ☐ 463 Habeas Corpus - Alien Detainee
- ☐ 465 Other Immigration Actions

BANKRUPTCY
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

PROPERTY RIGHTS
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

SOCIAL SECURITY
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

FEDERAL TAX SUITS
- ☐ 870 Taxes (U.S. Plaintiff or Defendant)
- ☐ 871 IRS—Third Party 26 USC 7609

OTHER STATUTES
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 480 Consumer Credit
- ☐ 490 Cable/Sat TV
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 USC 3410
- ☐ 890 Other Statutory Actions
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes

V. ORIGIN (Place an "X" in One Box Only)

☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

VI. CAUSE OF ACTION

Cite the U.S. Civil Statute under which you are filing (**Do not cite jurisdictional statutes unless diversity**):
35 U.S.C. Section 271 and 281

Brief description of cause:
This is a case for patent infringement

VII. REQUESTED IN COMPLAINT:

☐ CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23

DEMAND $

CHECK YES only if demanded in complaint:
JURY DEMAND: ☑ Yes ☐ No

VIII. RELATED CASE(S) IF ANY (See instructions):

SEE ACCOMPANYING NOTICE

JUDGE DOCKET NUMBER

DATE 4/16/09

SIGNATURE OF ATTORNEY OF RECORD

FOR OFFICE USE ONLY

RECEIPT # 168209 AMOUNT 350.00 APPLYING IFP JUDGE MAG. JUDGE

4/17/09

UNITED STATES
DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
SAN DIEGO DIVISION

162209 - SR

April 17, 2009
15:01:42

Civ Fil Non-Pris
USAO #.: 09CV0808
Judge..: WILLIAM Q HAYES
Amount.:
Check#.: BC#2281 $350.00 CK

Total-> $350.00

FROM: OAKLEY V. BUSHNELL
CIVIL FILING