



US 20110088429A1

(19) **United States**

(12) **Patent Application Publication**
CARTER

(10) **Pub. No.: US 2011/0088429 A1**

(43) **Pub. Date: Apr. 21, 2011**

(54) **REFRACTIVE ELEMENT ARRAY**

(57) **ABSTRACT**

(76) Inventor: **Carmen CARTER**, Newbury Park,
CA (US)

(21) Appl. No.: **12/580,767**

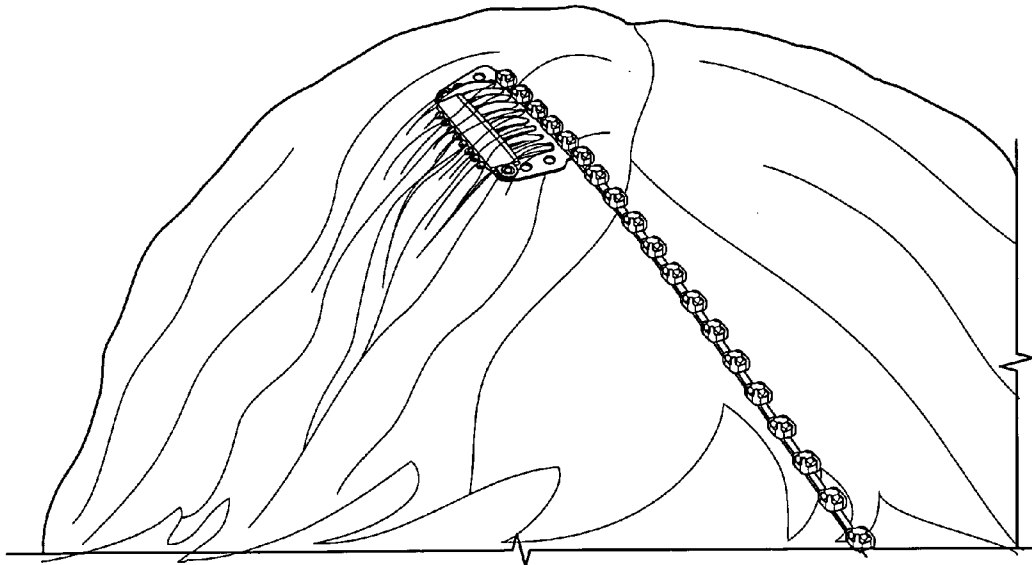
(22) Filed: **Oct. 16, 2009**

Publication Classification

(51) **Int. Cl.**
A44C 25/00 (2006.01)

(52) **U.S. Cl.** **63/43**

A refractive element array has a first securing member having a first retainer body. The retainer body includes a first outside retainer projecting from the first retainer body and a first inside retainer projecting from the first retainer body. The first securing member opposes the second securing member for cooperatively securing the refractive element array. The securing members have a deployed position and a not deployed position. The securing member has a retainer body. The retainer body includes an outside retainer projecting from the retainer body and an inside retainer projecting from second retainer body. A carrier strip connects to the first retainer body and connects to the second retainer body. The carrier strip is connected between the first retainer body and the second retainer body. Refractive elements are mounted to the carrier strip.



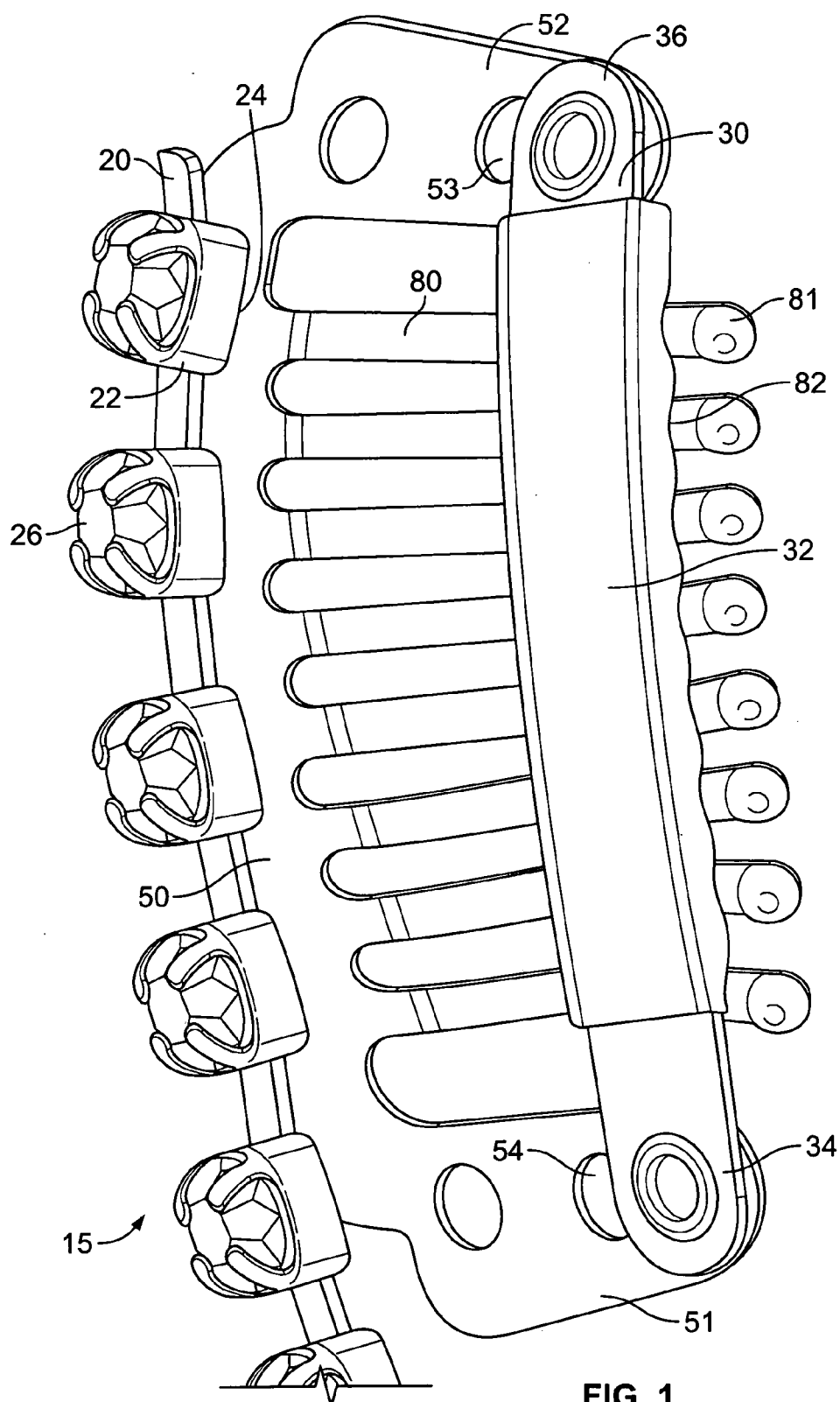


FIG. 1

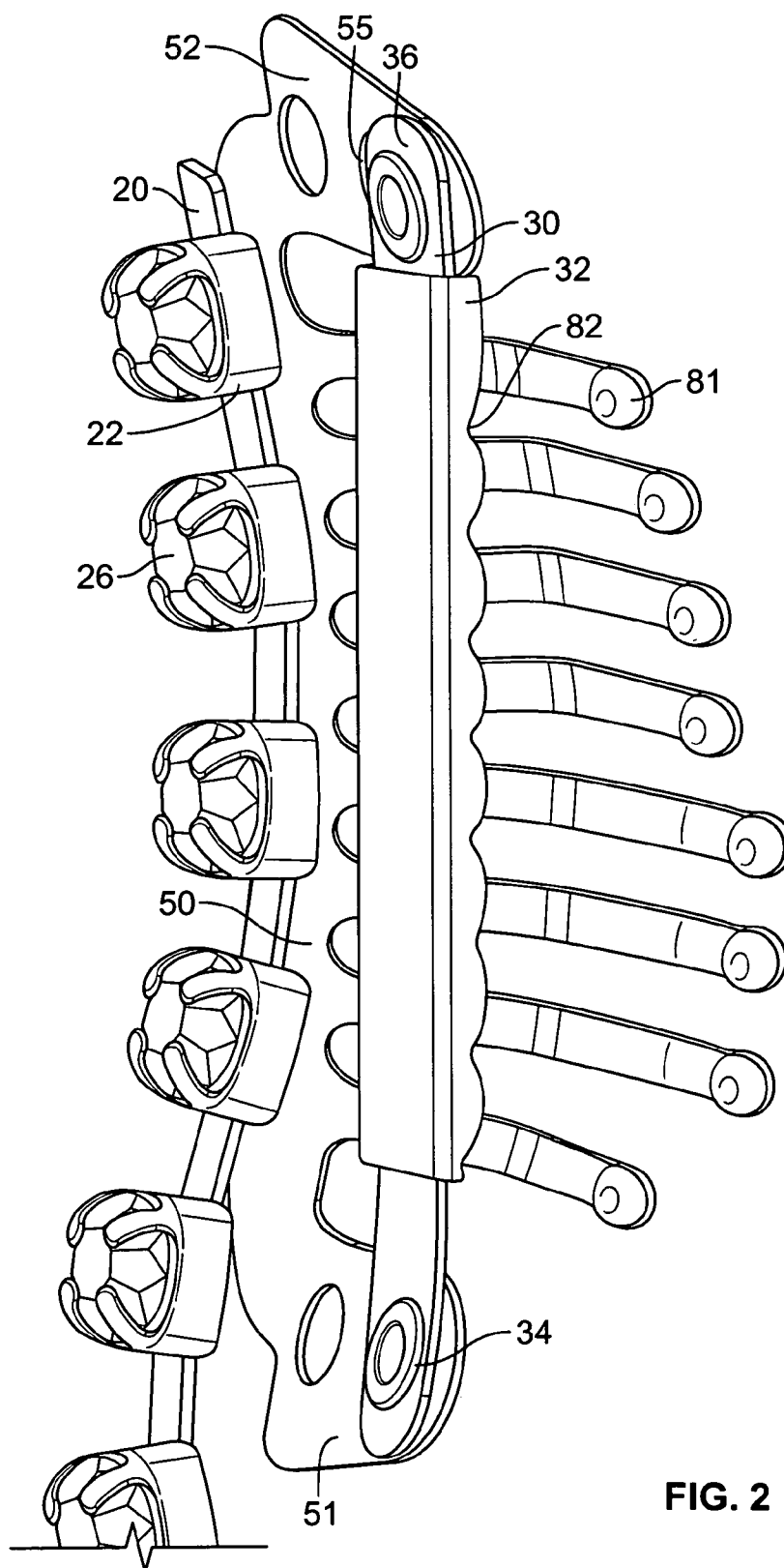


FIG. 2

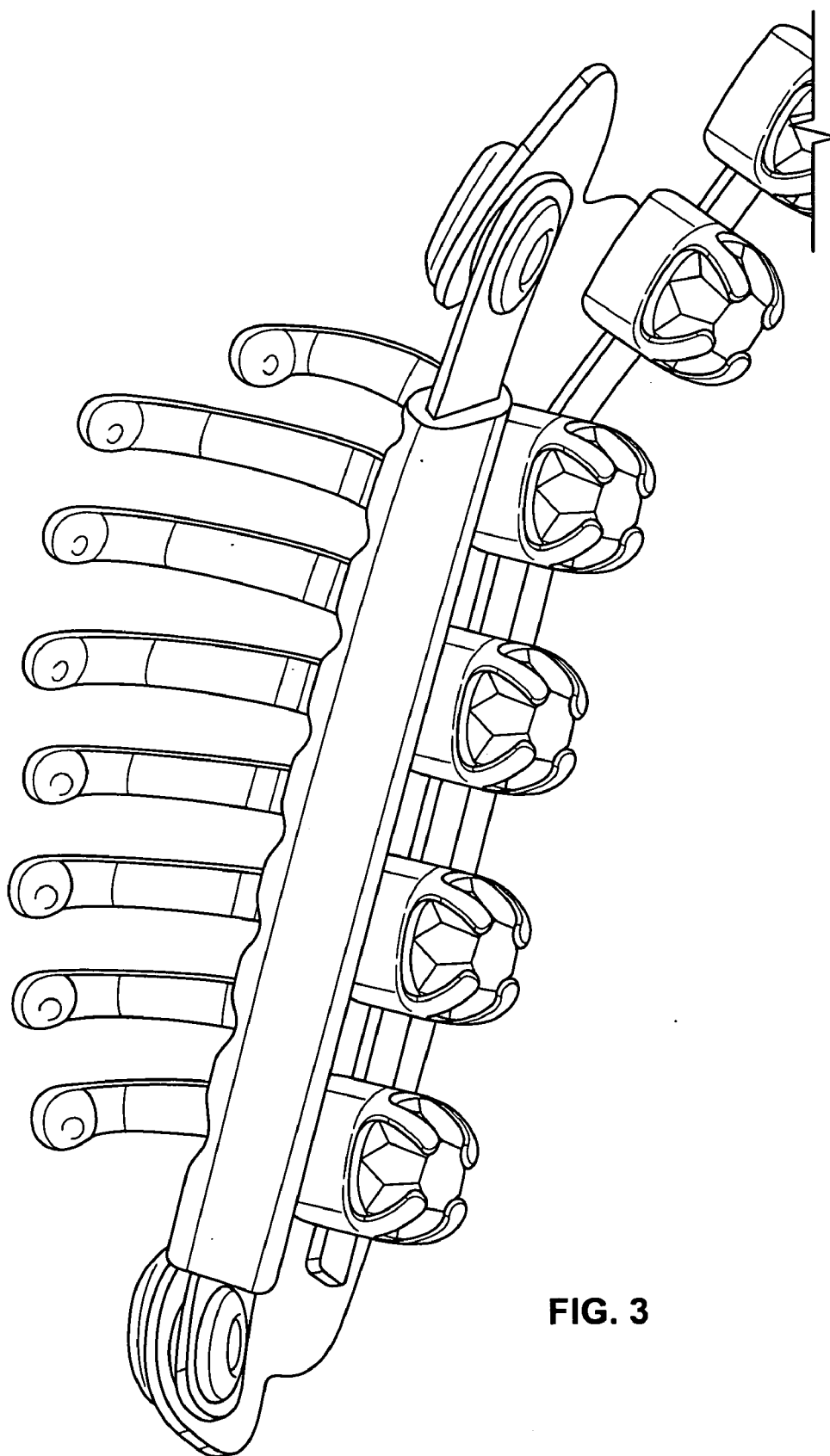


FIG. 3

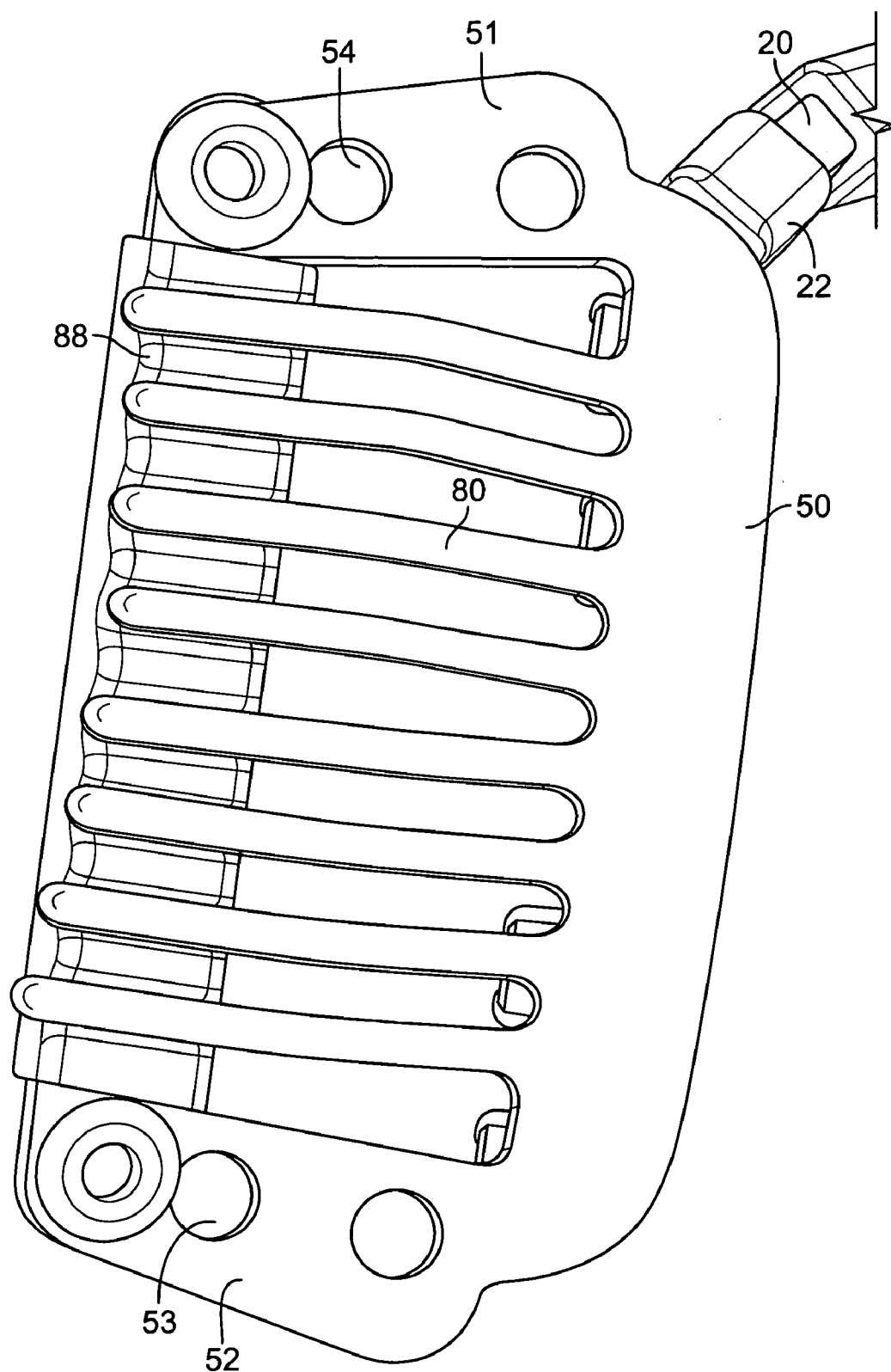


FIG. 4

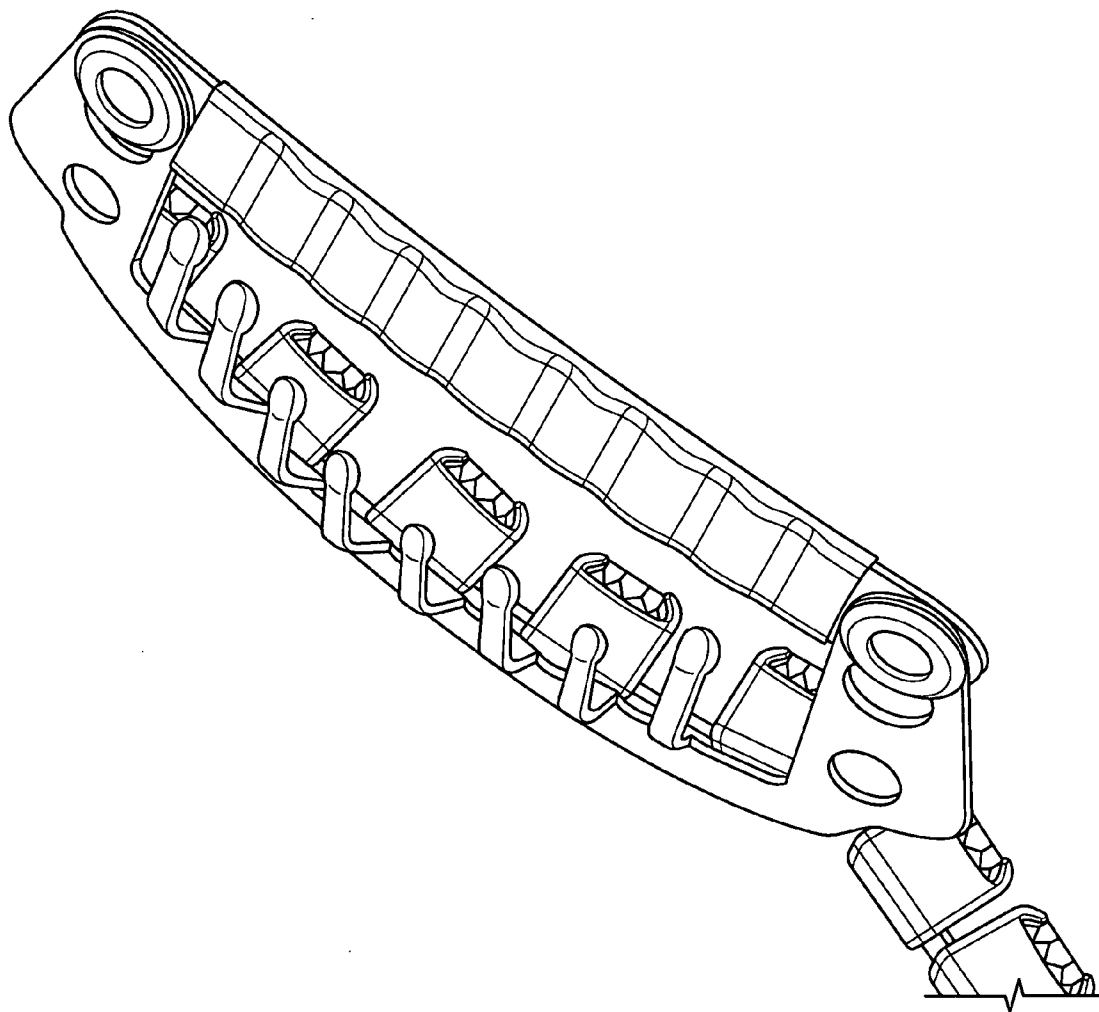


FIG. 5

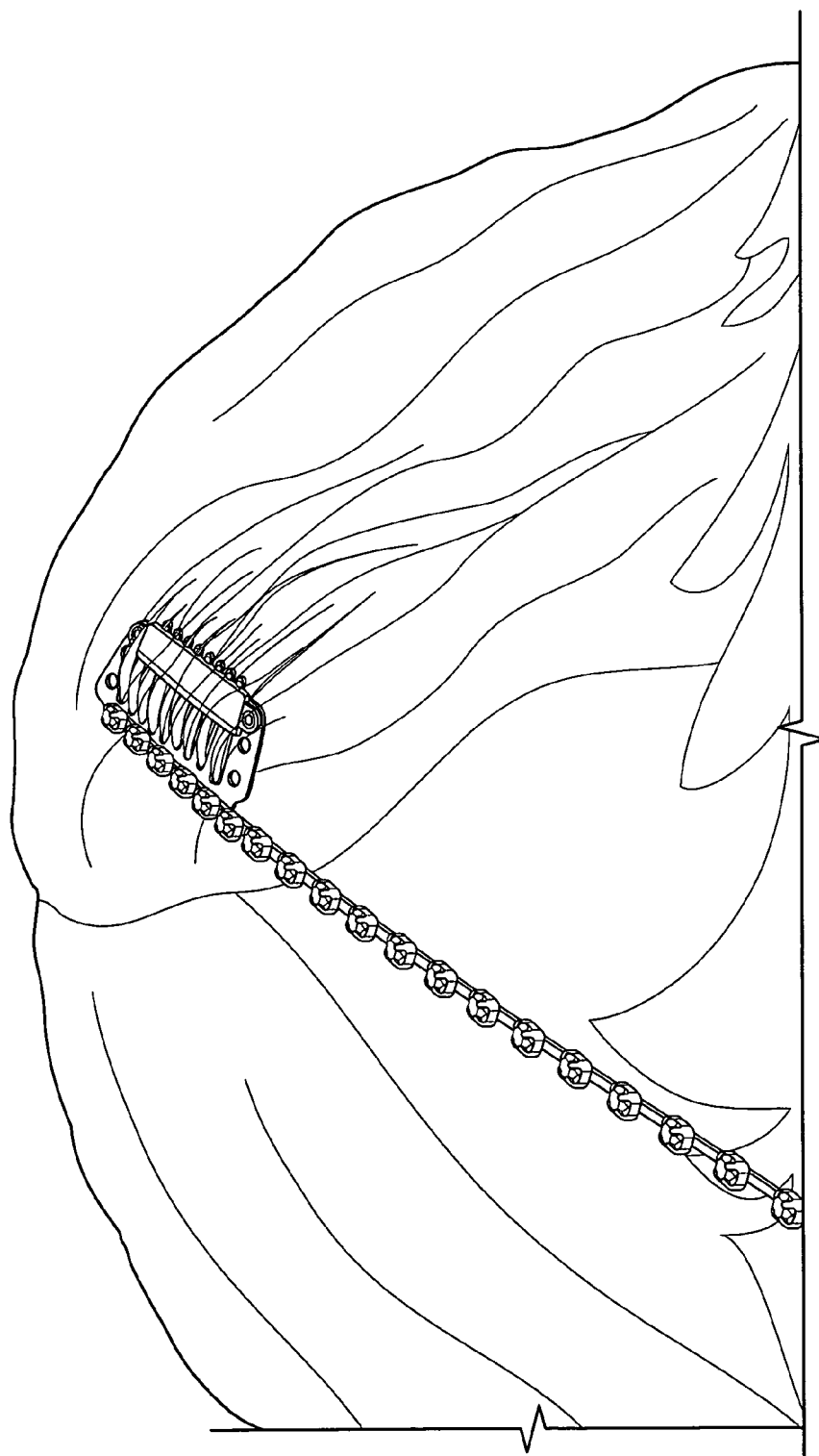


FIG. 6

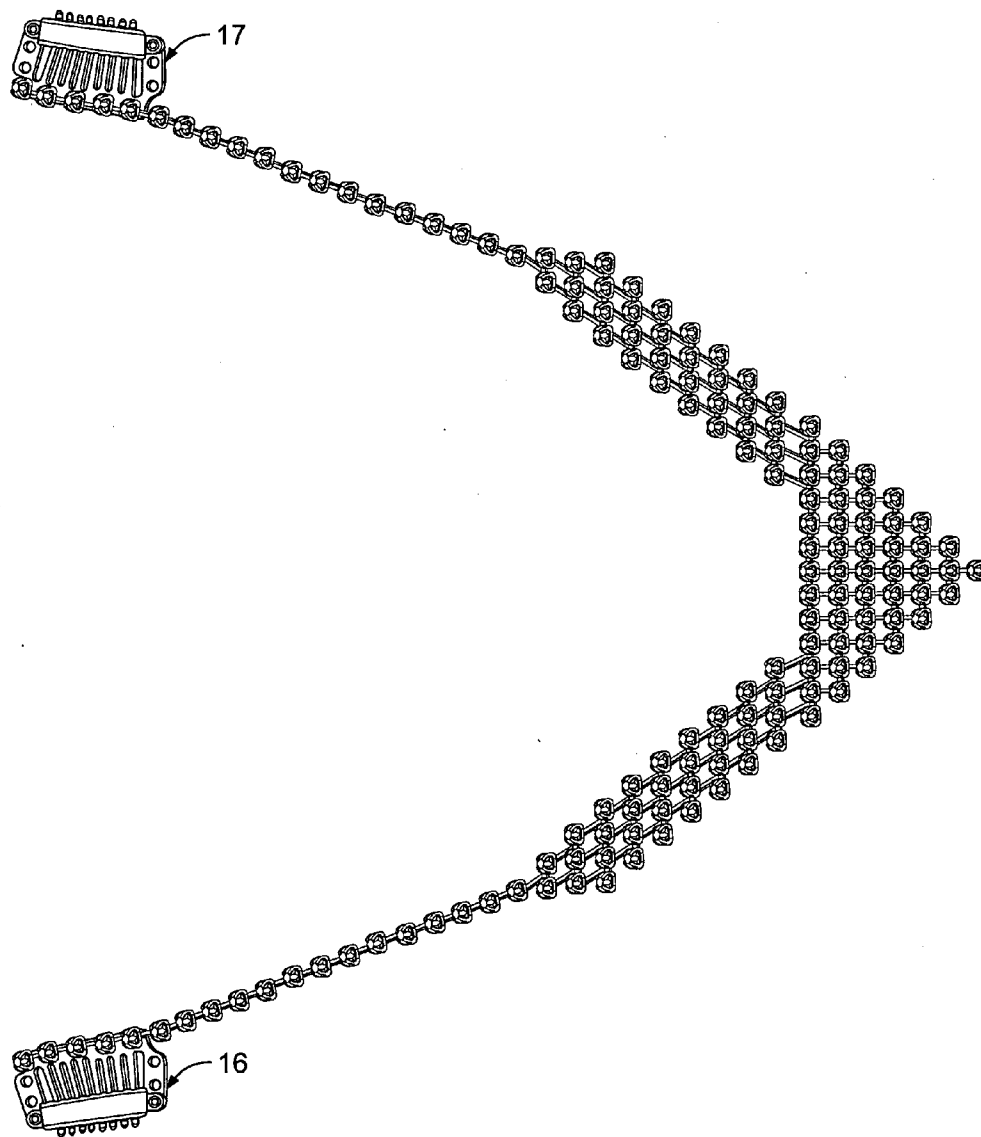


FIG. 7

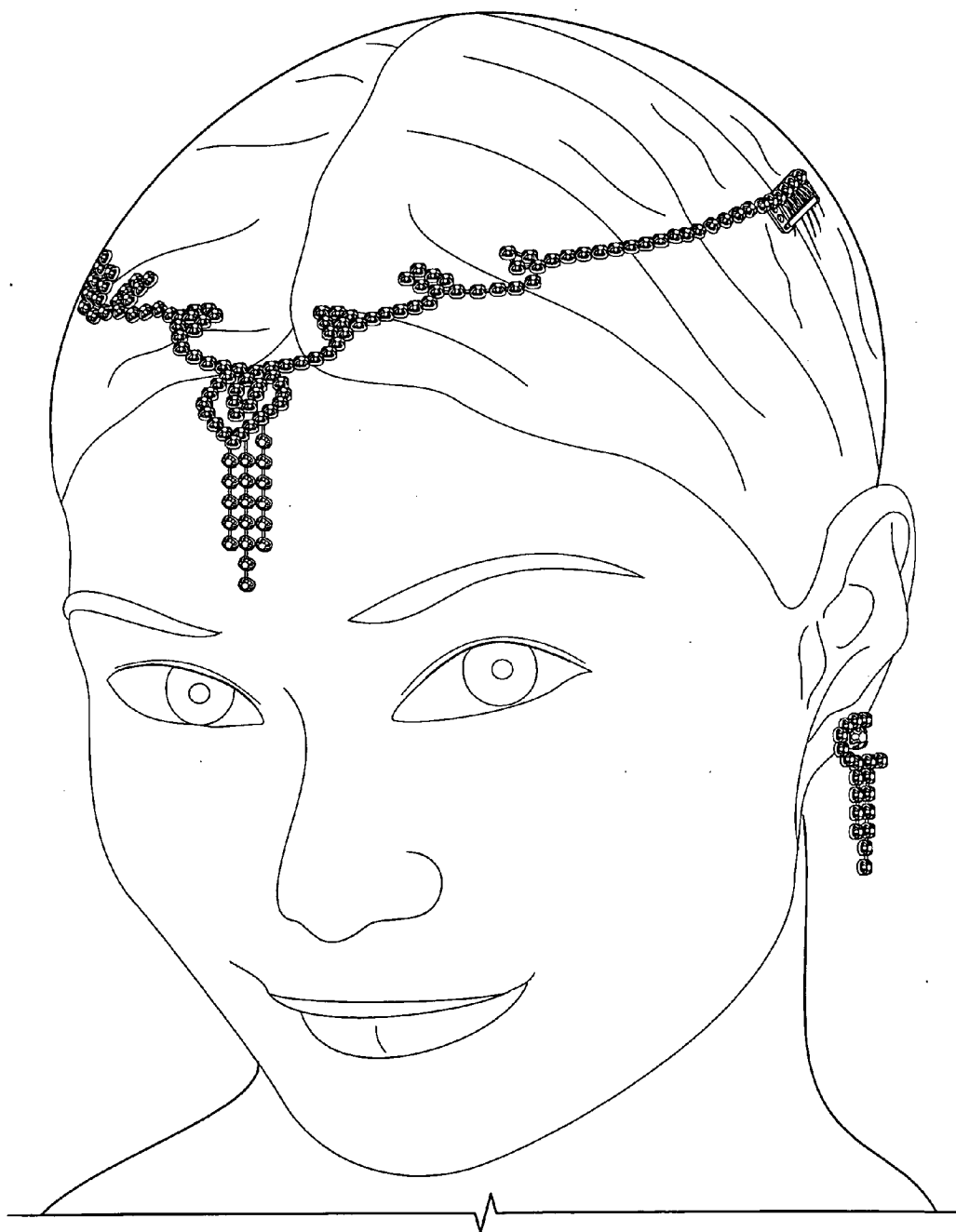


FIG. 8

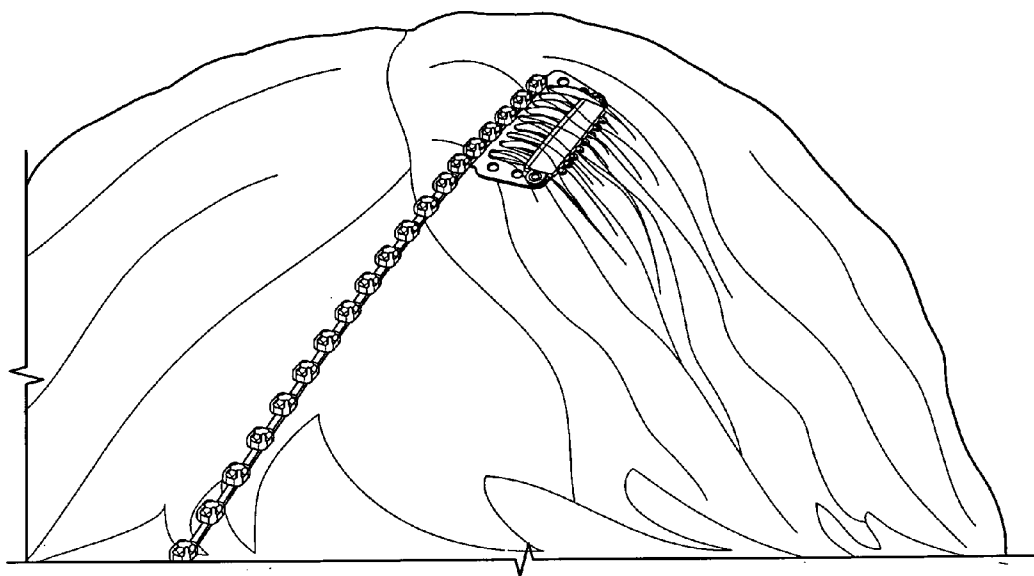


FIG. 9

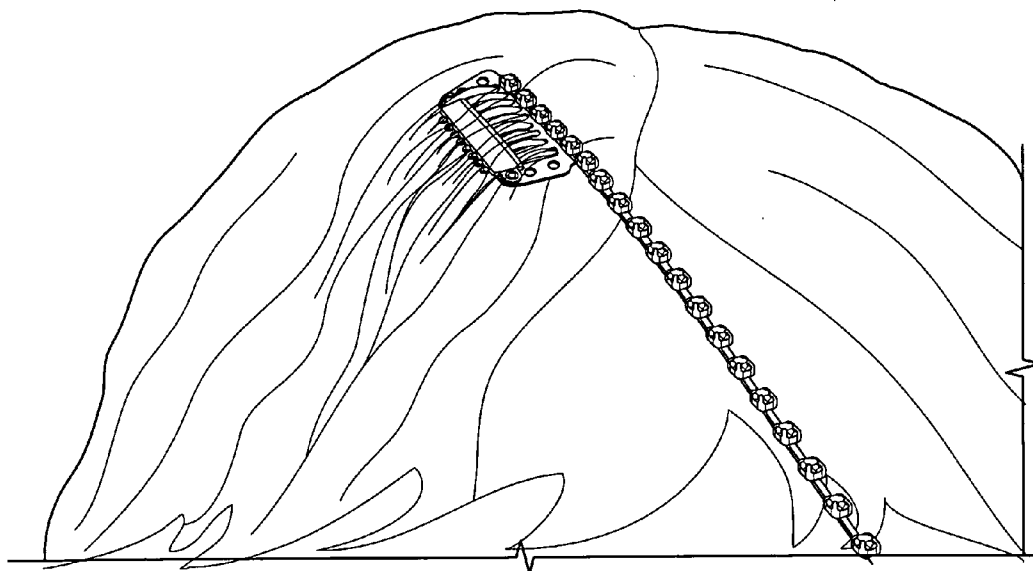


FIG. 10

REFRACTIVE ELEMENT ARRAY

DISCUSSION OF RELATED ART

[0001] Refractive element array are used for redirecting the path of light in various elements. In a chandelier for example, a crystal array redirects light from one or more light sources mounted within the chandelier. In other configurations, refractive element array can be used in necklaces such as crystal necklaces. Additionally, lighted necklaces featuring refractive element array have been commercialized. Although a variety of refractive elements have been used on jewelry historically, such jewelry has traditionally lacked attachment means for securing the refractive elements to articles such as hair.

[0002] United States publication 2008/0006288 published Jan. 10, 2008 to Graham provides a chain with a hair clasp that can be worn on a wearer's head, the disclosure of which is incorporated herein by reference. Other methods of attachment include magnetic closure members such as described in U.S. Pat. No. 5,197,168 issued Mar. 30, 1993 to Levy, the disclosure of which is incorporated herein by reference. Additionally, refractive elements have been disposed as light emitting members such as described in U.S. Pat. No. 6,296,364 issued Oct. 2, 2001 to Day, et. al. the disclosure of which is incorporated herein by reference.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] A securing member that has a carrier strip connected to a retainer body. The retainer body includes an outside retainer and an inside retainer projecting as a pair of extensions from the retainer body. The retainer body is generally planar and flat, preferably made of flexible spring metal. The main body further includes fingers extending from the retainer body between the outside retainer and the inside retainer. The fingers terminate at fingertips. The fingertips engage with finger indents on the main biasing member. The main biasing member can be formed as a leaf spring. The main biasing member connects to the outside retainer at an outside connector. The main biasing member connects to the inside retainer at an inside connector.

[0004] The outside connector engages with an outside slot. The inside connector and engages with an inside slot. The outside connector can be disengaged from the outside slot. The inside connector can be disengaged from the inside slot. The outside connector can be formed as a snap that snaps to outside slot. The outside connector can also be formed as a clasp having a flange that engages with outside slot. The outside connector can swivel relative to outside slot. The inside connector can be formed as a snap that snaps to inside slot. The inside connector can also be formed as a clasp having a flange that engages with inside slot. The inside connector can swivel relative to outside slot. A wide variety of attachment means commonly known in the art can be used for connecting the outside connector to the outside slot and for connecting the inside connector to the inside slot. Preferably either the outside or the inside connector is in pivot connection with the respective slot. Having a single connector in pivot connection in the opposite connector selectively engageable and detachable provides the main biasing member a biased connection to the main body via the outside retainer or the inside retainer. The main biasing member is preferably made out a spring metal and further includes a sheath having

a rubberized, elastomeric, grippy connection to articles between the main biasing member and the fingertips.

[0005] A first securing member can oppose a second securing member for cooperatively securing the refractive element array. The refractive element array extends between the first securing member and the second securing member. Preferably, a plurality of symmetrically arranged refractive element configurations are mounted on a middle portion in conglomeration to strands of the carrier strip. The carrier strip extends between the carrier attachment of the first securing member and the carrier attachment of the second securing member. The first securing member and the second securing member are deployed in deployed position simultaneously for cooperatively securing the refractive element array.

[0006] The carrier strip attaches to the main body at a plurality of carrier attachment. A plurality of carrier member attaches to the carrier strip. Each carrier member retains a refractive element. The refractive element has been exposed surface.

[0007] When the securing member is in closed position, the fingers may retain articles between themselves the main biasing member preferably formed as a leaf spring. The fingers are biased outward and the fingers are engaged with grooves formed between interstitial ridges, when the fingers are not retaining articles. The articles are held between the interstitial ridges and the fingers. The interstitial ridges can be formed on the sheath or on the main biasing member. The fingers have been engaged position when they are biased outward by retention of articles, and the fingers are in a disengaged position when they are not biased outward by retention of articles. The securing member can be mounted to hair on a head in different orientations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view of the top of the retainer with retracted fingers and the main biasing member in closed position.

[0009] FIG. 2 is a perspective view of the front of the retainer with extended fingers.

[0010] FIG. 3 is a perspective view of the front of the retainer with extended fingers.

[0011] FIG. 4 is a perspective view of the rear of the retainer with retracted fingers.

[0012] FIG. 5 is a perspective view of the front rear of the retainer with extended fingers.

[0013] FIG. 6 is an environmental view of the array with retainer installed in an upward orientation.

[0014] FIG. 7 is a top view of the refractive element array.

[0015] FIG. 8 is an environmental view of the refractive element array with retainer installed in a downward orientation.

[0016] FIG. 9 is a perspective view of the front of the retainer with the retainer installed in a rightward orientation.

[0017] FIG. 10 is a perspective view of the front of the retainer installed in a leftward orientation.

[0018] The following call a list of elements is used consistently throughout the drawings.

[0019] 15 Securing Member

[0020] 16 First Securing Member

[0021] 17 Second Securing Member

[0022] 20 Carrier Strip

[0023] 22 Carrier Member

[0024] 24 Carrier Attachment

[0025] 26 Refractive Element

[0026]	30 Main Biasing Member
[0027]	32 Sheath
[0028]	34 Inside Connector
[0029]	36 Outside Connector
[0030]	50 Main Body
[0031]	51 Inside Retainer
[0032]	52 Outside Retainer
[0033]	53 Outside Slot
[0034]	54 Inside Slot
[0035]	80 Finger
[0036]	81 Fingertip
[0037]	82 Finger Indent
[0038]	88 Interstitial Ridge

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0039] FIG. 1 shows generally a securing member 15 that has a carrier strip 20 connected to a retainer body. The retainer body includes an outside retainer 52 and an inside retainer 51 projecting as a pair of extensions from the retainer body. The retainer body is generally planar and flat, preferably made of flexible spring metal. The main body further includes fingers 80 extending from the retainer body between the outside retainer 52 and the inside retainer 51. The fingers terminate at fingertips 81. The fingertips engage with finger indents 82 on the main biasing member 30. The main biasing member 30 can be formed as a leaf spring. A leaf spring is one or more layers of flexible material. The main biasing member connects to the outside retainer 52 at an outside connector 36. The main biasing member connects to the inside retainer 51 at an inside connector 34. Mounted does not necessarily mean rigidly secured, just secured enough so it does not fall off when shaken by a jiggle.

[0040] The outside connector 36 engages with an outside slot 53. The inside connector 34 engages with an inside slot 54. The outside connector 36 can be disengaged from the outside slot 53. The inside connector 34 can be disengaged from the inside slot 54. The outside connector 36 can be formed as a snap that snaps to outside slot 53. The outside connector can also be formed as a clasp having a flange that engages with outside slot 53. The outside connector 36 can swivel relative to outside slot 53. The inside connector 34 can be formed as a snap that snaps to inside slot 54. The inside connector can also be formed as a clasp having a flange that engages with inside slot 54. The inside connector 34 can swivel relative to outside slot 54. A wide variety of attachment means commonly known in the art can be used for connecting the outside connector to the outside slot and for connecting the inside connector to the inside slot. Preferably either the outside or the inside connector is in pivot connection with the respective slot. Having a single connector in pivot connection in the opposite connector selectively engagable and detachable provides the main biasing member a biased connection to the main body via the outside retainer or the inside retainer. The main biasing member is preferably made out a spring metal and further includes a sheath 32 having a rubberized, elastomeric, grippy connection to articles between the main biasing member and the fingertips 81.

[0041] As seen in FIG. 7, a first securing member 16 can oppose a second securing member 17 for cooperatively securing the refractive element array. The refractive element array extends between the first securing member 16 and the second securing member 17. Preferably, a plurality of symmetrically arranged refractive element configurations are mounted on a

middle portion in conglomeration to strands of the carrier strip 20. The carrier strip 20 extends between the carrier attachment 24 of the first securing member and the carrier attachment 24 of the second securing member. The carrier strip 20 can be continuous or a linkage of discrete linked sections. The first securing member and the second securing member are deployed in deployed position simultaneously for cooperatively securing the refractive element array.

[0042] The carrier strip 20 attaches to the main body at a plurality of carrier attachment 24. A plurality of carrier member 22 attaches to the carrier strip 20. Each carrier member retains a refractive element 26. The refractive element 26 has been exposed surface. The carrier strip can have a varying cross section such as a rectangular or a round cross section.

[0043] When the securing member is in closed position, the fingers 80 may retain articles between themselves the main biasing member 30 preferably formed as a leaf spring. The fingers 80 are biased outward as seen in FIG. 2 and the fingers 80 are engaged with grooves formed between interstitial ridges 88, FIG. 4 when the fingers are not retaining articles. The articles are held between the interstitial ridges 88 and the fingers 80. The interstitial ridges 88 can be formed on the sheath 32 or on the main biasing member 30. The fingers have been engaged position when they are biased outward by retention of articles, and the fingers are in a disengaged position when they are not biased outward by retention of articles. The articles can be strands such as hair or any such plurality of linearly disposed flexible member groups. Hair can be curly, straight, bunched or braided. Refractive elements can be glass, crystal, LED's, incandescent bulbs or plastic. Refractive elements can be made of glass, crystal, LED's, light bulbs and plastic in a multiple layer and multiple material configurations. For example, plastic may encapsulate the LED's.

[0044] As can be seen in FIGS. 6, 8, 9, and 10, the securing member can be mounted to hair on a head in different orientations. As previously noted in the brief description of the drawings, FIG. 6 is an environmental view of the array with retainer installed in an upward orientation. As previously noted in the brief description of the drawings, FIG. 8 is an environmental view of the refractive element array with retainer installed in a downward orientation. As previously noted in the brief description of the drawings, FIG. 9 is a perspective view of the front of the retainer with the retainer installed in a rightward orientation. As previously noted in the brief description of the drawings, FIG. 10 is a perspective view of the front of the retainer installed in a leftward orientation. FIG. 8 shows the best mode of the present invention having a repair of downwardly installed securing member on each side of the head above the ear with the conglomeration of refractive element array disposed on the forehead.

1. A refractive element array comprising:

- a first securing member having a first retainer body, wherein the retainer body includes a first outside retainer projecting from the first retainer body and a first inside retainer projecting from the first retainer body, wherein the first securing member opposes the second securing member for cooperatively securing the refractive element array, wherein the first securing member has a deployed position and an not deployed position, wherein the second securing member has a deployed position and an not deployed position;
- a second securing member having a second retainer body, wherein the retainer body includes a second out-

side retainer projecting from the second retainer body and a second inside retainer projecting from the second retainer body;

- c. a carrier strip connected to the first retainer body and connected to the second retainer body, wherein the carrier strip is connected between the first retainer body and the second retainer body;
 - d. a plurality of refractive elements mounted to the carrier strip;
 - e. a first plurality of fingers extending from the first retainer body between the first outside retainer and the first inside retainer, the first plurality of fingers terminating at first plurality of fingertips; and
 - f. a first main biasing member extending between the first outside retainer projecting from the first retainer body and a first inside retainer projecting from the first retainer body.
2. The refractive element array of claim 1, further comprising: a first group of finger indents on the first main biasing member and a second group of finger indents on the second main biasing member.
3. The refractive element array of claim 1, wherein the first main biasing member is formed as a leaf spring, and wherein the second main biasing member is formed as a leaf spring.
4. The refractive element array of claim 1, wherein a first sheath having a rubberized, elastomeric, or grippy surface fits over the first main biasing member.
5. The refractive element array of claim 1, wherein the first main biasing member connects to the first outside retainer at a first outside connector and wherein the first main biasing member connects to the first inside retainer at a first inside connector; wherein the second main biasing member connects to the second outside retainer at a second outside connector and wherein the second main biasing member connects to the second inside retainer at a second inside connector.
6. The refractive element array of claim 1, wherein the first outside connector engages with a first outside slot.
7. The refractive element array of claim 1, wherein the first inside connector engages with a first inside slot.
8. The refractive element array of claim 1, wherein the first inside connector is in pivot connection and is selectively engagable and detachable.
9. The refractive element array of claim 1, further comprising: a plurality of carrier members mounted on the carrier strip, wherein the plurality of refractive elements are mounted

to the carrier strip by being mounted to the plurality of carrier members which are mounted to the carrier strip.

10. The refractive element array of claim 9, further comprising: a first group of finger indents on the first main biasing member and a second group of finger indents on the second main biasing member.

11. The refractive element array of claim 9, wherein the first main biasing member is formed as a leaf spring, and wherein the second main biasing member is formed as a leaf spring.

12. The refractive element array of claim 9, wherein a first sheath having a rubberized, elastomeric, or grippy surface fits over the first main biasing member.

13. The refractive element array of claim 9, wherein the first main biasing member connects to the first outside retainer at a first outside connector and wherein the first main biasing member connects to the first inside retainer at a first inside connector; wherein the second main biasing member connects to the second outside retainer at a second outside connector and wherein the second main biasing member connects to the second inside retainer at a second inside connector.

14. The refractive element array of claim 9, wherein the first outside connector engages with a first outside slot.

15. The refractive element array of claim 9, wherein the first inside connector engages with a first inside slot.

16. The refractive element array of claim 9, wherein the first inside connector is in pivot connection and is selectively engagable and detachable.

17. The refractive element array of claim 9, wherein the first plurality of fingers are engaged with first plurality of grooves.

18. The refractive element array of claim 9, wherein a first plurality of interstitial ridges are formed on the sheath.

19. The refractive element array of claim 9, further comprising a conglomeration of refractive element array positioned on the carrier strip so as to be disposed on a forehead.

20. The refractive element array of claim 9, wherein the first inside connector is in pivot connection and is selectively engagable and detachable, wherein the first plurality of fingers are engaged with first plurality of grooves, wherein a first plurality of interstitial ridges are formed on the sheath, further comprising a conglomeration of refractive element array positioned on the carrier strip so as to be disposed on a forehead.

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