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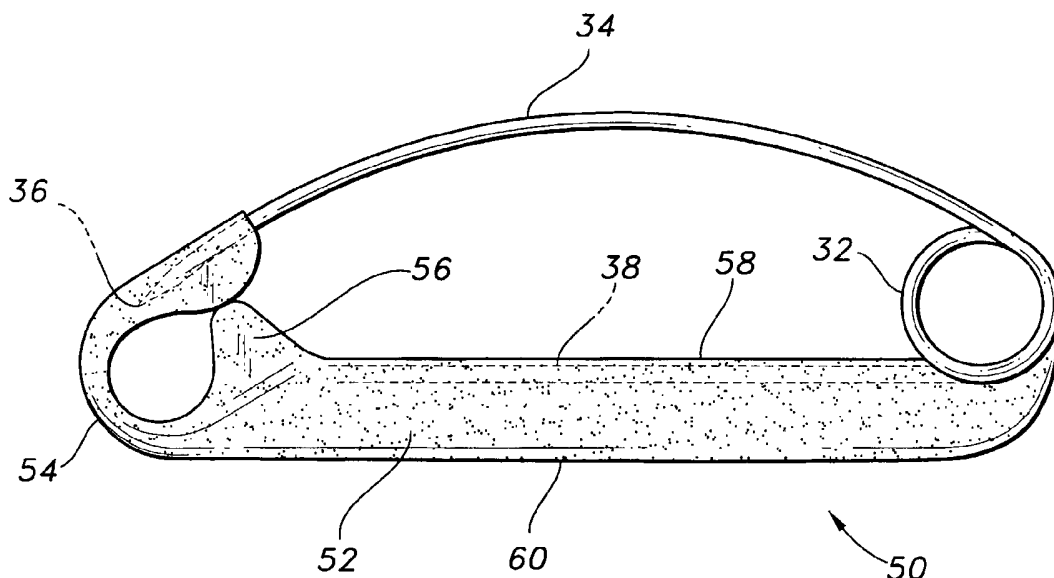
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(54) Title: SAFETY PIN WITH ARCuate PIN BAR



(57) Abstract: The safety pin 50 with an arcuate pin bar 34 is formed from pin wire bent in the middle to form a coil 32 having a stationary bar 38 extending from one end of the coil 32 and a pin bar 34 with a pointed end 36 extending from the opposite end of the coil 32. The pin bar 34 is arcuate, or formed with an arch. The stationary bar 38 has a shield 54 attached thereto, the end of the stationary bar 38 being bent backward or the shield 54 being attached to the end of the stationary bar 38 so that the shield 54 extends at an angle complementary to the curvature of the pin bar 34. The stationary bar 38 may have a textured or roughened fin 52 formed thereon, and may have linear inner 58 and outer 60 edges, a straight inner edge and convex outer edge, or a concave inner edge and convex outer edge.

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SAFETY PIN WITH ARCUATE PIN BAR**TECHNICAL FIELD**

The present invention relates to fasteners, and particularly to a safety pin with an
5 arcuate pin bar.

BACKGROUND ART

The safety pin was first developed in the 1840's to solve the problem of pins becoming dislodged from the fabrics that they were supposed to secure. Referring to Fig. 5, the modern safety pin 10 is formed from a length of pin wire wrapped into a single coil 12, in
10 essence forming a torsion spring. One end of the wire has a sharp point 14 for piercing the material to be secured, this leg of the pin 10 often being referred to as the pin bar 16. The opposite end of the pin wire has a shield 18 or catch attached thereto. The shield 18 is formed with a convex outer side and a concave inner side throughout its length, being bent into a substantially U-shape. The leg of the pin to which the shield 18 is attached is often
15 referred to as the stationary bar 20. A retainer or keeper 22 extends from the stationary bar into the center of the groove 24 formed by the shield 18, thereby preventing the pin bar 16 from being accidentally dislodged from the shield 18.

In order to fasten the pin 10, the pin bar 16 must be inserted into the shield 18 through a channel on one or the other side of the retainer 22, which acts as a guide for the pin bar 16,
20 until the pin bar 16 becomes lodged in the center of the shield 18 directly opposed to the retainer 22. Similarly, to unfasten the pin 10, the pin bar 16 must be moved into a channel on either side of the retainer 22.

While the safety pin solved the problem of pins slipping out of the materials they joined together, the conventional safety pin does have some drawbacks. For example, when

fastening together relatively thick materials, such as the folds of a diaper, it can be difficult to extend the pointed end far enough from the edge of the material to secure the layers together without incurring the risk of the pin tearing through the edge. The thin stationary bar can be difficult to grip firmly, having a tendency to roll or rotate between the fingers while trying to
5 manipulate the pointed end through the material. In addition, once the pin bar has been inserted through the material, the material may be so thick that a considerable amount of finger strength is required to bend the pin bar far enough to insert the pointed end into the shield, and in some cases, it may not be possible to secure the pin bar to the shield without withdrawing the pin from the material and re-inserting the pin through a thinner portion of
10 the materials.

Although many modifications to the safety pin have been developed for various purposes, and although there are various fasteners with arcuate pin bars for various other purposes but which lack the essential features of the safety pin, there remains a need for fasteners with the reliability, safety, and versatility of the conventional safety pin, but which
15 also are easier to insert through bulky materials, are easier to grasp, and/or have a larger fastening capacity than a conventional safety pin of comparable size. Thus, a safety pin with an arcuate pin bar solving the aforementioned problems is desired.

DISCLOSURE OF THE INVENTION

This disclosure is directed to a safety pin. The safety pin includes a torsion spring
20 coil. The torsion spring coil has a stationary bar and a pin bar extending from opposite ends. The pin bar is arcuate and has a pointed end. The safety pin further includes a shield attached to the stationary bar. The shield extends at an angle relative to the stationary bar and defines a groove. The pin bar is adapted for insertion through a material to be secured. The pin bar is compressed toward the stationary bar and secured in the groove defined by the shield.

This disclosure is additionally directed to a safety pin. The safety pin includes a torsion spring coil. The torsion spring coil has a stationary bar and a pin bar extending from opposite ends. The pin bar is arcuate and has a pointed end. The stationary bar has an end bent backward at an angle. The safety pin also includes a shield attached to the angled end of the stationary bar. The shield extends at an angle relative to the stationary bar and defines a groove. The pin bar is adapted for insertion through a material to be secured. The pin bar is compressed toward the stationary bar and secured in the groove defined by the shield.

The disclosure is further directed to a safety pin. The safety pin includes a torsion spring coil. The torsion spring coil has a fin and a pin bar extending from opposite ends of the coil. The pin bar is arcuate and has a pointed end. The safety pin additionally includes a shield attached to the fin. The shield extends at an angle relative to the fin and defines a groove. The pin bar is adapted for insertion through a material to be secured. The pin bar is compressed toward the fin and secured in the groove defined by the shield.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view of a first embodiment of a safety pin with an arcuate pin bar according to the present invention.

Fig. 2 is a front view of a second embodiment of a safety pin with an arcuate pin bar according to the present invention.

Fig. 3 is front view of a third embodiment of a safety pin with an arcuate pin bar according to the present invention.

Fig. 4 is a front view of a fourth embodiment of a safety pin with an arcuate pin bar according to the present invention.

Fig. 5 is a perspective view of a conventional safety pin according to the prior art.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

BEST MODES FOR CARRYING OUT THE INVENTION

The safety pin with an arcuate pin bar is formed from pin wire bent in the middle to form a coil having a stationary bar extending from one end of the coil and a pin bar with a pointed end extending from the opposite end of the coil. The pin bar is arcuate, or formed with an arch. The stationary bar has a shield attached thereto, the end of the stationary bar being bent backward or the shield being attached to the end of the stationary bar so that the shield extends at an angle complementary to the curvature of the pin bar. The stationary bar may have a textured or roughened fin formed thereon, and may have linear inner and outer edges, a straight inner edge and convex outer edge, or a concave inner edge and convex outer edge.

In use, the arcuate pin bar allows for easier insertion of the pointed end through thickened material by rotation of the pin bar to a convenient angle for insertion through the material. The fin may be made from metal or plastic, as may the shield. The pin may be made from stainless steel in order to be used for surgical purposes. The fin may be thick, or may be thin for savings in material costs. The fin is textured, serrated, roughened, or coated with spray weld to render the fin easier to grasp and less prone to slip through the fingers. The stationary bar and fin may be formed in various arcuate shapes, both to increase the gripping area and to allow for fastening thick material together.

The present invention is a safety pin with an arcuate pin bar. Referring to Fig. 1, a first embodiment of the safety pin 30 is made from pin wire bent in the middle to form a coil 32, in essence forming a torsion spring. The safety pin 30 has an arcuate pin bar 34 having a sharp, pointed end 36 for piercing the material to be secured. The safety pin 30 has a linear

stationary bar 38 having a shield 40 attached thereto. The shield 40 is formed with a convex outer side and a concave inner side throughout its length, being bent into a substantially U-shape. Either the end of the stationary bar 38 to which the shield 40 is attached is bent backward, or the shield 40 is attached to the end of the stationary bar at an angle, so that the shield 40 is at an angle relative to the stationary bar 38 that is complimentary to the curvature of the pin bar 34.

The safety pin 30 has a retainer 42 extending from the stationary bar 38 into the groove 44 formed by the shield 40. In order to fasten the pin 30, the pin bar 34 must be compressed towards the stationary bar 38 and inserted into the shield 40 through a channel on one or the other side of the retainer 42, which acts as a guide for the pin bar 34, until the pin bar 34 becomes lodged in the center of the groove 44 defined by the shield 40 directly opposing the retainer 42. Similarly, to unfasten the pin 30, the pin bar 34 must be moved into a channel on either side of the retainer 42.

The radius of curvature of the pin bar 34 may vary, depending upon the length of the pin bar 34. An exemplary dimension may be a radius of curvature of about two inches for a pin bar 34 having a length of about 1 3/4". The angle of the shield 40 is complementary to the curvature of the pin bar 34 to increase the segment of the pin bar 34 that bears against the shield 40 due to the torsion applied by the coil 32. The safety pin 30 may be made entirely from metal, such as stainless steel, or a portion of the safety pin 30, such as the shield 40 and/or the stationary bar 38 may be made from, or coated with, a plastic material, such as nylon.

Fig. 2 shows a second embodiment of the safety pin, designated as 50 in the drawing. The safety pin 50 is similar to safety pin 30, having a coil 32 and an arcuate pin bar 34 with a sharp, pointed end 36. However, this embodiment of the safety pin 50 has a wing or fin 52 that the user may grasp when fastening and unfastening the safety pin 50. The fin 52 may be

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substantially flat and thin, i.e., less than or equal to the diameter of the pin bar 34, or may have any desired thickness. The fin 52 may envelop the stationary bar 38, extend from the stationary bar 38, or be used in lieu of the conventional stationary bar 38, with only a portion of the stationary bar leg of the coil 32 extending into the fin 52.

5 The fin 52 may be made from metal or plastic, and has a textured or roughened surface to improve gripping of the fin 52. The textured surface may be formed in any conventional manner, e.g., by milling or grinding, by applying a coating such as spray weld, by molding, calendaring, extrusion, or other manufacturing processes in the case of plastics, etc. The shield 54 is attached to the end of the fin 52 at an angle, similar to that described for
10 attaching the shield 54 to stationary bar 38 above. The outer surface of the shield 54 may also be textured or roughened to make the shield 54 easy to grasp. A retainer 56 extends into the groove formed by shield 54 in the manner described above.

As shown in the drawings, the fin 52 has a substantially linear inner edge 58 and a substantially linear outer edge 60.

15 Fig. 3 shows a third embodiment of a safety pin, designated as 70 in the drawings. The safety pin 70 also has a coil 32, a pin bar 34 having a sharp, pointed end 36, and a shield 54 as described above. In this embodiment the safety pin 70 has a fin 72 formed with a substantially linear inner edge 74 and a convex outer edge 76. The outer edge 76 may have substantially the same radius of curvature as the pin bar 34. The fin 72 and shield 54 are
20 formed from metal or plastic and have a textured or roughened outer surface formed in the same manner as fin 52. The fin 72 may be substantially thin and flat, or may have any desired thickness, as described with respect to fin 52. Fin 72 may have stationary bar 38, or a portion thereof, embedded in the fin 72.

Fig. 4 shows a fourth embodiment of the safety pin with an arcuate pin bar,
25 designated as 80 in the drawing. As in the previous embodiments, the safety pin 80 has a coil

32, an arcuate pin bar 34 with a sharp, pointed end 36, and a shield 54. The safety pin 80 has a fin 82 with a concave inner edge 84 and a convex outer edge 86. The fin 82 and shield 54 are formed from metal or plastic and have a textured or roughened outer surface formed in the same manner as fin 52. The fin 82 may be substantially thin and flat, or may have any
5 desired thickness, as described with respect to fin 52. Fin 82 may have stationary bar 38, or a portion thereof, embedded in the fin 82.

In either the second, third or fourth embodiments, the fin 52, 72 or 82 may be further modified by having either a magnet or a strip of hook and loop fastening material adhered thereto. This would enable such items as badges, nametags, corsages, jewelry, etc., to be
10 releasably and interchangeably attached to the fin after the safety pin has been fastened to an article of clothing by providing the badge, nametag, corsage, jewelry, or other such item with a mating magnet or strip of hook and loop fastening material attached thereto.

The foregoing specification has described several objects, advantages, and features that are independent of each other, i.e., each of the following claims is commensurate with at
15 least one such object, advantage or feature, but not necessarily with all such objects, advantages, and features.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

CLAIMS

I claim:

1. A safety pin, comprising:
a torsion spring coil having a stationary bar and a pin bar extending from opposite
5 ends, the pin bar being arcuate and having a pointed end; and
a shield attached to the stationary bar, the shield extending at an angle relative to the
stationary bar and defining a groove, whereby the pin bar is adapted for insertion through a
material to be secured, being compressed toward the stationary bar and secured in the groove
defined by the shield.
- 10 2. The safety pin according to claim 1, further comprising a textured fin attached to
the stationary bar for better gripping.
3. The safety pin according to claim 2, wherein said fin has a linear inner edge and
a linear outer edge.
4. The safety pin according to claim 2, wherein said fin has a linear inner edge and
15 a convex outer edge.
5. The safety pin according to claim 4, wherein the pin bar has a radius of curvature
substantially the same as a radius of curvature of the outer edge of the fin.
6. The safety pin according to claim 2, wherein said fin has a concave inner edge and
a convex outer edge.
- 20 7. The safety pin according to claim 6, wherein the pin bar has a radius of curvature
substantially the same as a radius of curvature of the outer edge of the fin.
8. The safety pin according to claim 2, further comprising means for attaching a
decoration to said fin.

9. The safety pin according to claim 2, further comprising means for attaching identification to said fin to form a nametag or badge.

10. A safety pin, comprising:

a torsion spring coil having a stationary bar and a pin bar extending from opposite
5 ends, the pin bar being arcuate and having a pointed end, the stationary bar having an end bent backward at an angle; and

a shield attached to the angled end of the stationary bar, the shield extending at an angle relative to the stationary bar and defining a groove;

whereby the pin bar is adapted for insertion through a material to be secured, being
10 compressed toward the stationary bar and secured in the groove defined by the shield.

11. The safety pin according to claim 10, further comprising a textured fin attached to the stationary bar for better gripping.

12. The safety pin according to claim 11, wherein said fin has a linear inner edge and a linear outer edge.

15 13. The safety pin according to claim 11, wherein said fin has a linear inner edge and a convex outer edge.

14. The safety pin according to claim 13, wherein the pin bar has a radius of curvature substantially the same as a radius of curvature of the outer edge of the fin.

20 15. The safety pin according to claim 11, wherein said fin has a concave inner edge and a convex outer edge.

16. The safety pin according to claim 11, wherein the pin bar has a radius of curvature substantially the same as a radius of curvature of the outer edge of the fin.

17. The safety pin according to claim 11, further comprising means for attaching a decoration to said fin.

18. The safety pin according to claim 11, further comprising means for attaching identification to said fin to form a nametag or badge.

19. A safety pin, comprising:

5 a torsion spring coil having a fin and a pin bar extending from opposite ends of the coil, the pin bar being arcuate and having a pointed end; and

a shield attached to the fin, the shield extending at an angle relative to the fin and defining a groove, whereby the pin bar is adapted for insertion through a material to be secured, being compressed toward the fin and secured in the groove defined by the shield.

20. The safety pin according to claim 19, wherein the fin has a convex outer edge.

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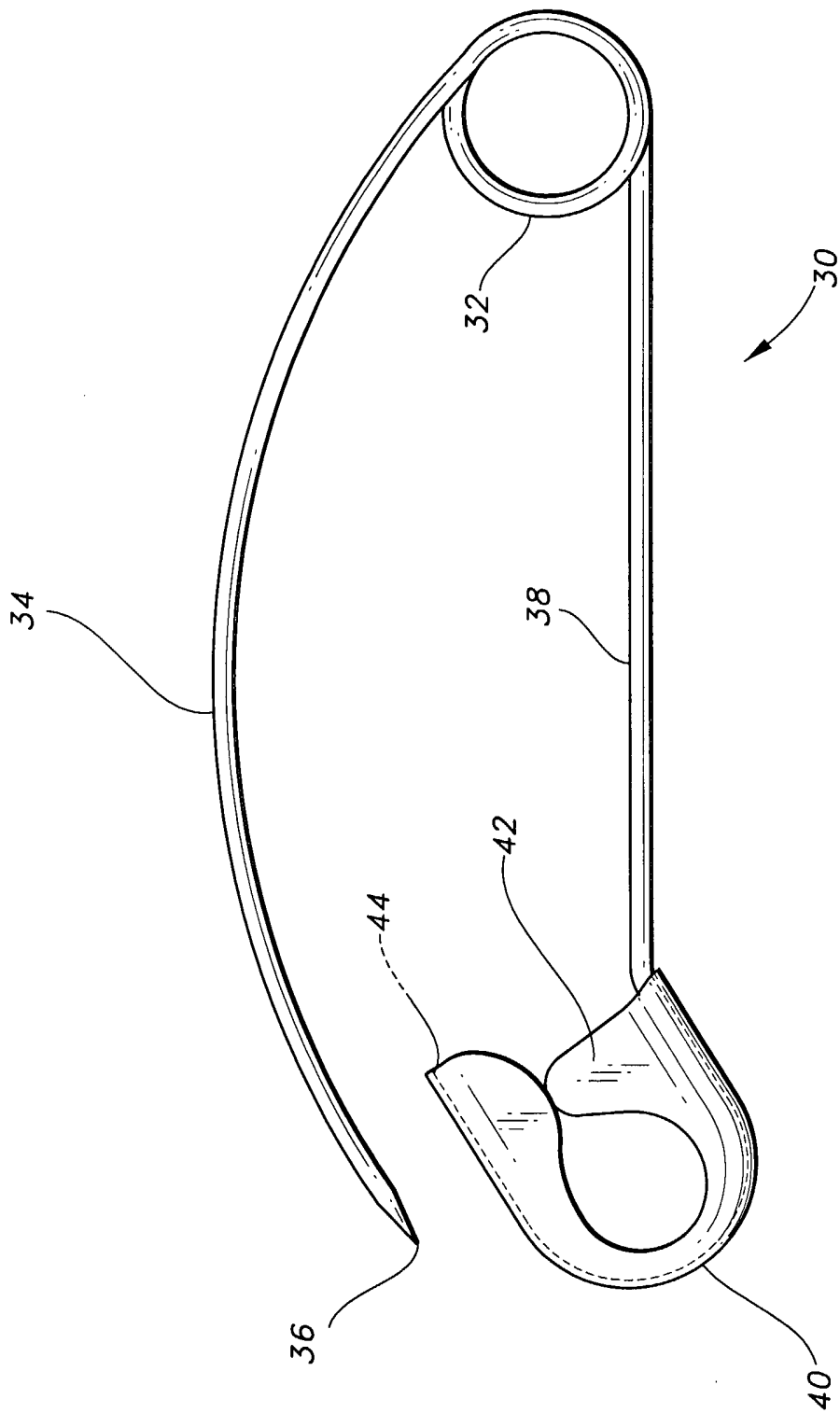


Fig. 1

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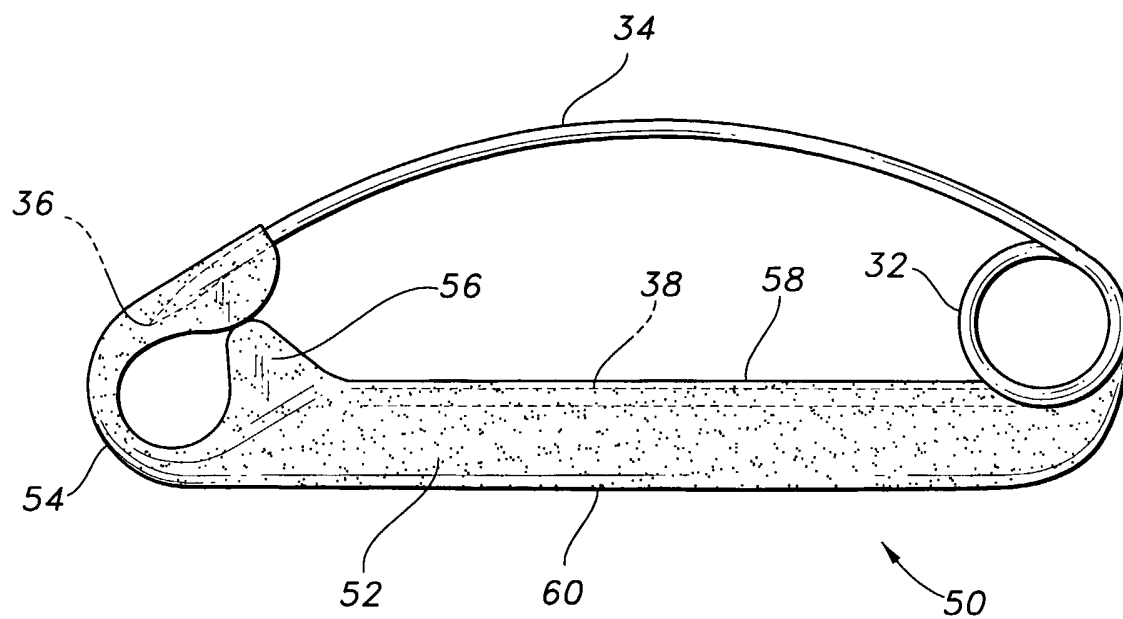


Fig. 2

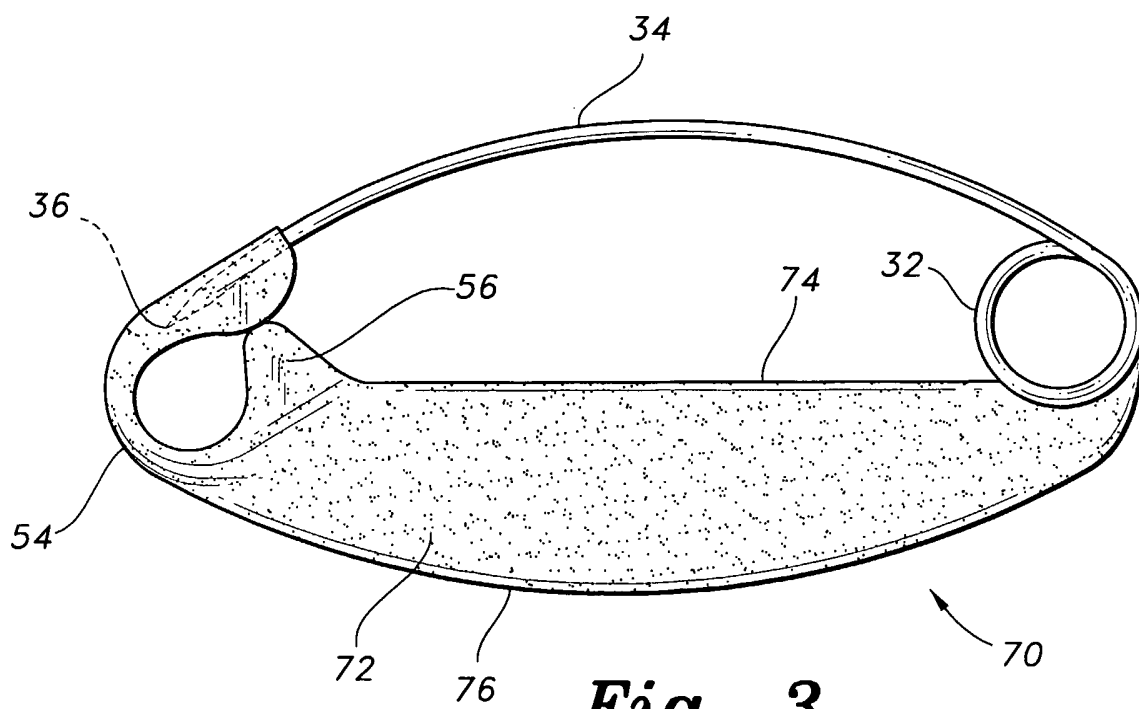


Fig. 3

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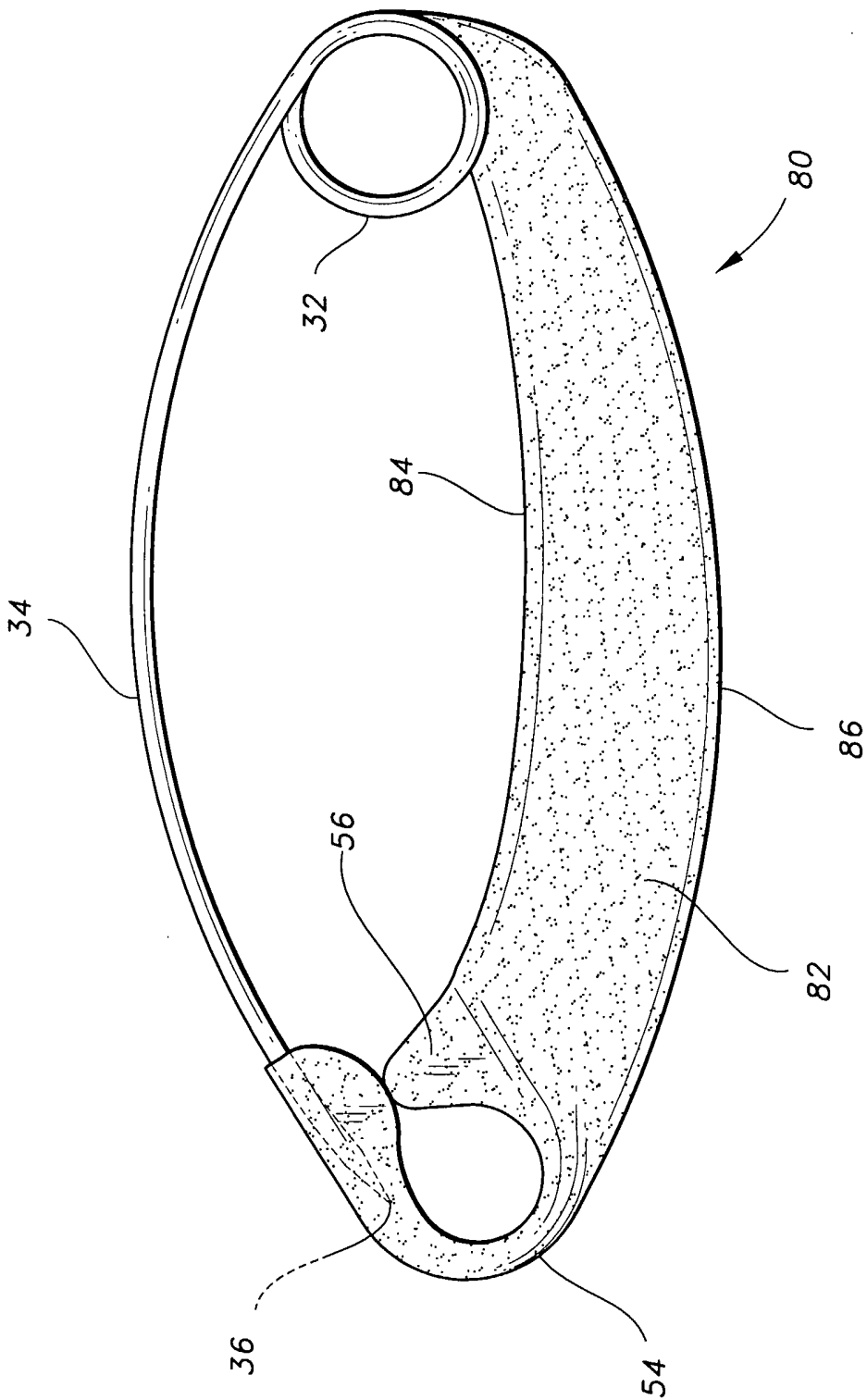


Fig. 4

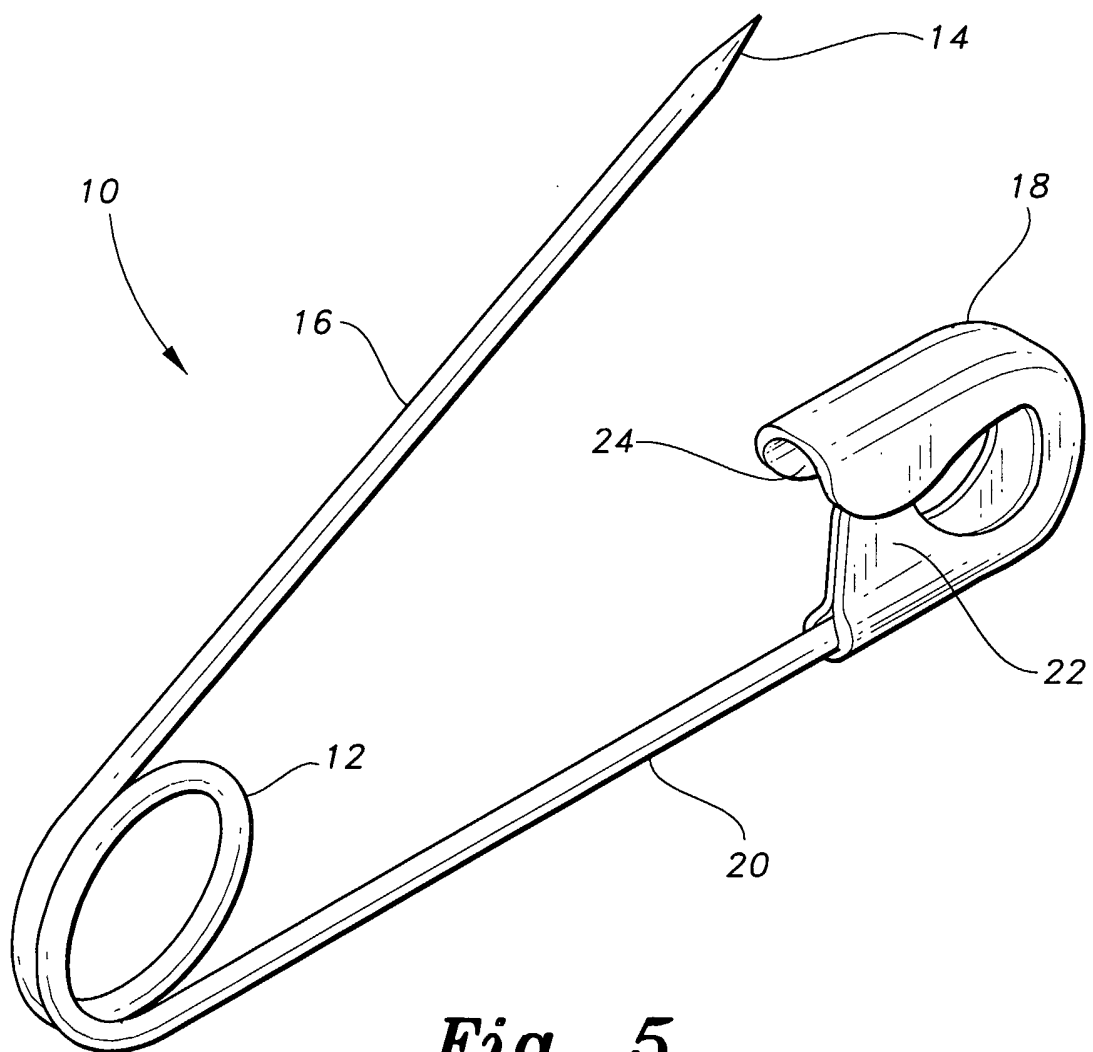
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Fig. 5
(PRIOR ART)