Feb. 3, 1959 J. H. BACON 2,871,691

KEY RING

Filed Dec. 8, 1955

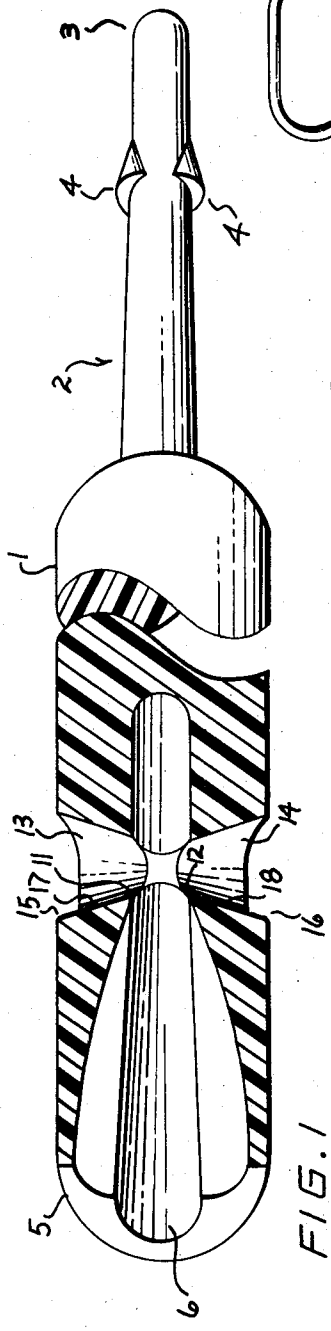


FIG. 1

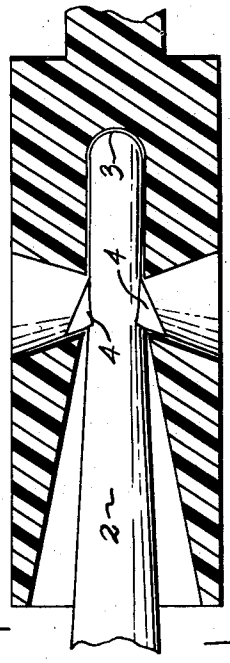


FIG. 2

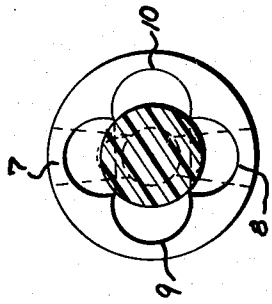


FIG. 3

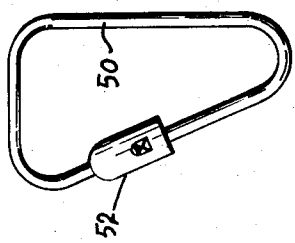


FIG. 5

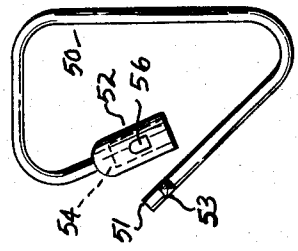


FIG. 6

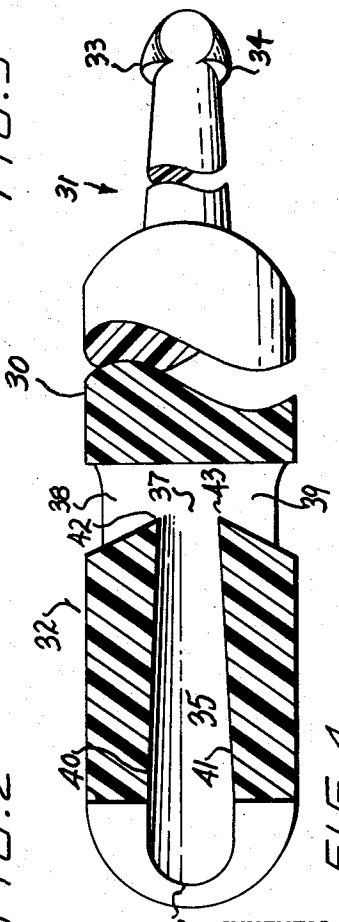


FIG. 4

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United States Patent Office

2,871,691

Patented Feb. 3, 1959

2,871,691

KEY RING

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Application December 8, 1955, Serial No. 551,956

5 Claims. (Cl. 70—458)

The present invention relates to a flexible one-piece key ring adapted to be molded of a single piece of material and used as a ring-like structure with one end interengaging the other end.

One object of the present invention is to provide an improved inexpensive key ring readily manufactured from plastic material without any assembly requirements.

A second object of the present invention is to provide a key ring structure, preferably made of a polyethylene material or material possessing similar resilient qualities in which the resilient quality of the plastic material is utilized in the operation of the key ring structure.

Another object of the present invention is to provide a key ring structure made of an elongated length of plastic or similar material in which one end locks into the other end forming a self-enclosed ring with the locking operation utilizing the torsional resilience property of the plastic material.

Another object of the present invention is to provide an improved plastic key ring structure of simple and inexpensive design. These and other objects and features of the present invention will be more clearly understood when considered in connection with the accompanying drawings in which:

Figure 1 discloses a fragmentary cross-sectional perspective view of the invention,

Figure 2 illustrates a cross-sectional side view of the invention in a locked position,

Figure 3 illustrates a cross-sectional end view taken substantially along the lines 3—3 of Figure 2,

Figure 4 illustrates a fragmentary perspective view partly in section of a modification of the invention,

Figure 5 illustrates a top plan view of a further modification, and

Figure 6 illustrates a top plan view of the ring shown in Figure 5 in an open position.

Referring specifically to the structure illustrated in Figures 1, 2 and 3, there is shown a key ring structure, preferably made of a flexible plastic material, such as polyethylene having some torsional resilient quality and having the body section 1 of any desired length permitting it to be formed into a ring. The male end 2 of this ring is formed of a narrower section tapering slightly towards its tip 3. Centrally located on this male end 2 are a pair of barbs 4 oppositely positioned on the male end 2 over an arc of approximately 90°. The other end of this key ring is formed as a female end 5 with a centrally located irregularly shaped elongated recess 6. This recess 6 as is illustrated in Figure 3 has at its outer end four arcuate sections 7 and 8 and 9 and 10. The walls of the recess 6 formed from the opposite arcuate section 7 and 8 taper inwardly towards one another to gripping edges 11 and 12 respectively well within the recess 6. These gripping and biting edges 11 or 12 are partially formed by the opposite top and bottom openings 13 and 14 respectively. These top and bottom openings 13 and 14 are provided with straight transverse edges

15 and 16 on the side of the outer end of the recess 6, with the transverse edges 15 and 16 inclined along the walls 17 and 18 to the edges 11 and 12 respectively. The center of the recess 6 is sufficiently large to contain the male end 2 with the barbs 4 positioned in the openings 13 and 14 as is illustrated in Figure 2. The arcuate sections 9 and 10, however, unlike the arcuate sections 7 and 8, do not taper inwardly towards the center, but rather extend parallel to the outer wall to the openings 13 and 14. These arcuate recessed elongated sections 9 and 10 are spaced apart a distance greater than the distance between the extreme edges of the opposite barbs 4. Thus, in the operation of this key ring, the extreme end of the male end 2 may be turned around and pushed into the opening 6. As it is moved forward through the opening illustrated in Figure 2, the barbs 4 will bear against the tapered sides extending from the arcuate sections 7 and 8. As the plastic forming the key ring has some resilience, the barbs 4 will force the gripping edges 11 and 12 apart until the barbs themselves have cleared these edges and are in the position as illustrated in Figure 2. The ring may readily be opened by twisting the male end until the barbs are aligned with the sections 9 and 10 and then readily pulled apart.

Referring to the modification illustrated in Figure 4, there is shown a key ring of material similar to that from which the key ring of Figure 1 is made. This modification is provided with an elongated body 30 of any desired length having a male end 31 and a female end 32. The male end 31 is tapered slightly towards its tip where it has oppositely arranged barbs 33 and 34, preferably both arranged at the extreme tip of the male end 31. The female end 32 is provided with a central longitudinally extending opening 35 having a generally oval-cross section. The longitudinal side portion 36 of this opening and the side portion opposite thereto, but not shown in Figure 4, are parallel with one another and extend longitudinally from the extreme open end to the inner end 37 where they join and meet the side walls of the openings 38 and 39. The upper and lower side sections 40 and 41 respectively of this longitudinal opening 35 are inclined towards one another from the open end to the inner end 37. The width of this opening 35 is sufficient to permit the longitudinal passage of the male end 31 when it is twisted so that the barbs 33 and 34 are aligned with the side longitudinal portion 36 and its opposite portion. The upper and lower edges 40 and 41 should be sufficiently close at their inner end so that the corners 42 and 43 form a gripping edge which engages the rear surfaces of the barbs 33 and 34. The vertically aligned openings 38 and 39, preferably tapered at their sides are sufficiently large to receive the barb tip of the male end 31 when in a locked position. These openings 38 and 39 may be bevelled as illustrated for ease in one-piece molding.

In the operation of this key ring, the barbs 33 and 34 which are in a normal untensioned position at right angles to the longest dimension of the opening 35 are turned so that they are aligned with this longitudinal dimension. The male end is then pushed through the opening 35 until the barbs clear the edges 42 and 43 at which point the tension is released and the barbs 33 and 34 will normally turn approximately 90° so that they engage the edges 42 and 43. For removal, a reverse procedure may be followed.

In Figures 5 and 6, there is illustrated a further modification of the present invention which utilizes the resilient features of the material from which these key rings are made to a greater extent than those illustrated in Figures 1 and 4. In this modification a key ring hav-

ing an elongated body member 50 molded in a circular form has a male end 51 and a female end 52. The male end 51, which may have the same diameter as the main portion of the body, is provided with projecting members 53 arranged in opposite sides of the end 51. These projecting members 53 and the male end 51 are adapted to be forced into the female end 52 which is provided with a recess shaped of substantially the same size in diameter of the male end 51. On opposite sides of this opening 54 are provided openings 56 normal to the opening through the end sufficiently large to receive the projection 53. Thus, in the operation of this key ring, the male end 51 is forced into the opening in the female end until the projections 53 become aligned with the openings 56 thereby engaging them.

Having now described my invention, I claim:

1. A ring structure molded of resilient plastic material comprising a body having integrally formed interengagable male and female ends, a pair of barbs molded as part of the male end and disposed on opposite sides of that end, a recess formed in the female end with its longitudinal center coincident with the longitudinal center of the female end, opposite sides of the recess converging inwardly from the female end and each side terminating in an abruptly widened section formed by passages through the walls of the female end, said passages receiving the barbs when the male end is inserted in the recess, a pair of channels formed on opposite sides of the recess normal to the converging opposite sides and extending outwardly from the passages, said channels being larger than the barbs and permitting withdrawal of the male end from the recess by twisting the male end so that the barbs are aligned with the channels.

2. A ring structure molded of resilient plastic material comprising a body having integrally formed interengagable male and female ends, a pair of barbs molded as part of the male end and disposed on opposite sides of that end, a recess formed in the female end with its longitudinal center coincident with the longitudinal center of the female end, opposite sides of the recess converging inwardly from the female end and each side terminating in an abruptly widened section formed by passages through the walls of the female end, said passages receiving the barbs when the male end is inserted in the recess, the width of the recess between the converging sides at the inner end being substantially smaller than the width of the male end across the barbs, the width of the recess normal to the converging sides being larger than the width of the male end across the barbs and permitting withdrawal of the male end from the recess by

turning the male end so that the barbs are normal to the converging sides.

3. A ring structure formed of an elongated tortionally resilient body having interengagable male and female ends, said male end having a projecting barb, a recess formed in the female end and tapered inwardly along one axial plane to a narrow internal section, a passage formed in the female end and extending outwardly from the narrower internal section, thus providing an abutment against which the barb may bear when the male end is inserted into the recess, and a channel formed along the recess and displaced 90° from the plane of the taper, said channel being larger than the barb whereby when the male end is twisted in the recess so that the barb registers with the channel the male end may be withdrawn from the recess.

4. A ring structure as defined in claim 1 further characterized by said barbs being displaced inwardly from the end of the male end, and said recess extends inwardly in the female end beyond the passages.

5. A ring structure molded of resilient plastic material comprising a body having integrally formed interengagable male and female ends, a pair of barbs molded as part of the male end and disposed on opposite sides of that end, a recess formed in the female end with its longitudinal center line coincident with the longitudinal center line of the female end, four channels running longitudinally in the sides of the recess and forming two opposite pairs, the depth of the channels forming one of the pairs decreasing inwardly from the female end, a pair of passes extending radially outward from the inner ends of the channels of decreasing depth, said passages receiving the barbs when the male end is inserted into the recess, said recess being wider across the other pair of channels when the width of the male end across the barbs whereby the male end may be withdrawn from the recess by turning the barbs so that they register with said other pair of channels.

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