United States Patent

Kahn

[15] **3,643,296**

[45] **Feb. 22, 1972**

[54] **TWO-PART SNAP FASTENER**

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[73] Assignee: **Togs, Inc.,** Baltimore, Md.

[22] Filed: **Sept. 3, 1970**

[21] Appl. No.: **69,324**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 863,060, Oct. 2, 1969, which is a continuation-in-part of Ser. No. 819,144, Apr. 25, 1969, which is a continuation-in-part of Ser. No. 781,296, Oct. 16, 1968, abandoned.

[52] **U.S. Cl.** **24/108,** 24/109, 24/221, 24/217, 85/5

[51] **Int. Cl.** **A44b 1/34,** A44b 1/32, A44b 17/00

[58] **Field of Search** ..... 24/73 RM, 109, 73 P, 221 L, 24/221 A, 221 R, 108, 107, 208 A, 90.6 F, 90.6 E, 102, 52, 217, 216, 221, 214, 213; 85/5, DIG. 2; 16/DIG. 13, 171, 191; 63/29; 287/74, 92, 99, 119; 46/173, 161, 163, 169, 29, 31, 26

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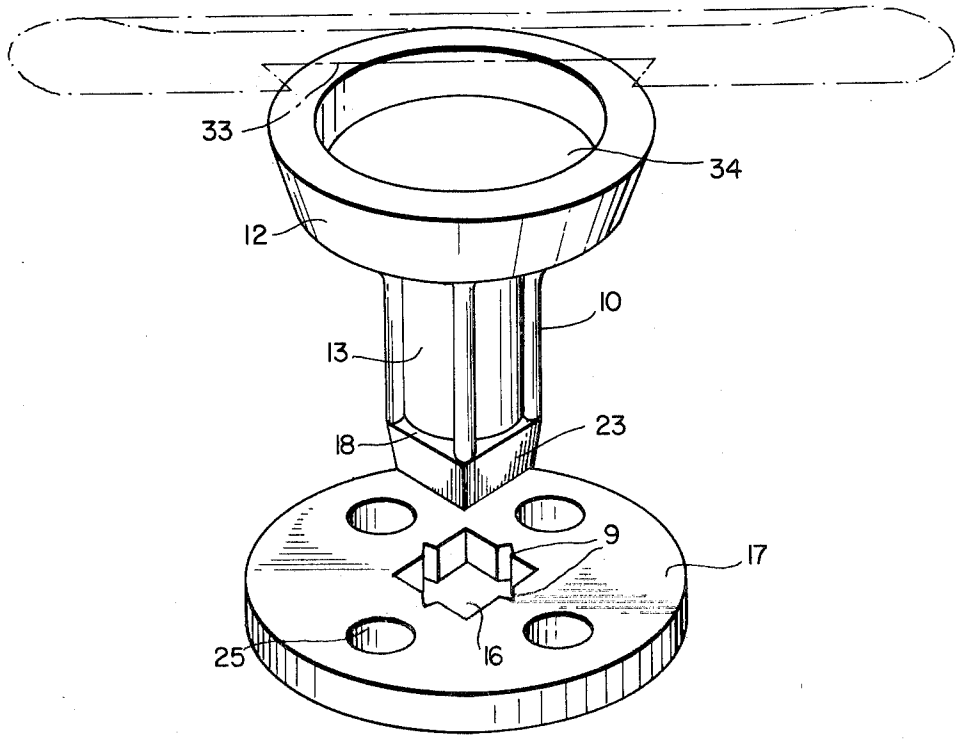
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[57] **ABSTRACT**

The invention is a two-part snap-fastening device which includes a button member having a stud projecting therefrom, and a foundation member securable to a garment. The projecting stud mates with the foundation member in a semipermanent fashion so that disengagement does not result during normal wearing. The button portion is made of relatively hard material having a stud integral therewith, the free end of which is bulbous and adapted to be inserted into the somewhat resilient foundation member and form a semipermanent connection.

9 Claims, 14 Drawing Figures



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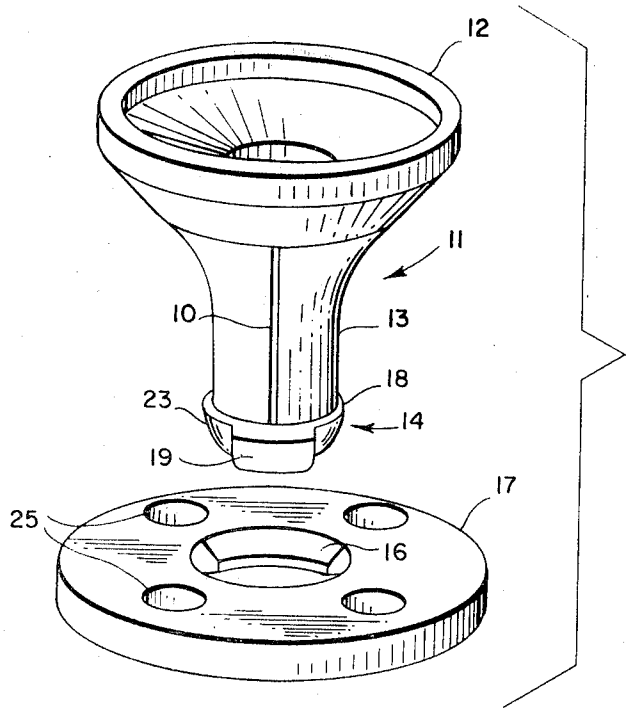


FIG. 1

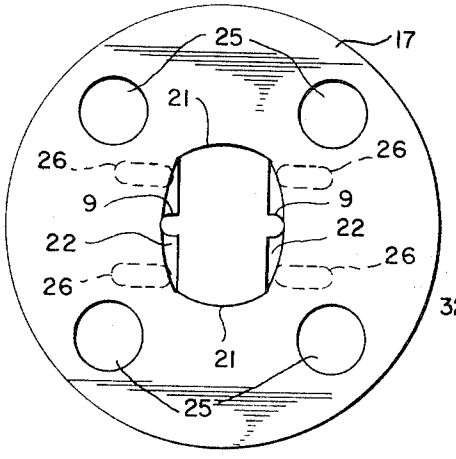


FIG. 3

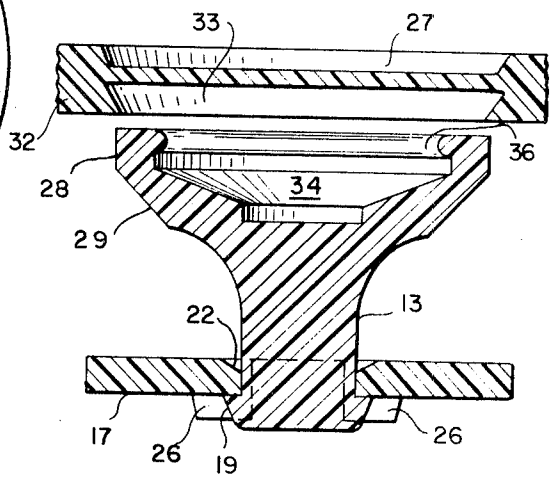


FIG. 2

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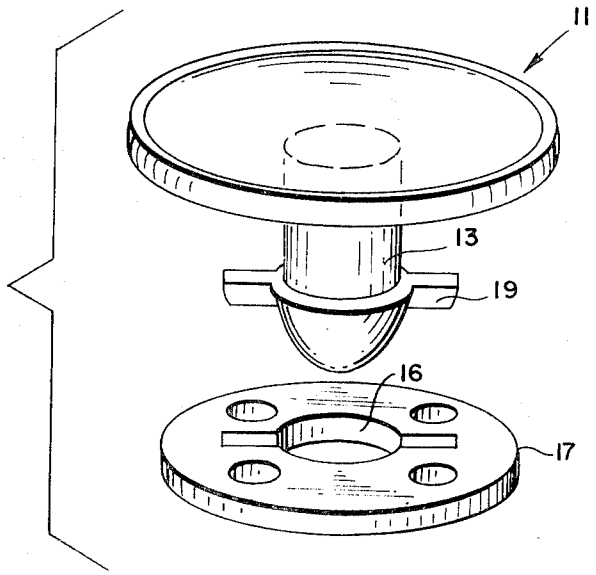


FIG. 4

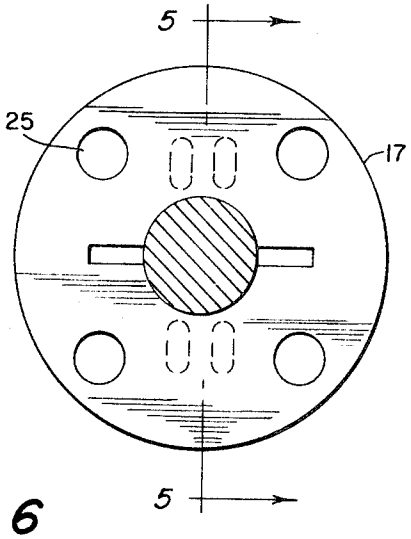


FIG. 6

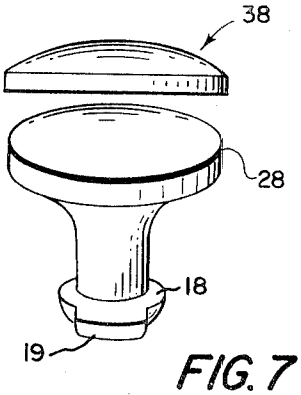


FIG. 7

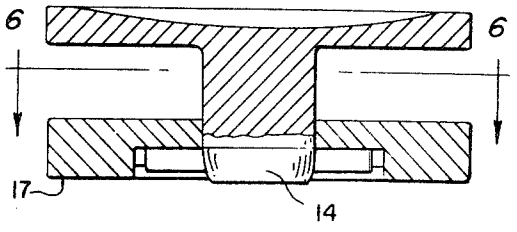


FIG. 5

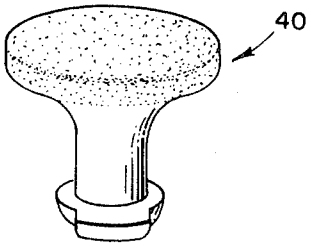


FIG. 8

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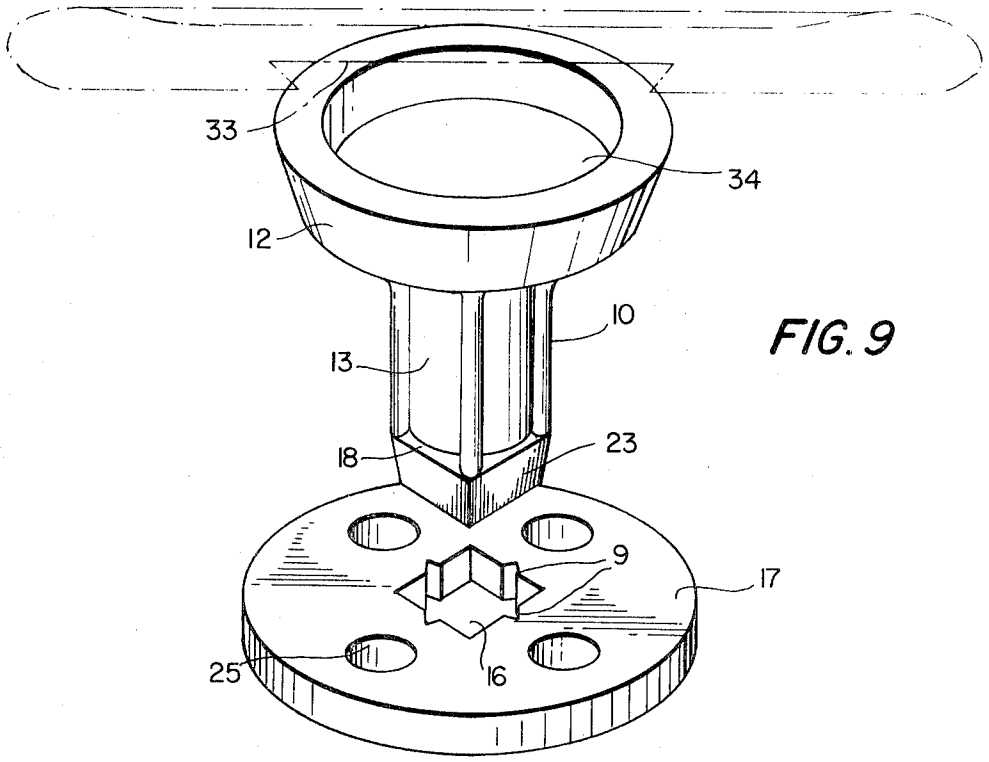


FIG. 9

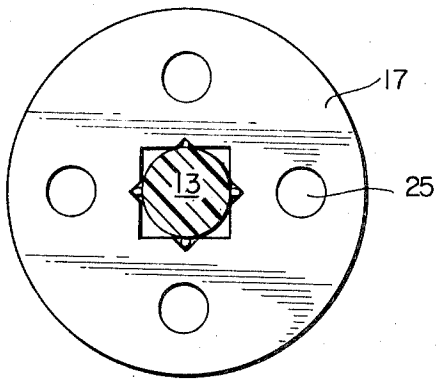


FIG. 11

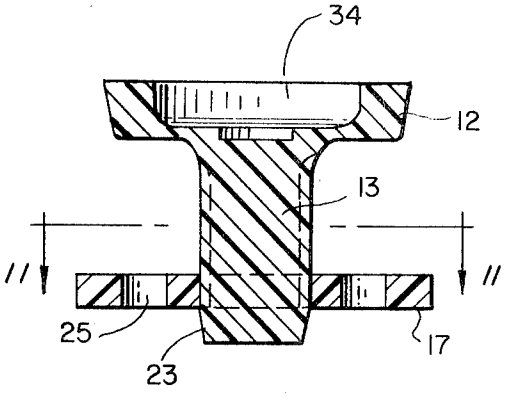


FIG. 10

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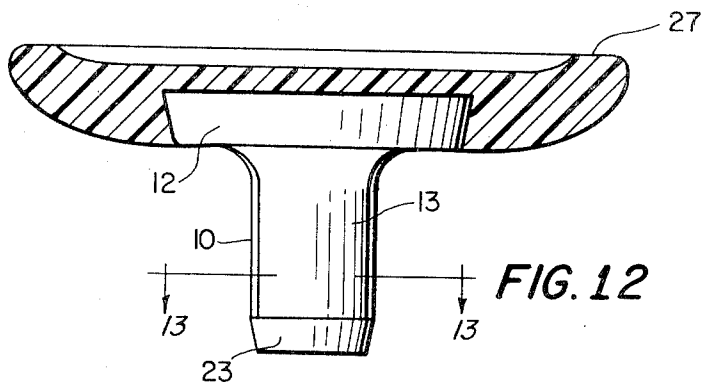


FIG. 12

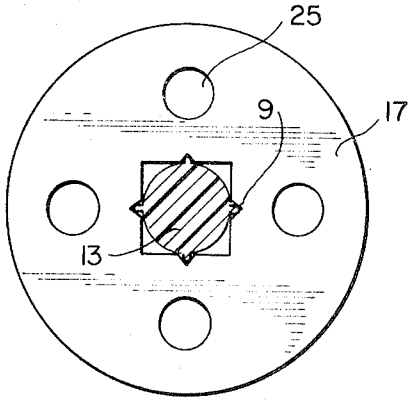


FIG. 13

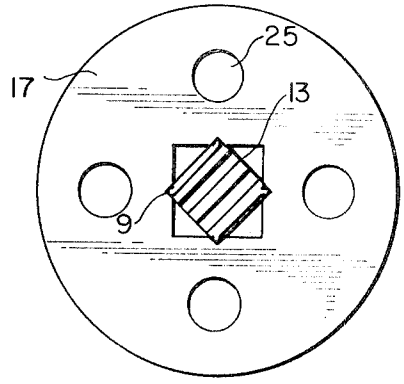


FIG. 14

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TWO-PART SNAP FASTENER

This is a continuation-in-part of my application Ser. No. 863,060 filed Oct. 2, 1969, which is a continuation-in-part of my application Ser. No. 819,144, filed Apr. 25, 1969, which in turn is a continuation-in-part of my application Ser. No. 781,296, filed Oct. 16, 1968, now abandoned.

This invention relates to a multiple-part garment fastener adapted for relatively permanent attachment to a garment and which provides means for easy attachment and replacement.

In my earlier applications, I have described the difficulties attendant upon the attachment of conventional buttons to garments and the problems encountered in wearing because of their ready detachment from garments and the difficulty of replacing them. The articles of my earlier applications are two-part fasteners comprising a flat, female member having an opening therein and being adapted for attachment to one fold of the garment and a separate male member including a shank having a button integrally formed therewith at one end and an enlargement at the opposite end integral therewith and adapted for operative association with the female member whereby the two are snapped together to form a relatively permanent attachment. However, the association of the male and female members is such that by deliberate effort they can be separated and other male members substituted therefor without detaching the female member from the garment.

The present invention is an extension and modification of the earlier devices whereby it is possible to achieve a swaged fit between the male and female members and avoid the use of the peripheral groove adjacent the mating enlargement of the male member as described in my earlier applications. In addition, in accordance with the present invention, it is possible to insert the face or platform of said male member into a cavity cut into the underside of any ordinary button. This insertion is accomplished by mechanically reducing the size of the platform or base of said male part by compression and then inserting it in the smaller cavity cut in the underside of the button. After insertion, the platform is released from compression, thereby allowing it to expand into the cavity of the button achieving a permanent fit. This new configuration of the male stem allows us to utilize all present button molds and products by forming an undercut cavity in the backface of the buttons. Thus, we can utilize existing equipment and provide an immediate, wide selection of different styles of buttons embodying my invention. For convenience in discussing the described three-part button, the outer element will be called the button member, the element sewn to the garment the female member and the connecting element the male member.

It is preferred to form the male member of somewhat resilient material so that it can be mated with the rigid female and button members to create in the assembled button a unitary characteristic.

Use of a button shank of slightly larger cross section than the opening in the female member assures a tight fit at the point of maximum stress. Further, by this means it is possible to eliminate the peripheral groove adjacent the shank inner enlargement as described in my earlier applications without sacrificing the rigidity of the button assembly. Elimination of the peripheral groove also facilitates molding of the male part since any break in the surface of a molded part requires additional work in mold construction and perfect alignment of the parts during molding.

By use of a resilient shank and a rigid opening, the larger shank can with pressure be inserted into the opening where it is held against ready withdrawal or rotation. It is possible to make the shank member of rigid material and the female member of resilient material and still accomplish the same desirable result of relatively fixed parts. However, where the male member must be mated with a rigid button member, it is preferred to have a relatively resilient male member. For a two-part button or braided or capped button, either the male or female may be rigid and the other resilient. The determination of which member is to be resilient is made on the basis of the materials to be used and the type of button. For example, if the male member is metal, the female portion must be resilient. It is fully within the scope of the present invention to have both members of relatively resilient material.

The selection of the materials of construction will depend largely upon availability and cost. Illustrative but nonlimiting examples of resilient plastic materials which may be used are nylon and polyolefins such as polyethylene, polypropylene, polybutene, and copolymers thereof. Rigid materials may be metal, wood, nylon, polyacetals, polyesters, polyvinylchloride, ureaformaldehyde, etc. My invention is not limited to materials of construction buy is applicable to any material having the desired properties.

The present invention will be further understood by reference to the accompanying drawings in which:

FIG. 1 is an exploded view in perspective of one embodiment of the male-female assembly of my invention;

FIG. 2 is a cross-sectional view partly exploded and partly assembled of the article of the present invention;

FIG. 3 is a top view of the female member of FIG. 2;

FIG. 4 is an exploded view of another embodiment of the present invention;

FIG. 5 is a side view in cross section of the embodiment shown in FIG. 4;

FIG. 6 is a top view of the embodiment shown in FIG. 5 taken along line 6—6;

FIG. 7 shows an embodiment wherein a metal cap is crimped onto the button end;

FIG. 8 shows an embodiment having a woven leather button end;

FIG. 9 is an exploded view of a composite button embodying a preferred embodiment of the present invention;

FIG. 10 is a longitudinal section of the article of the present invention showing the male and female members in operative association;

FIG. 11 is a cross-sectional view of FIG. 10 taken along the line 10—10;

FIG. 12 is a cross-sectional view of the male member of the present invention associated with an outer button;

FIG. 13 is a cross-sectional view of FIG. 17 taken along the line 13—13 and showing in addition the female member in plan view; and

FIG. 14 is a view similar to that of FIG. 5 wherein the shank of the male member is square in cross section rather than round.

Referring more specifically to the drawings, the device of the present invention comprises a male member 11 having a shank 13 and integrally formed therewith an outer enlarged end portion 12 adapted to be force fit and expanded into an undercut or cavity 33 in the back of a button 34 (FIG. 2), and at the opposite end thereof a second enlarged locking portion 14 adapted to be inserted into the opening 16 of female member 17. The enlarged locking end of male member 11 in one embodiment is provided with a shoulder 18 and around a portion of circumference with lugs 19 on opposed sides of the periphery. When the male and female members are mated, lugs 19 slide into opening 16 at points where the walls 21 (FIG. 3) are vertical. The walls of opening 16 throughout the other portions are beveled inwardly as at 22 (FIG. 3) to accommodate the slightly tapered end 23 of male member 11 of hard material, the sloping sidewalls 22 are deformed on insertion of the male member so that a tight fit is achieved. To prevent separation of the members, the male member 11 is rotated 90° whereby the lugs 19 are positioned between knobs 26 (FIG. 3) whereby rotation and withdrawal are prevented.

Female member 17 is adapted to be attached to the face of a garment by any convenient or conventional means as by sewing, for which holes 25 are provided.

In one specific embodiment, male member 11 is provided with a rib 10 (FIGS. 1 and 9) extending outwardly from shoulder 18. When the members are mated and rotated into locking position, ribs 10 register with grooves 9 of female member 17 and lock the members in place. Beveled walls 22 of opening 16 in female member 17 (FIG. 2) facilitate mating

of the parts but do not appreciably reduce the friction between members **11** and **17**.

In a preferred embodiment, the top outer portion **28** of the male member **13** is adapted to be squeezed into cavity **33** cut in the underside of button **27**. The outer diameter of top **28** of male member **11** is greater than the diameter of cavity **33**, which insures a tight fit. To mate these members, top **28** is mechanically compressed and inserted and allowed to expand into the undercut, cavity **33**, in the said button **27**. By employing a male member of suitably resilient material and a button of relatively hard material, it is possible to form a permanent force fit without the need of adhesives or plastic welding.

If desired, portion **12** can be made to maximum diameter and a decorative disc inserted into cavity **34**, FIG. **2**. If this is done, a retaining circumferential ring **36** may be provided. Obviously, this is not needed if button **27** covers the end of member **11**.

It is preferred that the top **28** of said male component **12** be of a somewhat resilient material such as nylon No. 6 so that it may be mechanically compressed for insertion into the cavity **33** of the button **27**, FIG. **2**. However, nylon No. 6 is by no means the only material acceptable, and should not be construed as a limiting factor.

The embodiment represented in FIG. **5** is functionally the same as that shown in FIGS. **1** and **2** but the lugs **19** are of slightly different configuration and smaller. If desired, female member **17** is provided with a concavity on its underside (FIG. **5**) whereby the locking end **14** of male member **11** can be inserted and rotated to wearing position without extending past the inner surface of female member **17**. To prevent easy separation of the members of the present invention, the shank **13** should be of slightly larger diameter than opening **16** in female member. It is necessary that some deformation of the resilient material occur so that the parts will not become easily separated during wear.

FIGS. **7** and **8** illustrate further embodiments of my invention. In FIG. **7**, top **28** of male component **11** approaches the size of a normal button. It serves as a base to which a metal cap **38** can be attached. The cap is crimped around the top **28** to give the desired metal button. A further extension of my invention can be seen in FIG. **8** where the top **28** is of such design as to allow leather strips to be woven around it to give a leather covered button.

In my application Ser. No. 863,060, filed Oct. 2, 1969, I showed as one embodiment (FIGS. **1**, **2** and **3**) opposed **10** ribs running longitudinal along the shank portion of male member **11** which are positioned to register with corresponding grooves **9** in the beveled sides **22** of the opening in female member **17** whereby, on rotation after insertion, the members are more securely locked together.

In another specific embodiment (FIG. **9**), I have found that the connection between the base and outer portion is made more secure if I use at least three and preferably four longitudinal ribs with double that number of notches in the inner periphery of the opening female member whereby on insertion, the male member need be rotated through only a small arc to lock the two members in position. If three longitudinal ribs are employed the shank should be trigonal in cross section, the end which mates with the female member should be pyramidal and the opening **16** in the female member **17** should be triangular. Thus, there would be six notches in the inner periphery of opening **16** to register with the three longitudinal ribs on insertion and locking.

In a preferred embodiment, the male member is formed with four longitudinal ribs **10** running from the inner end of the shank towards the button end although not necessarily running the entire length. Opening **16** in the female member is square and there are eight notches around the inner periphery of the opening. This inner wall tapers inwardly from the outer face to the inner face and the bulbous portion of the mating end of the male member has the configuration of a truncated, square base pyramid. The members are securely mated on rotating **45** degrees and the tendency of the button to flip-flop is eliminated.

For assembling the parts shown in FIG. **9**, a shallow cavity is cut in the button **27** having a smaller outer diameter than the inner. Male member **11** is formed with a top platform **14** having a dished central portion **34**. Since male member **13** is of relatively resilient material, the top can be compressed by passing the entire member **11** through a tapered channel to a size smaller than cavity **33** in button member **11**. By releasing the male member into the cavity, the top **14** returns to its original size and completely fills cavity **33**, thereby forming a relatively permanent assembly.

As shown in FIG. **9**, shank **13** is formed with four longitudinal ribs disposed at 90° intervals around the periphery and running from the interlocking end **14**, which, in this embodiment has the general shape of a truncated pyramid of greater cross-sectional area at its base than shank **13** thus forming a shoulder **18**.

Female member **17** is provided with a central opening **16** having a configuration adapted to receive the enlarged end **14** of shank **13** and having tapered sides whereby the opening is of slightly greater area at the outer face than at the inner face. Thus, when the members are assembled, the locking bulbous end **14** is squeezed through smaller opening **16** and on passing therethrough, regains its original dimensions and thereby locks the male and female members together in relatively permanent association.

After insertion, the male member is rotated 45° whereby ribs **10** register with notches **9** and thereby provide a strong fit which resists rotation or separation of the two members. The female member **17** may be provided with openings as at **25** for fastening the member to a garment or other article on which it is to be used. When the members are assembled as described, separation of the members can only be accomplished by deliberate effort.

While the cross-sectional configuration of shank **13** is subject to some choice, for ease of molding it is preferred to have the shank of round configuration. If it is to be triangular, only three longitudinal ribs would be employed. However, with this configuration, a triangular opening **16** would be necessary and the deformation of the inner walls of the opening or of the ribs on rotation would be much greater than in the case of a four-sided or round stem with four ribs. Furthermore, by using a round stem, the number of longitudinal ribs can be varied at will. However, the size of the shank **13** and the opening **16** places some limitation on the number of ribs that can be employed since it is necessary to have twice as many notches as ribs if opening **16** is round. I have found that four ribs with eight corresponding notches provide the preferred configuration. If opening **16** is square, only four notches are needed.

As with the earlier disclosed embodiments of my invention, any facing or button **27** may be employed. The button may be solid, round or any desired shape as long as the cavity can be formed in the back side. Thus, an extremely wide variety of button facings can be used on a single size of shank. The shank, also, may be of any desired length, so that the buttons can be used for decoration, in which use the shank is extremely short; or for heavy or light materials.

The present invention is not limited to use as a garment fastener but lends itself to use wherever buttons or fasteners of this type are employed.

The foregoing represents a description of certain preferred embodiments of my invention but all equivalent embodiments are contemplated by the present invention, the scope of which is defined by the following claims.

I claim:

1. A fastener comprising, in combination, a relatively thin one-piece female member having an opening of unitary sidewall construction therein, a solid male member comprising a shank having a terminal enlargement adapted for mating insertion into said opening in the female member and being larger than the said opening, one of the members being deformable and the other being rigid, said members being mated by snap fastening, and means for locking in fixed position upon rotation of one member relative to the other member, said locking being against further rotation.

2. The fastener of claim 1 wherein the male member includes a second enlargement at the end opposite the end for insertion into the said female member, said second enlargement for insertion into an opening in the underside of a button.

3. The fastener of claim 1 wherein the opening in said female member is formed with sloping partial sides and the mating end of said male member is formed with sides of the same geometric configuration but oppositely sloping whereby register of male and female members is facilitated.

4. A garment fastener comprising, in combination, a relatively thin one-piece female member adapted to be attached to one fold of a garment and having an opening of unitary sidewall construction therein, a shank member having an enlargement at one end adapted for insertion into the opening in said female member and being larger than the said opening in the female member, a plurality of longitudinal ribs on said shank member and at least an equal number of grooves on the inner wall of said opening in the female member and adapted to register therewith, one of the members being deformable and the other being rigid, said members being mated by snap fastening, said ribs and grooves providing means for locking in fixed position upon rotation of one member relative to the other member, said locking being against further rotation.

5. The garment fastener of claim 4 wherein the shank member includes a second enlargement at the end opposite the end for insertion into the said female member, said second enlargement for insertion into an opening in the underside of a button.

6. The garment fastener of claim 5 wherein said second enlargement is deformable.

7. The garment fastener of claim 4 wherein said shank member is formed with partial flange portions at the enlargement adapted for insertion

8. A garment fastener comprising, in combination, a relatively thin one-piece female member adapted to be attached to a garment and having an opening of unitary sidewall construction therein, a shank member having an enlargement at one end with slightly tapered walls adapted for insertion into the opening in said female member and being larger than the said opening in the female member, four longitudinal ribs on said shank member terminating with the said enlargement, four grooves on the inner wall of said opening in the female member and adapted to receive the longitudinal ribs upon rotation of one member relative to the other member, one of the members being deformable and the other being rigid, said members being mated by snap fastening, said ribs and grooves providing means for locking in fixed position upon rotation of one member relative to the other member, said locking being against further rotation.

9. The garment fastener of claim 8 wherein the shank member includes a second enlargement on the end opposite that for insertion into the female member, said second enlargement for insertion into an opening in the underside of a button.

* * * * *