

- 1 -

SNAP FASTENER FOR USE ON GARMENTS

The present invention relates to a snap fastener of synthetic resin for use on garments.

Various snap fasteners are known which comprise male and female members of synthetic resin staked on garment pieces by rivets of synthetic resin. The male and female members as thus attached tend to suffer from unwanted backlashes with respect to the rivets during use since the rivets as staked by cold forming cannot secure the male and female members with a sufficient amount of force comparable with that given by staked metal members. Another source of such backlashes is dimensional errors caused in the fabrication of the male and female members and the rivets. The snap fastener, with the backlashes, is liable to rotate with respect to the garment pieces, a condition which is disadvantageous particularly where a directional decorative pattern is marked on the heads of the rivets. One solution to such a problem would be to insert rivet shanks of a larger diameter forcibly into holes of a smaller diameter in the male and female members to retain the rivets

(13)

- 2 -

frictionally on the male and female members. However, forced insertion of the rivet shanks into the holes in the male and female members could crack the latter in the process of assembly, and the assembled snap fastener
5 would be broken apart or become useless in a short period of time.

According to the invention, there is provided a snap fastener of synthetic resin for use on garment pieces, comprising: a male member adapted to be mounted
10 on one of the garment pieces and including a first cylindrical wall and a bottom having a first central hole and a plurality of first radial reinforcing ribs around said first central hole; a first rivet including a first head and a first central shank mounted thereon,
15 said first head having a plurality of second reinforcing ribs extending radially from said first central shank, said first rivet being adapted to be inserted frictionally in said first central hole with said first and second reinforcing ribs biting in said one of the
20 garment pieces, said first central shank having a

(14)

- 3 -

pointed end remote from said head and a plurality of angularly spaced ridges extending axially thereof from said head and terminating short of said pointed end; a female member adapted to be mounted on the other of the garment pieces and including a second cylindrical wall and a bottom having a second central hole and a plurality of third radial reinforcing ribs around said second central hole; a second rivet including a second head and a second central shank mounted thereon, said second head having a plurality of fourth radial reinforcing ribs extending radially from said second central shank, said second rivet being adapted to be inserted frictionally in said second central hole with said third and fourth reinforcing ribs biting in said other of the garment pieces, said second central shank having a pointed end remote from said head and a plurality of angularly spaced ridges extending axially thereof from said head and terminating short of said pointed end; and said first cylindrical wall being snappingly fittable in said second cylindrical wall.

The invention will be described by way of example with reference to the accompanying drawings wherein:-

Figure 1 is an axial exploded cross-sectional view of a snap fastener embodying the present invention, the snap fastener being shown as disassembled prior to attachment to a garment;

5 Figure 2 is a bottom view of a male member of the snap fastener, taken along line II-II of Figure 1;

Figure 3 is a plan view of a female member of the snap fastener, taken along line III-III of Figure 1;

10 Figure 4 is a bottom view of the female member taken along line IV-IV of Figure 1;

Figure 5 is a bottom view of a rivet for use with the male or female member, taken along line V-V of Figure 1; and

15 Figure 6 is an axial cross-sectional view of the snap fastener as assembled on a garment.

As shown in Figure 1, a snap fastener comprises a male member or hook 10, a first rivet 11 connectable to the male member 10 with a garment piece 12 sandwiched therebetween, a female member or socket 13, and a second rivet 14 combinable with the female member 13 with another garment piece 15 placed therebetween.

20 The male member 10 has a cylindrical wall 16 including a bottom 17 and a rim 18 remote from the bottom 17 and projecting radially outwardly. The cylindrical wall 16 also has a flange 19 lying substantially flush with the bottom 17 and extending radially out-

wardly. A plurality of angularly spaced slots 20 (one shown in Figure 1) are defined in the rimmed end of the cylindrical wall 16 to render the latter resilient relatively to the rest of the male member 10. The bottom 17 has a central hole 21. An annular recess 22, which is concentric with the central hole 21, is defined in the bottom 17 and the flange 19 and opens away from the cylindrical wall 16. As best illustrated in Figure 2, a plurality (four in the illustrated embodiment) of radial reinforcing ribs 23 of a triangular cross section are disposed in the recess 22 at angularly equidistant locations.

The female member 13 as shown in Figure 1 is composed of a cylindrical wall 24 including a bottom 25 having a central hole 26 and an annular locking edge 27 projecting radially inwardly and located remotely from the bottom 25. The cylindrical wall 24 has a plurality (four as shown in Figure 3) of angularly equidistant cavities 28 defined in its radially inward surface to provide the cylindrical wall 24 with resiliency relative to the rest of the female member 13. The cylindrical wall 24 also has an annular groove 29 defined between the locking edge 27 and the bottom 25. The bottom 25 has an annular recess 30 opening away from the cylindrical wall 24 and having a plurality (four as shown in Figure 4) of radial reinforcing ribs 31 of a triangular cross section.

The first and second rivets 11, 14 are of an identical structure. Each rivet 11, 14 includes a head 32 having a round surface 38 and a central shank 33 having a pointed end 39. The head 32 has an annular recess 34 opening away from the round surface 38 and also has a plurality (four as shown in Figure 5) of angularly equally spaced reinforcing ribs 35 extending radially outwardly from the shank 33. The shank 33 has a plurality (four as shown) of ridges 36 extending axially from the head 32 and terminating substantially halfway of the axial length of the shank 33. The ridges 36 are triangular in cross section as shown in Figure 5 and each located angularly midway between adjacent two of the reinforcing ribs 35. The ridges 36 have radially-outward edges which jointly define an outside diameter slightly larger than the inside diameter of the central holes 21, 26 in the male and female members 10, 13. Although not shown, the round head 38 may be marked with a desired decorative pattern that may be directional with respect to the garment piece 12 or 15.

In assembly, the rivets 11, 14 are attached respectively to the male and female members 10, 13 by forcing the shanks 33, 33 to pierce the garment pieces 12, 15 and enter the holes 21, 26, respectively, in frictional engagement with the bottoms 17, 25 of the male and female members 10, 13. Then, as shown in Figure 6, the pointed ends 39, 39 of the shanks 33, 33

- 7 -

are flattened as by a punch to form flattened and spread ends 37, 37, by which the shanks 33, 33 are firmly staked on the male and female members 10, 13, respectively, with the garment pieces 12, 15 securely sandwiched therebetween. The male member 10 thus attached to the garment piece 12 by the rivet 11 can be inserted into the female member 13 until the rim 18 is snapped into the annular groove 29 past the locking edge 27. Since the cylindrical walls 16, 24 are relatively resilient, they are elastically deformable when they are to be combined together and hence are free from undue stresses that could otherwise damage the cylindrical walls 16, 24.

As assembled, the ridges 36 bite into inner wall surfaces defining the holes 21, 26 in the male and female members 10, 13 to thereby prevent the rivets 11, 14 from rotating with respect to the male and female members 10, 13, respectively, due to increased frictional engagement therebetween. Therefore, the directional decorative patterns on the rivet heads 32 remain oriented as desired on the garment pieces 12, 15 without the danger of getting accidentally turned away or disoriented under external forces applied. The reinforcing ribs 23, 31 on the male and female members 10, 13 and the reinforcing ribs 35, 35 on the rivets 11, 14 are caused to bite into the garment pieces 12, 15 so that the male and female members 10, 13 and the rivets 11, 14 can be

prevented from rotating with respect to the garment pieces 12, 15. The frictional engagement between the shanks 33, 33 with the male and female members 10, 13 eliminates any backlashes which would otherwise result from dimensional errors caused in the manufacture of the male and female members 10, 13 and the rivets 11, 14. The male and female members 10, 13 and the rivets 11, 14 may be relatively thin as the reinforcing ribs 23, 31 and 35 provide a sufficient degree of mechanical strength which protects these snap fastener components against cracks or deformation during assembly or use, thus enabling the snap fastener to have a prolonged service life.



20

Claims:

1. A snap fastener of synthetic resin for use on garment pieces, comprising:

(a) a male member adapted to be mounted on one of the garment pieces and including a first cylindrical wall and a bottom having a first central hole and a plurality of first radial reinforcing ribs around said first central hole;

(b) a first rivet including a first head and a first central shank mounted thereon, said first head having a plurality of second reinforcing ribs extending radially from said first central shank, said first rivet being adapted to be inserted frictionally in said first central hole with said first and second reinforcing ribs biting in said one of the garment pieces, said first central shank having a pointed end remote from said head and a plurality of angularly spaced ridges extending axially thereof from said head and terminating short of said pointed end;

(c) a female member adapted to be mounted on the other of the garment pieces and including a second cylindrical wall and a bottom having a second central hole and a plurality of third radial reinforcing ribs around said second central hole;

(d) a second rivet including a second head and a second central shank mounted thereon, said second head having a plurality of fourth radial reinforcing ribs extending radially from said second central shank, said

(21)



- 10 -

second rivet being adapted to be inserted frictionally in said second central hole with said third and fourth reinforcing ribs biting in said other of the garment pieces, said second central shank having a pointed end remote from said head and a plurality of angularly spaced ridges extending axially thereof from said head and terminating short of said pointed end; and

(e) said first cylindrical wall being snappingly fittable in said second cylindrical wall.

10 2. A snap fastener according to claim 1, said male member having a flange extending radially outwardly from said first cylindrical wall, said bottom and flange of said male member jointly having an annular recess in which said first radial reinforcing ribs are disposed
15 in angularly equally spaced relationship around said first central hole, said first cylindrical wall having a plurality of angularly spaced slots opening away from said bottom of the male member.

20 3. A snap fastener according to claim 1, said bottom of the female member having an annular recess in which said third radial reinforcing ribs are disposed in angularly equally spaced relationship around said second central hole, said second cylindrical wall having a plurality of angularly spaced cavities opening radially
25 inwardly.

4. A snap fastener according to claim 1, said first head of the first rivet having an annular recess extending around said first central shank, said second



reinforcing ribs being disposed in said annular recess.

5. A snap fastener according to claim 1, said second head of the second rivet having an annular recess extending around said second central shank, said fourth
5 reinforcing ribs being disposed in said annular recess.

6. A snap fastener according to claim 1, said first second, third and fourth reinforcing ribs being triangular in cross section.
