

(11)

"SNAP-FIT BUTTON ASSEMBLY"

This invention relates to a button assembly having a male and a female part which are adapted to be mounted with a snap fit on a fabric article.

There are known certain button assemblies of the type referred to herein as disclosed for example in U. S. Patent 2, 996, 777 which comprise a female part having a cylindrical shank and a male or fastener part having a pointed shank for insertion through a garment fabric into the aperture in the female shank. A similar button device is disclosed in Japanese Laid-Open Utility Model Publication No. 51-46501. The prior art button assemblies have a drawback in that when the male shank is pushed through the fabric into the female aperture, there is a tendency of air being trapped and compressed within the aperture with the results that a muscular effort is required to couple the two parts together which would often in turn cause the female button part to be ruptured.

According to the present invention there is provided a button comprising: a button part including a base and a female shank extending from said base and having an axial bore therein, and a fastener part having a head and a male shank extending from said head and adapted to

fit forcibly into said axial bore in said female shank, said male shank having means for allowing air to escape from said axial bore when said male shank is forced into said axial bore, said male shank having an enlarged
5 conical end portion, said conical end portion having a maximum diameter larger than the inside diameter of said axial bore, said male shank also having a plurality of annular locking ribs, said annular ribs having an outside diameter larger than the inside diameter of said
10 axial bore, said means comprising at least one slot extending axially in said male shank across said ribs and at least one groove extending radially-axially in said conical end portion, the or each said groove being merged with the or each said slot, respectively.

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

Fig. 1 is a vertical cross-sectional view of a base plate constituting one or female part of a button assembly embodying the invention;

20 Fig. 2 is a plan view of the front of the base plate shown in Fig. 1;

Fig. 3 is a partly broken away plan view of the rear of the base plate;

Fig. 4 is a side elevational view of a fastener constituting the other or male part of the button assembly embodying the invention;

Fig. 5 is a plan view of the rear of the fastener
5 shown in Fig. 4;

Fig. 6 is a view similar to Fig. 1 of the female part engaged across a garment fabric with the male part of Fig. 4;

Figs. 7 and 8 are side elevations of two modifications
10 of the fastener shown in Fig. 4;

Fig. 9 is a view similar to Fig. 1 but showing a modification of the female part; and

Figs. 10, 11 and 12 inclusive are views provided to illustrate a further embodiment of the invention which
15 has means indicating the position in which the button is mounted relative to a given fabric article.

Referring now to the drawings and Figs. 1 and 2 in particular, there is shown a female part 10, rather like a button, constituting one part, the "button part", of
20 a button assembly embodying the invention, which female part 10 has a base plate 11 generally in the form of

18

a circular disc as viewed in plan (see Fig. 2) and a female shank 12 extending integrally with and at right angles to the plane of the base plate 11. The base plate 11 has mounted on its front surface a decorative disc 13 of any suitable pattern or design 13' to give rise to an aesthetic appeal. On the opposite or rear surface of the plate 11, there are provided alternate annular ridges 14 and grooves 15 as shown in Figs. 1 and 3, the number of said ridges and grooves being dependent upon the size of the plate 11 to ensure sufficient mechanical strength against deformation or damage under the influence of external stresses. The female shank 12 has an axial bore 16 open at one end and extending at the other end into the web of the plate 11. The shape of the bore 16 is generally complementary with that of a male shank later to be described. The shank 12 has at its end periphery 17 a plurality of circumferentially spaced prongs 18 which bite into a garment fabric F (Fig. 6) and anchor the female part or button 10 in place in cooperation with the male part.

Turning now to Fig. 4, there is shown a male part 20, forming a "fastener" or "butt", constituting another part, the "fastener part", of the assembly. The fastener part 20 is generally in the form of a rivet having an enlarged circular head 21 and a male shank 22 extending centrally therefrom and pointed as at 23

to enable the shank 22 to thrust through the garment fabric F. The male shank 22 is shaped generally complementarily with the contour of the axial bore 16 of the female part or button 10 so that it can be received
5 therein when the two parts of the assembly are coupled together as shown in Fig. 6. The male shank 22 has an outside diameter slightly larger than the inside diameter or bore size of the axial bore 16 and preferably has a plurality of generally saw-toothed annular
10 ribs 24 so that the ribs 24 can intrude into the inner peripheral wall defining the bore 16 when assembling the fastener 20 with the button 10 as illustrated in Fig. 6. For this purpose, both parts 10 and 20 of the assembly are preferably made of a plastic material.
15 Alternatively, the part 10 may be plastic while the part 20 is metallic. Further alternatively, the parts 10 and 20 may be both made of aluminium.

The male shank 22 of the fastener 20 is provided with at least one axial slot 25, or preferably diametrically
20 opposed axial slots or recesses 25 as shown in Figs. 4, 5 and 6, each of which slots 25 extends across the ribs 24 and along a substantial length of the male shank 22. The air entrapped within the bore 16, when the button 10 and the fastener 20 are coupled together,
25 can be released and expelled through the slots 25 in the fastener 20 to the atmosphere.

(16)

The fastener 20 is provided at its conical end portion 26 with a plurality of circumferentially spaced radial-axial grooves 27, some of which are merged with the axial slots 25 as better shown in Fig. 5. These
5 grooves 27, cooperatively with the slots 25, serve to reduce frictional resistance of the fastener shank 22 with respect to the garment fabric F and thus facilitate insertion of the shank 22 therethrough.

Fig. 7 shows a modification 25a of the axial slot 25 of
10 the fastener 20. This modified slot 25a is formed only in and across the ribs 24 and merged with the groove or grooves 27.

Fig. 8 shows another modification which is a meander slot 25b resulting from cutting away a portion of each
15 of the ribs 24 in alternate positions, the slot 25b being also merged with the radial-axial groove 27.

Fig. 9 shows a modification of the female part or button 10 wherein there is provided at least one slot 16a formed in the inner peripheral wall defining the
20 bore 16, which slot 16a has the same function of air expulsion as the slots 25 in the fastener 20.

Figs. 10, 11 and 12 inclusive illustrate an example of a modification of the button assembly embodying the

(17)

-7-

invention. The decorative disc 13a shown in Fig. 10 carries a design pattern 13a' drawn as a marking to direct the position in which the button 10 is to be mounted. Figs. 11 and 12, respectively, show the
5 button 10 which has one of its ridges 14 partially cut away as at 28 to form a marking indicative of the position in which the button 10 is to be mounted with respect to the garment fabric F.



8

Claims:-

1. A button comprising: a button part including a base and a female shank extending from said base and having an axial bore therein, and a fastener part having a head and a male shank extending from said head and
5 adapted to fit forcibly into said axial bore in said female shank, said male shank having means for allowing air to escape from said axial bore when said male shank is forced into said axial bore, said male shank having an enlarged conical end portion, said
10 conical end portion having a maximum diameter larger than the inside diameter of said axial bore, said male shank also having a plurality of annular locking ribs, said annular ribs having an outside diameter larger than the inside diameter of said axial bore, said means
15 comprising at least one slot extending axially in said male shank across said ribs and at least one groove extending radially-axially in said conical end portion, the or each said groove being merged with the or each said slot, respectively.
- 20 2. A button according to claim 1, said means comprising at least one slot extending axially in said female shank and opening into said axial bore in said female shank.



(19)

-9-

3. A button according to claim 1, said at least one axial slot being formed only in and across said annular ribs.
4. A button according to claim 3, said axial slot
5 being of a meander form resulting from cutting away a portion of each of said annular ribs.
5. A button according to claim 1, said base having on its underside a plurality of alternate annular ridges and grooves.
- 10 6. A button according to claim 1, said female shank having at its periphery end a plurality of circumferentially spaced prongs.
7. A button according to claim 1, said base being provided with a marking indicative of the position in
15 which said button part is to be assembled.

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