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2,683,908

THREE-PART FASTENER, INCLUDING A DETACHABLE BUTTON ELEMENT

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**Fig. 1**

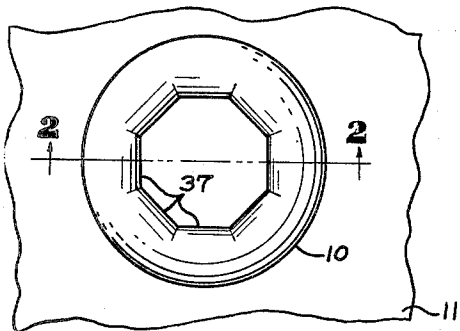


**Fig. 2**

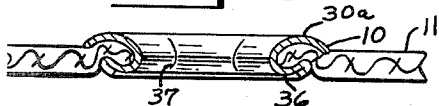


**Fig. 3**

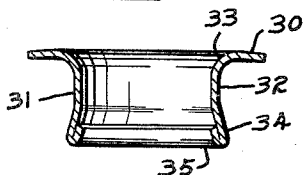


**Fig. 4**

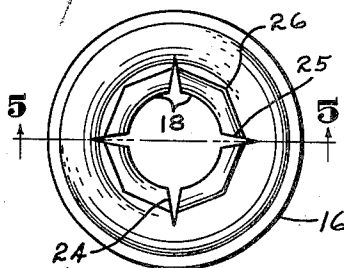


**Fig. 5**

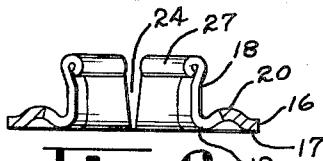


**Fig. 6**

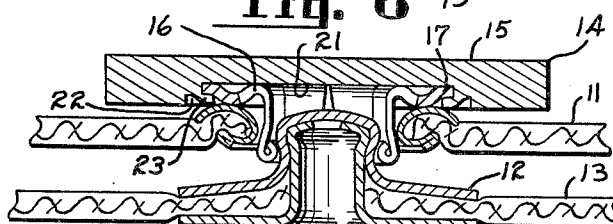


**Fig. 8**

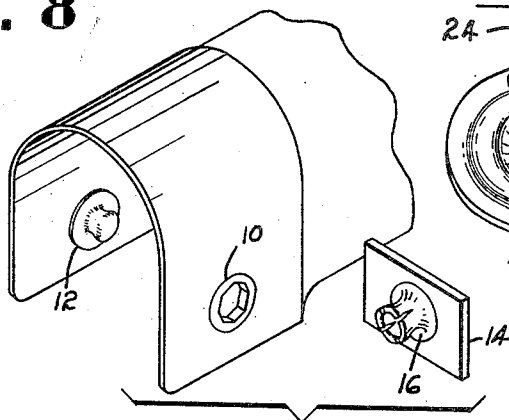
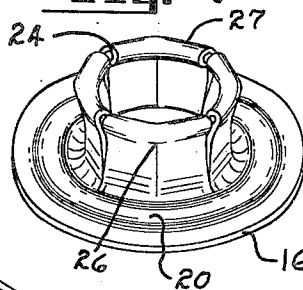


**Fig. 7**



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## UNITED STATES PATENT OFFICE

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THREE-PART SNAP FASTENER, INCLUDING  
A DETACHABLE BUTTON ELEMENT

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3 Claims. (Cl. 24-108)

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This invention relates to snap fasteners and is an improvement on the type of fastener disclosed in the Lyman B. Chapman Patent No. 1,904,122, which is a fastener adapted to be used on garments or articles intended to be laundered.

In the Chapman patent there is shown a stud that is permanently attached to one part of the garment and a ring eyelet or grommet permanently attached to another part of the garment. Another member, which is a combination stud and socket, in one instance is inserted into the grommet in the manner of a stud, and when there assembled it then serves as a socket to detachably receive the stud and hold the separated parts of the garment together.

This particular type of fastener is adapted for use on nurses' uniforms, shirt fronts and cuffs, etc. The removable part of the fastener is usually of an ornamental character and frequently may be embellished with a design that should be assembled so as to be viewed in an upright position.

It is, therefore, one of the objects of this invention to provide a three-part snap fastener construction, two parts of which are permanently attached to the garment and one part being removable therefrom and wherein the removable part is retained against rotation after assembly into one of the permanently attached parts.

Another object is to provide an eyelet grommet for permanent attachment to one part of the garment, which grommet is so constructed as not to split along one edge when said edge is rolled against the material or to cut into the material when the grommet is assembled about the edge of an opening in the garment. To this end the eyelet grommet is formed with a base part arcuate in cross section that engages one surface of the garment and an integral neck for insertion through an opening in the garment support. Also the outer or free end of the neck is formed with a beaded edge that is collapsed or rolled against the opposite side of the support and pressed into the support material substantially intermediate the width of the base part thus gripping the interposed material into substantially an S shaped form and assuring a firm anchorage of the eyelet grommet to the garment support.

A further object is to provide an improved stud-socket member that can be attached to a button or some other ornamental item and be removably attached to an eyelet grommet and also to a stud member. In the past such a stud-socket member usually had spring fingers formed outwardly from a substantially flat base. In such a construction

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the bending moment of the fingers would occur substantially at the point of finger attachment to the base and resulted in stiff fingers with relatively short life.

In my construction a raised annular rib is formed in the base surrounding the spring fingers and the split between the fingers extends radially into the rib about one-half the width of said rib. By this construction the maximum bending moment of the fingers is provided in the base of the stud socket member and particularly at a point where the base is strengthened by the annular rib formed therein.

Other objects and advantages will be set forth in the specification following the description of the patent drawing, wherein:

Fig. 1 is a plan view of the eyelet or what I prefer to call an eyelet grommet showing it attached to a garment support.

Fig. 2 is a cross sectional view of the same taken along the line 2-2 of Fig. 1.

Fig. 3 is a cross sectional view of the eyelet grommet as it appears before its assembly to a garment support.

Fig. 4 is a plan view of the stud-socket element.

Fig. 5 is a cross sectional view of the same taken along the line 5-5 of Fig. 4.

Fig. 6 is a cross sectional view of the three component parts of the fastener shown in assembled relationship and with the stud-socket element attached to a button cap.

Fig. 7 is a perspective view of the stud-socket element, per se, and

Fig. 8 is a perspective view showing the manner in which the three-part fastener may be used in association with a garment cuff.

The assembly includes in general an eyelet grommet 10 which may be secured to the upper of two pieces of overlapping material 11 and a stud element 12 permanently attached to the other or under piece of material 13. The two pieces of material 11 and 13 are held together by an attaching link button 14 cooperating with the grommet 10 and stud member 12 in a manner to be more fully explained later.

Considering first the structural details of the detachable link button 14, reference is made to Figs. 4, 5 and 6. The link button consists of a cap or base member 15 which may be made to simulate the head of a button or a cuff link head or other ornamental device and includes a stud-socket element 16. The stud-socket element 16 is formed with a base flange 17 from which extends a series of annularly arranged resilient

fingers 18 joined to the base by curved portions 19. Surrounding the fingers is an annular raised rib 20 formed in the base flange 17.

Our method of securing the stud-socket element 16 permanently to the button cap or base 15 is shown in Fig. 6 wherein the underside of the base is formed with a recess 21 in which is seated the base flange 17 of the stud-socket element 16. By a suitable tool an annular groove 22 is formed or stamped into the back of the base 15 for the purpose of striking up and folding over a lip 23 about the edge of the base flange 17.

As shown in Figs. 4 and 7 the resilient fingers 18 are formed to assume a polygonal shape in cross section and preferably an octagonal shape. In this instance there are four resilient fingers 18 separated by slits 24. The octagonal shaping of the fingers is such that four of the corners of the octagon occur at slits 24 between the fingers as indicated at 25 while the alternate corners 26 will occur at the mid section between the fingers 18 and extend lengthwise thereof. Each finger is formed with a beaded end 27 collectively so arranged and dimensioned as to provide snap locking engagement with the eyelet grommet 10 as well as with the stud element 12.

By reason of the fact that the corners 26 at the mid section of the fingers extend substantially the entire length of the fingers and up to the base flange 17, the fingers will be relatively stiff at their point of attachment to the base 17 at the curved portions 19. In order to overcome this stiffness and obtain more flexible and resilient fingers I extend the slits 24 through the curved portions 19 of the base 17 to substantially one-half the width of the annular rib 20, thus causing the maximum bending moment of the fingers to occur in the rib portion of the flange rather than at the juncture radius 19.

The eyelet grommet 10 in its assembled state is best shown in Figs. 1 and 2, and Fig. 3 shows the grommet as it is before assembly to a support. The eyelet grommet 10 in its preassembled state consists of a base flange 30 which is slightly biased to the axis of tubular neck 31. The tubular neck 31 consists of three distinct sections, a cylindrical portion 32, a relatively large radius 33 by means of which the cylindrical portion is joined to the flange 30, and an outwardly flared section 34. The outer free end of the flared section 34 is folded over on itself and preferably being folded inwardly to provide a reinforcing bead 35.

In assembling the eyelet grommet to the support 11, it will first be necessary to provide a suitable opening in the support 11 to receive the tubular neck 31 after which the neck is rolled outwardly to provide a flange 36 resting against the surface of the support 11 opposite from the flange base 30. It should be noted that during the setting of the eyelet grommet 10 the base flange 30 is reformed by the setting tools to assume an arcuate shape in cross section as indicated at 30a in Fig. 2. The length of the neck 31 preferably is such that when being collapsed against the support material 11 it will curve inwardly toward the arcuate base flange 30 to a position where the beaded end 35 will embed into said support material at a point about midway the width of the arcuate base flange 30 and grip the interposed material in somewhat of an S shape so as to obtain a firm anchorage of the grommet upon the support material.

As shown in Fig. 1 the opening in the grom-

met has an octagonal shape as indicated at 37 complementary to the shape of the fingers of the stud-socket element 16. This octagonal shape may be incorporated into the grommet in its initial state or it can be formed into the grommet coincident with the assembly operation.

In order to detachably join the overlapping portions 11 and 13 together the button member 14 with the attached stud-socket element 16 is first snapped through the grommet 10 preferably from the side on which the arcuate base flange 30a is located. In this case the button member 14 serves in the manner of a stud while being assembled with the grommet, then it may be forced over the head of the stud attached to the underlying support 13 and in this instance said button member serves in the capacity of a socket. It is for that reason that I choose to call the part 16 attached to the button 14 a stud-socket element. The fact that the eyelet grommet 10 is formed with an octagonal opening 37 and the stud-socket element is of like shape will hold the link button against twisting when the parts are assembled. Also it should be understood that the link button can be turned in the grommet 10 so as to index said link button to the desired upright position if it is done before the assembly of the stud element 12.

The clearance between the fingers of the stud-socket element 16 and the interior octagonal diameter of the grommet 10 is such that the bending moment of the fingers will occur in the base flange rather than at an intermediate portion of the fingers 18 whenever the stud member 12 is being assembled into said stud-socket member. This is in order to assure the usual easy stud and socket assembly without adding any undue strain to the fingers during the assembly and removal of the link button element.

While the form of the invention shown and described embraces a preferred embodiment of the same, it is to be understood that the construction may be varied as to mechanical details without departing from the spirit of the invention and the scope of what is claimed.

I claim:

1. In a three-part snap fastener, a stud member and an eyelet grommet adapted to be permanently attached to overlapping portions of a garment, and a detachable button element having a series of spring fingers for detachable snap engagement with said eyelet grommet, said fingers also serving as a resilient socket to detachably hold said stud on the side of said eyelet socket opposite the button, said button fingers and eyelet grommet when assembled together having complementary polygonal inter-fitted sections of a character to permit turning of the button relative to the grommet when the spring fingers are permitted to yield inwardly but prevent such relative turning when the stud is engaged with the fingers thus preventing inward movement of the fingers.

2. A resilient stud-socket element as defined by claim 1 wherein the fingers are four in number and their combined cross-sectional shape of said fingers are octagonal with the corners of said octagon occurring alternately at the slits and mid section of said fingers.

3. In a three-part snap fastener, a resilient stud-socket element comprising a base flange, a series of spring fingers extending normal to said flange, said flange having a raised portion constituting a circular rib between the edge of said flange and the spring fingers, a covering button

member having a central recess in which said flange is fitted and secured, an eyelet grommet adapted to be permanently attached to a portion of a garment, said spring fingers adapted to be inserted through said eyelet and to have snap engagement therewith, said raised rib on said base flange being adapted to contact the eyelet to locate said spring fingers relative to said eyelet, said fingers also serving as a resilient socket adapted to have snap engagement with a stud member attached to another portion of said garment.

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