United States Patent [19]

Gould

[11] **3,892,013**

[45] **July 1, 1975**

[54] **BUTTON MOUNTING DEVICE**

[76] Inventor: **Sheldon D. Gould,** 1159 Brighton Beach Ave., Brooklyn, N.Y.

[22] Filed: **Dec. 21, 1973**

[21] Appl. No.: **427,121**

[52] **U.S. Cl.** ..... **24/90 E;** 24/90 F; 24/108

[51] **Int. Cl.** **A44b 1/28;** A44b 1/44

[58] **Field of Search** ..... 24/90 E, 90 F, 108, 152

[56] **References Cited**

UNITED STATES PATENTS

313,017	2/1885	Noyes	24/90 F
488,219	12/1892	Platt	24/108
575,157	1/1897	Howell	24/152
1,375,873	4/1921	Waldes	24/90 E
1,680,033	8/1928	Blank	24/90 E
1,981,813	11/1934	Schuster	24/90 E
2,014,814	9/1935	Reiter	24/108

FOREIGN PATENTS OR APPLICATIONS

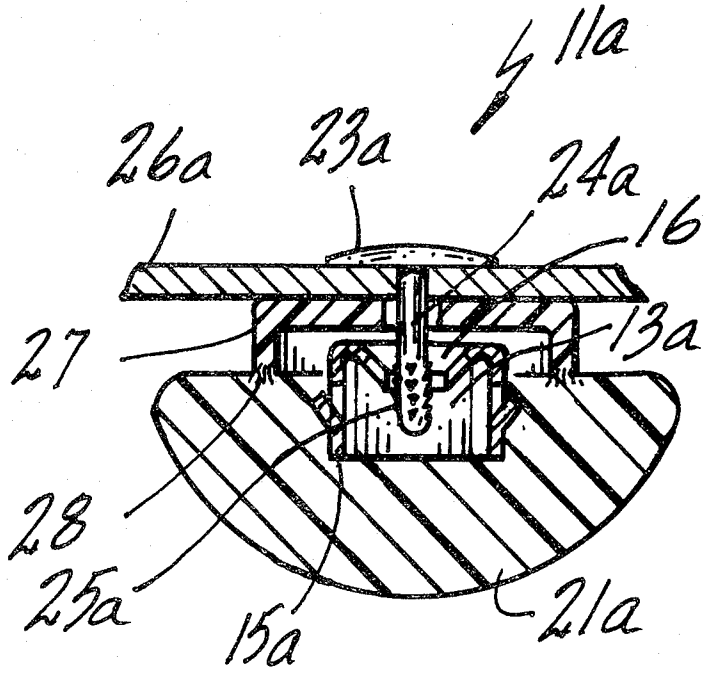
65,394	12/1913	Switzerland	24/108
427,775	8/1911	France	24/90 F
694,308	12/1930	France	24/108
2,273	1/1884	United Kingdom	24/108
171,619	11/1921	United Kingdom	24/108
187,580	2/1937	Switzerland	24/108

Primary Examiner—Bernard A. Gelak

[57] **ABSTRACT**

In a preferred embodiment, there is provided a plastic button having embedded in a back side of the button a flanged metal clamp defining an aperture lockably receivable of a barbed shaft of a metal tack for the mounting of the button on a sheet of material such as a shirt or blouse or the like, there being provided a plastic downwardly flanged cap of plastic fused to the button back also and the cap having a central aperture with a plastic tubular cylinder extending axially from and joined to an edge of the aperture structure into which tubular cylinder the tack mounting shaft extends therethrough upon a mounting of the button if a shank button is desired, but it being possible to merely break-off or snap-off or shear-off the shank tubular cylinder if a non-shank button is desired, and after removal of the shank therefrom mounting the button without the shank, the metal flanges being set into the body plastic from the rear or back side of the button by heat having been applied preferably by ultrasonic vibrations such that the button back plastic contacted by the flanged metal clamp melted sufficiently long for the flanged metal clamp to be pressed into the molton plastic, the invention also including the process of embedding the flanged metal clamp into the button back.

7 Claims, 8 Drawing Figures



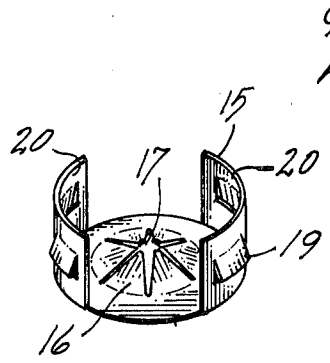


FIG. 1

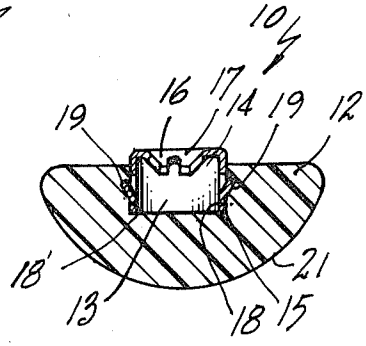


FIG. 2

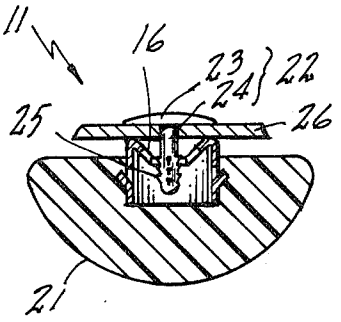


FIG. 3

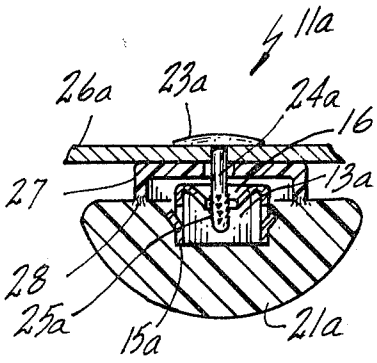


FIG. 4

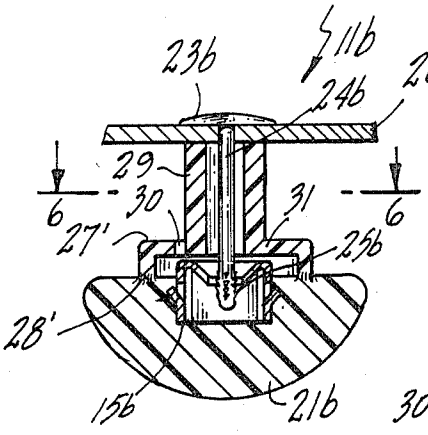


FIG. 5

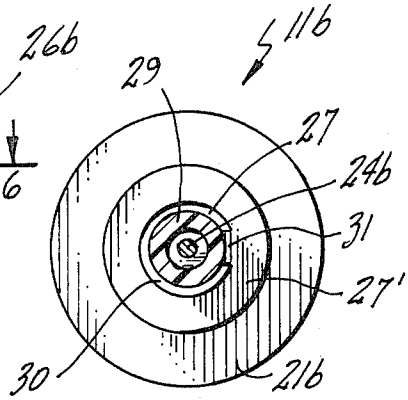


FIG. 6

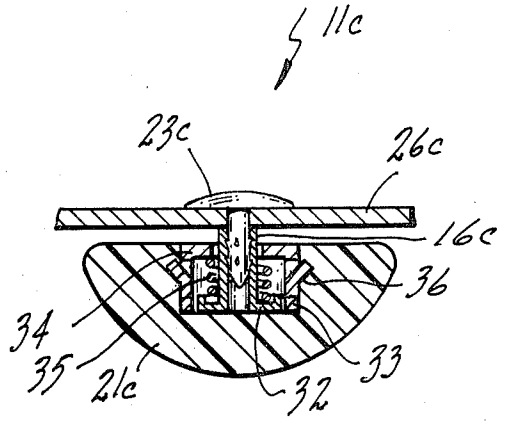


FIG. 7

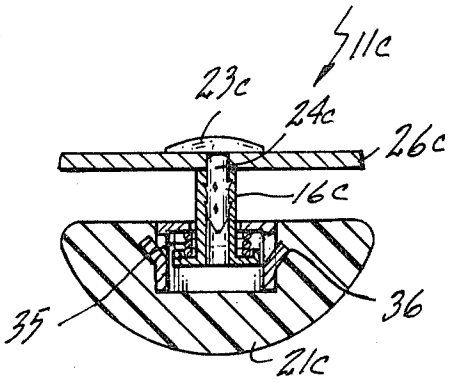


FIG. 8

BUTTON MOUNTING DEVICE

This invention relates to a novel method of producing novel buttons and the mounting thereof on garments.

BACKGROUND TO THE INVENTION DISCLOSURE

The two types of closure structures most commonly utilized on garments are buttons and snaps. Although snaps are highly desirable because they normally last the lifetime of the garment, the snaps have not been sufficiently commonly accepted for certain garments or clothes such as mens shirts, mens and womens coats, and the like, as well as there being fads such as are presently current for the popular use of showy buttons of many designs. However there have heretofore been many disadvantages to the use of certain buttons. For example, buttons are commonly sewn on by the use of threads, which threads eventually break-down and the button comes off, often becoming lost. Particularly for coats and the like where shank buttons are required, problems normally exist because of poor initial sewing, and/or no knot on the thread(s), and/or thread damage due to wear, and the like. Some buttons hang-down, particularly where a shank type button is required, thereby giving the garment a poor appearance. Loose threaded buttons often are found on new garments in stores because of poor workmanship.

It is most annoying normally to a person to find that he has lost a button and often more annoying to find it difficult or impossible to match the buttons that remain with a new button. Additionally, **50** percent about, of people losing a button do not have the ability and/or resources to sew on a new button even if they had a matching button.

Prior to the present invention there have existed metal buttons into which back side a barbed headed tack may be inserted lockably by the barbed shaft thereof, as a mounting mechanism for mounting the metal button onto fabric or garment(s). However, such a mechanism has been totally limited to metal buttons because of the heretofore lack of knowledge of any suitable method or even the possibility of manufacturing of a plastic button utilizing a barbed shaft of a mounting tack for the mounting onto the garment or fabric.

SUMMARY OF THE INVENTION

Accordingly, objects of the present invention are directed to the obtaining of a novel method and a novel plastic button combination of the barbed tack type, while avoiding the difficulties and problems of the type discussed above, together with the obtaining of novel results not heretofore possible prior to the present invention.

Another object of the present invention is to achieve a plastic button and method of manufacture which is of sufficient simplicity in the component elements required therefor and in the method of assemblying in the manufacture thereof, as to make the button a practical reality.

Another object is to provide a novel structured button of plastic which may alternately be utilized either as a shank button or a regular non-shanked button.

Other objects become apparent from the preceding and following disclosure.

One or more objects of the present invention are obtained by the invention as defined herein.

Broadly the invention may be defined as a novel button mounting combination of elements including a flanged female shaft-locking clamp element and a male headed barbed shaft member therefor, which when heated and in contact with a rear face of a meltable plastic rear face of a button causes the contacted face to melt and thereby the flanges may be pressed forwardly to become embeded beneath the melted plastic which is then permitted to harden, trapping the flanges beneath the surface within the hardened plastic button back, after which the button may be mounted on a fabric or the like by use of the barbed headed tack. In a preferred embodiment, a cap is provided which mates within the back upright side walls of the structure(s) from which the flanges extend outwardly, and in a further preferred embodiment there is provided a plastic cap which is fusable by downwardly extending flanges therefrom to a rear face of the button, or alternately may be adhered thereto, with a central aperture aligned with the hole of the barbed-receiving female shaft-locking clamp element, and preferably has mounted to one or more edges of the hole a hollow cylindrically shaped tube element extending axially from the hole as a hollow shank which may if desired be broken or sheared-off to produce a non-shanked button before the mounting thereof; as a shanked button the barbed shaft is passed through the tube during the mounting. Preferably the shaft-locking clamp portion of the shaft-locking clamp element and the upright flanged walls are separate from each other, with the flanged walls including a top support against which preferably a coil spring end is braceable for biasing downwardly against a base portion of the clamp portion, such that when the barbed shaft is secured within the clamp portion, the head of the headed tack is biased into close proximity of the upright flanged walls and such that when fastening a button, the biasing spring becomes compressed by pulling the button outwardly during the fastening, after which the expanding spring causes the retracting button to pull-back snugly and erectly held closely against the buttoned fabric, and when unbuttoned, the button snaps back into a still closer snug relationship so as not to hang.

Thus, by the present invention there is provided a mountable button which may be easily registered with the hole position after the coat or shirt or the like is fitted to the individual person, thereby preventing unsightly wrinkles in the garment as it is buttoned, and provided a button for use with or without a shank and a button which will normally last the life of the garment. Experimentation has confirmed that the mated plastic button of the present invention will typically hold up to **300** pounds of pressure before shearing or breaking from the pressure. On the other hand, for the mating of the male tack and the female button combination, so little pressure is required that a child is capable of pressing the barbed tack shaft into the locking clamp portion for any of the embodiments of the present invention.

In a preferred button of plastic to be combined with the tack-shaft receiving clamp, and in a preferred process, a plastic button is first molded with a hole in the rear face, and the clamp as an insert is installed on a second operation; if it were installed during the molding operation, then the steel insert clamp would anneal itself and not work properly as a barbed-shaft clamp. The clamp preferably include radially inwardly di-

rected rays of spring steel so that it makes a postive bite into the metal barbed tack shaft, the metal ray being preferably heat treated. This insert is by preplanning particularly design specifically so that at low production cost the insert flanged clamp element will work off of an assembly hopper and track. Before setting in the button hole, there are barbs—or flange projections provided which barbs or flanges heretofore referred to as flanges, will dig into the plastic rear wall and during the heating of the flanges by conduction heat will melt the contacted plastic to thereby become embedded into the melted plastic which thereafter promptly hardens to hold the flanges permanently. The plastic out of which the plastic button and/or shank portion(s) thereof are made may be any suitable and/or desirable and/or conventional plastic-like composition which preferably has high impact and/or tensile strength(s) provided that the button portion back face is of a composition which will melt when heated as provided above. Typically and preferably the composition is a high impact styrene material, but as noted above is not limited to this mere preferred example.

In a preferred embodiment of the process, the heating of the metal flanges is by way of ultrasonics, ultrasonically heating the flange-mounting upright metal walls while pressing the flanges or barbs thereof downwardly against the rearward face of the meltable plastic button wall or body such that the flanges melt into the plastic by melting the plastic to thereby become embeded within the plastic upon the cooling and thereby hardening thereof.

The invention may be better understood by reference to the figures as follow.

THE FIGURES

FIG. **1** illustrates in exploded view a perspective side and top view of a preferred barb-flanged female shaft-locking clamp element and matable cap therefor.

FIG. **2** illustrates in cross-sectional side view the assembled combination of FIG. **1** mounted within a back-face recess of a plastic button of the present invention.

FIG. **3** illustrates a cross-sectional view analagous to that of FIG. **2**, except additionally disclosing a mounted tack in side view as mounted on a fabric or garment sheet material also shown in cross-section.

FIG. **4** illustrates a further modified embodiment of the present invention in a view corresponding to that of FIG. **3**, and FIG. **5** illustrates a shank-variation on the embodiment of FIG. **3** also in a view corresponding to that of FIGS. **3** and **4**.

FIG. **6** illustrates a plan and in-part cross-sectional view as taken along lines **6-6** of FIG. **5**, for that embodiment.

FIGS. **7** and **8** each illustrate a further embodiment of the invention, in side cross-sectional views corresponding to those of FIGS. **3, 4,** and **5**, but for a spring-type button which normally in the spring biased closed state holds the button close to the fabric or garment sheet as in FIG. **7**, but which may be pulled outwardly away from the sheet for the buttoning or unbuttoning of the button as shown in the extended spring compressed state of FIG. **8**.

DETAILED DESCRIPTION OF THE INVENTION

With particular reference to FIG. **1**, there is disclosed an element **9** of a shaft-locking clamp element **15** having radially inwardly extending steel rays **16** defining central recess **17** and having peripherally located upright walls **18** and **18'** with their respective barb-flanges such as barb-flange **19**, and the rays **16** defining aperture **13** in button back **12** and peripherally located downwardly extending flange lip **20** which snaps between the inner surfaces of the button walls **18** and **18'**, clamp element **9** being illustrated in inverted perspective side view in FIG. **1**, with free edges **15**.

FIG. **2** illustrates a greater combination **10** of the FIG. **1** clamp element together with the mounted plastic button **21** with the combination **9** shaft-locking clamping element **9** embedded within button recess space **13** and the flanges such as barb-flanges **19** embedded within the body **12** of the plastic composition lateral to the surfaces **18, 18'** cavity walls of the button **21** thereby anchoring the shaft-locking clamping element **15** into the space of recess space **13**. In each of FIGS. **1** and **2**, it may be seen that the lock rim **20** of the cap **12** defines space **14**.

FIG. **3** illustrates in cross-section the same embodiment as FIG. **2**, except showing the side view of the tack having head **23** and barbed shaft **24** having barbs **25**, the shaft and head being jointly identified as tack **22** which in combination with the fabric sheet **26** and the combination **10** of FIG. **2** is cumulatively identified as FIG. **3** combination **11**. It may be seen that the barbs **25** of the barbed shaft **24** are locked within the locking clamp rays **16** of the clamping element **9**.

FIG. **4** illustrates an analogous combination **11a** having corresponding elements identified by corresponding numerals except for the additional *a* designation as element barb **25***a* for example corresponds to barb **25**, and the like for other numerals; additionally however, there is provided plastic cap **27** having its downwardly turned lip adhered or fused, as the case may be as desired, at fixed fusion point **28** with a central aperture or hole therethrough through which the shaft **24** extends in the mounted state with the shaft **24***a* pressed through a sheet **26***a* on which the button **21***a* is thereby mounted, with the sheet **26***a* being tightly and snugly held between the upper face of the cap **27** and the lower face of the head **23***a*.

FIG. **5** illustrates an embodiment similar to that of FIG. **4** in most respects with parts such as clamp element **15***b* corresponding to formerly identified edges **15***a* and **15** of other embodiments; however, this embodiment additionally includes the cylindrically shaped tube element **29** mounted within the hole **30** but joined to one edge of the hole-defining structure through a bridge structure **31**; this relationship is better shown in FIG. **6** which is the same embodiment as FIG. **5**, as taken along the view line **6—6** of FIG. **5**.

FIG. **7** substantially corresponds to the FIG. **4** embodiment and FIG. **8** substantially corresponds to the FIG. **5** embodiment except that for the embodiments of FIGS. **7** and **8**, the clamping portion **32** is separate from the upright flanged side **33** with the barb-flanges **36** and an integral cap portion **34** thereof having a central aperture therethrough through which shank **16***c* extends upwardly from the base **32** thereof, the hollow shank **16***c* snugly receiving the barbed shaft **24***c* while being rigidly mounted firmly against the sheet **26***c* against the underface of the head **23***c*, and there being a coil spring **35** mounted between the cap portion **34** and the base **32** for thereby drawing biasingly the button body **21***c* inwardly close to the fabric **26***c* as shown in FIG. **7** in the button retracted state, while for the same mecha-

nism and structure, the FIG. 8 illustrates the button in the state of being temporarily pulled outwardly for buttoning or unbuttoning.

It is to be understood that modifications and variations and substitution of equivalents as would be apparent to a person of ordinary skill are within the scope of the present invention.

I claim:

1. A button mounting device comprising in combination: a male tack means including an elongated barbed shaft having at a distal end portion thereof radially outwardly-extending barbs directed toward a tack head thereof; a female barbed-shaft receiving-means of a metallic composition and for lockably receiving said distal end portion and barbs thereof, having a hollow first cap structure with an open bottom and with an upper cap central aperture defined by inner distal ends of downwardly-directed radially-inwardly-extending tongue-flanges of the first cap structure, the inner distal ends being lockably engageable of said barbs against withdrawal of the barbs, the female barbed-shaft receiving-means including downwardly-extending upright wall structure of said first cap structure, upwardly-directed radially-outwardly-extending flanges being formed from and cut at upper ends thereof from said upright wall structure and being integral at base ends thereof to remaining portions of said upright wall structure.

2. A button mounting device of claim 1, in which the male tack means includes a head having an underface which extends in a plane substantially perpendicular to said upright wall structure and which is located in juxtaposition to and above an upper edge of the upright wall structure when the barbed shaft is locked through the upper cap central aperture to the female barbed-shaft receiving means.

3. A button mounting device of claim 2, including a button having a substantially flat underface with a central recess into which recess said upright wall structure is mounted therein with said upwardly-directed radially-outwardly-directed flanges extending laterally into button structure fused therearound.

4. A button mounting device of claim 3, including a second cap structure defining downwardly directed mounting-flanges fused at lower ends thereof to the button flat underface at points located laterally outwardly from said upper edge, and the cap structure defining a second aperture therethrough positioned to be aligned with said aperture.

5. A button mounting device of claim 2, including a button having a substantially flat underface with a central recess into which recess said upright wall structure is mounted therein with said upwardly-directed radially-outwardly-directed flanges extending laterally into button structure fused therearound, the button including a recess base-surface as a recessed bottom to said central recess, and a hollow cylindrically shaped tube structure extending substantially linearlly upwardly through said aperture and being movable axially within said aperture, and the hollow cylindrically shaped tube structure including at a lower end thereof a spring-retaining abuttment, said barbs being lockably engageable within said hollow cylindrically shaped tube structure, and spring means mounted biasingly between a lower face of said top and said spring-retaining abuttment such that the said hollow cylindrically shaped tube structure is spring biased axially away from a direction of mounting of the elongated barbed shaft whereby the female barbed-shaft receiving means of a mounted button when the elongated barbed shaft is mated is able to be pulled away outwardly from the sheet mounting material for the fastening of a button after which fastening the button snaps back into a snug position to the sheet mounting material.

6. A button mounting device of claim 5, in which the spring means includes a coil spring structure and a cap structure to which the spring-retaining abuttment is fused, said coil spring structure being positioned such that the coil spring structure becomes compressed when a button mounted on the flanges is pulled away from a sheet material onto which the button mounting device is mounted when the male tack means is mated.

7. A button mounting device comprising in combination: a male tack means including an elongated barbed shaft having at a distal end portion thereof radially outwardly-extending barbs directed toward a tack head thereof; a female barbed-shaft receiving-means of metallic composition and for lockably receiving said distal end portion and barbs thereof, having a hollow first cap structure with an open bottom and with an upper cap central aperture defined by inner distal ends of downwardly-directed radially-inwardly-extending tongue-flanges of the first cap structure, the inner distal ends being lockably engageable of said barbs against withdrawal of the barbs, the female barbed-shaft receiving-means including downwardly-extending upright wall structure of said first cap structure, upwardly-directed radially-outwardly-extending flanges being formed from and cut at upper ends thereof from said upright wall structure and being integral at base ends thereof to remaining portions of said upright wall structure, the male tack means including a head having having an underface which extends in a plane substantially perpendicular to said upright wall structure and which is located in juxtaposition to and above an upper edge of the upright wall structure when the barbed shaft is locked through the upper cap central aperture to the female barbed-shaft receiving-means, and a button having a substantially flat underface with a central recess into which recess said upright wall structure is mounted therein with said upwardly-directed radially-outwardly-directed flanges extending laterally into button structure fused therearound, and a second cap structure defining downwardly directed mounting-flanges fused at lower ends thereof to the button flat underface at points located laterally outwardly from said upper edge, the second cap structure defining a second aperture therethrough positioned to be aligned with said aperture, and in which the second cap structure further defines within the second aperture, and shearably attached to an edge-defining structure of the second aperture a hollow cylindrically shaped tube structure extending upwardly and of predetermined inner diameter greater than outer ends of said bars, the tube structure being receivable of the barbed shaft axially thereof within space of the tube structure such that the tack head's said underface is spaced away a predetermined distance from the button flat underface when the barbed shaft is mated engagingly at the distal end portion thereof with said radially-inwardly-extending tongue-flanges.

* * * * *