

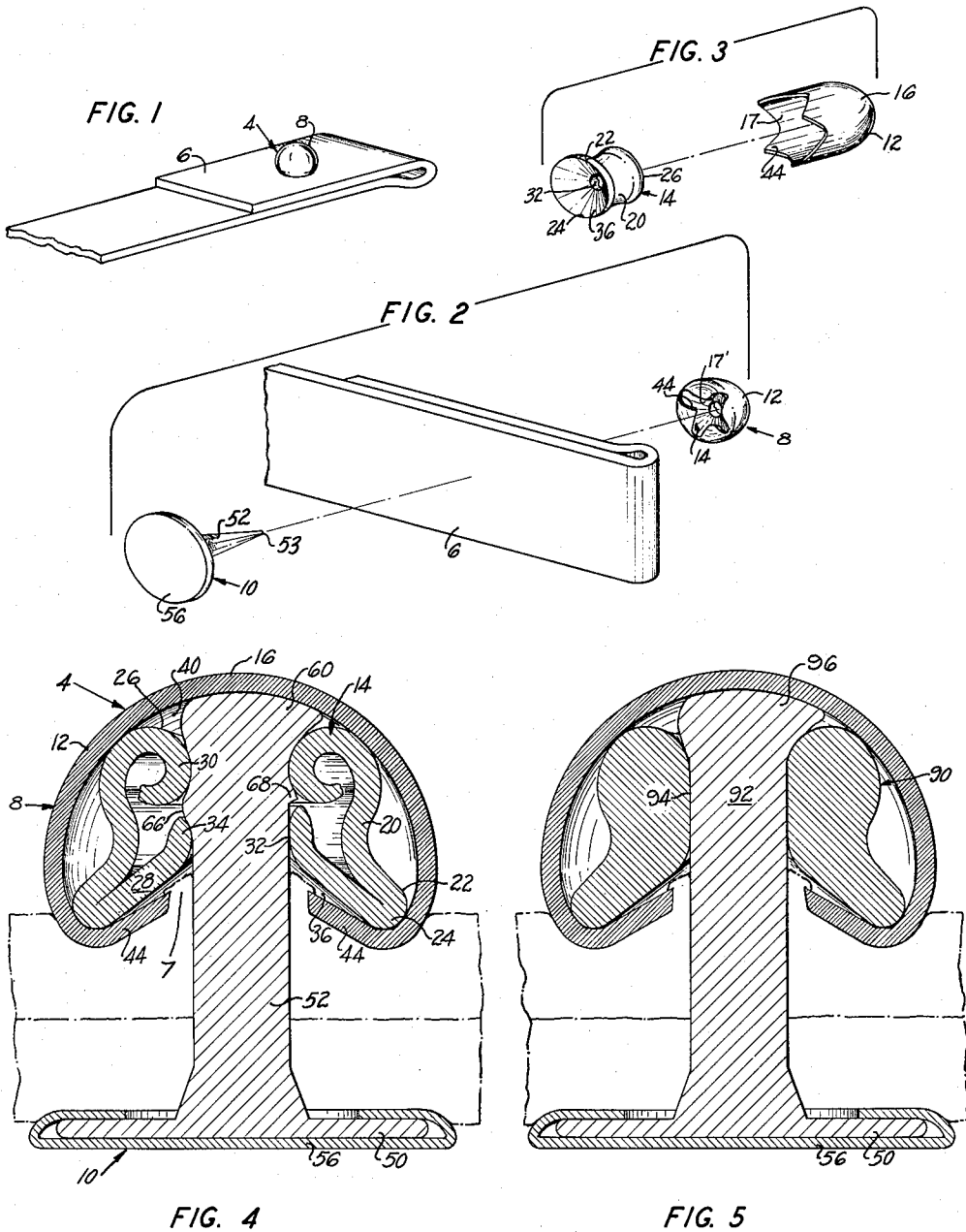
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FASTENING DEVICE

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## FASTENING DEVICE

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This invention relates to an improved fastening device generally employed on garments, handbags, luggage pieces or other objects needing a decorative fastener and is more particularly directed to the provision of an improved type of fastening device that has come to be known as a burr.

One of the primary objects of the present invention is to provide an improved burr-type fastening device that may be securely attached to a conventional tack to provide a very rugged fastener assembly suitable for use on footwear and work garments while providing such a decorative appearance as to encourage use on premium quality luggage, garments, etc.

A further object of this invention is the provision of an improved fastening assembly that is self-piercing with regard to the objects to be secured together, that provides a decorative appearance and that is easily assembled with conventional hand tools or automatic machinery.

A still further object of the present invention is the provision of a burr that will accomplish the above objects while being constructed from elements that may be economically manufactured and that are susceptible to automatic assembly by machines at minimum cost.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a perspective view of a stud assembly embodying the invention shown attached to a folded strap section;

FIG. 2 is a perspective view of the stud assembly elements shown on opposite sides of the strap section in pre-assembly relationship;

FIG. 3 is an exploded perspective view of a burr of this invention prior to assembly;

FIG. 4 is a cross-sectional elevational view of a burr and tack after assembly to an article (shown in phantom); and

FIG. 5 is a view similar to FIG. 4 but showing another embodiment of the invention.

Referring to the drawings and particularly FIGS. 1 and 2, a fastening assembly generally designated 4 embodying a preferred embodiment of the present invention is utilized to secure overlapped portions of a strap 6 or the like together and is generally comprised of a burr or head 8 and conventional tack 10 adapted to pierce the strap 6 and engage the burr 8, as will be subsequently described in greater detail. The burr 8 is comprised of a cap or shell 12 and a vise or retaining member 14 received in the shell 12 for cooperation with the tack 10.

As most clearly seen in FIGS. 3, 4 and 5, the cap 12 is formed from suitable material such as metal and has a domelike construction with a closed end or crest 16 and an open end 17 through which the retaining member 14 is inserted during assembly of the burr 8 and for receiving the end of the tack 10 in the final assembly shown in FIGS. 4 and 5.

In the embodiment shown in FIG. 4, the retaining member 14 is dimensioned to be received within the cap 12 and is comprised of a sleeve formed of suitable material such as sheet metal in a generally double-wall construction

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having an exceptionally rigid serpentine cross section. The outer wall 20 of the sleeve is flared outwardly at 22 to provide a lower end 24 of larger diameter than the upper end 26 (as viewed in FIG. 4). The sleeve further includes reentrant portions 28, 30 extending into the sleeve from the ends 24, 26, respectively, and forming a segmented inner wall which describes a through passage 32 for receiving the end of the tack 10. As viewed in FIG. 4 of the drawings and for reasons to be subsequently defined in greater detail, the upper reentrant portion 30 is arcuately formed and is spaced from the extremity 34 of the lower reentrant portion 28. The lower reentrant portion 28 is formed as a frustoconical recess 36 flaring outwardly from the through passage 32 of the sleeve.

The vise or sleeve 14 is centered in the cap 12 with its upper end 26 engaging the interior cap surface adjacent the crest 16 with reentrant portion 30 and the cap surface forming a clinching chamber 40 of relatively small size overlying the upper end 26 of the sleeve. The sleeve is securely fixed in the cap against movement relative thereto by the base of the cap which is bent around and in engagement with the lower sleeve end 24 in the manner shown in FIG. 4 to lock the sleeve in the above-described position. In the illustrated embodiment, the base of the cap 12 is formed by a plurality of generally V-shaped tabs 44 which are shown in FIG. 3 prior to their locking engagement with the sleeve 14. The tabs 44 are dimensioned to be folded by any suitable method inwardly around and in engagement with the sleeve end 24 and then upwardly (as viewed in FIG. 4) into the sleeve recess 36, whereby sharp edges are not exposed and an aperture 17' is provided generally aligned with the passage 32 to receive the end of tack 10 with the tabs 44 spaced laterally therefrom as shown in FIG. 4.

In the drawings, the tack 10 comprises a head 50, a shank 52 and a pointed end 53 with a decorative cap 56 provided on the head of the tack. Other fastening devices besides conventional tacks can be effectively utilized, however.

The burr 8 and tack 10 of the assembly are attached together on the strap 6 by piercing the strap sections with the tack point 53 and shank 52, inserting the shank and point through passage 32 of the vise 14, and then clinching the end of the tack in the chamber 40. The clinching operation deforms the extremity of the tack into an enlarged head 60 which engages the inner surface of the cap and the end 26 of the sleeve, whereby the tack is fixed against movement. Additionally, the compressive force of the clinching operation can be made sufficiently large to deform the shank 52 into engagement with the inner wall of the sleeve 14 formed by reentrant portions 28, 30 such that portions of the shank at 66, 68 are trapped between the ends of the reentrant portions to thereby enhance the locking of the tack in the burr. The conical contour of recess 36 of the sleeve 14, in addition to receiving the tabs 44 of the cap 12 as described above, additionally guides the point of the tack into proper position in the cap during the assembly operation and further acts as a receptacle for receiving any material displaced by the tack during insertion through the strap as shown in FIG. 4 wherein the portions 7 of the strap 6 are illustrated as being displaced and secured in the recess 36.

Referring to FIG. 5, a second embodiment of the invention is shown therein as employing a retaining member or vise 90 formed of solid construction instead of the double-wall sleeve construction employed in the above-described embodiment shown in FIG. 4. The clinching of the tack in this embodiment deforms the tack 92 into a press-fit engagement with the inner surface 94 of the retaining member 90 which, together with the clinched point 96 as in the above-described embodiment, securely locks the tack shank in the stud head against movement.

The present invention thus provides a fastener assembly that may be securely attached by a conventional machine or by hand to an associated article in a simple and rapid operation. Additionally, the present invention permits the burr to be economically manufactured to produce a decorative appearance which can be devoid of sharp edges or projections without affecting the strength of the fastening accomplished thereby.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. A burr for use with a fastening device such as a tack comprising a dome-like shell having a closed crest at one end and a re-entrant portion defining a central aperture at the other end, a vise positioned within the shell and having a through passage in alignment with the aperture of the shell for receiving the shank of a tack therethrough, one end of the vise being flared and engaged by the inner surface of the re-entrant portion of the shell, the opposite end of the vise being of smaller diameter than said flared end and engaging the inner surface of the shell adjacent the crest to form a clinching chamber for receiving the end of a tack therein.

2. A two-piece burr for use with a fastening device such as a tack comprising a one-piece dome-like shell having a closed crest at one end and a re-entrant portion defining a central aperture at the other end, a vise positioned within the shell and having a through passage in alignment with the aperture of the shell for receiving the shank of a tack therethrough, one end of the vise engaging the inner surface of the shell adjacent the crest thereof to form a clinching chamber for receiving the end of a tack, the other end of the vise being flared and engaging the inner surface of the shell adjacent the re-entrant portion thereof, whereby the shell and the vise mutually reinforce each other.

3. A burr as recited in claim 2 wherein the vise comprises a sleeve having a generally frustoconical outer wall and re-entrant portions on each end thereof with the re-entrant portions extending toward each other to provide a narrow gap therebetween for receiving a deformed portion of the shank of a tack clinched therein.

4. A burr as set forth in claim 2 wherein the vise comprises a sleeve having a generally frustoconical outer wall and re-entrant portions on each end thereof to form a double wall construction, the re-entrant end of the vise adjacent the crest of the shell being arcuately formed and terminating adjacent the outer wall of the vise so as to engage the same upon being subjected to lateral forces imposed by the skewing of the end of the tack during the clinching operation.

5. A burr as set forth in claim 2 wherein the vise comprises a sleeve having a generally frustoconical outer wall and re-entrant end portions on each end thereof, the re-entrant end portion adjacent the apertured end of the shell providing a frustoconical recess for receiving the re-entrant portion of the shell and for receiving material displaced by the tack in passing through the parts being secured together.

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