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⑤④ **Magnetic button for articles of clothing, leather goods, and the like.**

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FR-A-1 586 926
FR-A-2 044 965
GB-A- 589 304
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US-A-3 259 383
US-A-4 102 239
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Description

This invention relates to a magnetic button for articles of clothing, leather goods, and the like.

As is known, there are commercially available magnetic buttons which can secure together two flaps of an article of clothing by virtue of the magnetic attraction established between two elements, usually male and female ones of cylindrical shape. Magnetic buttons of this kind are available in a variety of shapes, and various method are used for attaching them to the articles flaps. In particular the published Italian Utility Model application N. 23266 B/82 by the same Applicant illustrates in Figure 7 a magnetic button wherein the male element comprises a rivet shank which is passed through the article flap and upturned at one of its ends for fixing purposes, whilst the female element has, in addition to a similar upturned end, a magnetic core which generates the magnetic field attracting the male shank.

This prior embodiment has proved to be advantageous in that it affords the possibility of greatly decreasing the overall bulk of the magnetic button, and because it can be applied even where limited thicknesses are required.

It is a primary object of this invention to improve the magnetic button of the cited prior application so as to combine the reduced thickness and wide applicability features with constructional features which afford a simple and quick assembling to the article flaps.

Another object of this invention is to provide such an improved magnetic button which can be installed automatically using specially provided equipment, and no longer require the costly and time-consuming manual procedure used heretofore for the same purpose.

A further object of this invention is to provide such a magnetic button which is simple and extremely inexpensive and involves no costly procedures for its assembling.

A not least object of this invention is to provide such an improved magnetic button which has an appealing outward appearance.

These and other objects, such as will be apparent hereinafter, are achieved by a magnetic button for articles of clothing, leather goods, and the like, comprising magnetically cooperating male and female elements each having a rivet element for attachment to a respective flap of an article and at least one holed plate wherethrough said rivet element is passed and being clamped between one face of the respective flap and an upsettable end of said rivet, characterized in that said plate has a substantially crowned shape with peripheral radial cutouts defining peripheral tabs on said plate so as to enable an elastic deformation thereof.

According to another aspect of the invention, the cited objects are achieved by a magnetic button particularly for clothing and leather articles, comprising male and female elements cooperating with each other magnetically and

each having a rivet element for attachment to a respective flap of an article and a drilled disk wherethrough the shank of said rivet element is passed and being arranged between the head of said rivet and one side of the respective flap of one side, characterized in that said rivet element and said disk are made fast with each other.

Further features and advantages will become apparent from the following detailed description of a preferred embodiment of the invention, with reference to the accompanying illustrative drawings, where:

Figure 1 is a cross-section taken through the magnetic button incorporating the plate according to the invention;

Figure 2 is a top plan view of the inventive plate;

Figure 3 is a cross-section taken through the plate of Figure 2;

Figures 4—7 show fragmentary cross-sectional views across changed embodiments of the button's male element according to the invention; and

Figure 8 is a cross-sectional view through a changed embodiment of the female member of the button according to the invention.

With reference to Figure 1, the improved magnetic button of this invention comprises, in a conventional fashion, a male element 14 attached to a flap 16 of an article and a female element 15 attached to another flap 17 of the article. This improved magnetic button has a similar overall configuration to that of the button shown in Figure 7 of the cited prior Application by the same Applicant. In detail, the male element 14 comprise essentially a rivet having a head 20, shank 21, and upsetting zone 22. Between the head 20 and fabric or hide flap of the article 16, there is interposed a small disk 23. Likewise, the female element 15 includes a rivet having a head 20, shank 21, and upsetting end 22 whereto a magnetic core 30 is affixed which is accommodated within a cap 31, adapted to be clinched on a small disk 32. The button of this invention further comprises small plates, designated with the reference numeral 1, located on the sides of the flaps 16 and 17 facing away from each other and clamped by the upset heads 22 of the rivets against such surfaces.

Said plates, which form the peculiar aspect of this invention, are shown more detailedly in Figures 2 and 3.

With reference to Figures 2 and 3, the plate of this invention comprises a circular disk of substantially crowned shape, as shown in the sectional view of Figure 3. The plate 1 is divided into plural concentric areas having individual characteristics for performing a well-defined function and obtaining particular advantages. In detail, the plate 1 has an outermost annular zone whereat cutouts 2 are formed to define a plurality of fins or tabs 3 effective to confer on the plate—formed from hardened steel and, hence, inelastic—compliance characteristics necessitated to lock the button on the flap. The tabs 3 extend preferably over a frusto-conical surface

coaxial with the plate. Advantageously, the outermost portion of the tabs 3 defines a substantially flat zone 12 extending approximately parallel to the flap of the articles on which the button is to be installed, prior to its installation. This prevents the outer edge of the plate, during the fastening thereof, from digging into the fabric or hide and causing laceration thereof. Proceeding concentrically, toward the inside with respect to the zone of the tabs 3, a conical portion 4 is defined, which has an opposite taper angle and which, together with the next annular zone 8, also conical and extending more or less in the same direction as the tabs 3, defines a groove or seat 5 for the upsetting head 22 of the rivet, as shown in Figure 1, and as explained more fully hereinafter. The inner conical zone 8, delimiting a hole 7 for accommodating the shank 21 of the rivet, further defines (at the bottom in Figure 3) a conical lead-in zone 10 to facilitate insertion and centering of the rivet during assembly and also to permit assembling of an automatic type.

Figures 4—8 show modifications of the male and female elements to which the plate shown in Figures 1—3 may be attached. Such elements are characterized in that the rivet and disk are made fast to each other.

In detail, with reference to Figure 4, the male element shown comprises essentially a small disk 101 and a rivet element 102 made fast to each other. In particular, the rivet element 102 comprises an enlarged head 103 and a shank portion 104. The shank 104 has an undersize zone 106 adjacent the head 103 and an oversize zone on the inside whereof there is a cavity 105, thereby a step 107 is formed between the undersize zone 106 and the remainder of the shank. That male element is obtained in this way. Initially, the rivet shank 104 has a uniform cross-section throughout its longitudinal extension, then, after being inserted into the drilled disk 101, a chamfering operation is carried out on the rivet by means of a punch penetrating the hole 105 in the shank 104 of the rivet and causing its expansion and the formation of the step 107. Upon completion of the chamfering operation, therefore, the rivet has an expanded shank zone the diameter whereof is greater than that of the hole in the disk 101 and prevents, therefore, the rivet from coming out and accordingly the permanent attachment of the rivet to the disk 101.

The male element according to Figure 5 comprises a drilled disk 110 and a rivet element 111. Also in this case, the rivet 111 has a head 112 and shank 113 on the interior whereof there extend (at least part-way) an cavity 114 to allow outwards expansion of the rivet shank end. In this case, the upper portion of the shank 113, adjacent the head 112, has a knurled formation 115 which, upon force fitting the rivet shank into the hole in the disk 110, engages with the cylindrical wall of the hole in the disk 110 and prevents the rivet from coming off the disk 110. Of course, the knurled formation, instead of

being provided on the rivet shank, could be provided on the wall delimiting the hole in the disk 110, to achieve the same effect.

In the embodiment of Figure 6, the disk and rivet form a single monolithic element, generally designated with the reference numeral 120. In particular, that unitary element 120 comprises a disk-like element 121 on one face whereof there extends a preferably frusto-conical projection 122 having a greater width dimension than its height, whilst the other face has a cylindrical projection portion 123 provided with a longitudinal bore 124. Both the projection 122 and cylindrical portion 123 on the other side of the disk-like element 121 are arranged centrally with respect to that disk-like element.

In the embodiment of Figure 7, the rivet element 131 is of traditional shape, having a head 132, shank 133, and longitudinal cavity 134. The disk 130 has, however, a chamfered portion 135 provided with a lip 136 extending toward the shank 133 of the rivet and force-fitted adjacently the latter to retain it and prevent the rivet 131 from coming out. That element is formed from a disk of an ordinary type which is chamfered by means of a suitable punch acting on the annular dimpled zone of the disk to cause displacement of material and the formation of the retaining lip 136 for the rivet shank.

Figure 8 shows the female element obtained from the male element fabricated as in Figure 4. That female element has, accordingly, a disk 101 and rivet 102 provided with a head 103 and chamfered shank 104 having an undersize portion through the disk and an oversize portion which prevents the rivet from coming out. The female element 140 is then completed by a magnetic core 141 and a clenching cap 142, of a traditional type. However, it would also be possible to form a female element from the embodiments of Figures 2—4.

During assembly, after placing the plate 1 against the flap where to the button is to be attached and after centering the plate, the rivet is inserted into the disk, thereafter the rivet and disk are passed through the related flap, 16 or 17 (which may be previously holed at the more or less precise location), then rivetting is performed by upsetting its end 32. Thereupon, the plate 1 is pressed against its respective flap and deformed to widen and adapt to the form and consistency of the flap fabric or hide. During this operation, the upset, widened head 22 of the rivet is positioned at the groove 5, thereby the rivet as a whole will barely protrude beyond the thickness of the plate 1 or may even be flush therewith.

Assembling is even simpler in the instance where the male and female elements are embodied as shown in Figures 4—8. In this instance, in fact, it is only required that the rivet-disk combination be passed through the related attachment flap, thus saving one operation in the attachment step. This advantage is much more significant in the instance of the female element, where problems could be encountered due to the

magnetic interaction of the rivet and magnetic core at the time of inserting the rivet.

As may be appreciated from the above description, the invention fully achieves its objects. In fact, a magnetic button has been provided which, by virtue of the elasticity and compressibility of the plate has very little bulk, especially if compared to the magnetic buttons which include tabs attached to either the male or female element and passed through the attachment flap to be folded over during assembly. The elasticity and compliance of the plate of this invention allow the latter to flatten itself against the flap and fit so as to accommodate unavoidable variations in thickness and consistency of the application material. Furthermore, as already explained, the provision of the flat zone 12 at the edges ensures perfect spreading of the plate and adaptation to the fabric without digging into the fabric in any circumstances, even if the plate is not positioned exactly parallel to the flap to which it is to be attached.

The fact, moreover, that the plate has a conical lead-in or invitation zone 10 ensures perfect centering of the rivet and plate, thus enabling the use of automatic machinery for assembling.

Finally, the presence of the groove or seat 5 in the face not adjacent to the flap forming a seat for the rivet upsetting zone enables the overall thickness of the button to be decreased.

Further, the button so constructed is aesthetically pleasing, as well as being inexpensive by virtue of its extreme simplicity.

The materials used, as well as the dimensions, may be an ones contingent on requirements.

Claims

1. A magnetic button for articles of clothing, leather goods, and the like, comprising magnetically cooperating male and female element (14, 15) each having a rivet element for attachment to a respective flap (16, 17) of an article and at least one holed plate (1—5, 7, 8, 10, 12) wherethrough said rivet element (20—22, 102—107, 111—115, 122—124, 131—134) is passed and being clamped between one face of the respective flap (16, 17) and an upsettable end (22) of said rivet (20—22, 102—107, 111—115, 122—124, 131—134), characterized in that said plate (1—5, 7, 8, 10, 12) has a substantially crowned shape with peripheral radial cutouts (2) defining peripheral tabs (3, 12) on said plate (1—5, 7, 8, 10, 12) so as to enable an elastic deformation thereof.

2. A button according to Claim 1, characterized in that said plate (1—5, 7, 8, 10, 12) is formed from hardened steel.

3. A button according to either Claim 1 or 2, characterized in that said plate (1—5, 7, 8, 10, 12) has an annular groove (5) concentric with the hole (7) for the passage of said rivet element (20—22, 102—107, 111—115, 122—124, 131—134) and facing toward the upsettable end (22) of said rivet element so as to define a seat for said end after upsetting the same.

4. A button according to one or more of the preceding claims, characterized in that an inner portion (4) of said plate (1—5, 7, 8, 10, 12) adjacent and concentric with the passage hole (7) for the rivet element (20—22, 102—107, 111—115, 122—124, 131—134) defines a conical lead-in and centering mouth (4) for said rivet element (20—22, 102—107, 111—115, 122—124, 131—134).

5. A button according to one or more of the preceding claims, characterized in that said peripheral tabs (3) define, at the peripheral portion (4) of said plate (1—5, 7, 8, 10, 12), a flat zone (12) extending substantially parallel to said respective flap (16, 17).

6. A magnetic button, particularly for clothing and leather articles, comprising male and female elements (14, 15) cooperating with each other magnetically and each having a rivet element (20—22, 102—107, 111—115, 122—124, 131—134) for attachment to a respective flap (16, 17) of an article and a drilled disk (101, 110, 121, 130, 135, 136) wherethrough the shank (21, 104, 113, 123) of said rivet element (20—22, 102—107, 111—115, 122—124, 131—134) is passed and being arranged between the head (103, 112, 122, 132) of said rivet and one side of the respective flap (16, 17) of one side, characterized in that said rivet element (20—22, 102—107, 111—115, 122—124, 131—134) and said disk (101, 110, 121, 130, 135, 136) are made fast with each other.

7. A magnetic button according to Claim 6, characterized in that said shank (104) of the rivet element (102—107) has a narrower shank portion (106) at said disk (101) and at least one expanded portion (107) at the free end of said shank (104), said expanded portion (107) having a greater diameter than the hole in said disk (101).

8. A magnetic button according to Claim 6, characterized in that said shank (113) of said rivet element (111—115) has a knurled zone (115) proximated to said head (112) of the rivet element (111—115) for forcibly engaging said rivet (111—115) with the hole in said disk (110).

9. A magnetic button according to one or more of the preceding claims, characterized in that said rivet element and said disk are fabricated as a unitary construction piece (120—124).

10. A magnetic button according to one or more of the preceding claims, characterized in that said disk (130) has a chamfered portion (135) clamped on the shank (133) of said rivet element (131—134).

Patentansprüche

1. Magnetischer Knopf für Bekleidungsstücke, Lederwaren u.dgl., bestehend aus einem Einsteckteil und einem Aufnahmeteil (14, 15), die magnetisch zusammenwirken und von denen jeder ein Nitelement zur Anbringung an einen jeweiligen Lappen (16, 17) eines Gegenstandes und wenigstens eine Hohlplatte (1—5, 7, 8, 10, 12), durch welche das Nitelement (20—22, 102—107, 111—115, 122—124, 131—134) hindurch-

gesteckt und zwischen einer Seite des betreffenden Lappens (16, 17) und einem umschlagbaren Ende (22) der Niete (20—22, 102—107, 111—115, 122—124, 131—134) eingeklemmt wird, dadurch gekennzeichnet, daß die Platte (1—5, 7, 8, 10, 12) eine im wesentlichen kronenartige Form mit peripheren radialen Ausschnitten (2) besitzt, welche periphere Nasen (3, 12) auf der Platte (1—5, 7, 8, 10, 12) definieren, so daß diese elastisch verformt werden können.

2. Knopf nach Anspruch 1, dadurch gekennzeichnet, daß die Platte (1—5, 7, 8, 10, 12) aus gehärtetem Stahl gebildet ist.

3. Knopf nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Platte (1—5, 7, 8, 10, 12) eine ringförmige Nut (5) besitzt, die zum Loch (7) zum Hindurchstecken des Nitelements (20—22, 102—107, 111—115, 122—124, 131—134) konzentrisch ist und gegen das umschlagbare Ende (22) des Nitelementes weist und auf diese Weise einen Sitz für das genannte Ende nach dem Umschlagen desselben bildet.

4. Knopf nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß ein innerer Teil (4) der Platte (1—5, 7, 8, 10, 12) neben und konzentrisch zum Durchsteckloch (7) für das Nitelement (20—22, 102—107, 111—115, 122—124, 131—134) eine konische Einführungs- und Zentriermündung (4) für das genannte Nitelement (20—22, 102—107, 111—115, 122—124, 131—134) definiert.

5. Knopf nach einem oder mehreren der vorhergehenden Ansprüche dadurch gekennzeichnet, daß die peripheren Nasen (3) am peripheren Teil (4) der Platte (1—5, 7, 8, 10, 12) eine flache Zone (12) definieren, die sich im wesentlichen parallel zum betreffenden Lappen (16, 17) erstreckt.

6. Magnetischer Knopf, insbesondere für Bekleidungsstücke und Lederwaren, bestehend aus einem Einsteckteil und einem Aufnahmeteil (14, 15), die magnetisch zusammenwirken und von denen jeder ein Nitelement (20—22, 102—107, 111—115, 122—124, 131—134) zur Anbringung an einen jeweiligen Lappen (16, 17) eines Gegenstandes und eine durchbohrte Scheibe (101, 110, 121, 130, 135, 136) aufweist, durch welche der Schaft (21, 104, 113, 123) des Nitelements (20—22, 102—107, 111—115, 122—124, 131—134) hindurchgesteckt und zwischen dem Kopf (103, 112, 122, 132) der Niete und einer Seite des betreffenden Lappens (16, 17) angeordnet wird, dadurch gekennzeichnet, daß das Nitelement (20—22, 102—107, 111—115, 122—124, 131—134) und die Scheibe (101, 110, 121, 130, 135, 136) aneinander befestigt werden.

7. Magnetischer Knopf nach Anspruch 6, dadurch gekennzeichnet, daß der Schaft (104) des Nitelements (102, 107) einen engeren Schaftteil (106) bei der Scheibe (101) und wenigstens einen erweiterten Schaftabschnitt (107) am freien Ende des Schaftes (104) besitzt, welcher erweiterte Schaftabschnitt (107) einen größeren Durchmesser besitzt als das Loch in der Scheibe (101).

8. Magnetischer Knopf nach Anspruch 6, dadurch gekennzeichnet, daß der Schaft (113) des

Nitelements (111—115) eine gerändelte Zone (115) in der Nähe des Kopfes (112) des Nitelements (111—115) zum Zwangseingriff der Niete (111—115) mit dem Loch in der Scheibe (110) aufweist.

9. Magnetischer Knopf nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Nitelement und die Scheibe als einteiliger Konstruktionsteil (120—124) hergestellt sind.

10. Magnetischer Knopf nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Scheibe (130) einen geschweiften Abschnitt (135) besitzt, der auf den Schaft (133) des Nitelements (131—134) aufgeklemmt ist.

Revendications

1. Bouton magnétique pour vêtements, articles en cuir et analogues, comprenant des éléments mâle et femelle (14, 15) coopérant magnétiquement, chacun ayant un élément de rivetage pour sa fixation à un pan respectif (16, 17) d'un article et au moins une plaque perforée (1—5, 7, 8, 10, 12) à travers laquelle ledit élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) est passé et qui est serrée entre une face du pan respectif (16, 17) et une extrémité refoulable (22) dudit rivet (20—22, 102—107, 111—115, 122—124, 131—134), caractérisé en ce que ladite plaque (1—5, 7, 8, 10, 12) présente sensiblement une forme en couronne avec des découpes radiales périphériques (2) définissant des pattes périphériques (3, 12) sur ladite plaque (1—5, 7, 8, 10, 12) de façon à permettre une déformation élastique de celle-ci.

2. Bouton selon la revendication 1, caractérisé en ce que ladite plaque (1—5, 7, 8, 10, 12) est formée à partir d'acier trempé.

3. Bouton selon la revendication 1 ou la revendication 2, caractérisé en ce que ladite plaque (1—5, 7, 8, 10, 12) présente une rainure annulaire (5) concentrique avec le trou (7) pour le passage dudit élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) et faisant face à l'extrémité refoulable (22) dudit élément de rivetage de façon à définir un siège pour ladite extrémité après refoulement de celle-ci.

4. Bouton selon une ou plusieurs des revendications précédentes, caractérisé en ce qu'une partie interne (4) de ladite plaque (1—5, 7, 8, 10, 12) adjacente et concentrique au trou de passage (7) pour l'élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) définit une entrée de centrage et de guidage conique (4) pour ledit élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134).

5. Bouton selon une ou plusieurs des revendications précédentes, caractérisé en ce que lesdites pattes périphériques (3) définissent, à la partie périphérique (4) de ladite plaque (1—5, 7, 8, 10, 12), une zone plate (12) s'étendant sensiblement parallèlement audit pan respectif (16, 17).

6. Bouton magnétique, en particulier pour des

vêtements et des articles en cuir, comprenant des éléments mâle et femelle (14, 15) coopérant l'un avec l'autre magnétiquement et ayant chacun un élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) pour sa fixation à un pan respectif (16, 17) d'un article et un disque foré (101, 110, 121, 130, 135, 136) à travers lequel la tige (21, 104, 113, 123) dudit élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) est passée et qui est disposé entre la tête (103, 112, 122) dudit rivet et un côté du pan respectif (16, 17) d'un côté, caractérisé en ce que ledit élément de rivetage (20—22, 102—107, 111—115, 122—124, 131—134) et ledit disque (101, 110, 121, 130, 135, 136) sont fixés l'un à l'autre.

7. Bouton magnétique selon la revendication 6, caractérisé en ce que ladite tige (104) de l'élément de rivetage (102—107) présente une partie de tige plus étroite (106) au niveau dudit disque (101) et au moins une partie élargie (107) à l'extrémité libre

de ladite tige (104), ladite partie élargie (107) ayant un diamètre plus grand que le trou dans ledit disque (101).

8. Bouton magnétique selon la revendication 6, caractérisé en ce que ladite tige (113) dudit élément de rivetage (111—115) présente une zone molletée (115) à proximité de ladite tête (112) de l'élément de rivetage (111—115) pour engager à force ledit rivet (111—115) dans le trou dudit disque (110).

9. Bouton magnétique selon une ou plusieurs des revendications précédentes, caractérisé en ce que ledit élément de rivet et ledit disque sont fabriqués en une seule pièce (120—124).

10. Bouton magnétique selon une ou plusieurs des revendications précédentes, caractérisé en ce que ledit disque (130) présente une partie chanfreinée (135) serrée sur la tige (133) dudit élément de rivetage (131—134).

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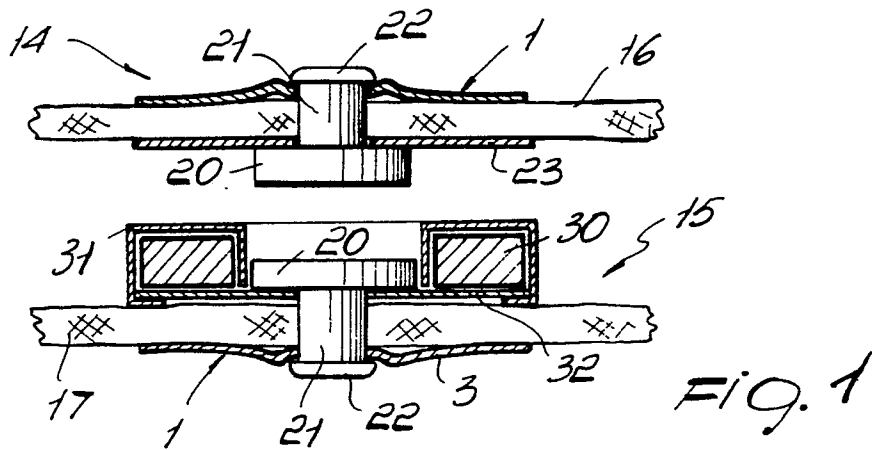
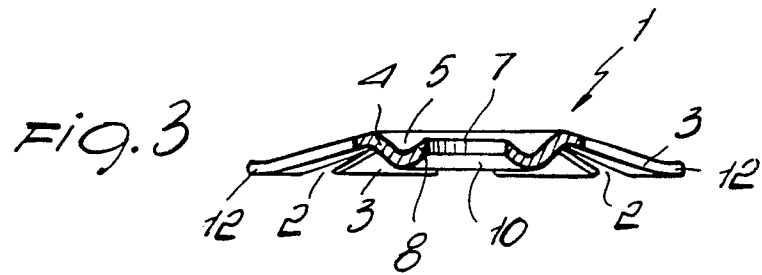
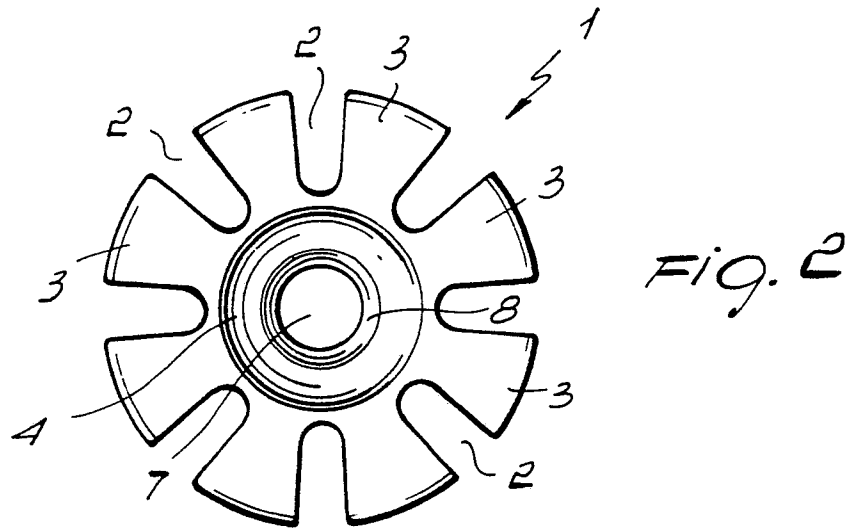
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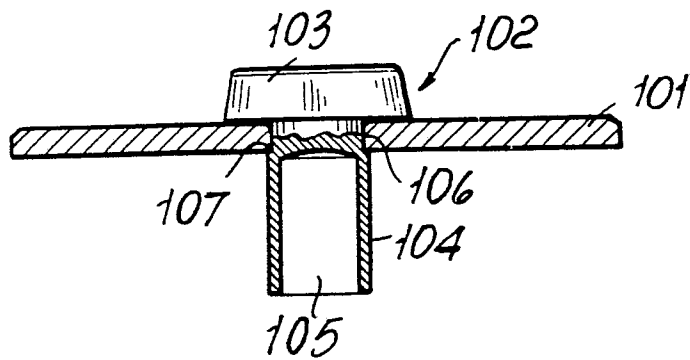


FIG. 4

FIG. 5

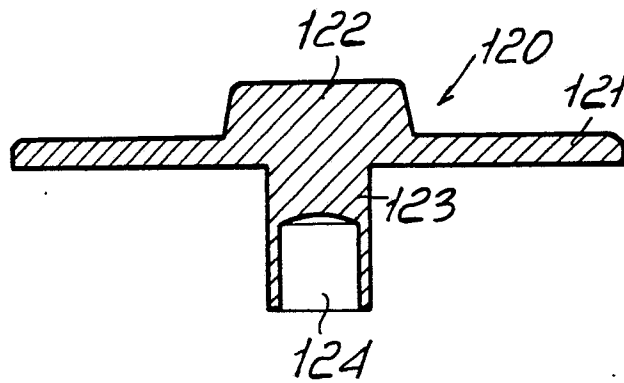
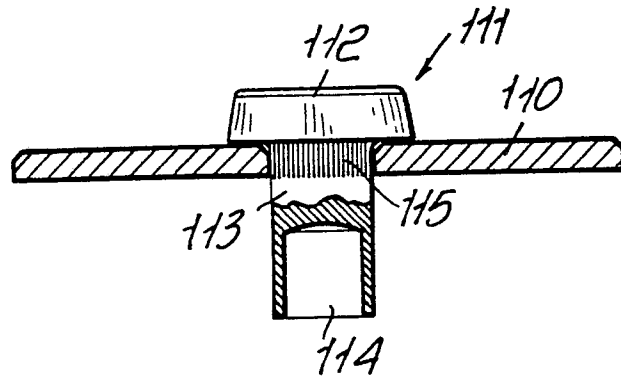


FIG. 6

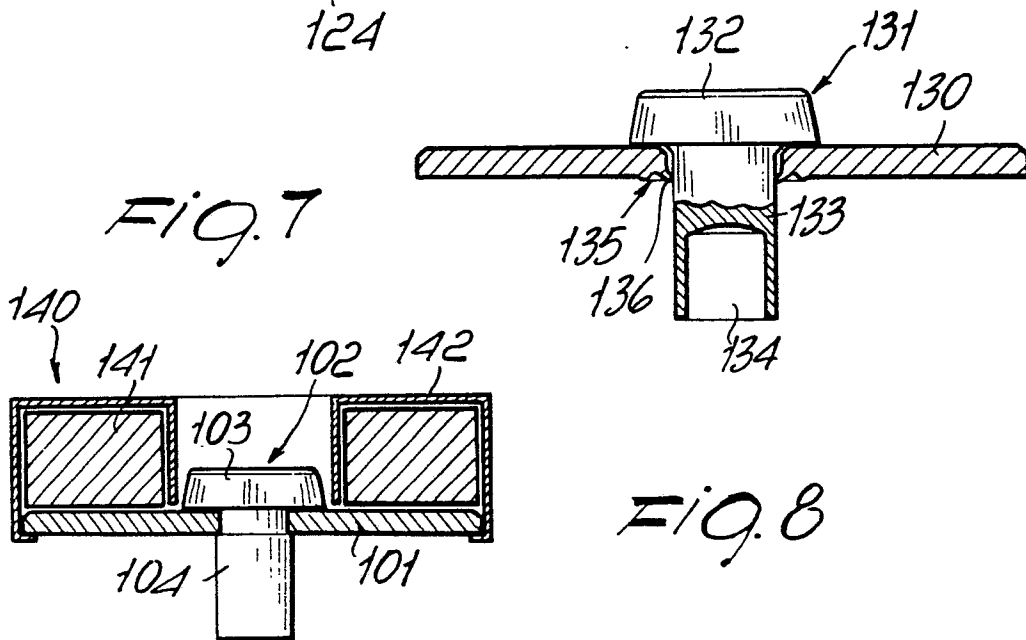


FIG. 7

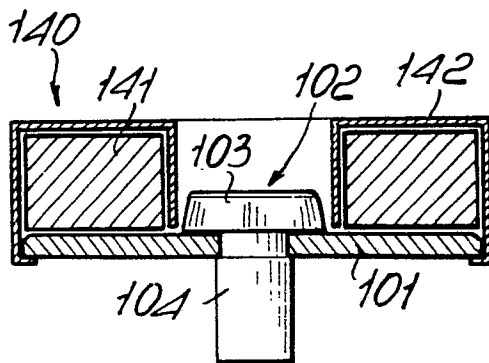


FIG. 8