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(54) **AN IMPROVED PRESS STUD**
VERBESSERTER DRUCKKNOPF
BOUTON À PRESSION AMÉLIORÉ

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Description

[0001] The present invention relates to a press stud of the type comprising a male component which can be selectively connected by a snapping action to a female component.

[0002] Press studs are used in various ways, although they are most commonly, but not exclusively, applied to garments. In particular, the male component and the female component are applied by sewing, riveting, stapling, gluing or other known methods to two corresponding flaps of garments, which can thus be selectively fastened or unfastened. For the sake of clarity, reference will therefore be made in the remainder of this description to the use of press studs on garments, although this use is not to be considered as limiting the present invention in any way, and persons skilled in the art will readily understand that the invention is applicable to the selective closing or joining of objects other than garments, such as footwear, bags, belts, curtains, boxes, and the like, although this list is not exclusive.

[0003] A press stud of the known type comprises a resilient member generally composed of a resiliently deformable ring, housed and retained in the female component of the stud. The male component comprises a head which can be fitted into the ring and which has dimensions slightly greater than those of the ring, such that the ring is resiliently deformed when the head of the male component is introduced into the ring and consequently into the female component. The male component also comprises a stem having a portion with smaller dimensions, particularly a smaller diameter, than those of the head, such that, when the male component is inserted into the female component, the resilient ring, having ridden over the head of the male component, recloses or retightens on the stem portion of the male component with a smaller diameter, to keep the press stud securely closed. Depending on the relative dimensions of the head and stem of the male component of the stud with respect to the dimensions of the resilient ring, and the elasticity of the latter, the closing and opening of the stud take place with a snapping action that is more or less evident and more or less gentle.

[0004] There are different types of press stud, having resilient members of various types. The most conventional type of press stud comprises a split metal ring acting as the resilient member for retaining the male component in the female component. Other types of press stud comprise resilient members with flexible appendages and/or lips projecting into the aperture in the female component into which the male component of the stud is inserted at the time of closing.

[0005] One specific type of press stud of the aforementioned type, devised by the present applicant, is described in WO 97/15207. This stud comprises a resilient ring of substantially polygonal shape, housed and retained in a groove of the female component formed by bending the sheet metal which forms the structure of the

female component into a U-shape. The two opposing sides of the groove, substantially forming the branches of the U-shape, retain the resilient member axially, in other words in the direction in which the male component is inserted into the female component and extracted therefrom, and prevent it from moving out of the female component when axial forces are exerted on it during the insertion and extraction of the male component, in the course of the closing and opening of the press stud respectively.

[0006] It is frequently desirable to customize press studs, such as those applied to garments, by using graphic customizing elements such as text, symbols, patterns or trademarks, which are visible when the stud is applied to the garment. The female element of a press stud is customized by applying these graphic customizing elements to the annular crown portion which surrounds the hole for the insertion of the male component and which is visible when the female element is applied, for example, to a flap of a garment. One of the limitations of this method is the poor quality of the marking. This is because the roughness of the material, which is deformed to produce the requisite profile, imparts a rather unfinished appearance to the parts.

[0007] A relatively simple way of customizing press studs of the aforementioned type is to apply a cover cap to the female component, this cap covering the functional structure of the component and having the graphic customization elements reproduced on it.

[0008] However, the application of such a cover cap gives rise to a number of problems which detract from the quality and appearance of the press stud. One of these problems is the fact that the application of the cover cap increases the thickness of the female component of the stud, making it impossible to produce very slender press studs which are particularly desirable in terms of appearance. Another problem, caused by the particular structure of the female component of most known types of press stud, is that the cover cap may frequently be less than completely flat, owing to the pressure exerted on it during the manufacture of the stud, and, in particular, during the bending of the edge of the cap around the structure of the female component, resulting in a press stud having a less pleasing appearance.

[0009] The object of the present invention is to provide a press stud having a female component with a reduced overall thickness, comprising a cover cap with a substantially flat surface, without detracting from the ease of assembly, robustness, reliability and security of closure of the prior art press studs. Another object of the present invention is to provide a press stud with a female component which is simple to produce and relatively inexpensive. Another object of the invention is to provide a press stud with a female component comprising a cover cap with a substantially flat surface on which graphic customization elements such as texts, symbols, patterns or trademarks can be applied, without these elements being deformed when the manufacture of the press stud is com-

pleted.

[0010] In order to achieve the aforementioned objects, the present invention proposes a press stud of the type indicated in the preamble of the present description, in which the female component comprises a resiliently deformable member which, in a closed condition of the press stud, keeps the male component connected to the female component, characterized in that the female component comprises a base structure with a housing seat for the resiliently deformable member, cover cap means being fixed to the base structure so as to cover it at least partially and close off, at least partially, the housing seat for the resiliently deformable member.

[0011] In a specific embodiment, the female component of the press stud comprises the base structure only, the resiliently deformable member and the cap means being fixed to the base structure by bending a peripheral edge of the cap means around a portion of the base structure. This structure makes it possible to produce, in an easy and economical way, a female component having the requisite functional and aesthetic qualities, for the production of a high-quality press stud.

[0012] According to a further feature of the invention, the housing seat is substantially cylindrical and is partially closed by an annular retaining edge. In particular, the annular seat and the annular retaining edge are made in one piece of sheet metal, which is bent to form the whole base structure. The base structure has a peripheral groove portion for housing the means which fix the base structure to a support, for example the flap of a garment. The cover cap means have a flat annular face which bears on the entry of the housing seat and a substantially annular area of the outer wall of the peripheral groove.

[0013] Other features and advantages of the present invention will become clear from the following detailed description of a preferred embodiment, which refers to the attached drawings, in which:

- Figure 1 is a cross section of a press stud according to the present invention, in the closed condition in which the male component is connected to the female component,
- Figure 2 is a cross section corresponding to that of Figure 1 and showing only the female component provided with the resiliently deformable member of the press stud according to the present invention,
- Figures 3 and 4 are cross sections corresponding, respectively, to those of Figures 1 and 2, showing a different embodiment of the female component of a press stud according to the present invention, and
- Figure 5 is a perspective view of the female component of Figure 4.

[0014] With reference to the drawings, in which identical reference numerals correspond to identical compo-

nents in the different embodiments, the reference numeral 10 indicates the whole of a press stud comprising a male component 12 designed to engage selectively by a snapping action in a female component 14, using a resiliently deformable member which in the specific example shown in Figures 1 and 2 is composed of a split metal ring 15, while in the embodiment shown in Figures 3 to 5 it is composed of a ring of resilient material 16 having a substantially polygonal shape. The features of such a resilient ring 16 are specified in detail in patent WO 97/15207 held by the present applicant, the content of which is understood to be incorporated herein in full, and will not be discussed in greater detail in the rest of the present description. Clearly, the type and shape of the resiliently deformable member housed in the female component is not essential for the purposes of the present invention, and can therefore be varied widely, not being limited to the examples shown in the appended drawings.

[0015] More specifically, Figures 1 and 3 show two different embodiments of the press stud according to the present invention in a closed configuration, in which the male component 12 has been inserted in an axial direction Z-Z and is locked in the female component 14. For this purpose, the male component 12, of a generally known type, comprises a base structure 22 from which a stem 20 projects, this stem terminating in a head 18. The stem 20 has a portion 20a of smaller diameter than that of the head 18, and the resiliently deformable member 15, 16 can engage resiliently with this portion in the closed configuration of the press stud, after the head 18 of the male component 12 has been passed through it.

[0016] The base structure 22 of the male component 12 can be fixed, for example, to a flap of a garment by one of the methods known in the art, for example by sewing, riveting, stapling, gluing, or another known method. The shape of the male component 12 illustrated by way of example in Figures 1 and 3, which is not to be construed as limiting the present invention, is described more fully in US Patent 5 647 105 held by the present applicant, the detailed description of which should be consulted, this detailed description being considered to be reproduced and incorporated herein in its entirety.

[0017] The ratio between the dimensions of the head 18 of the male component 12, particularly its diameter, and those of the stem 20 and of the portion of reduced diameter 20a, together with the size, geometry and characteristics of flexibility and elasticity of the resiliently deformable member or resilient ring 15, 16, are such that the stud can be closed and opened by a snap-action mechanism.

[0018] The female component 14 of the press stud 10, shown more clearly in Figures 2, 4 and 5, comprises a base structure 24 with an annular brim 26 which forms a peripheral circumferential groove 28 with an opening 29 facing a rear side (at the bottom in the figures) of the female component 14, into which, for example, it is possible to insert in a known way the points of a member

(not shown) for connecting the female component 14 to the other flap of the garment. The peripheral groove is preferably formed by a sheet or plate which is suitably shaped and bent.

[0019] A housing 30 of substantially tubular shape is provided in a central area of the base structure 24 of the female component 14, this housing receiving the resiliently deformable member (the metal ring 15 or resilient ring 16) and forming a central aperture for the passage of the head 18 of the male component 12 of the press stud 10. The housing 30 is partially closed at its rear end (at the bottom of the figures) by an annular stop wall 32, preferably made by forming a reverse bend in the sheet or plate from which the whole base structure 24 is made. The annular stop wall 32 retains the resiliently deformable member 15, 16, preventing it from moving out of the female component 14 as a result of the thrust exerted in the axial direction by the male component in the closing operation, in other words the fastening operation.

[0020] Clearly, the material of the base structure and the method of forming it can vary from those indicated above. The base structure 24 can be made from plastics material, by moulding, injection or similar methods for example, as well as from a shaped and bent sheet or plate.

[0021] The base structure 24 of the female component 14 is covered by a cap 34 which is preferably, but not exclusively, metallic, having a substantially flat annular front face 36 (at the top in the figures), with a central hole 38. A portion of the annular front face 36 closes the front end (at the top in the figures) of the tubular housing 30 such that the resiliently deformable member 15, 16 is prevented from moving out of the female component 14 as a result of the thrust exerted in the axial direction Z-Z by the male component in the opening operation, in other words the unfastening operation.

[0022] In particular, in the examples shown in the figures, the tubular housing 30 is closed by an edge 40 of the central hole 38 which, for reasons of appearance and safety, and in order to promote the retention of the resiliently deformable member 15, 16 in the vertically centred position along the central axis Z-Z, is preferably bent slightly towards the inside of the female component 14, although this feature is not to be construed as limiting the present invention.

[0023] The cap 34 has an outer cylindrical wall 42 whose edge 44 is bent around the base structure 24 in such a way that the cap 34 is fixed permanently to the base structure 24. The rear surface 37 of the annular front face 36 of the cap bears against at least two support portions 48 and 50 of the base structure 24, located on the same plane orthogonal to the axial direction Z-Z along which the male component 12 is introduced into the female component 14 and extracted therefrom. Preferably, the support portions 48 and 50 are spaced apart radially with respect to said axial direction Z-Z.

[0024] More specifically, as is clearly seen in Figures 2 and 4, the support portions 48 and 50 comprise a first,

radially outer, support area 48, composed of the outer surface of the wall of the peripheral circumferential groove 28, and a second, radially inner, support area 50, formed by the front edge of the housing 30. The arrangement of the support portions 48 and 50 is such that the flat configuration of the annular front face 36 of the cap 34 can be maintained, thus preventing the deformation of any graphic elements applied to it in advance for the purpose of customizing the press stud 10.

[0025] The configuration of the female component 14 permits the simple and economical manufacture and assembly of the press stud according to the present invention. After the base structure 24 has been formed, for example by shaping and bending a sheet or plate, or by moulding or injection of a plastics material, or by other methods known in the art, the resiliently deformable member or resilient ring 15, 16 is placed in the housing 30 which is then partially closed by the annular front face 36 of the cap 34, thus preventing the resilient ring 15, 16 from subsequently moving out of the female component 15, while allowing the male component 12 to be introduced into it for the purpose of closing the press stud. The resilient ring 15, 16 can be housed in the housing 30 either with a degree of clearance or with an exact fit, and in the latter case the clearance may be eliminated laterally and/or axially with respect to the axis Z-Z. The cap 34 is fixed to the base structure 24 by bending the end 44 of the cylindrical edge 42 around the outer surface of the wall of the peripheral circumferential groove 28, leaving the aperture 29 free.

[0026] The configuration of the press stud according to the present invention, and particularly the configuration of its female component 14, makes it possible to produce a press stud whose total thickness is reduced, and in which the risks of deformation of the cover cap of the female component are substantially eliminated, so that customizing graphic elements can be reproduced easily and economically on this cap. Furthermore, the presence of the central housing 30 for the resilient ring 15, 16, which is subsequently partially closed by the application of the cap 34, makes it possible to produce and assemble the press stud according to the present invention, with ease and at low cost.

[0027] The specific, but non-limiting, embodiment of the press stud illustrated in the figures is particularly simple and economical because the female component 14 of the press stud comprises only the base structure 24, the resiliently deformable member 15, 16 and the cap means 34 being fixed to the base structure 24 by bending the peripheral edge 44 around a portion 26 of the base structure 24. A further simple and economical feature of the female component 14 described in the specific embodiment illustrated in the drawings is the fact that the base structure 24 is made from a single sheet or plate which is suitably shaped and bent. Essentially, it is possible to make a female component of the press stud according to the present invention from only three parts which are simply assembled together.

[0028] Clearly, provided that the principle of the invention is retained, the details of construction and the forms of embodiment can be varied widely from those which have been described and illustrated, without departure from the scope of the present invention as defined by the claims.

Claims

1. A press stud comprising a female component (14) and male component (12) which can engage selectively by a snapping action in the female component (14), wherein the female component (14) comprises a resiliently deformable member (15, 16) which, in a closed condition of the press stud, retains the male component (12) in connection with the female component (14), **characterized in that** the female component (14) comprises a base structure (24) with a housing seat (30) for the resiliently deformable member (15, 16), cover cap means (34) being fixed to the base structure (24) to cover it at least partially and close off, at least partially, the housing seat (30) for the resiliently deformable member (15, 16).
2. A press stud according to Claim 1, **characterized in that** the female component (14) of the press stud is composed solely of the base structure (24), the resiliently deformable member (15, 16), and the cap means (34) fixed to the base structure (24) by bending a peripheral edge (44) of the cap means (34) around a portion of the base structure (24), the resiliently deformable member (15, 16) being housed in the housing (30) formed by the base structure (24) and at least partially closed by a portion of the cap means (34).
3. A press stud according to any one or more of the preceding claims, **characterized in that** the housing seat (30) is substantially cylindrical and is partially closed by an annular retaining edge (32) of the base structure (24).
4. A press stud according to Claim 3, **characterized in that** the housing seat (30) and the annular retaining edge (32) are made in one piece from the same bent sheet or plate.
5. A press stud according to any one or more of the preceding claims, **characterized in that** the cap means (34) comprise an annular front face (36) which is substantially flat with a central hole (38), at least part of the annular front face (36) forming a stop element for the resiliently deformable member (15, 16).
6. A press stud according to Claim 5, **characterized in that** a rear surface (37) of the annular front face

(36) of the cap means (34) bears against at least two support portions (48, 50) of the base structure (22).

7. A press stud according to Claim 6, **characterized in that** said at least two support portions (48, 50) are located on the same plane orthogonal to an axial direction (Z-Z) along which the male component (12) is introduced into the female component (14) and extracted therefrom.
8. A press stud according to Claim 7, **characterized in that** said at least two support portions (48, 50) are spaced apart radially with respect to said axial direction (Z-Z).
9. A press stud according to Claim 8, **characterized in that** said at least two support portions (48, 50) comprise a first, radially outer, support area (48), composed of the outer surface of the wall of the peripheral circumferential groove (28), and a second, radially inner, support area (50), formed by a front edge of the housing (30).

25 Patentansprüche

1. Druckknopf mit einer Aufnahmekomponente (14) und einer Steckkomponente (12), die durch einen Einrastvorgang gezielt in der Aufnahmekomponente (14) in Eingriff kommen kann, wobei die Aufnahmekomponente (14) ein federnd verformbares Element (15, 16) umfasst, das in einem geschlossenen Zustand des Druckknopfs die Steckkomponente (12) mit der Aufnahmekomponente (14) in Verbindung hält, **dadurch gekennzeichnet, dass** die Aufnahmekomponente (14) eine Basisstruktur (24) mit einem Gehäusesitz (30) für das federnd verformbare Element (15, 16) umfasst, wobei Abdeckkappenmittel (34) an der Basisstruktur (24) befestigt sind, um sie mindestens teilweise abzudecken und den Gehäusesitz (30) für das federnd verformbare Element (15, 16) mindestens teilweise abzuschließen.
2. Druckknopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die Aufnahmekomponente (14) des Druckknopfs nur aus der Basisstruktur (24), dem federnd verformbaren Element (15, 16) und den durch Biegen eines Umfangsrandes (44) der Kappenmittel (34) um einen Abschnitt der Basisstruktur (24) an der Basisstruktur (24) befestigten Kappenmitteln (34) besteht, wobei das federnd verformbare Element (15, 16) in dem durch die Basisstruktur (24) gebildeten Gehäuse (30) untergebracht und durch einen Abschnitt der Kappenmittel (34) mindestens teilweise abgeschlossen ist.
3. Druckknopf nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet,**

dass der Gehäusesitz (30) im Wesentlichen zylindrisch und durch einen ringförmigen Halterand (32) der Basisstruktur (24) teilweise geschlossen ist.

4. Druckknopf nach Anspruch 3, **dadurch gekennzeichnet, dass** der Gehäusesitz (30) und der ringförmige Halterand (32) einteilig aus demselben gebogenen Blech oder derselben gebogenen Platte hergestellt sind.
5. Druckknopf nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Kappenmittel (34) eine ringförmige Vorderfläche (36) umfassen, die im wesentlichen flach mit einem mittleren Loch (38) ist, wobei mindestens ein Teil der ringförmigen Vorderfläche (36) ein Anschlagelement für das federnd verformbare Element (15, 16) bildet.
6. Druckknopf nach Anspruch 5, **dadurch gekennzeichnet, dass** eine Rückfläche (37) der ringförmigen Vorderfläche (36) der Kappenmittel (34) an mindestens zwei Stützabschnitten (48, 50) der Basisstruktur (22) anliegt.
7. Druckknopf nach Anspruch 6, **dadurch gekennzeichnet, dass** die mindestens zwei Stützabschnitte (48, 50) auf derselben Ebene angeordnet sind, die orthogonal zu einer axialen Richtung (Z - Z) verläuft, entlang derer die Steckkomponente (12) in die Aufnahmekomponente (14) eingeführt und aus ihr herausgezogen wird.
8. Druckknopf nach Anspruch 7, **dadurch gekennzeichnet, dass** die mindestens zwei Stützabschnitte (48, 50) bezüglich der axialen Richtung (Z - Z) radial beabstandet sind.
9. Druckknopf nach Anspruch 8, **dadurch gekennzeichnet, dass** die mindestens zwei Stützabschnitte (48, 50) einen ersten radial äußeren Stützbereich (48), der aus der äußeren Oberfläche der Wand der umlaufenden Umfangsnut (28) besteht, und einen zweiten radial inneren Stützbereich (50), der durch einen Vorderrand des Gehäuses (30) gebildet ist, umfassen.

Revendications

1. Bouton-pression comprenant un composant femelle (14) et un composant male (12) qui peut s'engager sélectivement par une action de pression dans le composant femelle (14), dans lequel le composant femelle (14) comprend un membre déformable de manière résiliente (15, 16) qui, dans une condition fermée du bouton-pression, retient le composant male (12) en connexion avec le composant femelle

(14), **caractérisé en ce que** le composant femelle (14) comprend une structure de base (24) avec un logement (30) pour le membre déformable de manière résiliente (15, 16), un moyen de capuchon de couverture (34) étant fixé à la structure de base (24) pour la couvrir au moins partiellement et pour fermer, au moins partiellement, le logement (30) pour le membre déformable de manière résiliente (15, 16).

2. Bouton-pression selon la revendication 1, **caractérisé en ce que** le composant femelle (14) du bouton-pression est composé uniquement de la structure de base (24), du membre déformable de manière résiliente (15, 16) et du moyen de capuchon (34) fixé à la structure de base (24) en pliant un bord périphérique (44) du moyen de capuchon (34) autour d'une portion de la structure de base (24), le membre déformable de manière résiliente (15, 16) étant logé dans le logement (30) formé par la structure de base (24) et au moins partiellement fermé par une portion du moyen de capuchon (34).
3. Bouton-pression selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le logement (30) est substantiellement cylindrique et est partiellement fermé par un bord de retenue annulaire (32) de la structure de base (24).
4. Bouton-pression selon la revendication 3, **caractérisé en ce que** le logement (30) et le bord de retenue annulaire (32) sont fait en une pièce à partir de la même feuille ou plaque pliée.
5. Bouton-pression selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le moyen de capuchon (34) comprend une face frontale annulaire (36) qui est substantiellement plate avec un trou central (38), au moins une partie de la face frontale annulaire (36) formant un élément d'arrêt pour le membre déformable de manière résiliente (15, 16).
6. Bouton-pression selon la revendication 5, **caractérisé en ce qu'une** surface arrière (37) de la face frontale annulaire (36) du moyen de capuchon (34) s'appuie contre au moins deux portions de support (48, 50) de la structure de base (22).
7. Bouton-pression selon la revendication 6, **caractérisé en ce que** lesdites au moins deux portions de support (48, 50) sont situées sur le même plan orthogonal à une direction axiale (Z-Z) le long de laquelle le composant male (12) est introduit dans le composant femelle (14) et en est retiré.
8. Bouton-pression selon la revendication 7, **caractérisé en ce que** lesdites au moins deux portions de support (48, 50) sont éloignées l'une de l'autre ra-

dialement par rapport à ladite direction axiale (Z-Z).

9. Bouton-pression selon la revendication 8, **caracté-**
risé en ce que lesdites au moins deux portions de support (48, 50) comprennent une première zone de support (48), radialement extérieure, composée de la surface extérieure de la paroi de la gorge circonférentielle périphérique (28), et une seconde zone de support (50) radialement intérieure, formée par un bord frontal du logement (30).

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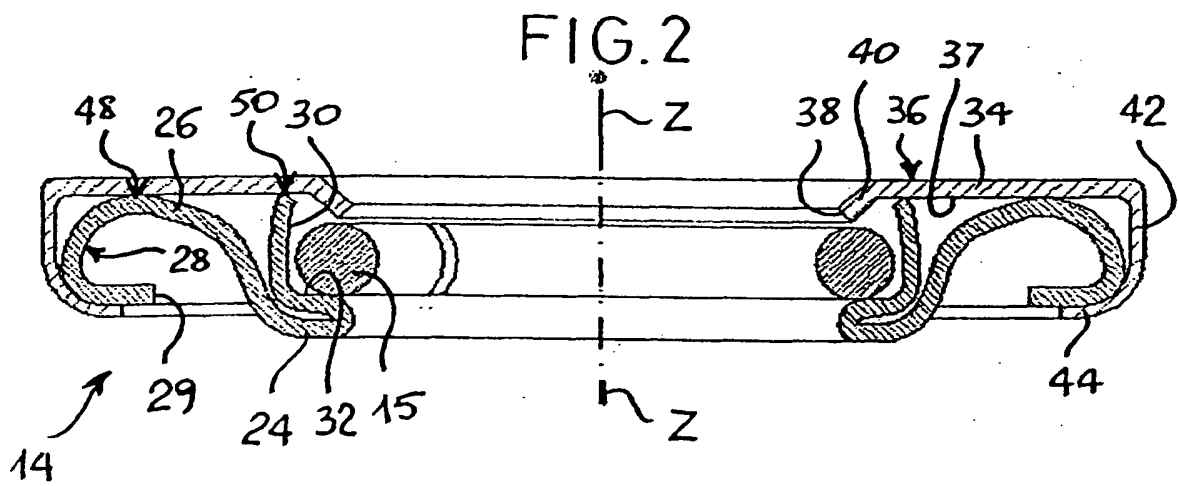
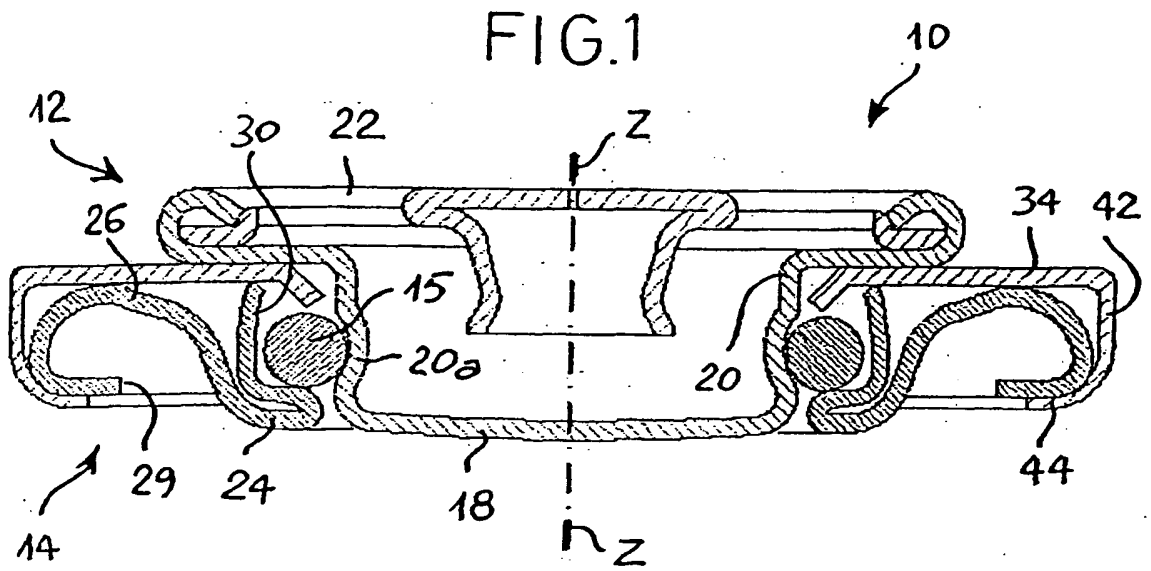
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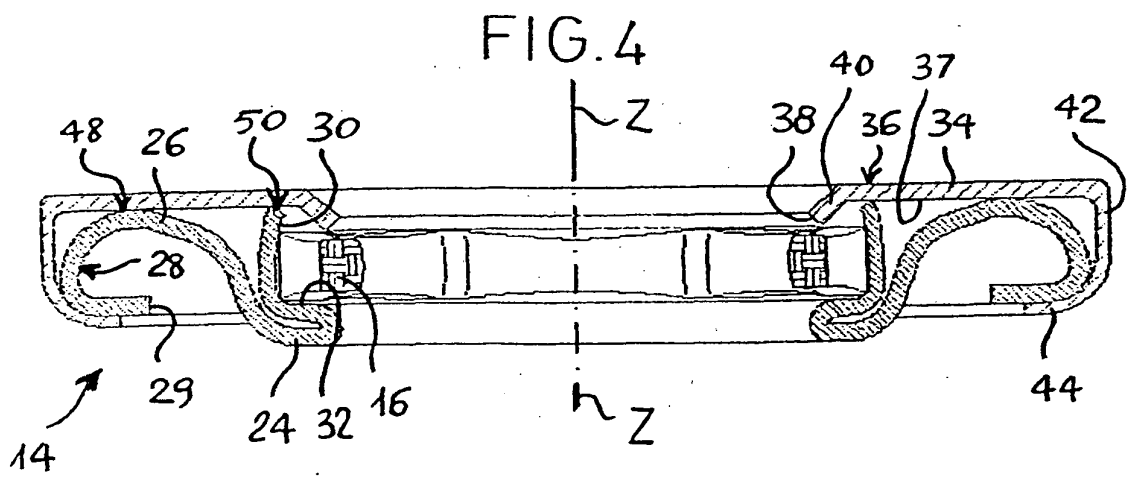
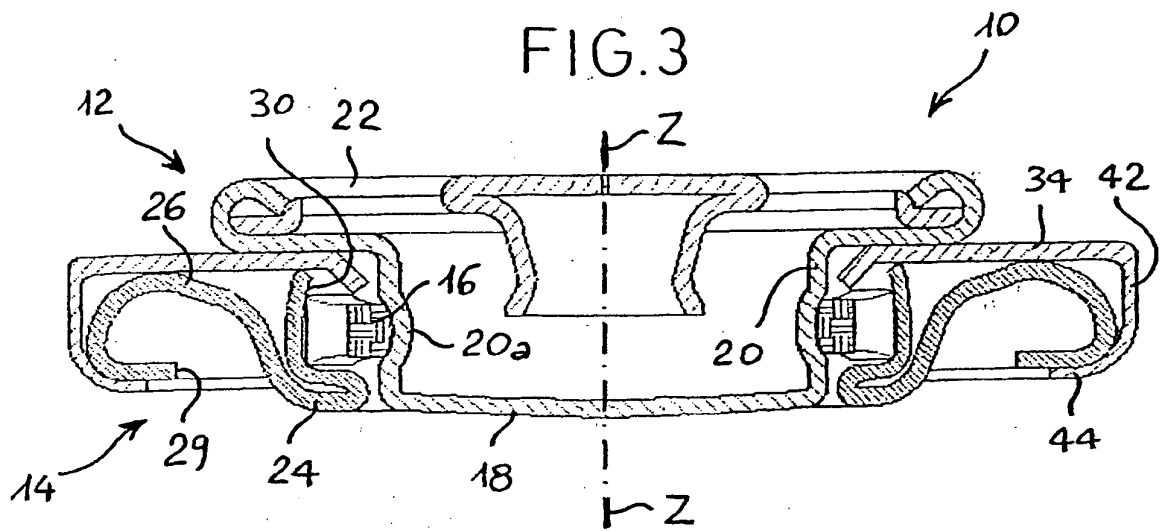
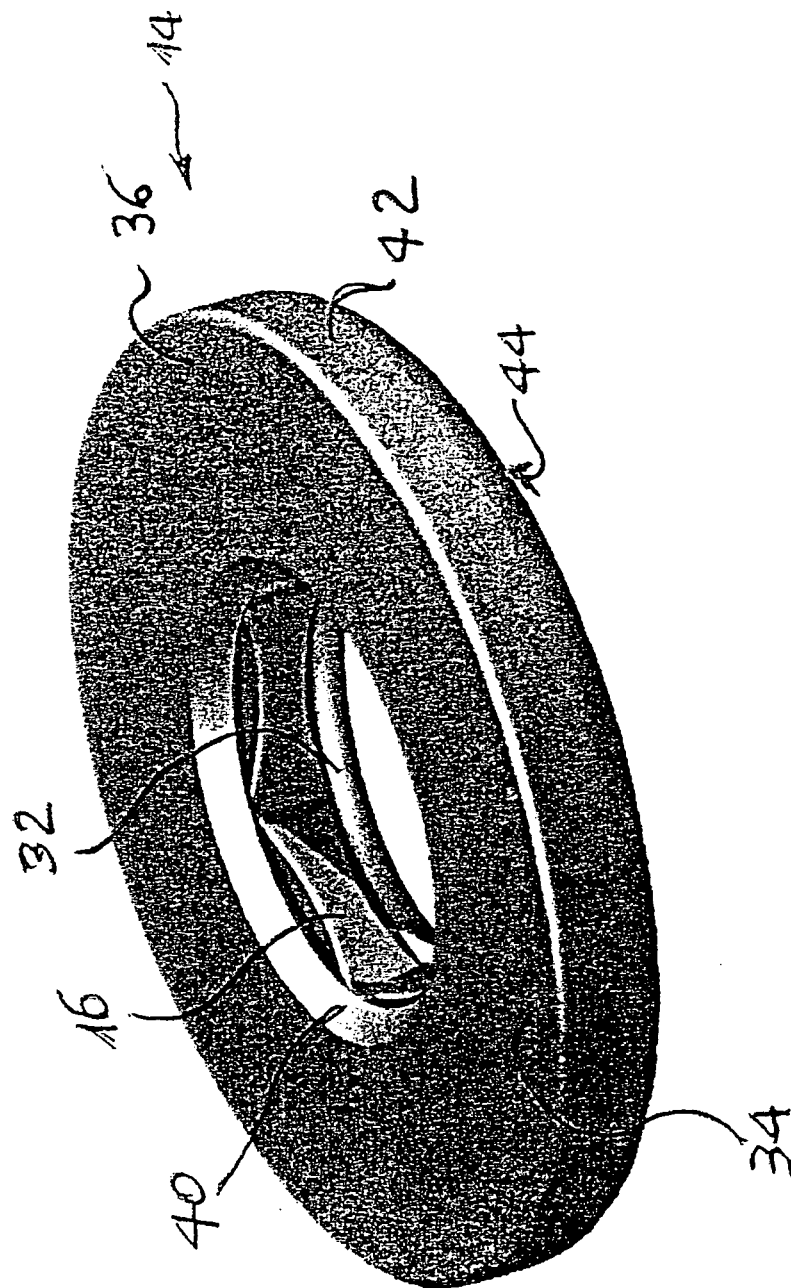


FIG. 5



REFERENCES CITED IN THE DESCRIPTION

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