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(54) **Press-stud, particularly for items of clothing or the like**

(57) A press-stud, particularly for items of clothing or the like, which is highly comfortable to use and very simple to produce, the press-stud (1) comprising a female element (2), in which there is a coupling seat (6) that accommodates an elastic retention element (8) and is provided with an access inlet (7) formed at one end of the female element (2), said female element (2) can be applied to a first strip (3) by way of first fixing means (9), the press-stud (1) comprising a male element (4) which

has a protrusion (10) which is insertable in the coupling seat (6) of the female element (2) through the access inlet (7) and engageable by the elastic retention element (8) in order to retain it in the coupling seat (6), the press-stud (1) further comprising second fixing means (11) for applying the male element (4) to a second strip (5) to be connected to the first strip (3) by means of the press-stud (1), at least the female element (4) being made of synthetic material.

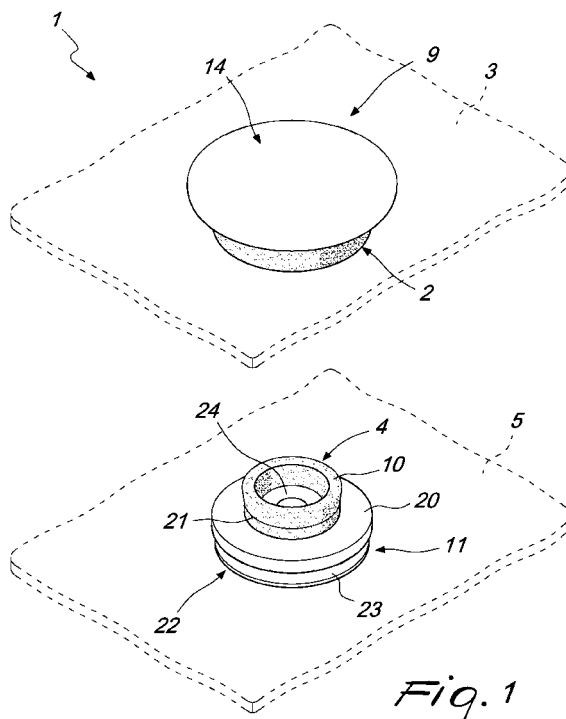


Fig. 1

Description

[0001] The present invention relates to a press-stud, particularly for items of clothing or the like, which is highly comfortable to use and very simple to produce.

[0002] As is known, press-studs for items of clothing or the like are generally constituted by a female element which is designed to be fixed to a first strip of an item of clothing and by a male element which is designed to be fixed to a second strip of an item of clothing and which can be removably coupled with the female element in such a way that it activates the connection between the two strips of the item of clothing.

[0003] More specifically, in the female element a coupling seat is provided that accommodates an elastic retention element and is provided with an access inlet defined at one end of the female element. The female element is fixed to the item of clothing by means of a head which constitutes the most visible part of the press-stud, once the male element is engaged with the female element. The head is generally provided with a hollow shaft that is made to pass through the strip of the item of clothing and which is inserted in a hole, which is defined in the bottom wall of the female element or in the wall of the female element that lies opposite from the access inlet to the coupling seat. The hollow shaft is then plastically deformed within the female element so as to firmly hold the strip of the item of clothing between the head and the female element.

[0004] The male element is provided with a protrusion that is insertable in the coupling seat through the access inlet and is engageable by the elastic retention element in such a way as to retain it in the coupling seat.

[0005] The male element is fixed to the corresponding strip of fabric by means of a post which is inserted, with its tip, through the strip of the item of clothing and through a hole which is defined in the male element. The tip of the post is then plastically deformed so as to firmly hold the strip of the item of clothing between the head of the post and the male element.

[0006] In conventional press-studs, the different components of the press-stud are made of metal. Because of this, conventional press-studs suffer some problems.

[0007] Due to the fact that the female element is made of metal and the elastic retention element is generally constituted by an open metal ring which is accommodated within an annular seat defined in the side walls of the coupling seat, with a certain amount of play so as to be able to radially expand when the male element is inserted into or extracted from the coupling seat and to retract, by elastic reaction, around the male element in order to retain it within the coupling seat, the elastic retention element is free to move about within the annular seat when the male element is disengaged from the female element and this freedom of movement inevitably generates a metallic jingle which may be bothersome.

[0008] Moreover, with conventional press-studs, closing the press-stud, i.e. engaging the male element with

the female element, generates a metallic snap which can also be bothersome to the user.

[0009] Another problem is represented by the costs of making the components of conventional press-studs, which are predominantly made by means of cutting and pressing sheet metal of reduced thickness.

[0010] The aim of the present invention is to solve the above mentioned problems, by providing a press-stud that is particularly comfortable to use, while eliminating or substantially reducing the metallic noise that is typical of press-studs of the traditional type.

[0011] Within this aim, an object of the invention is to provide a press-stud from which the jingling that derives, in press-studs of the known type, from the impacts of the elastic retention element and the female element, is eliminated.

[0012] Another object of the invention is to provide a press-stud in which the engagement of the male element with the female element is deadened, both as a noise and as a tactile perception by the user.

[0013] A further object of the invention is to provide a press-stud that makes it possible to achieve a high level of adherence to the item of clothing without producing excessive deformations in the region of the item of clothing or the like to which it is applied.

[0014] Another object of the invention is to provide a press-stud that can be made with a simpler production cycle and therefore at appreciably lower cost than that of conventional press-studs.

[0015] This aim and these and other objects which will become better apparent hereinafter are achieved by a press-stud, particularly for items of clothing or the like, which comprises:

- a female element, which has a coupling seat which accommodates an elastic retention element and is provided with an access inlet formed at one end of said female element;
- first means for fixing said female element to a first strip;
- a male element, which has a protrusion insertable in said coupling seat of the female element through said access inlet and engageable by said elastic retention element to retain it in said coupling seat;
- second means for fixing said male element to a second strip to be connected to the first strip by means of the press-stud;

characterized in that at least said female element is made of synthetic material.

[0016] Further characteristics and advantages of the present invention will become better apparent from the description of a preferred, but not exclusive, embodiment of the press-stud according to the invention, illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view of the press-stud ac-

cording to the invention, with the male element disengaged from the female element;

Figure 2 is an axial cross-sectional view of the press-stud according to the invention, with the male element disengaged from the female element;

Figure 3 is an axial cross-sectional view of the press-stud according to the invention, with the male element engaged with the female element.

[0017] With reference to the figures, the press-stud according to the invention, generally designated by the reference numeral 1, comprises a female element 2 which is designed to be fixed to a first strip 3 in particular of an item of clothing or the like, and a male element 4 which is designed to be fixed to a second strip 5 of the item of clothing or the like and which can be removably coupled with the female element 2 in such a way that it activates the connection between the two strips 3 and 5.

[0018] In the female element 2 there is a coupling seat 6 that is provided with an access inlet 7 defined at one end of the female element 2. The female element 2 accommodates an elastic retention element 8 which is engageable with the male element 4 in such a way as to retain it in the coupling seat 6.

[0019] The female element 2 can be fixed to the first strip 3 by way of first fixing means 9.

[0020] The male element 4 has a protrusion 10 which is insertable in the coupling seat 6 of the female element 2 through the access inlet 7 and which is engageable by the elastic retention element 8.

[0021] The male element 4 can be fixed to the second strip 5 by way of second fixing means 11.

[0022] According to the invention, at least the female element 2 is made of synthetic material.

[0023] As illustrated, while the female element 2 can have a variety of shapes according to requirements, such female element 2 is preferably substantially cylindrical, and within it is defined, coaxially, the coupling seat 6, which is also substantially cylindrical and extends from the access inlet 7 formed on one of the bases of the female element 2.

[0024] The elastic retention element 8 is preferably constituted by an open ring 12 that is accommodated with play within an annular seat 13 which is defined in the side walls of the coupling seat 6.

[0025] Preferably, the elastic retention element 8 is made of metal, for example copper alloy, so as to achieve a high level of resistance and reduced wear for such element.

[0026] The first fixing means 9 comprise a head 14 which has, on its side to be directed toward the female element 2, a hollow shaft 15, which is insertable through the first strip 3 and through a hole 16 provided in the bottom wall of the female element 2 that delimits the coupling seat 6 on the opposite side with respect to the access inlet 7. The hollow shaft 15 is plastically deformable in order to stably engage with the female element 2 in order to retain the first strip 3 between the head 14 and

the bottom wall of the female element 2.

[0027] The head 14, which constitutes the most visible portion of the press-stud when the male element 4 is coupled with the female element 2, comprises a cap-bearing element 17 with a substantially disk-like portion at the center of which the hollow shaft 15 extends. On the other side of the cap-bearing element 17 with respect to the side from which the hollow shaft 15 extends, a first cap 18 is applied, in a way that is known per se, for example by means of seaming, and, above this, a second cap 19 can be applied, again by means of seaming.

[0028] The firm engagement of the hollow shaft 15 with the female element 2 can be activated, in a way that is known per se, through the beading of the free end of the hollow shaft 15 following insertion of this end through the hole 16 provided in the bottom wall of the female element 2.

[0029] Preferably, the male element 4 is also made of synthetic material.

[0030] As illustrated, while the male element 4 can also have a variety of shapes according to requirements, such male element 4 has a substantially disk-shaped portion 20 from one side of which the protrusion 10 extends. The protrusion 10 is substantially frustum shaped and hollow, with the lower base connected to the substantially disk-shaped portion 20. Optionally, on the side surface of the protrusion 10, a slight recess 21 can be provided in order to accentuate the engagement of the ring 12 with the side surface of the protrusion 10 at the time of coupling the male element 4 with the female element 2.

[0031] The second fixing means 11 comprise a post 22, which is provided with a head 23 and a hollow stem 24 that extends centrally from one side of the head 23 and can be inserted through the second strip 5 and through a hole 25 formed in the substantially disk-like portion 20 of the male element 4 on the opposite side with respect to the protrusion 10. The hollow stem 24 is plastically deformable, in a way that is known per se, in order to stably engage the male element 4 in such a way as to retain the second strip 5 between the head 23 of the post 22 and the substantially disk-like portion 20 of the male element 4.

[0032] As illustrated, the plastic deformation of the hollow stem 24 of the post 22, in order to obtain its engagement with the male element 4, can be achieved by beading the free end of the hollow stem 24 following its insertion through the hole 25 defined in the male element 4.

[0033] Conveniently, the female element 2 and the male element 4 have, on their surface which is designed to make contact respectively with the first strip 3 and the second strip 5, an increased roughness in order to increase adhesion to the corresponding strip 3, 5 of the item of clothing or the like.

[0034] This increased roughness can be constituted, for example, by embossing or bosses or milling 26.

[0035] Preferably, the components of the press-stud according to the invention which are made of synthetic material are injection molded. The synthetic material

used can be a technopolymer, for example nylon, acetal resins, acrylonitrile-butadiene-styrene (ABS), polycarbonate, polyarylamide etc. The embossing or bosses or milling 26 provided on the female element 2 and/or on the male element 4 in order to increase adhesion to the strips 3 and 5 of the item of clothing can be obtained, very simply, directly by molding during the production of the female element 2 and/or of the male element 4.

[0036] It should be noted that making the female element 2 from molded synthetic material makes it particularly simple to make the annular seat 13, which can be obtained by molding the female element 2, unlike the traditional technique of making the female element from metal, which requires, in order to obtain the annular seat, a beading process which is complex to execute because of the extremely reduced tolerances required in such work.

[0037] Making the male element 4 from synthetic material, together with making the ring 12 from metal, perceptibly improves the engagement and disengagement between the male element 4 and the female element 2, particularly if, for the female element 2, self-lubricating synthetic materials are used, such as for example nylon.

[0038] In practice it has been found that the press-stud according to the invention fully achieves the intended aim in that making at least the female element from synthetic material almost totally eliminates the noise of the press-stud thus perceptibly improving the comfort of the press-stud during its use.

[0039] Another advantage of the press-stud according to the invention is that it makes it possible, in a simple manner, to obtain a high level of adhesion to the item of clothing which is such as to prevent the rotation of the press-stud relative to the item of clothing.

[0040] Moreover, if, as preferred, the male element is also made from synthetic material, then the engagement of the male element with the female element is deadened with a snap that is softer and more pleasant for the user.

[0041] A further advantage of the press-stud according to the invention consists in that making some components of the press-stud from molded synthetic material reduces the transformation steps, thus making the production cycle simpler and therefore reducing the overall costs of producing the press-stud according to the invention compared with the costs of producing conventional press-studs.

[0042] The press-stud, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be replaced by other, technically equivalent elements.

[0043] In practice the materials employed, as well as the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0044] The disclosures in Italian Patent Application No. MI2010A001184 from which this application claims priority are incorporated herein by reference.

[0045] Where technical features mentioned in any

claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A press-stud (1), particularly for items of clothing or the like, comprising:
 - a female element (2), which has a coupling seat (6) which accommodates an elastic retention element (8) and is provided with an access inlet (7) formed at one end of said female element (2);
 - first means (9) for fixing said female element (2) to a first strip (3);
 - a male element (4), which has a protrusion (10) insertable in said coupling seat (6) of the female element (2) through said access inlet (7) and engageable by said elastic retention element (8) to retain it in said coupling seat (6);
 - second means (11) for fixing said male element (4) to a second strip (5) to be connected to the first strip (3) by means of the press-stud (1);**characterized in that** at least said female element (2) is made of synthetic material.
2. The press-stud according to claim 1, **characterized in that** said male element (4) is made of synthetic material.
3. The press-stud according to claims 1 and 2, **characterized in that** said elastic retention element (8) is constituted by an open ring (12), which is accommodated with play in an annular seat (13) formed in the side walls of said coupling seat (6).
4. The press-stud according to one or more of the preceding claims, **characterized in that** said elastic retention element is made of metallic material.
5. The press-stud according to one or more of the preceding claims, **characterized in that** said first fixing means (9) comprise a head (14) which has, on its side to be directed toward said female element (2), a hollow shaft (15), which is insertable through said first strip (3) and through a hole (16) formed in the bottom wall of said female element (2) that delimits said coupling seat (6) on the opposite side with respect to said access inlet (7); said hollow shaft (15) being plastically deformable in order to engage stably said female element (2) for the retention of said first strip (3) between said head (14) and said bottom wall of the female element (2).

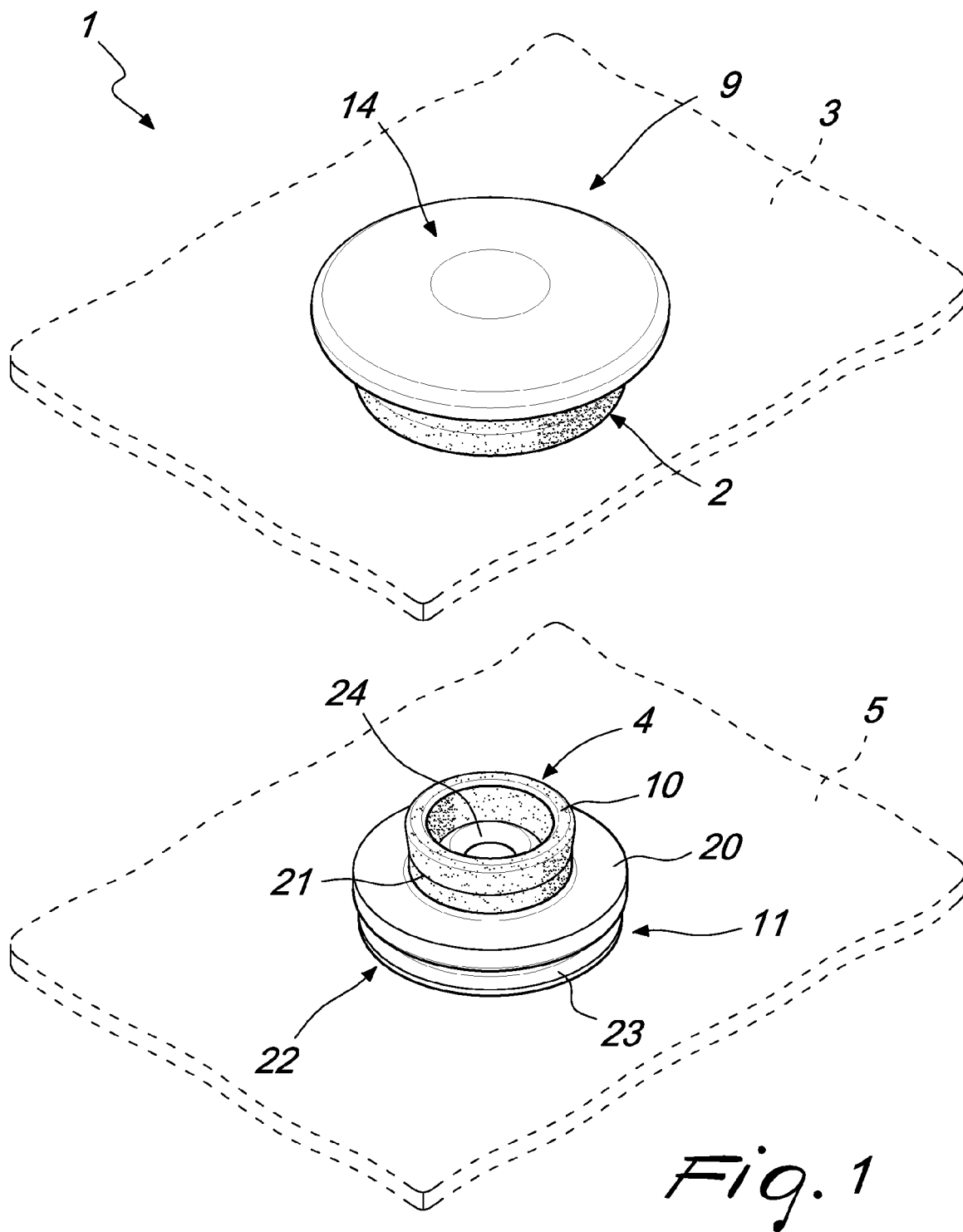
6. The press-stud according to one or more of the preceding claims, **characterized in that** said male element (4) has a substantially disk-like portion (20), from one face of which said protrusion (10) protrudes; said protrusion (10) having a substantially frustum-like hollow configuration, in which the smaller end face is connected to said substantially disk-like portion (20). 5
7. The press-stud according to one or more of the preceding claims, **characterized in that** said second fixing means (11) comprise a post (22), which is provided with a head (23) and a hollow stem (24), which can be inserted through said second strip (5) and through a hole (25) formed in said substantially disk-like portion (20) of the male element (4) on the opposite side with respect to said protrusion (10); said hollow stem (24) being plastically deformable in order to engage stably said male element (4) to retain said second strip (5) between the head (23) of said post (22) and said substantially disk-like portion (20) of the male element (4). 10 15 20
8. The press-stud according to one or more of the preceding claims, **characterized in that** said male element (4) and/or said female element (2) have, on their surface designed to make contact respectively with said first strip (3) and said second strip (5), an increased roughness in order to increase adhesion to the corresponding strip (3, 5). 25 30
9. The press-stud according to one or more of the preceding claims, **characterized in that** the components of the press-stud (1) made of synthetic material are injection-molded. 35

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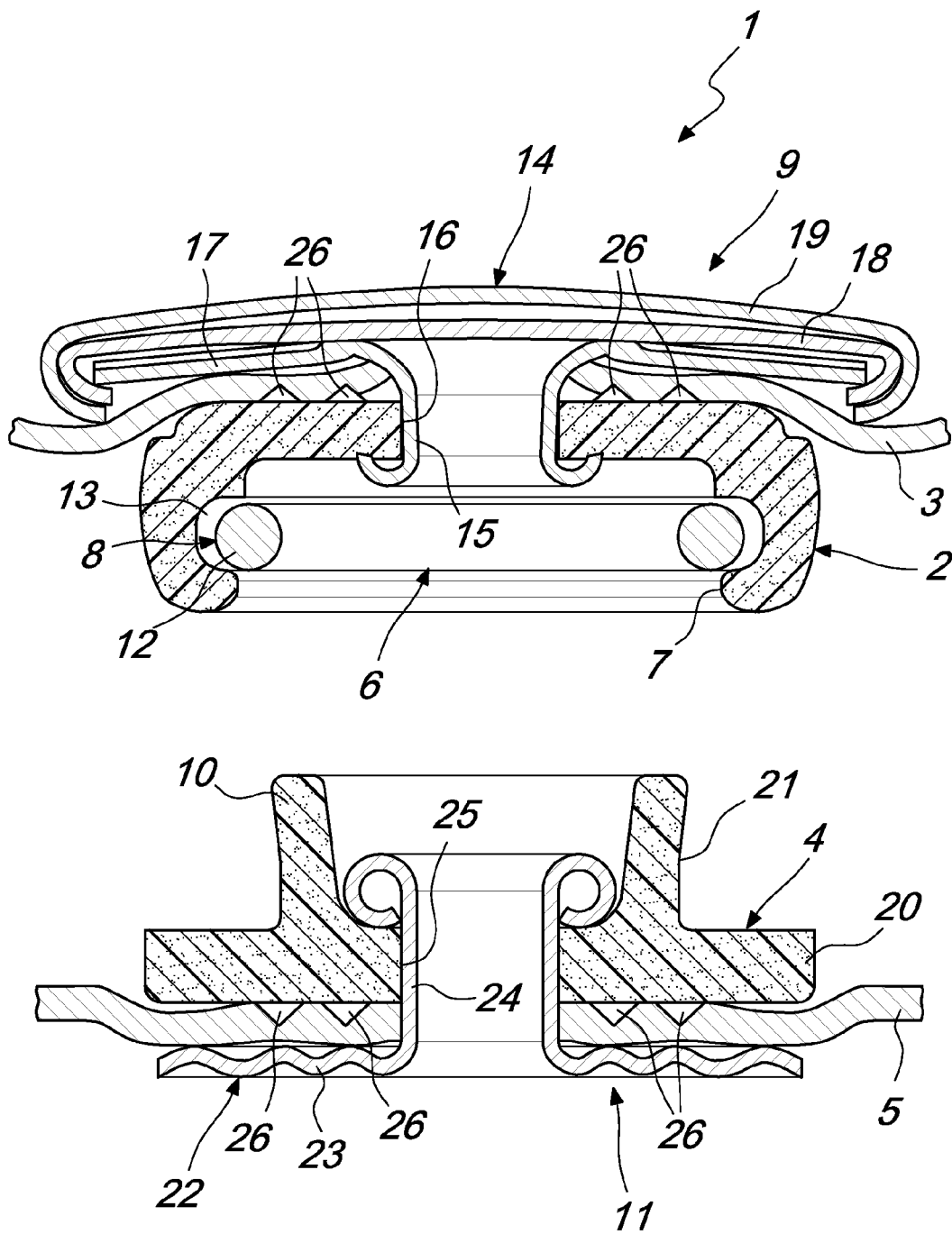


Fig. 2

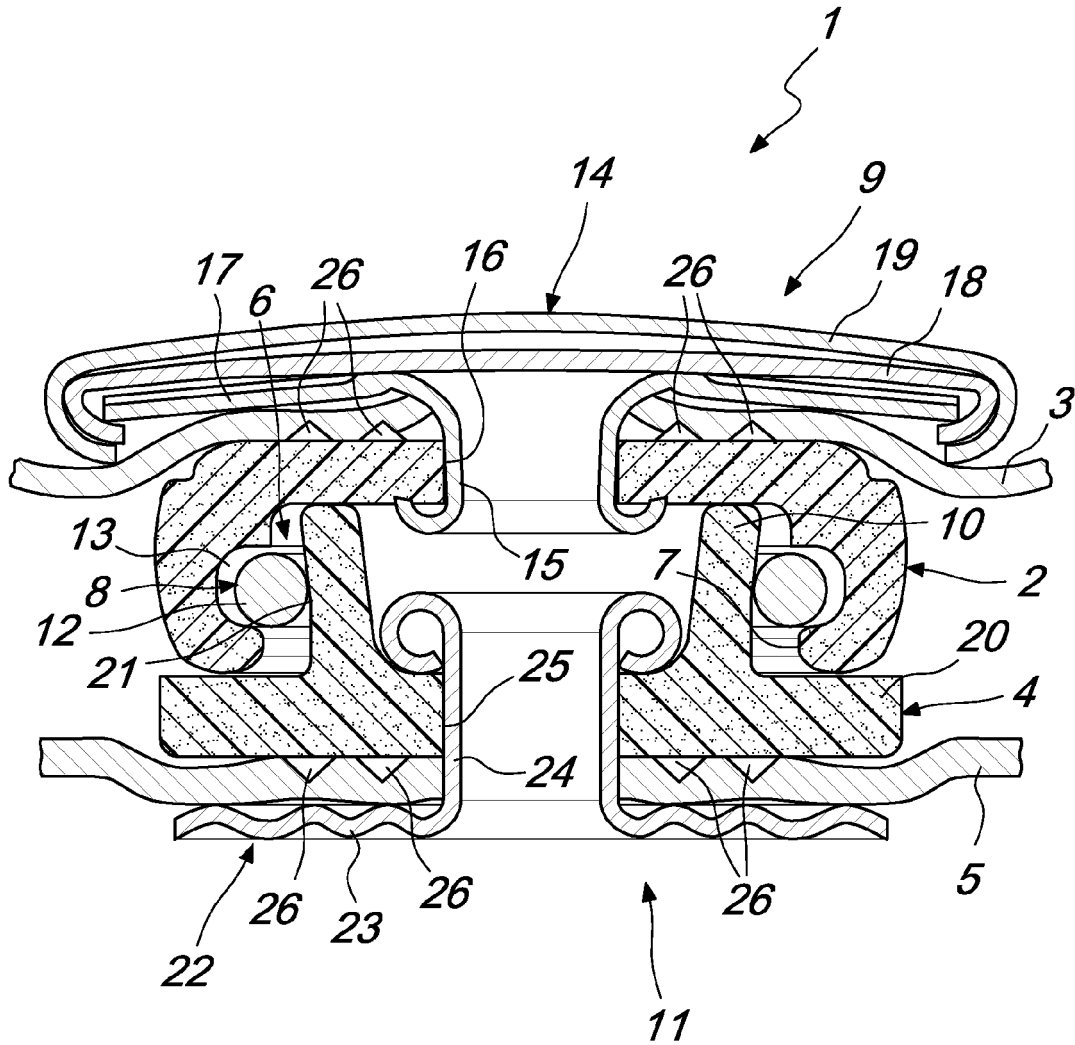


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 6007

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 September 2011	Examiner Debard, Michel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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