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(11)

EP 2 441 340 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

18.04.2012 Bulletin 2012/16

(51) Int Cl.:

A44B 17/00 (2006.01)

(21) Application number: **11184796.8**

(22) Date of filing: **12.10.2011**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

(71) Applicant: **RIRI Industries S.p.A.**
35127 Padova (PD) (IT)

(72) Inventor: **Violato, Ernesto**
35028 Piove di Sacco (PD) (IT)

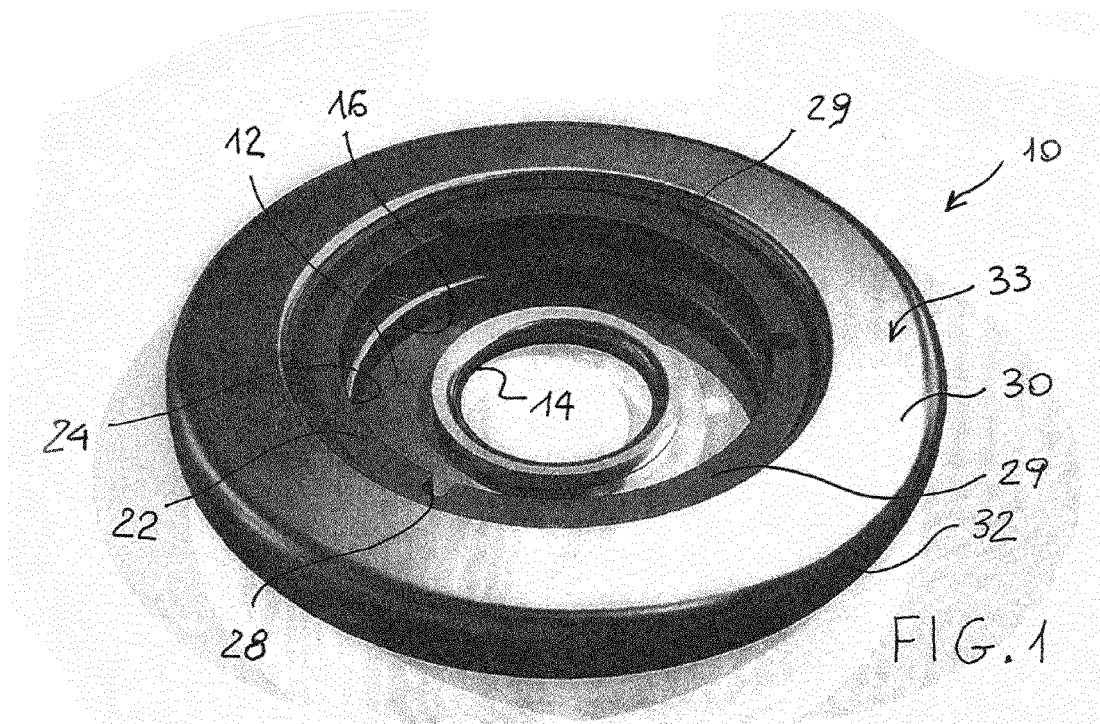
(74) Representative: **Provvisionato, Paolo**
Provvisionato & Co S.r.l.
Piazza di Porta Mascarella 7
40126 Bologna (IT)

(30) Priority: **13.10.2010 IT BO20100611**

(54) Improvements in a press-stud

(57) A press-stud comprises a female element having a seat in which is accommodated a resiliently deformable anchoring member (22) which is to anchor a male element in a closed configuration of the stud. The anchoring member is a ring having a flattened cross-section with an inner edge (24) on which are defined substantially freely bending arcuate lips (29) which project in a canti-

levered manner from a support wall of the female element (10) by not more than one third of the width of the flattened cross-section of the anchoring ring (22). Preferably, the press-stud has an overall height, in the closed configuration, which does not exceed 2.5 mm, and a ratio between the diameter and the height which is greater than 3.5.



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Description

[0001] The present invention relates to the field of press-studs.

[0002] The invention has been developed with particular regard to a press-stud comprising a female element having a seat for accommodating a resiliently deformable anchoring member which is to anchor a male element in a closed configuration of the stud.

[0003] Various press-studs of the type indicated above are known for satisfying the most varied market requirements. Press-studs are all the more appreciated the better their hold while closed and the ease with which they can be opened. In addition, the best press-studs are very strong and maintain their coupling and uncoupling characteristics for a long time, even after a very large number of opening and closing cycles.

[0004] Press-studs of the most common type have a male element comprising a head which engages in the accommodating seat of the female element where it is locked by a spring in the form of a split ring. An improved model of a press-stud, developed by the present applicant and illustrated in the patent EP 0855865, comprises a special spring which permits the use of a male element having a substantially flat head, which is appreciated from the aesthetic point of view.

[0005] The object of the present invention is to improve the press-studs of the prior art, in particular by reducing the axial space requirement thereof as much as possible while at the same time ensuring optimum functionalities of good hold while closed, easy opening and strength over time. A further object of the invention is to provide a simple and economical press-stud.

[0006] In order to achieve the objects indicated above, the invention relates to a press-stud having the features indicated in the claims which follow.

[0007] The press-stud described here comprises a female element having a seat for accommodating a resiliently deformable anchoring member which is to anchor a male element in a closed configuration of the stud, wherein the anchoring member is a ring having a flattened cross-section. The ring has an inner edge on which are defined substantially freely bending arcuate lips which project in a cantilevered manner from a support wall of the female element, preferably by not more than one third of the width of the flattened cross-section of the anchoring ring.

[0008] The lips are preferably defined by notches having a width which is much smaller than the length of the circumference of the inner edge of the flattened ring. Preferably, the depth of the notches is substantially equal to the cantilevered projection of the lips from the support wall.

[0009] Preferably, the notches are substantially U-shaped, and even more preferably they are three in number, although they could be smaller in number, for example two, or larger in number, for example four or five. The notches are preferably equidistant along the

circumference of the inner edge of the flattened ring.

[0010] In the press-stud described, the anchoring ring is preferably held in the female element by an annular covering strip.

[0011] Preferably, the overall height of the press-stud described, in an axial direction of insertion of the male element into the female element, in the closed configuration of the press-stud, does not exceed 2.5 mm. Preferably, in the stud described, the ratio between the diameter and the height in an axial direction of insertion of the male element into the female element, in the closed configuration, is greater than 3.5.

[0012] Further features and advantages will emerge from the following detailed description with reference to the appended drawings which are given by way of non-limiting example and in which:

- Figure 1 is a perspective view of an embodiment of the female element of a press-stud according to the present invention,
- Figure 2 is a cross-section through a male element of the press-stud according to the present invention,
- Figure 3 is a cross-section through the female element of Figure 1, and
- Figure 4 is a cross-section through another embodiment of the female element of a press-stud according to the present invention.

[0013] Referring now to Figures 1 and 3, a press-stud according to one embodiment of the present invention comprises a female element 10 having a base plate 12 with a central hole 14 of axis Z-Z which is to receive a connecting member, for example a nail or rivet or another functionally similar element, for connecting the female element 10 to a substrate, for example a piece of fabric, cloth, leather, plastics material or other materials of various types.

[0014] The base plate 12 has an inclined peripheral edge 16 which continues in a flat manner to form a low annular step which defines a substantially plane annular support wall 18 having a circular peripheral edge 20 for containing an annular spring or resilient member 22 having a substantially rectangular flattened cross-section. The resilient member 22 can rest flat on the annular support wall 18 via a lower face 22a thereof, which is likewise substantially plane, in such a manner that the inner edge 24 of the resilient member 22 projects in a cantilevered manner from the annular support wall 18 towards the inside of the female element 10. As can be seen in Figure 3, the cantilevered projection of the inner edge 24 of the resilient member 22 is very small, and preferably does not exceed approximately one third, and even more preferably approximately one quarter, of the width of the flattened cross-section of the annular member.

[0015] The outer edge 26 of the resilient member 22 is disposed alongside or in the vicinity of the circular edge 20, so that the resilient member 22 is substantially centred axially in the female element 10, preferably with

some small degree of clearance.

[0016] Radial notches or incuts 28, which are preferably equidistant and even more preferably three in number, are preferably formed on the inner edge 24 of the resilient member 22. The notches 28 preferably have a U-shape in plan and a very small size compared with the overall dimensions of the resilient member 22. As can in fact be seen in Figure 1, the notches 28 extend radially over a length which corresponds substantially to, or is slightly less than, the extent to which the inner edge 24 of the resilient member 22 projects in a cantilevered manner from the annular support wall 18. The width of the notches 28 is likewise very small compared with the overall circumference of the inner edge 24 of the resilient member, which is thus configured as a series of arcuate elongate lips 29, which are preferably three in number, although this does constitute a limitation. This configuration of the resilient member 22 promotes a good snap hold of the press-stud, and at the same time permits a considerable reduction in the axial dimensions, that is to say, in the direction of the axis Z-Z of the stud, because the bending excursion of the resilient member 22 in the direction Z-Z upon insertion of the male element of the stud is small in magnitude.

[0017] An annular cap 30 partially covers the upper face 22b of the resilient member 22 in order to hold it in position inside the female element 10. To that end, the annular cap 30 has an outer skirt 32 which wraps round the circular edge 20, being bent underneath it.

[0018] Overall, the female element 10 is very compact in the axial direction Z-Z, that is to say, the direction of insertion of a male element 40, which is illustrated in a preferred although non-limiting form in Figure 2. The male element 40 is produced substantially using a single piece of bent sheet-metal which comprises an outer annular flange 42 from which projects a lateral wall 41 which is knurled, that is to say, shaped with an annular depression 43 which is to cooperate actively with the lips 29 of the resilient member 22 of the female element 10. The lateral wall 41 is terminated by a rounded end 44 which is connected by a small link 46 to an inner wall 48 which ends in a base 50. Formed in the base 50 is a central opening 52 which is to receive a connecting member, for example a nail or rivet or another functionally similar element, for connecting the male element 40 to a substrate, for example a piece of fabric, cloth, leather, plastics material or other materials of various types, to be connected to the corresponding substrate to which, as stated above, the female element 10 of the press-stud according to the invention is secured.

[0019] Another embodiment of a female element 60 of the present invention is illustrated in Figure 4. Analogously to the female element described above, the female element 60 likewise has a base plate 62 having a central hole 64 which is to receive a connecting member, for example a nail or rivet or another functionally similar element, for connecting the female element 60 to a substrate as mentioned above. Here too, an annular portion

66 of the base plate 62 is bent slightly to form a low substantially flat annular step 68 having a circular edge 70 for containing an annular spring or resilient member 72 which is entirely analogous to the annular spring 22 described above.

[0020] In particular, the annular spring or resilient member 72 rests flat on the annular step 68 with its substantially plane lower face 72a, so that its inner edge 74 projects in a cantilevered manner beyond the step, as described above, while its preferably circular outer edge 76 is disposed substantially alongside the circular edge 70 with play or in the vicinity thereof. Radial notches or incuts 78, which are preferably equidistant and even more preferably three in number and which correspond to the notches 28 described above and have a similar function and features, are preferably formed on the inner edge 74 of the annular spring 72.

[0021] Unlike the female element 10 described above, the female element 60 does not have a separate cap for holding the resilient member 72 inside it but, instead, the circular edge 70 is extended and bent over the resilient member 72 to form an annular rim 80 for containing the resilient member 72. In particular, the annular rim 80 is disposed alongside the upper face 72b of the resilient member 72, but without compressing or crushing it.

[0022] A press-stud produced in accordance with the invention permits minimization of the axial space requirement along the axis Z-Z, as well as of its weight. This is particularly advantageous when used for light-weight garments, for example of silk, or in cases where the thickness of the stud could prove troublesome, such as in the case of closures for purses, wallets, pillow-cases, etc., but of course the uses of such a stud are varied and are not limited to those given by way of example.

[0023] In order to produce a press-stud having reduced axial dimensions, while ensuring its correct functioning, solid strength and excellent snap hold, with the aim of manufacturing the metal component parts thereof by the deformation of pieces of sheet-metal, rather than by the far more expensive methods of turning or die-casting, it has been found that the optimum thickness of the sheet-metal is preferably from 0.3 to 0.4 mm, while the overall height of the knurled male element 40 in the direction of the axis Z-Z is preferably from 1.9 to 2.0 mm. Those features provide for an overall size of the press-stud according to the present invention, in the closed configuration with the male element connected to the female element, of preferably approximately from 2.3 to 2.5 mm, which, to the applicant's knowledge, is smaller than the axial space requirement of any known type of press-stud having a metal body.

[0024] In order to reduce even further the axial dimensions of the press-stud of the present invention, with all of the other features remaining the same, it is possible to use a spring or resilient member which is likewise composed of sheet-metal having high-grade flexibility characteristics, for example piano wire. Thus, the cross-section of the resilient member of the present invention,

which is always characterized by being flattened, may have an extremely small thickness in the axial direction Z-Z of approximately a few tenths of a millimetre. In the case of a resilient member of plastics material, its dimension in the axial direction Z-Z may in any case be less than 1.0 mm, adopting the configuration features of the present invention.

[0025] The press-stud of the present invention is also characterized in that, as clearly visible in the appended Figures, the ratio between the overall diameter and its height is preferably greater than 3.5.

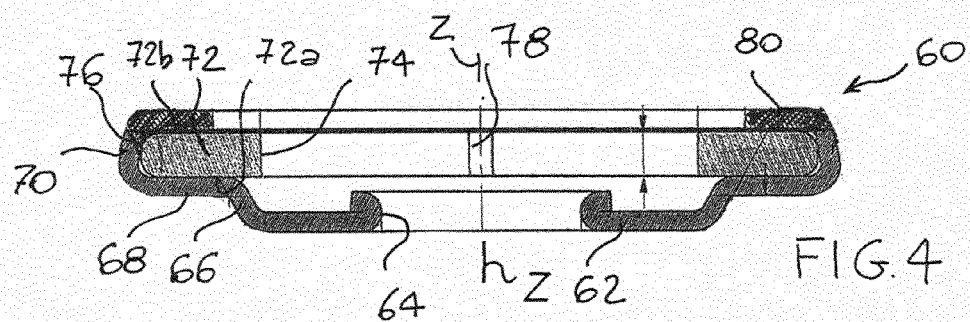
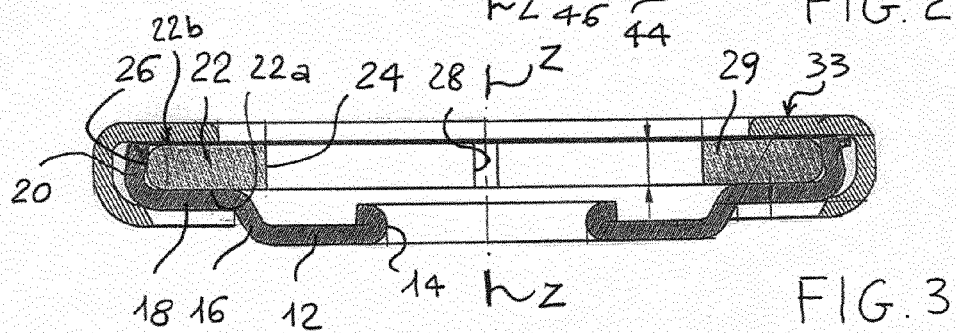
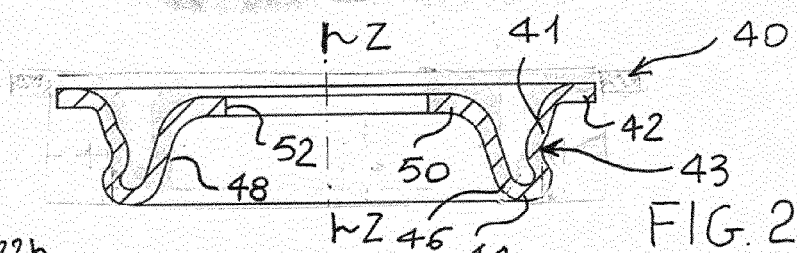
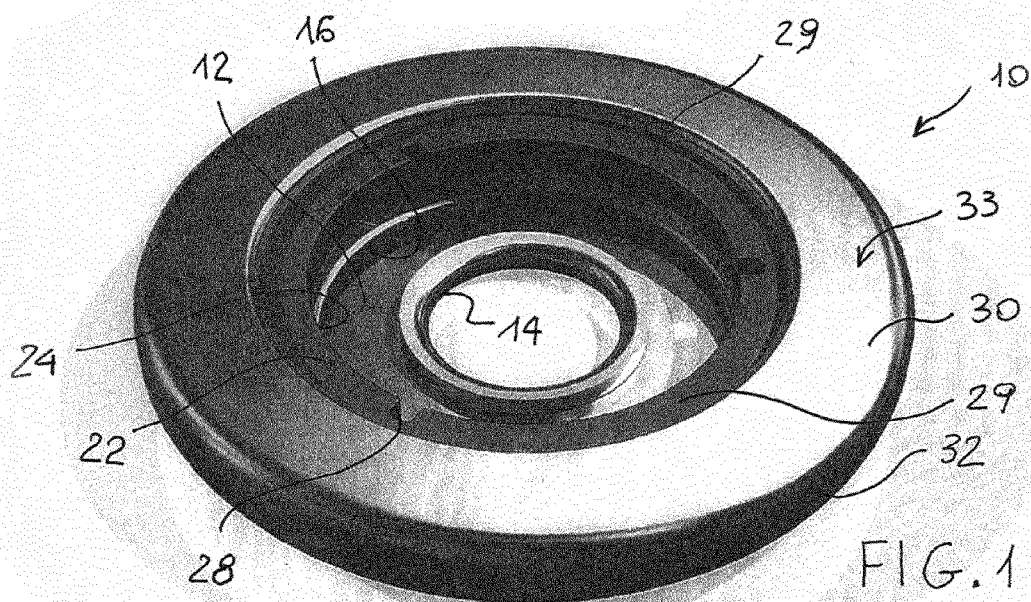
[0026] The system for securing the male and female elements to the respective substrates could be of a type other than that illustrated and could be obtained, for example, by stitching or, in order to reduce the space requirement even further, also by adhesive bonding. In such cases, it is not necessary for the male and female elements of the press-stud to have the hole and the central opening indicated by the reference numerals 14, 64 and 52, respectively, and shown in Figures 2 and 3.

[0027] The materials used may also be of a type other than that illustrated because it is not necessary to use sheet-metal for the production of the press-stud of this invention, it also being possible to use plastics materials or materials of another type, alone or in combination with metal materials.

[0028] Naturally, the principle of the invention remaining the same, the forms of embodiment and details of construction may be varied widely with respect to those described and illustrated, without thereby departing from the scope of the present invention.

Claims

1. A press-stud, comprising a female element having a seat for accommodating a resiliently deformable anchoring member which is to anchor a male element in a closed configuration of the stud, wherein the anchoring member is a ring having a flattened cross-section (22, 72) with an inner edge (24, 74) on which are defined substantially freely bending arcuate lips (29) which project in a cantilevered manner from a support wall (18, 68) of the female element (10, 60) by not more than one third of the width of the flattened cross-section of the anchoring ring (22, 72).
2. A press-stud according to claim 1, wherein the lips are defined by notches (28, 78) having a width much smaller than the length of the circumference of the inner edge (24, 74) of the flattened ring.
3. A press-stud according to claim 2, wherein the depth of the notches (28, 78) is substantially equal to the cantilevered projection of the lips (29) from the support wall (18, 68).
4. A press-stud according to claim 2 or 3, wherein the notches (28, 78) are substantially U-shaped.
5. A press-stud according to any one of claims 2 to 4, comprising at least three notches (28, 78).
6. A press-stud according to any one of claims 2 to 5, wherein the notches (28, 78) are equidistant along the circumference of the inner edge (24, 74) of the flattened ring.
7. A press-stud according to any one of the preceding claims, wherein the anchoring ring (22, 72) is held in the female element by an annular covering strip (30, 80).
8. A press-stud according to any one of the preceding claims, having an overall height in an axial direction (Z-Z) of insertion of the male element (40) into the female element (10, 60), in the closed configuration, which does not exceed 2.5 mm.
9. A press-stud according to any one of the preceding claims, wherein the ratio between the diameter and the height in an axial direction (Z-Z) of insertion of the male element (40) into the female element (10, 60), in the closed configuration, is greater than 3.5.





EUROPEAN SEARCH REPORT

Application Number
EP 11 18 4796

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Y	* page 2, paragraph 2 * * page 3, paragraph 4 * * page 6, paragraph 2 * * page 7, paragraphs 2,3 * * page 8, paragraph 3 * * page 10, paragraph 2; figures 3-5 *	4,6,8,9	
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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