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(54) **Bottom end stop for a slide fastener**

(57) A bottom end stop (1) for a slide fastener, comprising a plate member (2) and deformable arm portions (4a, 4b, 4c; 5a, 5b, 5c), arranged to form accommodating portions (3) for side edges of fastener tapes of a slide fastener; the arm portions have a proximal end (18) connected to the plate member (2), and a distal end facing a side part (2a, 2b) of the plate member; a plurality of left arm portions (4a, 4b, 4c) and a plurality of right arm portions (5a, 5b, 5c) are arranged along the left and right sides of the bottom end stop (1).

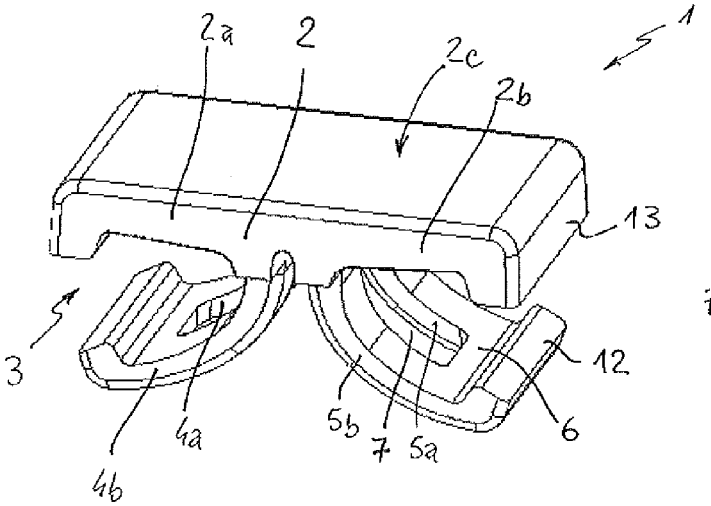

FIG. 1

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Description

Field of application

[0001] The invention refers to a bottom end stop for a slide fastener. The invention discloses an improvement to bottom end stops that enable a decoration such as letters or marks.

Prior Art

[0002] A description of the related art can be found in FR-A-2 908 610. Conventional bottom end stops are substantially X-shaped with a core portion and four leg portions departing obliquely from the core portion. The bottom end stop is clamped on side edges of the fastener tapes, or reinforcing side cords thereof, by pressing and deforming the aforesaid leg portions. A projection is formed on the inner side of the leg portions, to form an accommodating portion for the side edge of the fastener tape. Drawbacks of such end stops are that cracks may often occur when the bottom end stop is pressed, and the lack of any plane surface for a decoration such as letters or marks.

[0003] Another bottom end stop is disclosed, which is constituted of an upper plate and a lower plate connected by a base portion; the upper plate is formed of a flat plate and a flange is provided on each of both side ends thereof by bending each side end; the lower plate comprises a circular groove portion formed in a center of a rear face thereof. More in detail, the lower plate and the upper plate face each other in the vertical direction, and arm portions are formed so as to extend from a central side of the lower plate toward each of the right and left sides of the lower plate. The core portion of the right and left fastener tapes is sandwiched between the upper plate and the lower plate. This kind of a bottom end stop makes available a flat surface on the upper plate, which is not deformed while the stop is pressed on the fastener tapes and, then, is adapted to receive a decoration or mark, prior to attachment to the fastener tapes. In addition, the circular groove is thought to reduce the risk of cracks.

[0004] The above solution however is not yet satisfying. The applicant has found that under intense use, the attachment to the edges of the fastener tapes is not resistant enough, especially in the longitudinal direction, i.e. the sliding direction of the slider of the fastener, and slipping of the end stop may occur. The bottom end stop must be able to absorb the impact with the slider, for example when the slide fastener is opened quickly. Any misalignment of the bottom end stop, that may be caused by intense use and slipping of the end stop relative to fastener tapes, can compromise the correct function and appearance of the slide fastener. The bottom end stop is required to maintain the engagement between the teeth, in particular to form a support for the bottom end tooth of the slide fastener. In case of a failure of the attachment of the end stop, a disengagement of the bottom teeth may occur.

Summary of the invention

[0005] The problem faced by the invention is to improve the attachment to fastener tape edges of a bottom end stop, the stop allowing an upper flat surface for decorations, marks or the like.

[0006] The problem is solved with a bottom end stop for a slide fastener, comprising a plate member and deformable arm portions arranged to form a left and right accommodating portions for side edges of fastener tapes of a slide fastener, characterized in that said arm portions extend from said plate member, each of the arm portions having a proximal end connected to the plate member, and a distal end facing a side part of the plate member, and in that the end stop comprises a plurality of left arm portions and a plurality of right arm portions, arranged along the left and right sides of the bottom end stop respectively, and spaced from each other.

[0007] The number of left and right arm portions is variable. Preferably, the arms are curved towards the left/right ends of the stop; more preferably the arms are formed substantially as arcs of a circumference.

[0008] Due to the provision of two or more arm portions spaced along sides of the stop, there is at least a free space or a window between two adjacent arm portions, on each side of the plate. This allows a free expansion of the fastener edges under deformation, as will be explained hereinbelow.

[0009] The distal ends of the arm portions, distanced from the plate member, may be connected by bridge portions. Bridged arm portions form respective windows, between two consecutive arm portions. Hence, the distal ends of the two (or more) left arm portions and the distal ends of the two (or more) right arm portions are connected by a left bridge portion and a right bridge portion, so that clamping deformable elements are formed on each side of the end stop, each clamping element having one (or more) window between consecutive arm portions.

[0010] The plate member and the ends of the arm portions may be provided with flanges to securely hold the edges of the fastener tapes. Flanges can also be formed integrally with the bridge portions.

[0011] According to some embodiments of the invention, the proximal ends of the arm portions are joined to a longitudinal relief projecting from the rear face of the plate member. A left and right relief may be provided, supporting the left and right arm portions, respectively. Each arm portion may have a base part larger than said proximal end. For example, each arm portion may have a base part substantially formed as a pyramid, with inclined faces that gradually join the proximal end of the arm portion to the rear face of the plate member.

[0012] The plate member has an upper flat surface that is suitable to receive a trademark, logo or any decoration, prior to attachment of the stop to the fastener tapes.

[0013] The bottom end stop is preferably made of met-

al or a metal alloy. More preferably the material of the stop is a Zinc alloy. The end stop can be manufactured for example by die casting.

[0014] It has been noted that the arrangement with two or more arm portions on each side allows a more secure and stronger attachment to the fastener tapes, thanks to the free space or window which remain between the arm portions. It has been noted that, since the material of the side edges of the fastener tape is allowed to expand through said free space or windows, a deeper penetration of the arm portion into the side edges is possible. In other words, the presence of two or more arm portions on each sides, and related one or more intermediate free spaces or windows, allows expansion of the deformable material of the side edges of fastener tapes, thus compensating for the deformation induced by the rigid metal portions on the material of the fastener tape edges. This ability is not found in the conventional bottom end stops, with only one and relatively large arm portions on each side, leaving no room for such expansion. It can be stated that the inventive bottom end stop is more adaptive to the actual deformation of the fastener tape edges, upon pressing of the stop onto the tape edges, this resulting in a stronger attachment.

[0015] Another advantage of the invention is that the arm portions, departing from the plate member, rather than being associated to a further lower plate, are longer and are more easily deformed, thus reducing the risk of cracking also without the need of a circular groove.

[0016] The plate member is substantially unaffected by the clamping action and related deformation of the arm portions. Then, a decoration, a logo or a mark can be expressed on the visible outer surface of the plate member.

[0017] These and further advantages of the invention will be more evident from the detailed description provided here below, given as indicative and not limiting example.

Brief description of the drawings

[0018]

Fig. 1 is a view of a bottom end stop for a slide fastener, according to one of the embodiments of the invention.

Fig. 2 is a bottom perspective view of the stop of Fig. 1.

Fig. 3 is a side view of the end stop of Fig. 1.

Fig. 4 is a sectional view of the bottom end stop of Fig. 1, showing the edges of fastener tapes of a slide fastener.

Fig. 5 is a sectional view of the bottom end stop of Fig. 1 attached to edges of the fastener tapes.

Fig. 6 is a cut-out view of the bottom end stop and fastener tapes of Fig. 5.

Fig. 7 is a view of a bottom end stop according to a second embodiment of the invention.

Figs. 8 to 10 are views of a bottom end stop according to a third embodiment of the invention.

Detailed description of preferred embodiments

[0019] A bottom end stop 1 for a slide fastener comprises a plate member 2 and deformable arm portions departing from said plate member 2. The arm portions are arranged on a plurality of left arm portions 4a to 4c, and a plurality of right arm portions 5a to 5c. The figures show embodiments with two arm portions 4a, 4b and 5a, 5b on each side, or three arm portions 4a to 4c and 5a to 5c each side. Each of said arm portions extends from a proximal end 18 connected to a rear face 11 of said plate member 2 (Fig. 2), to a distal end facing a left side part 2a or right side part 2b of the plate member 2. Accommodating portions 3 for the side edges of fastener tapes of a slide fastener are formed between said parts 2a, 2b of the plate 2 and the arm portions.

[0020] The upper plate 2 is formed with a flat surface 2c, covering at least a portion of the outer face of said plate 2.

[0021] The distal ends of left and right arm portions, distanced from the plate 2, can be connected each other by a respective left and right bridge portion 6. A window 7 is then formed between two adjacent left or right bridged arm portions.

[0022] The distal ends of the arm portions are preferably provided with flanges 12 and, more preferably, corresponding flanges 13 are provided at the side ends of the upper plate 2. As shown in Figs. 1 to 5, flanges 12 may be integral with the bridge portions 6 connecting the distal ends of the arm portions. Said flanges 12 and 13 are arranged to surround the side edges 21 of fastener tapes 20, when the bottom end stop 1 is clamped on said tapes 20 as seen in Figs. 5 and 6.

[0023] The arm portions preferably depart from a central region 8 of the plate member 2. Said central region 8 may be formed thicker than other parts of the plate member 2. As seen in Figs. 1 and 2, the proximal ends 18 of the arm portions may be joined to a left and right relief 10, distancing the proximal ends 18 from the rear face 11 of the plate member 2. A groove 9 may optionally be provided between the reliefs 10. Said groove 9 however is not essential. In another embodiment (not shown), a single relief 10 is provided at the center of the rear face 11 of the plate member 2, all the left and right arm portions being joined to said single relief.

[0024] A further embodiment is depicted in Fig. 7: each of the arm portions, such as for example the arm portion 4b, has a base part 15 larger than the proximal end 18. Preferably, said base part 15 is substantially formed as

a pyramid, with inclined side surfaces 16, that gradually join the proximal end 18 of the arm portion to the rear face 11 of the plate member 2 or to the aforesaid relief or reliefs 10.

[0025] The advantage achieved with said larger base part 15 is that the starting point of deformation of the arm portions is distanced from the plate 2, the larger base part 15 being more rigid than the rest of the arm portion. Hence, the larger base part 15 helps to maintain a constant deformation of the arm portion during the pressing action that secures the end stop 1 to the tapes 20, and the deformed arm portion, as seen for example in Fig. 5, can more efficiently embrace the tape edge 21. Moreover, excessive stress of the base part of the arm portion, with the related risk of cracks, is avoided.

[0026] A logo, trademark or other decoration can be made on the surface 2c, before the end stop 1 is attached to the fastener tapes 20. Preferably, the upper stop 1 is non symmetrical with respect to a vertical axis, to sallow automatic recognition of front/rear of the stop 1 and, then, to sallow correct orientation of said logo, trademark of decoration when the stop 1 is attached to the fastener tapes. To this purpose, the position of front arm portions 4a, 5a and rear arm portions 4b, 5b or 4c, 5c can be non symmetrical with respect to a vertical axis, thus forming a rear step 14. Said rear step 14 allows a machine to automatically recognize the orientation of the upper stop 1.

[0027] Referring now with greater detail to Figs. 1 to 6, a first embodiment is shown where a bottom end stop 1 comprises two arm portions each side, namely a left pair comprising front left arm portion 4a and rear left arm portion 4b, and a right pair comprising front right arm portion 5a and rear right arm portion 5b.

[0028] The distal ends of left arm portions 4a, 4b and the distal ends of right arm portions 5a, 5b, away from the plate 2, are connected by bridge portions 6. Hence, each side of the stop 1 has a deformable clamping element comprised of arm portions 4a and 4b or 5a and 5b, and the distal bridge portion 6, leaving a central window 7.

[0029] The arm portions are formed as substantially circular arc-shaped elements, departing from two reliefs 10 formed in a central region 8 of the plate member 2 and curved towards the left/right ends of the stop 1, where the distal ends of the arm portions are bridged by said bridge portions 6.

[0030] Flanges 12 are integrally formed in the bridge portions 6 and the left and right ends of the plate member 2 are formed with corresponding end flanges 13. The flanges 12 and 13 are arranged to surround the side edges 21 of fastener tapes 20, when the bottom end stop 1 is clamped on said tapes 20 as seen in Figs. 5 and 6.

[0031] The front arm portions 4a and 5a are substantially aligned with the front of upper plate 2, while the rear arm portions 4b and 5b are shifted with respect to rear of upper plate 2, thus forming the rear step 14 for automated recognition of the position of the stop 1.

[0032] Fig 4 shows the bottom end stop 1 before attachment to fastener tapes 20. The ends 21 of the fastener tapes are accommodated in the left and right accommodating portions 3, formed between the parts 2a, 2b of the plate member 2 and the left/right clamping elements formed by said arm portions 4a, 4b, 5a, 5d and related bridge portions 6. Then, the clamping elements are pressed, reaching the configuration of Fig. 5, where deformed arm portions hold the edges 21 of the fastener tapes. It can be noted that the material of the edges 21 of the tapes 20 can expand through the windows 7, as shown by the dotted line 23 in Fig. 5. Hence, a deeper penetration and closer contact are possible between the arm portions of the stop 1 and the tape edges 21, resulting in a more secure attachment. The surface 2c is unaffected by the deformation and, hence, is suitable to carry a logo, trademark or the like.

[0033] Fig. 6 shows another view of a slide fastener comprising tapes 20, teeth 22 made for example of metal, and the bottom end 1 attached to tape edges 21. Fig. 7 shows a second embodiment with two separate arm portions 4a, 4b and 5a, 5b each side, i.e. without the bridge portions. Figs. 8 to 10 show an embodiment with three separate arm portions 4a to 4c and 5a to 5c each side. The accomodating portions 3 for the tape edges 21 are then formed between the plate 2 and the left or right plurality of separate arm portions; the material of tape edges 21 can expand in free spaces 27 between any of two adjacent arm portions, said free spaces 27 acting substantially as the aforesaid windows 7 of the bridged arm elements. Each of the arm portions is formed with an end flange 12, to hold the tape edges 21 in cooperation with the flange 13 of the plate member 2.

[0034] The arm portions join gradually with the surface 11 of the plate member 2, by means of inclined surfaces 16, forming a pyramid-like base part 15 of the arm portion, larger than the proximal end 18 of the arm portion itself. This embodiment with larger pyramid-like base parts 15 is applicable also to bridged-arm embodiments, such as those depicted in Figs. 1 to 3.

Claims

1. A bottom end stop (1) for a slide fastener, comprising: a plate member (2) and deformable arm portions (4a, 4b, 4c; 5a, 5b, 5c), arranged to form a left and right accommodating portions (3) for side edges of fastener tapes of a slide fastener, said bottom end stop (1) being **characterized in that:**

   - said arm portions extend from said plate member (2), each of the arm portions having a proximal end (18) connected to the plate member (2), and a distal end facing a side part (2a, 2b) of the plate member;
   - the end stop (1) comprises a plurality of left arm portions (4a, 4b, 4c) and a plurality of right arm portions (5a, 5b, 5c), arranged along the left

and right sides of the bottom end stop (1) respectively, and spaced from each other.

2. An end stop according to claim 1, the arm portions having proximal ends (18) joined to a longitudinal relief (10) of the rear face of the plate member (2).

3. An end stop according to claim 1 or 2, each arm portion having a base part (15) connecting the proximal end (18) of the arm portion to the rear face of the plate member (2), said base part (15) being larger than the proximal end (18) of the arm portion.

4. An end stop according to claim 3, said larger base part (15) being substantially formed as a pyramid, with inclined surfaces (16) joining the proximal end (18) of the arm portion to the rear face of the plate member (2).

5. An end stop according to any of the preceding claims, the distal ends of the left arm portions and the distal ends of the right arm portions being connected by respective bridge portions (6), left and right windows (7) being formed by two adjacent arm portions (4a, 4b; 5a, 5b) and said bridge portions (6).

6. An end stop according to any of the preceding claims, the plate member (2) comprising left and right end flanges (13), and opposite flanges (12) being associated to the arm portions.

7. An end stop according to claims 5 and 6, the flanges of the arm portions being integrally formed with said bridge portions (6).

8. An end stop (1) according to any of the preceding claims, the plate member having an upper flat surface (2c).

9. An end stop according to any of the preceding claims, the end stop (1) being non symmetrical with respect to a vertical axis, to allow automatic recognition of front/rear of the stop (1).

10. An end stop according to claim 9, the position of front arm portions (4a, 5a) and rear arm portions (4b, 5b) being non symmetrical with respect to a vertical axis of said plate member (2), thus forming a rear step (14) adapted to allow said automatic recognition.

11. An end stop according to any of the preceding claims, the end stop being made of metal.

12. A slide fastener comprising a bottom end stop according to any of claims 1 to 10.

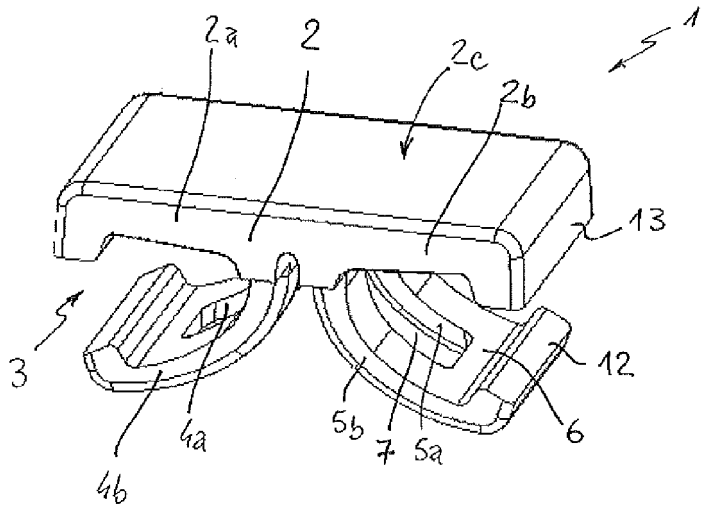

FIG. 1

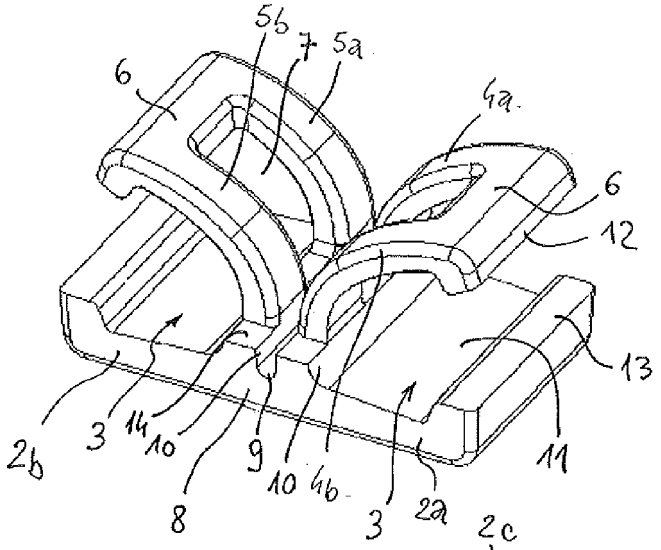

FIG. 2

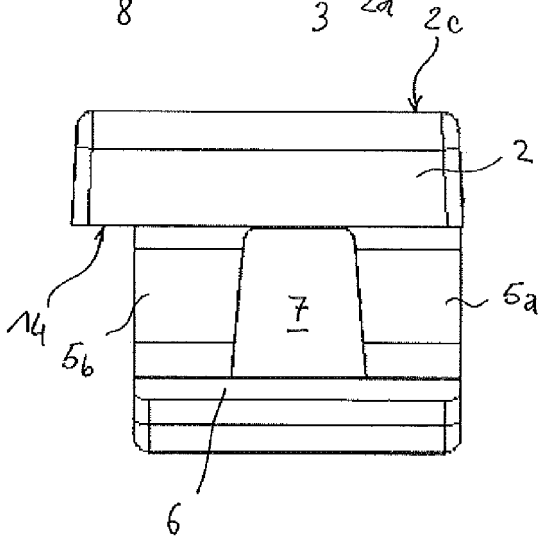

FIG. 3

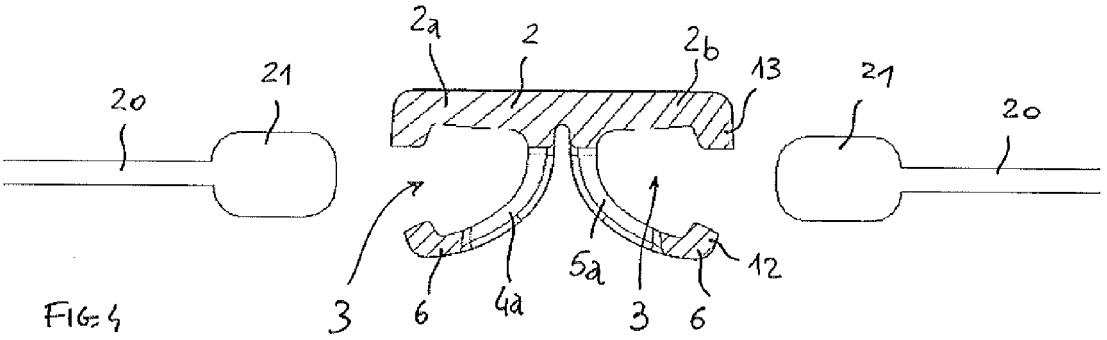

FIG. 4

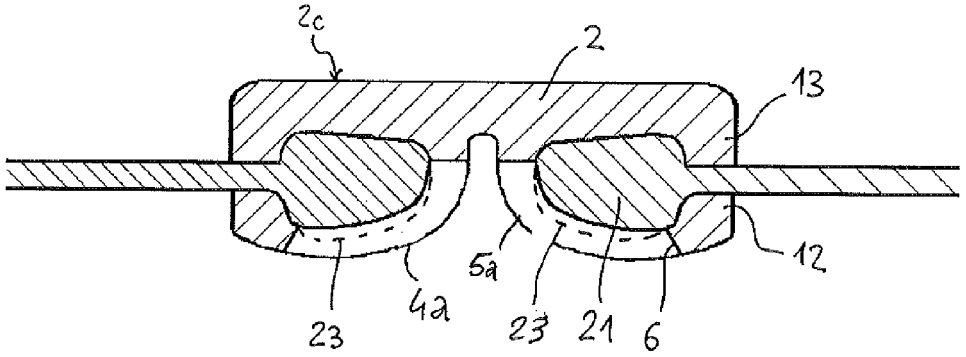

FIG. 5

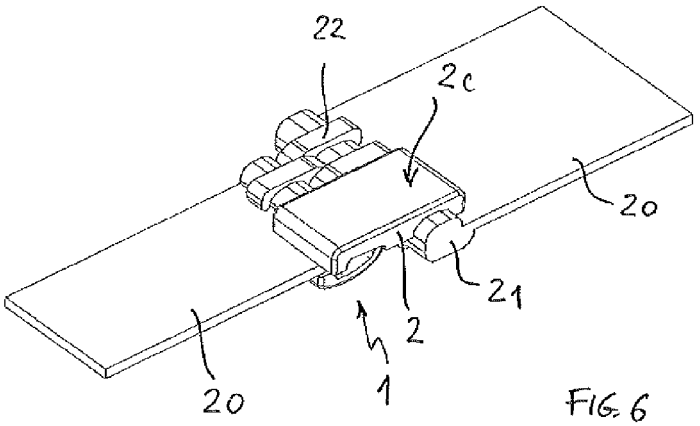

FIG. 6

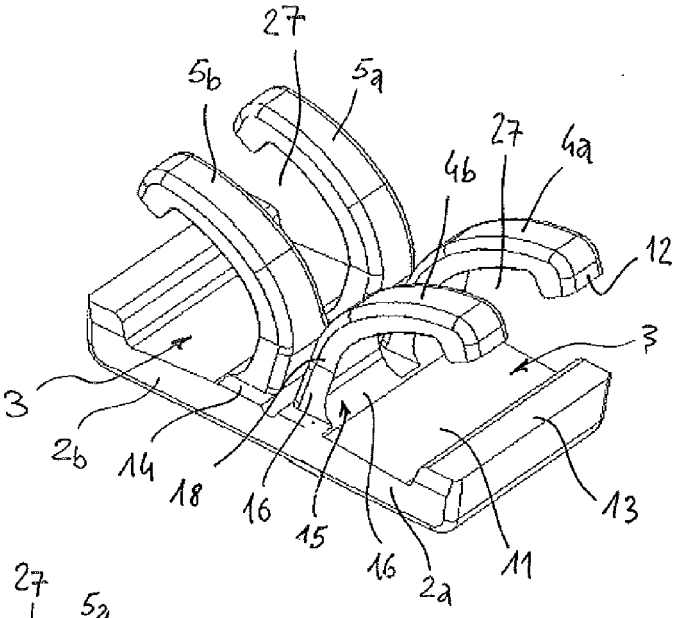

FIG. 7

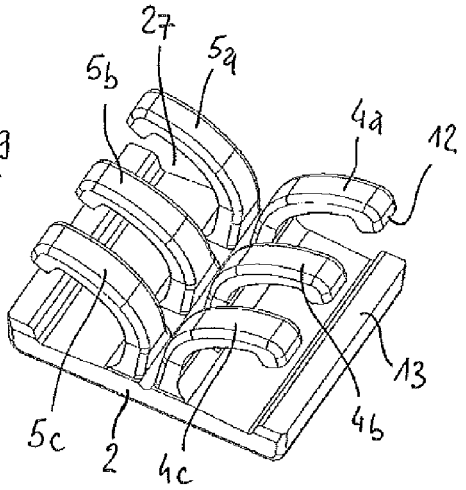

FIG. 9

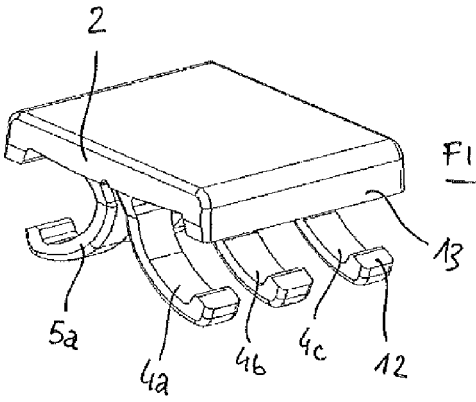

FIG. 8

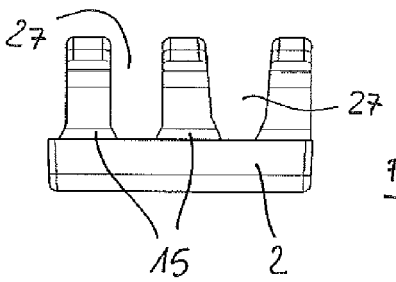

FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 5076

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC) A44B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 August 2010	da Silva, José

CATEGORY OF CITED DOCUMENTS

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04-08-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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