(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 669 691 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.06.2020 Bulletin 2020/26

(51) Int Cl.:
A44B 19/30 *(2006.01)*

(21) Application number: **18215125.8**

(22) Date of filing: **21.12.2018**

(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
Designated Validation States:
KH MA MD TN

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(54) **SLIDER FOR A SLIDE FASTENER**

(57) Slider for a slide fastener wherein the ring (9) of the pull tab is retained longitudinally inside a recess of the bridge or of a respective protective insert, so as to prevent the movement and friction of the ring with respect to the slider body (2).

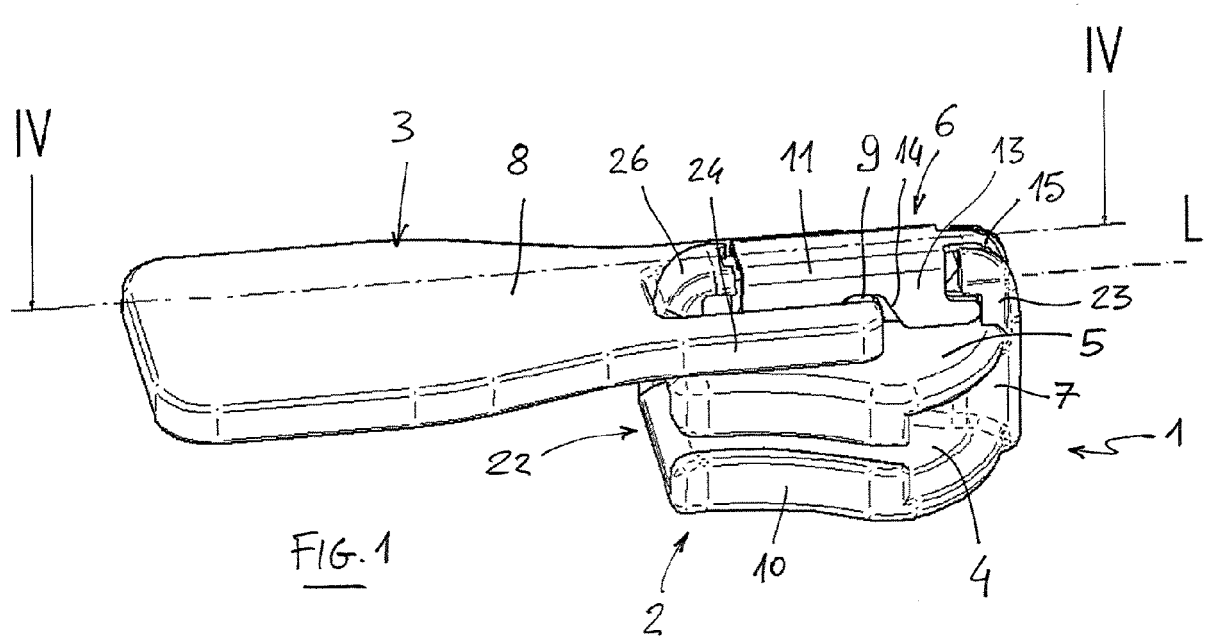

FIG. 1

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Description

Field of application

[0001] The invention relates to the field of slide fasteners (zip fasteners). In particular the invention relates to a slider for a slide fastener.

Prior art

[0002] A slide fastener, as is known, comprises two tapes provided with respective rows of teeth and a slider provided with a pull tab. The slider in turn typically comprises an inner flange and an outer flange which define a space of meshing of the teeth. The two flanges are connected by a core which is also termed "diamond" owing to its essentially rhomboidal shape. The slider also comprises a bridge element which retains the pull tab. In greater detail the pull tab has a ring which is retained between the bridge and the outer flange of the slider.

[0003] In the simpler type of slider, the bridge is formed as one piece with the body comprising the flanges and the diamond.

[0004] Another type of slider comprises a resilient element (sometimes called "spring") associated with the bridge. Said resilient element has the function of retaining the pull tab. In some embodiments said resilient element also has the function of providing an automatic lock to prevent undesired sliding of the slider. In this latter case, the resilient element is configured to engage the teeth of the zip fastener in such a way to prevent sliding of the fastener; when the user acts to open or close the zip fastener, the pull tab raises the resilient element and temporarily disengages the locking action.

[0005] The resilient element generally has an essentially U-shaped or C-shaped cross-section which comprises an upper face, directed upwards i.e. towards the outside of the slider, and two shaped sides, which extend from said upper face towards the flange of the slider itself. The pull tab is mounted so that the ring of the pull tab is received in suitable grooves, for example V-shaped grooves, of the sides of the resilient element.

[0006] The resilient element is normally made of metal by means of a shearing process. The shearing process is advantageous since it is quick and inexpensive and is well-suited for the mass-production of a large number of parts.

[0007] The applicant has realized, however, that this type of slider has a problem in that the sides of the resilient element have sharp cutting edges as a result of the shearing process.

[0008] The ring of the pull tab rests just on the edges of the sides being therefore exposed to the risk of surface damage. Furthermore, the ring of the pull tab has a certain freedom of movement and may also be subject to rubbing against the upper surface of the outer flange, with the risk of damaging the finish of both the pull tab and the slider body.

[0009] Experience has shown that the contact between the ring of the pull tab and the resilient element and/or the slider body may produce scratches or visible marks. This constitutes a problem especially for sliders made of a fine material and/or with a high-quality paint or surface finish.

[0010] The aforementioned problem is particularly evident in sliders with a sheared metal spring, the edges of which are aggressive for the ring of the pull tab. The same undesirable effect affects also the simpler sliders with no automatic lock, due to the friction between the pull tab and the slider body.

[0011] The prior art does not yet offer a satisfactory solution for dealing with this problem.

Summary of the invention

[0012] The aim of the invention is to solve the aforementioned problem. More particularly, the invention has the purpose of an improved slider to avoid damage to the surface finish caused by contact and friction with the pull tab. Said slider may be of the type with an anti-sliding locking system.

[0013] The object is achieved by means of a slider for a slide fastener in which:

the slider comprising a slider body and a pull tab;

the slider body comprises an inner flange, an outer flange and a bridge which extends above the outer flange;

the pull tab comprises a ring which is retained between said outer flange and said bridge;

wherein the slider is configured to slide, in a slide fastener, according to a sliding direction named longitudinal direction;

characterized in that the ring is retained between the outer flange and the bridge in a way to substantially prevent the movement of the ring in said longitudinal direction with respect to the slider body.

[0014] The ring is retained so as to prevent or limit substantially its possibility of movement with respect to the slider body and consequent friction against the same.

[0015] Preferably, the ring is retained so that a possibility of movement of the ring with respect to the slider body, in said longitudinal direction, is limited to not more than 1.5 mm and preferably not more than 1 mm.

[0016] This value represents the longitudinal range of the ring between two stop positions. Said stop positions may be defined for example by the bridge or by an insert thereof.

[0017] According to different embodiments of the invention, the ring of the pull tab is received and retained longitudinally inside a recess formed in the bridge or in

an insert of the bridge.

[0018] Said recess is sized to constrain the ring in the longitudinal direction with respect to the slider body, the longitudinal direction being the direction of sliding of the said slider when it is mounted in a slide fastener. Said recess is sized to receive the ring of the pull tab with a coupling having a small play, such that the pull tab is essentially retained in the longitudinal direction.

[0019] In greater detail, in a first embodiment of the invention the bridge of the slider body comprises a resilient element which retains the pull tab.

[0020] Advantageously said resilient element performs an automatic anti-sliding lock of the slider. Said resilient element has a rest position wherein the lock is engaged and wherein a pulling of the pull tab causes said ring to lift the resilient element to release the lock and allow sliding of the slider.

[0021] The slider may comprise an insert which is arranged between said resilient element and said ring of the pull tab, so that the ring can lift the resilient element and release the lock (if present) by means of a contact with said insert, wherein the ring does not contact directly the resilient element. The ring, in this embodiment, is retained inside a recess of said insert.

[0022] The resilient element preferably is made of metal. More preferably said resilient element is produced by means of shearing.

[0023] The protective insert preferably is made of plastic material.

[0024] It should be noted that the primary function of the resilient element is retention of the pull tab. Optionally, said resilient element is configured to perform also said automatic lock.

[0025] In a preferred embodiment, the resilient element comprises, in correspondence of the bridge, a portion with a U-shaped cross-section comprising a flat face and two side walls which protrude from said flat face towards the outer flange.

[0026] The insert is advantageously situated inside said portion of resilient element with a U-shaped cross-section. In particular, in this embodiment, the insert is housed inside the space defined between the two side walls. The insert may be co-molded together with the spring in some embodiments of the invention.

[0027] The automatic anti-sliding lock is obtained, for example, by one or more protrusions of the resilient element which, through openings in the outer flange, can engage the teeth of the slide fastener so as to prevent a movement of the slider.

[0028] The above described recess of the protective insert preferably has a longitudinal dimension which is slightly greater than the ring of the pull tab. In this way the recess accommodates the ring of the pull tab with a very small play and substantially keeps the ring from moving backward and forward both with respect to the resilient element and with respect to the body of the slider.

[0029] In another embodiment the ring is retained by a recess formed directly in the bridge.

[0030] More preferably, in this second embodiment, the bridge comprises a shaped part which extends from the bridge towards the outer flange and which defines a recess inside which the ring is received. Advantageously, said shaped part is represented by a tongue of material with a thickness smaller than the thickness of the bridge. Said thickness is understood in a direction transverse to the mentioned sliding direction. Said shaped part may be formed integrally with the bridge or may include a part to be mounted on the bridge.

[0031] The invention has a dual advantage: the insert protects the ring of the pull tab from direct contact with the resilient element, in particular with the possibly sharp edges of the two sides. Moreover, the suitable configuration of the recess which accommodated the ring with a small amount of longitudinal play prevents a back and forth movement of the pull tab relative to the slider body and, consequently, prevents also the damaging friction between the ring and the surface of the flange. All this greatly reduces the risk that, during use, the pull tab and/or the slider body may damage each other owing to the friction between them. The invention is advantageous also in the simplified embodiment without the automatic lock since it prevents in any case rubbing of the pull tab against the slider body and consequent damage thereto.

[0032] This will emerge more clearly below, with the aid of examples which are shown by way of a non-limiting example.

Description of the drawings

[0033]

Fig. 1 shows a perspective view of a slider for a slide fastener in one embodiment of the invention, complete with pull tab.

Fig. 2 shows a side view of the slider according to Fig. 1.

Fig. 3 shows the pull tab and some components of the slider according to Fig. 1.

Fig. 4 shows a cross-sectional view of the slider along the plane IV-IV of Fig. 1.

Fig. 5 shows the slider according to Fig. 1 with the pull tab raised and in the condition where locking is disengaged.

Fig. 6 is an exploded view which shows the components of the slider according to Fig. 1.

Fig. 7 shows a slider, complete with pull tab, in another embodiment of the invention.

Fig. 8 shows a side view of the slider according to Fig. 7.

Fig. 9 shows a side view of the slider according to Fig. 7 with the pull tab (shown only partially) in the raised position.

Fig. 10 shows a variation of embodiment of one of the elements of the slider.

Detailed description

[0034] Figures 1 to 6 show a slider 1 for a slide fastener, comprising essentially a slider body 2 and a pull tab 3.

[0035] The slider body 2 comprises essentially: an inner flange 4, an outer flange 5, a bridge 6, a core or diamond 7. The diamond 7 defines the front part of the slider 1.

[0036] The pull tab 3 comprises a body 8 and a ring 9 (better visible in Fig. 3 and Fig. 6). The ring 9 extends between two sides 24 which define a window 25.

[0037] The flanges 4 and 5 of the slider body 2 are connected by the diamond 7 and define a channel 22 for receiving and meshing of the teeth of a slide fastener. Advantageously, guide wings 10 for the teeth protrude from the edges of the flanges 3 and 4. These details are known per se and therefore are not further described.

[0038] The bridge 6 comprises, in this embodiment, a resilient element 11, briefly named spring, which is made of metal, preferably by means of a shearing process.

[0039] The spring 11 in greater detail comprises a body with an essentially U-shaped cross-section which includes an upper face 12 and shaped sides 13. The sides 13 each have a cut 14, which is for example a V-shaped cut, in the region of the ring 9.

[0040] The spring 11 has a tongue 15 for attachment to the front part 23 of the slider body 2, that is in the region of the diamond 7. The spring 11 extends between said front part 23 and an opposite end 26 of the bridge 6.

[0041] Furthermore, the spring 11 has at least one small tooth 16 positioned to engage inside a window 17 (Fig. 6) of the outer flange 5. Via said window 17, the tooth 16 is able to be inserted inside the channel 22 and engage with the teeth of the slide fastener so as to prevent sliding of the slider. The tooth 16 thus performs a slider lock which is active when the spring 11 is in the rest position, i.e. when the pull tab 3 is not operated.

[0042] The above described lock of the spring 11, as can be understood from the figures, is released when the user operates the pull tab 3. In this condition in fact the ring 9 lifts the spring 11, elastically bending the tongue 15, so as to move the tooth 16 away from the teeth and thus leave the slider 1 free to slide. Said condition of released lock is shown, for example, in Fig. 5. It can be seen in the figure that pulling of the pull tab 3 upwards lifts the spring 11, causing the tongue 15 to bend and raising the tooth 16. When the pull tab 3 is released, the spring 11 returns into the locking position described above.

[0043] The slider comprises a protective insert 18, preferably made of plastic material, which is inserted inside the spring 11, more particularly inside a channel 19 bounded by the two sides 13 and by the face 12 of the spring.

[0044] The insert 18 may be made by means of direct co-molding onto the spring 11 (so that the insert 18 and the spring 11 form a single piece) or may be made as a separate piece inserted inside the spring 11 during production of the slider or of the spring itself.

[0045] Said insert 18 has a recess 20 which, being situated at the cuts 14, receives the ring 9 of the pull tab 3.

[0046] Due to the presence of the insert 18, which is arranged between the spring 11 and the ring 9, the lift of the spring 11 (and consequently release of the anti-sliding lock) is performed by contact of the ring 9 with said insert 18, and the ring 9 does not touch directly the spring 11.

[0047] In particular, owing to the presence of the insert 18, the ring 9 does not touch the edges 21 of the sides 13 which can be sharp and potentially damaging for the surface finish of the said ring 9. The insert 18 thus acts as a protection for the ring 9 of the pull tab.

[0048] Said recess 21 has dimensions so as to retain the pull tab 3 longitudinally and substantially prevent a back and forth movement of the pull tab 3 with respect to the slider body 2. The longitudinal direction is defined here as the direction L of forward movement of the slider which is indicated in Fig. 1.

[0049] More particularly, said recess 21 has dimensions such as to receive the ring 9 with a precise tolerance, and therefore with a small play, in the longitudinal direction. The recess 21 and the ring may be regarded as a shaft and bore coupling. The longitudinal dimension of the recess 21 preferably corresponds (with play) to the dimension (for example the diameter) of the ring 9.

[0050] Advantageously, the play in the longitudinal direction L, i.e. the possibility of any movement of the ring 9 inside the recess 21, is not more than 1 mm.

[0051] According to the above, the object is achieved of limiting or substantially fully preventing a longitudinal movement of the ring 9 of the pull tab with respect to the spring 11 as well as with respect to the slider body 2, which longitudinal movement is damaging for the finish of the parts.

[0052] The accommodation of the ring 9 inside the recess 20 is such that the ring is substantially unable to move back or forth in the longitudinal direction L, something which would cause friction against the upper face of the flange 5.

[0053] Advantageously, the recess 20 of the insert 18 is narrower in the longitudinal direction L than the cut 14 in the spring 11. In this way the insert 18 not only protects the ring 9 from contact with the edges 21, but also performs the function of a longitudinal constraint for the pull tab 3. The ring protection and retaining functions are incorporated in the so realized insert 18.

[0054] Figs. 7-9 show another embodiment of the invention, which is applied to a slider simpler than the slider according to Figs. 1-6, being not equipped with the afore-

mentioned spring 11.

[0055] For the sake of simplicity Figs. 7-9 use the same reference numbers as Figs. 1-6.

[0056] In this embodiment, the ring 9 is retained by a recess 31 formed directly in the body of the bridge 6. As in the embodiment described above, the ring 9 is received inside the recess 31 with a small amount of play, so that the ring 9 is substantially retained and prevented from moving in the longitudinal direction L.

[0057] More particularly, the bridge 6 comprises a shaped part 30 which extends from the inside of the bridge 6 towards the underlying flange 5 and which is shaped so as to define the recess 31. Advantageously said shaped part 30 has a tongue-like form.

[0058] In a preferred embodiment, the shaped part 30 is formed integrally in the bridge 6. Alternatively, the shaped part 30 may be applied to the bridge 6.

[0059] The bridge 6 has an inner surface 32 facing and spaced in relation to said outer flange 5. Said shaped part 30, which defines the recess 31 for the ring 9, extends from said surface 32 of the bridge towards the flange 5.

[0060] In the example, the shaped part 30 is composed essentially of two projections 33, 34 directed towards the flange 5; the recess 31 is defined between these two projections.

[0061] The slider in this embodiment does not have moving parts. The body 2 is preferably formed as one piece, including the bridge 6 and the above-described shaped part 30.

[0062] In another embodiment (Fig. 10) the spring 11 does not have the tooth 16 or other means for engagement and lock of the teeth. In this embodiment the only function of the spring 11 is to retain the pull tab.

Claims

1. Slider for a slide fastener wherein:

the slider (1) comprises a slider body (2) and a pull tab (3);
the slider body (2) comprises an inner flange (4), an outer flange (5) and a bridge (6) which extends above the outer flange;
the pull tab (3) comprises a ring (9) which is retained between said outer flange (5) and said bridge (6);
wherein the slider is configured to slide, in a slide fastener, according to a sliding direction (L) named longitudinal direction;
characterized in that the ring (9) is retained between the outer flange and the bridge in a way to substantially prevent the movement of the ring in said longitudinal direction with respect to the slider body (2).

2. Slider according to claim 1, wherein the ring is retained so that a movement of the ring with respect to the slider body, in said longitudinal direction, is limited to not more than 1.5 mm and preferably not more than 1 mm.

3. Slider according to claim 1 or 2, wherein the ring is received and retained longitudinally inside a recess (20, 31) formed in the bridge (6) or in an insert (18) of the bridge.

4. Slider according to claim 3, wherein said bridge (6) comprises a resilient element (11) for retaining the pull tab.

5. Slider according to claim 4, wherein the slider comprises an insert (18) which is arranged between said resilient element (11) and said ring (9) of the pull tab, in such a way that the ring (9) can lift the resilient element (11) by contacting said insert (8) and the ring does not contact directly the resilient element.

6. Slider according to claim 5, wherein said insert (18) comprises a recess (20) which is sized to receive and retain longitudinally said ring (9).

7. Slider according to any one of claims 4 to 6, wherein said resilient element (11) is configured to realize an automatic anti-sliding lock of the slider.

8. Slider according to claim 7, wherein: said resilient element (11) has a rest position in which said lock is effective, and pulling the pull tab causes said ring (9) to lift the resilient element from said rest position to release the lock and allow the sliding of the slider, wherein the ring can lift the resilient element and release the lock by means of contact with said insert and without a direct contact with the resilient element.

9. Slider according to any one of claims 4 to 8, wherein the resilient element is made of metal and is preferably produced by means of shearing.

10. Slider according to any one of claims 4 to 9, wherein the insert is made of plastic material.

11. Slider according to any one of claims 4 to 10, wherein the resilient element comprises, in correspondence of the bridge (6), a portion with a U-shaped cross-section comprising a flat face and two side walls which protrude from the said flat face towards the outer flange.

12. Slider according to claim 11, wherein the insert (18) is situated inside said portion of the resilient element with a U-shaped cross-section, the insert being housed in the space defined between the two side walls (13).

13. Slider according to claim 3, wherein the bridge (6) of the slider body comprises a shaped part (30) which extends towards the outer flange and defines a recess (31) which is sized to receive and retain longitudinally said ring (9).

14. Slider according to claim 13, wherein said shaped part (30) has a thickness smaller than the thickness of the bridge.

15. Slider according to claim 13 or 14, wherein the bridge has an inner surface (32) facing and spaced from said outer flange (5), and said shaped part (3), which defines the recess (31) for the ring (9), extends from said surface (32) of the bridge towards said flange.

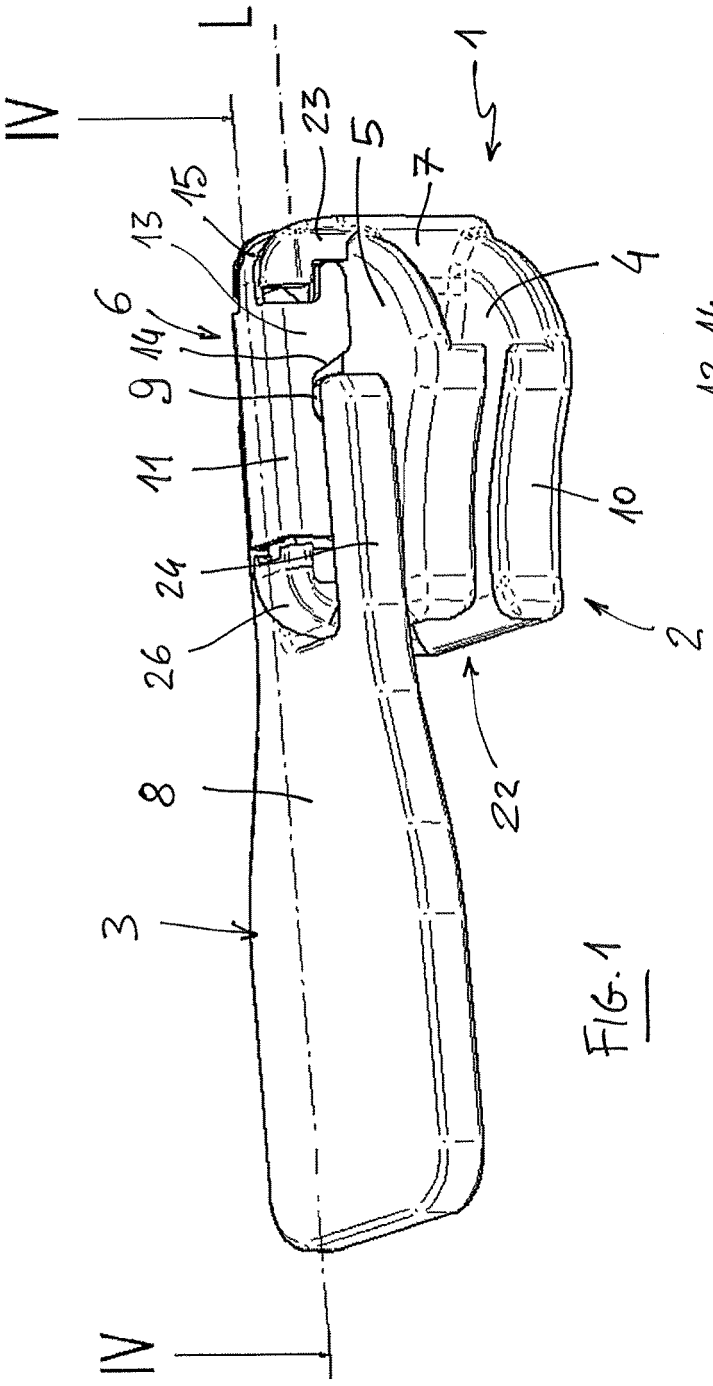
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FIG. 1

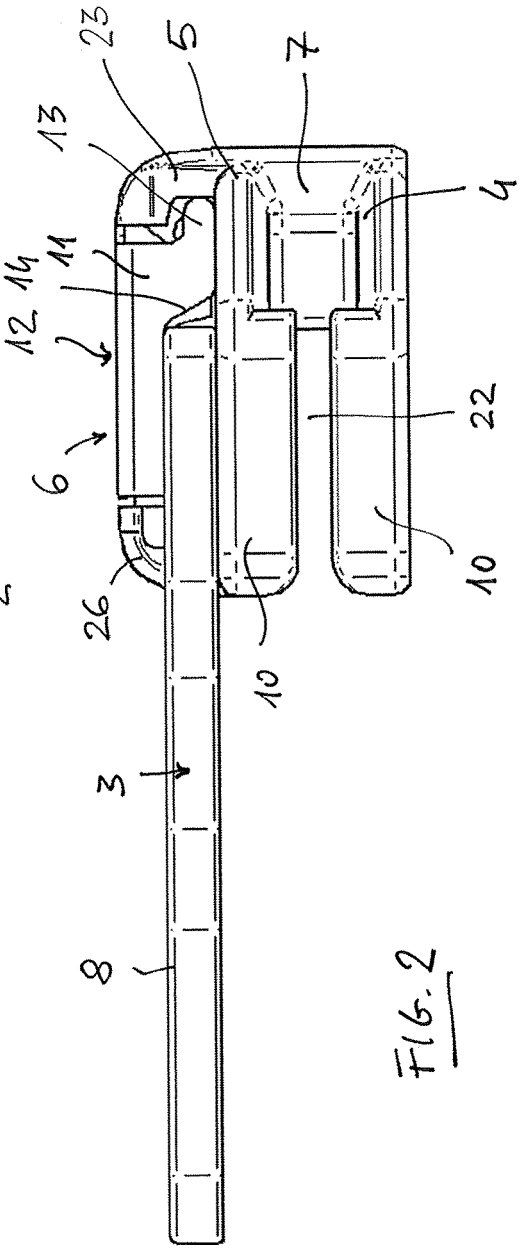
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FIG. 2

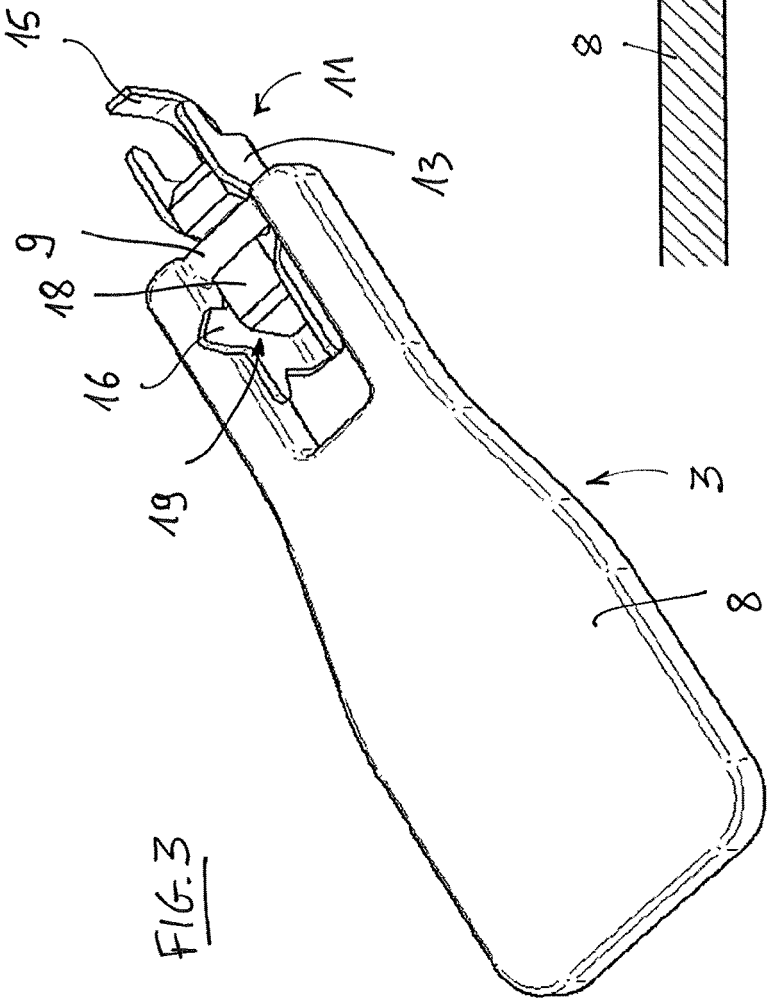


FIG. 3

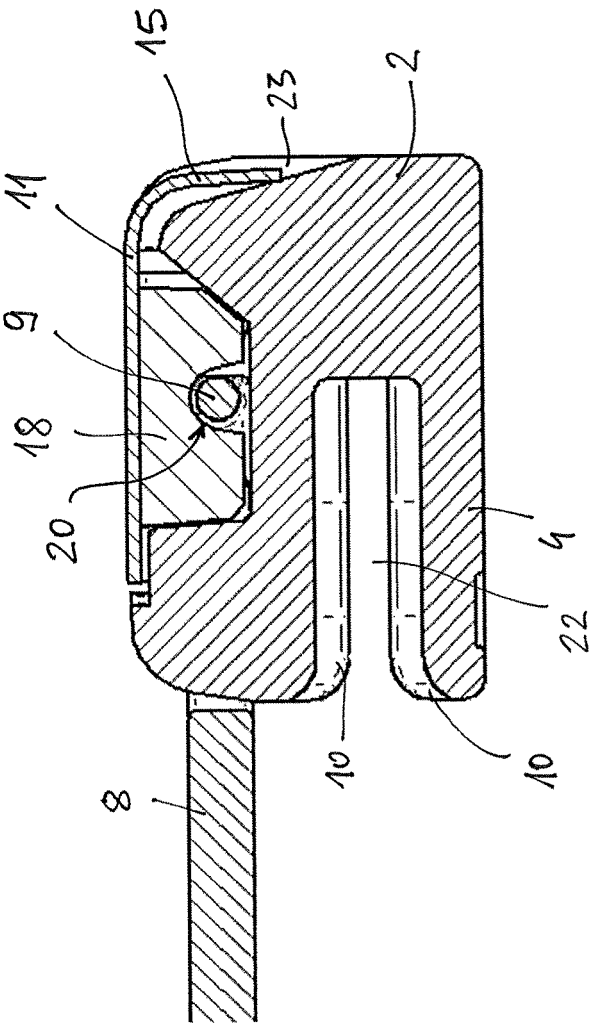


FIG. 4

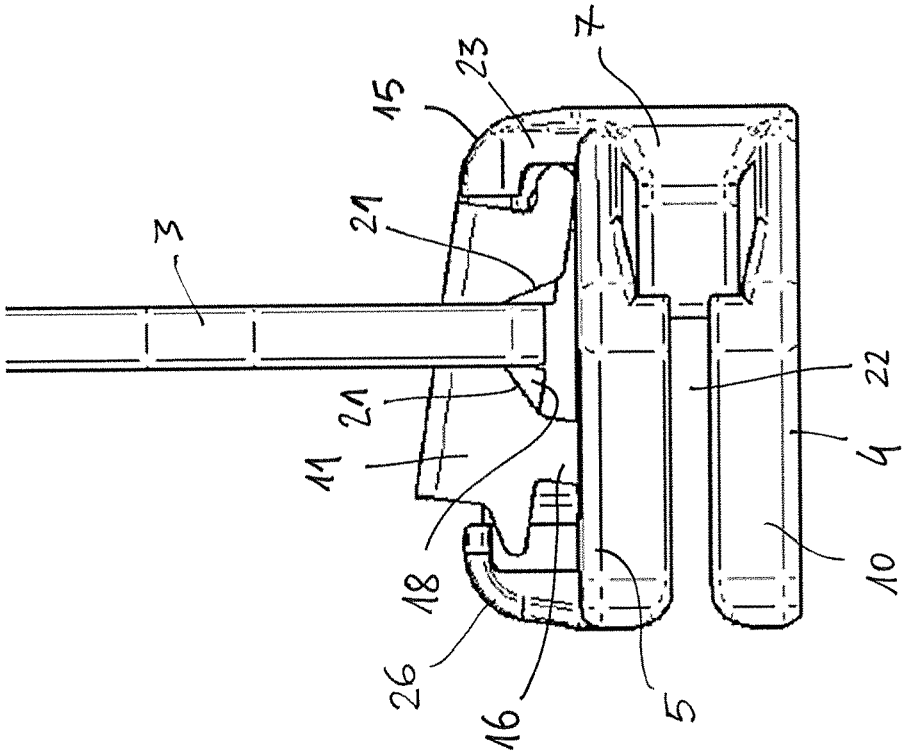
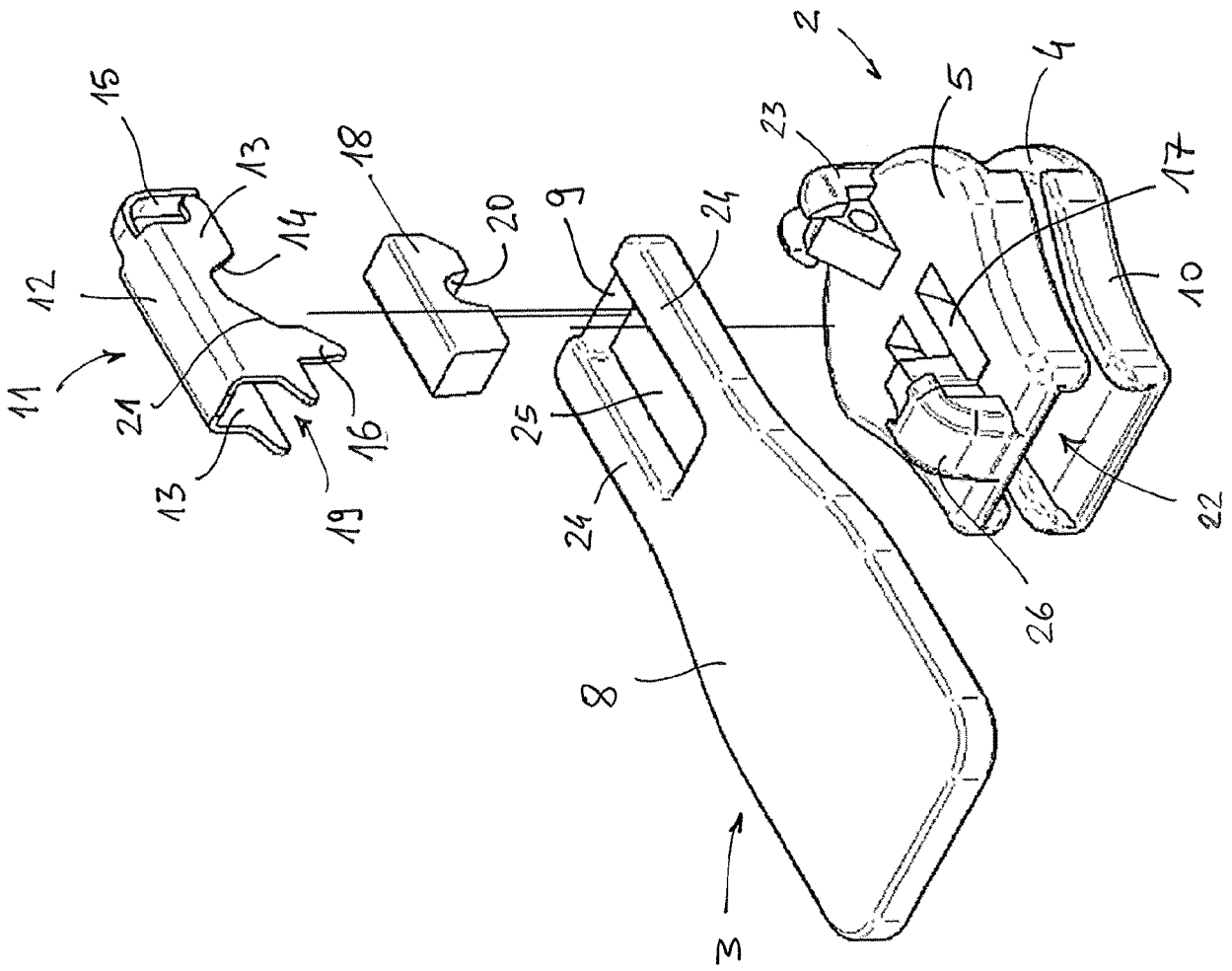


FIG. 5

FIG.6



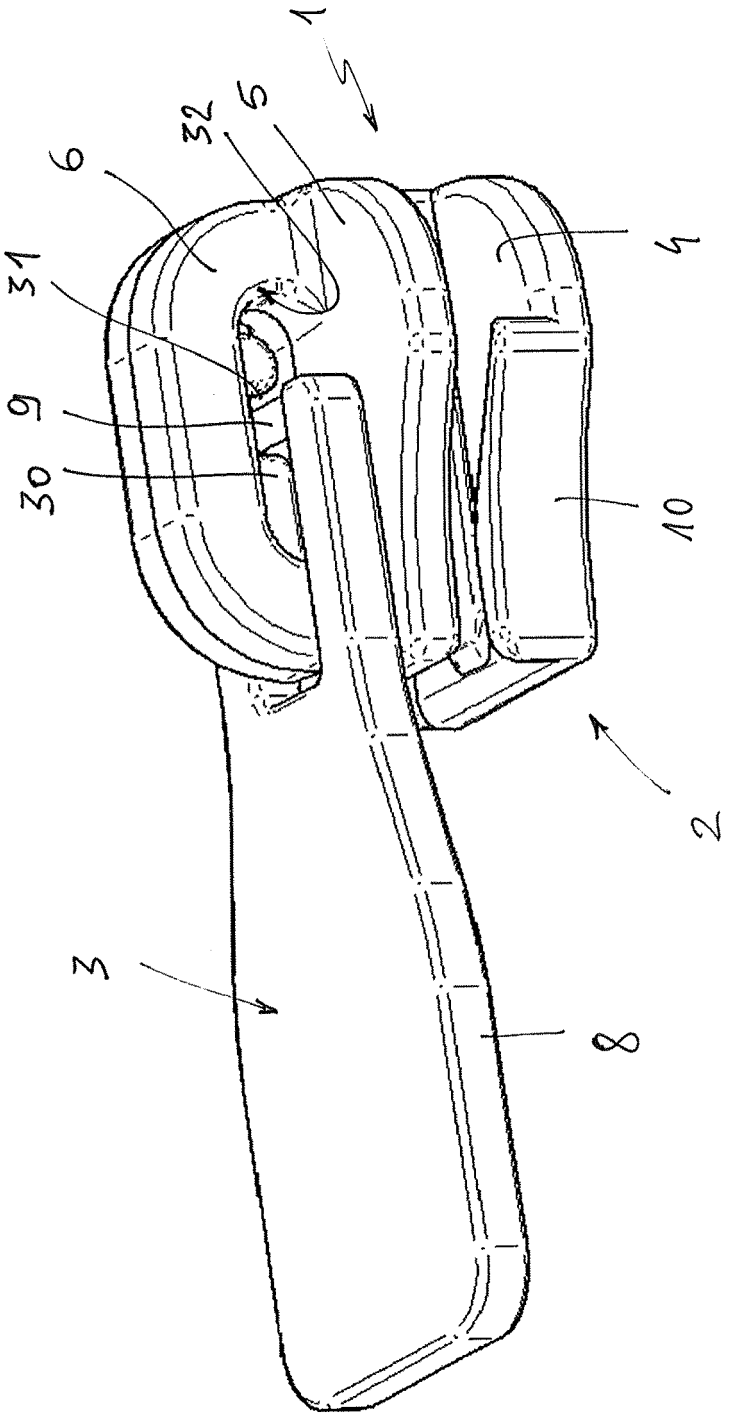


FIG. 7

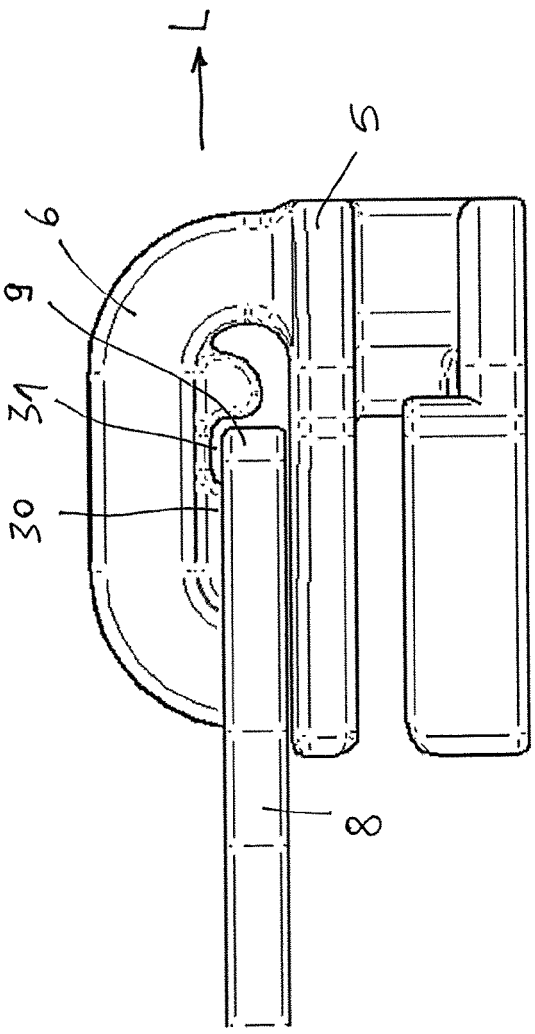


FIG. 8

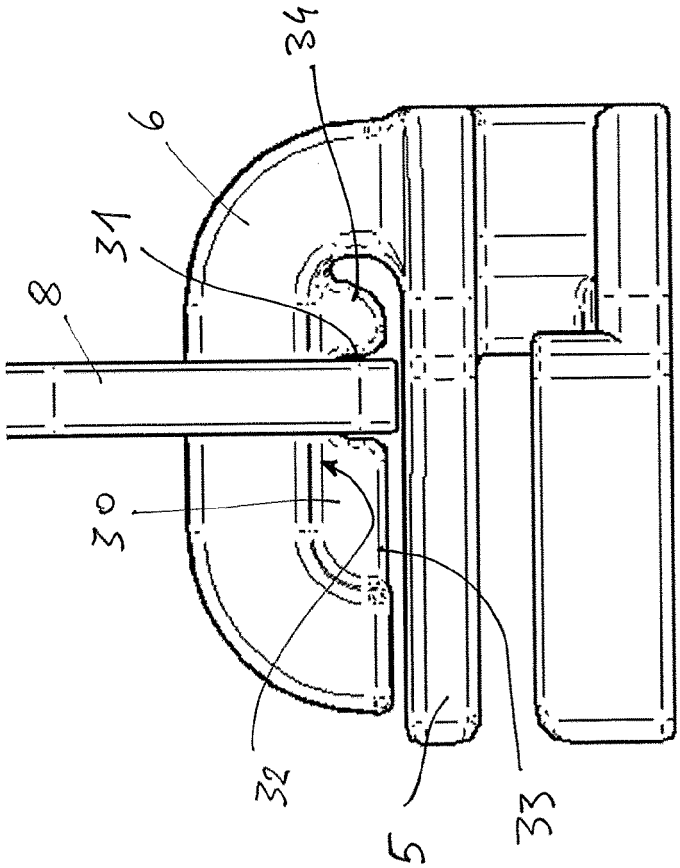


FIG. 9

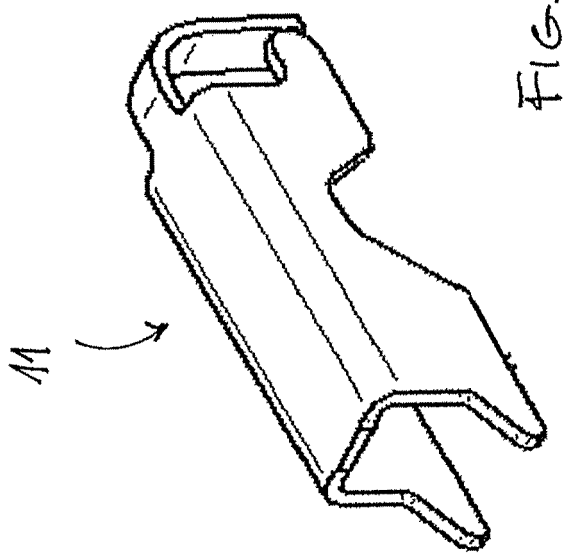


FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 18 21 5125

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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	12 June 2019	Monné, Eric

CATEGORY OF CITED DOCUMENTS

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