(12) STANDARD PATENT (11) Application No. **AU 2009200998 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
A slide fastener and a top stop for a slide fastener

(51) International Patent Classification(s)
A44B 19/32 (2006.01)

(21) Application No: **2009200998** (22) Date of Filing: **2009.03.11**

(30) Priority Data

(31) Number	(32) Date	(33) Country
08004703.8	**2008.03.13**	**EP**

(43) Publication Date: **2009.10.01**
(43) Publication Journal Date: **2009.10.01**
(44) Accepted Journal Date: **2012.12.20**

(71) Applicant(s)
Riri SA

(72) Inventor(s)
Cossutti, Livio;Peano, Roberto

(74) Agent / Attorney
Intellepro, Gpo Box 1339, Brisbane, QLD, 4001

(56) Related Art
US 5681115 A
US 2193827 A
GB 2000220 A

2009200998 11 Mar 2009

ABSTRACT

A slide fastener (1) comprising a slider (5) with a pull-tab (6), and a top stop (4) with a retaining element (20) disposed to act against a contact face (30) of the puller (6), when said pull-tab (6) is in a suitable locking position, to prevent the slider (5) from sliding away and keep the fastener (1) closed.

2009200998 11 Mar 2009

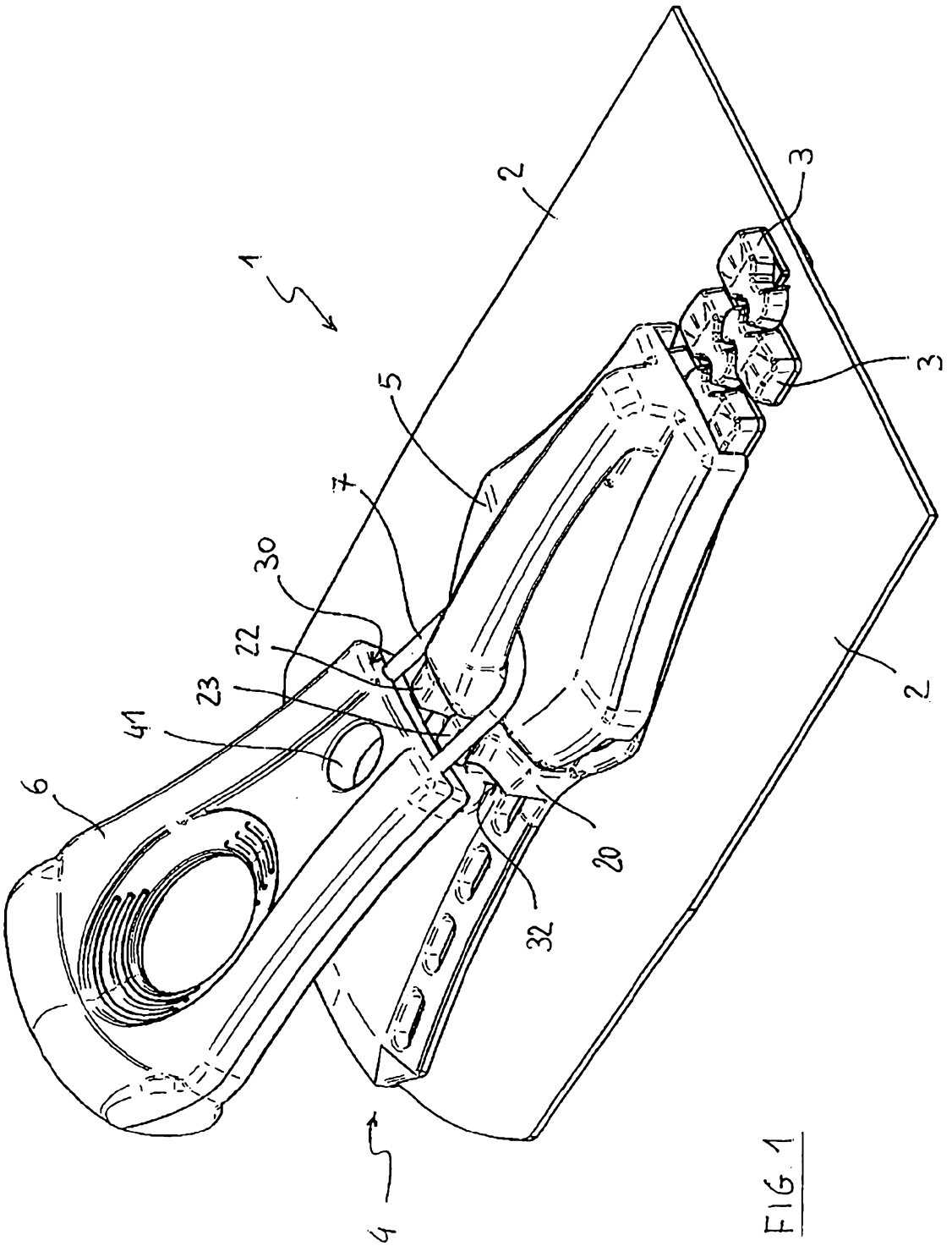


FIG. 1

2009200998 11 Mar 2009

P/00/011
Regulation 3.2

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION FOR A STANDARD PATENT

Name of Applicant:	RIRI SA
Actual Inventor(s):	LIVIO COSSUTTI ROBERTO PEANO
Address for Service:	INTELLEPRO Patent & Trade Mark Attorneys Level 7 102 Adelaide Street BRISBANE, QLD, 4000 (GPO Box 1339, BRISBANE, 4001)
Invention Title:	A SLIDE FASTENER AND A TOP STOP FOR A SLIDE FASTENER
Details of Basic Convention Application	European Patent Application No 08004703.8 filed 13 March 2008.

The following statement is a full description of this invention, including the best method of performing it known to me:

2009200998 11 Mar 2009

Title: "A slide fastener and a top stop for a slide fastener"

DESCRIPTION

Field of application

The present invention refers to a slide fastener and to a top stop of a slide fastener. The invention relates in particular to fluid-tight slide fasteners and top stops of fluid-tight slide fasteners.

Prior Art

A slide fastener, in essential terms, comprises a pair of tapes bearing respective rows of teeth, top and bottom stops, and a slider for opening and closing the fastener by engaging and disengaging the teeth. The slider is operated by a puller (or pull-tab) which is usually connected to the slider by a ring or a ring shaped end portion of the same puller.

The top and bottom stops are at opposite ends of the slide fastener, which is completely closed when the slider reaches the top stop.

Fluid-tight slide fasteners, in particular, are used in sports and outdoor activity items, diving or sailing suits, camping tents and the like, and are required to securely prevent the passage of a liquid and/or gas, e.g. water and/or air. In some cases, a fluid-tight fastener must ensure fluid-tightness even under a significant pressure difference between the interior and the exterior, for example up to about 2 bars.

2009200998 11 Mar 2009

Fluid-tight slide fasteners are realized for example with layered tapes made of a textile core with a waterproof coating layer, and injection-molded teeth.

The slider of a slide fastener, more in detail, comprises upper and lower blades, lateral flanges and a central portion, called diamond, connecting the upper and lower blades. In known slide fasteners, especially fluid-tight slide fasteners, the top stop is a substantially U-shaped element with leg portions defining a front opening for the diamond of the slider, and a seat for receiving said diamond when the slide fastener is fully closed. It is known technique to provide a suitable shape of the lateral flanges of the slider so that they act on the sides of said leg portions of the U-shaped top stop, in order to close said front opening in a fluid-tight manner when the slider reaches the full-closed position.

It can be understood that, in order to guarantee the fluid-tightness of the closed slide fastener, during the use, the slider should be kept in position and prevented from moving away from the top stop. In fact, an accidental displacement of the slider, even of few tenths of a millimeter, may compromise the fluid-tightness of the fastener at the region of the top stop and/or between the teeth.

Nevertheless, the user must always be able to open the slide fastener quickly, also for safety reasons. These needs are felt, in particular, in the field of fluid-tight slide fasteners for waterproof items such as diving suits, military or fireman suits, and the like.

2009200998 11 Mar 2009

Summary of the invention

The technical problem underlying the invention is to provide a reliable and safe closure of a slide fastener as defined above, avoiding the slider from leaving the position where the fastener is fully closed, allowing at the same time a quick and easy opening of the fastener itself.

This problem is solved by a slide fastener comprising a pair of tapes, carrying respective teeth, a top stop and a slider comprising a puller, the slider being movable up to a closing position of the fastener where said slider is in contact with said top stop, **characterized in that** the top stop comprises at least one retaining element adapted to retain the slider in said closing position.

According to a further aspect of the invention, said at least one retaining element is integrally formed with the top stop.

According to another aspect of the invention, said retaining element is disposed to act as a stop means for the slider when the puller is fitted on the top stop in a determined locking position. Preferably, said locking position is a position where the puller is lying on the top stop, substantially parallel to the sliding direction of the slider.

In a preferred embodiment, a retaining element is integrally formed with the top stop, having a surface disposed to act as a stop means against a contact face of

2009200998 11 Mar 2009

the puller, when the puller is fitted on the top stop in said locking position.

According to further aspects of the invention, the top stop further comprises at least one locking element, adapted to a snap engagement with a suitable seat or portion of the puller, to retain the puller in said locking position. Preferably, said seat or portion of the puller is a ring or a ring portion connecting the puller to the slider.

In a preferred embodiment, said at least one locking element is an elastically deformable element adapted to snap on the ring connecting the puller to the slider. Preferably, said locking element has an elastically deformable stem portion and a head portion projected from top of the stem portion, defining an undercut recess for receiving the ring of the puller.

Said locking element(s), according to the invention, are able to engage/disengage the ring of the slider by elastic deformation induced by contact with the ring itself when the puller is locked or unlocked on the top stop. Preferably, the head portion of the locking elements has a suitably profiled surface to allow deformation of the element by contact with the ring of the slider, while the puller is pressed down to the locking position, or lifted from that position. Thanks to said profiled surface, contact with the ring of the puller results in a force directed to deform the locking element(s) in such a way to receive or, respectively, to free the ring of the puller, as will be clearer hereinbelow with the help of an example.

2009200998 11 Mar 2009

According to a particularly preferred embodiment, said at least one retaining element of the top stop is formed as a wall of the top stop, comprising a base part with a surface adapted to act as a stop means against a contact face of the puller, and two locking elements formed as elastically deformable toothed elements projecting upwards from said base part and each defining an undercut recess for receiving the ring of the puller.

More in detail, the base part of the wall integrally formed with the top stop has a front surface facing the slider and a rear surface adapted to act as a stop means against a bottom face of the puller, to retain the slider when the puller is in the locking position.

According to another aspect of the invention, the top stop comprises at least one pin adapted to engage a corresponding hole of the puller, to retain the puller from lateral movement.

In further embodiments of the invention, the retaining element is adapted to cooperate with a corresponding locking element of the slider. As an example, the top stop has a suitable seat or recess for receiving a locking element projecting from the front of the slider, the locking element of the slider being engaged in said seat or recess of the top stop when the slider reaches the top stop. In these further embodiments, a disengagement system, e.g. by pressing a disengagement button, can also be provided on the top stop, to unlock the slider.

2009200998 11 Mar 2009

An object of the invention is also a top stop for a slide fastener, the slide fastener comprising a pair of tapes, carrying respective teeth, and a slider comprising a puller, the slider being movable to a closing position where said teeth are fully engaged and the slider is in contact with the top stop, the top stop being **characterized by** comprising at least one retaining element(s) as described above.

In particular, the invention provides a top stop for a slide fastener wherein said at least one retaining element is formed as a front wall of the top stop, the top stop being adapted to receive the puller of the slider in a locking position, said front wall comprising a surface adapted to act as a stop means against a contact face of the puller when the puller is fitted in said locking position.

The invention has the advantage that the slider is securely kept in the closing position. It should be noted that the snap-on engagement between the locking elements and the slider, namely the puller thereof, provides a quick and simple locking/unlocking action, so that the slider of the fastener is securely kept in the closing position and prevented from accidental opening even under intensive use, but the user can open the fastener rapidly and easily at any time.

The invention is particularly useful in a fluid-tight fastener, where a small deviation of the slider from the full-closing position may compromise the fluid-tightness. Hence, an item fitted with a slide fastener according to

2009200998 11 Mar 2009

the invention, such as a sports garment or the like, gives reliable fluid-tight performance with easy and safe use.

Further advantages and characteristics of the slide fastener according to the invention will be more evident from the detailed description and examples provided here below, with indicative and not limiting purpose.

Brief description of the drawings

Fig. 1 is a perspective view of the top end of a slide fastener according to an embodiment of the invention.

Fig. 2 is a side view of the fastener of Fig. 1.

Fig. 3 is a side view of the fastener of Fig. 1, with the puller of the slider in a different position.

Fig. 4 is a top view of the fastener, in the position of Fig. 3.

Fig. 5 and 6 are cross-sectional views according to lines V-V and VI-VI of Fig. 4.

Fig. 7 is an enlargement of Fig. 5.

Detailed description of a preferred embodiment

Fig. 1 shows a top portion of a slide fastener 1, in accordance with a preferred embodiment of the invention, comprising a pair of tapes 2, equipped with teeth 3, a top stop 4, and a slider 5 with a puller 6. The puller 6 is connected to the slider 5 by a ring 7.

2009200998 11 Mar 2009

The slider 5 is movable in a sliding direction, parallel to tapes 2, up to a closing position where the slide fastener 1 is fully closed, i.e. all teeth 3 are engaged and the slider 5 is in contact with the top stop 4. Said closing position is shown in Fig. 1.

Details of tapes 2 an teeth 3 can be according to known art and are not discussed in detail. For example, in a fluid-tight sliding fastener, tapes 2 are made of a textile core layer fully coated on both sides by a suitable waterproof layer and teeth 3 are injection-molded on tapes 2. The top stop 4, in a fluid-tight slide fastener, can also be injection-molded on tapes 2.

The slider 5 (Fig. 2) substantially comprises upper and lower blades 8, 9 with lateral flanges 10, 11 on both sides, and a diamond connecting said upper and lower blades 8, 9. Flanges 10 and 11, in use, act on suitable contact faces of teeth 3 in order to bring the facing teeth of the tapes 2 to reciprocal engagement, according to known art. When the slide fastener 1 is fully closed, i.e. the slider 5 is in the position of Fig. 1, the diamond can be received in a seat between leg portions 12 of the top stop 4.

The puller 6 can be fitted from the position of normal use, as seen in Fig. 1 and 2, to a locking position on the top stop 4, shown in Figs. 3 and 4. In said locking position, the puller 6 is lying on the top stop 4, substantially parallel to the sliding direction of the slider 5.

A front wall 20 is integrally formed in the top stop 4, acting as a stop means against a bottom contact face 30 of

2009200998 11 Mar 2009

the puller 6. The wall 20 has a rear surface 32 (Fig. 2) acting as a stop means against the contact face 30 of the puller 6, when in position of Figs. 3-4. Opposite to the surface 32, the wall 20 has a front surface 31 facing the slider; advantageously, there is a gap between said front surface 31 and the slider 5 for clearance recovery. The contact face 30 may be slightly curved and, in this case, the rear surface 32 of wall 20 is curved accordingly (Fig. 4).

Two toothed elements 22, 23 project upwards from the central portion of base part 21 of the wall 20, adapted to mechanically engage the ring 7 in order to "lock" the puller 6 in the position of Figs. 3-4. Each of said elements 22 and 23 has an elastically deformable stem portion projecting upwards from the base 21, and a head portion defining an undercut recess 22 for receiving the ring 7 when the puller is in the locking position.

As seen in the cross-sectional view of Figs. 5 and 7, each of elements 22, 23 has a stem portion 24 projecting upwards from base part 21 of the wall 20, and carrying a head portion 25 projecting laterally and outward from the top of the stem 24, defining inclined surfaces 26 and 27 converging to an edge 28, and the undercut recess 22 below said edge 28 and between the base 21 and the head 25 itself.

Pressing the ring 7 against faces 26 or 27 has the effect of bending laterally and inwards the stem portion 24 of the toothed elements 22 and 23, thus engaging the ring 7 in the

2009200998 11 Mar 2009

recess 22 or vice-versa disengaging the same ring 7 and puller 6 from the locking position.

In the shown embodiment, the top stop 4 also comprises a pin 40 which is received in a corresponding hole 41 of the puller 6, when the puller 6 is in said locking position. Said pin 40, received in the hole 41, retains the puller 6 from lateral movement.

In the example, the pin 40 is elliptical and frusto-conical, with a cross section decreasing from base to top. However, the pin 40 may also be cylindrical in simpler embodiments.

The invention is open to many variants. In other (not shown) embodiments, for example, the toothed elements 22, 23 or equivalent locking elements can engage a suitable seat (e.g. a recess) of the puller, rather than the ring connecting the puller to the slider. Clearly, the position of said locking elements can be different according to the needs and/or the design of the top stop.

The puller 6 may also be shaped in a different manner, for example with a hole in the bottom part defining a ring portion connecting the puller with the slider 5.

The retaining element, rather than wall 20, may be realized in different ways, including a plastic or metal element not integrally formed with the top stop itself.

In a further variant, the slider 5 may be equipped with a locking element, adapted to cooperate with another engagement element provided in the top stop 4, so that when

2009200998 11 Mar 2009

the slider 5 reaches the top stop 4, said slider is locked to the top stop and prevented from sliding away. An unlocking system may be incorporated in the top stop.

Referring to said further variant, the slider for example has a first coupling element protruding from the front of the slider itself, adapted to snap on a second coupling element or recess of the top stop when the slider reaches the top stop. Said second coupling element or recess may be provided e.g. on face 31 or equivalent part of the top stop 4. The top stop has an unlocking button associated to said second coupling element of the top stop, so that acting on said button the user can move the second coupling element to a disengaging position, freeing the slider from the top stop.

Referring back to embodiment of the figures, the invention operates as follows.

When closing the slide fastener 1, the user pulls the slider 5 up to the position of Fig. 1, where all the teeth 3 are mutually engaged and the slider 5 reaches the top stop 4.

To secure the fastener, the user lowers the pull-tab 6 from the position of use of Figs. 1-2 to the locked position of Figs. 3-4. As the ring 7 contacts the upper surfaces 26 of teeth 22, 23 (Fig. 2), and due to inclination of said surfaces 26, the stems 24 are deformed until the ring 7 can overcome the edge 28, and reach the undercut recesses 22.

When the ring 7 is received in said undercut recesses 22 (Fig. 5), it is locked by elements 22, 23. The contact

2009200998 11 Mar 2009

between surfaces 30 and 32 prevents the slider 5 from sliding away from the top stop 4, thus keeping the fastener 1 closed and ensuring fluid-tightness at the region of the top stop 4. The puller 6 is safely prevented from leaving the locking position, by lateral outward projections of the heads 25 of elements 22 and 23, locking the ring 7 as seen in Figs. 5 and 7. This is sufficient to avoid undesired unlock due to the use, plying of the fastener, etc. The pin 40 is a further help to maintain the puller 6 in the correct locking position, preventing the puller from lateral movement.

The fastener is unlocked by lifting the puller 6, so that the ring 7 bends the elements 22, 23 pressing against the contact surfaces 27, until the ring 7 itself reaches the edge 28 and is freed to the use position of Figs. 1-2 again. Then, the user can open the slide fastener 1 as usual.

It should be appreciated that the puller 6 is locked and unlocked manually and in a quick and immediate way by lowering or, respectively, lifting the puller. Notwithstanding this, when the puller 6 is locked the slider 5 is firmly secured on the top stop 4, and accidental opening of the fastener and/or loss of the fluid-tightness is prevented in a reliable way.

Of course, a person skilled in the art can bring modifications and variants to the invention in order to satisfy specific requirements, all of which are in any case covered by the scope of protection of the following claims.

2009200998 09 Nov 2012

CLAIMS

1. A slide fastener comprising a pair of tapes, carrying respective teeth, a top stop and a slider having a puller, said puller having a ring for connection to the slider, the slider being movable up to a closing position of the fastener where said slider is in contact with said top stop, the top stop having at least one retaining element adapted to retain the slider in said closing position, said retaining element being disposed to act as a stop means for the slider when said puller is fitted on the top stop in a determined locking position, and the top stop having at least one locking element, adapted to a snap engagement with a suitable seat or portion of the puller, to retain the puller in said locking position, said at least one locking element being an elastically deformable element adapted to snap on said ring connecting the puller to the slider.

2. A slide fastener according to claim 1, said at least one retaining element being integrally formed with the top stop.

3. A slide fastener according to claim 1 or 2, said determined locking position of the puller being a position where the puller is lying on the top stop, substantially parallel to the sliding direction of the slider along the fastener.

4 A slide fastener according to claim 2 or 3, said retaining element having a surface adapted to act as a stop means against a contact face of said puller.

5. A slide fastener according to any of claims 1 to 4, said at least one locking element being formed as a toothed

2009200998 09 Nov 2012

element adapted to snap on said ring connecting the puller to the slider.

6. A slide fastener according to claim 5, said toothed element being formed with an elastically deformable stem portion and a head portion, said head portion projecting from top of the stem portion and defining an undercut recess for receiving said ring of the puller.

7. A slide fastener according to claim 6, said at least one retaining element of the top stop being formed as a front wall of the top stop, comprising a base part with a surface adapted to act as a stop means against a contact face of the puller, and two elastically deformable toothed elements for locking the puller in a locking position, said elements projecting upwards from said base part and each defining an undercut recess for receiving said ring of the puller.

8. A slide fastener according to any one of the previous claims, said top stop having at least one pin adapted to engage a corresponding hole of the puller.

9. A slide fastener according to any one of the previous claims, the fastener being fluid-tight.

10. An item such as a sports suit or the like, comprising a fastener according to any one of claims 1 to 9.

11. A top stop for a slide fastener, the slide fastener comprising a slider with a puller, the top stop having at least one retaining element adapted to retain the slider in a closing position, the top stop being characterized in that said at least one retaining element is disposed to act as a stop means for the slider of the slide fastener

2009200998 09 Nov 2012

when the puller is fitted on the top stop in a determined locking position, and in that the top stop has at least one locking element, adapted to a snap engagement with a suitable seat or portion of the puller, to retain the puller in said locking position, said at least one locking element being an elastically deformable element adapted to snap on the ring connecting the puller to the slider.

12. A slide fastener as hereinbefore described with reference to the drawings.

13. A top stop for a slide fastener as hereinbefore described with reference to the drawings.

2009200998 11 Mar 2009

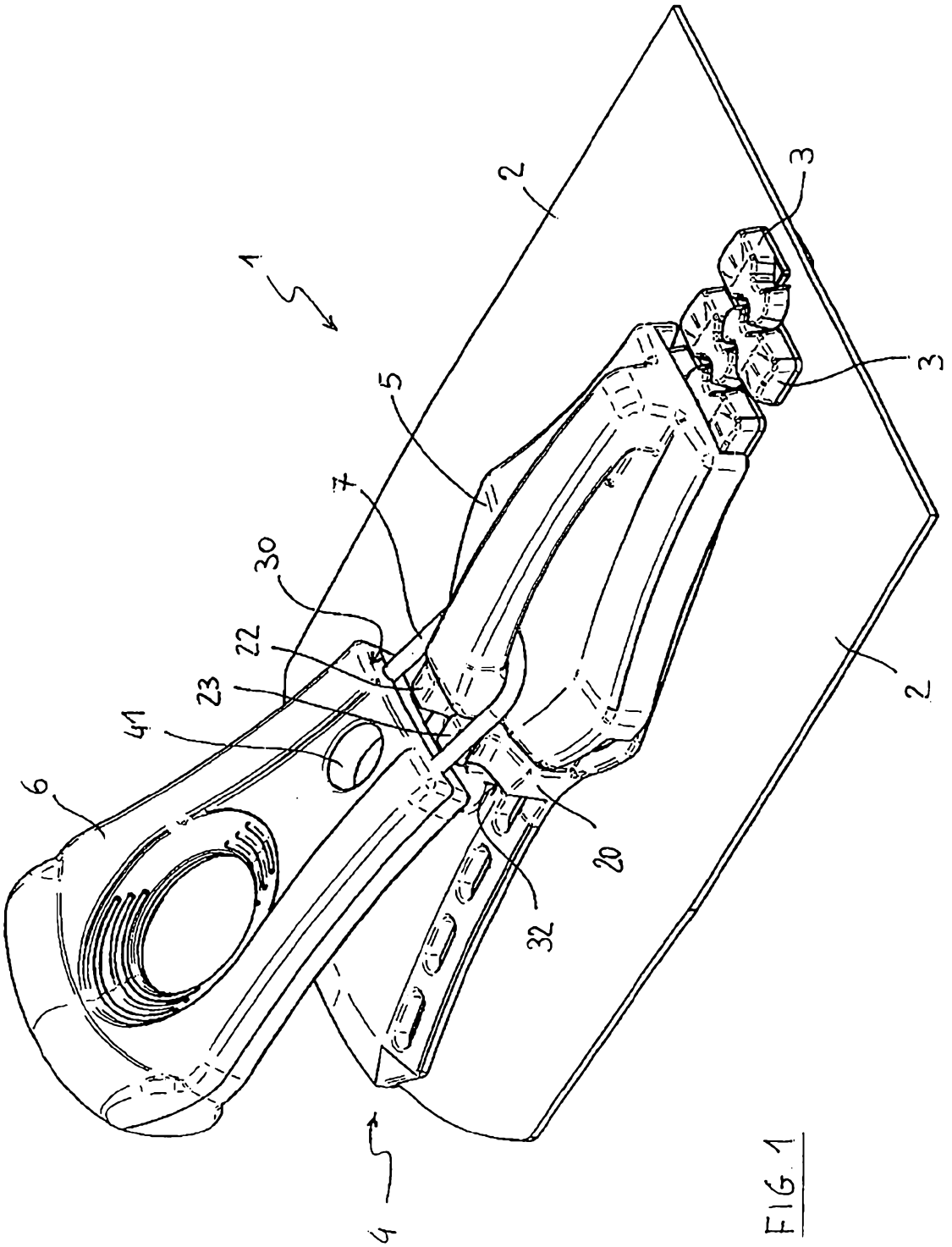


FIG. 1

2009200978

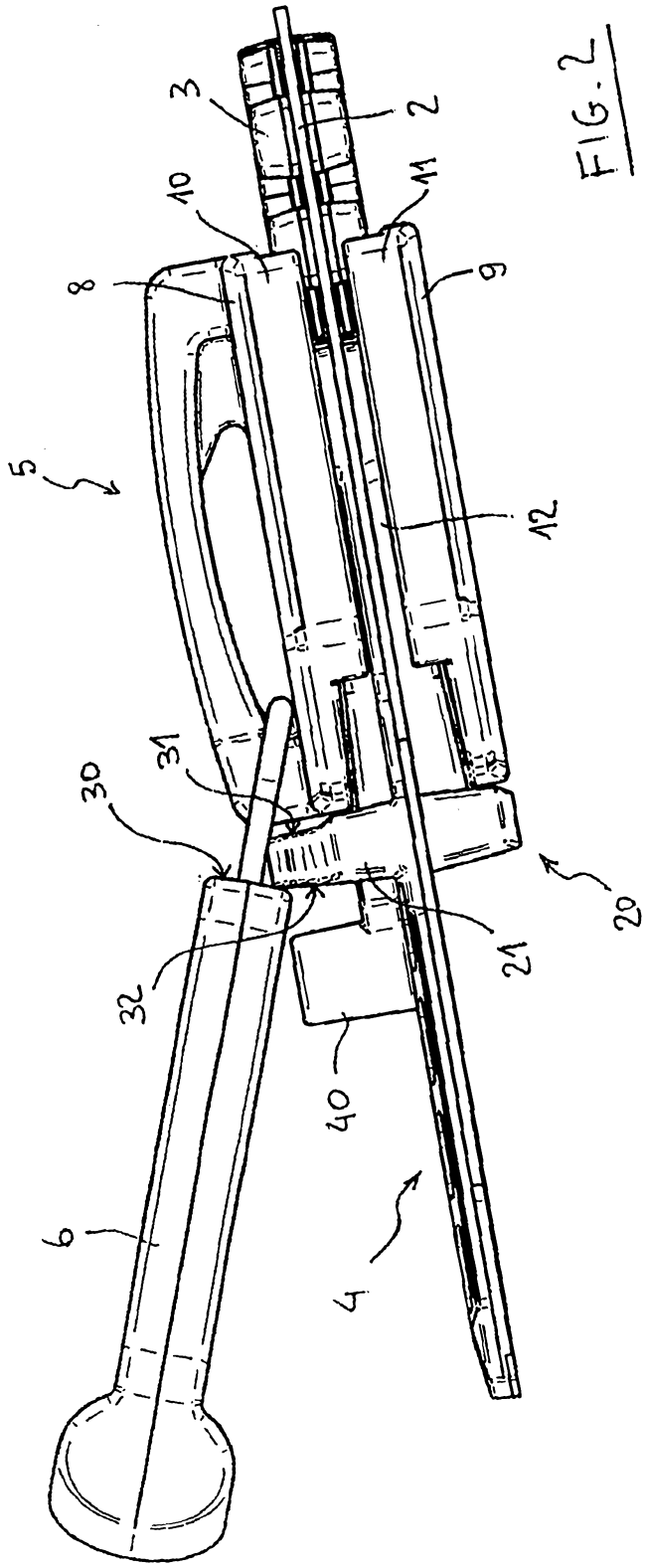


FIG. 2

2009200998 11 Mar 2009

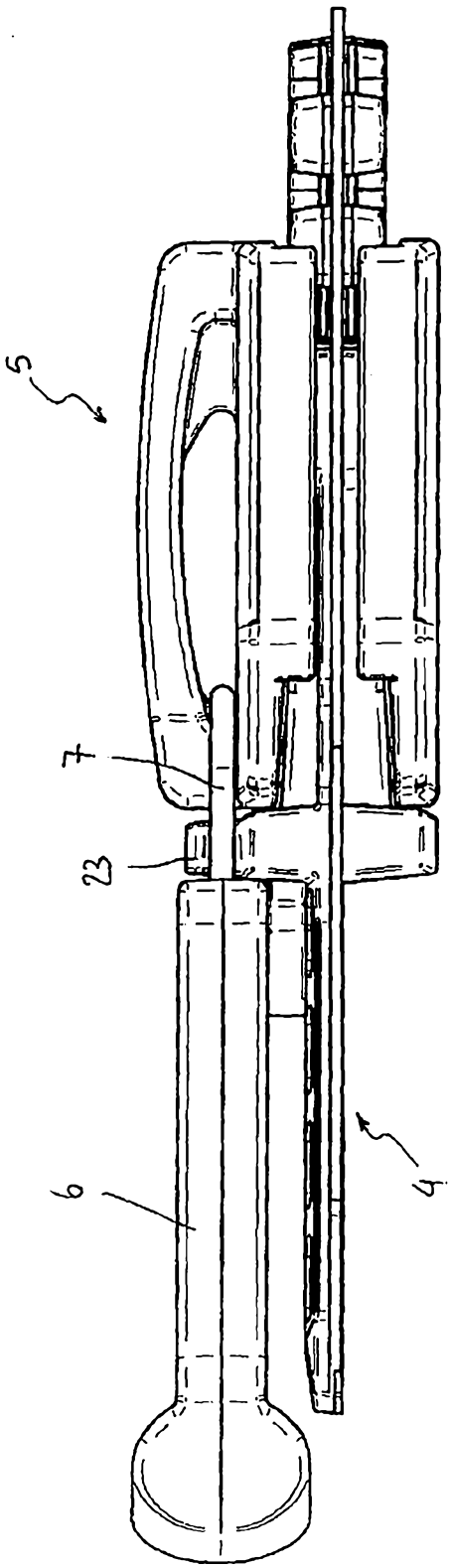


FIG. 3

2009200998 11 Mar 2009

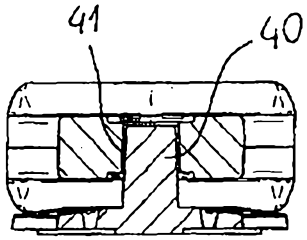


FIG.6

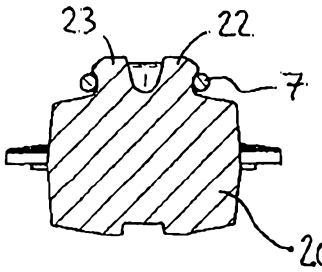


FIG.5

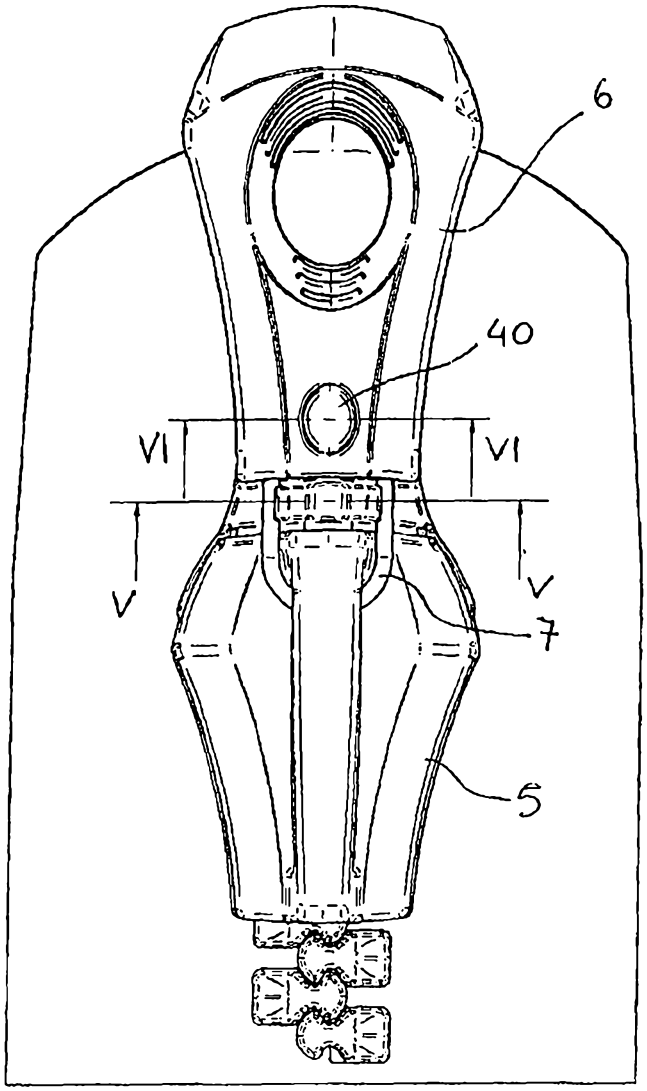


FIG.4

2009200998 11 Mar 2009

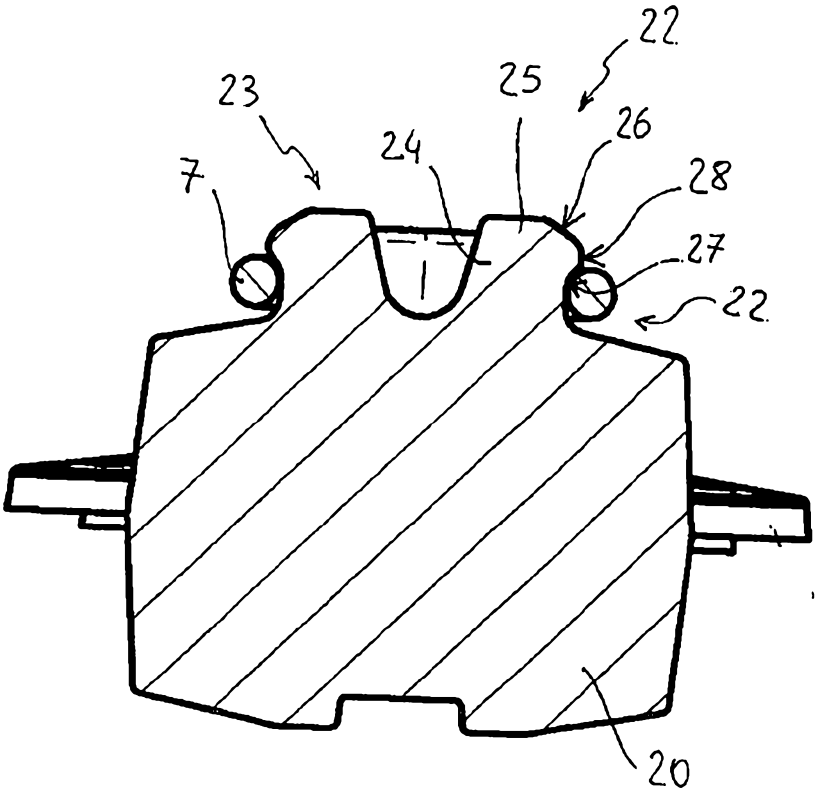


FIG. 7