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(54) **Buckle for a belt**

(57) The object of the present invention is a buckle (1) for a belt. First, the buckle comprises a plate (10) having a slot (11) and a system (12) suitable to be fixed to the first end (2') of a belt (2). The buckle further comprises a plaque (20) having a system (22) suitable to be fixed to the second end (2'') of a belt (2). The plaque (20)

is suitable to adopt an engagement position, in which the same is allowed to pass through the slot (11) and a position of use. The buckle further comprises a mask (30) movable between a first position in which it allows the slot (11) to be completely accessible and a second position in which it partially restrains the accessibility of the slot (11).

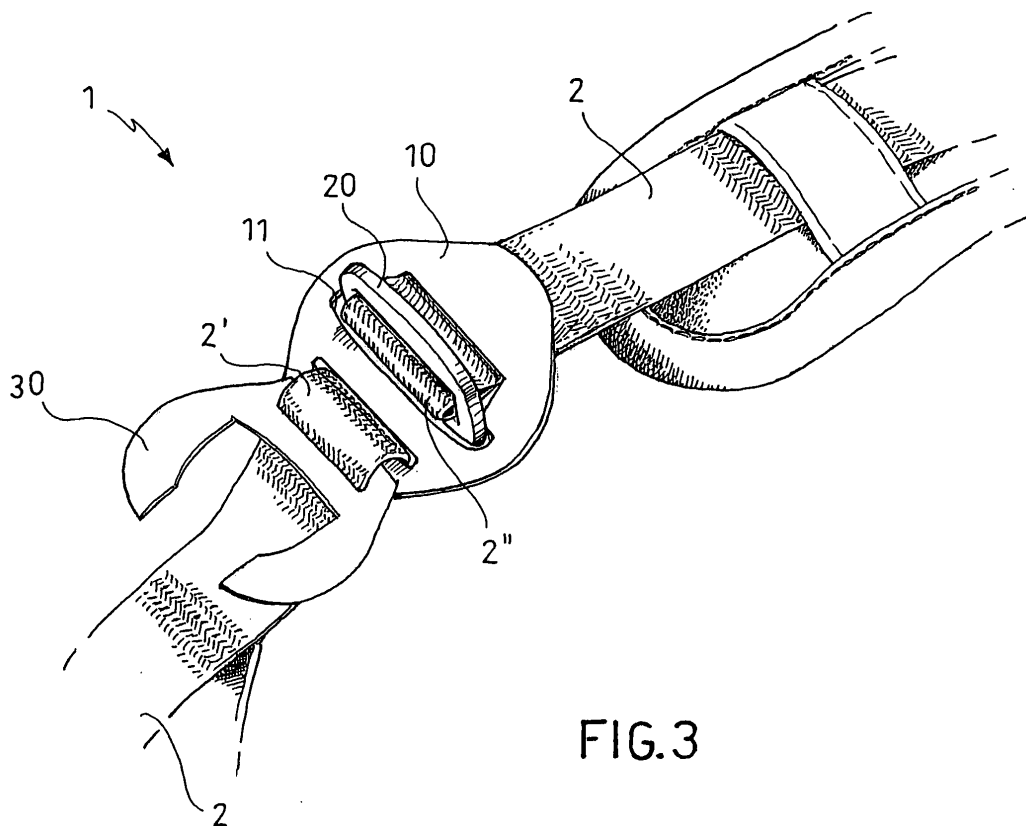


FIG.3

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Description

[0001] . The object of the present invention is a buckle for attaching the ends of two belts or two ends of a belt to each other.

[0002] . Buckles for attaching belts are used, for example, in the field of harnesses for sports such as climbing, which consist of a plate comprising a slot fixed to an end and a plaque fixed to the other end which substantially acts as a button.

[0003] . In fact, during the step of fixing this known buckle, the user arranges the plaque in a suitable relative position with respect to the plate. This relative position allows the plaque to pass through the slot formed in the plate. When the plaque has passed through the slot, it is arranged by the user in the position of use as provided for the step of employing the belt. In this position, due to its size, the plaque cannot pass through the slot formed in the plate in the reverse direction, thereby the connection between the two ends is maintained upon use.

[0004] . On the other hand, during the step of unfastening this known buckle, the user arranges the plaque back to the suitable relative position in which it can pass through the slot formed in the plate, thereby the belt ends can be released when use has ceased.

[0005] . These known buckles allow carrying out the fastening and unfastening steps in a comfortable and quick manner. Furthermore, these known buckles allow for a quick adjustment of the belt available length. In view of the above, these buckles are very appreciated, mainly in the climbing field.

[0006] . The buckle described above, however, has considerable drawbacks. In many applications of this type of buckle, typically when it is used in the climbing field, it is not possible to ensure in advance that the belt ends and the buckle parts will stand steady relative to each other throughout use.

[0007] . On the contrary, however, the user (and also the belts and buckle) often has to make and adopt positions, which are quite unpredictable, or may experience fast accelerations in random directions. In these conditions, nothing prevents that parts of the buckle may move relative to each other, and the plaque may inadvertently adopt the position in which the same is allowed to pass through the slot formed in the plate.

[0008] . It is clearly understood that this event, although it may be considered as improbable, must be however absolutely avoided. This event, in fact, will be a serious danger for the safety of the climber, and often for everyone on the rope.

[0009] . The object of the present invention is to provide a buckle for attaching belt ends, which has such structural and functional characteristics to overcome the drawbacks mentioned with reference to the prior art.

[0010] . The task of the present invention is further to meet the requirements of comfort and usage convenience as discussed above with reference to the prior art.

[0011] . This object and this task are achieved by

means of a buckle for attaching belt ends in accordance with claim 1. The dependent claims relate to further aspects or embodiments of the invention.

[0012] . Further characteristics and the advantages of the buckle according to the invention will be apparent from the description below of several preferred embodiments thereof, which are merely illustrative and non-limiting, with reference to the annexed figures, in which:

[0013] . Fig. 1 illustrates an overall perspective view of the buckle according to the invention in a first configuration of use;

[0014] . Fig. 2 illustrates an overall perspective view of the buckle according to the invention in a second configuration;

[0015] . Fig. 3 illustrates an overall perspective view of the buckle according to the invention in a third engagement configuration;

[0016] . Fig. 4 illustrates a longitudinal sectional view of the buckle according to the invention in a configuration similar to that of Fig. 1;

[0017] . Fig. 5 illustrates a longitudinal sectional view of the buckle according to the invention in a configuration similar to that of Fig. 2;

[0018] . Fig. 6 illustrates a longitudinal sectional view of the buckle according to the invention in a configuration similar to that of Fig. 3;

[0019] . Fig. 7.a illustrates a plan view of a mask comprised in the buckle according to the invention;

[0020] . Fig. 7.b illustrates a plan view of a plate and mask comprised in the buckle according to the invention;

[0021] . Fig. 7.b illustrates a plan view of a plaque comprised in the buckle according to the invention.

[0022] . With reference to said figures, a fastening buckle for two ends of belt 2 has been generally designated with 1.

[0023] . First and second ends will be designated below with 2' and 2'', respectively. These numerals will be used without requiring to establish whether 2' and 2'' are two ends of the same belt to be looped or rather two ends of two different belts to be fastened to each other. This difference is, in fact, completely insignificant to the purposes of the present invention.

[0024] . The buckle 1 comprises a plate 10 on which there are obtained a slot 11 and a fixing system 12, which is known per se, to a first end 2' of the belt 2.

[0025] . An exemplary plate 10 comprising a fixing system 12 is represented in Fig. 7.b. In accordance with this embodiment, the fixing system 12 is a simple slit 120, through which the end 2' of the belt 2 is passed, folded and finally stitched such that the plate 10 is definitely fastened in position along the belt 2.

[0026] . In accordance with another embodiment, the fixing system 12 is of the type allowing adjusting the position of the plate 10 along the belt 2.

[0027] . In accordance with a further embodiment, the fixing system 12 is of the type allowing a quick adjustment of the position of the plate 10 along the belt 2. In other words, the fixing system 12 allows the plate 10 to slide

smoothly along the belt 2 in the direction required for adjusting the belt 2 to the desired length, while it effectively counteracts the sliding movement in the opposite direction when the belt 2 is tensioned.

[0028] . An exemplary plate 10 comprising a slot 11 is represented in Fig. 7.b. In accordance with this embodiment, the aperture 110 of the slot 11 defines a first opening 111 which has an available length A.

[0029] . The buckle 1 further comprises a mask 30 movable between a first position in which it allows the slot 11 to be completely accessed and a second position in which, on the contrary, it partially restrains the accessibility of the slot 11.

[0030] . More particularly, when the mask 30 is in the second position, it restrains the aperture 110 of the slot 11 such as to define a second opening 112 instead of the first opening 111. The second opening 112 has an available length B which is lower than the available length A of the first opening 111.

[0031] . In accordance with the embodiment as illustrated in Fig. 7.a, the mask 30 is thus substantially C-shaped, and thus has a closed side 301, two tabs 306 and an open side 302.

[0032] . The mask 30 comprises fastening means 303 allowing the same to be freely rotated about an axis R-R proximate to the closed side 301. The fastening means 303 comprise a single slit 304 for a belt 2 to pass therethrough. Thereby, the mask 30 is fastened by the belt relative to any movement, the only exception being the rotation about the axis R-R.

[0033] . On the other hand, on the open side 302 of the mask 30 there is formed an aperture 310 being defined by the two tabs 306. The aperture 310 has such a size as to define the second opening 112 on the slot 11 of the plate 10. Particularly, the available length C of the aperture 310 is substantially equal to the available length B of the second opening 112.

[0034] . The buckle 1 finally comprises a plaque 20 having a fixing system 22, known per se, to be applied to a second end 2" of the buckle 2. The plaque 20, due to its shape and size, is suitable to pass through the slot 11 only when it adopts a particular predetermined engagement position relative to the plate 10.

[0035] . In accordance with the embodiment of the invention as represented in Fig. 7.c., the plaque 20 has a length D that is slightly lower than the available length A of the first opening 111 and greater than the available length B of the second opening 112. Due to this size, the plaque 20 can pass through the first opening 111 of the slot 11 by being arranged (see Fig. 3 and 6, for example) in the engagement position relative to the plate 10, i.e. by arranging the same edgewise to the plate 10.

[0036] . In accordance again with the embodiment as represented in Fig. 7.c., the fixing system 22 is of the type allowing a quick adjustment of the position of the plaque 20 along the belt 2.

[0037] . A fixing system 22 of this type is embodied by two parallel slits 22, the end 2" of the belt 2 being se-

quentially caused to pass therethrough. A smooth sliding of the plaque 20 along the belt 2 is thereby obtained in the step of adjusting the belt 2 to the desired length, i.e. when the belt is at rest. On the other hand, when the belt is tensioned, the tension acts as the force clamping the belt 2 to the plaque 20 due to the arrangement in the two slits 220, thus effectively counteracting the sliding movement in the opposite release direction.

[0038] . In accordance with an embodiment of the invention, the plate 10, the mask 30 and the plaque 20 are arranged on the belt 2 such as described below.

[0039] . First, the first end 2' is connected to the plate 10 by means of the fixing system 12 as described above.

[0040] . Secondly, the mask 30 is also connected to the first end 2' by means of the fastening means 303 as described above.

[0041] . The mask 30 can thus rotate along the axis R-R such as schematically represented in Fig. 5 and 6. Particularly, in accordance with the embodiment illustrated, the mask 30 rotates such as to pass from a first position partially raised from the plate 10 (represented in Fig. 3 and 6) to a second abutment position against the latter (represented in Fig. 1 and 4).

[0042] . When the mask 30 is in the first position, partially raised from the plate 10, the aperture 110 of the slot 11 is completely accessible, such as to define the first opening 111.

[0043] . On the contrary, when the mask 30 adopts the second abutment position against the plate 10 by rotating about the axis R-R, the tabs 306 and possibly a part of the closed side 301 partially cover the aperture 110 of the slot 11 such as to restrain the accessibility thereof. Simultaneously, the aperture 310 of the mask 30 at least partially overlaps to the aperture 110 of the slot 11 such as to define the second opening 112.

[0044] . Third, the second end 2" is connected to the plaque 20 by means of the fixing system 22 as described above.

[0045] . A preferred method of use for the buckle 1 according to the invention is described below by steps:

[0046] . The first step is placing the mask 30 in the first position, which ensures that the slot 11 is completely accessible;

[0047] . The second step is placing the plaque 20 in the engagement position, which allows the same to pass through the slot 11;

[0048] . The third step is causing the plaque 20 and the second end 2" to pass through the slot 11;

[0049] . The fourth step is placing the mask 30 in the second position, which prevents the slot 11 from being completely accessible;

[0050] . The fifth step is placing the plaque 20 in the position of use as provided for using the belt 2.

[0051] . For example, with reference to the embodiment of the invention as represented in the annexed figures, the method of using the buckle 1 as described above comprises the following steps:

[0052] . The first step is placing the mask 30 in a par-

tially raised position from the plate 10, which position allows the first opening 111 to be completely accessible;

[0053] . The second step is placing the plaque 20 in the engagement position edgewise relative to the plate 10 (see Fig. 3 and 6) ;

[0054] . The third step is causing the plaque 20 and the second end 2" to pass through the first opening 111 of the slot 11;

[0055] . The fourth step, for example, is placing the mask 30 in an abutment position against the plate 10, in which position the mask 30 at least partially closes the aperture 110 of the slot 11 and leaves the second opening 112 accessible.

[0056] . The fifth step is placing the plaque 20 in the position of use abutted against the surface formed by the plate 10 and the mask 30. In this position of use, the second end 2" is arranged through the second opening 112. The available length B and the width of the second opening 112 are such that the belt 2 remains snugly housed therein.

[0057] . In accordance with an embodiment of the method, a further step provides the plate 10 sliding along the first end 2' and/or the plaque 20 along the second end 2", such that the length of the belt 2 is adapted to the particular requirements.

[0058] . The available length B and the width of the second opening 112 are such that the belt 2 can smoothly slide therethrough during the length adjustment step.

[0059] . In accordance with an embodiment of the invention, the second end 2" is provided with an end stop 25 at the end 222" thereof. This end stop 25 ensures that the second end 2" will not inadvertently come off the fixing system 22 when the latter, as described above, provides that the plaque 20 may slide along the belt 2.

[0060] . In accordance with a further embodiment, the end stop 25 further comprises an obstacle 250 that is of such a size that it cannot pass through the slot 11, regardless of the position adopted by the mask 30.

[0061] . The provision of the obstacle 250 prevents that the user may wrongly arrange the tip 222" of the end 2" through the slot 11. This wrong arrangement is potentially very dangerous, because it will compromise the effectiveness of the clamping force to the plaque 20 as resulting from the belt tensioning. If this clamping is not effective, the plaque 20 will slide along the belt 2 when the latter is tensioned. This sliding will result in the belt 2 being released.

[0062] . From what has been stated above, it is clearly understood that any arrangement of the obstacle 250 on the end stop 25 will result in additional safety for the user.

[0063] . To the preferred embodiment of the buckle as described above, those skilled in the art, aiming at satisfying contingent and specific requirements, may carry out a number of modifications, adaptations and replacements of elements with functionally equivalent ones, without however departing from the scope of the claims below.

Claims

1. A buckle (1) for a belt comprising:

- 5 - a plate (10) having a slot (11) and a system (12) suitable to be fixed to a first end (2') of a belt (2); and
- 10 - a plaque (20) having a system (22) suitable to be fixed to a second end (2") of a belt, said plaque (20) being suitable to adopt an engagement position in which the same is allowed to pass through said slot (11), and a position of use;

wherein said buckle further comprises a mask (30) movable between a first position in which it allows said slot (11) to be completely accessible and a second position in which, on the contrary, it partially restrains the accessibility of said slot (11).

- 20 2. The buckle (1) according to claim 1, wherein said slot (11) defines a first opening (111), said plaque (20) being suitable to pass through said first opening (111) in said engagement position.

- 25 3. The buckle (1) according to claim 2, wherein said mask (30) in said second position at least partially obstructs said slot (11) such as to define a second opening (112), said plaque (20) being unsuitable to pass through said second opening (112).

- 30 4. The buckle (1) according to claim 2, wherein said first opening (111) has a length A greater than the available length B of said second opening (112).

- 35 5. The buckle (1) according to claim 4 wherein said plaque (20) has an available length D greater than the available length B of said second opening (112) and lower than the available length A of said first opening (111), respectively.

- 40 6. The buckle (1) according to claim 3, wherein said mask (30) comprises an aperture (310) suitable to overlap, at least partially, to said slot (11) such as to define said second opening (112).

- 45 7. The buckle (1) according to any preceding claim, wherein said system (12) for fixing said plate (10) to said belt (2) is of a type allowing the adjustment of the position of said plate (10) along said belt (2).

- 50 8. The buckle (1) according to any preceding claim, wherein said system (22) for fixing said plaque (20) to said belt (2) is of a type allowing the adjustment of the position of said plaque (20) along said belt (2).

- 55 9. The buckle (1) according to claim 1, wherein said second end (2") comprises an end stop (25) having such a size as to prevent the tip (222") of said second

end (2'') from passing through said fixing system (22).

10. The buckle (1) according to claim 1, wherein said second end (2'') comprises an obstacle (250) having a larger size than said slot (11) such as to prevent the tip (222'') of said second end (2'') from passing through said slot (11). 5

11. A method for using a buckle in accordance with claim 1, comprising the following steps: 10
 - placing said mask (30) in said first position such as to ensure that said slot (11) is completely accessible; 15
 - placing said plaque (20) in said engagement position such as to allow the passage through said slot (11) ;
 - passing said plaque (20) and said second end (2'') through said slot (11); 20
 - placing said mask (30) in said second position such as to prevent said slot (11) from being completely accessible;
 - placing said plaque (20) in said position of use. 25

12. The method according to claim 12, wherein said step of placing said mask (30) in said first position comprises the step of partially rotating said mask (30) relative to said plate (10) such as to be partially raised therefrom. 30

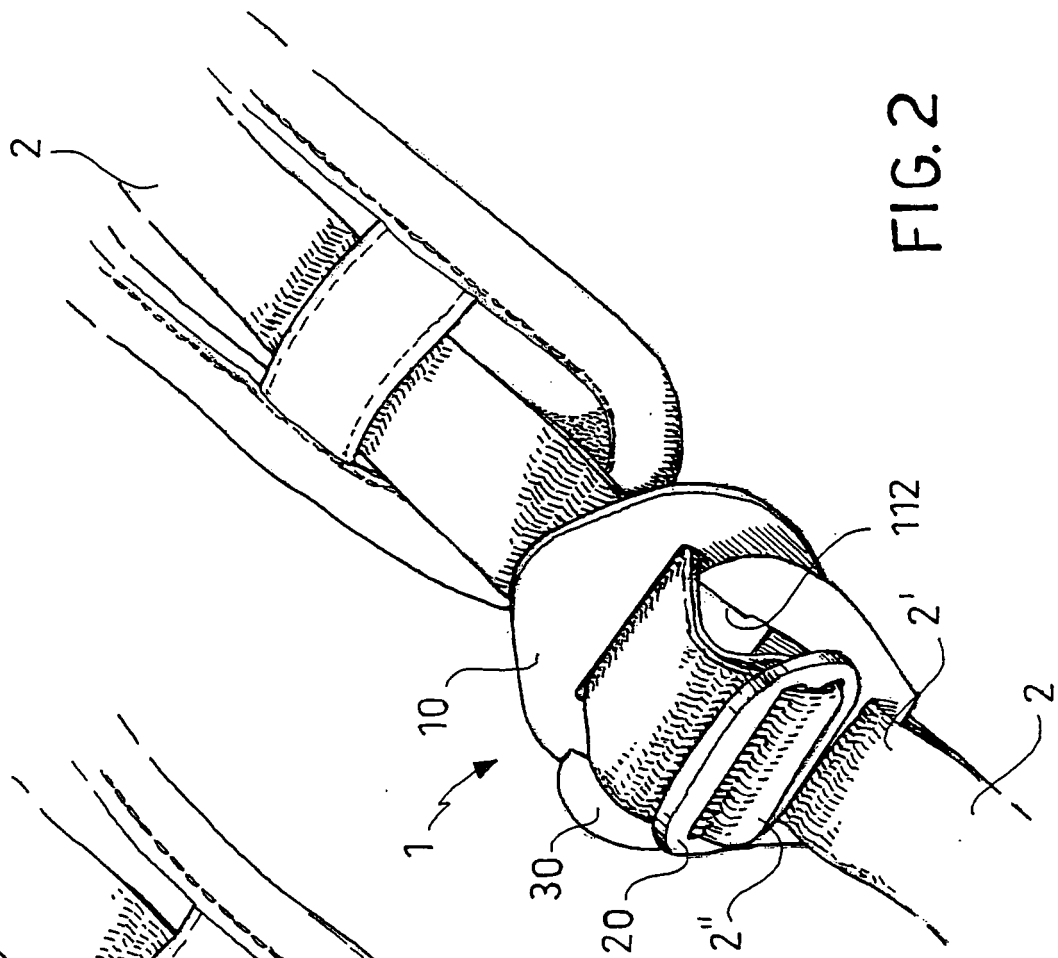
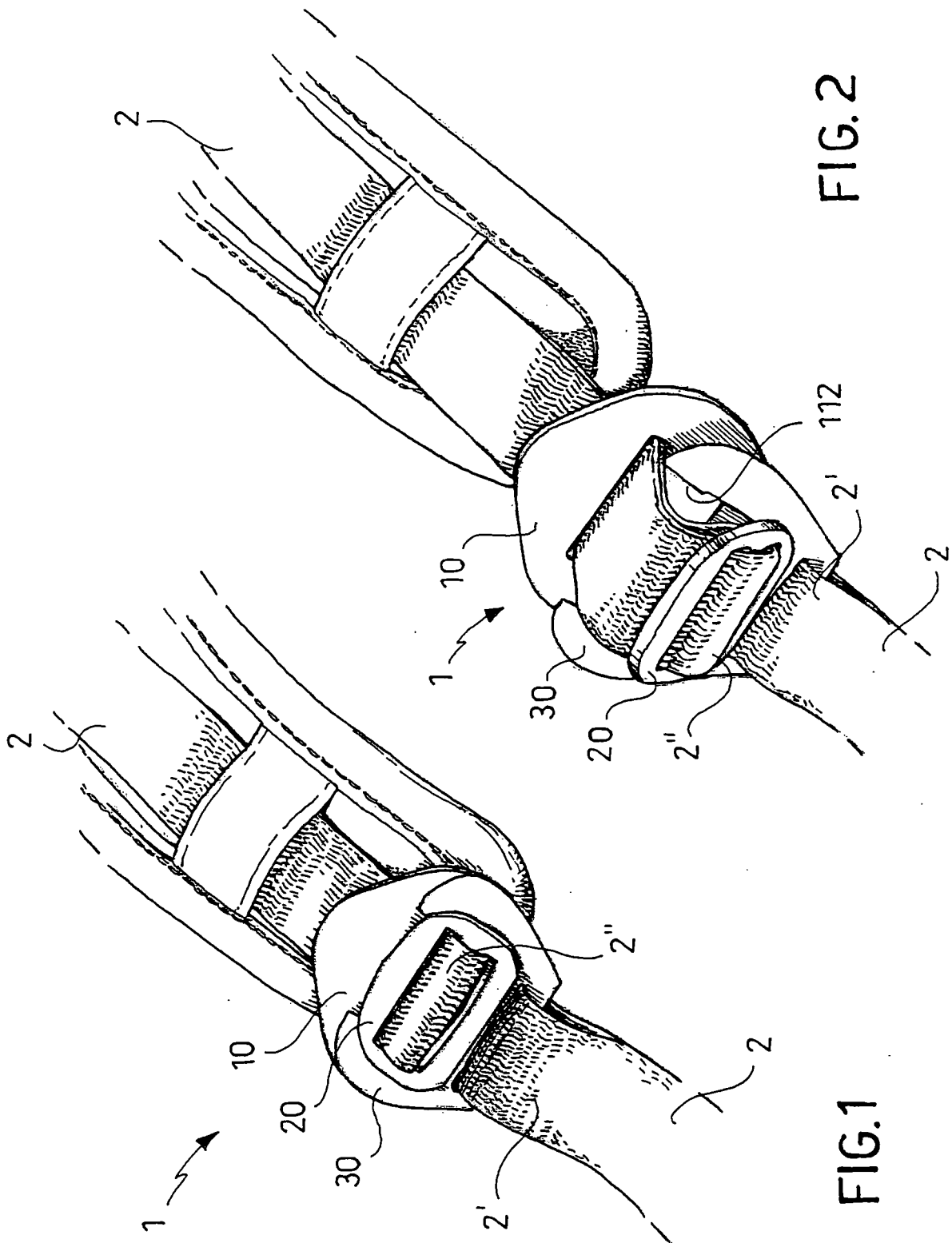
13. The method according to claim 12, wherein said step of placing said plaque (20) in said engagement position comprises the step of placing said plaque (20) edgewise relative to said plate (10). 35

14. The method according to claim 12, wherein said step of placing said mask (30) in said second position comprises the step of rotating said mask (30) such as to bring the latter into abutment against said plate (10). 40

15. The method according to claim 12, wherein said step of placing said plaque (20) in said position of use comprises the step of abutting said plaque (20) against a surface formed by said plate (10) and said mask (30). 45

16. The method according to any claim 12 to 16, comprising as a further step the plate (10) sliding along said first end (2') and/or the plaque (20) sliding along said second end (2'') such as to adjust the length of said belt (2). 50

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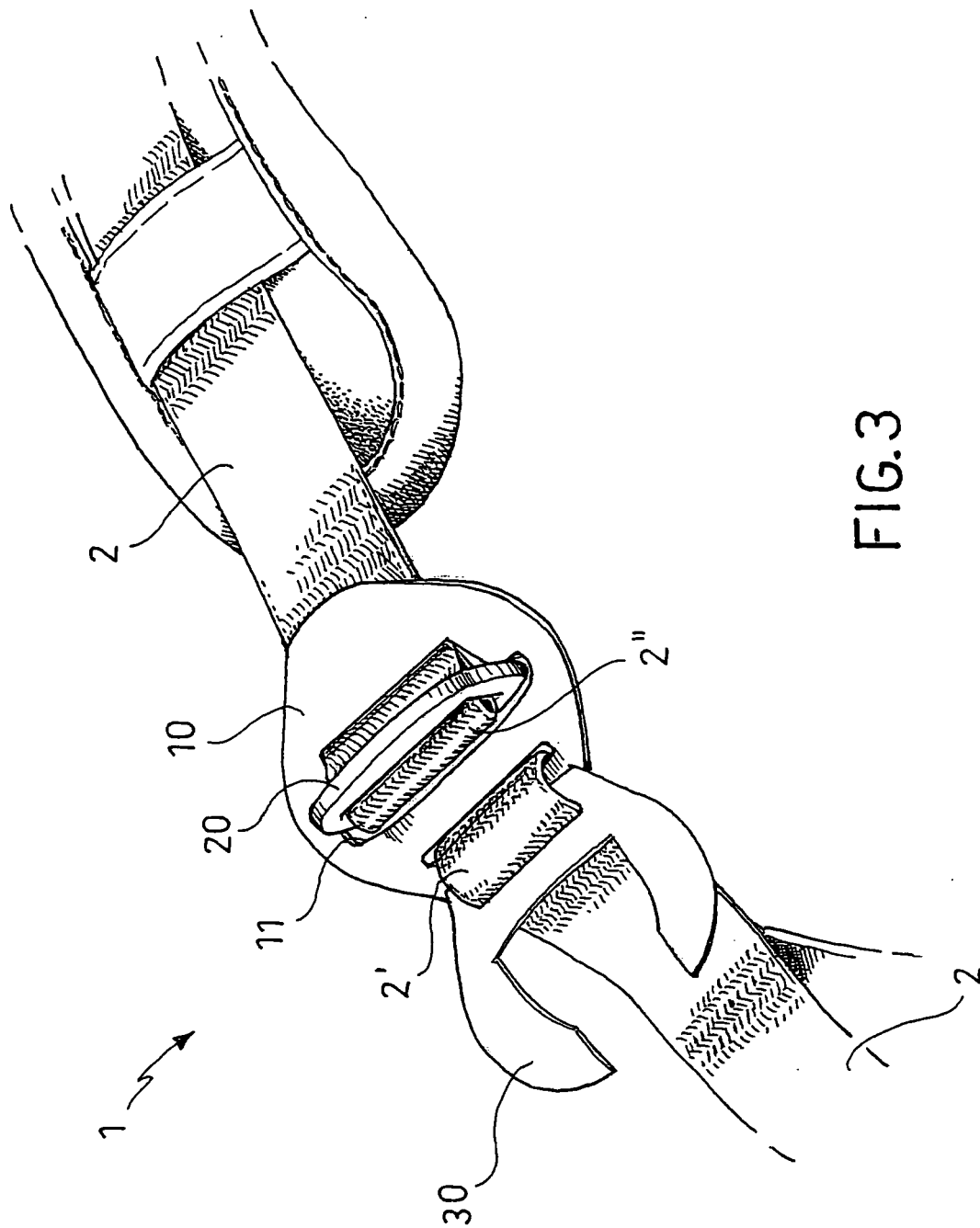


FIG.3

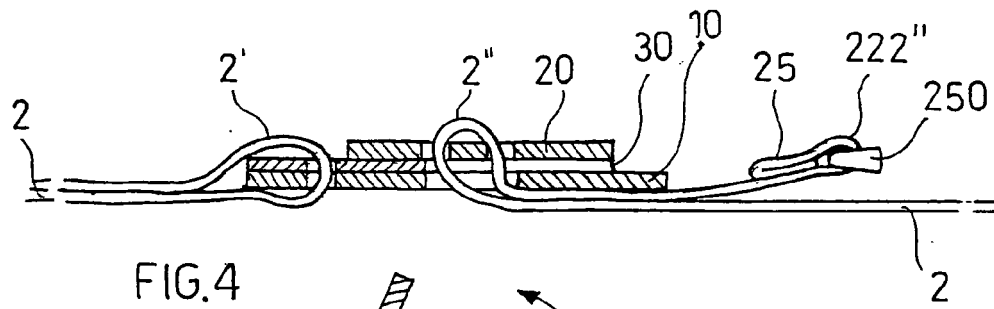


FIG. 4

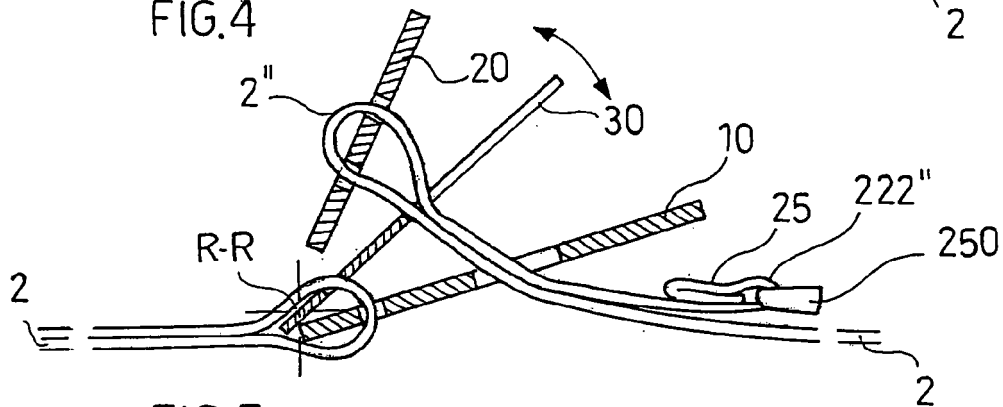


FIG. 5

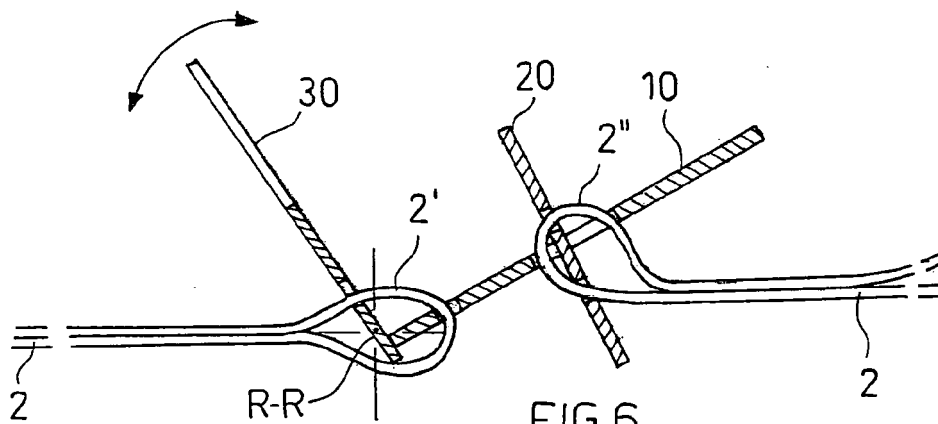


FIG. 6

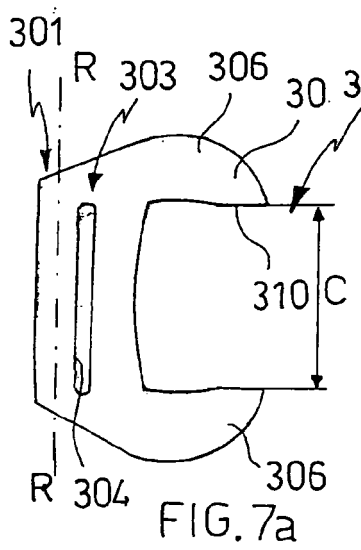


FIG. 7a

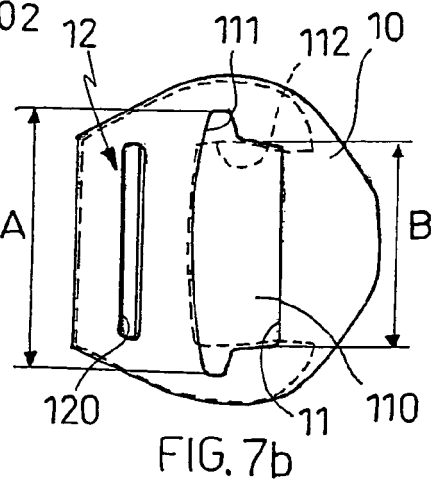


FIG. 7b

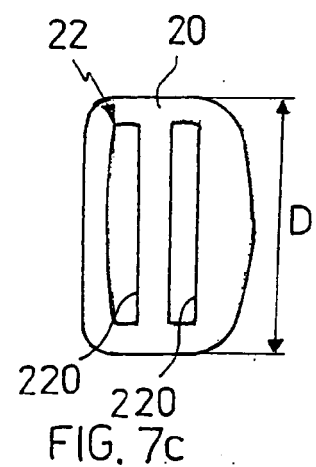


FIG. 7c