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(54) **OFF-TRACK SKI BOOT PROVIDED WITH AN IMPROVED SKI/WALK SELECTION MECHANISM**

(57) Off-track ski boot (4) comprising a lower part or shell (8), suitable to embrace the foot of the user and an upper portion or cuff (12), suitable to embrace the lower part of the skier's leg, wherein the cuff (12) is hinged to the shell (8) so as to rotate relative to the shell (8) about a hinge defining an axis of rotation (X-X), forwards, towards a tip (20) of the boot (4), and backwards, towards a heel (22) of the boot (4), wherein the boot (4) comprises fastening means (24) suitable selectively lock and/or unlock the rotation of the cuff (12) with respect to the shell (8) depending on whether the user wants to switch, respectively, from a skiing configuration to a walking configuration. Advantageously, the fastening means (24) comprise an intermediate element (28) at least partially interposed between the cuff (12) and the shell (8), wherein said intermediate element (28) comprises a pusher (32) which, in the locked configuration, causes the cuff (12) to rotate forward, the cuff (12) butting against at least one stop portion (36) positioned on the intermediate element (28) itself and/or on the shell (8), defining a limit on the travel of the cuff (12) forwards, the pusher (32) defining a limit on the travel of the cuff (12) backwards.

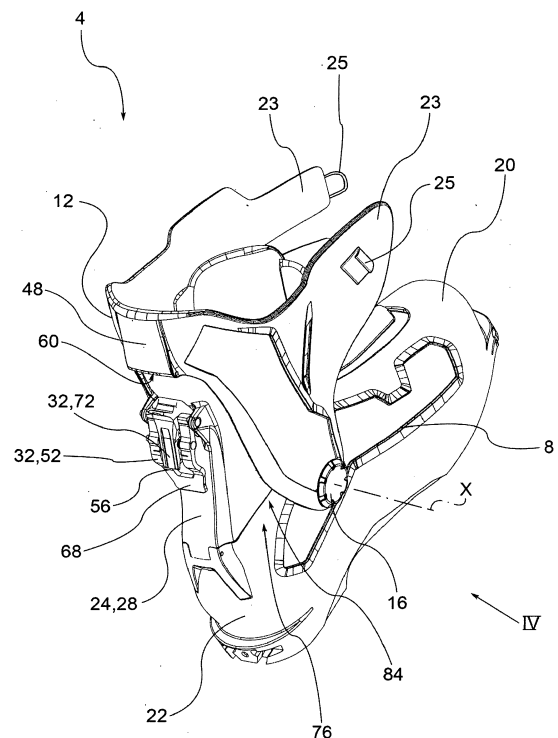


Fig.1

Description

FIELD OF APPLICATION

[0001] This invention relates to an off-track ski boot provided with an improved ski/walk selection mechanism.

STATE OF THE ART

[0002] Off-track ski boots differ from ski boots for the fact that they alternatively allow the skier to both walk or ski in the most comfortable way possible.

[0003] To allow the two configurations, respectively, of walking and skiing, they provide that the cuff portion of the boot, i.e., the upper part that embraces the lower end of the leg of the skier, can rotate with respect to the shell, i.e., the lower part of the boot that embraces the foot. In particular, the rotation of the cuff with respect to the shell favours walking and makes it easier. This relative rotation can be locked, making the leg integral to the shell, so as to allow skiing.

[0004] The transition from one configuration to the other must be as fast and easy as possible since the skier, during skiing, has the need to intervene very often on the configuration of the boot depending on the stretch of trail to be confronted from time to time.

PRESENTATION OF THE INVENTION

[0005] The main solutions of the prior art require that the cuff be hinged to the shell and that its rotation movement be guided by at least one rod.

[0006] The rod, in correspondence of a first fixed end, is hinged in turn to the shell while, in correspondence of a second free end, it slides inside a guide fixed to the cuff.

[0007] In the walking position, the free end of the rod can slide inside the guide fixed to the cuff; furthermore, in the walking condition, the rod can rotate about the first end so as to accommodate the rotation of the cuff. In the skiing position, the free end of the rod can slide integral with the guide and, thus, the cuff. Such closure or locking of the rod can take place for example by actuating a pin that engages in a hole specially made on the rod.

[0008] The solutions of the known art described above have numerous disadvantages.

[0009] Firstly, in the skiing position there is always a certain resistance to the rotation of the cuff due to the fact that the free end of the locking rod rubs against the specific seat/portion of the cuff suitable to house/guide it.

[0010] In other words, the rod tends to get stuck inside the guide thus making walking particularly tiring. The problem is further amplified due to the low operating temperature and snow/ice that, during use, further tend to get caught between the rod and related guide making it increasingly difficult for it to slide relative to it.

[0011] In addition, the type of cuff guide adopted by the known solutions imposes severe limitations on the

reciprocal positioning between the connecting hinges of the cuff to the shell and the anchorages of the guide rod. These geometric limits serve to only partially limit the problem of the sticking of the cuff but, on the other hand, create strong overall constraints on the aesthetics and functionality of the boot.

[0012] Moreover, in the skiing position, the known solutions do not provide adequate stiffness, for example comparable to that obtainable by an equivalent ski boot, in particular with the cuff of the fixed type or non-rotatable with respect to the shell.

[0013] In fact, the shape coupling between the pin/peg and the respective seat is inevitably of the free type and thus implies the presence of play, albeit limited.

[0014] Moreover, if there were no play, the locking operation by the user would become anything but convenient, since the pin would get stuck in its seat from time to time. The play, even if limited, in the shaft/hole coupling, translates into a forwards and backwards movement of the cuff with respect to the shell, even the locked or skiing configuration. Besides, this play also results in an annoying clicking sound every so often, shifting weight forwards or backwards during skiing and/or changes of direction, and a corresponding movement of the cuff.

[0015] This play reduces the stiffness of the boot and certainly reduces the precision of skiing because the user feels a lability certainly not present in ski boots without movement of the cuff.

[0016] In summary, the ski boot solutions of the prior art present excessive resistance to the rotation movement of the cuff during walking, and excessive lability of the same cuff during skiing.

[0017] In yet other words, walking is never easy because restrained, and skiing is never as precise as that obtained with a corresponding ski boot, due to the movement of the cuff with respect to the shell even in the closed/locking configuration.

[0018] It should then be noted that the two requirements, namely ease of walking and precision in skiing, are often antithetical to the practicality of use since, on the one hand, rigid, precise closing mechanisms stiffen the structure of the boot, on the other, they are not very easy to operate by the user. The practicality of actuation should never be neglected since, during a hiking-skiing excursion, the user must be able to lock/unlock the ski-walk mechanism even dozens of times an hour, without ever having to take off his gloves and often without even completely stopping.

[0019] The purpose of this invention is to provide an off-track ski boot that solves the drawbacks cited with reference to the known art.

[0020] These drawbacks and limitations are solved by an off-track ski boot according to claim 1.

[0021] Other embodiments of the boot according to the invention are described in the subsequent claims.

DESCRIPTION OF THE DRAWINGS

[0022] Further characteristics and advantages of this invention will be more understandable from the following description of its preferred and non-limiting examples of embodiments, wherein:

Figure 1 is a perspective view of a boot according to this invention, in the open configuration, with the cuff in the forward position;

Figure 2 is a perspective view of a boot according to this invention, in the open configuration, with the cuff in a slightly retracted position;

Figure 3 is a perspective view of a boot according to this invention, in the closed configuration, with the cuff in a fixed position;

Figure 4 is a side view of the boot of Figure 1, from the side of the arrow IV of Figure 1;

Figure 5 is a side view of the boot of Figure 5, from the side of the arrow V of Figure 5;

Figure 6 is a side view of the boot of Figure 3, from the side of the arrow VI of Figure 3;

Figure 7 is a side view, of a boot according to this invention, in a configuration of total retraction of the cuff with respect to the shell;

Figures 8-9 are perspective views of a boot according to this invention, in which some elements have been represented only partially to allow a better view of the internal parts of the shell of the boot;

Figures 10-11 are perspective views and a front view of a detail of the boot according to an embodiment of this invention.

[0023] The members, or parts of members, in common between the embodiments described below will be indicated with the same reference numbers.

DETAILED DESCRIPTION

[0024] With reference to the aforesaid figures, the number 4 globally indicates an off-track ski boot consisting of a lower part or shell 8, suitable to enclose the foot of the user or skier and an upper part or cuff 12, suitable to enclose the lower part of the skier's leg.

[0025] The definitions of shell and cuff should be considered in a general and not restrictive manner: this invention presents no type of limitation with respect to shapes, sizes, materials, type of shell and cuff and therefore the invention also covers types of shell and cuff that at least partially embrace the foot and the upper part of the leg, i.e., the shin of the skier.

[0026] In the type of ski touring boot, as in the case of this invention the cuff 12 is hinged to the shell 8 with respect to hinges 16 defining an axis of rotation X-X, so as to rotate relative to the shell about said axis of rotation X-X.

[0027] The type of hinge 16 can be varied and, preferably, there is provided a pair of hinges 16 arranged on

opposite sides with respect to the cuff 12.

[0028] Preferably, the hinges 16 identify a horizontal rotation axis X-X, i.e., parallel to a sole 18 of the boot 4.

[0029] The cuff 12 is hinged to the shell 8 so as to be able to rotate relative to the shell 8 around said hinges 16 both forwards, i.e., towards a tip 20 of the boot 4, and backwards toward a heel 22 of the boot 4.

[0030] According to an embodiment, the cuff 12 and/or the shell 8 are provided with flaps 23 provided with closing means 25 such as for examples levers, hooks, and racks of the known type.

[0031] The boot 4 comprises fastening means 24 suitable to selectively lock the rotation of the cuff 12 with respect to the shell 8 depending on whether the user wishes to pass from a skiing configuration to a walking configuration, respectively.

[0032] It should be noted that selective locking/unlocking means that the user can actuate the fastening means 24, as better described below, to switch at will from one configuration to another.

[0033] Preferably the fastening means 24 may be made of plastic, possibly loaded, or a metal material preferably obtained by forging or die-casting.

[0034] Advantageously, the fastening means 24 comprise an intermediate element 28 at least partially interposed between the cuff 12 and the shell 8, wherein said intermediate element 28 comprises a pusher 32 that, in the locked configuration, causes the cuff 12 to rotate forward, the cuff 12 butting against at least one stop portion 36 positioned on the intermediate element 28 itself and/or on the shell 8.

[0035] The stop portion 36 defines a limit on the travel of the cuff 12 forwards, while the pusher 32 defines a limit on the travel of the cuff 12 backwards, when the fastening means 24 are in the locked or "skiing" configuration.

[0036] The pusher 32 is configured so that, in the locked configuration, the cuff 12 is elastically caused to butt against the stop portion 36, so as to reach the limit of rotation travel forward, while the pusher 32 itself is compressed by the cuff 12 so as to realise the limit of rotation travel backwards.

[0037] The intermediate element 28, in the closed configuration, is compressed between the cuff 12 and the shell 8 so as to realise a bilateral fastening to the forwards and backwards rotation of the cuff 12 with respect to the shell 8.

[0038] According to an embodiment, the intermediate element 28 comprises a spoiler, in turn hinged at a first hinging end 40 to the shell 8, the spoiler supporting, at a second end 44, said pusher 32.

[0039] According to an embodiment, the first hinging end 40 of the spoiler is positioned in a retracted position with respect to said hinges 16 of the cuff 12, from the side of the heel 22 of the boot 4.

[0040] According to an embodiment, the first hinging end 40 of the spoiler is positioned in a raised position with respect to said hinges 16 of the cuff 12, from the

side opposite the heel 22 of the boot 4.

[0041] According to an embodiment, the cuff 12 comprises an arched portion 48, at least partially overlapping the intermediate element 28 in the forward rotation of the intermediate element 28, and wherein said arched portion 48 creates an undercut which rests on a stop portion 36 of the intermediate element 28, in the forward rotation of the cuff 12 itself.

[0042] In other words, the pusher 32 exerts a forward thrust on the cuff 12, which in turn impacts with the arched portion 48 against the stop portion 36 of the intermediate element 28 and locks.

[0043] According to an embodiment, the pusher 32 comprises an actuating lever 52 rotatably coupled to the intermediate element 28 so as to switch from a raised or active configuration, in which the pusher 32 exerts a forward thrust action on the cuff 12, to a lowered or inactive configuration, in which it exerts no action on the cuff 12, enabling the latter to rotate backwards without interfering with the intermediate element 28.

[0044] For example, the cuff 12 has an arched portion 48 shaped so that, in the unlocked configuration the fastening means 24, the arched portion 48 surrounds the actuating lever 52 so as to be free to rotate backwards beyond the intermediate element 28 without interfering with the intermediate element 28 and without dragging it in rotation.

[0045] In this way the cuff 12 does not meet any constraint or resistance in the backward rotation, obviously in the unlocked configuration of the fastening means 24.

[0046] As regards the forward rotation, the cuff does not, in its turn, meet any constraint until it reaches the limit of travel forwards.

[0047] According to an embodiment, the pusher 32 comprises a supporting wall 56 shaped so as to jam itself against an arched portion 48 or cross member of the cuff 12, facing the heel 22 of the boot 4 and straddling the hinges 16.

[0048] For example, said supporting wall 56 has a concave shape so as to accommodate an edge or projection 60 of said arched portion 48 or cross member of the cuff 4.

[0049] According to a further possible embodiment, the supporting wall 56 is shaped so as to engage the arched portion 48 or cross member.

[0050] The eventual coupling of the supporting wall 56 and therefore of the pusher 32 to the arched portion 48 of the cuff 12 can stiffen the arched portion 48 so as to control the possible deformation/elastic twisting under load.

[0051] Preferably, the pusher 32 and the intermediate element 28 are shaped so that, in the closed configuration, a thrust action of the cuff 12 backwards generates a moment that further the locks the pusher 32 in the closed position, relieving said thrust action on the intermediate element 28 and, through this, on the shell 8.

[0052] In this way, further stiffening of the boot is achieved in the locked configuration of the fastening means 24, since any backwards rotation imposed by the

user is not transformed into a deformation or bending of the cuff, which would be felt as a yielding by the user, but is transformed into a further compression of the intermediate element, which tends to further tighten the cuff 12 relative to the shell 8.

[0053] This effect of additional closure may be obtained by suitably playing on the mutual positions of the hinges of the pusher 32 and the first hinging end 40.

[0054] The pusher 32 may in turn be provided with a preload spring 64 for elastically influencing it to lock in the desired position, be it of opening or closing.

[0055] For example, the actuating lever 52 may comprise a gripping portion 68 in turn hinged to the intermediate element 28 which protrudes from the intermediate element so as to facilitate its gripping by a user.

[0056] According to an embodiment, the gripping portion 68 is hinged to the intermediate element 28, for example in correspondence of the second end 44, and in turn rotatably supports a rod 72 that acts as a pusher against the cuff 12. This double hinging guarantees the jamming of the rod 72 and therefore of the pusher 32 against the cuff 12, in the locking configuration of the fastening means 24.

[0057] According to an embodiment, the intermediate element 28 is counter-shaped relative to a rear portion 76 of the shell 8, arranged on the side of the heel 22, so as to delimit with the shell 8 a housing compartment of the lower part of the leg of the skier.

[0058] The intermediate element 28 comprises a perimeter profile 80 that rests against at least one supporting wall 84 of the shell 8 to stop the forward rotation of the intermediate element 28, defining a limit of travel in rotation forwards of the intermediate element 28, and thus of the cuff 12.

[0059] According to an embodiment, the intermediate element 28 is shaped so that a projection of its centre plane M-M, perpendicular to the hinging axis X-X, has an overall triangular configuration, in which two sides 88,90 of the triangle are counter-shaped with respect to the shell 8 so as to create a limit to the forward rotation of the intermediate element 28 and thus of the cuff 12.

[0060] For example, the third side 92 of the triangle, opposite to the first two 88,90, is facing a rear portion 76 of the boot 4 and supports the pusher 32.

[0061] Obviously, to each side of the said triangular projection of the intermediate element 28 on the centre plane M-M, there corresponds a pair of walls that defines the perimeter profile 80 of the intermediate element 28. These walls but against counter-shaped edges or profiles 96 of the supporting wall 84 of the shell 8.

[0062] On these counter-shaped edges or profiles 96 of the supporting wall 84 are discharged the thrust forces that the intermediate element 28 receives from the cuff 12.

[0063] According to a possible embodiment, the stop portion 36 to the rotation of the cuff 12 is at least partially positioned on the shell 8, so as to receive in abutment at least a portion of the cuff 12 when the fastening means

24 are in locked configuration.

[0064] For example, said stop portion 36 could be at least partially positioned in a portion of the shell 8 between the hinges 16 of the cuff 12 and the tip 20 of the boot 4.

[0065] As can be appreciated from the description, the off-track ski boot according to the invention allows overcoming the drawbacks presented in the prior art.

[0066] In particular, in the opening or unlocking configuration, the rotation of the cuff with respect to the shell does not encounter any resistance noticeable by the user, since the cuff does not encounter obstacles to rotation, in particular in backwards rotation.

[0067] Furthermore, the locking of the cuff with respect to the shell is extremely rigid and does not provide any play that could allow even small movements of the cuff with respect to the shell.

[0068] In fact, the solution of this invention provides for the presence of two unilateral constraints, distinct and opposite each other, so that each stops a direction of rotation of the cuff with respect to the shell.

[0069] In fact, the pusher influences the cuff to rotate forward against the stop portion which represents the end of travel forward.

[0070] In addition, the same pusher represents a block or limit to the backwards rotation of the cuff.

[0071] As seen, in the closed configuration of the intermediate portion is in a state of compression so as to prevent any type of play or movement that can reduce the feeling of stiffness and precision by the user.

[0072] In this way there is no possibility of play or slack of the cuff since any rotation/movement of the cuff is prevented by the fastening means.

[0073] This architecture gives a high rigidity to the structure of the boot entirely comparable with respect to that of the corresponding ski boots. Therefore the skier, in the closed or locking configuration, has the feeling of using a ski boot since he feels a high stiffness and guiding precision; in addition, the skier does not receive any feeling of play or slack and does not hear any noise due to contact between parts coupled to each other, as happens in the solutions of the known art.

[0074] Furthermore, the boot according to this invention is extremely easy to use since the locking/unlocking is performed with a simple movement of the actuating lever.

[0075] The locking and unlocking mechanism is extremely reliable and easy to use: it can be easily and repeatedly operated by the user even when wearing gloves.

[0076] Moreover, thanks to the solution of this invention, there are no constraints for the positioning of the hinges of the cuff with respect to the shell: in this way the designer has more design freedom.

[0077] In addition, the locking mechanism is displaced in a position protected from accidental impacts as it is located in the upper part of the boot, well above the malleolus; plus, the arched portion of the cuff in fact realises

a shield, at least partially, of the locking mechanism.

[0078] A person skilled in the art, in order to satisfy contingent and specific needs, may make numerous modifications and variations to the boots described above, all however contained within the scope of the invention as defined by the following claims.

Claims

1. Off-track ski boot (4) comprising a lower part or shell (8), suitable for enclosing the user's foot and an upper part or cuff (12), suitable for enclosing the lower part of the skier's leg,

- wherein the cuff (12) is hinged to the shell (8) so as to rotate relative to the shell (8) around hinges defining a rotation axis (X-X), forward, toward a tip (20) of the boot (4), and backwards toward a heel (22) of the boot (4),

- in which the boot (4) comprises a means of fastening (24) suitable for selectively locking and/or unlocking the rotation of the cuff (12) with respect to the shell (8) depending on whether the user wants to switch from, respectively, a skiing configuration to a walking configuration, **characterised in that**

- the fastening means (24) comprise an intermediate element (28) at least partially interposed between the cuff (12) and the shell (8), wherein said intermediate element (28) comprises a pusher (32) which, in the locked configuration, causes the cuff (12) to rotate forward, the cuff (12) butting against at least one stop portion (36) positioned on the intermediate element (28) itself and/or on the shell (8), defining a limit on the travel of the cuff (12) forward, the pusher (32) defining a limit on the travel of the cuff (12) backwards.

2. Alpine ski boot (4) according to claim 1, wherein the pusher (32) is configured so that, in the locked configuration, the cuff (12) is elastically caused to butt against the stop portion (36), so as to reach the limit of rotation travel forward, and the pusher (32) itself is compressed by the cuff (12) so as to realise the limit of rotation travel backwards.

3. Off-track ski boot (4) according to claim 1 or 2, wherein the intermediate element (28), in the closed configuration, is compressed between the cuff (12) and the shell (8) so as to realise a bilateral fastening to the forwards and backwards rotation of the cuff (12) with respect to the shell (8).

4. Off-track ski boot (4) according to any one of claims 1 to 3, wherein the intermediate element (28) comprises a spoiler, in turn hinged at a first hinging end

(40) to the shell (8), the spoiler supporting, at a second end (44), said pusher (32).

5. Off-track ski boot (4) according to claim 4, wherein the first hinging end (40) of the spoiler is positioned in a retracted position with respect to said hinges (16) of the cuff (12), from the side of the heel (22) of the boot (4). 5
6. Off-track ski boot (4) according to claim 4 or 5, wherein the first hinging end (40) of the spoiler is positioned in a raised position with respect to said hinges (16) of the cuff (12), from the side opposite the heel (22) of the boot (4). 10
7. Off-track ski boot (4) according to any one of the preceding claims, wherein the cuff (12) comprises an arched portion (48), at least partially overlapping the intermediate element (28) in the forward rotation of the intermediate element (28), and wherein said arched portion (48) creates an undercut which rests on a stop portion (36) of the intermediate element (28), in the forward rotation of the cuff (12) itself. 15 20
8. Off-track ski boot (4) according to any of claims 1 to 7, wherein the pusher (32) comprises an actuating lever (52) rotatably coupled to the intermediate element (28) so as to switch from a raised or active configuration, in which the pusher (32) exerts a forward thrust action on the cuff (12), to a lowered or inactive configuration, in which it exerts no action on the cuff (12), enabling the latter to rotate backwards without interfering with the intermediate element (28). 25 30
9. Off-track ski boot (4) according to claim 8, wherein the cuff (12) has an arched portion (48) shaped so that, in the unlocked configuration of the fastening means (24), said arched portion (48) surrounds the actuating lever (52) so as to be free to rotate backwards beyond the intermediate element (28) without interfering with the intermediate element (28) and without dragging it in rotation. 35 40
10. Off-track ski boot (4) according to any of claims 1 to 9, wherein the pusher (32) comprises a supporting wall (84) shaped so as to jam itself against an arched portion (48) or cross member of the cuff (12), facing the heel (22) of the boot (4) and straddling the hinges (16), wherein said supporting wall (56) has a concave shape so as to accommodate an edge or projection (60) of said arched portion (48) or cross member of the cuff (4). 45 50
11. Off-track ski boot (4) according to any of claims 8 to 10, wherein the pusher (32) and the intermediate element (28) are shaped so that, in the closed configuration, a thrust action of the cuff (12) backwards 55

generates a moment that further locks the pusher (32) in the closed position, relieving said thrust action on the intermediate element (28) and, through this, on the shell (8).

12. Off-track ski boot (4) according to any one of claims 8 to 11, wherein the actuating lever (52) comprises a gripping portion (68) in turn hinged to the intermediate element (28), the gripping portion (68) projecting from the intermediate element (28) so as to facilitate the gripping thereof by a user, in which the gripping portion (68) is hinged to the intermediate element (28) and in turn rotatably supports a rod (72) which acts as a pusher (32) against the cuff (8), so as to favour the jamming of the rod (72) against the cuff (8), in the locking configuration of the fastening means (24). 5
13. Off-track ski boot (4) according to any of claims 1 to 12, wherein the intermediate element (28) is counter-shaped relative to a rear portion (76) to the shell (8), arranged on the side of the heel (22), so as to delimit, together with the shell (8), a housing compartment of the lower part of the skier's leg, the intermediate element (28) comprising a perimeter profile which rests against at least one supporting wall (84) to stop the forward rotation of the spoiler, defining a limit of the forward travel rotation of the intermediate element (28) and thus of the cuff (12). 10 15 20 25 30
14. Off-track ski boot (4) according to any one of claims 1 to 13, wherein the intermediate element (28) is shaped so that a projection of its centre plane (M-M), perpendicular to the hinging axis (X-X), has an overall triangular configuration, in which two sides (88, 90) of the triangle are counter-shaped with respect to the shell (8) so as to create a limit to the forward rotation of the intermediate element (8) and thus of the cuff (12). 35 40
15. Off-track ski boot (4) according to any one of the preceding claims, wherein said stop portion (36) to the rotation of the cuff (12) is at least partially positioned on the shell (8), so as to receive in abutment at least a portion of the cuff (12) when the fastening means (24) are in locked configuration. 45 50 55

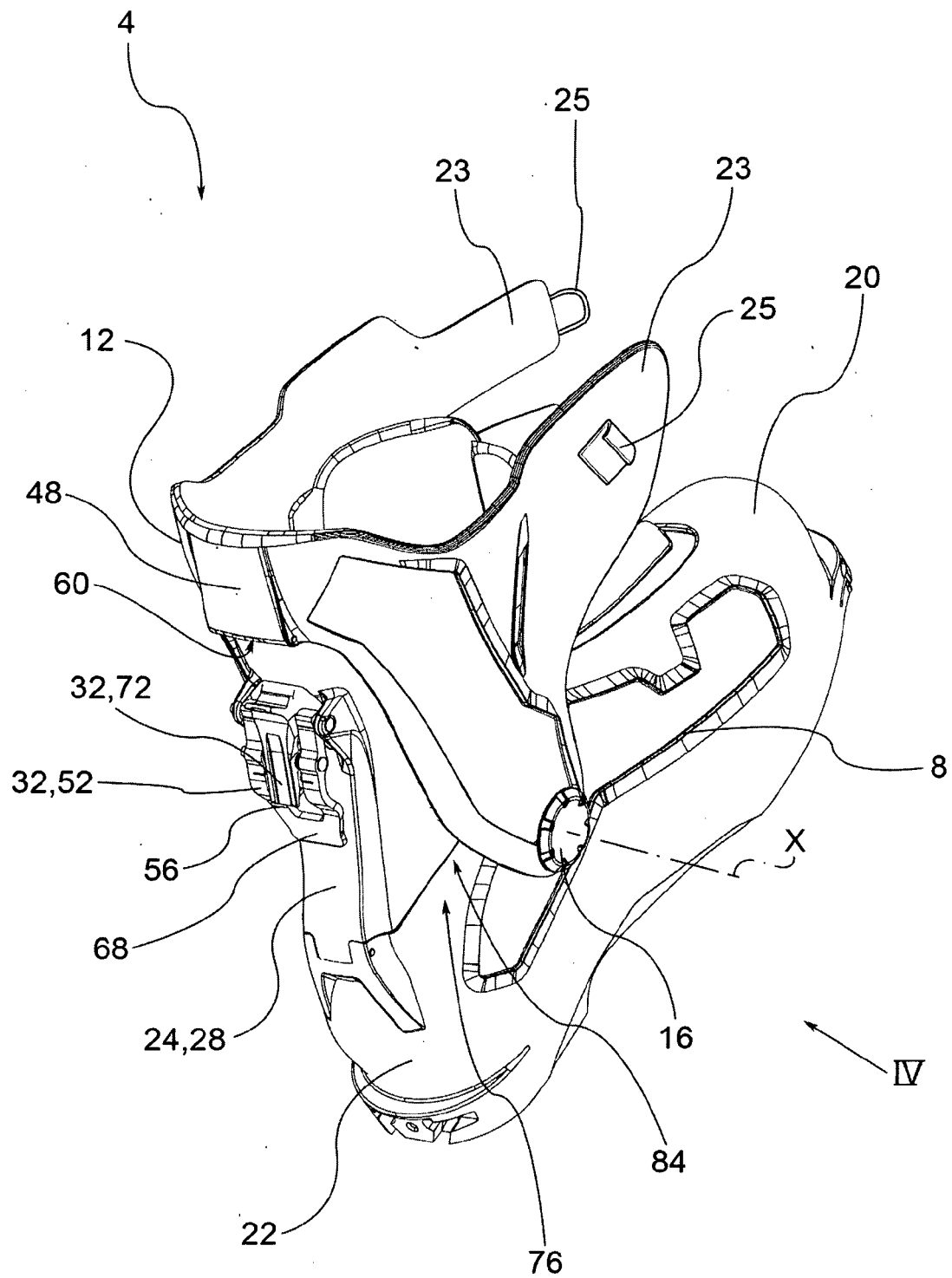


Fig.1

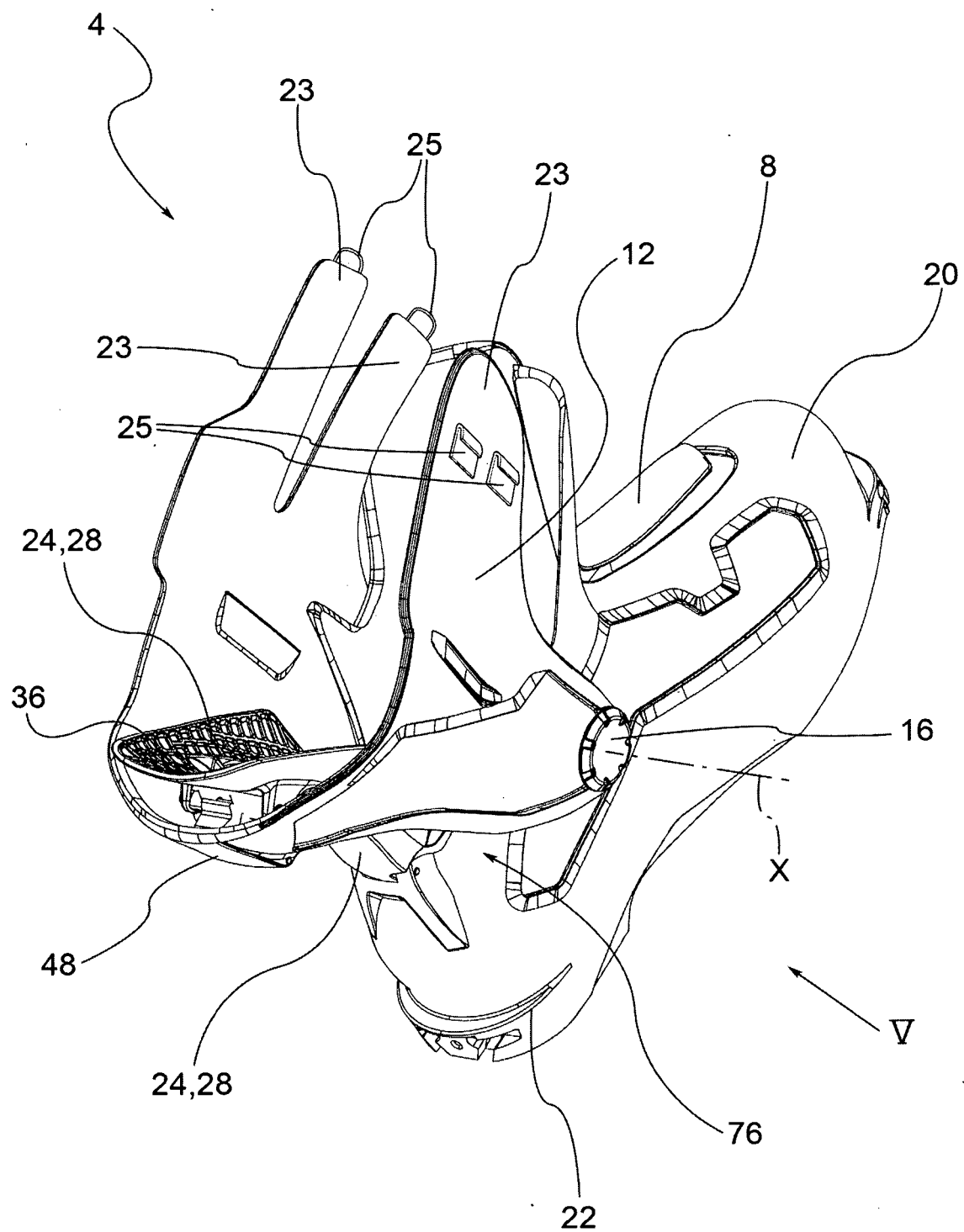


Fig.2

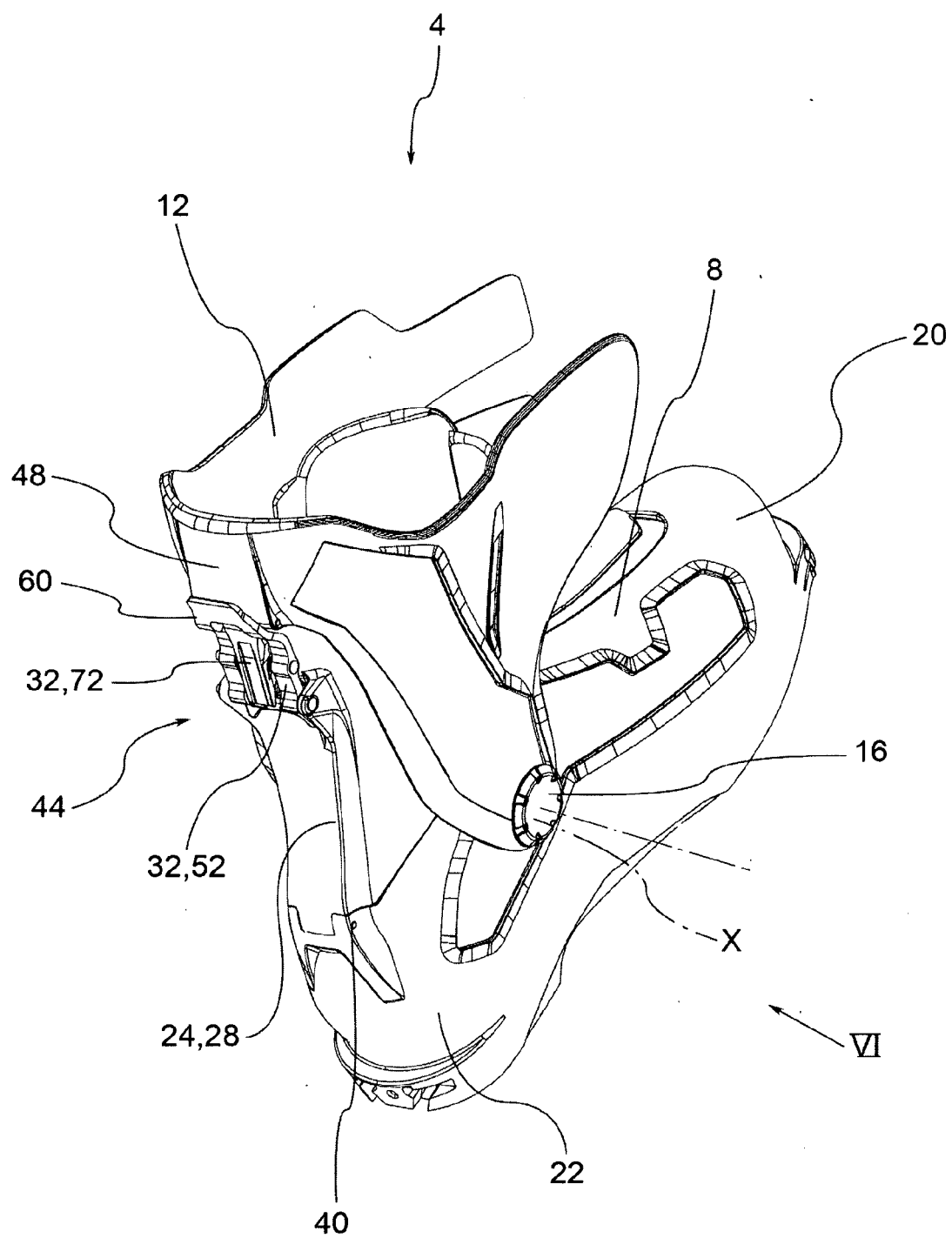


Fig.3

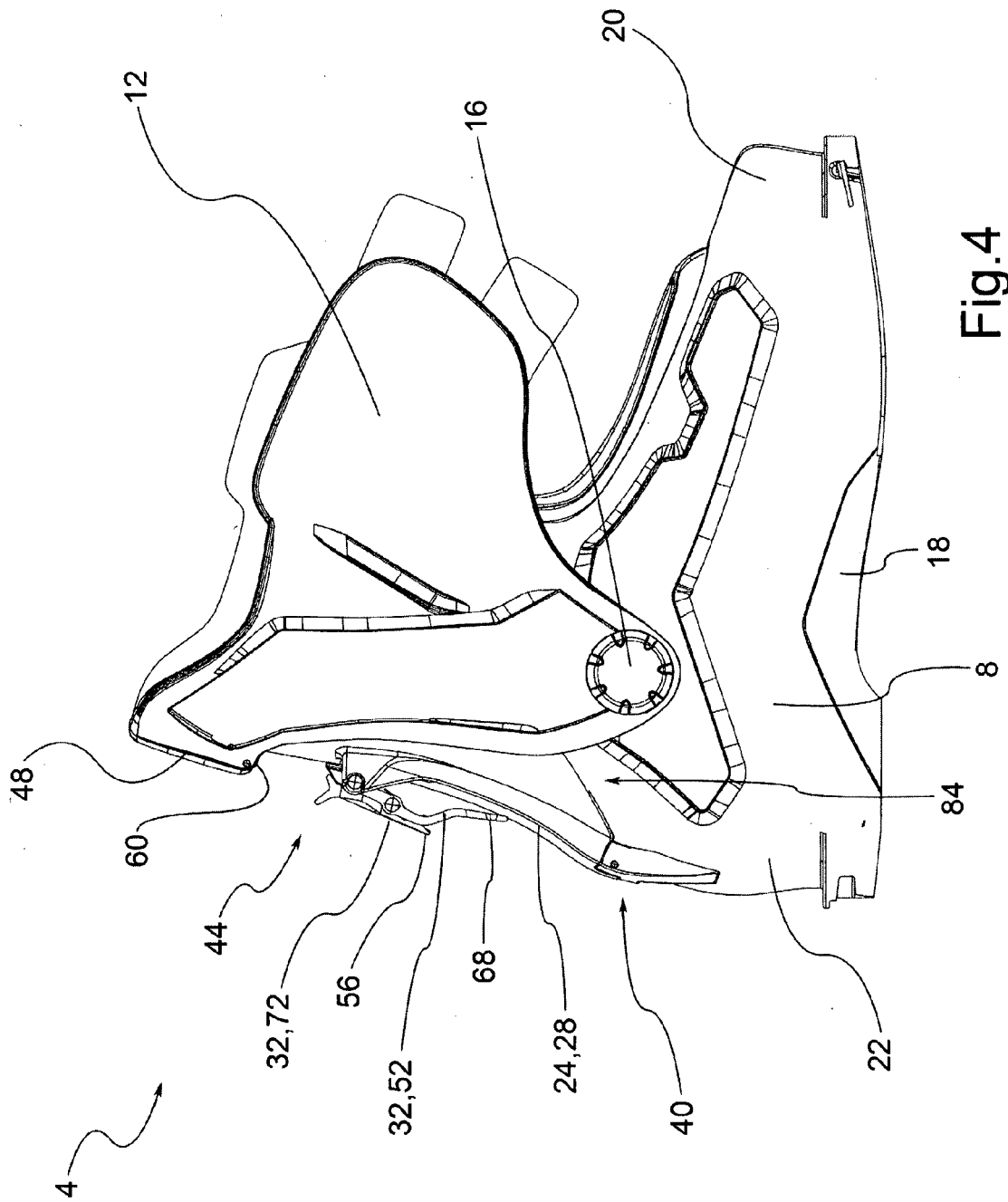


Fig.4

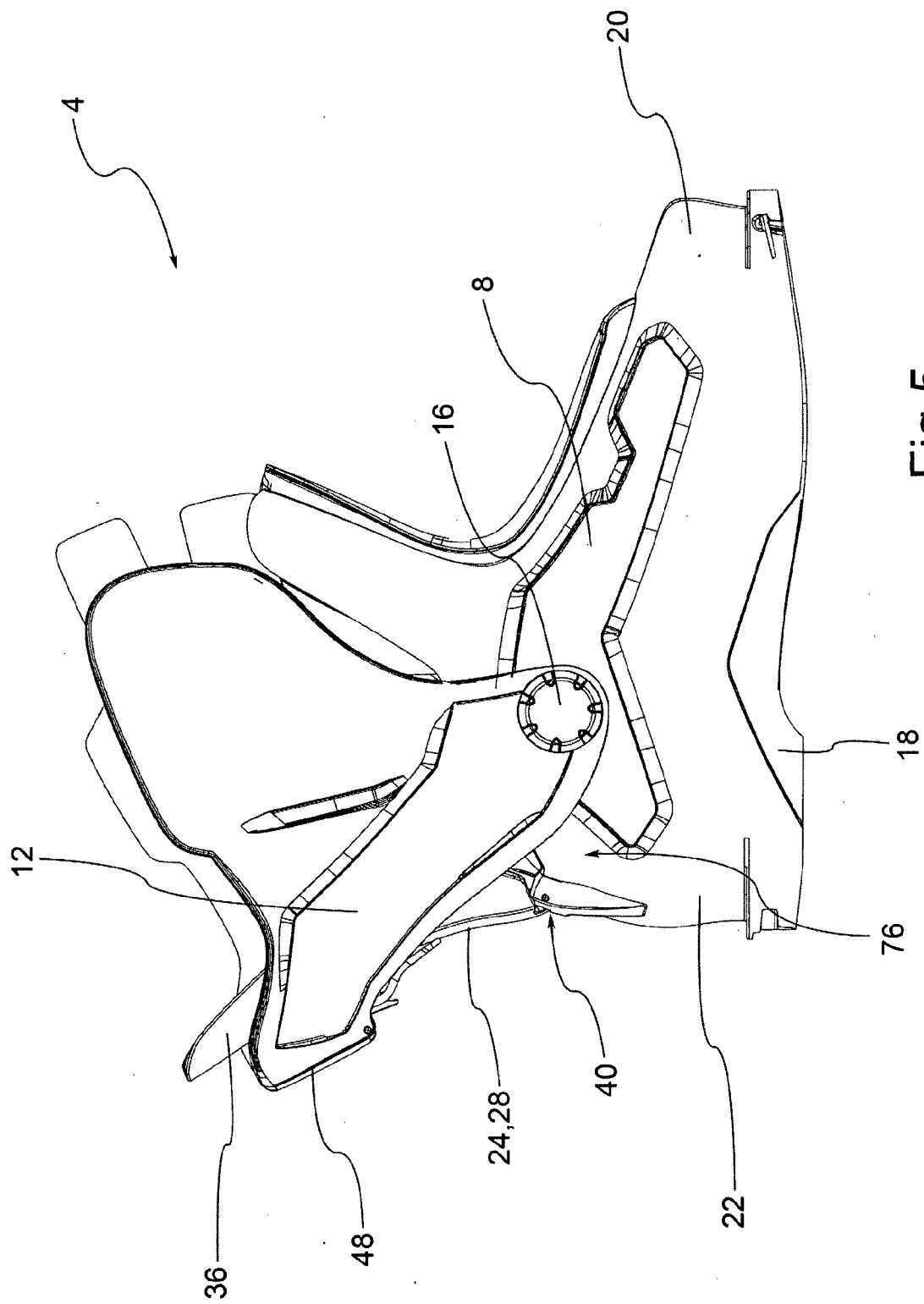


Fig.5

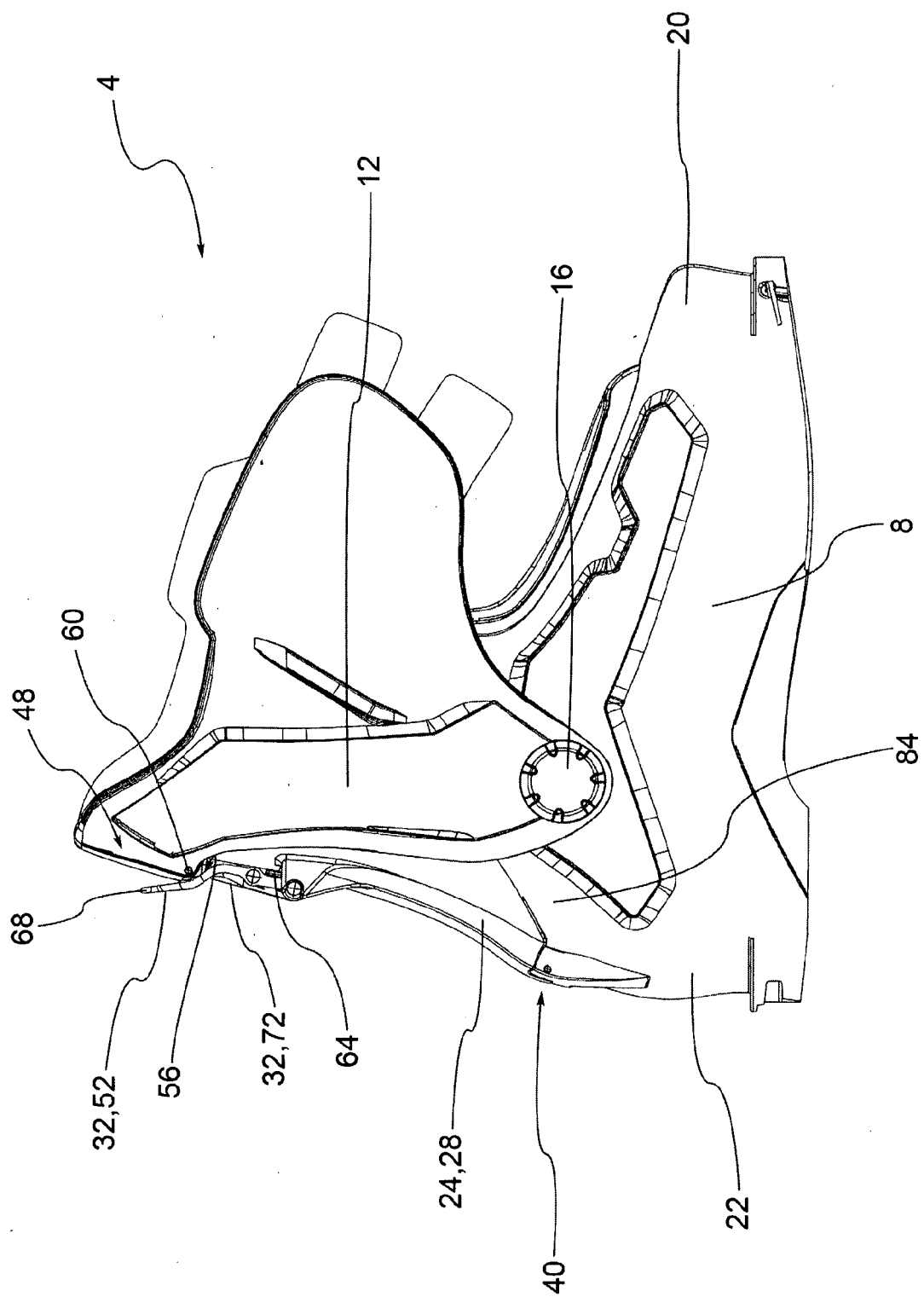


Fig.6

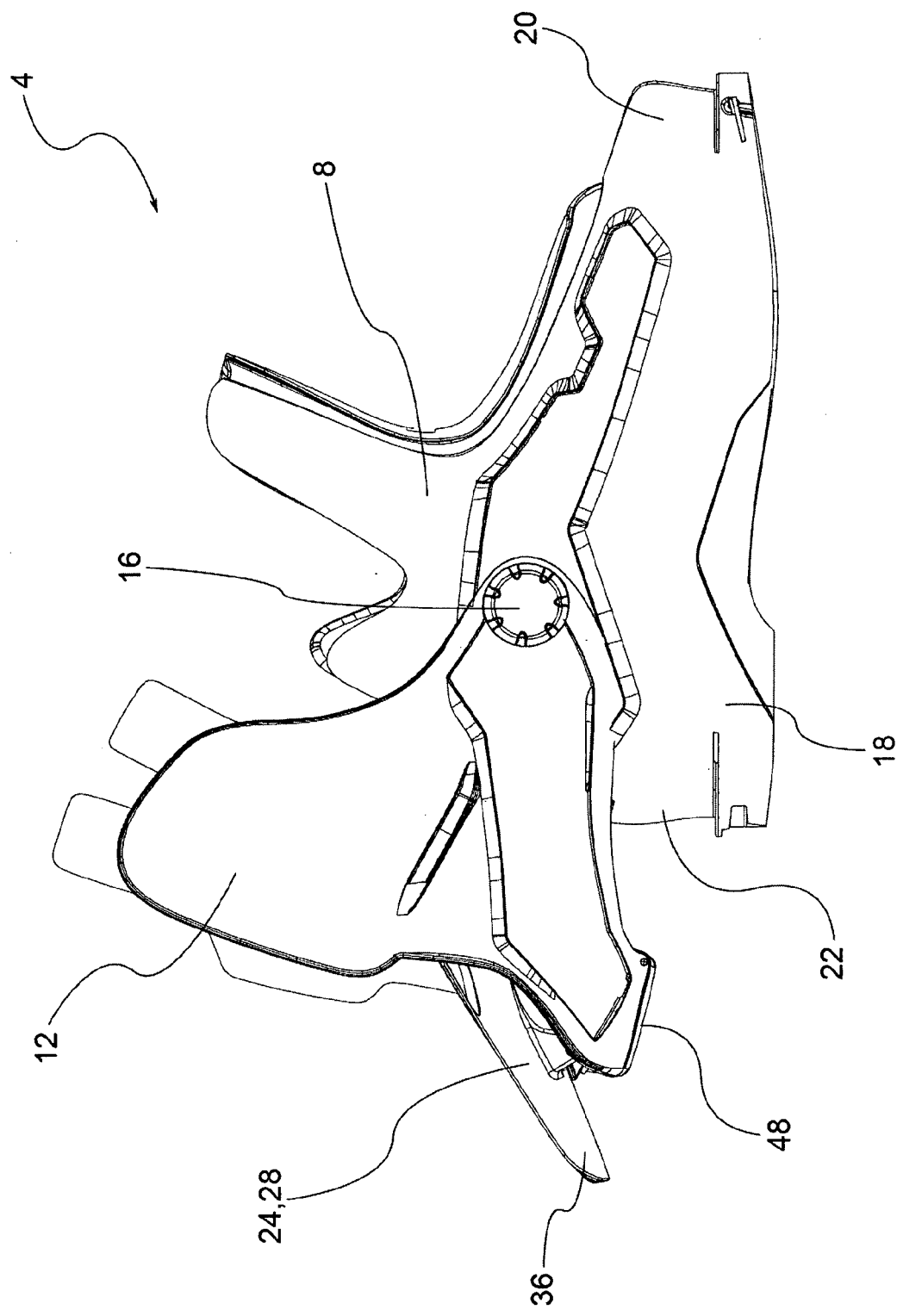


Fig.7

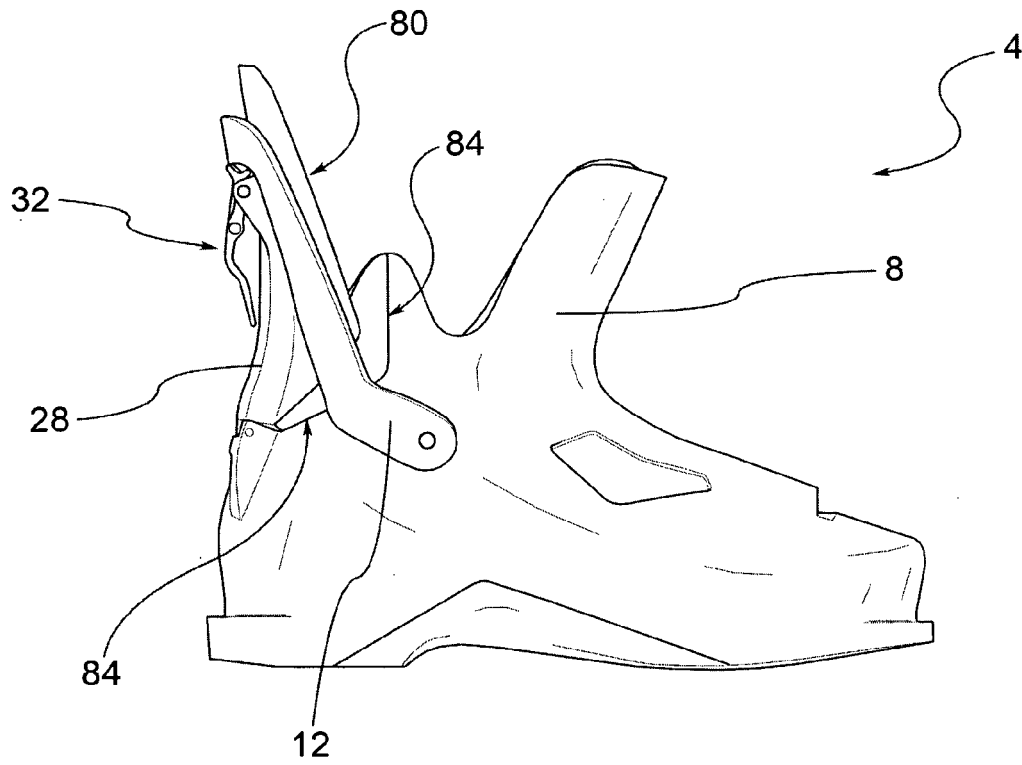


Fig.8

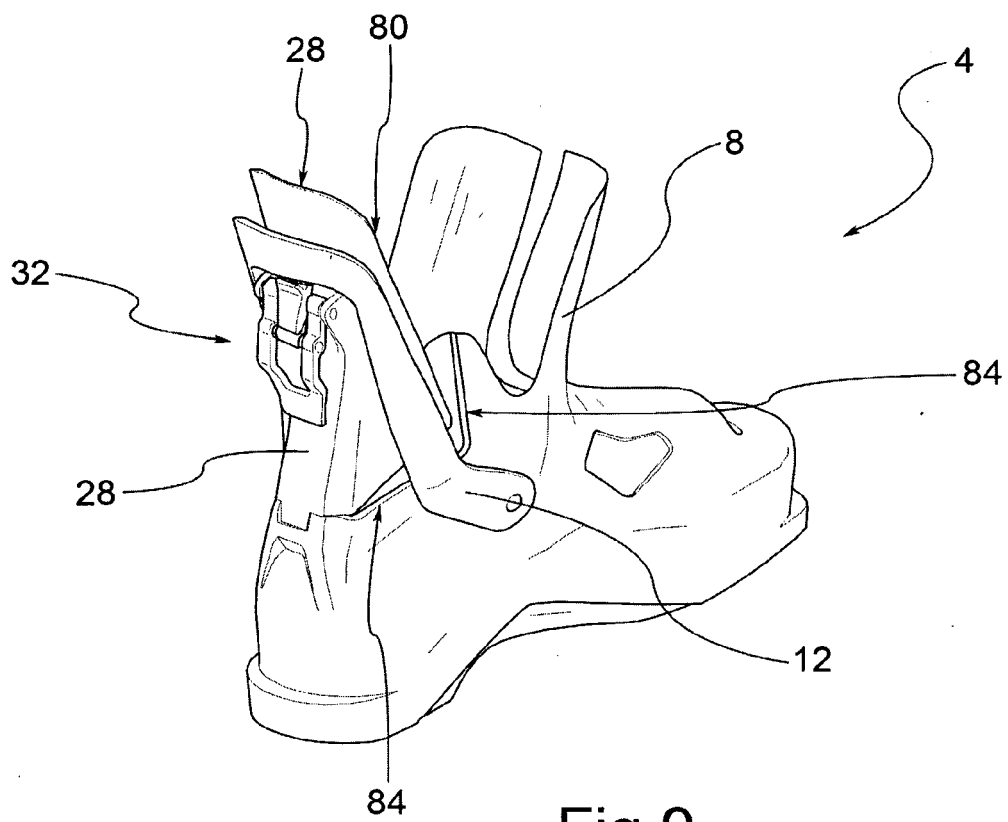


Fig.9

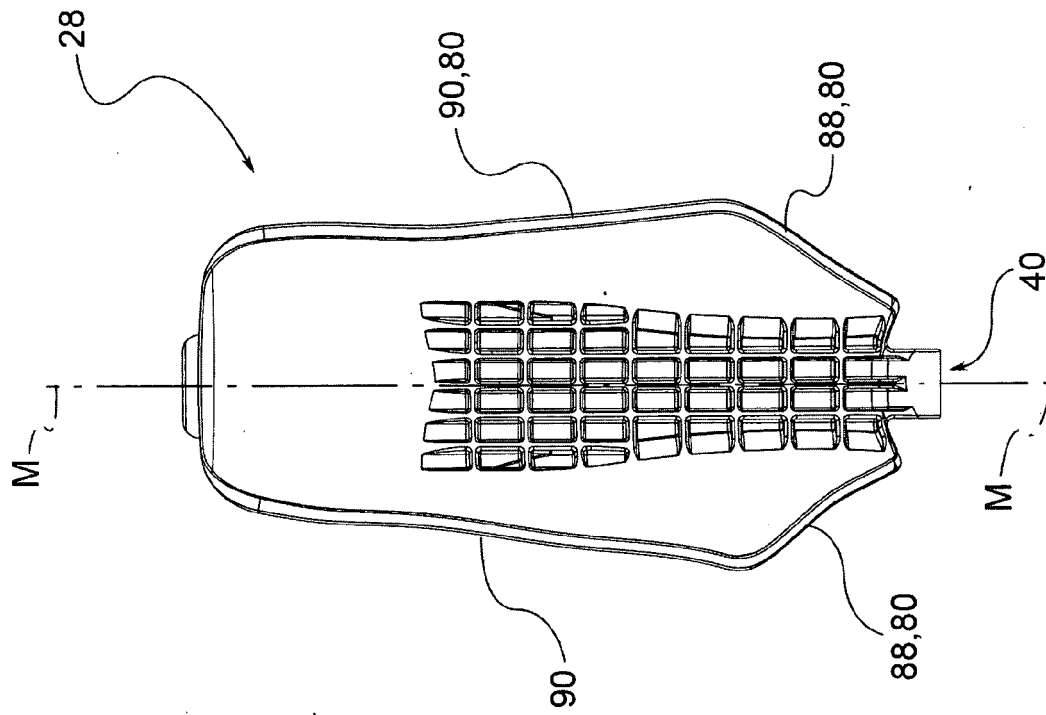


Fig. 11

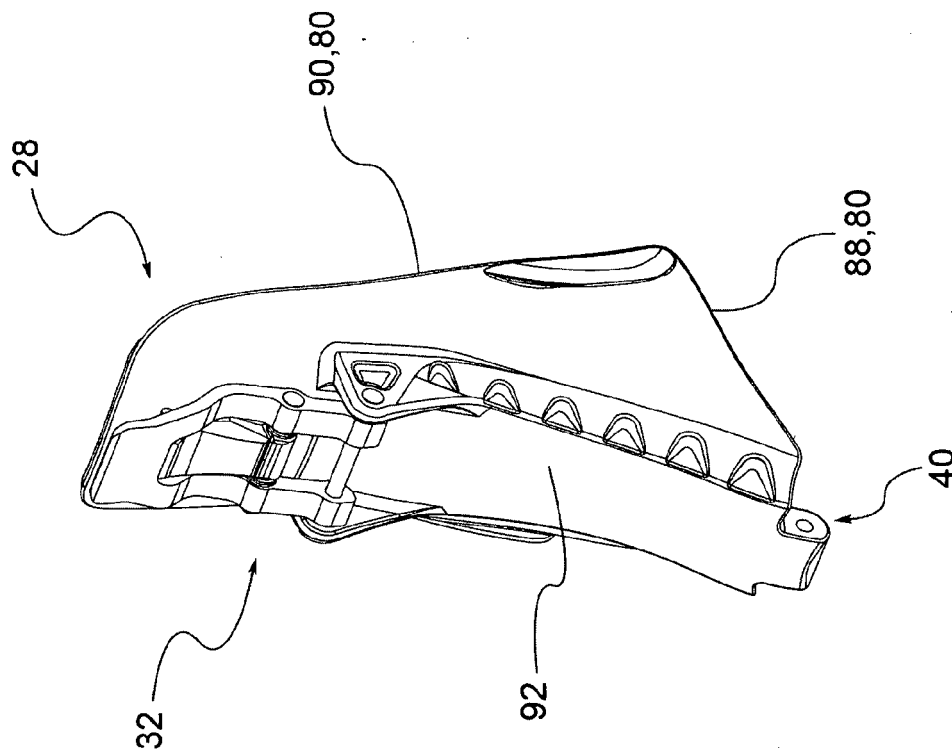


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 15 00 3136

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 470 383 A1 (SALOMON SA [FR]) 12 February 1992 (1992-02-12)	1,3,7	INV. A43B5/04
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