



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.12.2018 Bulletin 2018/51

(51) Int Cl.:
A43C 15/06 (2006.01)

(21) Application number: **17175860.0**

(22) Date of filing: **13.06.2017**

(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:
MA MD

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(54) **CRAMPON WITH FASTENING SYSTEM**

(57) The invention provides a crampon 10 comprising a shoe support 20 having at least one tooth 22 for engaging the ground and a fastening system 30 for fastening the shoe support 20 to a shoe 12, wherein the fastening system 30 comprises a heel fixing portion 32 connected to the shoe support 20, a loop strap 34 attached to the heel fixing portion 32, wherein the loop strap

34 forms a loop adapted to accommodate a shoe 12, and a connecting element 36 adapted to open and close the loop of the loop strap 34, wherein the fastening system 30 further comprises an adjusting element 38 adapted to adjust a length of the loop strap 34 such as to adjust the size of the loop.

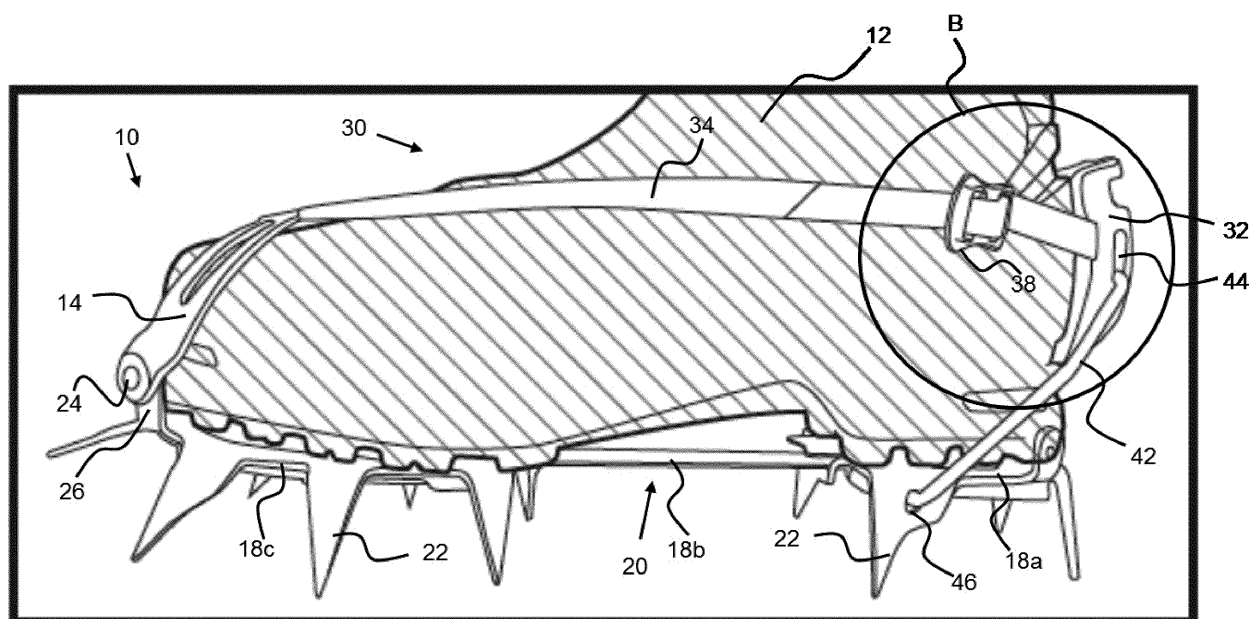


FIG. 3

Description

[0001] The present invention relates to a crampon comprising a shoe support having at least one tooth for engaging the ground and a fastening system for fastening the shoe support to a shoe. The fastening system comprises a heel fixing portion connected to the shoe support, a loop strap attached to the heel fixing portion, wherein the loop strap forms a loop adapted to accommodate a shoe, and a connecting element adapted to open and close the loop of the loop strap. The invention is in particular used in the field of ice climbing, but is also used for a secure travel on snow and ice.

[0002] Generally crampons have a shoe support, on which the shoe is placed and fixed with fastening means. The bottom side of such a shoe support, which is opposite of the side on which the shoe is placed, is provided with teeth. These teeth engage in the underground in order to minimize a danger of slipping while walking. In order to allow an adjustment of the shoe support and therefore the crampon to various shoe sizes, the shoe support may have a front part and a rear part connected through an connecting part suitable to adjust the shoe support to the required size. The means for fixing the shoe on the shoe support is usually one long loop strap connecting the fixing points of the shoe support over the surface of the shoe in order to hold the shoe in place. This loop strap is generally long enough to fix the shoe securely on the shoe support in all possible settings of the shoe support. The loop strap may also have two or more connected loop straps. The fixation of the shoe on the shoe support by means of such a loop strap is usually achieved by tightening and fixing said loop strap using a buckle or the like.

[0003] In most of the cases said loop strap is longer than actually needed, as cases where bigger shoe sizes have to be fixed are to be considered as well when choosing the length of said loop strap. The portion of the loop strap, which is not used in the actual loop surrounding the shoe can then entangle in the surroundings, in the other crampon or shoe and the user might be injured when falling or stumbling due to this entanglement. Hence this part of the loop strap has to be cumbersome secured or even shortened. The latter of course narrows the adjustment possibilities of the crampon to different shoe sizes and hence its usage possibilities.

[0004] Therefore the object of this invention is to provide a crampon, which allows a secure and easy handling of its fastening system for different shoes sizes.

[0005] It should be noted at this point that in connection with the present disclosure, statements of direction such as "vertical", "horizontal", "sideways", "lateral", "top", "bottom", "front", "back" and the like should be understood from the point of view of the person using the crampons and relate to a shoe which has been inserted in a ready state operating position on the shoe support of the crampon, wherein the shoe support is resting on a horizontal plane and the user is standing upright in his or her

shoes.

[0006] To achieve this object the invention provides a crampon wherein the fastening system further comprises an adjusting element adapted to adjust a length of the loop strap such as to adjust the size of the loop. When the size of the loop is separately adjustable by means of an additional adjusting element, a long loop strap projecting from the connecting element can be avoided. Therewith a secure and easy use of the crampon can be enhanced.

[0007] In a preferred embodiment the adjusting element may be a buckle. A buckle allows an easy adjustment of the length of the loop strap, while the loop strap is closed by means of the connecting element.

[0008] Advantageously, the buckle of the adjusting element may be a slider buckle, which allows a continuous adjustment of the length of the loop strap, while the loop strap is closed by means of the connecting element.

[0009] In a further preferred embodiment the connecting element may be a buckle. With a buckle, a closing and opening operation of the connecting element can be simplified.

[0010] Advantageously the connecting element buckle may comprise two slider buckles, which provide a continuous adjustment of the length of the loop strap and therefore of the size of the loop.

[0011] In a further preferred embodiment the connecting element may comprise at least one hook member or may even consist of the at least one hook member and a buckle, wherein the at least one hook member and the buckle can be operated separately from each other in order to open and close the loop strap. Thus the closing and opening operation of the connecting element may be simplified and therefore may be sped up.

[0012] In a further preferred embodiment the heel fixing portion may comprise a sling. By connecting the heel fixing portion and the loop strap via a sling, a firm yet flexible connection can be provided between the heel fixing portion and the loop strap.

[0013] Preferably the crampon may have a toe fixing portion, said toe fixing portion may extend orthogonally to a longitudinal axis of the crampon to traverse a front portion of a shoe and the loop strap may be guided around said toe fixing portion to form a deflection point. By being guided around the toe fixing portion the loop strap can change its position around the shoe and with regard to the crampon only to a limited extent. This enhances the safety of the use of the crampon.

[0014] Advantageously the connecting element may be arranged such as to be located on the lateral outer side of a shoe fixed to the crampon. The arrangement of the connecting element on the lateral outer side of a shoe fixed to the crampon allows a closing and opening operation of the connecting element to be performed on the side of the shoe which is free from obstacles projecting from the other shoe. So the closing and opening operation of the loop strap is simplified. The connecting element and the adjusting element may therefore be located

on different sides of the shoe, though it is of course possible to arrange both on one side of the shoe.

[0015] Furthermore the connecting element may be connected directly to the heel fixing portion.

When the connecting element is connected directly to the heel fixing portion, a bigger continuous surface contacting the shoe can be provided, which enhances the fit of the shoe in the loop strap.

[0016] In a further preferred embodiment one end of the loop strap may be guided through the adjusting element, further through the heel fixing portion, further again through the adjusting element, then may form the main part of the loop to accommodate the shoe and may further be guided through the connecting element. By guiding the loop strap as described and thereby providing the loop, the shoe is secured tightly and safely on the shoe support yet separately adjustable while being closed, which enhances a safe use of the crampon.

[0017] The invention is explained in greater detail below with reference to the attached drawings, in which:

FIG. 1 is a top view of a shoe and a fastening system according to an embodiment of the invention,

FIG. 2 is a view of the lateral outer side of the shoe and the fastening system,

FIG. 3 is a view of the lateral inner side of the shoe and the fastening system,

FIG. 4 is a side view of detail A of FIG. 2,

FIG. 5 is a side view of detail B of FIG. 3,

FIG. 6 is a perspective view of detail A of FIG. 2, and

FIG. 7 is a perspective view of detail B of FIG. 3.

[0018] FIG. 1 shows a crampon 10 according to a first embodiment of the invention. Only a main portion of a shoe 12 fixed on the shoe support is shown in a top view in FIG. 1 for illustrating reasons.

[0019] The crampon 10 comprises a shoe support 20 and a fastening system 30, as it can be seen in FIG. 2 and 3. Further the crampon 10 of this embodiment comprises a toe fixing portion 14 and a heel fixing portion 32. Said crampon 10 is in particular suitable for special mountaineering shoes, which are adapted for the usage of crampons, which might be achieved by a certain design.

[0020] The shoe 12 is resting on the shoe support 20, as it can be seen in Figures 2 and 3. As crampons are usually designed to accommodate various sizes of shoes, the shoe support 20 comprises a rear part 18a, a connecting part 18b and a front part 18c. The connecting part 18b is adjustable in a longitudinal direction of the shoe support 20 to accommodate a shoe 12 of the user.

[0021] Preferably the shoe support 20 has teeth 22 facing away from the shoe 12 resting on the shoe support

20. The teeth 22 provide a secure grip even on icy underground. On the front part 18c at least two teeth 22 may be provided and on the rear part 18a of the shoe support 20 may also at least two teeth 22 be provided, so that the crampon 22 provides strong grip even in steep slopes and/or icy underground or when the user is ice climbing. The front part 18c and/or the rear part 18a may each have an anti-stall-plate which prevents the collection of snow underneath.

[0022] The toe fixing portion 14 accommodates and fixes the front portion of the shoe 12, whereas the heel fixing portion 32 accommodates and fixes the rear portion of the shoe 12 onto the shoe support 20.

[0023] The toe fixing portion 14 may be fixed by means of rotatable rivets 24 on ridges 26 extending upwardly from a lateral inner and a lateral outer side of the shoe support 20.

[0024] Said heel fixing portion 32 may comprise a sling 28 of the same material as a loop strap 34 on the lateral outer side of the shoe 12, though any other shape or material suitable for serving the intended purpose might be used.

[0025] The heel fixing portion 32 of the fastening system 30 may be connected to the shoe support 20. The heel fixing portion 32 may be a heel bracket, which may be designed to suit onto the upper rear part of the shoe 12 and which may comprise two clasps 42 connecting the heel fixing portion 32 with the shoe support 20. The ends of said clasps 42 are bent, so that one end of said clasp 42 is held in a receiving hole 44 formed in the heel fixing portion 32, whereas the other end of said clasp 42 is held in a receiving hole 46 formed in a tooth 22 of the shoe support 20, as it is shown in FIG. 2 and 3.

[0026] Further the heel fixing portion 32 may comprise a fixing hole 48, 52 on each side. One of these fixing holes 48 is adapted to fix a loop strap 34 of the fastening system 30 to the heel fixing portion 32 and the other fixing hole 52 is adapted to fix the sling 28 to the heel fixing portion 32.

[0027] Moreover the fastening system 30 comprises the loop strap 34, which is attached to the heel fixing portion 32. This loop strap 34 forms a loop, in which a shoe 12 is accommodated.

[0028] The loop strap 34 is formed by an elongated strap. Said loop strap 34 may preferably be one single piece. Alternatively it can be made up of two or more pieces, which are operatively connected.

[0029] For opening and closing the loop strap 34 a connecting element 36 is comprised in the fastening system 30. Said connecting element 36 is adapted to open and close the loop of the loop strap 34, and may have preferably two slider buckles or may alternatively have a snap or a release buckle.

[0030] For the closing operation, the two slider buckles of the connecting element 36 may be placed above one another so that their holes align and the loop strap 34 may be guided through one hole formed by the two slider buckles from the side facing the shoe 12. Then it may be

guided around the outer ridge of the slider buckle, which is on top of the slider buckle facing the shoe 12 and may then be inserted once again in the same hole of the slider buckle facing the shoe 12. After having tightened the loop strap 34, the loop is closed. The connecting element 36 is preferably located on the lateral outer side of the shoe 12 and may be directly connected to the heel fixing portion 32.

[0031] In order to adjust the length of the loop strap 34 (and therefore the size of the loop) independently from a closing or opening operation of the loop strap 34, the fastening system 30 may further comprise an adjusting element 38 in addition to the connecting element 36. The adjusting element 38 is preferably located on the lateral inner side of the shoe 12.

[0032] The adjusting element 38 may be a buckle, preferably a slider buckle. For the adjusting operation the loop strap 34 may be guided through one hole from the side, which is facing the shoe 12, then may be guided over the middle ridge of the slider buckle and then may be guided into the second hole, after that it may be guided through the fixing hole 48 in the heel fixing portion 32 and from that it may be guided back and again through the second hole of the slider buckle from the side facing the shoe 12, once again over the ridge and back into the first hole. By pulling the end of the loop strap 34, the loop strap 34 may be drawn through the slider buckle and the loop formed by the loop strap 34 may be adjusted.

[0033] The loop of the fastening system 30 may therefore be formed by the loop strap 34 being guided through the adjusting element 38 as described above, wherein one end of the loop strap 34 is then guided around the toe fixing portion 14 and is further guided through the connecting element 36 as described above. With this arrangement, the connecting element 36 and the adjusting element 38 may be arranged on different sides of the shoe 12.

[0034] Therefore, the length of the remaining loop strap 34 is once adjusted with the adjusting element 38 for the shoe to be fitted in and afterwards the loop is closed and opened by opening and closing the loop strap 34 by means of the connecting element 38. With this, the length of the remaining loop strap 34 projecting from the connecting element 36 is always kept essentially at the same length. Hence the remaining end cannot entangle in surrounding obstacles or the other shoe.

Claims

1. Crampon (10) comprising a shoe support (20) having at least one tooth (22) for engaging the ground and a fastening system (30) for fastening the shoe support (20) to a shoe (12),

wherein the fastening system (30) comprises

- a heel fixing portion (32) connected to the

shoe support (20),

- a loop strap (34) attached to the heel fixing portion (32), wherein the loop strap (34) forms a loop adapted to accommodate a shoe (12), and
- a connecting element (36) adapted to open and close the loop of the loop strap (34),

characterized in that

the fastening system (30) further comprises an adjusting element (38) adapted to adjust a length of the loop strap (34) such as to adjust the size of the loop.

2. Crampon (10) according to claim 1, wherein the adjusting element (38) is a buckle.
3. Crampon (10) according to claim 2, wherein the buckle is a slider buckle.
4. Crampon (10) according to any of the preceding claims, wherein the connecting element (36) is a buckle.
5. Crampon (10) according to claim 4, wherein the connecting element (36) buckle comprises two slider buckles.
6. Crampon (10) according to claim 1, 2 or 3, wherein the connecting element (36) comprises at least one hook member.
7. Crampon (10) according to claim 6, wherein the connecting element (36) comprises the least one hook member and a buckle, wherein the at least one hook member and the buckle can be operated separately from each other in order to open and close the loop strap (34).
8. Crampon (10) according to any of the preceding claims, wherein the heel fixing portion (32) comprises a sling (28).
9. Crampon (10) according to any of the preceding claims, wherein the crampon (10) has a toe fixing portion (14), said toe fixing portion (14) extending orthogonally to a longitudinal axis of the crampon (10) to travers a front portion of a shoe (12) and the loop strap (34) is guided around said toe fixing portion (14) to form a deflection point.
10. Crampon (10) according to any of the preceding claims, wherein the connecting element (36) is arranged such as to be located on the lateral outer side of a shoe (12) fixed to the crampon (10).
11. Crampon (10) according to any of the preceding claims, wherein the connecting element (36) is con-

nected directly to the heel fixing portion (32).

12. Crampon (10) according to any of the preceding claims, wherein one end of the loop strap (34) is guided through the adjusting element (38), further through the heel fixing portion (32), further again through the adjusting element (38), then forms the main part of the loop to accommodate the shoe (12) and is further guided through the connecting element (36).

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FIG. 1

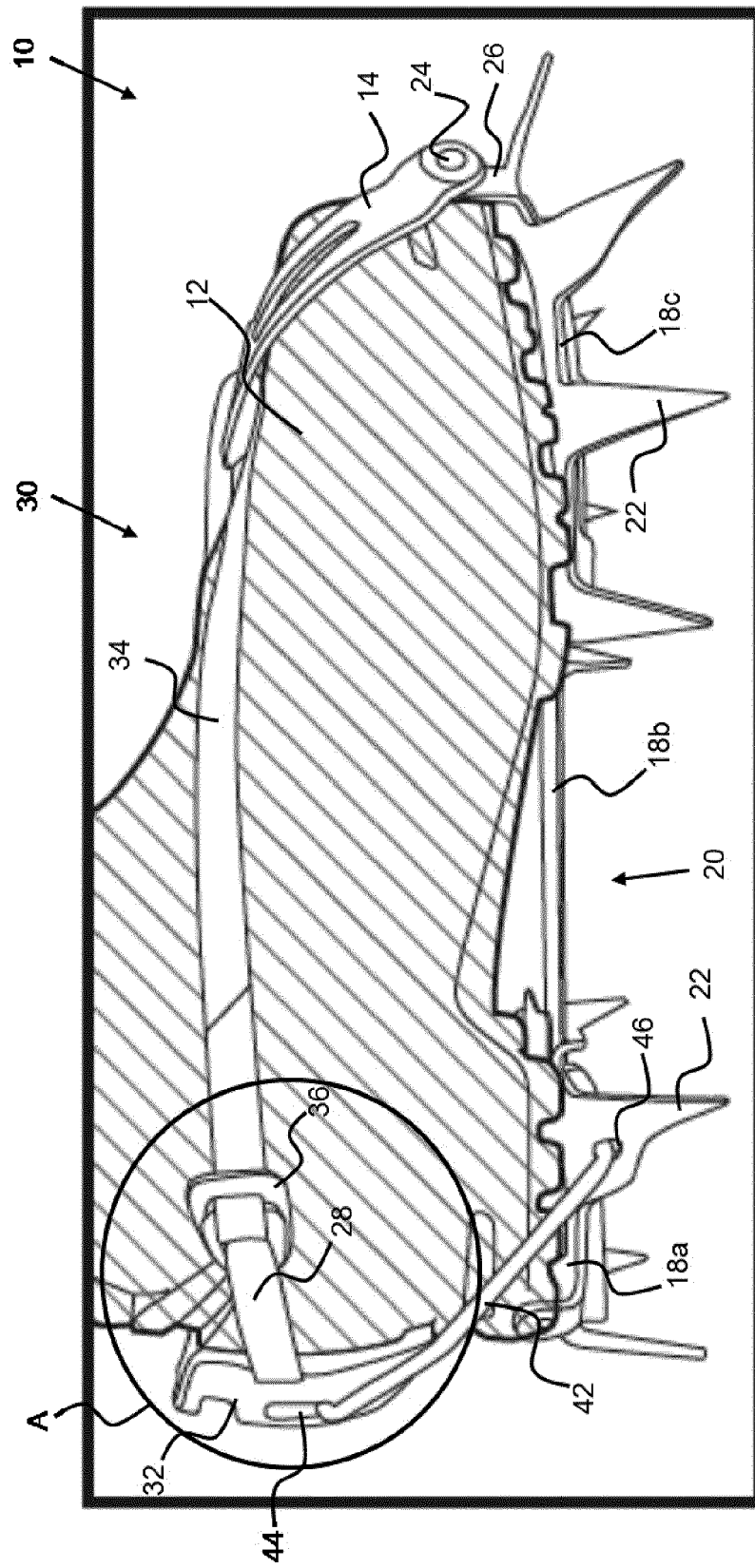


FIG. 2

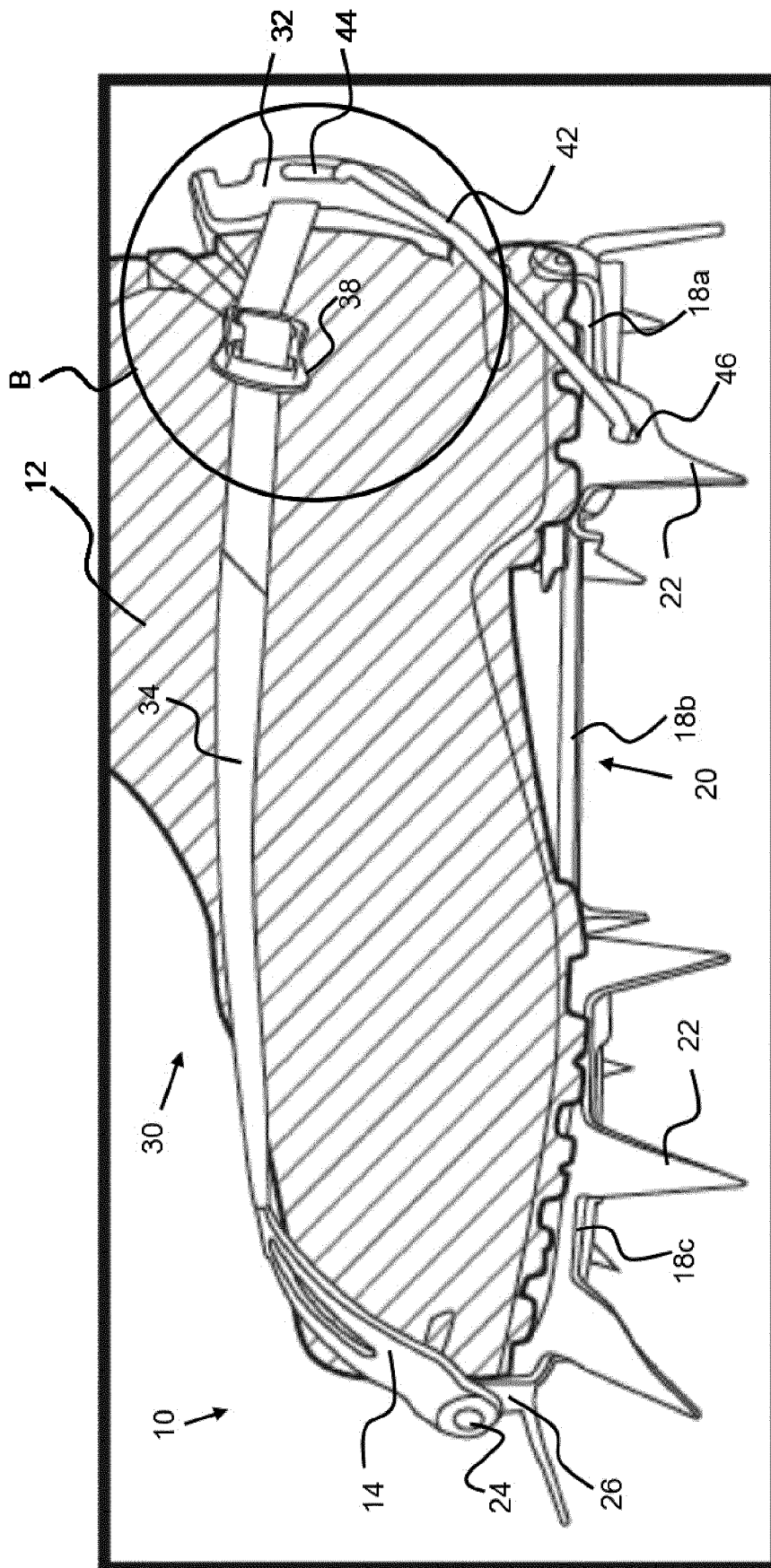


FIG. 3

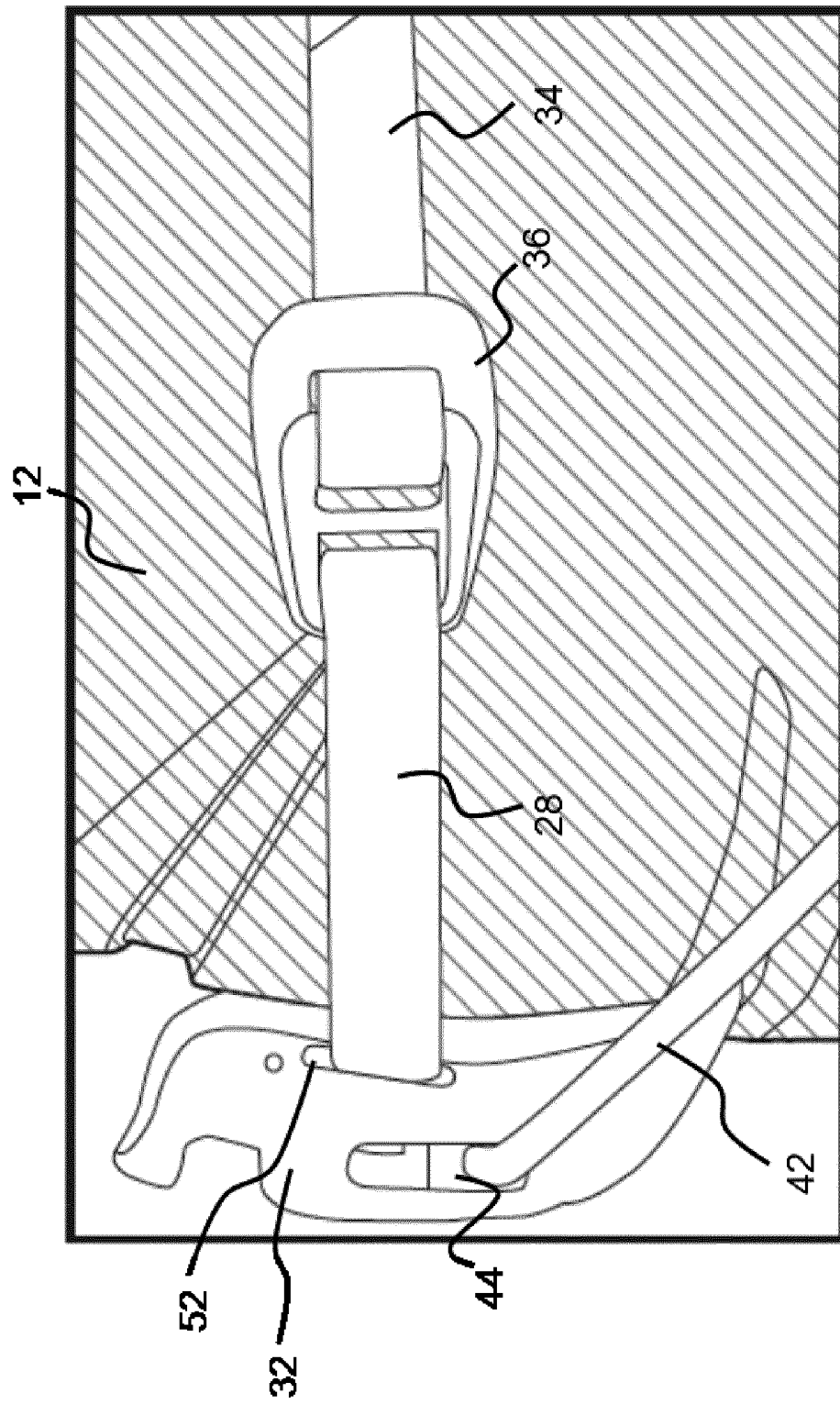


FIG. 4

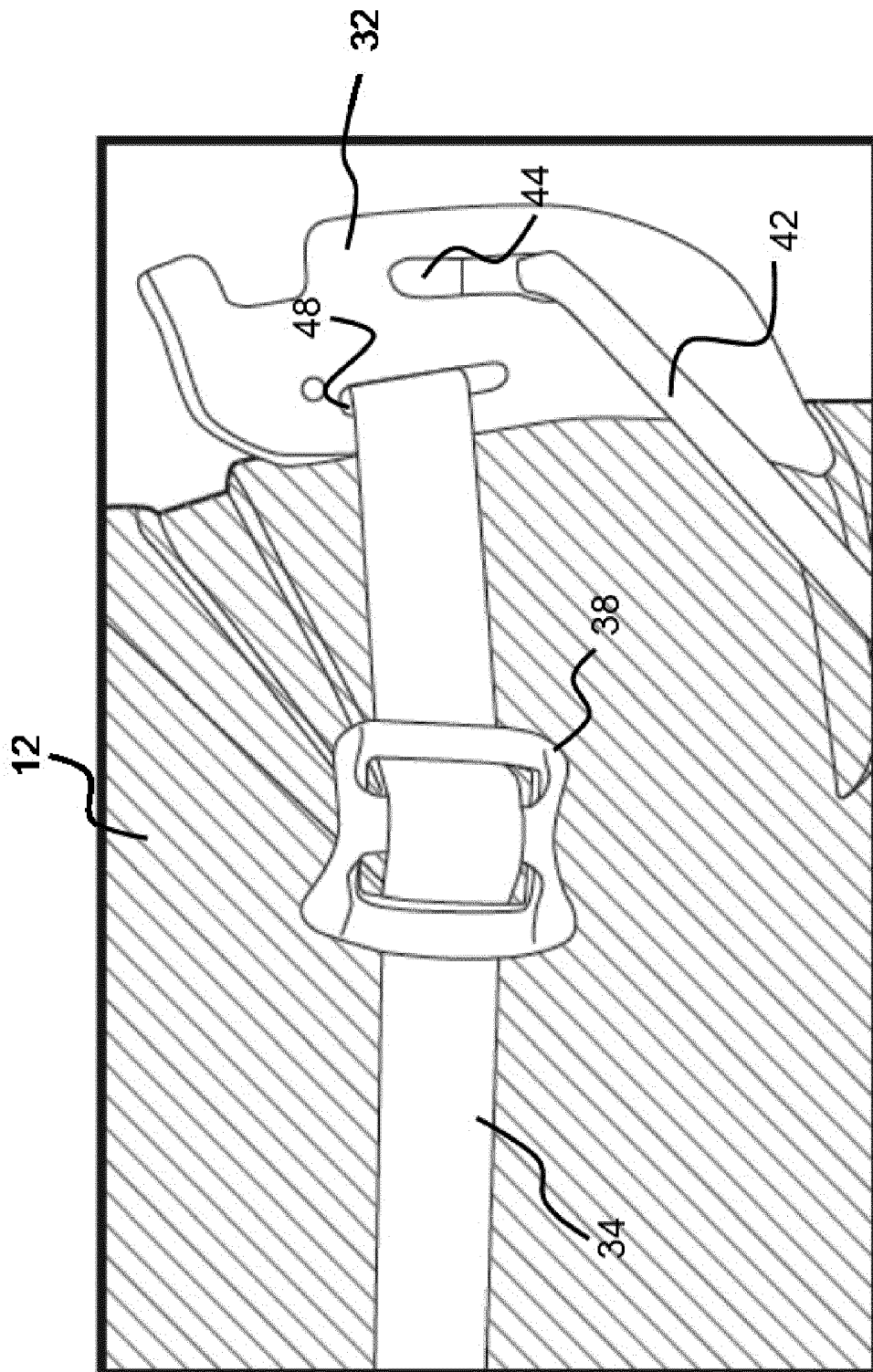


FIG. 5

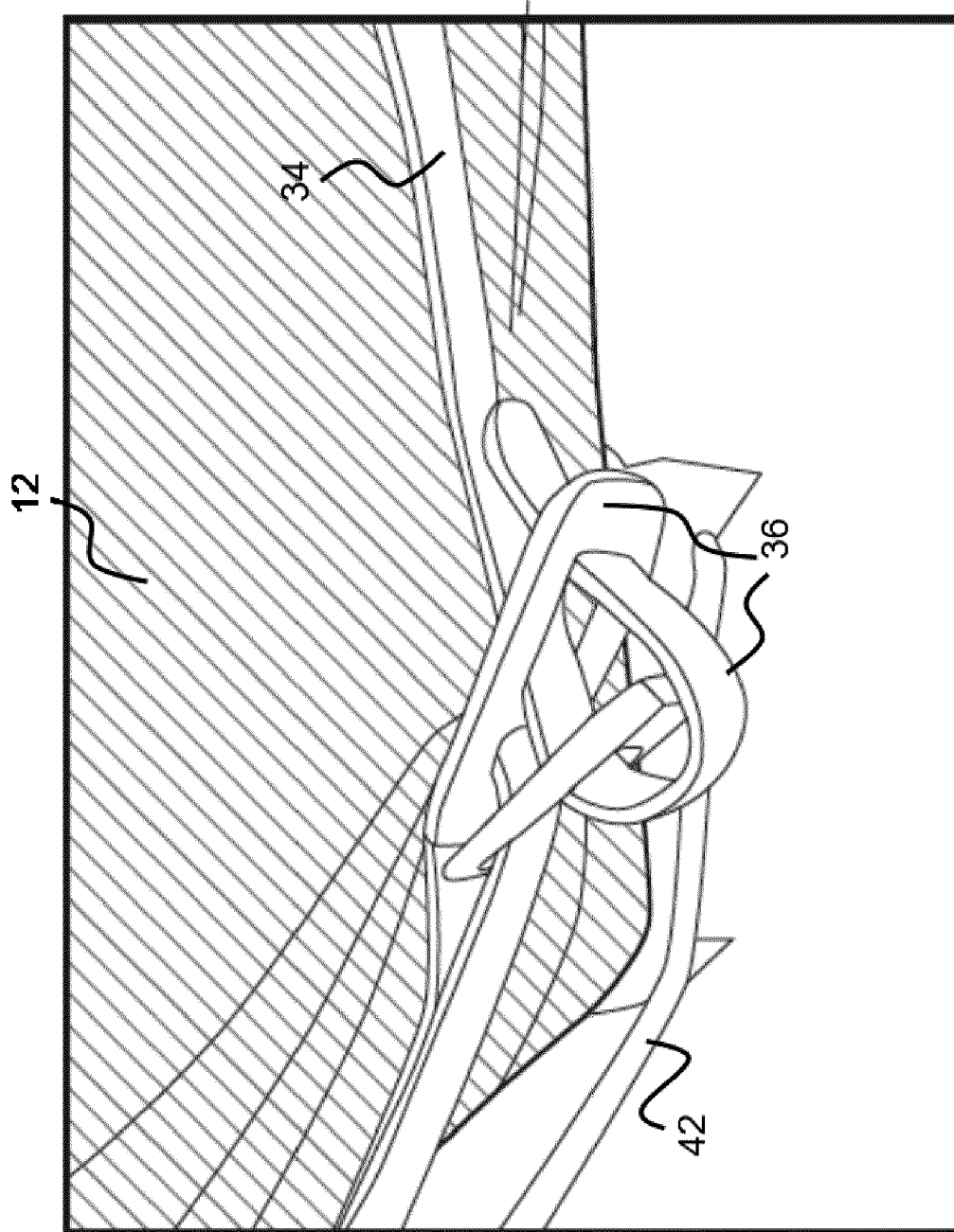


FIG. 6

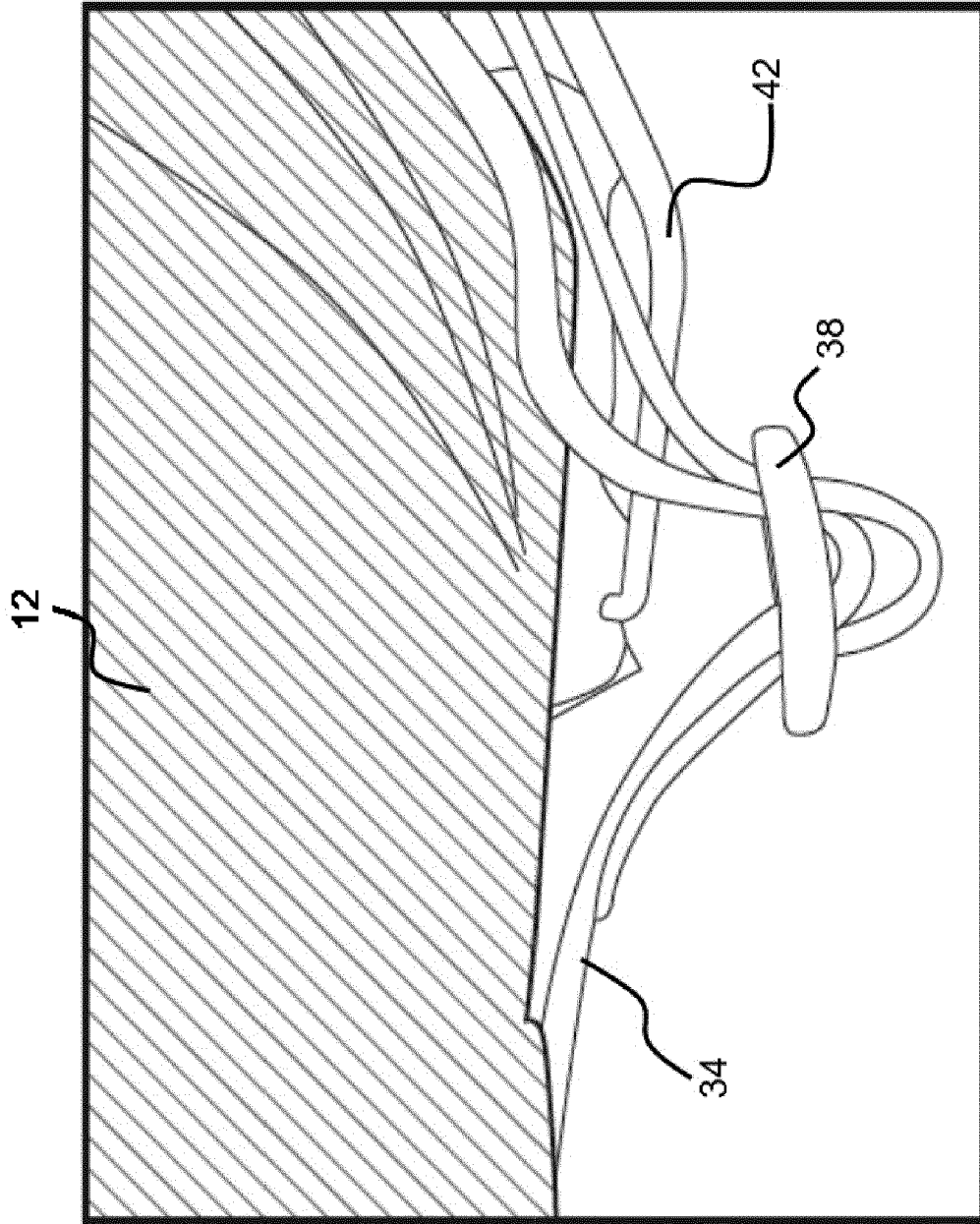


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 17 17 5860

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A43C
Place of search		Date of completion of the search	Examiner
The Hague		30 November 2017	Chirvase, Lucian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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