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(72) Inventor: **RIGHELE, Matteo**
36015 Schio (VI) (IT)

(74) Representative: **Feller, Frank et al**
Weickmann & Weickmann
Patent- und Rechtsanwälte PartmbB
Postfach 860 820
81635 München (DE)

(71) Applicant: **Oberalp Spa**
39100 Bozen (IT)

(54) **CRAMPON**

(57) The present invention provides a crampon (2) comprising: a front element (4) provided with at least one point (6, 8); a heel element (12) provided with at least one point (14); and a connection mechanism (20) adapted to adjust a maximum distance between the front element (4) and the heel element (12), wherein the connection mechanism (20) comprises a receiving member (22l,

22r) having an opening (24l, 24r); and a locking member (26l, 26r) adapted to be fixed in at least two separate locking positions of the opening (24l, 24r), wherein the locking member (26l, 26r) is adapted to slide in the opening (24l, 24r) along a first direction of the opening (24l, 24r) between the locking positions.

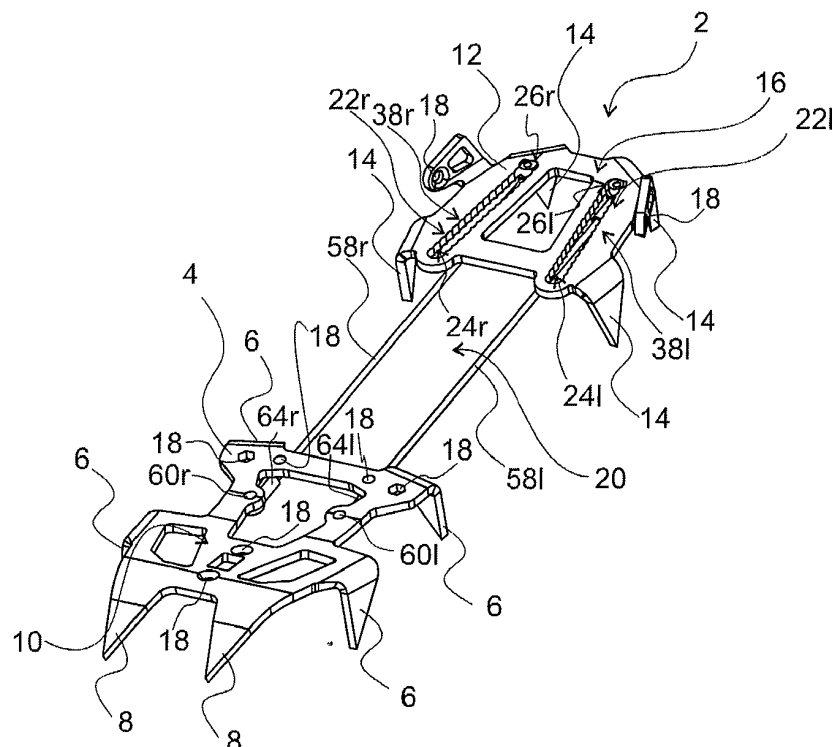


Figure 1

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Description

[0001] The present invention relates to a crampon according to the preamble of claim 1. Such crampons are generally known in the art and allow adjusting of the maximum distance between the front element and the heel element of the crampon in order to fit the outer dimensions of the shoe of the user. The most commonly used connection mechanism comprises as an essential element a rigid web interconnecting the front element and the heel element. These connection mechanisms however require that fixing elements are being removed from the web in order to change the maximum distance between the front element and the heel element.

[0002] It is therefore an object of the present invention to provide a crampon with an improved operability.

[0003] This object is solved according to the invention by a crampon according to claim 1. Preferred embodiments of the invention are described in the dependent claims.

[0004] According to the invention there is provided a crampon comprising: a front element provided with at least one point; a heel element provided with at least one point; and a connection mechanism adapted to adjust a maximum distance between the front element and the heel element, wherein the connection mechanism comprises a receiving member having an opening or an elongated opening; and a locking member adapted to be fixed in at least two separate locking positions of the opening or of the elongated opening, wherein the locking member is adapted to slide in the opening along a first direction of the opening between the locking positions or wherein the locking member is adapted to slide in a longitudinal direction of the elongated opening between the locking positions.. Since the locking member is confined in the opening or elongated opening while being moved between the locking positions, a guided movement of the locking member is provided improving the operability.

[0005] Preferably the opening is an elongated opening or slit allowing a guided movement in a preferred orientation of the first direction, wherein the preferred orientation of the first direction can be defined by the orientation of the elongated opening. In case the opening is an elongated opening or slit, the first direction can be labelled a longitudinal direction of the elongated opening or/and a direction transverse to or/and essentially perpendicular to the longitudinal direction of the elongated opening can be labelled a transversal direction of the elongated opening.

In a preferred embodiment, the opening or elongated opening is formed with a finite number of separate locking positions. By providing a finite number of separated locking positions the user can be guided to select the correct locking position more quickly.

[0006] In a particularly preferred embodiment, a locking section of the locking member is eccentric in shape. The provision of an eccentric shape on the locking element allows performing an in-place locking of the locking

element inside the opening or elongated opening by simply changing the orientation of the locking element with respect to the opening or elongated opening, in particular by simply changing the orientation of the locking element with respect to the longitudinal direction of the elongated opening, and thus avoiding complicated manual adjustment.

[0007] It is possible that the locking member comprises a locking section and a support section, and that the locking section protrudes from the support section such that the locking member has an L-shape. The provision of an L-shape of the locking member allows to provide a functional part of the locking mechanism, responsible for the locking/fixing of the locking member in the opening or elongated opening, in one plane and to provide a connecting part, used for interconnecting the front element and the heel element in a different, preferably perpendicular plane, allowing easy operation of the functional part of the locking mechanism.

[0008] In a particularly preferred embodiment, the connection mechanism comprises an elongated flexible member, preferably comprising a cable, a wire, a chain, a tape, a strap or a flexible rod, wherein the elongated flexible member is part of a connection between the locking member and one of the front element and the heel element; and wherein preferably the other one of the front element and the heel element is connected to or formed integrally with the receiving member. The provision of an elongated flexible member allows a further degree of freedom in the movement of the locking member without the need to disconnect the locking member from parts of the connection mechanism and thus avoiding further complicated manual adjustment. In order to avoid additional mounting elements which could collide with elements of the crampon during adjustment of the connection mechanism it is preferred that the locking member is directly connected to an end of the elongated flexible member.

[0009] Preferably, a locking state of the locking member in the locking position of the opening or elongated opening is defined by the inhibition of movement of the locking member in and antiparallel to the first direction of the opening or the longitudinal direction of the elongated opening (movement in and antiparallel to the first direction of the opening or the longitudinal direction of the elongated opening due to mechanical play and/or clearance of elements/members involved can however be permitted). Furthermore, a sliding state of the locking member is preferably defined by the ability of the locking member to move in and antiparallel to the first direction of the opening or the longitudinal direction of the elongated opening, in particular between locking positions of the opening or elongated opening. In a preferred embodiment, the locking member is formed, e.g. by providing a locking section of the locking member with an eccentric shape, such that a transition between the locking state and the sliding state of the locking member is caused by turning the locking member. Preferably, in the locking

state of the locking member and/or in the sliding state of the locking member, the locking member is mounted and/or positioned in the opening or elongated opening. An antiparallel direction has in this application the same meaning as in the field of vectors in an Euclidean space, such that for a direction P represented by the vector p, the antiparallel direction is represented by the vector -p and indicated by the direction -P.

[0010] It is preferred that the opening is an elongated opening and the elongated opening has a passing channel of width d; the locking member has a passing dimension smaller than d, and the locking member has a locking dimension bigger than d. Such an arrangement allows the transition between the locking state of the locking member in the locking position of the elongated opening and the sliding state of the locking member by simply turning the locking member. The passing channel of the elongated opening is preferably a non-obstructed, e.g. non-obstructed by protrusions from walls of the elongated opening, preferably straight, channel in the elongated opening.

[0011] In a preferred embodiment the opening of the elongated opening and each locking position can correspond to at least one pocket of the elongated opening formed in a transversal direction of the elongated opening, wherein preferably each locking position corresponds to two pockets on opposite sides of the elongated opening formed in respective opposite transversal directions of the elongated opening. Preferably, the first direction is a longitudinal direction of the elongated opening. The provision of such pocket(s) is a simple and for a user easily recognisable way of providing a structure defining locking positions.

[0012] In a preferred embodiment, the pocket or each of the pockets is formed as a section of a cylindrical bore; wherein the/each bore is preferably centred with respect to a course of the elongated opening; wherein preferably the diameter of the bore is the same for each of the pockets; and wherein preferably at least one pair of pockets, formed by two of the pockets on opposite sides of the elongated opening and formed in respective opposite transversal directions of the elongated opening, or all such pairs of pockets, is/are formed by sections of a single (respective) bore. The use of cylindrical bores to create the pockets provides guidance for the rotational movement of the locking member and thus supports a simple movement of the locking member in the transition between the locking state and the sliding state.

[0013] In order to provide a high density of locking positions along the elongated opening, the distance between two centres of cylindrical bores, whose sections form pockets adjacent in the longitudinal direction of the elongated opening, is smaller than the diameter, preferably smaller than the radius, of the bores. However, the distance between the centres of the cylindrical bores is preferably being kept big enough, such that pockets are still being created.

[0014] It is preferred however that the locking member

is formed as a pin, which is preferably formed in the shape of a cylinder with a cutout portion, wherein the cutout portion is preferably formed such that an outer shape of a cross-section of the pin perpendicular to a cylinder axis the cylinder is a complement of a rectangle in a circle, wherein the circle intersect only one of the sides of the rectangle. The forming of the locking member as a pin allows the locking member to be inserted in the receiving member and thus providing a reliable connection. The provision of a cutout allows to provide an eccentric shape of the locking member in a simple way. In case the cutout is formed such that the cross-section of the pin perpendicular to the cylindrical axis has the outer shape of the above defined complement, the locking member/pin can be formed by providing a solid cylinder which is being moved simply in a straight line during processing by a milling machine to remove material in order to form the cutout.

[0015] In a particular preferred embodiment the connection mechanism comprises a further locking member; and two elongated flexible members, each preferably comprising a cable, a wire, a chain, a tape, a strap or a flexible rod; wherein both of the elongated flexible members are fixed at one end to one of the front element and the heel element and the other end of each of the elongated flexible members is connected to the associated locking member; wherein preferably: the connection mechanism comprises a further receiving member having an opening or an elongated opening; and the other one of a the front element and the heel element is connected to or formed integrally with both receiving members. The provision of two flexible members and two locking members as described above provides a stable and secure connection between the front element and the heel element. Thus, the provision of two flexible members and two locking members provides a stable and secure/safe crampon.

[0016] In a further preferred embodiment, each of the openings or each of the elongated openings of the receiving members is aligned or oriented along one associated leg of a V-shape. This allows to provide the respective receiving members in respective webs of the crampon along the extension of those webs of the front element or the heel element avoiding additional structural elements in the crampon.

[0017] A preferred embodiment of the invention is being described with reference to the accompanying figures, showing in

figure 1 a perspective view of a crampon according to the invention;

figure 2 a top view of the crampon shown in figure 1;

figure 3 a top view of an enlarged portion of a heel element of the crampon shown in figure 1, with a locking member in the locking state;

figure 4 an enlarged portion of figure 3;

figure 5 a top view of an enlarged portion of the heel element of the crampon shown in figure 1, with the locking member in the sliding state;

figure 6 a sketch illustrating the formation of an outer shape of a pin of the locking member shown in figure 1 in a plane perpendicular to a cylinder axis of the pin;

figure 7 a perspective view of the locking member shown in figure 1; and

figure 8 a sketch illustrating the dimension of an outer shape of the pin of the locking member shown in figure 1 in a plane perpendicular to a cylinder axis of the pin.

[0018] In a preferred embodiment of the invention the crampon 2 comprises a front element 4 with at least one, preferably multiple points 6, 8, of which preferably at least some points 6 point away from a shoe bearing surface 10 of the front element 4 towards the surface, the crampon 2 is being used on. Some points 8 point in the front direction of the crampon 2 and provide additional grip when the crampon 2 is used in steep terrain.

[0019] The crampon 2 comprises a heel element 12 with at least one, preferably multiple points 14 preferably pointing away from a shoe bearing surface 16 towards the surface, the crampon 2 is being used on. The crampon 2 is provided with multiple attachment means 18, for example openings, allowing the attachment of fastening means (not shown) for fastening a shoe to the crampon 2. Such fastening means can comprise straps, frames and so on and are known to the person skilled in the art. A point can be a protrusion, a spike and the like, preferably formed from the material, e.g. sheet metal, of the front element 4 and/or the heel element 12. Not all attachment means 18 need to be used for attachment of fastening means.

[0020] The crampon 2 comprises a connection mechanism 20 which in this embodiment essentially is mirror symmetrical with respect to the left and right directions, thus only one part, for example the left part, will be described and this description is to be applied, preferably taking into account the preferred symmetry described above, for the other part, for example the right part, as well, where necessary.

[0021] In a preferred embodiment for each element of the left part of the connection mechanism 20, the connection mechanism 20 comprises a corresponding right element in the right part of the connection mechanism 20, and vice versa. The right part of the connection mechanism 20 corresponds preferably in an essentially mirror symmetrical manner with respect to axis A (or a plane perpendicular to the plane of the drawing of figure 2 passing through axis A) to the left part of the connection mechanism 20, and vice versa, such that the elements of the

left and right part of the connection mechanism 20 show essentially the above symmetry as well. The reference signs of such corresponding elements are provided with "r" indicating that the element belongs to the right part of the connection mechanism 20, and are provided with "l" indicating that the element belongs to the left part of the connection mechanism 20. Since some figures relate to only one side of the crampon 2, only the reference signs for the right part or the left part are present in the figures, even though the above applies.

[0022] However, only one of the above left and right part of the connection mechanism 20 can be provided, for example such part can be provided essentially along the axis A.

[0023] The connection mechanism 20 of the crampon 2 is provided with at least one, in this embodiment two receiving members 22l, 22r, each formed with an opening, which is preferably an elongated opening 24l, 24r in the preferred embodiment of the invention shown in the figures. The elongated opening 24l, 24r preferably forms a through hole in the receiving member 22l, 22r and can be labelled a slit. The heel element 12 is connected to or as in this embodiment formed integrally with the receiving member 22l, 22r. A respective locking member 26l, 26r of the connection mechanism 20 is provided in each of the elongated openings 24l, 24r. The locking member(s) 26l, 26r can slide in the openings or elongated openings 24l, 24r between locking positions along a first direction of the elongated opening/ opening, wherein the first direction of the elongated opening is preferably a longitudinal direction of the elongated opening. In a preferred embodiment the locking member(s) 26l, 26r can slide in the elongated openings 24l, 24r between locking positions along the longitudinal direction DI and preferably antiparallel to DI, in the direction -DI, as described below. Preferably each of the locking members 26l, 26r is provided with a locking section 28l, 28r and a support section 30l, 30r. The locking members 26l, 26r are preferably shaped in the same way for the left and right part of the connection mechanism 20. The locking section 28l, 28r preferably protrudes from the support section 30l, 30r such that the locking member 26l, 26r has essentially an L-shape, see figure 7. The locking section 28l, 28r is preferably formed as a pin 32l, 32r with a cutout portion 34l, 34r providing an eccentric shape of the locking section 28l, 28r. In a preferred embodiment the pin has essentially the shape of the cylinder Z (cutout portion of cylinder Z is sketched by the broken line in figure 7). The cutout portion 34l, 34r can essentially be formed by moving the pin 32l, 32r essentially along a straight line in a milling machine, such that the cross-section of the pin perpendicular to a cylinder axis C of the outer shape of the cylinder Z is the complement of a rectangle in a circle, see for example the outer shape of the top surface of the pin 32l, 32r in figure 7 or the sketch in figure 6.

[0024] The construction of the above discussed shape of the complement B is shown in figure 6, wherein B is the complement of a rectangle E in a circle D. B is defined

as $B=D \setminus E = \{x \in D | x \notin E\}$, which is the common definition in terms of set theory for a complement of one set in another set (sometimes called relative complement). Please note that the circle D intersects only one side F1 of the rectangle E, and none of the other sides F2, F2 or F4. The outer shape of B is preferably the outer shape of the top surface of the pin 32l, 32r/the top surface of the locking section 28l, 28r.

[0025] A base of the pin 32l, 32r is preferably surrounded by a guiding surface 36l, 36r of the support section 30l, 30r, which is preferably adapted to guide the movement of the locking member 26l, 26r on a first surface surrounding the elongated opening 24l, 24r. The first surface is placed on the side of the heel element 12 not shown in figure 1 and 2 (e.g. the first surface is formed on a side of the heel element 12 opposite to the shoe bearing surface 16). Preferably the pin 32l, 32r comprises a bore 40l, 40r for receiving a not shown fastening means for fixing the pin 32l, 32r. The fastening means is preferably a screw, wherein optionally a head of the screw can represent a sliding means, which is preferably adapted to guide the movement of the locking member 26l, 26r on a second surface 38l, 38r surrounding the elongated opening 24l, 24r (e.g. the second surface 38l, 38r is formed on the side of the heel element 12 of the shoe bearing surface 16), wherein preferably the first surface is opposite the second surface. In a particularly preferred embodiment the screw can be used to lock the pin 32l, 32r with respect to the receiving member 22l, 22r, preferably by simply tightening the screw.

[0026] Each of the locking members 26l, 26r is adapted to slide in the longitudinal direction DI, Dr (and/or antiparallel to it in the respective directions -DI -Dr) of the respective elongated opening 24l, 24r. Each of the elongated openings 24l, 24r comprises preferably multiple pockets 42al, 42bl, 42ar, 42br (only exemplary pockets are provided with reference signs in the figures) formed in a transversal direction HI, -HI or respectively Hr, -Hr of the respective elongated opening 24l, 24r. Preferably each of the pockets 42al, 42bl, 42ar, 42br corresponds to a single locking position, wherein adjacent pockets in the longitudinal direction of the elongated opening DI correspond to separate, preferably adjacent, single locking positions. The Number of adjacent pockets in the longitudinal direction of the elongated opening DI (or in the first direction of the opening), preferably on one side of the elongated opening 24l, 24r, corresponds preferably to the finite number of separate locking positions. Non-opposite, with respect to a transversal direction of the elongated opening 24l, 24r, pockets can correspond to separate single locking positions.

[0027] Preferably for each pocket 42al, 42ar there is provided a corresponding pocket 42bl, 42br on the opposite side of the elongated opening 24l, 24r, and thus those pockets are formed in the respective opposite transversal direction -HI, -Hr. In case "-" is put in front of a direction in this application, the antiparallel direction is meant.

[0028] The pockets are preferably formed by sections 46al, 46bl, 46ar, 46br of cylindrical bores 48l, 48r (only exemplary sections and bores and centres of bores are provided with reference signs). Centres 44l, 44r of the cylindrical bores are centred with respect to the course of the elongated opening 24l, 24r, meaning for example that those centres lie along a symmetry axis (or a symmetry plane perpendicular to the plane of the drawing of figure 3 passing through axis S1l, S1r) S1l, S1r with respect to mirror symmetry of the elongated opening 24l, 24r or a long a centre of the elongated opening 24l, 24r which coincidence in this embodiment with the symmetry axis S1l, S1r. The symmetry axis S1l, S1r is represented by direction DI in figure 3. Preferably a distance gl, gr between centres 44l, 44r of bores adjacent in the longitudinal direction of the elongated opening 24l, 24r is smaller than the diameter and/or of the radius of each of those adjacent bores.

[0029] Preferably the cylindrical bores have the same diameter. This can be seen from figure 3. Preferably a pair of pockets (exemplary marked by a broken line rectangle 50l, 50r), preferably formed by two pockets on opposite sides of the elongated opening (with respect to a transversal direction of the elongated opening) as sections of a single bore, corresponds to a single separate locking position, wherein the number of pairs of pockets can correspond to the finite number of separate locking positions.

[0030] Figure 3 shows the locking state of the locking member 26l, 26r in one of the locking positions, defined by a pair of pockets 50l, 50r of the elongated opening 24l, 24r, in which the locking member 26l, 26r can essentially not move in the longitudinal direction DI, Dr of the elongated opening 24l, 24r (or/and antiparallel to it). Each of the pairs of pockets preferably defines a separate locking position of the elongated opening. The positional locking of the locking member 26l, 26r in one of the locking positions works as follows: the elongated opening 24l, 24r has a passing channel 52l, 52r (see channel between broken lines in figure 3), which can be defined by a rectangle inside the elongated opening 24l, 24r having a width equal to the minimum distance d of the opposite side walls of the elongated opening 62al, 62bl and 62ar, 62br outside of the end bores 54l, 54r, 56l, 56r or ends of the elongated opening 24l, 24r. The diameter e of the cylinder Z, essentially contributing to the shape of pin 32l, 32r, is bigger than d, such that the outer surface of the pin 32l, 32r is in close contact with the inner surface of the sections 46al, 46bl, 46ar, 46br of cylindrical bores 48l, 48r. In particular, the extension of the pin 32l, 32r in the transversal directions HI, -HI, Hr, -Hr in this alignment of the pin 32l, 32r in the elongated opening 24l, 24r is bigger than d essentially fixing the pin 32l, 32r in the elongated opening 24l, 24r with respect to a movement in the longitudinal directions DI, -DI, Dr, -Dr. Preferably, the extension of the locking member 26l, 26r in the transversal direction of the elongated opening 24l, 24r while the locking member 26l, 26r is in its locking

state in a state and wherein the locking member 261, 26r is mounted in the elongated opening 24l, 24r, is the locking dimension of the locking member 261, 26. In the present embodiment, the diameter e of cylinder Z, essentially contributing to the shape of pin 32l, 32r, is a locking dimension of the locking member 261, 26r. The locking position of the elongated opening is thus preferably a position, in the which locking member 261, 26r is placed and in which the locking member 261, 26r is adapted to enter the locking state.

[0031] However, once the locking member 261, 26r is turned and reaches the orientation shown in figure 5, such that it reaches its sliding state, the extension of the locking member 261, 26r in the transversal direction of the elongated opening 24l, 24r is smaller than d and thus locking member 261, 26r can slide along the transversal direction of the elongated opening 24l, 24r (and/or antiparallel to it). Thus, in this embodiment the distance f between the surface F5 of the cutout portion and the apex K on the opposite side of the pin is the passing dimension of the locking member 261, 26r. Preferably, the extension of the locking member 261, 26r in the transversal direction of the elongated opening 24l, 24r while the locking member 261, 26r is in its sliding state in a state wherein the locking member 261, 26r is mounted in the elongated opening 24l, 24r, is the passing dimension of the locking member 261, 26r. The Surface F5 is preferably essentially oriented perpendicularly to the direction of extension of the support section 30l, 30r.

[0032] In a preferred embodiment, the connection mechanism 20 comprises at least one, preferably two, flexible member 58l, 58r which comprises or is formed by a cable, a wire, a chain, a tape, a strap or a flexible rod. Each of the flexible members 58l, 58r is preferably fixed at one end, for example by a fastening means like screw or a rivet 60l, 60r to the front element 4, wherein the fastening means may be seated in a support member 64l, 64r, to which the flexible member 58l, 58r is attached e.g. by gluing, welding and/or crimping. Preferably, the respective other end of each of the flexible members 58l, 58r is, preferably directly, i.e. without any intermediate parts or elements, connected, for example by crimping, welding or gluing, to the respective locking member 26l, 26r, in particular to the support section of the respective locking member 26l, 26r.

[0033] Since the locking member 26l, 26r is connected by the flexible member 58l, 58r to the front element 4, the turning of the locking member 26l, 26r can be carried out without disconnecting the locking member 26l, 26r from the front element 4, since the flexible member 58l, 58r can bend during the turning of the locking member 26l, 26r. When the locking members 26l, 26r are moved from the locking state to the sliding state, then slide from one locking position to a different locking position in the respective elongated opening 24l, 24r, and are moved into the locking state again, the maximum distance between the front element 4 and the heel element 12 is adjusted. Since locking members 26l, 26r are preferably

connected to the receiving members, the at least one flexible member 58l, 58r can be part of a connection between the front element 4 and the heel element 12.

[0034] In order to avoid the provision of additional elements in the crampon 2, the receiving member 22l, 22r is as shown in the figures preferably formed integrally with the heel element 12, or as not shown in the figures connected to the heel element 12. Preferably each of the elongated openings or openings 24l, 24r is aligned along one leg of a V-shape as is shown in figure 2, since the elongated openings 24l, 24r are essentially formed in a common plane and they are not parallel to each other. Furthermore, each of the end bores 54l, 54r and/or respectively the end bores 56l, 56r can have essentially the respective same distance from an intersection of the symmetry axes S1l, S1r, wherein the axes S1l, S1r are preferably positioned in the above mentioned common plane of the elongated openings 24l, 24r.

[0035] Alternatively, the connection mechanism 20 could only comprise one receiving member and one locking member with the functions and shapes as described above, and e.g. with a single flexible member connecting the front element and the locking member.

[0036] In a further alternative, the orientation of the connection mechanism could be reversed, i.e. a single or two receiving members could be connected to or formed integrally with the front element 4 and the flexible member(s) could be fixed on the heel element.

Claims

1. Crampon (2) comprising:

- a front element (4) provided with at least one point (6, 8);
- a heel element (12) provided with at least one point (14); and
- a connection mechanism (20) adapted to adjust a maximum distance between the front element (4) and the heel element (12),

characterised in that

the connection mechanism (20) comprises a receiving member (22l, 22r) having an opening (24l, 24r); and

a locking member (26l, 26r) adapted to be fixed in at least two separate locking positions of the opening (24l, 24r),

wherein the locking member (26l, 26r) is adapted to slide in the opening (24l, 24r) along a first direction of the opening (24l, 24r) between the locking positions.

2. Crampon (2) according to claim 1, wherein the opening (24l, 24r) is formed with a finite number of separate locking positions.

3. Crampon (2) according to claim 2 or 3, wherein a locking section (28l, 28r) of the locking member (26l, 26r) is eccentric in shape.
4. Crampon (2) according to one of the preceding claims,
 - wherein the locking member (26l, 26r) comprises a locking section (28l, 28r) and a support section (30l, 30r), and
 - wherein the locking section (28l, 28r) protrudes from the support section (30l, 30r) such that the locking member (26l, 26r) has an L-shape.
5. Crampon (2) according to one of the preceding claims, wherein the connection mechanism (20) comprises
 - an elongated flexible member (58l, 58r), preferably comprising a cable, a wire, a chain, a tape, a strap or a flexible rod,
 - wherein the elongated flexible member (58l, 58r) is part of a connection between the locking member (26l, 26r) and one of the front element (4) and the heel element (12); and
 - wherein preferably the other one of the front element (4) and the heel element (12) is connected to or formed integrally with the receiving member (22l, 22r).
6. Crampon (2) according to claim 5, wherein the locking member (26l, 26r) is directly connected to an end of the elongated flexible member (58l, 58r).
7. Crampon (2) according to one of the preceding claims,
 - wherein the opening is an elongated opening (24l, 24r);
 - wherein the elongated opening (24l, 24r) has a passing channel (52l, 52r) of width d;
 - the locking member (26l, 26r) has a passing dimension smaller than d, and
 - the locking member (26l, 26r) has a locking dimension bigger than d.
8. Crampon (2) according to one of the preceding claims,
 - wherein the opening is an elongated opening (24l, 24r);
 - wherein each locking position corresponds to at least one pocket (42al, 42bl, 42ar, 42br) of the elongated opening (24l, 24r) formed in a transversal direction of the elongated opening (24l, 24r),
 - wherein the first direction is preferably a longitudinal direction of the elongated opening (24l, 24r);
 - wherein preferably each locking position corresponds to two pockets (42al, 42bl; 42ar, 42br) on opposite sides of the elongated opening (24l, 24r) and formed in respective opposite transversal directions (HI, -HI) of the elongated opening (24l, 24r).
9. Crampon (2) according to claim 8, wherein the pocket (42al, 42bl, 42ar, 42br) or each of the pockets (42al, 42bl, 42ar, 42br) is formed as a section of a cylindrical bore;
 - wherein the/each bore is preferably centred with respect to a course of the elongated opening (24l, 24r)
 - wherein preferably the diameter of the bore is the same for each of the pockets (42al, 42bl, 42ar, 42br); and
 - wherein preferably at least one pair of pockets (50l, 50r), formed by two of the pockets (42al, 42bl; 42ar, 42br) on opposite sides of the elongated opening (24l, 24r) formed in respective opposite transversal directions (HI, -HI) of the elongated opening (24l, 24r), is formed by sections of a single bore.
10. Crampon (2) according to claim 9,
 - wherein the distance between two centres of cylindrical bores, whose sections form pockets (42al, 42bl, 42ar, 42br) adjacent in the longitudinal direction of the elongated opening (24l, 24r), is smaller than the diameter, preferably smaller than the radius of the bores.
11. Crampon (2) according to one of the preceding claims,
 - wherein the locking member (26l, 26r) is formed as a pin (32l, 32r), which is preferably formed in the shape of a cylinder with a cutout portion (34l, 34r),
 - wherein the cutout portion (34l, 34r) is preferably formed such that an outer shape of a cross-section of the pin (32l, 32r) perpendicular to a cylinder axis the cylinder is a complement of a rectangle in a circle, wherein the circle intersect only one of the sides of the rectangle.
12. Crampon (2) according to one of the preceding claims, wherein the connection mechanism (20) comprises
 - a further locking member (26l, 26r); and
 - two elongated flexible members (58l, 58r), each preferably comprising a cable, a wire, a chain, a tape, a strap or a flexible rod;

wherein both of the elongated flexible members (58l, 58r) are fixed at one end to one of the front element (4) and the heel element (12) and the other end of each of the elongated flexible members (58l, 58r) is connected to the associated locking member (26l, 26r); wherein preferably:

the connection mechanism (20) comprises a further receiving member (22l, 22r) having an opening (24l, 24r) or an elongated opening (24l, 24r); and the other one of a the front element (4) and the heel element (12) is connected to or formed integrally with both receiving members (22l, 22r).

13. Crampon (2) according to claim 12, wherein each of the openings (24l, 24r) or each of the elongated openings (24l, 24r) of the receiving members (22l, 22r) is aligned along one associated leg of a V-shape.
14. Crampon (2) according to one of the preceding claims, wherein the opening is an elongated opening (24l, 24r).

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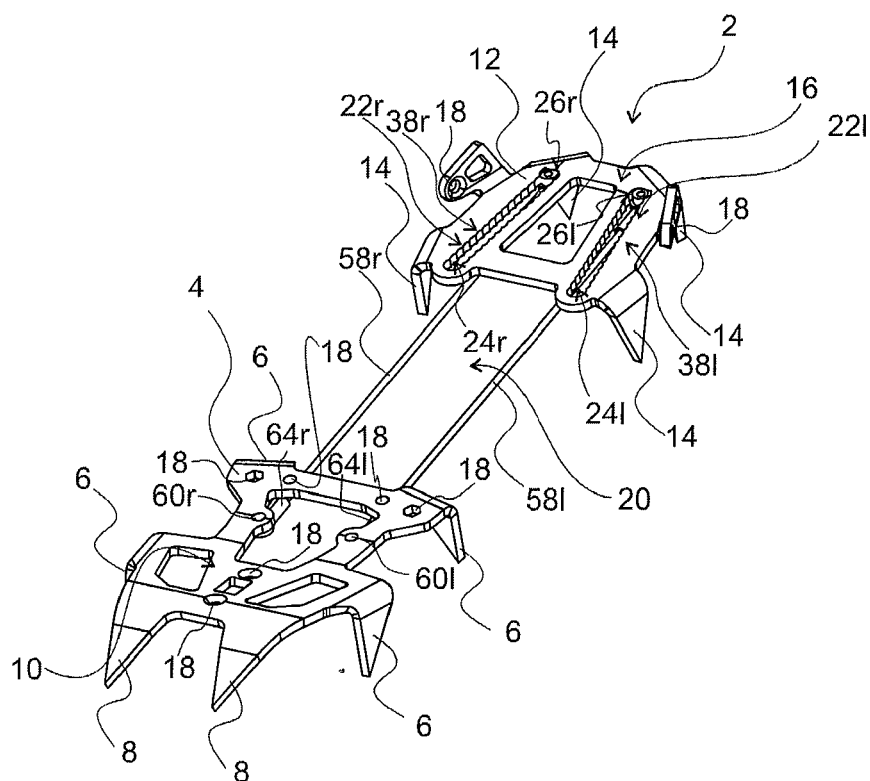


Figure 1

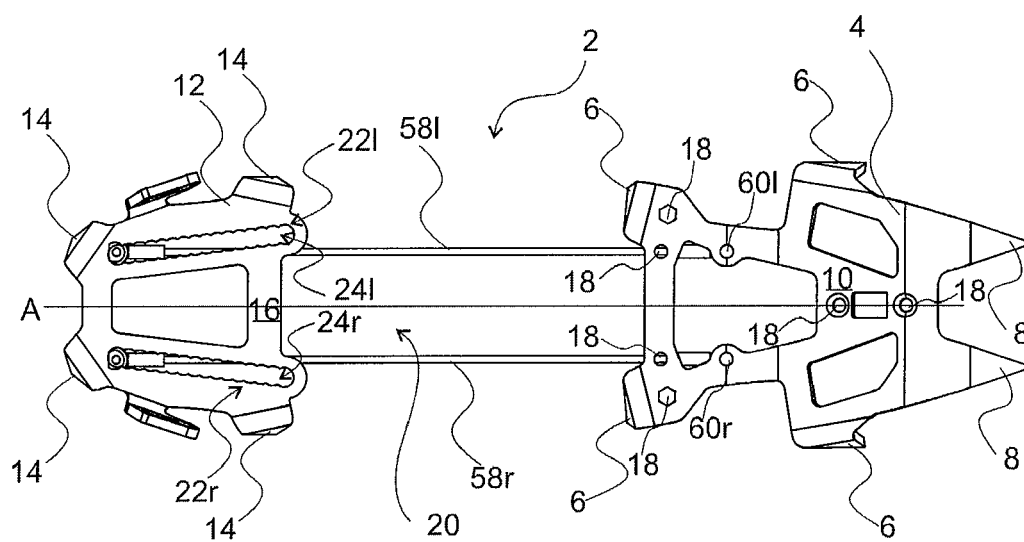


Figure 2

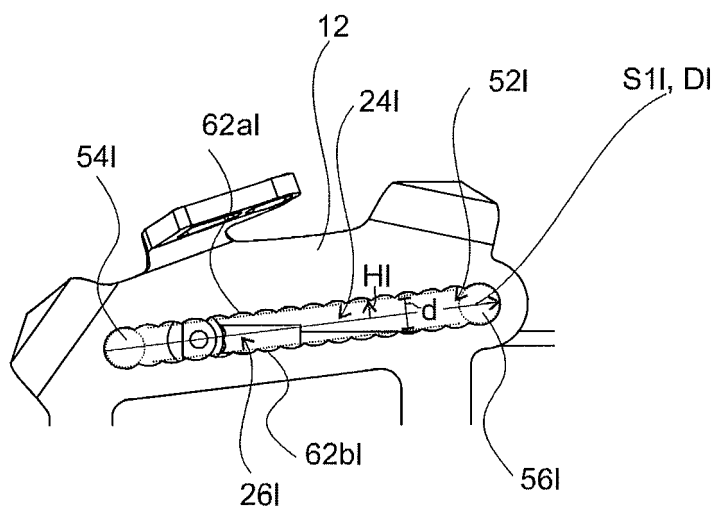


Figure 3

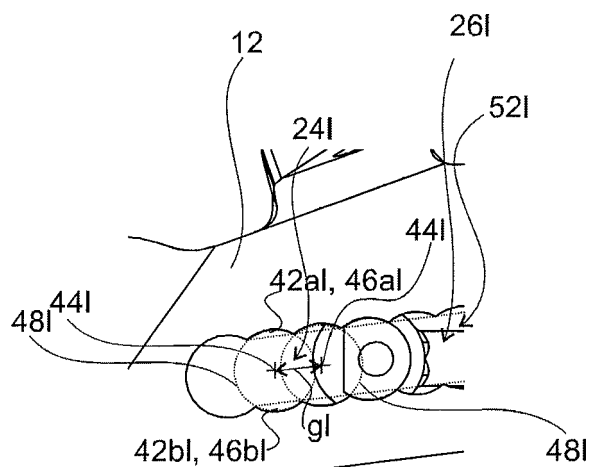


Figure 4

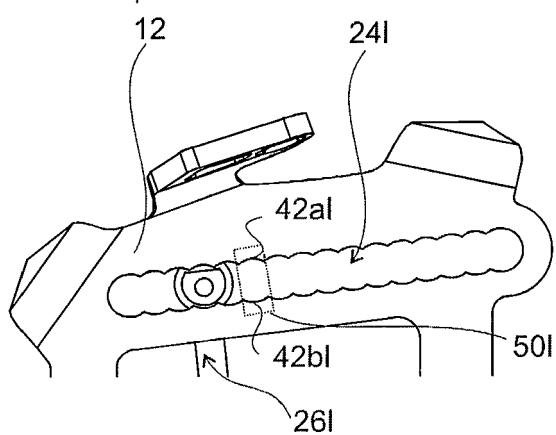


Figure 5

Figure 6

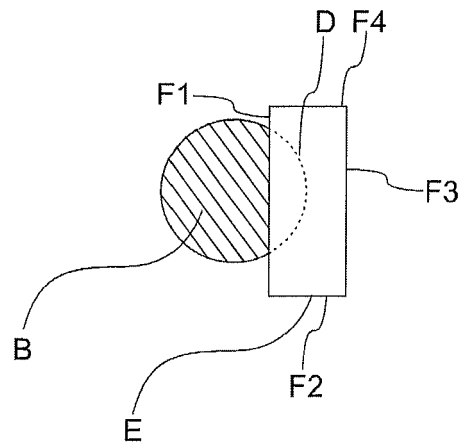


Figure 7

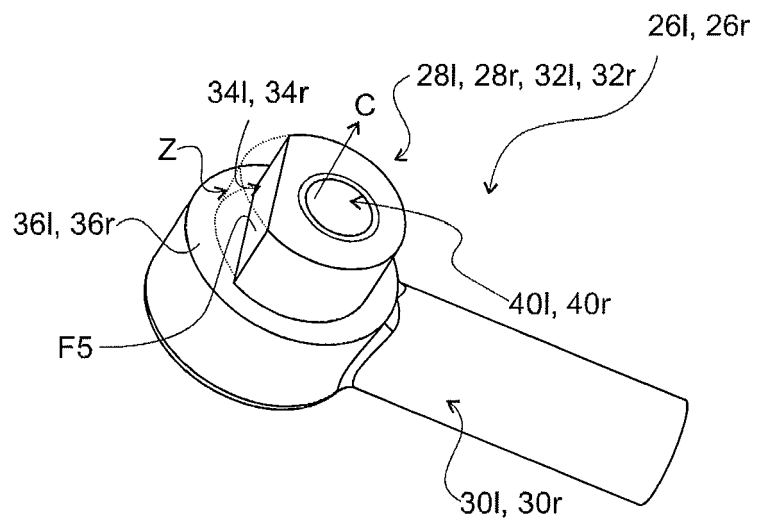
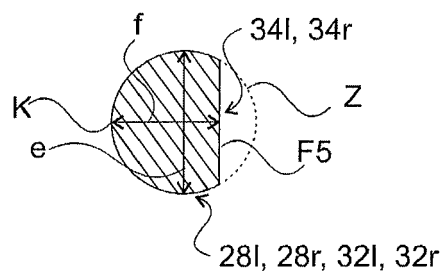


Figure 8





EUROPEAN SEARCH REPORT

Application Number
EP 17 18 4716

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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 2 904 921 A1 (ZEDEL [FR]) 12 August 2015 (2015-08-12)	1,2,4-14	INV. A43C15/06
Y	* figures *	3	A43C15/10
Y	----- WO 98/36654 A1 (LUNDY JAMES [GB]) 27 August 1998 (1998-08-27)	3	
A	----- EP 2 666 382 A1 (SALOMON SAS [FR]) 27 November 2013 (2013-11-27)	1-14	
A	----- EP 2 666 381 A1 (SALOMON SAS [FR]) 27 November 2013 (2013-11-27)	1-14	
	* figures *		

			TECHNICAL FIELDS SEARCHED (IPC)
			A43C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		18 December 2017	Gkionaki, Angeliki
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			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 18 4716

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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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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2904921 A1	12-08-2015	EP 2904921 A1	12-08-2015
		ES 2585228 T3	04-10-2016
		FR 3017032 A1	07-08-2015
		US 2015216265 A1	06-08-2015
WO 9836654 A1	27-08-1998	AU 6300698 A	09-09-1998
		WO 9836654 A1	27-08-1998
EP 2666382 A1	27-11-2013	CA 2817150 A1	22-11-2013
		EP 2666382 A1	27-11-2013
		FR 2990831 A1	29-11-2013
		US 2013312282 A1	28-11-2013
EP 2666381 A1	27-11-2013	CA 2817349 A1	22-11-2013
		EP 2666381 A1	27-11-2013
		FR 2990830 A1	29-11-2013
		US 2013312281 A1	28-11-2013