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(54) The shaft and the attachable handle of the ice axe

(57) Ice axe's shaft equipped with at least two, permanent or attachable, grips out of which at least one pair forms - together with the elements that link them to each other - a closed or an L-shaped profile. What is beneficial; such a pair of grips is placed in the working distance between each other smaller than the maximum of the length of the grips in the pair; the grips in such a pair of grips are placed at different angles off the vertical; at least one grip is displaced laterally in relation to the main plane of the climbing ice axe; at least one of the grips is asymmetrical in relation to the main plane of the ice axe, irrespective of the external surface structure; at least one of the handles is attachable; the subject of the invention is also an attachable handle, containing a grip.

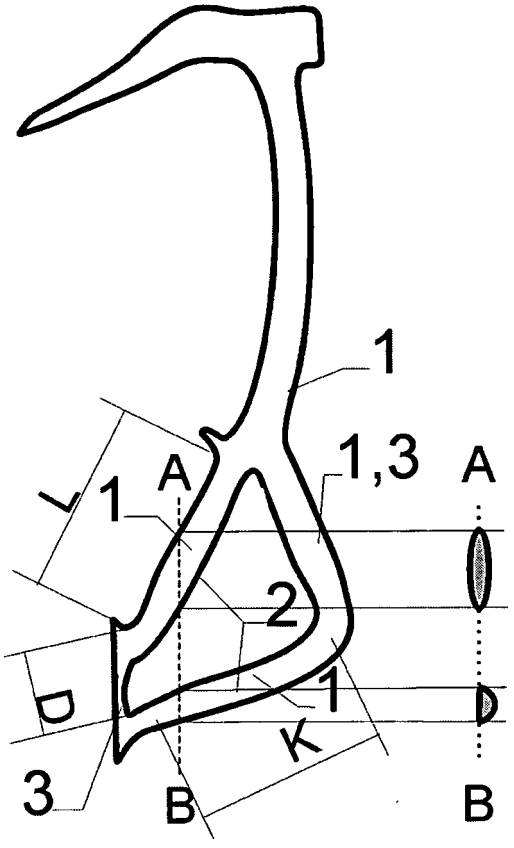

Fig. 1

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Description

[0001] The subject of the invention is a shaft of the climbing ice axe and an attachable handle of the climbing ice axe.

[0002] The notions below are contained in the hereby specification:

the notion of an *"ice axe"* should be understood also as an *"ice hammer"* and as other climbing "ice tools";
the notion of a *"wall"* should be understood as an "area where a climber moves - it can be icy, rocky, mixed, as well as formed by other surfaces";
the notion of a *"grip"* should be understood as a place devoted to holding an ice axe with one hand, too small to hold it bimanually, with whole, not overlapping hands;
the notion of a *"critical point"* of the ice axe's grip should be understood as a spot closest to the wall, situated on the upper - or on the front if the upper one cannot be differentiated - edge of the given grip, intended for a finger (predominantly for a small finger);
the notion of a *"working distance"* between a pair of grips on an ice axe should be understood as "distances between the critical points of these grips";
the notion of an *"angle of rotation at the loading's change between the grips"* in a given pair of grips should be understood as an angular measure of an undirected angle whose vertex is the pick, and whose arms cross the critical points in a given pair of grips, and thus as a measure of an undirected angle - the angle of rotation of the axe hanging on the pick from the position in which it is loaded downwards in the critical point of one of the grips, to the position in which it is loaded downwards in the critical point of the second grip; it is assumed at the same time that the only contact place of the axe and the wall is the pick;
the notion of a *"grip's length"* should be understood as the length measured within the straight line;
the notion of a *"closed profile"* should be understood also as a profile that can be closed with a segment of the length not longer than 50% of the length of the longest chord contained inside of an area limited by that profile;
the notion of a *"head'* in an ice axe should be understood also as the (upper) part of the shaft, intended for the installation of the attachments (e.g. pick) in the headless ice axes;
the notion of a *"grip's inclination angle"* off the vertical should be understood as the average inclination angle in relation to the vertical at the head-upwards positioning of the axe;
In the present specification, the notions "lower, higher" etc. refer to the classical position of the ice axe - head upwards, pick in the direction of the wall and it is assumed that the pick determines the front of the ice axe.

[0003] The solutions of the ice axe's shaft applied so far can be divided into three categories: straight (classic ice axes) - known, among others, from the patent specifications FR 2709971 A1, DE 3442933; slightly bent - known, among others, from the patent specifications D448640 S, US 005996235; and the so-called technical axes - the handle is displaced in relation to the main curve of the shaft - known, among others, from the patent specifications 20060070248 A1, EP 1533006 A; the attachable handles have not existed at all. In the technical ice axes, there is a significant working distance of the grips. There is usually no separate grip for the second hand in the non-technical axes, so in case of a need for a bimanual holding or a change of hands, the hold of one hand over the other is usually used (finger rests are often applied above the proper-lower grip, facilitating such a hold or such a change of hands, forming - in fact - a new grip). In all the solutions that have been implemented so far, there is a huge angle of rotation at the loading's change from one grip to the other and the possibility of taking a full, comfortable advantage of the wall's inclination is limited - the straight axes are applied for not very steep terrains, the slightly bent axes - for more steep to almost vertical ones, the technical axes - for almost vertical to over-hanging areas.

[0004] The subject of the invention is the ice axe's shaft, characterized by being equipped with at least two, permanent or attachable, grips out of which at least one pair forms - together with the elements that link them to each other - a closed or an L-shaped profile. What is beneficial, such a pair of grips is placed in the working distance between each other smaller than the maximum of the length of the grips in the pair; what is beneficial as well is that the grips in such a pair of grips are placed at different angles off the vertical; beneficial is also the fact that at least one grip of such a pair is displaced laterally in relation to the main plane of the climbing axe; another advantage is that at least one of the grips is asymmetrical in relation to each plane parallel to the main plane of the ice axe, irrespective of the external surface structure; advantageous is also the fact that at least one of the handles, containing a grip from such a pair of grips, is attachable; the subject of the invention is also an attachable handle, containing a grip, characterized by the fact that after its fixing on the ice axe, together with the connecting elements and the ice axe's shaft, it forms a closed or an L-shaped profile; also, beneficial is that the working distance, that appears after fastening the handle to the ice axe, between at least one pair of grips, out of which at least one is located on an attachable handle, is smaller than the maximum of the length of the grips in the pair; advantageous is that after attaching of such a handle to the ice axe, at least in one pair of grips, out of which at least one is located on the attachable handle, the inclination angles of the grips off the vertical are different; beneficial is also the fact that at least one of the grips in

such a pair is displaced laterally in relation to the main plane of the ice axe; it is profitable that after attaching the handle to the climbing axe, at least one of the grips on the handle is asymmetrical in relation to each of the planes parallel to the main plane of the ice axe, regardless of the external surface structure.

Benefits:

[0005] Very small, or even equal to zero, angle of rotation at the change of grip. It protects to a large extent against falling of the ice axe out of the ice/cracks/clumps of earth or grass etc. and against sliding of the ice axe down the rock at the change of the grip on the ice axe. In case of the grips placed at different angles in relation to the vertical, the possibility of using the axe comfortably increases drastically - by holding the grip less deviated off the vertical at the smaller inclinations, and more deviated at higher inclinations. Small distance between the little finger and the wall on the both lower grips. It has a significant influence on the angle of the pick's loading, and also on the comfort of the ice axe's hammering. The asymmetrical section of the grip increases ergonomics and the comfort of using the grip, at the adjustment of the ice axe to the specified (right or left) hand. Very effective protection of hands against hitting the wall.

[0006] The subject of the invention was presented on the examples of construction on attached drawings in which figure 1 shows an ice axe whose shaft contains a pair (2) of grips (1) forming, together with the connecting elements (3), a closed profile with the marked working distance (D) of a specified pair (2) of grips smaller than the maximum of the length of the grips (L), (K) in the pair with visible, different inclination angles of these grips in relation to the vertical, together with the section (A-B) showing the lateral displacement of the grip in relation to the main plane of the axe, marked with a dotted line, and also showing the asymmetrical section of one of the grips; figure 2 presents an ice axe whose shaft contains a pair (2) of grips (1) forming, together with the connecting elements (3), an L-shaped profile with the marked working distance (D) of a specified pair (2) of grips smaller than the maximum of the length of the grips (L), (K) in the pair with visible, different inclination angles of these grips off the vertical; figure 3 presents an attachable handle, containing a grip that - together with the linking elements (3) and the shaft of the axe, marked with a broken line - forms the closed profile with a distinguished working distance (D) of the specified pair (2) of grips, out of which one is situated on the attachable handle, that is smaller than the maximum of the length of the grips (L), (K) in the pair, with visible, different inclination angles off the vertical.

Claims

1. The ice axe's shaft, **characterized in that** it is equipped with at least two, permanent or attachable, grips (1), out of which at least one pair (2) together with the connecting elements (3) and the remaining part of the shaft, forms a closed or an L-shaped profile;

2. The ice axe's shaft according the claim 1, **characterized in that** a pair of grips (2) is situated beneficially in the working distance (D) smaller than the maximum of the length of the grips (L), (K) in the pair;

3. The ice axe's shaft according the claim 1, **characterized in that** the grips in the pair of grips are situated beneficially at different angles in relation to the vertical;

4. The ice axe's shaft according the claim 1, **characterized in that** at least one grip is profitably displaced laterally in relation to the axe's main plane;

5. The ice axe's shaft according the claim 1, **characterized in that** at least one of the grips is profitably asymmetrical in relation to every plane parallel to the main plane of the axe, regardless of the external surface structure;

6. The ice axe's shaft according the claim 1, **characterized in that** at least one of the handles, that contains a grip from the pair of grips, is profitably attachable.

7. An ice axe's attachable handle, containing a grip, **characterized in that** after its fixing on the axe together with the connecting elements (3) and the axe's shaft, it forms a closed or L-shaped profile;

8. An ice axe's attachable handle according the claim 7, **characterized in that** the working distance (D), formed after attaching the handle to the axe, between at least one pair of grips, out of which at least one is situated on the attachable handle is profitably smaller than the maximum of the length of the grips (L), (K) in the pair;

9. An ice axe's attachable handle according the claim 7, **characterized in that** after fixing it on the axe, it is beneficial that in at least one pair of grips, out of which at least one is situated on the attachable handle, the inclination angles off the vertical are different;

10. An ice axe's attachable handle according the claim 7, **characterized in that** after fixing it on the axe, it is profitable that at least one of the grips on the attachable handle is displaced laterally in relation to the axe's main plane;

11. An ice axe's attachable handle according the claim 7, **characterized in that** after fixing it on the axe, at least one of the grips on the handle is profitably

asymmetrical in relation to every plane parallel to the main plane of the axe, regardless of the external surface structure.

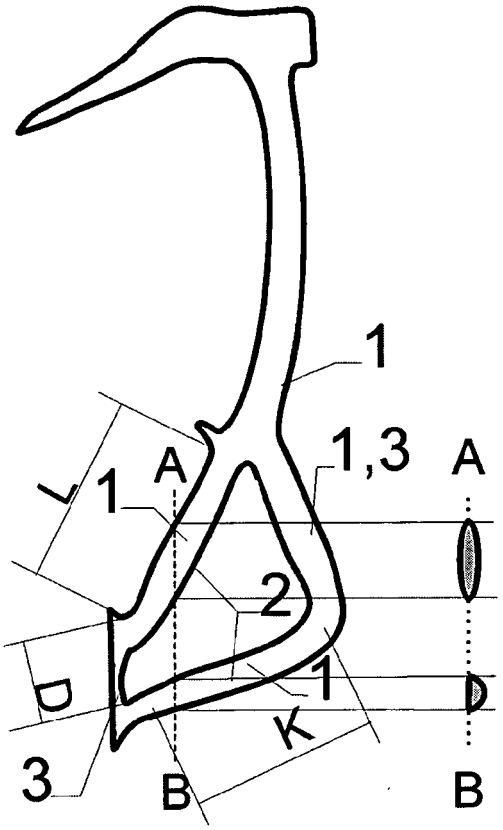

Fig. 1

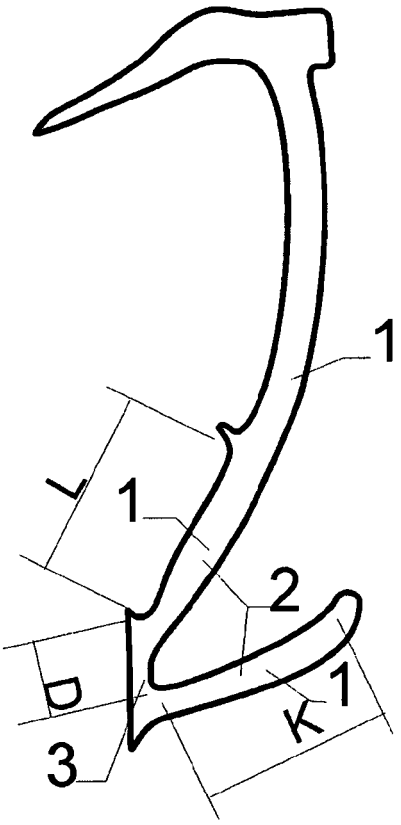

Fig. 2

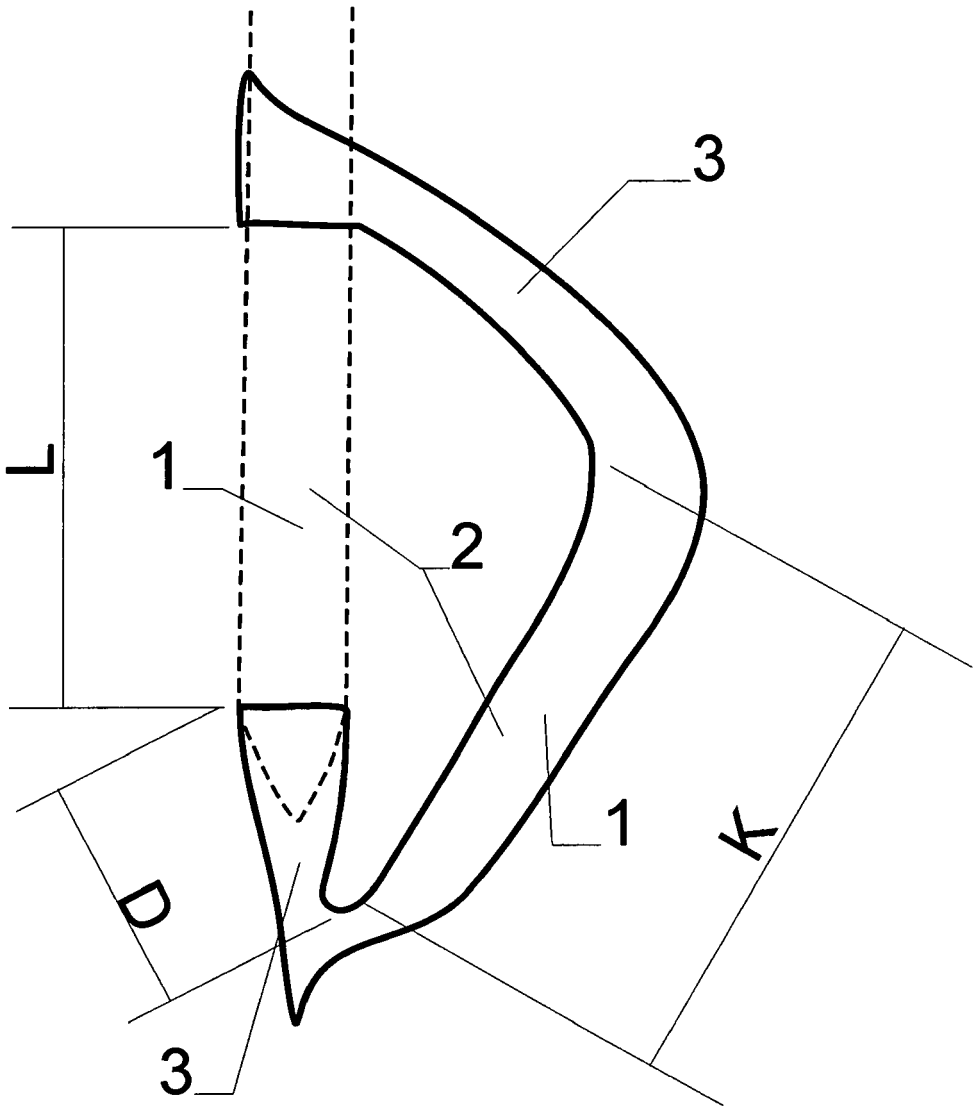

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 08 46 0010

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	US 2007/028462 A1 (SKRIVAN JOSEPH [US]) 8 February 2007 (2007-02-08) * the whole document *	1-5	INV. A63B29/08 B25D7/00 B25G1/10
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Y	DE 34 42 933 A1 (RUTHE HANS HERMANN) 5 June 1986 (1986-06-05) * the whole document *	1-6	
Y	WO 2006/106542 A (GRIVEL SRL [IT]; GOBBI GIOACHINO [IT]) 12 October 2006 (2006-10-12) * the whole document *	1-6	
X		7-11	
X	US 5 606 772 A (ILIC DRAGAN [US]) 4 March 1997 (1997-03-04) * the whole document *	7-11	

TECHNICAL FIELDS SEARCHED (IPC)

A63B
B25D
B25G
B26B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 June 2008	Millward, Richard

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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11-06-2008

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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