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(54) **A SKI POLE**

(57) A ski pole comprises means to hold a hand of a user substantially fastened to an upper end portion (4) of a shaft (2) while allowing a pivoting movement of the hand of a user with respect to this portion around an axis (6) extending substantially transversally to the running direction of a user when skiing for allowing the user to let loose the grip of the hand around a hand grip (3) of the ski pole at an end phase of a pole-pushing. The ski

pole comprises a rigid element (13) secured to an upper end (14) of the shaft to project forwardly from the shaft in the running direction of the user when skiing and the shaft being in a state of extending vertically. A substantially rigid support member (7) of the holding means is pivotally connected to the element around said axis (6) at a location displaced forwardly with respect to the shaft in said state.

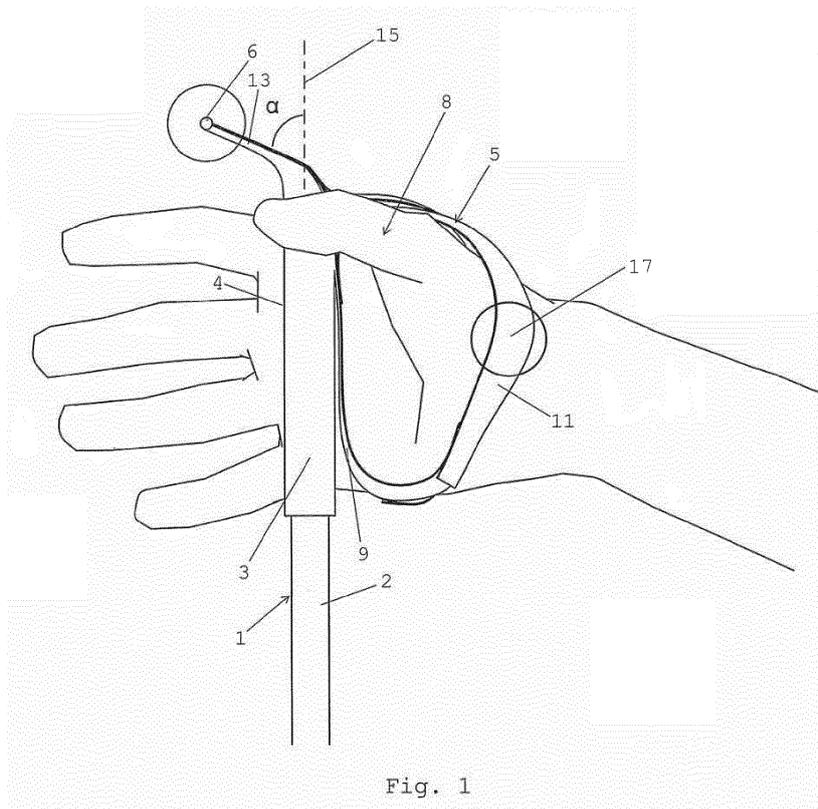


Fig. 1

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Description

[0001] The present invention relates to a ski pole according to the preamble of appended claim 1. The invention is particularly directed to cross-country ski poles, so that ski poles for that application will be discussed in the rest of this disclosure for illuminating the invention but not restricting it thereto.

[0002] A ski pole having holding means comprising a substantially rigid support member having first support portions adapted to form a substantially rigid support to at least portions of the palm of a user of the ski pole while allowing the hand of the user to grip around the hand grip of a ski pole in a base position of the support member is known through EP 2 135 646 B1. Although a ski pole with such a holding means of the type disclosed in that document results in a high comfort when using the ski pole and a good result of pole-pushing carried out thereby there is of course an ongoing attempt to improve a ski pole of this type in at least some aspect.

SUMMARY OF THE INVENTION

[0003] The object of the present invention is accordingly to provide a ski pole of the type defined in the introduction being improved in at least some aspect with respect to such ski poles already known.

[0004] This object is according to the invention obtained by providing such a ski pole with the features listed in the characterizing part of appended patent claim 1.

[0005] Accordingly, this ski pole further comprises a rigid element rigidly secured to an upper end of the shaft of the ski pole to project forwardly from the shaft in the running direction of a user when skiing and the shaft being in a state of extending vertically, and the support member is pivotally connected to the element around an axis at a location displaced forwardly with respect to the shaft in said state thereof. Such a displacement of the pivot axis of the support member and by that the holding means for holding a hand of the user with respect to the extension of the shaft results in a possibility to obtain a more efficient pole-pushing at the end of the pole-pushing cycle where such an improvement has a great impact upon the result of the pole-pushing.

[0006] When cross-country skiing with all types of grips, at the end of the pole-push, a pivoting movement of the skiers hand is used to increase the length of the pole. This pivoting movement of the wrist will also increase the speed of the skier. The skiers hand is used as a lever to push the pole further backwards. This lever can only be used when the skiers hand is letting go of the pole at the very end of the push. Using this wrist movement, the pole can be pushed away further behind the skier and at a higher speed than without this pivoting movement. When starting the pivoting movement of the wrist described above with an almost horizontal shaft at the end of the pole-push, the distance perpendicular to the pole between the wrist of the user and the point where

the hand of the user is attached to the pole by said holding means, i.e. the location of said axis, determines the lever, and the greater this lever is the more speed may be gained when pushing and using the pivoting of the users wrist. This lever will be substantially increased at the beginning of the pivoting of the holding means with respect to the shaft by displacing said axis forwardly with respect to the shaft in comparison to known ski poles of the type defined in the introduction and conventional ski poles having stripes in the form of a band loop secured to the upper end portion of the shaft as holding means.

[0007] According to an embodiment of the invention the element projects from the shaft while making an angle to the shaft of at least 20°. It is preferred to have at least such a great angle between the element and the shaft, since the greater angle the more efficient start of the pivot movement of the holding means with a longer lever, although a great such angle at a fixed length of said element will lower the efficiency of the pole pushing at the end of the pivot movement with respect to a smaller such angle assuming that said axis is located at the same distance to the connection of the element to the shaft.

[0008] According to another embodiment of the invention the element projects from the shaft while making an angle to the shaft of at least 30° or at least 45°. Such larger angles will increase the lever for pushing the skier forwardly in the beginning of the pivot movement of the holding means.

[0009] According to another embodiment of the invention the element projects upwards from the shaft when the shaft is in said state. This results in an increased vertical distance between said axis and the wrist of a user in said state, which will especially improve the efficiency of the pole pushing in the middle and end phase of the pivot movement of the holding means.

[0010] According to another embodiment of the invention said axis around which the support member is pivotally connected to said element is located at a distance of at least 2 cm to a prolongation of a centre axis of the shaft. This results in a substantial elongation of the lever pushing a user forward in the beginning of the pivot movement of the holding means.

[0011] According to another embodiment of the invention the support member is pivotally connected to said element around an axis located at a distance of 2-6 cm or 3-5 cm to a prolongation of a centre axis of the shaft, which has turned out to be suitable locations of said axis for combining pole pushing efficiency and comfort of the user of the ski pole.

[0012] According to another embodiment of the invention the support member has two substantially rigid portions which are connected to an upper region close to the upper shaft end of a first said support portion for the palm of a said user and which are extending in said base position apart to on opposite sides surround the back of the hand of a user and converge to be connected to said first palm support portion at a lower end of this portion close to the wrist of the hand of a said user. Such a con-

struction of the support member enables obtention of a firm and comfortable receipt of the hand of a user in said holding means throughout the entire pole-pushing action.

[0013] According to another embodiment of the invention the second of said two support portions is configured to support the metacarpus part of the four fingers of a hand of a user and a third of said two support portions is configured to support the thumb side of the wrist on the back side of the hand of a user. This means that said three support portions of the support member together provide comfortable support to a hand of a user of the ski pole.

[0014] According to another embodiment of the invention said second and third support portions have arc-like extensions with the arc of the second support portions being shorter than the arc of the third support portion and which starts and ends inside the arc of the third support portion. This design of these support portions, especially in combination with another embodiment of the invention in which the second and third support portions are bendable to allow pushing and bending them towards each other after introduction of a hand of a user into an opening surrounded by them for adaption to said hand of a user, results in a possibility to adapt the holding means to the appearance of a hand of a user once introduced into the holding means increasing comfort of the user and efficiency of the pole-pushing action.

[0015] According to another embodiment of the invention at least said second and third support portions of the support member are made of plastic.

[0016] Further advantages and advantageous features of the invention will appear from the description following below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] With reference to the appended drawings, below follows a description of an embodiment of the invention cited as an example.

[0018] In the drawings:

Fig. 1 is a side elevation view of the upper portion of a ski pole for the left hand of a user according to an embodiment of the invention with a hand of a user received therein,

Fig. 2 is a perspective view of the upper portion of the ski pole shown in Fig. 1 with the shaft being in a state of extending vertically,

Fig. 3 illustrates schematically the levers obtained by the ski pole according to the embodiment of the invention in the state shown in Fig. 1, and

Fig. 4 illustrates how the ski pole according to the invention is gripped at a start of a pole-pushing action.

DETAILED DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0019] Fig. 1 illustrates an upper part of a cross-country ski pole 1 having an elongated shaft 2 with a basket and tip not shown on the lower end for being pushed into the snow for pole-pushing. A hand grip 3 is arranged around an upper end portion 4 of the shaft and configured to be gripped by a user of the ski pole.

[0020] The ski pole further comprises means 5 configured to hold a hand of the said user substantially fastened to said upper end portion 4 of the shaft while allowing a pivoting movement of the hand with respect to said upper end portion around an axis 6 extending substantially transversally to the running direction of said user when skiing for allowing said user to let loose the grip of the hand around the hand grip at an end phase of a pole pushing. The holding means 5 comprises a substantially rigid support member 7 made of for example plastic or a synthetic material, such as a composite for lowering the weight thereof. The support member 7 shown in this figure is designed to fit the right hand of a user, and it is shown how such a right hand 8 is held by the holding means.

[0021] The support member 7 has first support portions 9 adapted to form a substantially rigid support to the palm of a user while allowing the hand of the user to grip around the hand grip 3 in a base position of the support member shown in Fig. 1. The support member has also two substantially rigid support portions which are connected to an upper region close to the upper shaft end of a first said support portion 9 for the palm of a user and which are extending in said base position apart to opposite sides surrounding the back of the hand of a user and converge to be connected to said first support portion at a lower end of this portion close to the wrist of the hand of a said user when received in the holding means. Moreover, a second 10 of said two support portions is configured to support the metacarpus part of the four finger of a hand of a user and a third 11 of these two support portions is configured to support the thumb side of the wrist on the back side of the hand of a user. It is shown how the second and third support portions have arc-like extensions with the arc of the second support portion 10 being shorter than the arc of the third support portion 11 and which starts and ends inside the arc of the third support portion. This in combination with the construction of the two support portions to be bendable to allow pushing and bending them towards each other after introduction of a hand of a user into an opening 12 surrounded by them enables adaption of the holding means to the hand of a user once received by the holding means. Selecting plastic as material for the second and third support portions is advantageous for obtaining this. To secure a hand introduced through the opening 12 even better a strap or the like may be applied and tightened to draw the two support members 10 and 11 towards each other and fixate them.

[0022] The ski pole further comprises a rigid element 13 rigidly secured to an upper end 14 of the shaft to project forwardly from the shaft in the running direction of said user when skiing and the shaft being in a state of extending vertically. "Project forwardly" shall be interpreted as having one component of the extension thereof directed forwardly and not that the element has to make an angle of 90° with respect to the shaft, and in the embodiment shown in Fig. 1 this angle α is in fact about 60°. The support member 7 is pivotally connected to the element 13 around said axis 6 at a location displaced forwardly with respect to the shaft as seen in said state. The axis 6 is by this typically located at a distance of 2-6 cm to a prolongation of a centre axis 15 of the shaft. Fig. 1 illustrates the location of the pivot axis 6 and wrist 17 in a start phase of a pivoting action.

[0023] Fig. 1 shows how a user of the ski pole is loosening the hand grip around the ski pole when beginning a pivoting action at the end phase of a pole push with the shaft being in a state of extending almost horizontally, and Fig. 3 illustrates the levers obtained by the pole to act by the tip thereof onto the ground for getting the pole moving faster backwards than the hand gripping the pole. A first lever 18 is defined by the distance between the wrist 17 of the hand and the pivot axis 6 in the running direction perpendicular to the ski pole. This first lever 18 is here greater in the state of the ski pole shown in Fig. 1 than for known ski poles thanks to the displacement of the axis 6 forwardly with respect to the shaft, and the longer first lever 18 the more speed may be transferred to the ski pole with respect to the hand of the user. A second lever 19 directed perpendicularly to the first lever 18 and formed by the distance of the wrist 17 to the axis 6 in this direction needs to be kept as short as possible because the direction of the force generated by this lever is vertical to the desired direction and therefore the force used to move the pole through the second lever 19 will be wasted. However, the distance defining the unwanted lever 19 at this start point of the pivoting movement will help to increase the lever 18 at the rest of the pivoting movement when the grip is tilted. The lever 18 in Fig. 1 is efficient at the start of the pivoting movement, while the lever 19 in Fig. 1 is efficient at the end of the pivoting movement.

[0024] The present invention is not in any way restricted to the embodiment described above, but many possibilities to modification thereof will be apparent to a person with ordinary skill in the art without departing from the scope of the invention as defined in the appended claims.

[0025] The invention is also applicable to other ski poles than for cross-country, such as alpine ski poles.

[0026] Although not shown, it will in principal be possible to having the rigid element projecting downwards from the shaft when the shaft is in a state of extending vertically. The pivot axis of the holding means will by this be moved to a lower height than the upper end of the shaft.

[0027] The angle made by the rigid element to the shaft is in this disclosure to be understood as the angle made to the shaft by a straight line extending from the upper end of the shaft to the axis around which the support member is pivoted.

Claims

1. A ski pole comprising

- an elongated shaft (2),
- a hand grip (3) arranged around an upper end portion (4) of the shaft and configured to be gripped by a user of the ski pole and
- means (5) configured to hold a hand (8) of a said user substantially fastened to said upper end portion of the shaft while allowing a pivoting movement of the hand with respect to said upper end portion (4) around an axis (6) extending substantially transversally to the running direction of said user when skiing for allowing said user to let loose the grip of the hand around said hand grip (3) at an end phase of a pole-pushing,

said holding means comprising a substantially rigid support member (7) having first support portions (9) adapted to form a substantially rigid support to at least portions of the palm of a said user while allowing the hand of the user to grip around said hand grip (3) in a base position of the support member, **characterized in that** the ski pole further comprises a rigid element (13) rigidly secured to an upper end (14) of the shaft to project forwardly from the shaft (2) in the running direction of said user when skiing and the shaft being in a state of extending vertically, and that said support member (7) is pivotally connected to said element (13) around said axis (6) at a location displaced forwardly with respect to the shaft (2) in said state thereof.

2. A ski pole according to claim 1, **characterized in that** the element (13) projects from the shaft (2) while making an angle to the shaft of at least 20°.

3. A ski pole according to claim 1, **characterized in that** the element (13) projects from the shaft (2) while making an angle to the shaft of at least 30° or at least 45°.

4. A ski pole according to any of the preceding claims, **characterized in that** the element (13) projects upwards from the shaft (2) when the shaft is in said state.

5. A ski pole according to any of the preceding claims, **characterized in that** said axis (6) around which the support member (7) is pivotally connected to said

element (13) is located at a distance of at least 2 cm to a prolongation of a centre axis (15) of the shaft (2).

6. A ski pole according to any of the preceding claims, **characterized in that** the support member (7) is pivotally connected to said element (13) around an axis (6) located at a distance of 2-6 cm or 3-5 cm to a prolongation of a centre axis (15) of the shaft (2). 5
7. A ski pole according to any of the preceding claims, **characterized in that** the support member (7) has two substantially rigid support portions (10, 11) which are connected to an upper region close to the upper shaft end of a first said support portion (9) for the palm of a said user and which are extending in said base position apart to on opposite sides surround the back of the hand of a user and converge to be connected to said first palm support portion (9) at a lower end of this portion close to the wrist (17) of the hand of a said user. 10
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8. A ski pole according to claim 7, **characterized in that** a second (10) of said two support portions is configured to support the metacarpus part of the four fingers of a hand (8) of a user and a third (11) of said two support portions is configured to support the thumb side of the wrist (17) on the back side of the hand of a user. 25
9. A ski pole according to claim 8, **characterized in that** said second (10) and third (11) support portions have arc-like extensions with the arc of the second support portions being shorter than the arc of the third support portion (11) and which starts and ends inside the arc of the third support portion. 30
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10. A ski pole according to any of claims 7-9, **characterized in that** said two support portions (10, 11) are bendable to allow pushing and bending them towards each other after introduction of a hand of a user into an opening (12) surrounded by them for adaption to said hand of a user. 40
11. A ski pole according to any of claims 7-10, **characterized in that** at least said second (10) and third (11) support portions of the support member (7) are made of plastic. 45

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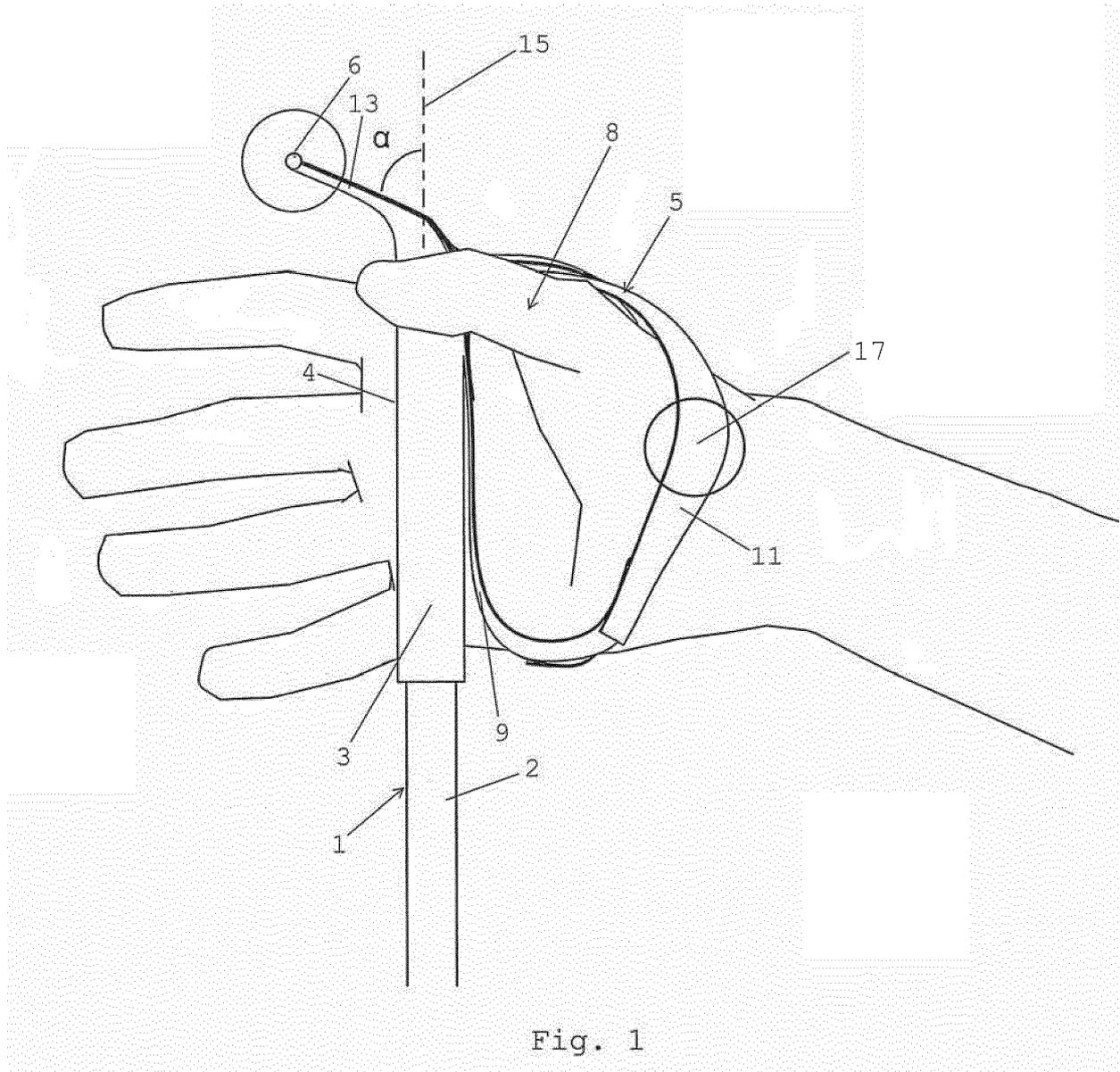


Fig. 1

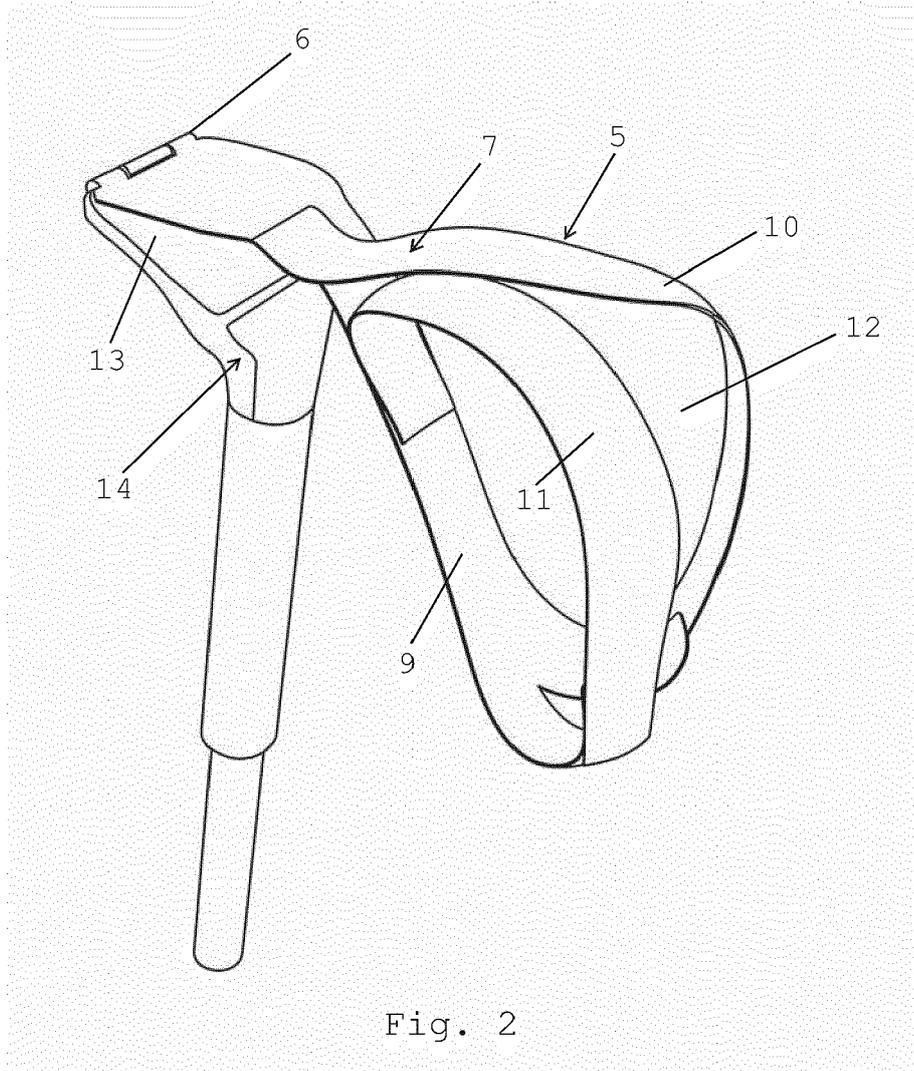


Fig. 2

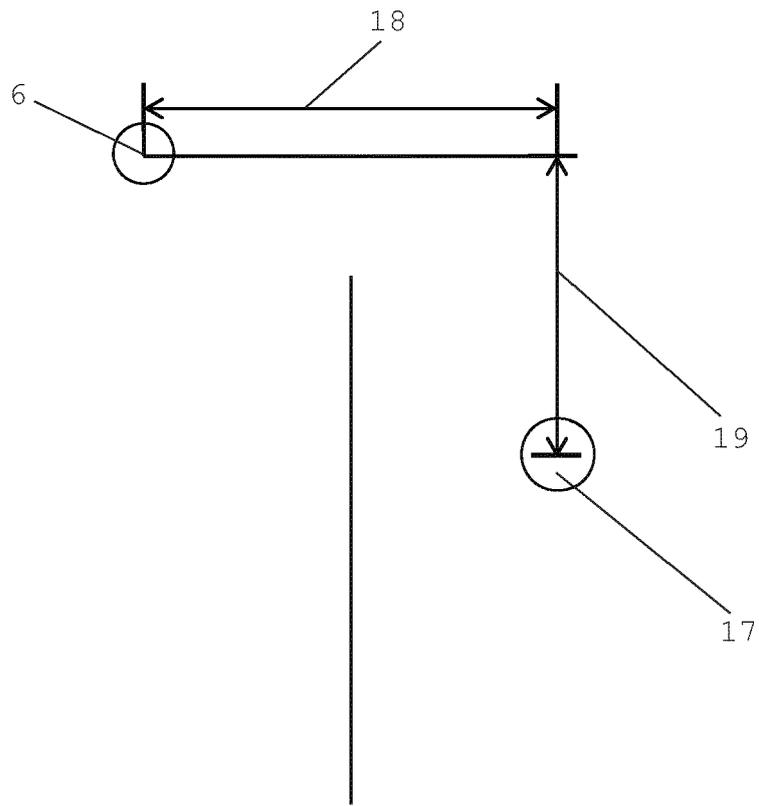
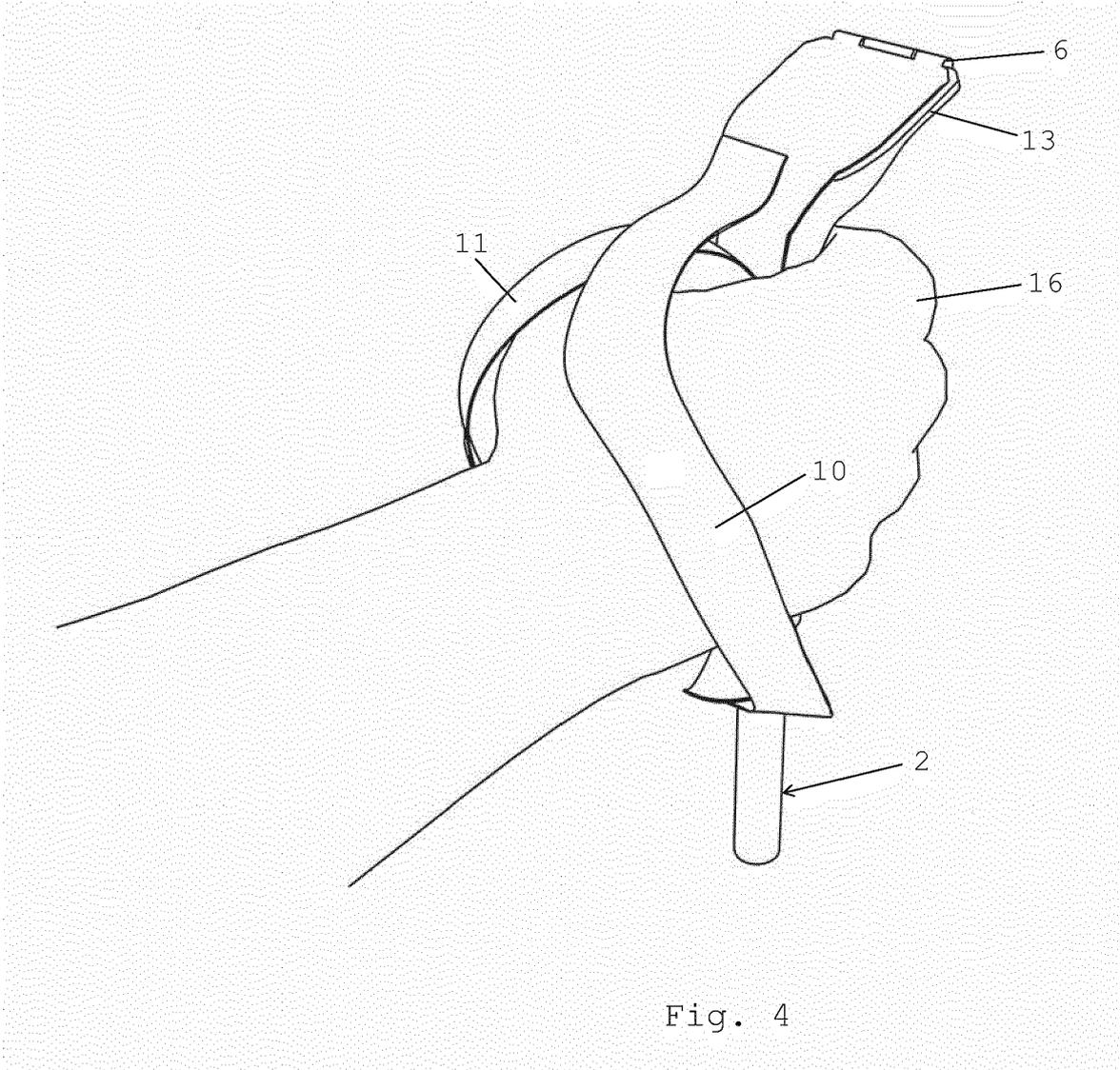


Fig. 3





EUROPEAN SEARCH REPORT

Application Number
EP 18 19 8756

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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	KR 101 027 746 B1 (LIM JAE WHOON [KR]) 7 April 2011 (2011-04-07)	1-6	INV. A63C11/22
A	* paragraph [0011]; claim 1; figures 2-8 * * paragraph [0030] - paragraph [0050] *	7-11	
A	FR 2 871 663 A1 (NAPPA ALEXANDRE XAVIER RAPHAEL [FR]; EROLA NADAL JOAN [ES]; PUIGDEMASA) 23 December 2005 (2005-12-23) * figures 8,9 *	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A63C A45B
Place of search		Date of completion of the search	Examiner
Munich		20 March 2019	Brunie, Franck
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 19 8756

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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KR 101027746	B1	07-04-2011	NONE
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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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Patent documents cited in the description

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