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## (54) Lever particularly for sports shoes

(57) A lever (1), particularly for sports shoes which comprise a first flap (7) with which a plate (5) is associated which has a pair of shoulders (8a, 8b) to which a lever arm (11) is pivoted. A base (12) of a U-shaped support (13) is rotatably associated with the lever arm (11) and has a likewise shaped seat (20) for a tensioning element (22) which is slidingly associated thereat. The ends (23, 25) of the tensioning element (22) are respectively associated and selectively associable with a second flap (21) to be joined of the shoe.

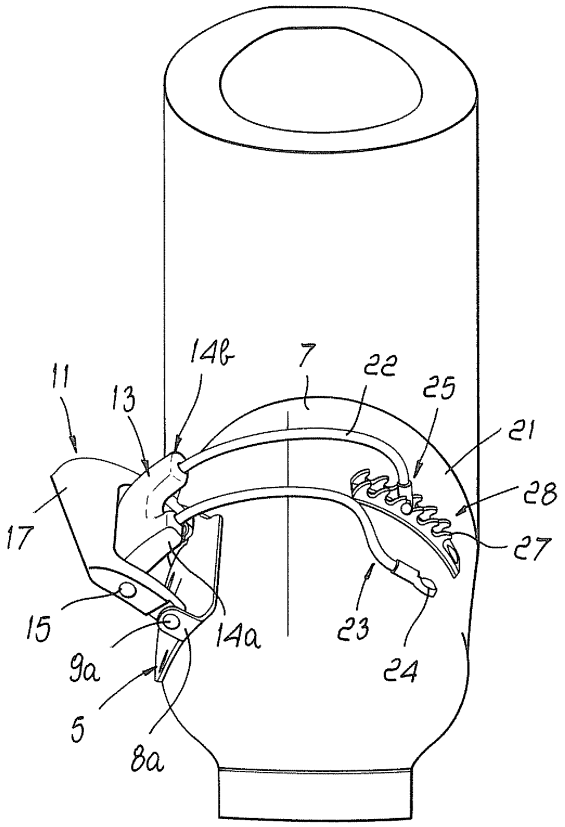


Fig. 4

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## Description

**[0001]** The present invention relates to a lever particularly for sports shoes.

**[0002]** Known systems composed of a generally metallic plate, which is fixed to a first flap, for example of the shell of a shoe, provided with two shoulders on which a lever arm which generally has a U-shaped profile is hinged by means of a first pivot, are currently in use.

**[0003]** Such lever arm supports a first end of a tensioning element so that it can rotate by means of a second pivot which is arranged parallel to the first one, and a means for interconnection to a rack is hinged to a second end of the tensioning element by means of a third pivot, the axis of which is parallel to the two above cited pivots.

**[0004]** Such means is provided with a hook, which is generally constituted by a fourth pivot which is parallel to the preceding ones and is adapted to be arranged selectively between a plurality of teeth formed on a rack which is fixed to a second external flap, for example of the shell of the shoe.

**[0005]** These levers of a known type, however, suffer a drawback which is linked to the fact that in a boot at least two of them must be arranged at the shell.

**[0006]** This entails for the user the need to adjust individually and distinctly the two levers in order to obtain optimum closure of the boot, and this entails a long time and a certain manual skill for the operator, who must further perform it in less than ideal conditions, since usually he/she is wearing gloves due to the temperature at which the sports activity is performed.

**[0007]** A ski boot is also known which has a shell with overlapping flaps which has a single lever arm which is articulated to a first flap by means of a plate whose width is approximately equal to the space usually used in the background art to position two distinct levers.

**[0008]** The first end of two distinct tensioning elements is pivoted to such lever arm about a same axis and can be interconnected at a second end to an interconnection means which is rigidly coupled to the other flap to be joined.

**[0009]** In this known solution, therefore, by acting on a single lever arm one achieves the simultaneous traction of two distinct tensioning elements, both of which are articulated to the lever arm.

**[0010]** However, although this solution allows to achieve fastening of the flaps of the shell of the boot with a single operation, it has a severe drawback due to the fact that it is very difficult to adjust the useful length of the two tensioning elements assuming that both are under traction.

**[0011]** If an adjustment on one tensioning element is performed, this adjustment also affects the other tensioning element, and therefore it is not possible to achieve correct fastening for both and the lever arm is subjected to continuous accidental opening or to less than optimum fastening of the flaps of the shell.

**[0012]** The aim of the present invention is to solve the above-mentioned problems, eliminating the drawbacks of the cited background art, by providing a lever, particularly for fastening sports shoes, which can allow to achieve optimum fastening of the flaps of a shoe easily and rapidly.

**[0013]** Within this aim, an object of the invention is to provide a lever which allows to achieve optimum closure of the flaps with an optimum adjustment of the degree of activation of the tensioning element.

**[0014]** Another object is to provide a lever whose actuation entails, once it has been adjusted the first time, the obtainment of the same tensioning upon subsequent activations.

**[0015]** Another object is to provide a lever which is rugged and reliable in use, the risks of its possible breakage being limited.

**[0016]** Another object is to provide a lever which is structurally simple and has low manufacturing costs.

**[0017]** This aim and these objects, as well as others which will become better apparent hereinafter, are achieved by a lever, particularly for sports shoes which comprise a first flap with which a plate is associated which has a pair of shoulders to which a lever arm is pivoted, characterized in that a base of a U-shaped support is rotatably associated with said lever arm and has a seat for at least one tensioning element which is slidingly associated thereat and whose ends are respectively associated and selectively associable with a second flap to be joined of said shoe.

**[0018]** Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a side perspective view of a ski boot with the lever according to the invention applied thereto in the closed condition;
Figure 2 is a front view of the boot;
Figures 3 and 4 are views, similar to Figures 1 and 2, of the lever in the open condition;
Figure 5 is an exploded view of the components of the lever;
Figure 6 is a side view of the lever;
Figure 7 is a top view of the lever;
Figure 8 is a sectional view, taken along the line VIII-VIII of Figure 7;
Figure 9 is a sectional view, taken along the line IX-IX of Figure 8.

**[0019]** In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

**[0020]** Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a dis-

claimer.

**[0021]** With reference to the figures, the reference numeral 1 generally designates a lever, particularly for sports shoes such as for example a ski boot 2, or a roller skate or ice skate, of the type which comprises a shell 3 with which one or more quarters 4 are associated.

**[0022]** The lever 1 comprises a preferably metallic plate 5, which can be associated for example by means of suitable rivets 6 with a first flap 7 of the shoe.

**[0023]** Such first flap can be related to the shell 3 or to the quarter 4.

**[0024]** Two shoulders 8a, 8b protrude from the plate 5 at the transverse ends, are provided with holes along the same axis and act as seats for first pivots 9a, 9b for the pivoting of first wings 10a, 10b of a lever arm 11 which has a substantially U-shaped plan configuration.

**[0025]** A base 12 of a support 13 is generally associated with the lever arm 11 in the interspace provided between the first wings 10a, 10b and is also U-shaped and has second wings 14a, 14b, which during use face the first wings 10a, 10b.

**[0026]** The rotary interconnection of the support 13 to the lever arm 11 occurs by means of a second pivot 15, which passes at appropriately provided first holes 16a, 16b, which have the same axis and are formed in the first wings 10a, 10b of the lever arm 11 in a region which is adjacent to the portion 17 that connects said wings and a second hole 18 which is formed at the base 12 of the support 13.

**[0027]** At least one approximately U-shaped seat 20 is provided on the lower surface 19 of the support 13 which is directed toward the underlying plate 5 and has a first portion which is approximately parallel to the base 12 and is connected, with a preferably arc-like shape, to second portions which are approximately parallel to the second wings 14a and 14b and protrude from them toward a second flap 21 to be joined.

**[0028]** A tensioning element such as a cable 22 is slidingly associated within the seat 20.

**[0029]** Such cable has a first end 23 which is rigidly coupled, for example by means of a cable lug 24, to the second flap 21 and a second end 25 which can be associated selectively with the second flap 21.

**[0030]** A T-shaped terminal 26 is in fact rigidly coupled to the second end 25 and its wings can be engaged selectively between teeth 27 of a rack 28 which is associated with the second flap 21.

**[0031]** The use of the invention is therefore as follows: once the foot has been inserted in the shoe, it is sufficient for the user to adjust the position of the terminal 26 between the chosen teeth of the rack and then act on the lever arm to fasten the cable in the two directions of the second wings 14a and 14b, thus fastening two separate regions of the shoe.

**[0032]** The degree of tensioning is further provided a single time and is distributed along both directions thanks to the possibility of the cable to slide within the seat 20, this allowing automatic adjustment of the degree of fastening and a balancing of the tension of the cable during sports practice.

**[0033]** It has thus been found that the invention has achieved the intended aim and objects, a lever having been devised which allows to achieve optimum fastening of the flaps of a shoe easily and rapidly simply by activating a single lever arm which tensions simultaneously and in an optimum manner two distinct cables, achieving with a single maneuver the tensioning and release of the single cable.

**[0034]** This lever further allows to achieve optimum closure of flaps with an optimum adjustment of the degree of activation of the cables, which self-adjust also as a function of the stresses imparted to the shoe during sports practice: the cable in fact balances the traction loads at its ends.

**[0035]** Moreover, the lever, once it has been adjusted the first time, allows to achieve the same degree of tensioning upon subsequent activations, since the useful extension of the cable needs to be set only once.

**[0036]** Further, activation of the lever is very easy and quick even if it is performed while wearing gloves and the simplicity of the closure is further appreciated by non-expert users.

**[0037]** The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

**[0038]** Thus, the number and shape of the seats provided on the support 13 and the direction of the first and second portions with respect to the base 12 and the second wings 14a and 14b can be the most pertinent according to requirements.

**[0039]** The shape of the support 13 also can be the most disparate according to requirements.

**[0040]** The materials used, as well as the dimensions which constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

**[0041]** The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

**[0042]** The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

**[0043]** The disclosures in Italian Patent Application No. TV2006A000227 from which this application claims priority are incorporated herein by reference.

**[0044]** Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. A lever (1), particularly for sports shoes which comprise a first flap (7) with which a plate (5) is associated which has a pair of shoulders (8a, 8b) to which a lever arm (11) is pivoted, **characterized in that** a base (12) of a U-shaped support (13) is rotatably associated with said lever arm (11) and has at least one seat (20) for a tensioning element (22) which is slidingly associated thereat and whose ends (23, 25) are respectively associated and selectively associable with a second flap (21) to be joined of said shoe.

2. The lever according to claim 1, **characterized in that** said two shoulders (8a, 8b) are perforated along the same axis and protrude from said plate (5) at the transverse ends, said shoulders acting as seats for first pivots (9a, 9b) for the pivoting of first wings (10a, 10b) of said lever arm (11) which has a substantially U-shaped plan configuration, said base (12) of the support (13) being associated with said lever arm (11) in an interspace provided between said first wings (10a, 10b), being also U-shaped and having second wings (14a, 14b) which during use face said first wings (10a, 10b).

3. The lever according to claims 1 and 2, **characterized in that** the rotary interconnection of said support (13) to said lever arm (11) occurs by means of a second pivot (15) which passes at preset first holes (16a, 16b), which have the same axis and are formed in said first wings (10a, 10b) of said lever arm (11) in a region which is adjacent to a connecting portion (17) between said wings (10a, 10b) and a second hole (18) which is formed at said base (12) of said support (13).

4. The lever according to claims 1 and 3, **characterized in that** said at least one approximately U-shaped seat (20) is provided on the lower surface of said support (13) toward said plate (5) and has a first portion which is approximately parallel to said base (12) and is blended with second portions which are approximately parallel to said second wings (14a, 14b) and protrude from them toward the second flap (21) to be joined.

5. The lever according to claims 1 and 4, **characterized in that** said tensioning element (22) is a cable associated slidingly within said seat (20).

6. The lever according to claims 1 and 5, **characterized in that** said cable (22) has a first end (23) which is rigidly coupled, by means of a cable lug (24), to said second flap (21) and a second end (25) which can be associated selectively with said second flap (21).

7. The lever according to claims 1 and 6, **characterized in that** a T-shaped terminal (26) is rigidly coupled to said second end (25) and its wings can be engaged selectively between teeth (27) of a rack (28) which is associated with said second flap (21).

8. The lever according to one or more of the preceding claims, **characterized in that** the shape of said at least one seat (20) formed in said support (13) is such as to form second portions which have a chosen orientation with respect to said second flap (21).

9. The lever according to one or more of the preceding claims, **characterized in that** said second end (25) of the cable (22) can be associated selectively with said second flap (21) by means of temporary engagement means or fine adjustment means.

10. A lever (1), particularly for sports shoes comprising a first flap (7) with which a plate (5) is associated, which has a pair of shoulders (8a, 8b) to which a lever arm (11) is pivoted, **characterized in that** a support (5) is rotatably associated with said lever arm (11) and has at least one seat (20) for at least one tensioning element (22) which is guided slidingly therein, its ends (23, 25) being respectively associated with a second flap (21) to be joined of said shoe and selectively associable with connection means provided on said second flap (21) to be joined.

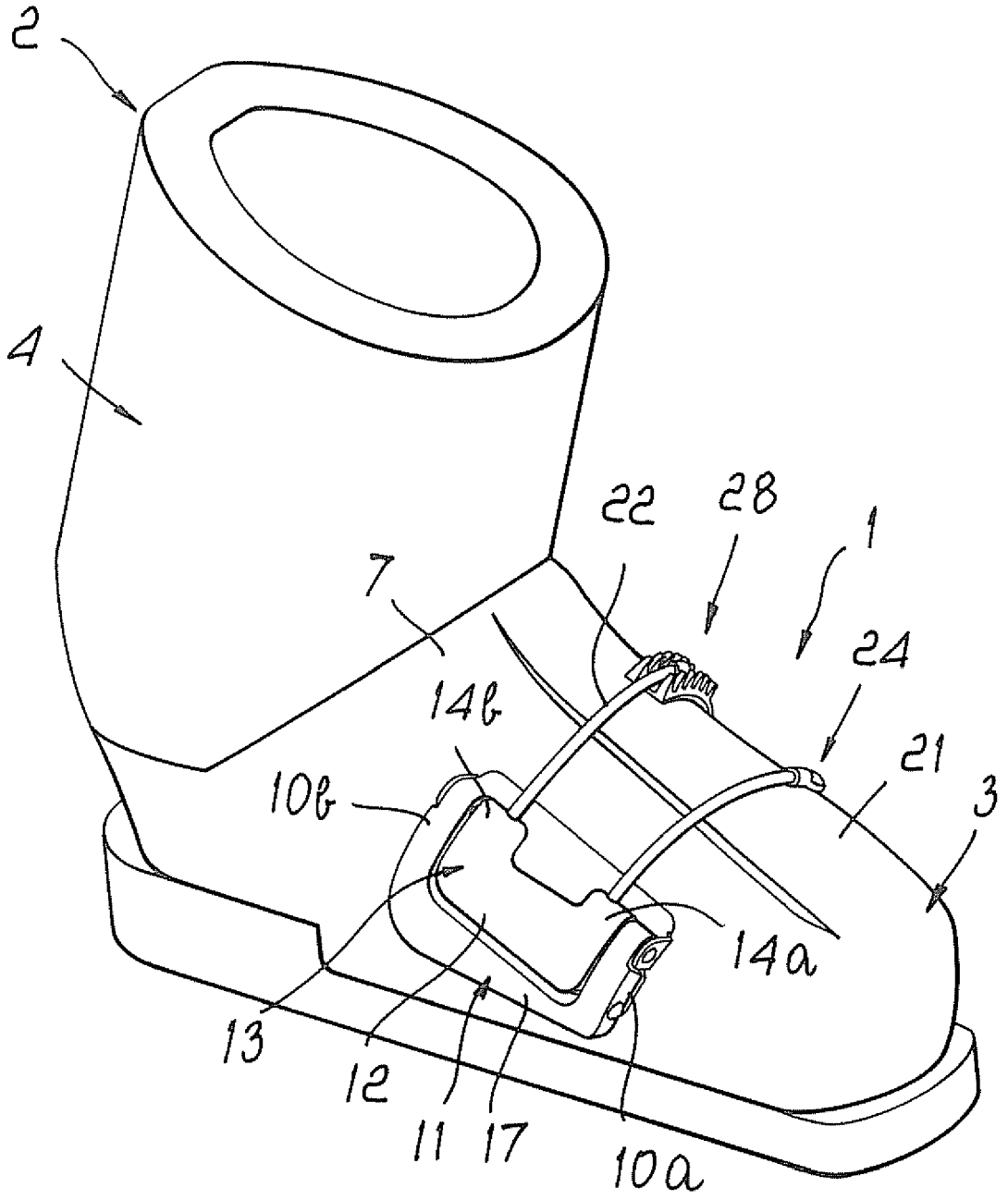


Fig. 1

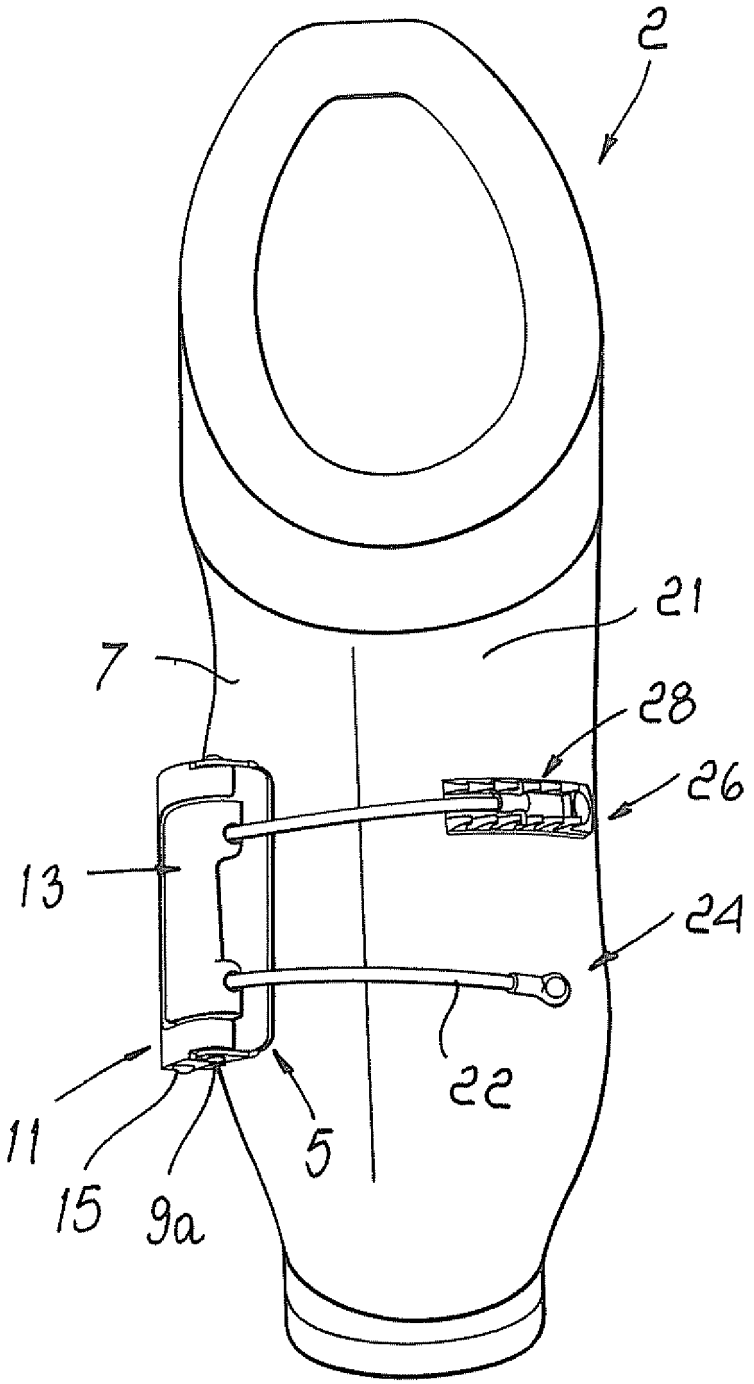


Fig. 2

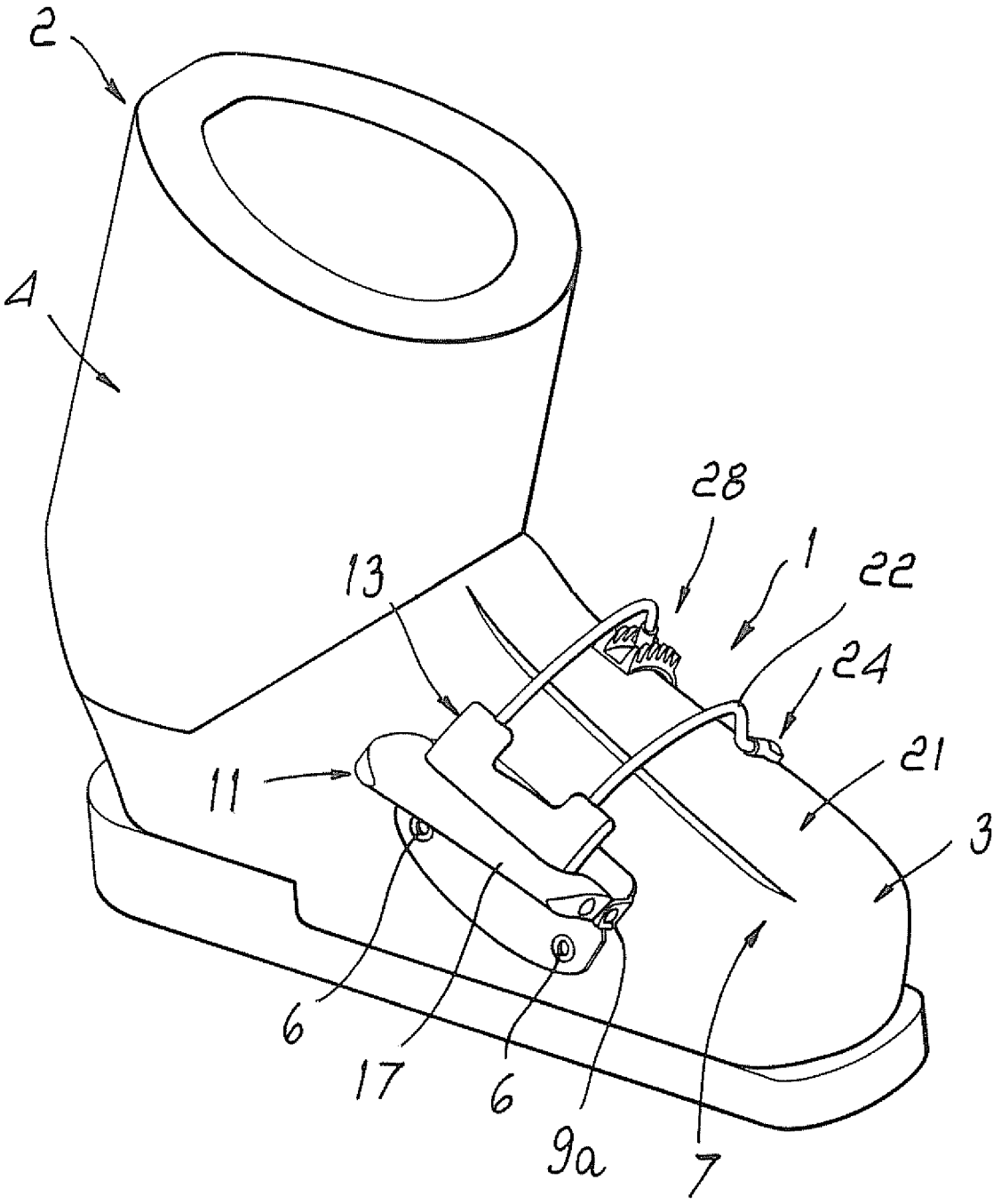


Fig. 3

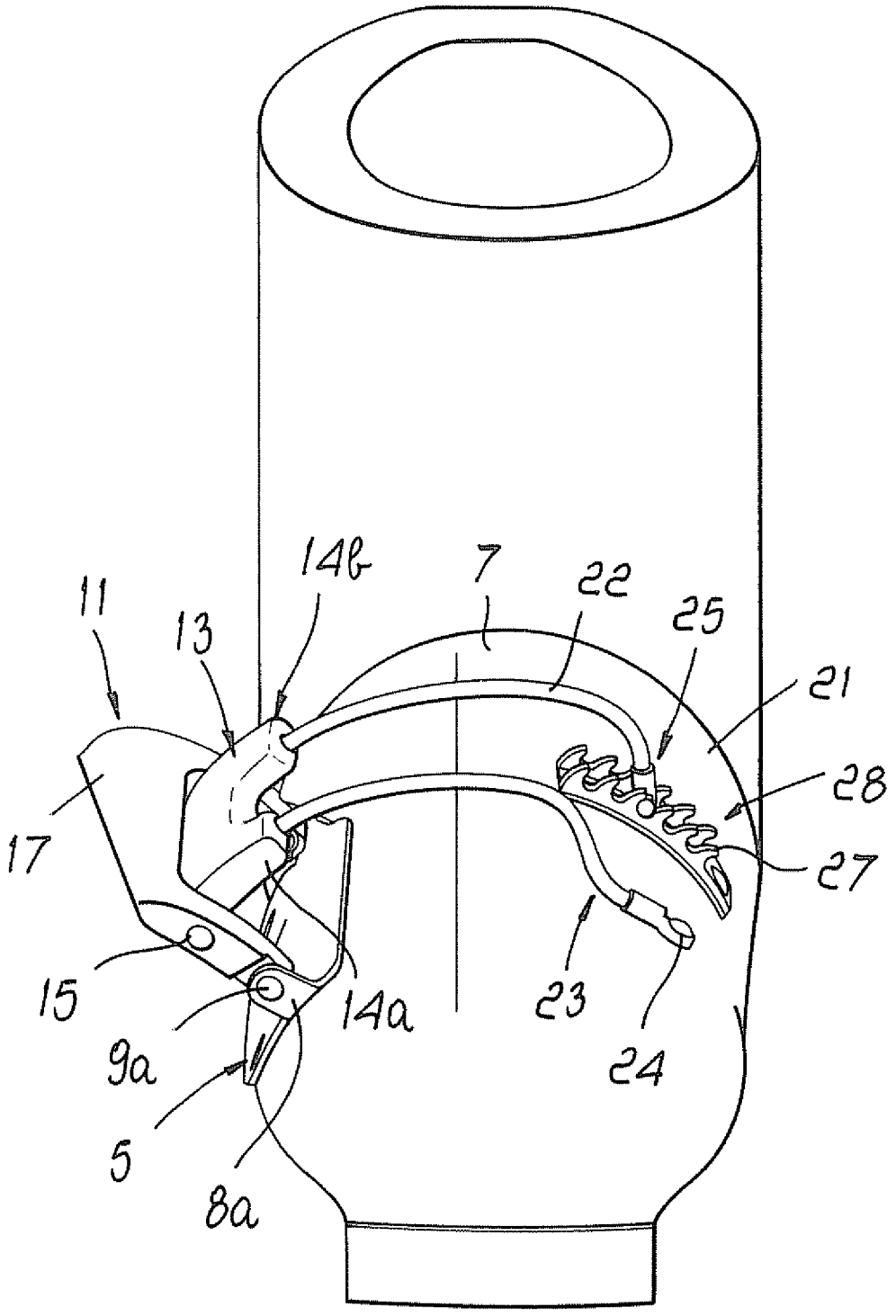


Fig. 4

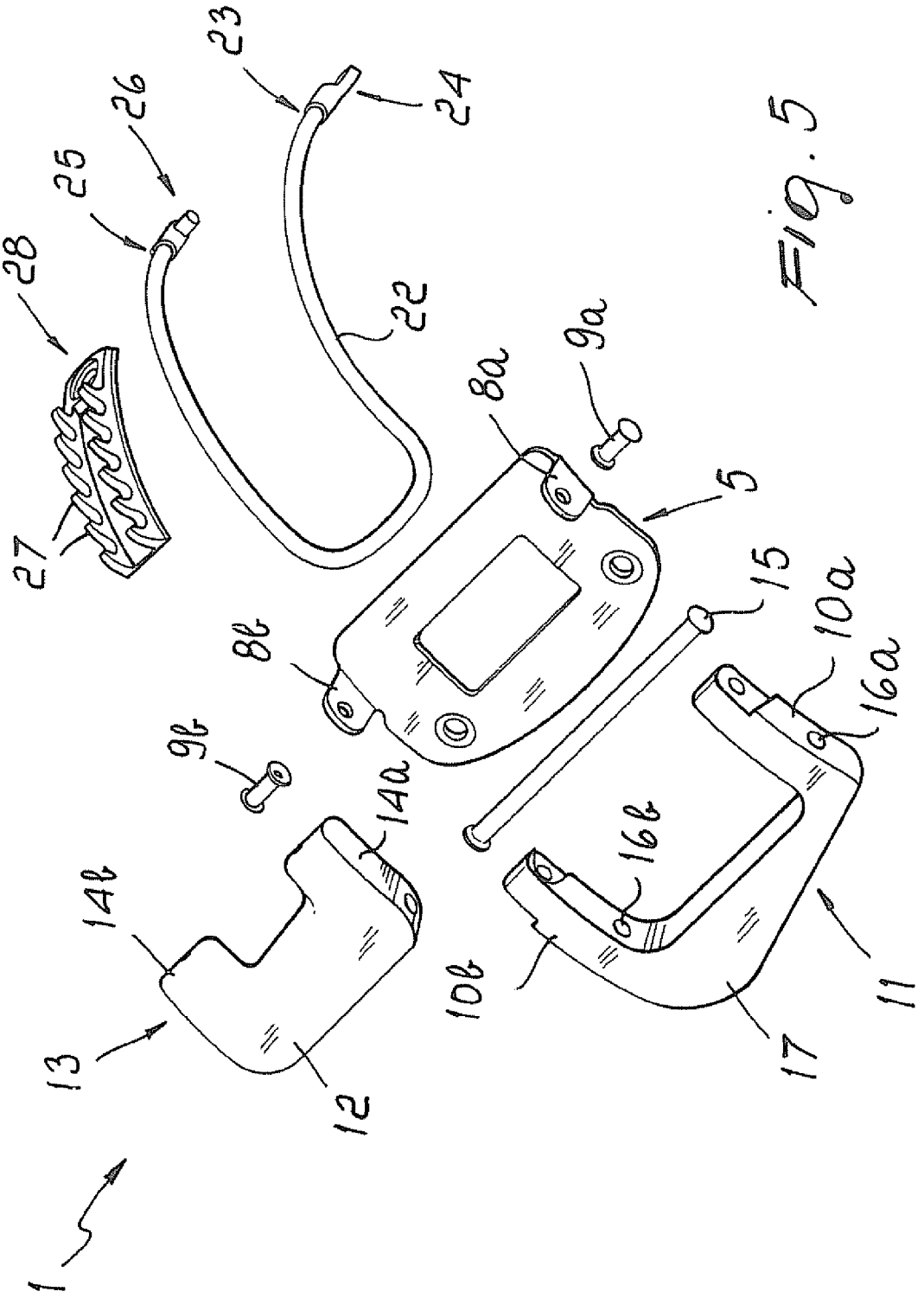
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Fig. 5

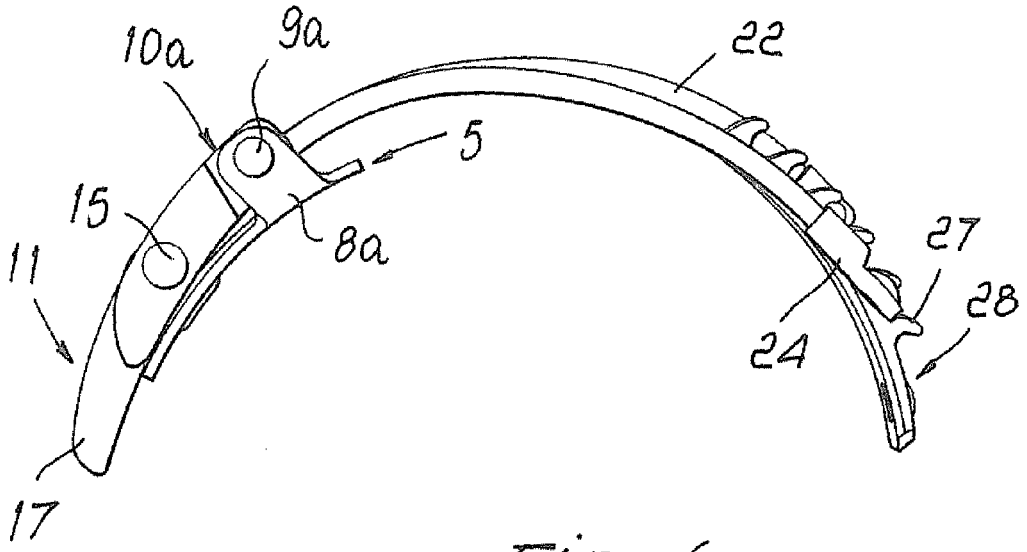
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Fig. 6

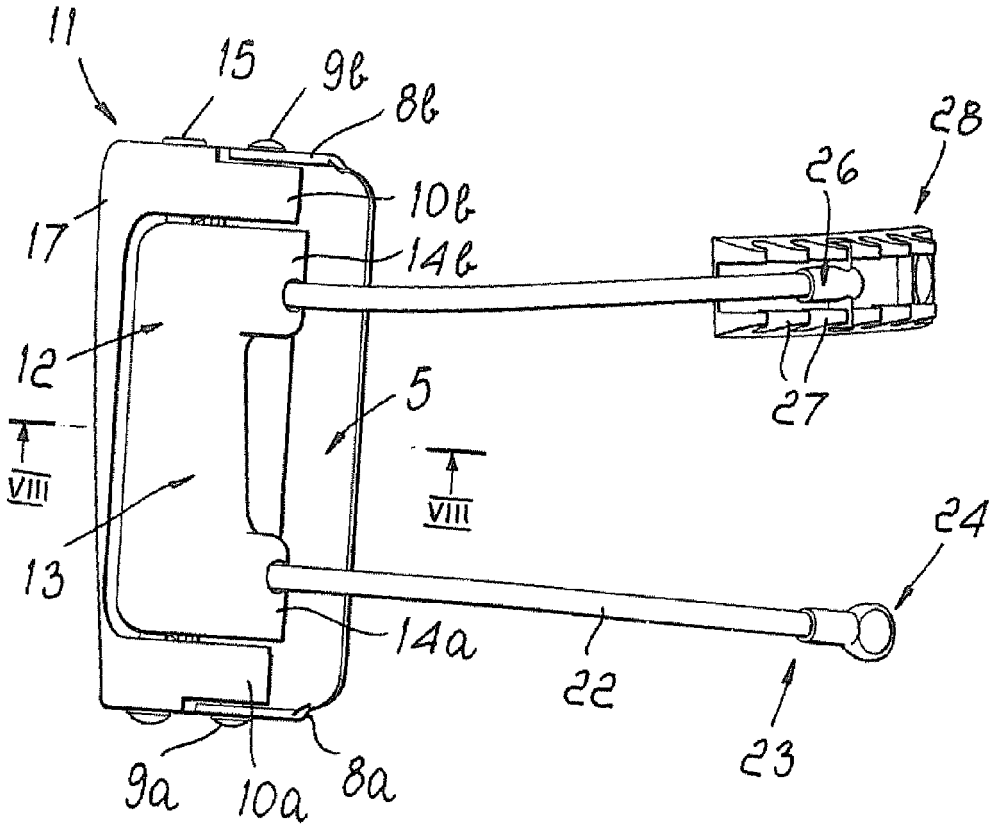
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Fig. 7

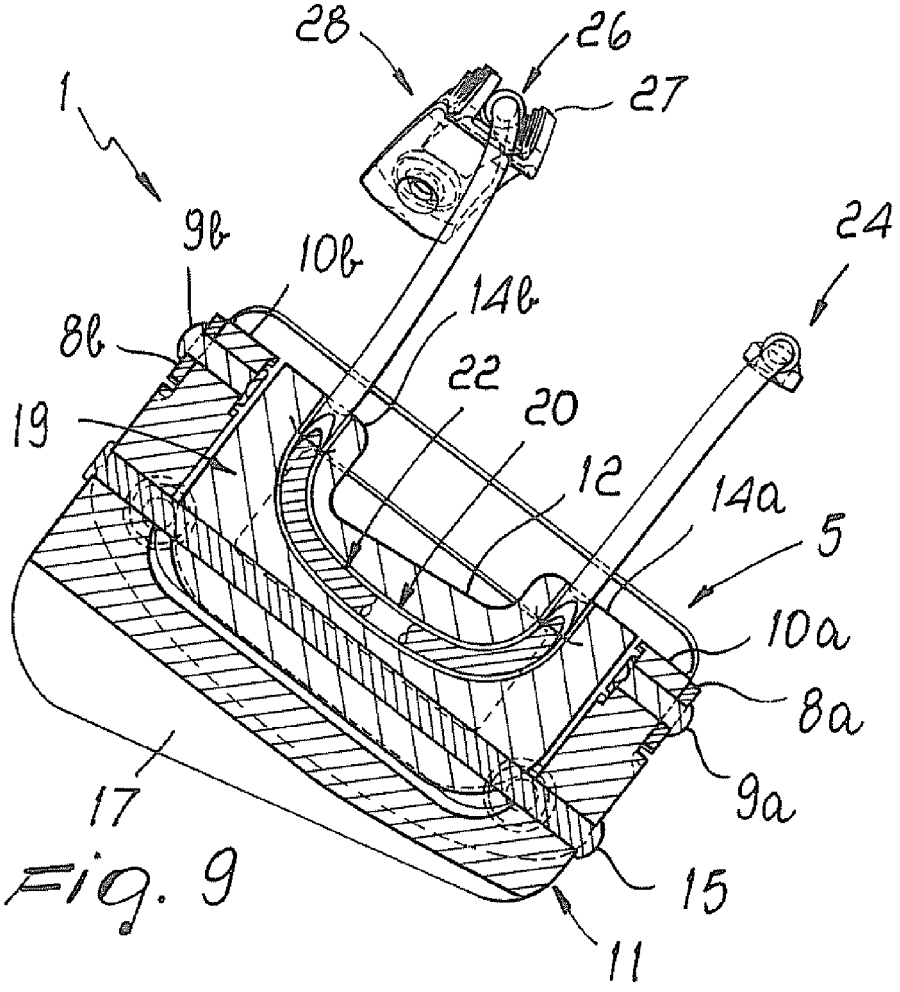
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Fig. 9

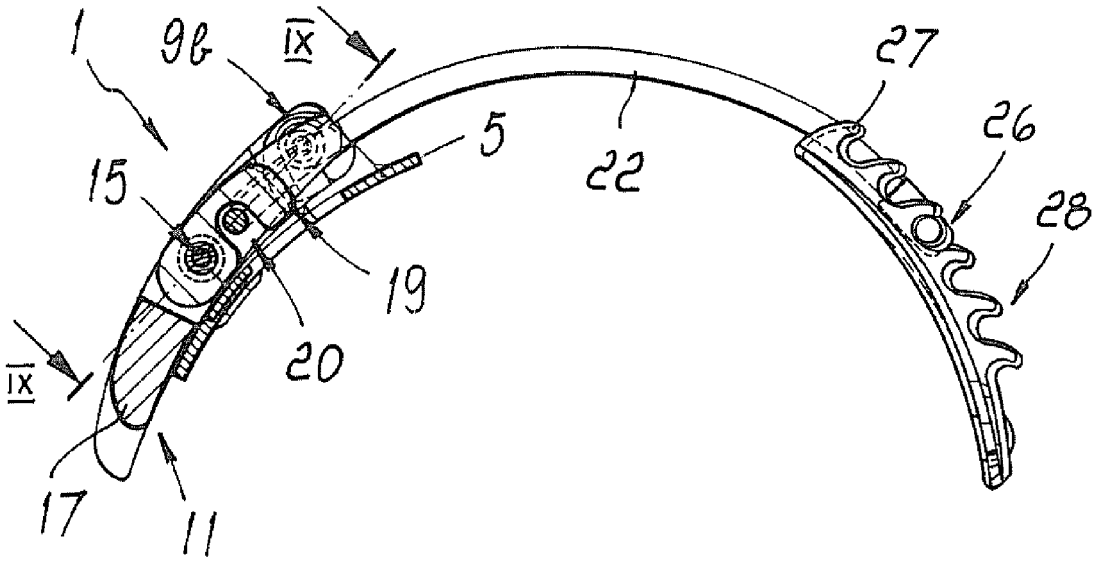
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Fig. 8

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# EUROPEAN SEARCH REPORT

Application Number
EP 07 11 9153

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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 3 April 2008 | Schölvinck, Thérèse |

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