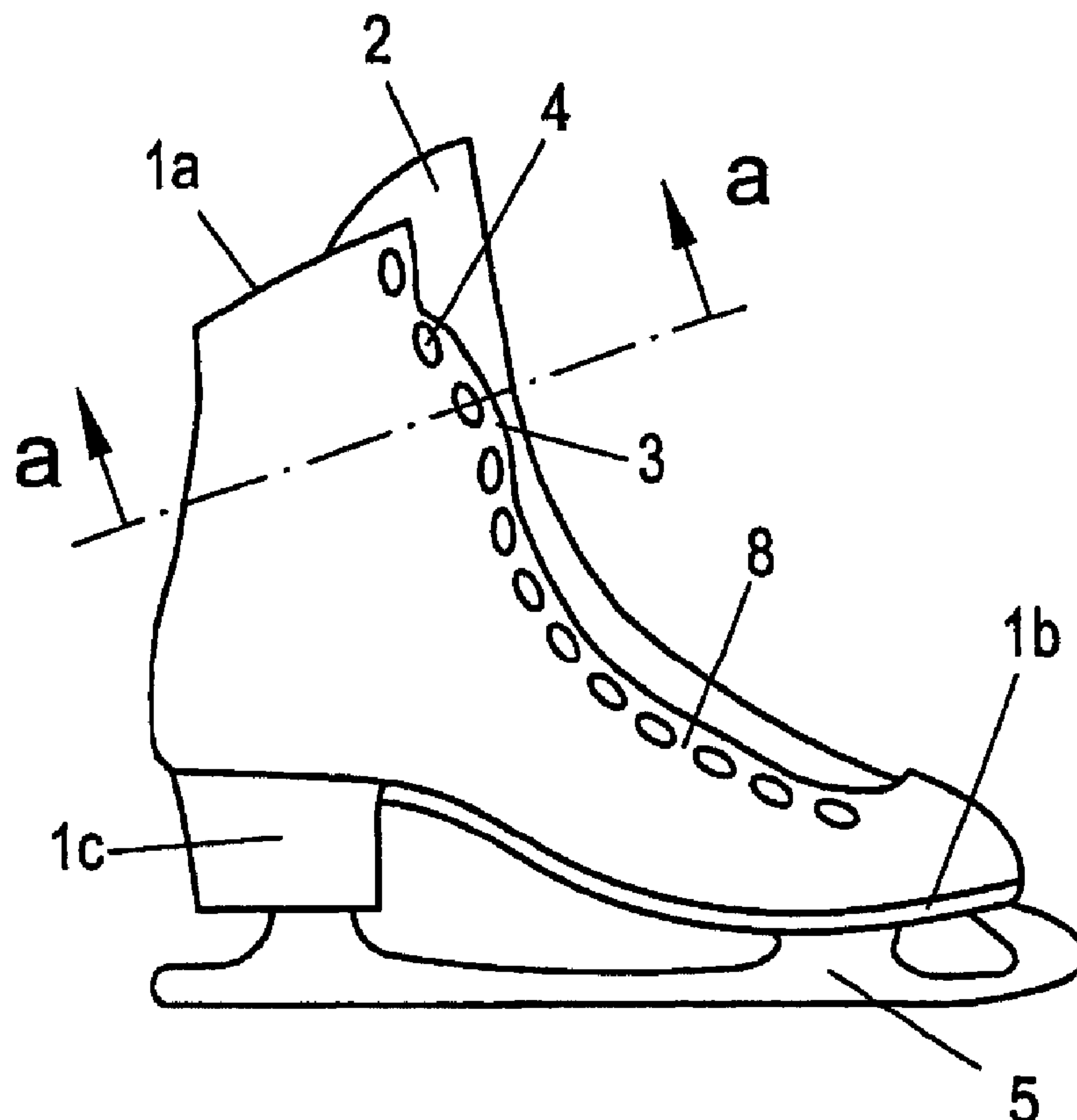




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(54) Title: ICE-SKATE



(57) Abrégé/Abstract:

An ice-skating boot with a high upper, used in particular for sports' purposes, requires greater space for the ankle to allow intensive forward inclinations. To that end, according to the invention, the closure edges in the top region of the upper project convexly in the direction of the centre plane of the foot, so as to enlarge the surface. The closure parts are disposed towards the front so as to vary their tension effect. Linings or padding can further be provided in the region of extensions.



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(54) Title: ICE-SKATING BOOT WITH OPTIMIZED UPPER SHAPE

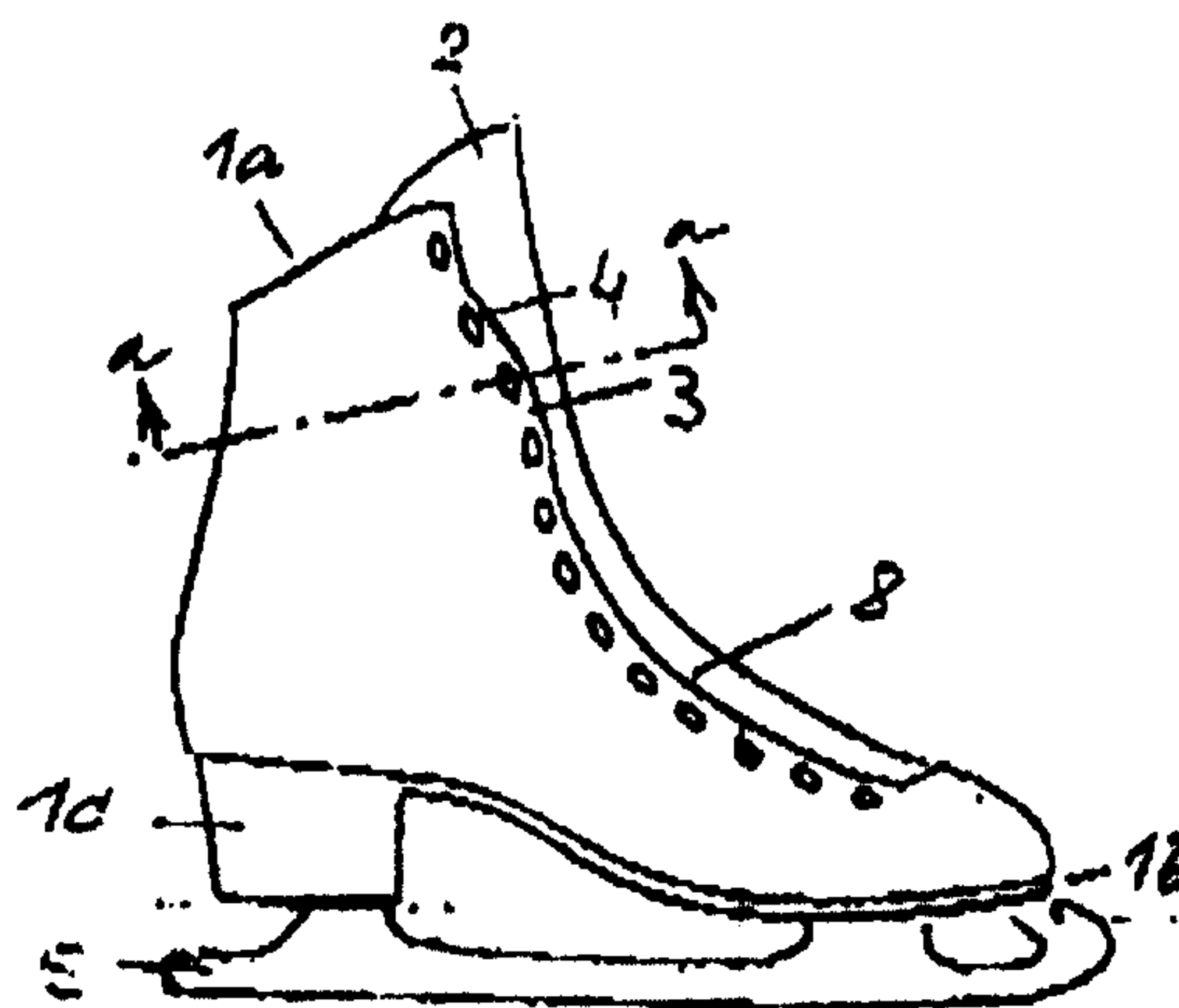
(54) Bezeichnung: EISLAUFSCHUH MIT OPTIMIERTER SCHAFTGESTALTUNG

(57) Abstract

An ice-skating boot with a high upper, used in particular for sports' purposes, requires greater space for the ankle to allow intensive forward inclinations. To that end, according to the invention, the closure edges in the top region of the upper project convexly in the direction of the centre plane of the foot, so as to enlarge the surface. The closure parts are disposed towards the front so as to vary their tension effect. Linings or padding can further be provided in the region of extensions.

(57) Zusammenfassung

Ein Eislaufschuh mit hochschaftigem Schuhoberteil, insbesondere im Sportbereich, benötigt bei verstärkter Vorwärtsneigung einen vergrößerten Knöchelraumbedarf. Es wird daher empfohlen, die Verschlussränder im oberen Schaftbereich konvex in Richtung Fußmittelebene vorspringend auszubilden, um die Oberfläche zu vergrößern und Verschluss Teile vorzuverlegen, um deren Zugwirkung zu verändern. Ferner können im Bereich der Fortsätze Auskleidungen oder Polsterungen vorgesehen sein.



ICE SKATE

The present invention relates to an ice skate shoe comprising a sole having a toe end and a heel end and a high shoe portion connected to the sole for containing the foot of an ice skater, the high shoe portion comprising an upper end to enclose a lower leg portion of the ice-skater, an anterior side of the high shoe portion defining a longitudinal direction extending from the toe end to the upper end, the high shoe portion comprising a pair of opposed unitary continuous uninterrupted undifferentiated edging portions extending along the longitudinal direction and extending from the toe end to the upper end to define
10 an opening between the edging portions.

In the case of high shoes of conventional tongue-design and lacing, in particular in the area of sport, on the one hand relatively rigid upper parts are used and, on the other hand, the soles are completely rigid owing to the attachment of a device (ice-skate/roller skate/ski-boot). Even if the edges of the foot insertion opening are cut relatively widely, this does not adequately suit the spatial requirements in the ankle region, because the straight-cut edges open extremely wide apart from each other. Thus, in the event of a forward inclined movement unpleasant to painful pressure of the relatively hard edges is exerted upon the arch of the instep and owing to material stress, the pressure on the ankle also
20 increases.

In the case of leather, which even in a reinforced design assumes the shape of the user's foot and is therefore in demand, the ankle region thus tends gradually to become floppy and folded, whereby the danger of injury is increased, and it is only possible to use the old lacing-up method, because each other method would cause even earlier material fatigue owing to lever forces.

The reason for this behaviour resides not only in the fact that the foot bones, in the proximity of the ankle, spread out but also in the fact that the outline of the ankle bone is trapezoidal in shape, spread out in a forward direction, and thus

drives apart the ankles as soon as the forward-leaning position is taken. In the case of a trained athlete, there is therefore an increased spatial requirement for the ankle, because, on the one hand, he/she is more powerfully built, and, on the other hand, he/she takes up the forward leaning position more frequently. In the case of ice-skates for figure skating, the sole is cambered, to an extent, by the heels of the skate, which essentially causes the ankle to lean forward.

Many efforts have been made without success to remedy this lack of fit, such as additional lacing or reinforcements, or incisions at the lacing edges. Since these measures did not increase space, they acted either in a blocking manner or in
10 such a manner as to cause material fatigue because excessive flexion was provided.

U.S. Pat. No. 5,371,957 discloses a construction, wherein particularly the tab 22A, applied to rigid leather, would only cause unnecessary pressure, at least owing to its edge formation. In the case of a possible attachment beyond the curvature 3, 4 or the holes thereof (FIG. 2, 2a) this would cause pain in the case of leather material. The allowance does not show any improved surface formation, which can be applied when the entire upper part consists of a solid material.

In the case of the design in U.S. Pat. No. 4,780,969 with the aim of a specific
20 division of pulling force, the pull on the strips at the uppermost shoe edge is localised in the narrowest position and therefore a pressure site would also be produced in the event that the ice-skate consists of a rigid material. Furthermore, this design does not correspond to a formation or distribution which requires space with respect to pressure relief.

The precurvatures, not illustrated in detail, of U.S. Pat. No. 4,876,806 relate only to the front part of the foot or instep region and do not permit any spherical adaptation. The latter also applies to the precurvatures in the region of the numeral 30 of FIG. 1 of U.S. Pat. No. 4,972,613. The sleeve of the latter

document would also cause unnecessary pressure owing to the edge formation and also does not illustrate any improvement in the surface formation which can be applied when the entire upper part consists of a solid material.

The object of the wave-like structure of U.S. Pat. No. 4,533,342 is merely to overcome spatial problems and first and foremost relates merely to the front part of the foot. CH 181 838 A describes a high ice-skate having lacing, wherein the iron fitting of the skate, i.e. the runner, can be adjusted against the skate in a transverse and longitudinal direction, so that it is possible to make an optimum adaptation to suit the skater, e.g. also with respect to the centroidal axis. The
10 ice-skate does not display any other particular aspects which are of interest here.

The object of the present invention is to provide an ice-skate with an improved fit, wherein the above described spatial problems can be solved. This solution should be as convenient as possible and should be able to be produced in a cost-effective manner whilst still using current production methods.

According to the present invention, there is provided an ice-skate shoe comprising:

- a sole having a toe end and a heel end;
- a high shoe portion connected to the sole for containing a foot of an ice
20 skater, the high shoe portion comprising an upper end to enclose a lower leg portion of the ice-skater, an anterior side of the high shoe portion defining a longitudinal direction extending from the toe end to the upper end, the high shoe portion comprising a pair of opposed unitary continuous uninterrupted undifferentiated edging portions extending along the longitudinal direction and extending from the toe end to the upper end to define an opening between the opposed edging portions, the opposed edging portions each having in a region above an ankle of the lower leg portion an arcuate extension into the opening;

a plurality of closure parts formed on the pair of opposed edging portions to narrow the opening by applying a closing force to the opposed edging portions in a tangential direction normal to the longitudinal direction; and

a camber member formed in association with the sole to introduce a camber on the foot at the heel end, the camber member comprising a mounting surface for receiving a skate blade.

10 In a similar manner to the case of cartographic spheroid developments, it is not only an improved surface adaptation which is produced thereby in an advantageous manner, but the increase in material also allows an improved rounded bend, whereby the pressure upon the ankle and the closure strips decreases.

Preferably, a closure means for the shoe acts upon this extension. In so doing, the pulling force upon the lacing-up edges causes tangential and fewer radial resulting closing forces, which also causes a relief in pressure.

20 In the case of a preferred embodiment of the ice-skate in accordance with the invention, the extensions are provided approximately 15 mm from the upper and of the lick shoe portion along the longitudinal diversion. In the case of an ice-skate, in which the closure means is lacing, which acts by way of closure parts, e.g. holes or hooks, upon the skate, a preferred embodiment is provided, wherein the arcuate extensions extend on the one side from a second closure part as far as to a fourth closure part or as far as to a first closure part lying above the joint region. Preferably, at least one closure part is disposed in the middle portion of the substantially symmetrical extension and the closure parts, which are disposed in the region of the end portions of the extension, can be disposed both within the extension or on the outside thereof. In the case of this embodiment, at least one closure part, hooks, eyelets, rivets, is therefore located approximately in the middle region of the said extension, where it produces a genuinely tangential pulling force. In contrast, further closure parts within the edge regions of the extension or on the outside thereof produce

pulling lines which are directed approximately vertically and horizontally, allocated preferably to the front part of the foot and the lower leg, whereby the centre of movement is localised. The arcuate extensions project approximately 12 millimeters from the pair of opposing edging portions along the tangential direction. Furthermore, within the scope of the present invention there is the possibility that the extensions of the edges can be larger or at least overlapping to the extent that the closure parts do not prevent them from being closed.

10 In order to achieve an improved anatomic adaptation of the effect of the extensions, the extensions can be formed or disposed, in view of anatomic characteristics and their application, in an asymmetrical manner both in the transverse and skate longitudinal directions.

Preferably, it is an advantage in practice that the shaft tongue is placed under the extensions and the shaft tongue comprises for this purpose a specific lining or padding. Alternatively, the extensions can also be disposed, so as to lie on an inner skate or on a padding portion of a sleeve.

20 For the closure parts of the closure means, it is possible for example to provide eyelets, hooks, rivets, fittings, weld-on parts, stick-on parts or seam points, which are provided at least conveniently within the extensions. Likewise, in order to improve the effect of the extensions, in accordance with the invention, it can be provided that said extensions are at least partially covered by a congruent strip or sleeve part extension, which takes over sections of the closure parts or comprises its own additional closure parts.

The inner surfaces of the extensions can comprise linings at least at the site, where no closure parts are provided. Furthermore, within the scope of the present invention, there is the possibility that the extensions terminate at least in the lower region at a transverse gap of the closure edge or become the same, in order to reinforce the effect of the extensions. It is possible to adapt the extensions in an improved manner by virtue of the fact that for the purpose of

individual adaptation the extensions are formed in an adjustable manner by virtue of toothings, eccentrics or a screw-connection and for this purpose comprise simultaneously displaceable or elastic inner lining or padding.

A detailed explanation of the present invention and further advantages and features of the present invention will be more apparent in the description hereinafter of some non-limiting exemplified embodiments, wherein reference is made to the accompanying FIGS. 1 to 10, in which:

FIG. 1 shows a lateral view of a foot,

FIG. 1a shows a front view of the foot of FIG. 1,

10 FIG. 2 shows the lateral view of an ice-skate,

FIG. 2a shows a front view of the ice-skate of FIG. 2,

FIG. 3 shows a side view of the foot inside the skate of FIG. 2,

FIGS. 4 and 4a show horizontal sectional views of skate shafts as in FIG. 2, and

FIGS. 5-10 show lateral views of different embodiments of ice-skates of the type in accordance with the invention.

FIG. 1 shows the inner ankle position kt, the affected regions (small arrows) and the inner bend of the instep above the joint (large arrow).

FIG. 1a illustrates the tibia and fibula (t, f), and the inner and outer ankle extensions (kf, kt), wherein the lower leg is designated by U and the foot is
20 designated by F.

FIG. 2 shows the lateral view of an ice-skate 1 having the arcuate extensions 3.

FIG. 2a shows the associated lateral view. The eyelets 4 in the closure strips 6

can be supplemented or replaced in the shaft 1a by virtue of the hooks 4a or other closure parts. The tongue 2 is covered by virtue of the arcuate extensions 3, the rigid sole 1b changes into the raised heel 1c, which determines the camber. Instead of the iron fitting 5, it is also possible to mount a roller skate. The section aa is explained in the following FIGS. 4, 4a.

FIG. 3 shows the problem region (small arrows), which when the leg moves forward (large arrow), occurs owing to the camber 1c'.

FIGS. 4, 4a showing the shaft sections aa with the arcuate extension 3 and aa' without extensions 3', illustrate how the hooks 4a, lying further inside, with comprehensive lining 1d in the shaft 1a, "smooth out" pressure regions R, R' resulting from tangential pulling forces V, V' on the closure parts.

FIG. 5 shows the synthetic material walking shoe having four closure hooks 4a. Three of the four closure hooks are arranged in a symmetrical manner in the arcuate extension 3 and allow mobility above the ankle joint. The quasi-horizontal pulling force R1 is produced in the upper edge region of the extension. The quasi-vertical pulling force R2 is produced in the lower edge region thereof.

FIG. 6 shows a hockey shoe. The rear reinforcement 6 is separated into a lower region 6a and an upper region 6b (spoiler), and two eyelets 4b, quasi-symmetrical in the lacing-up strip 8, which is premachined in a radial manner so as to be congruent with the extension 3.

FIG. 7 shows the same with a reinforced lateral support 7a, which can also receive an attachment underneath, and follows in a congruent manner the extension 3 and the lacing-up strip 8, and comprises furthermore a foot bed extension 7e and abrasion protection inserts 7b, 8a which are attached to the lacing-up strip 8. The reinforcement is welded or stitched 7c directly to the shaft 1.

FIG. 8 shows a rigid or flexible reinforcement 7a connected at least to the lacing-up strip 8 or merely to the sole 1b, where it comprises an extension 7e, wherein it takes over the lacing-up eyelets 7g of the extension 3, whereas said extension 3 does not have to comprise any eyelets 4 in the relevant region.

FIG. 9 shows a stitched flexible reinforcement 7c, connected to the lacing-up strip 8.

FIG. 10 shows a metal or synthetic material reinforcement 7a having an embossed part 7f which can be riveted 7d to the shaft 1a or to the lacing-up strip.

- 10 When putting on or taking off the ice-skate, the reinforcement 7 is curved outwards over the axis "x", because it is fixed to the sole 1b and can be moved as soon as the closure is open.

WHAT IS CLAIMED IS:

1. An ice-skate shoe comprising:
 - a sole having a toe end and a heel end;
 - a high shoe portion connected to the sole for containing a foot of an ice skater, the high shoe portion comprising an upper end to enclose a lower leg portion of the ice-skater, an anterior side of the high shoe portion defining a longitudinal direction extending from the toe end to the upper end, the high shoe portion comprising a pair of opposed unitary continuous uninterrupted
 - 10 undifferentiated edging portions extending along the longitudinal direction and extending from the toe end to the upper end to define an opening between the opposed edging portions, the opposed edging portions each having in a region above an ankle of the lower leg portion an arcuate extension into the opening;
 - a plurality of closure parts formed on the pair of opposed edging portions to narrow the opening by applying a closing force to the opposed edging portions in a tangential direction normal to the longitudinal direction; and
 - a camber member formed in association with the sole to introduce a camber on the foot at the heel end, the camber member comprising a mounting surface for receiving a skate blade.
- 20 2. The ice-skate according to claim 1, wherein the arcuate extensions are provided approximately 15 millimeters from said upper end of said high shoe portion along said longitudinal direction.
3. The ice-skate according to claim 1 or 2, wherein the arcuate extensions project approximately 12 millimeters from said pair of opposed edging portions along said tangential direction.
4. The ice-skate according to claim 1 or 2, wherein the arcuate extensions have an asymmetrical shape along said longitudinal and tangential directions.

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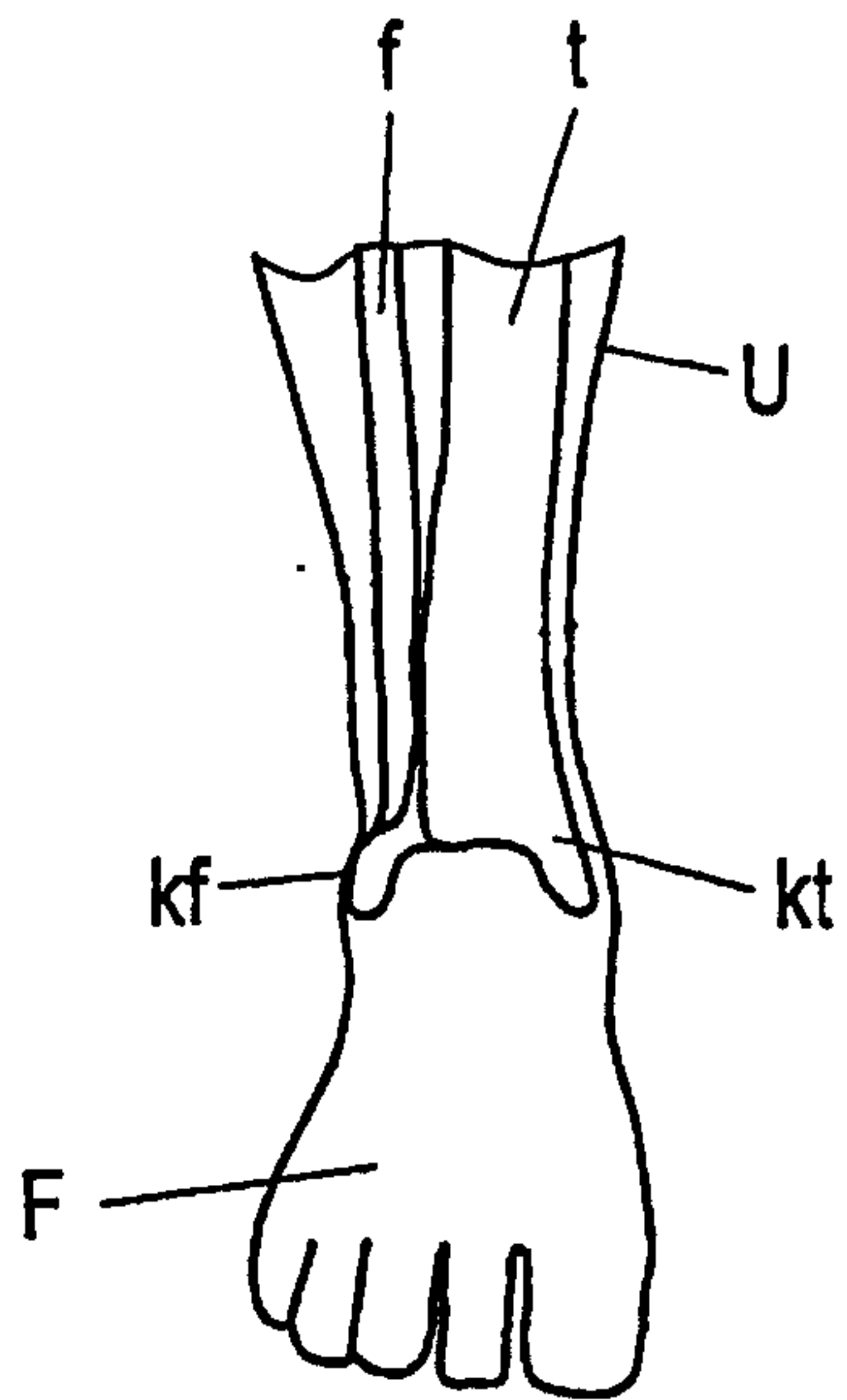


FIG. 1a

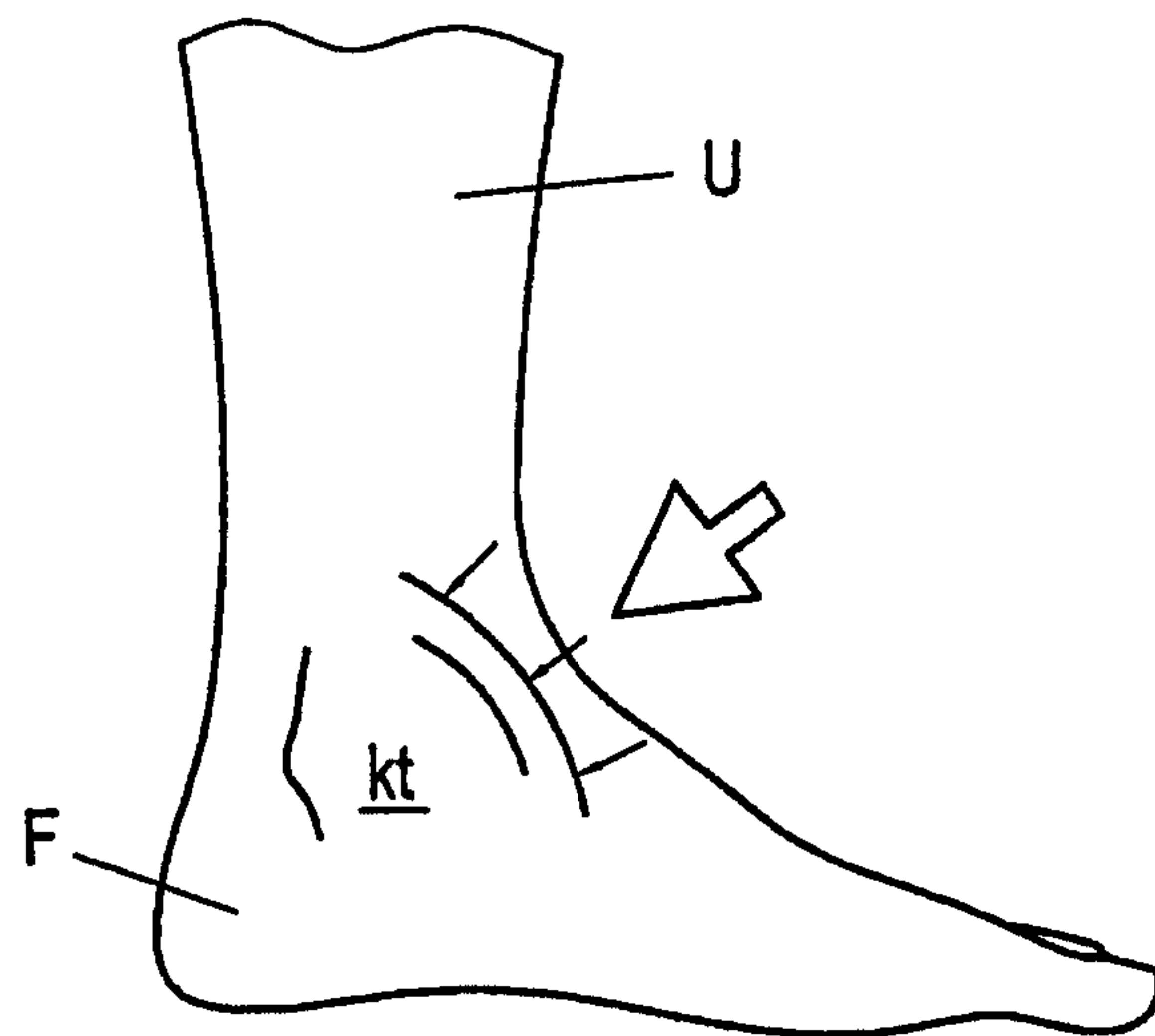


FIG. 1

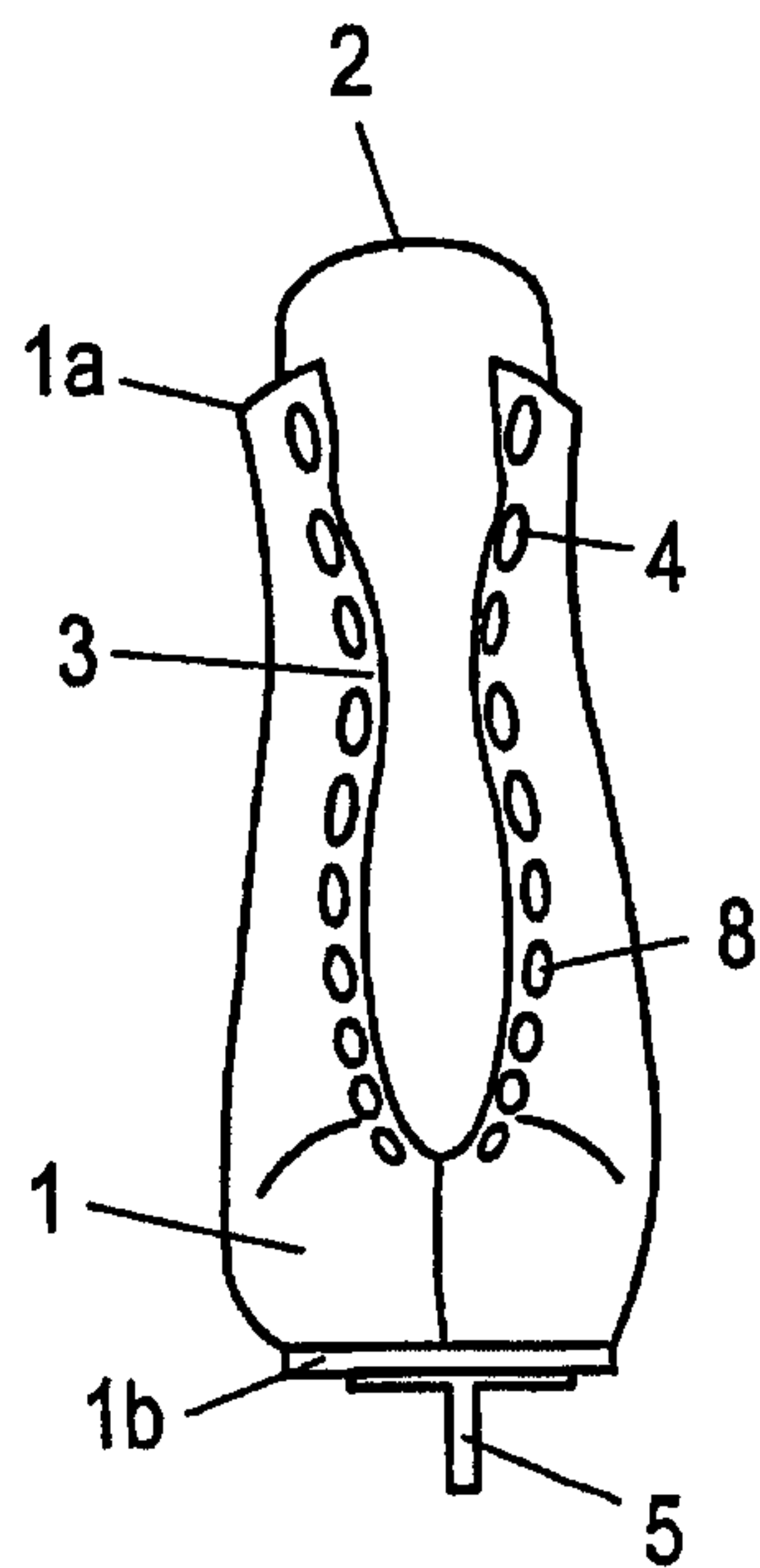


FIG. 2a

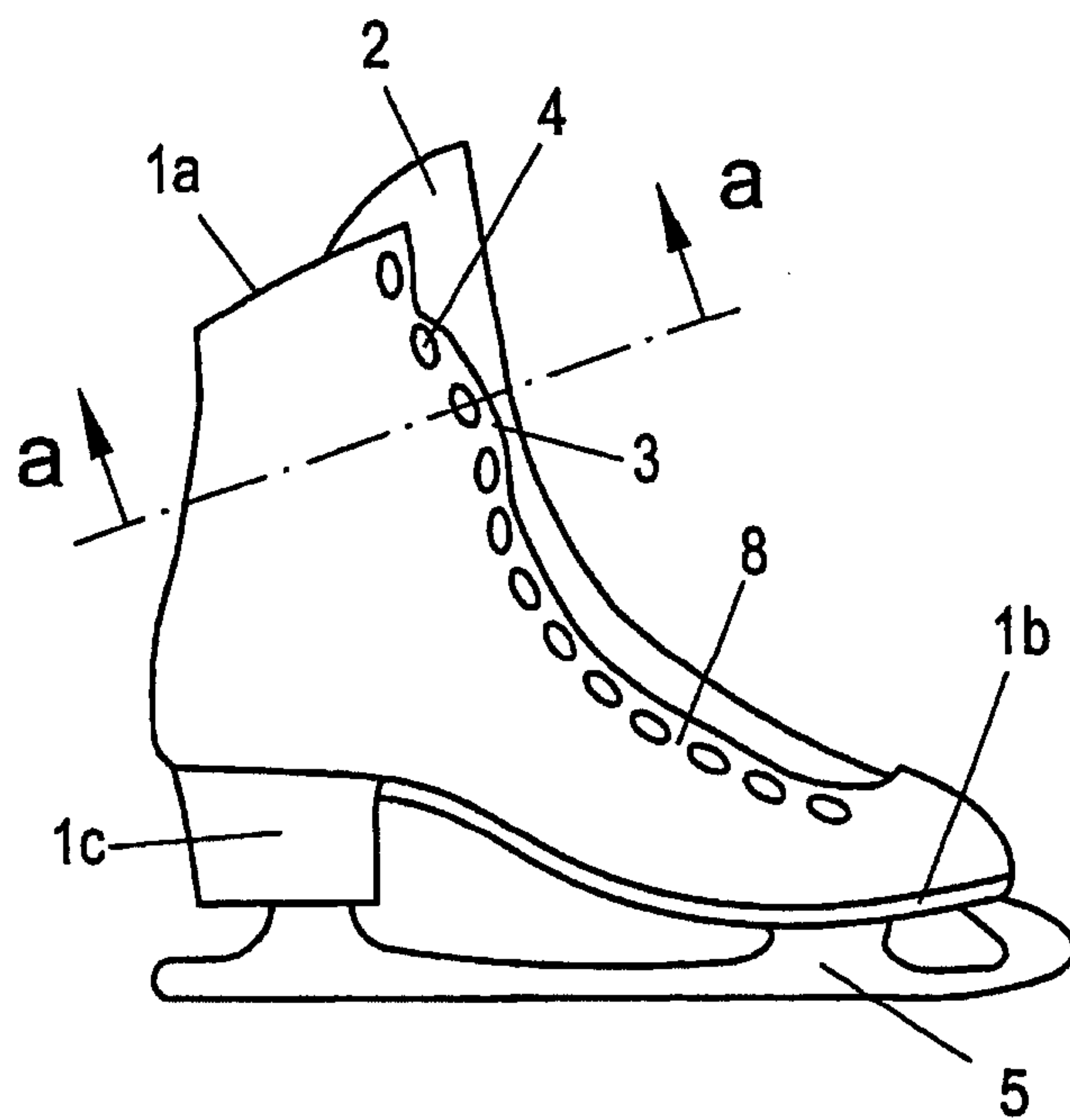


FIG. 2

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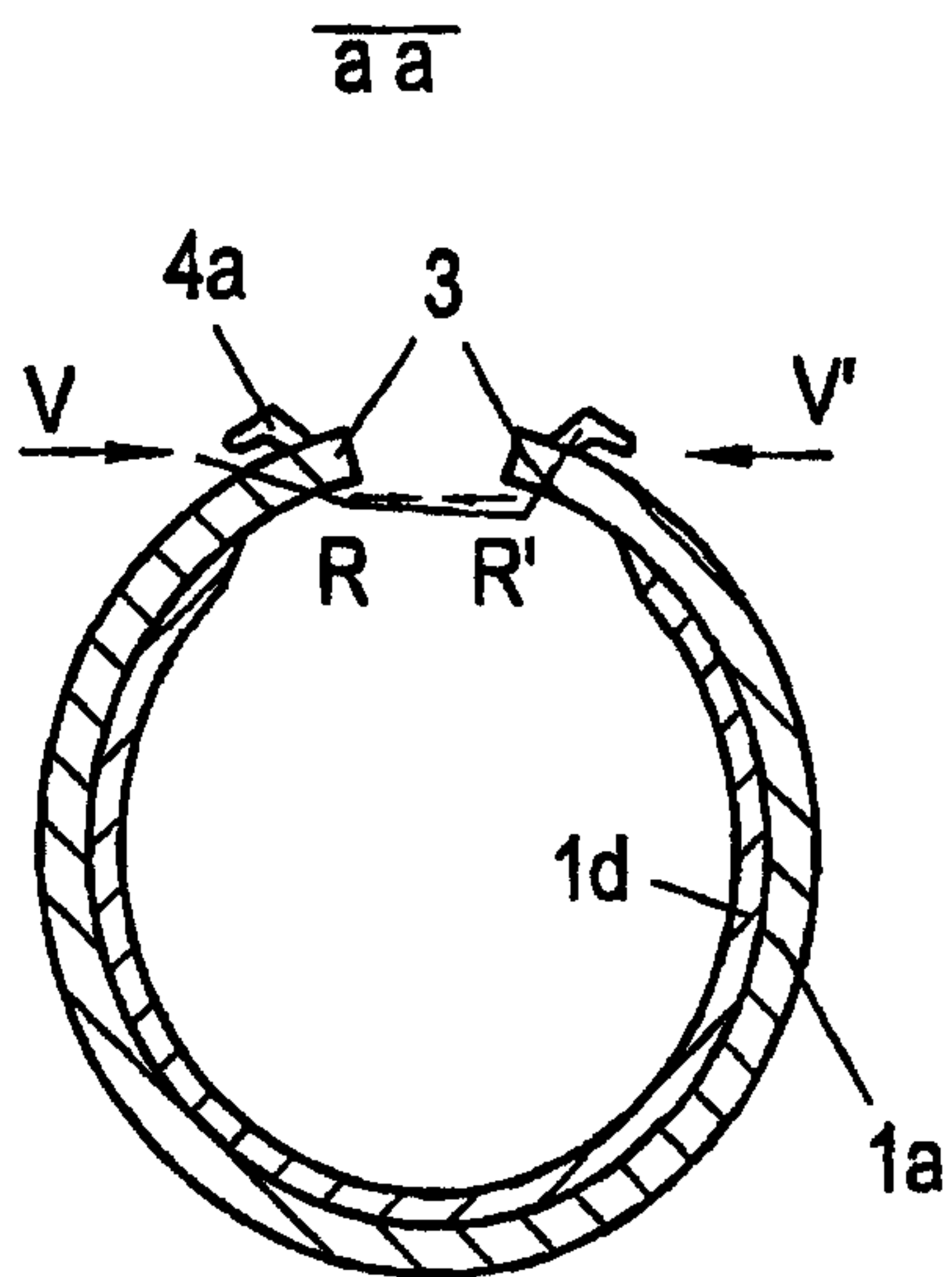
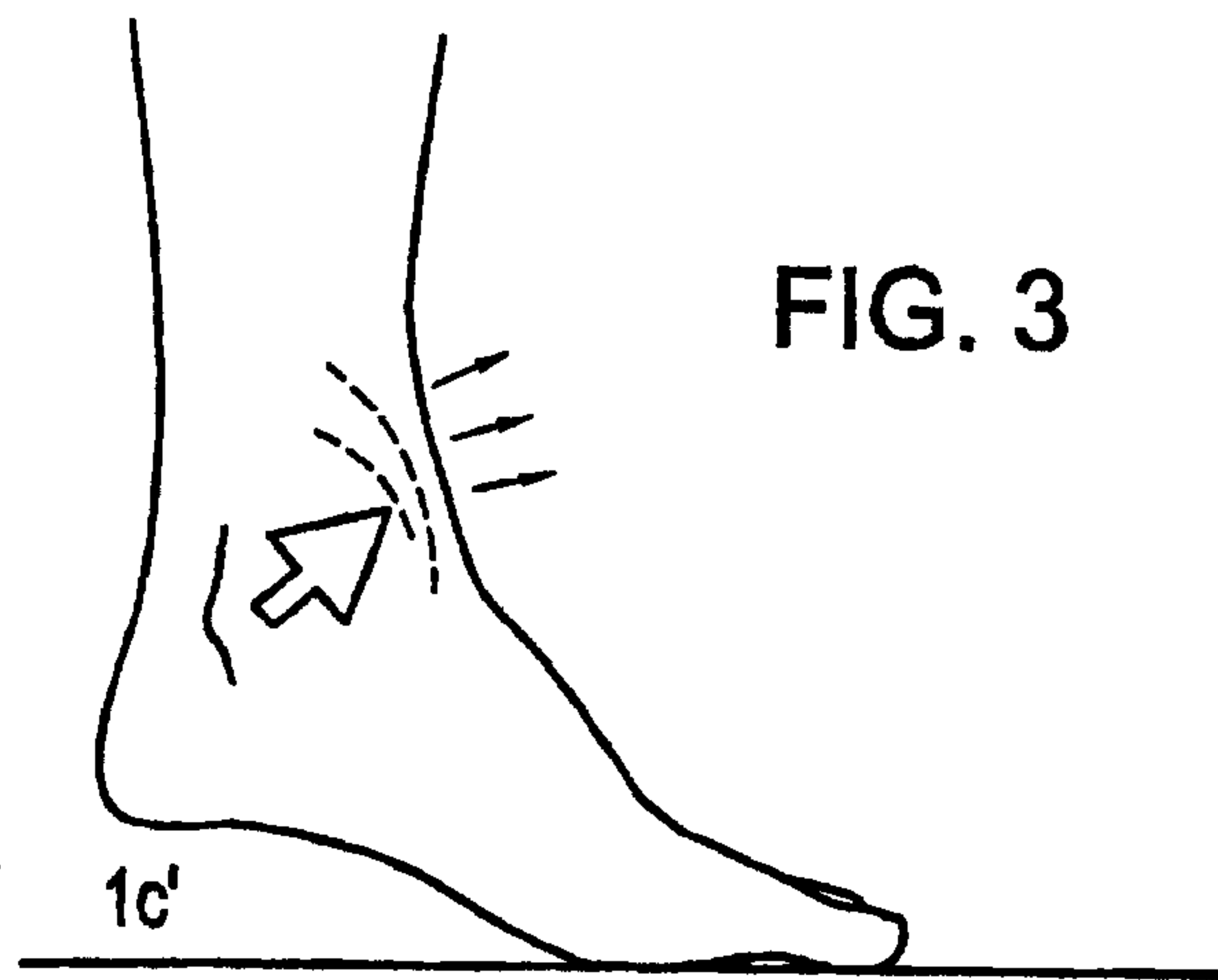


FIG. 4

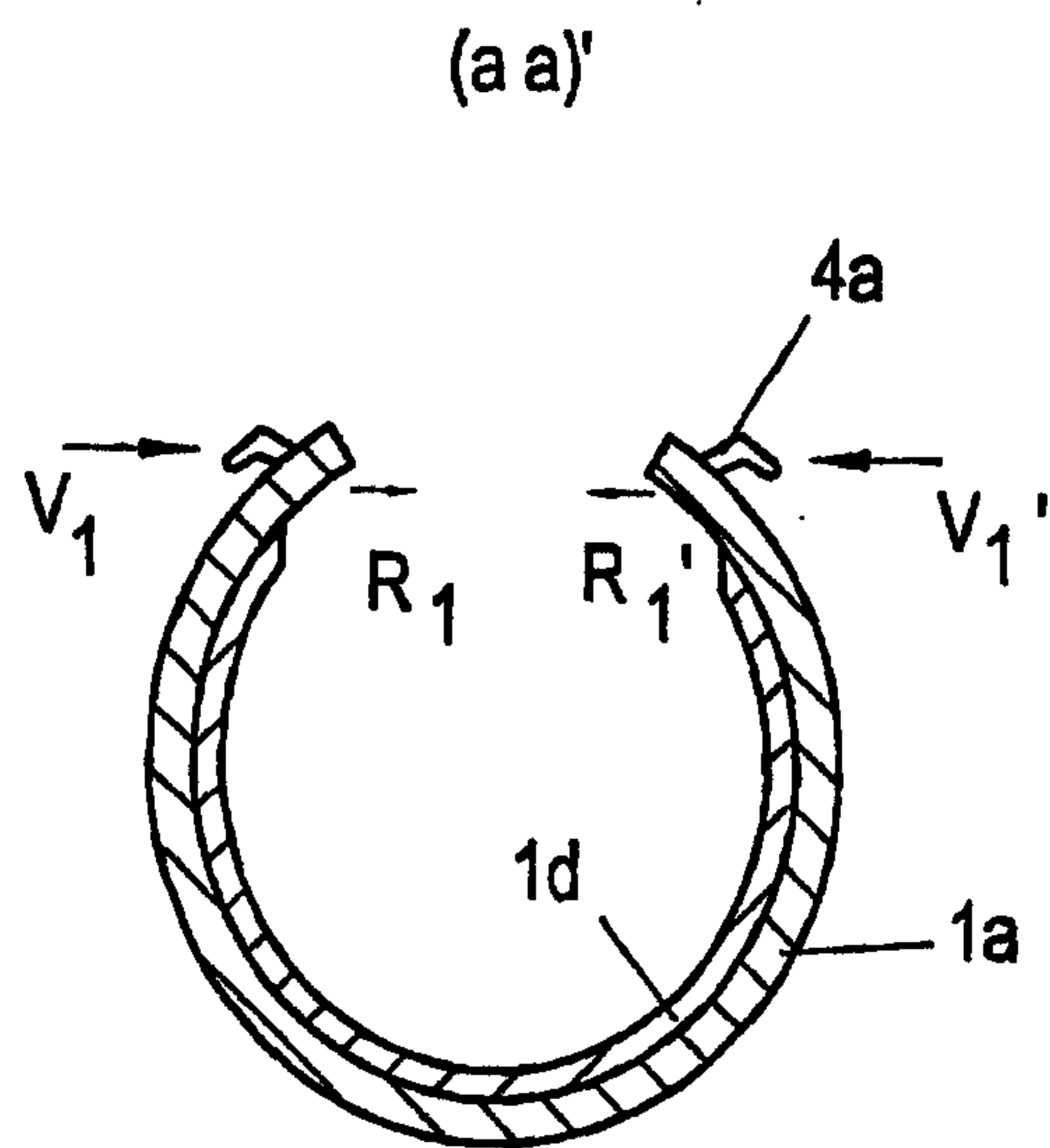
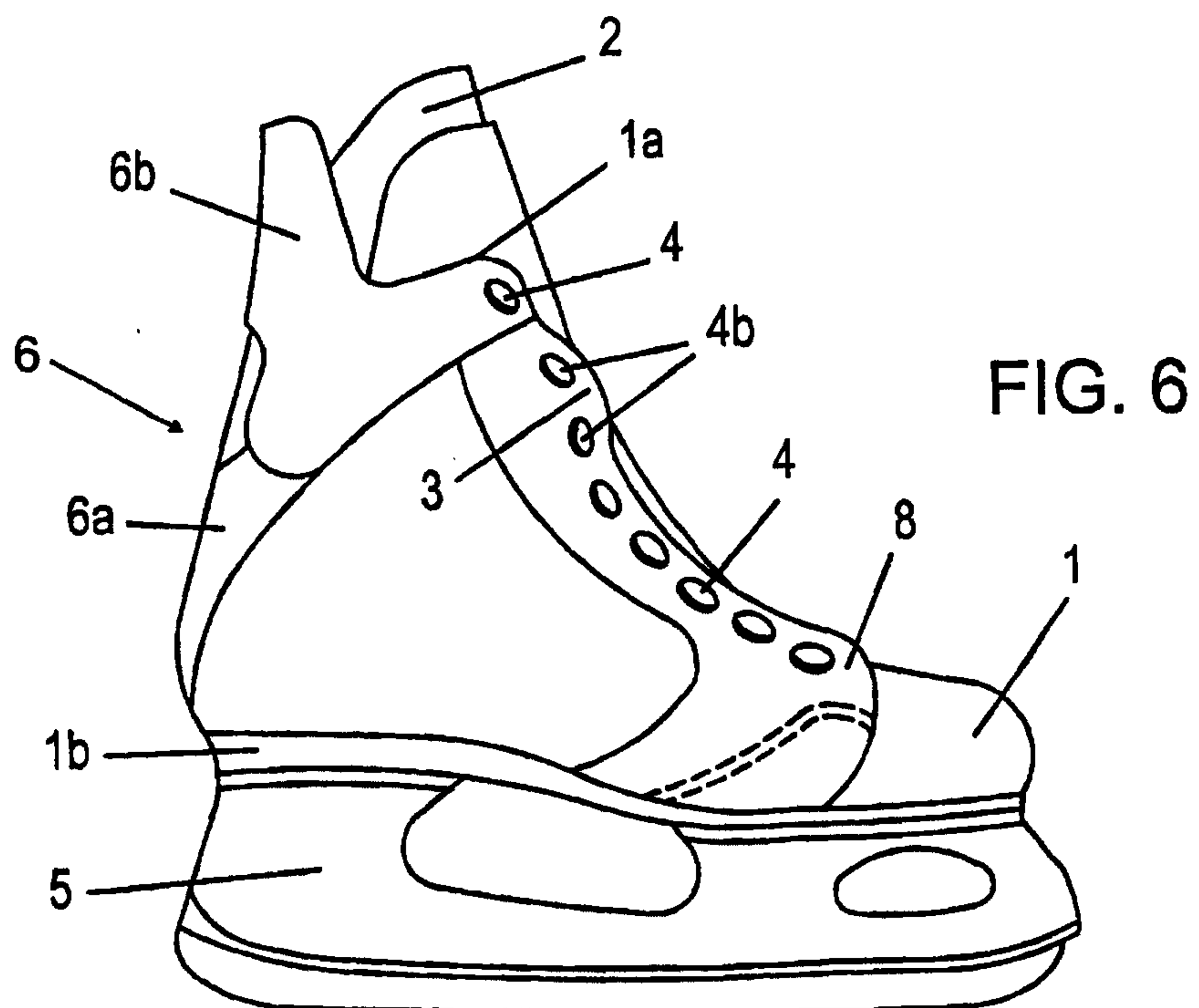
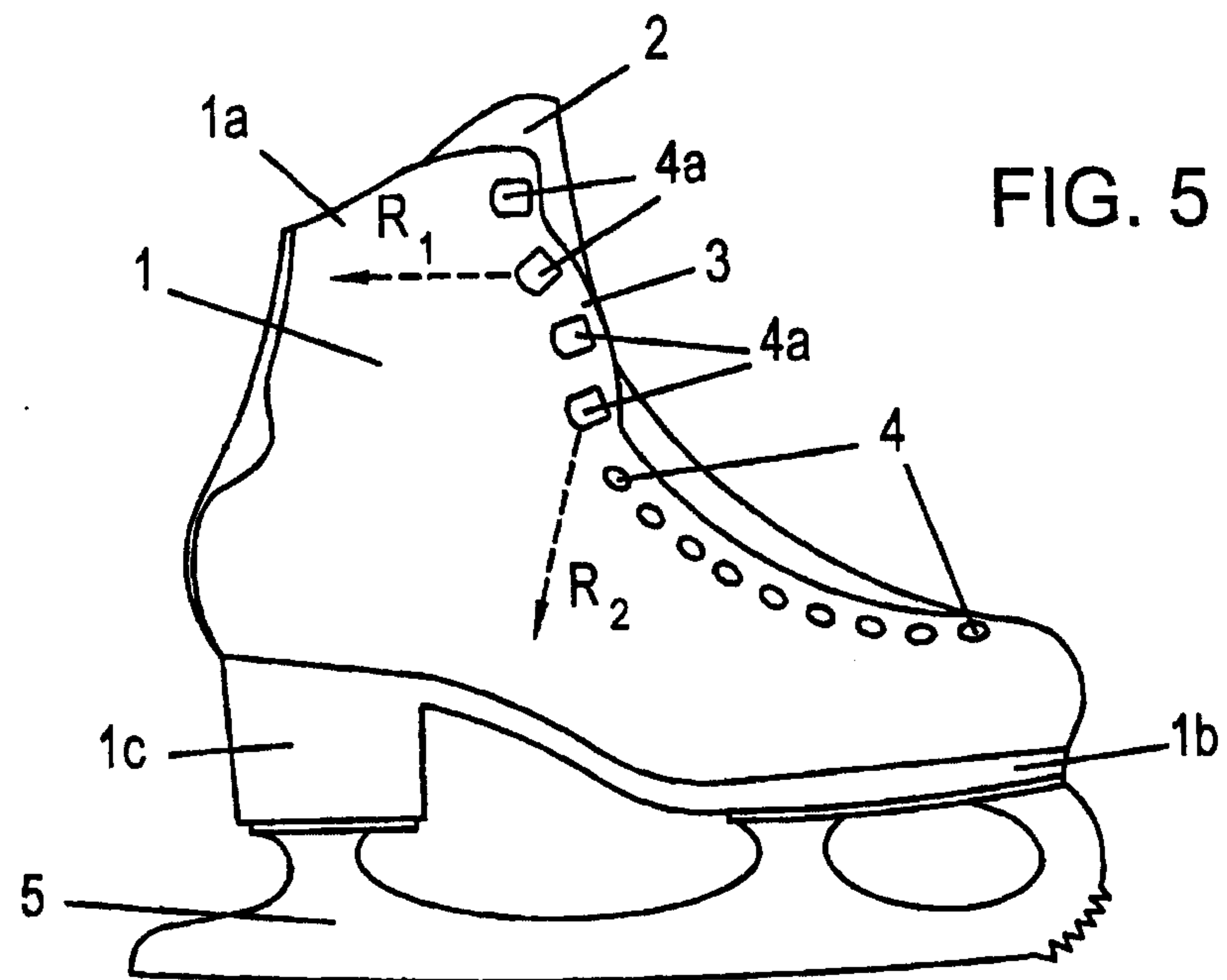
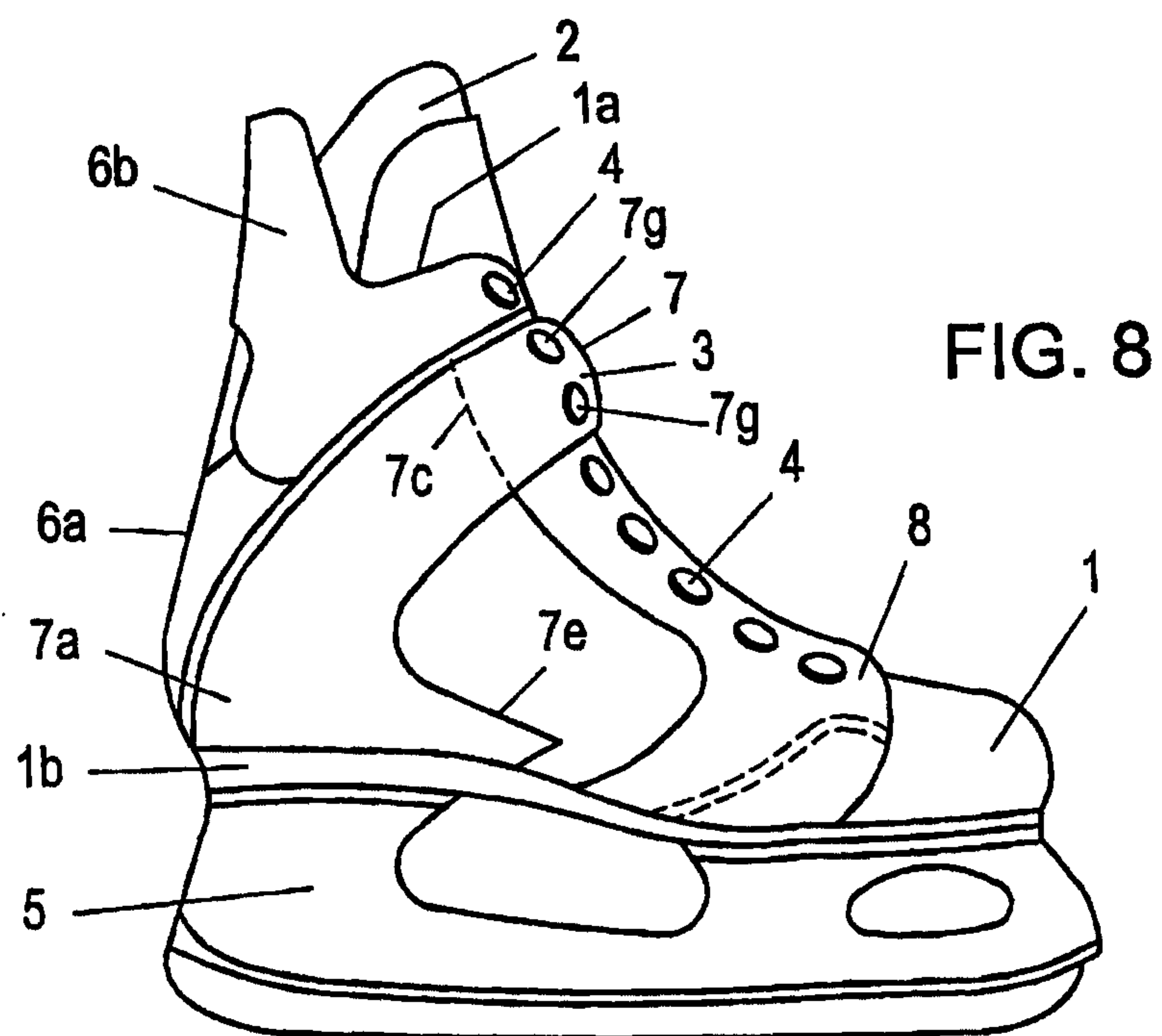
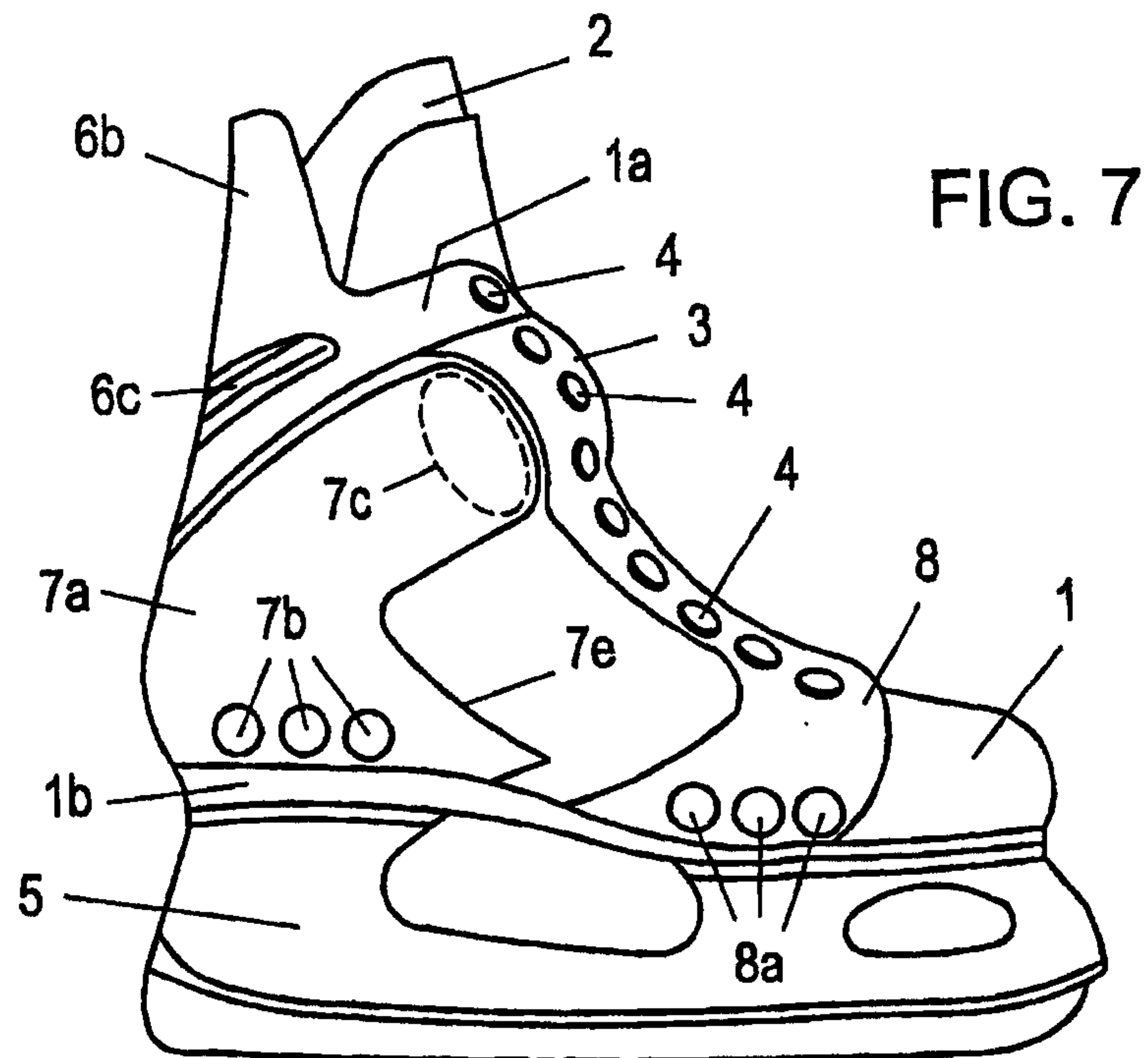


FIG. 4a

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