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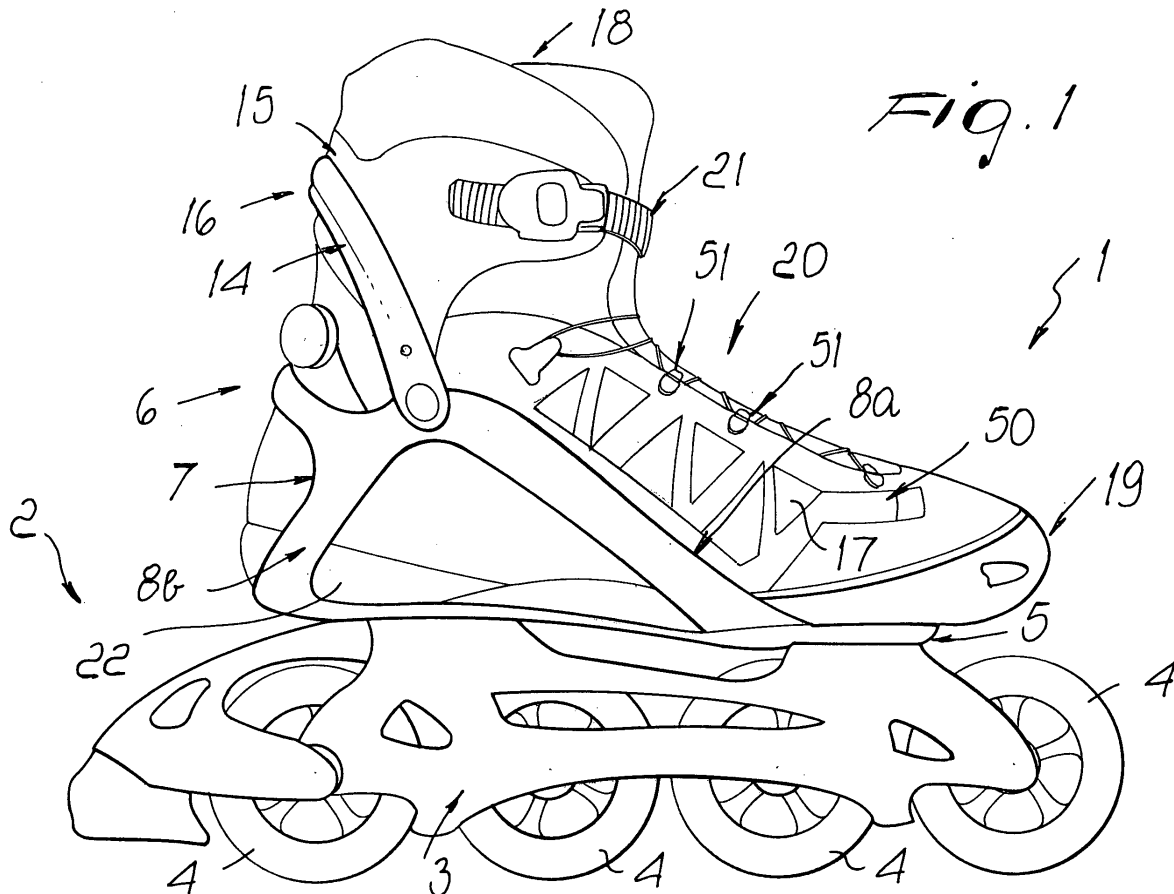
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(54) **Improved sports shoe**

(57) A sports shoe, particularly for skates, constituted by a rigid sole (5) and by a separate soft upper (17), which surrounds at least part of the heel, the rigid sole

being associated or formed monolithically with a frame that surrounds the foot at least laterally for containing a soft innerboot (18).



## Description

**[0001]** The present invention relates to a sports shoe that can be used particularly for example for practicing sports such as street skating and ice skating or for skiing.

**[0002]** Currently in use sports shoes which are constituted by a rigid shell below which a likewise rigid sole is associated or formed monolithically for connection to the optional sports implement, such as for example a frame or truck for supporting a plurality of in-line wheels or a ski.

**[0003]** The sole and the shell, which wraps around the user's foot, are usually made of rigid materials in order to allow efficient transmission of forces between the user's foot and the sports implement.

**[0004]** Such known type of sports shoe, further has a quarter that is pivoted to the shell approximately in the malleolar region and is suitable to surround the lower part of the leg.

**[0005]** The shell and the quarter are further provided with fastening means in order to achieve temporary closure of the shoe around the foot.

**[0006]** An example of these known types of sports shoe is shown in US 5,437,466, which discloses a skate with in-line wheels that comprises a soft shoe provided with reinforcements for containing the foot, such reinforcements being advantageously made of semirigid plastic material and being arranged approximately at the heel, at the malleoli and at the ankle.

**[0007]** The body of the shoe can be made of materials that allow the circulation of ventilation and cooling air; moreover, the shoe is fitted on a frame that supports a plurality of in-line wheels for gliding on the ground.

**[0008]** The known type of sports shoe, however, has limited comfort for the user, since it is very heavy.

**[0009]** Another drawback of these conventional shoes is the presence of soft material that wraps around the foot and is inadequate in preventing the discomfort caused by the external presence of the containment reinforcements made of semirigid material.

**[0010]** US 6,148,546 is also known which illustrates a sports shoe, particularly a skate with in-line wheels, which comprises an outer sole, suitable for connection to the sports implement, above which a containment structure for the user's foot is associated.

**[0011]** Such containment structure comprises a first portion, made of relatively rigid material, which constitutes a rear seat for containment and support of the heel of the user.

**[0012]** The first portion is advantageously formed monolithically with the sole and is associated, at its front edges, with a second portion, made of relatively soft material, which constitutes an upper for surrounding the front part of the foot.

**[0013]** The upper is associated, in a downward region, with the front free portion of the sole and with the lateral regions of the rear seat.

**[0014]** One drawback that can be observed in such known type of sports shoe is the fact that its overall weight is still significant even though the first portion of the upper is made of soft materials.

**[0015]** Furthermore, manufacture of the sports shoe requires a large number of operations, such as the necessary stitched seams between the various components, which lead to an increase in overall costs.

**[0016]** The aim of the present invention is to solve the above noted problems, eliminating the drawbacks of the cited known art, by providing a sports shoe that ensures high performance in terms of maneuverability of the implement with which it is associated and at the same time ensures a high degree of comfort for the user.

**[0017]** Within this aim, an object of the present invention is to provide a sports shoe that allows to reduce manufacturing costs.

**[0018]** Another object of the present invention is to provide a sports shoe that is structurally simple.

**[0019]** This aim and these and other objects that will become better apparent hereinafter are achieved by a sports shoe, particularly for skates, characterized in that it comprises a rigid sole, associated with a frame that wraps around the foot at least laterally, and a separate soft upper, which surrounds at least part of the heel, for containing an optional soft innerboot which is provided with a rigid toe cap that is associated with said sole, a rigid rod-like element for a quarter being rotatably associated with said frame.

**[0020]** Further characteristics and advantages of the invention will become better apparent from the detailed description of exemplary embodiments of the sports shoe according to the present invention, illustrated by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a side view of a skate with in-line wheels that comprises a first embodiment of the sports shoe according to the present invention;

Figures 2 and 3 are respectively a side view and a bottom perspective view of the sports shoe of Figure 1;

Figure 4 is a perspective view of the sports shoe of Figure 1, with the innerboot partially removed;

Figures 5 and 6 are respectively a side view and a perspective view of a detail of the sports shoe of Figure 1;

Figures 7 and 8 are respectively a side view and a perspective view of a second embodiment of the frame of the sports shoe according to the present invention;

Figures 9 and 10 are respectively a side view and a perspective view of a third embodiment of the frame of the sports shoe according to the present invention;

Figures 11 and 12 are respectively a side view and a perspective view of a fourth embodiment of the frame of the sports shoe according to the present

invention.

**[0021]** With reference to Figures 1 to 4, the reference numeral 1 designates the sports shoe according to the present invention, particularly usable for sports implements such as a skate, designated by the reference numeral 2 in Figure 1.

**[0022]** The skate 2 comprises a frame or truck 3, which is shaped like an inverted letter U and between the wings whereof a plurality of in-line wheels 4 are pivoted.

**[0023]** The truck 3 is associated below the sports shoe 1, which has a rigid sole 5 for supporting the foot of the user that is advantageously associated with, or formed monolithically with, a frame 6 that wraps around the foot at least laterally.

**[0024]** The frame 6 comprises one or more rigid rod-like elements.

**[0025]** For example, the frame 6 comprises two rod-like arms 7, each of which is approximately shaped like an inverted letter V, so as to form a first wing 8a and a second wing 8b, which diverge and are arranged laterally to the foot of the user.

**[0026]** The first wing 8a is arranged obliquely and blends with the first perimetric edge, designated by the reference numeral 5a, of the sole 5, approximately at a first region 9 of the metatarsus of the foot.

**[0027]** The second wing 8b, also arranged obliquely and approximately at right angles to the direction of the first wing 8a, affects the second region 10 of the heel and therefore blends laterally with the sole 5 approximately at the first perimetric edge 5a.

**[0028]** The first and second wings 8a and 8b of each one of the rod-like arms 7 are blended at a vertex 11 that is preferably rounded and is located approximately proximate to a third malleolar region 12.

**[0029]** In the illustrated embodiment, the two second wings 8b, related to the two lateral regions of the foot, are advantageously blended by means of a first bridge 13, which is approximately U-shaped and wraps around, at the rear, the second region 10 of the heel approximately at the level of the malleoli, so as to increase the overall rigidity of the entire frame 6.

**[0030]** A quarter 15 is rotatably associated with the frame 6 and wraps around the lower part of the user's leg.

**[0031]** The quarter 15 preferably comprises a rod-like rigid support 14.

**[0032]** The support 14 is advantageously approximately U-shaped so as to affect a fourth region 16 for supporting the lower rear part of the leg.

**[0033]** The sports shoe 1 further comprises a separate soft upper 17, which is accommodated freely inside the frame 6 and is suitable to contain an optional soft innerboot 18 for containing the foot of the user.

**[0034]** The upper 17, which can be advantageously made of different materials, such as one or more layers of PVC, leather, fabric, rubber or foamed materials, is

shaped so as to affect at least partially the heel of the user; advantageously, it can also affect substantially all of the surface of the foot, extending from the heel region 10 of the heel to the malleolar region 12, until it affects the upper metatarsal region and the lower metatarsal region 9.

**[0035]** Advantageously, the rear and central portion of the upper 17 preferably comprise a multilayer fabric that comprises a soft inner layer associated with a partially elastic outer layer constituted by a three-dimensional lattice.

**[0036]** The front portion of the upper 17 preferably comprises a multilayer fabric, which comprises a soft inner layer associated with an outer layer that is externally coated with plastics so as to give a certain resistance to abrasion or environmental agents.

**[0037]** A rigid toe cap 19 is associated, for example by gluing, with the upper 17 at the toes and is in turn associated or formed monolithically with the sole 5 in a downward region.

**[0038]** Advantageously, the toe cap 19 can be formed by means of a relatively thin contoured layer of plastic material.

**[0039]** The upper 17 can also be connected to the sole by gluing or riveting or by way of a similar process.

**[0040]** Moreover, the upper 17 can be connected to the frame 6, for example at the articulation to the support 14 for the quarter 15.

**[0041]** The temporary fastening of the sports shoe 1 around the foot of the user is allowed by the presence of first fastening means 20, which are associated with the upper 17 approximately at the upper metatarsal region, and of second fastening means, designated by the reference numeral 21, which are preferably constituted by a conventional fastening lever, which is arranged at the front of the quarter 15 and transversely thereto.

**[0042]** In the embodiment shown in Figures 1 to 4, the first fastening means 21 comprise a lattice-like semirigid structure made of plastic material, which forms the flaps 50 and is suitable to strengthen the shoe, prevent abrasions of the soft fabrics, and support one or more closure elements, such as closure hooks or guiding elements 51 for the shoe or, as an alternative, a plurality of loops for laces or cables 52 that allow to close the shoe.

**[0043]** An at least partially soft element 22, commonly known as shock absorber, can further be arranged between the sole 5 and the upper 17 and is suitable to compensate for the impacts and/or vibrations transmitted by the wheels to the foot.

**[0044]** The shock absorber 22 is suitable to support in a downward region the user's foot at least in the heel and/or plantar arc region.

**[0045]** The shock absorber 22 preferably affects the entire heel and plantar arch.

**[0046]** As an alternative, it can affect the entire foot. The shock absorber 22 is preferably arranged so as to have second edges, designated by the reference numeral 22a, which protrude laterally so as to affect the

lower part of the upper and in particular a fifth region 23 of the plantar arch of the foot.

**[0047]** The second edges 22a are preferably blended at the third region 12 of the heel, so as to constitute a support for the lower part of the heel of the user.

**[0048]** The shock absorber 22 can be associated with the upper 17 and optionally also with the facing surface of the sole 5 by gluing or riveting.

**[0049]** Use of the sports shoe 1 is therefore as follows: with reference to Figure 1, the user inserts his foot in the innerboot 18, then activates the first and second fastening means 20 and 21, thus fastening the shoe 1 around the foot.

**[0050]** The particular rod-like structure of the frame 6 allows adequate containment of the foot during sports practice and at the same time also allows optimum transmission of force to the sports implement.

**[0051]** Moreover, it allows to support the foot only in its essential points, leaving it free from rigid containment structures in the remaining regions.

**[0052]** In particular, the heel of the user is surrounded by soft material and therefore comfort is increased also due to the use of the soft innerboot.

**[0053]** It has thus been shown that the sports shoe according to the present invention has achieved the intended aim and objects.

**[0054]** The shoe in fact ensures achieving high performance and at the same time considerable comfort as well as a low overall weight.

**[0055]** The soft part of the shoe is in fact fully separated from the rigid part: this entails a considerable reduction of the weight of the shoe, since a drastic reduction in plastic material is possible, and also entails very easy assembly and a reduction of production costs, since it is no longer necessary to glue the soft part to the rigid part.

**[0056]** The sports shoe according to the present invention is structurally simple, thus allowing easy product engineering.

**[0057]** In this manner it is possible to speed up and optimize the steps of production, consequently also reducing manufacturing costs.

**[0058]** The sports shoe according to the present invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

**[0059]** Thus, for example, Figures 7 and 8 illustrate a different embodiment for a frame 106, which is again constituted by two rod-like arms that form a first wing 108a and a second wing 108b, which are substantially shaped like an inverted letter V and at the vertex of which a support 114 is articulated.

**[0060]** In the illustrated embodiment, the frame 106 is associable at a rigid sole 105, which in turn can be connected in a downward region to a truck 103 for supporting wheels 104.

**[0061]** The frame 106 in fact has means for detachable connection to the sole 105; such means are consti-

tuted by two plates 126a and 126b, which are arranged so as to face each other on a same plane and protrude at the ends of each one of said first wings 108a.

**[0062]** Each one of the two plates 126a, 126b advantageously has suitable first holes 127, and the plates can be arranged at complementarily shaped first seats 128a, 128b formed at the sole 105 in a first metatarsal region 109 and at a first perimetric edge 105a of the sole 105.

**[0063]** At the first seats 128a, 128b there are second holes 129, which have the same axis as the first holes 127 for connection for example by riveting or by another known device.

**[0064]** Likewise, at the heel region 110 there is, on the sole 105, a second seat 130 for positioning a second bridge 131 for blending the ends of the second wings 108b, such bridge and such second seat being provided respectively with third holes 132 and with fourth holes 133 for mutual connection by known means.

**[0065]** Figures 9 and 10 illustrate still another embodiment of a frame 206, which is again constituted by two rod-like arms that are shaped like an inverted letter V and form a first wing 208a and a second wing 208b.

**[0066]** A support 214 is articulated at the vertex of said wings.

**[0067]** The first wings 208a are again associated, approximately at a first metatarsal region 209, with a sole 205 at a first perimetric edge 205a of the sole.

**[0068]** The second wings 208 are instead coupled or articulated, at their free end, at a counter 234 that protrudes upward with respect to the sole 205 at the first perimetric edge 205a.

**[0069]** Such counter therefore affects the region 210 of the heel so as to affect the sole approximately up to the entire fifth region 223 of the plantar arch.

**[0070]** This solution allows better containment of the foot and therefore an optimum transmission of forces, especially during lateral thrust while skating.

**[0071]** Figures 11 and 12 illustrate a further embodiment for a frame 306, which is constituted by two rod-like arms that are shaped like an inverted letter V so as to form a first wing 308a and a second wing 308b.

**[0072]** A support 314 is associated at the vertices of the wings.

**[0073]** The tips of the first and second wings 308a and 308b are connected at a counter 334 that protrudes from the sole 305 at the entire first perimetric edge 305a so as to form a foot containment shell, such foot being thus surrounded at a second heel region 310, at its entire inner and outer lateral region, and at its entire toe region.

**[0074]** The interconnection of the end of the first and second wings to said shell can occur by known devices, such as for example riveting.

**[0075]** The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to the specific requirements.

**[0076]** The various means for performing certain dif-

ferent 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.

**[0077]** The disclosures in Italian Patent Application No. TV2002A000055 from which this application claims priority are incorporated herein by reference.

**[0078]** 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 sports shoe, particularly for skates, **characterized in that** it comprises a rigid sole, associated with a frame that wraps around the foot at least laterally, and a separate soft upper, which surrounds at least part of the heel, said frame being rotatably associated with said frame.
2. The sports shoe according to claim 1, **characterized in that** it comprises a soft innerboot contained inside said soft upper.
3. The sports shoe according to claim 1, **characterized in that** said frame and/or said quarter comprise one or more rigid rod-like elements.
4. The sports shoe according to claim 1, **characterized in that** said rigid sole is associated with said frame or obtained monolithically therewith, said frame comprising two rod-like arms, each of which is approximately shaped like an inverted letter V, so as to form a first wing and a second wing which diverge and are arranged laterally with respect to the user's foot.
5. The sports shoe according to claims 1 and 4, **characterized in that** said first wing is orientated obliquely and blends with a first perimetric edge of said sole, approximately at a first region of the metatarsus of the foot.
6. The sports shoe according to claim 5, **characterized in that** said second wing is arranged obliquely approximately at right angles to said first wing, affects a second region of the heel and is blended laterally with said sole approximately at said first perimetric edge.
7. The sports shoe according to claims 5 and/or 6, **characterized in that** said first and second wings are blended at a vertex that is arranged approximately proximate to a third region of the malleoli, said quarter being rotatably associated therewith, said quarter comprising a rigid support that wraps around the lower part of the leg of the user.
8. The sports shoe according to one or more of the preceding claims, **characterized in that** said frame comprises a first bridge that is approximately U-shaped and wraps around, at the rear, said second region of the heel approximately at the level of the malleoli.
9. The sports shoe according to one or more of the preceding claims, **characterized in that** said separate soft upper affects the entire surface of the foot and runs from the heel region to the malleolar region until it affects the upper metatarsal region and the lower metatarsal region.
10. The sports shoe according to claim 9, **characterized in that** the rear and central portions of said outer upper comprise a multilayer fabric that comprises a soft inner layer associated with a lattice-like outer layer that is partially elastic.
11. The sports shoe according to claims 9 and/or 10, **characterized in that** the front portion of said outer upper comprises a multilayer fabric, which in turn comprises a soft inner layer that is associated with an outer layer that is coated with plastic externally so as to provide resistance to abrasion or environmental agents.
12. The sports shoe according to one or more of the preceding claims, **characterized in that** a rigid toe cup is associated with said soft upper at the tip of the toe and is in turn associated with said sole or monolithic therewith in a downward region.
13. The sports shoe according to one or more of the preceding claims, **characterized in that** said separate soft upper is connected to said frame at the articulation to said support for said quarter.
14. The sports shoe according to one or more of the preceding claims, **characterized in that** first fastening means are associated with said soft upper and are arranged approximately at the upper metatarsal region, said first fastening means comprising a lattice-like semirigid structure made of plastic material, which forms flaps and is adapted to strengthen said shoe, prevent abrasions of said soft fabrics and/or support one or more closure elements.
15. The sports shoe according to one or more of the preceding claims, **characterized in that** an at least partially soft element is interposed between said

sole and said soft upper.

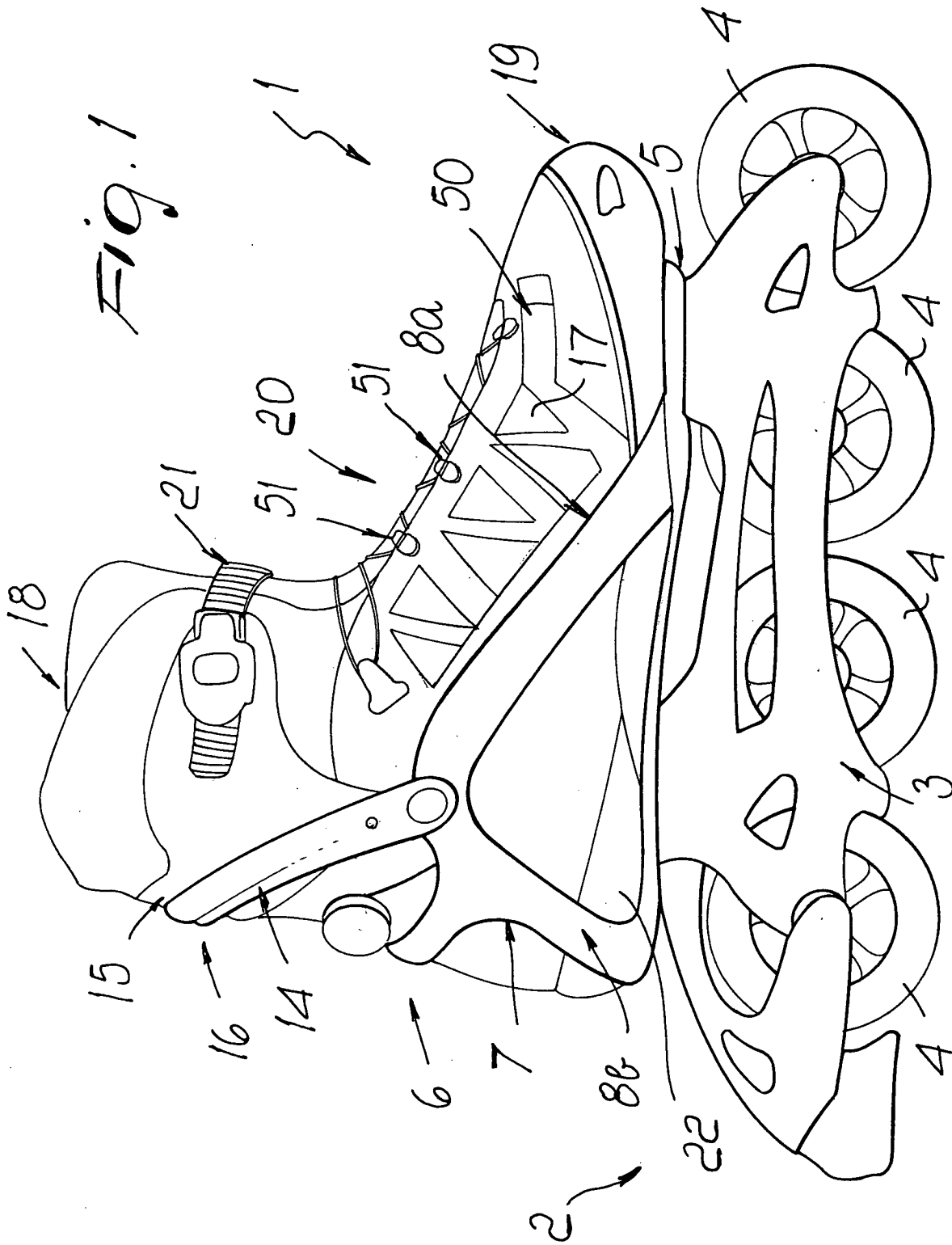
16. The sports shoe according to claim 15, **characterized in that** said soft element supports, in a downward region, the foot of the user at least in the heel region and/or in the plantar arch region. 5
17. The sports shoe according to claim 15 and/or 16, **characterized in that** said soft element supports, in a downward region, the foot of the user from the heel region to the plantar arch. 10
18. The sports shoe according to claim 15, **characterized in that** said soft element supports, in a downward region, the entire foot of the user. 15
19. The sports shoe according to one or more of claims 15-17, **characterized in that** said soft element has second edges that protrude laterally so as to affect the lower part of said upper and in particular a fifth region of the plantar arch of the foot, said second edges being connected at said third heel region, so as to constitute a support for the lower part of the heel of the user. 20  
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20. The sports shoe according to one or more of the preceding claims, **characterized in that** said soft element is associable with said upper and/or said sole. 30
21. The sports shoe according to one or more of claims 1-20, **characterized in that** said frame is provided with means for detachable connection to said sole.
22. The sports shoe according to one or more of claims 1-20, **characterized in that** said frame is formed monolithically with said sole. 35

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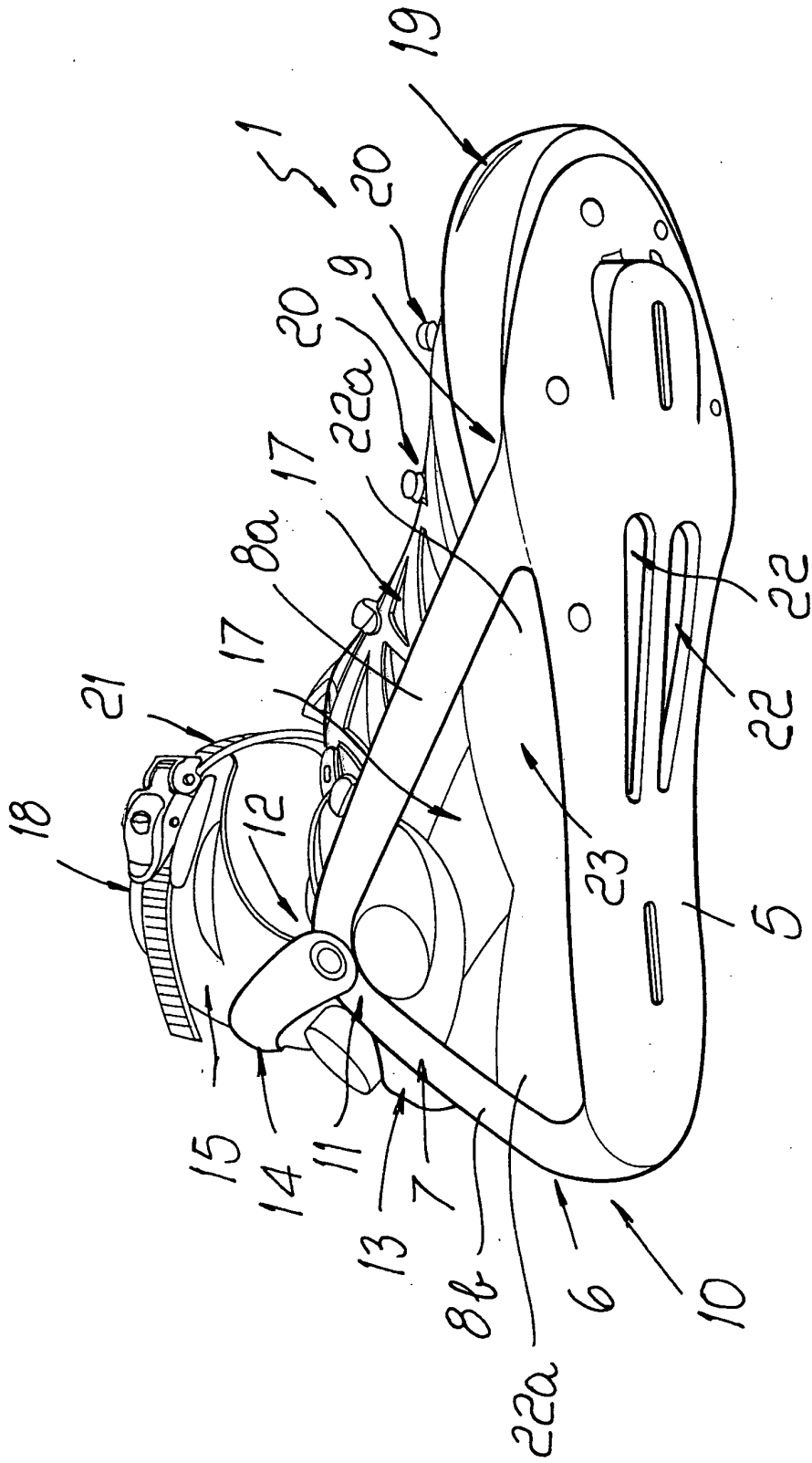
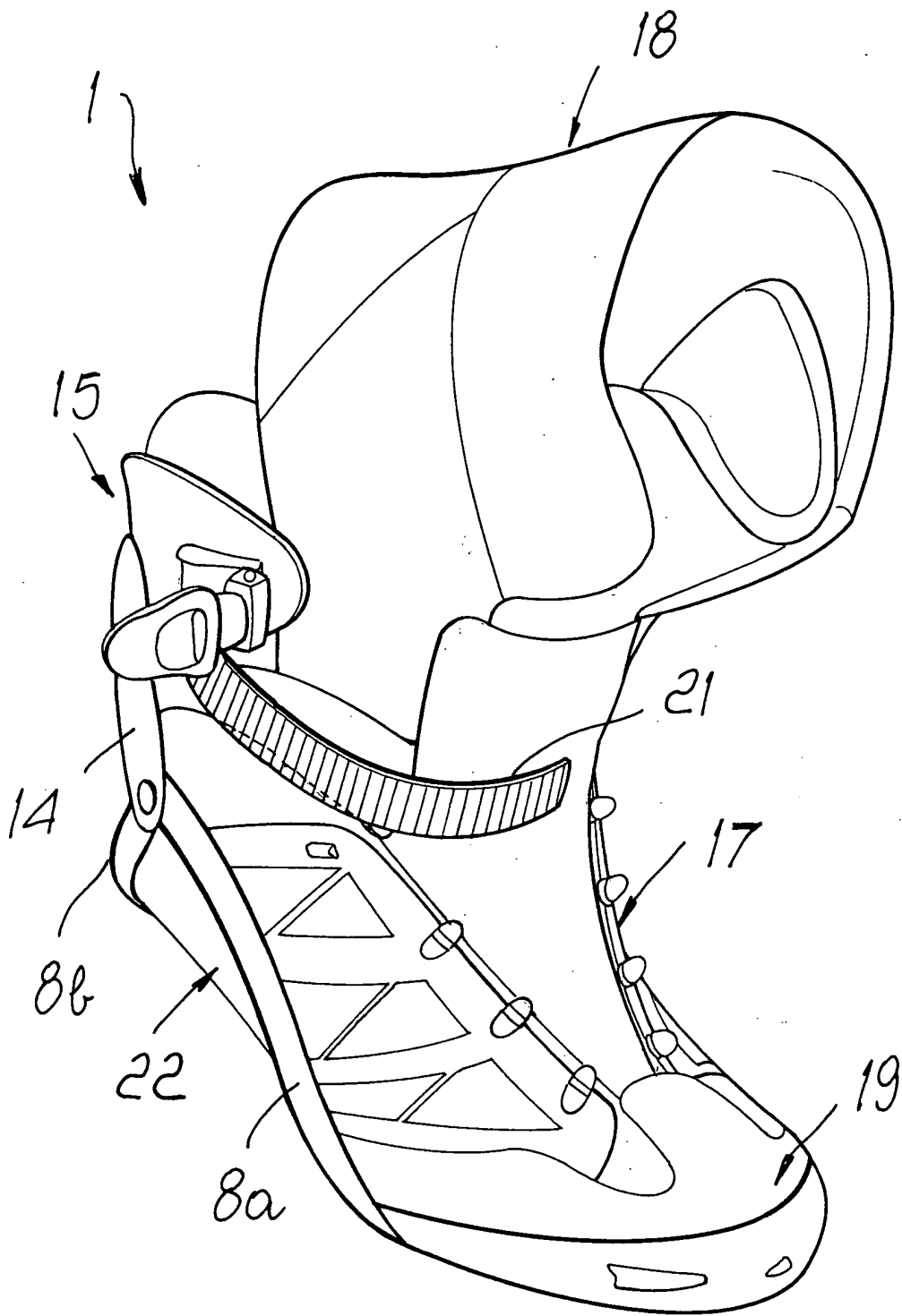


FIG. 3



*Fig. 4*

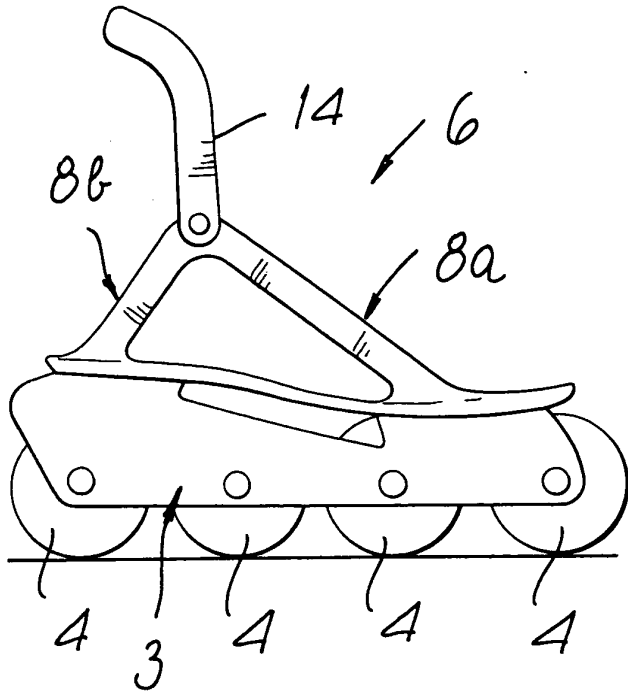


Fig. 5

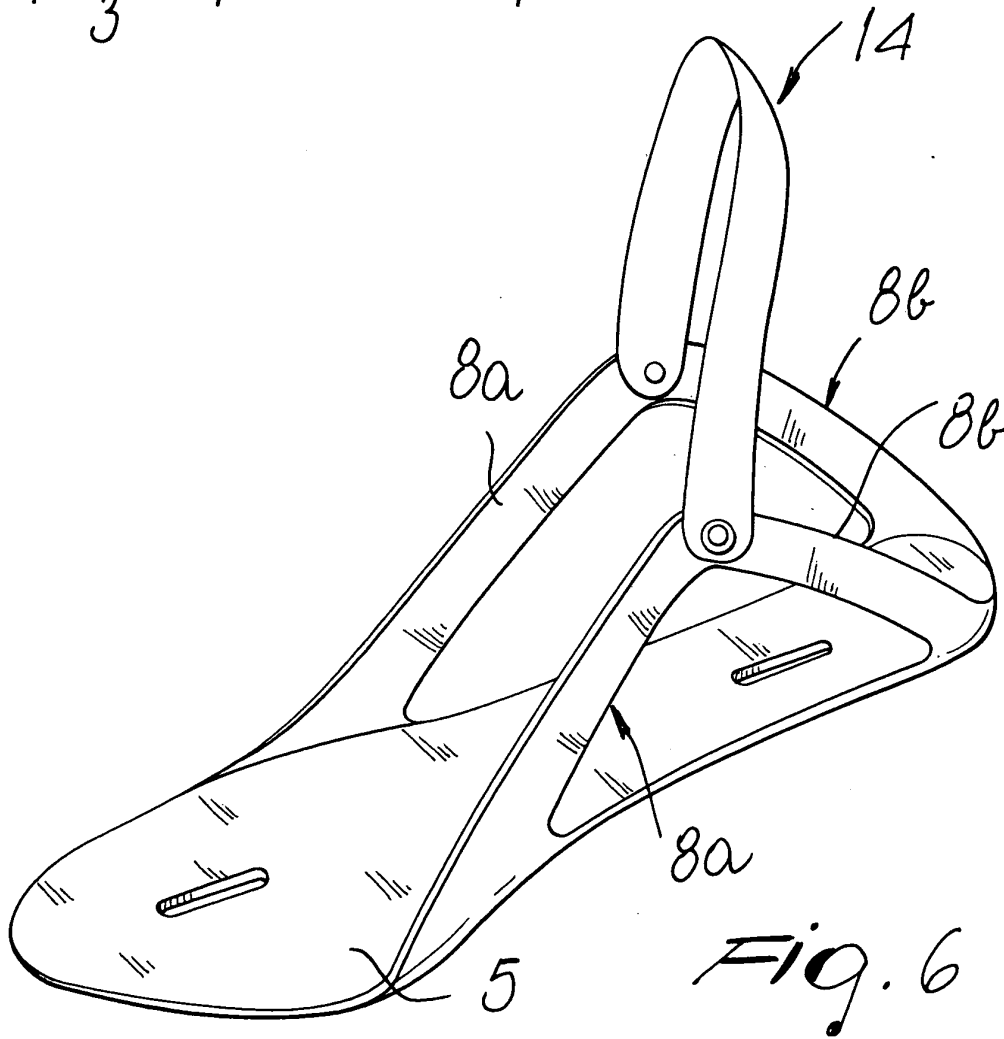


Fig. 6

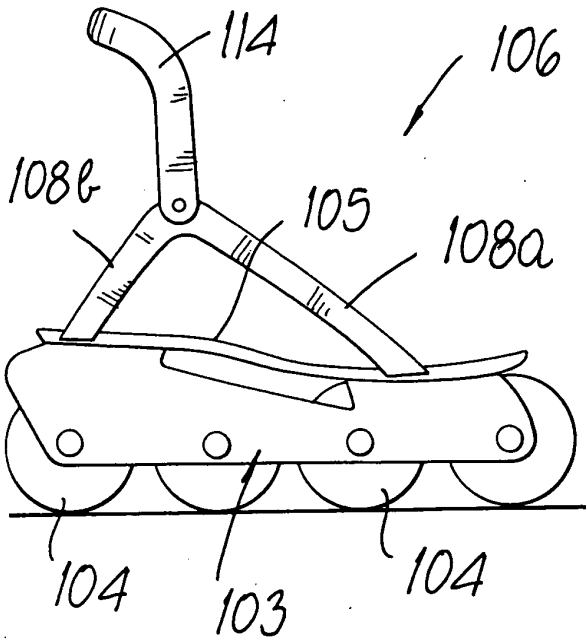


Fig. 7

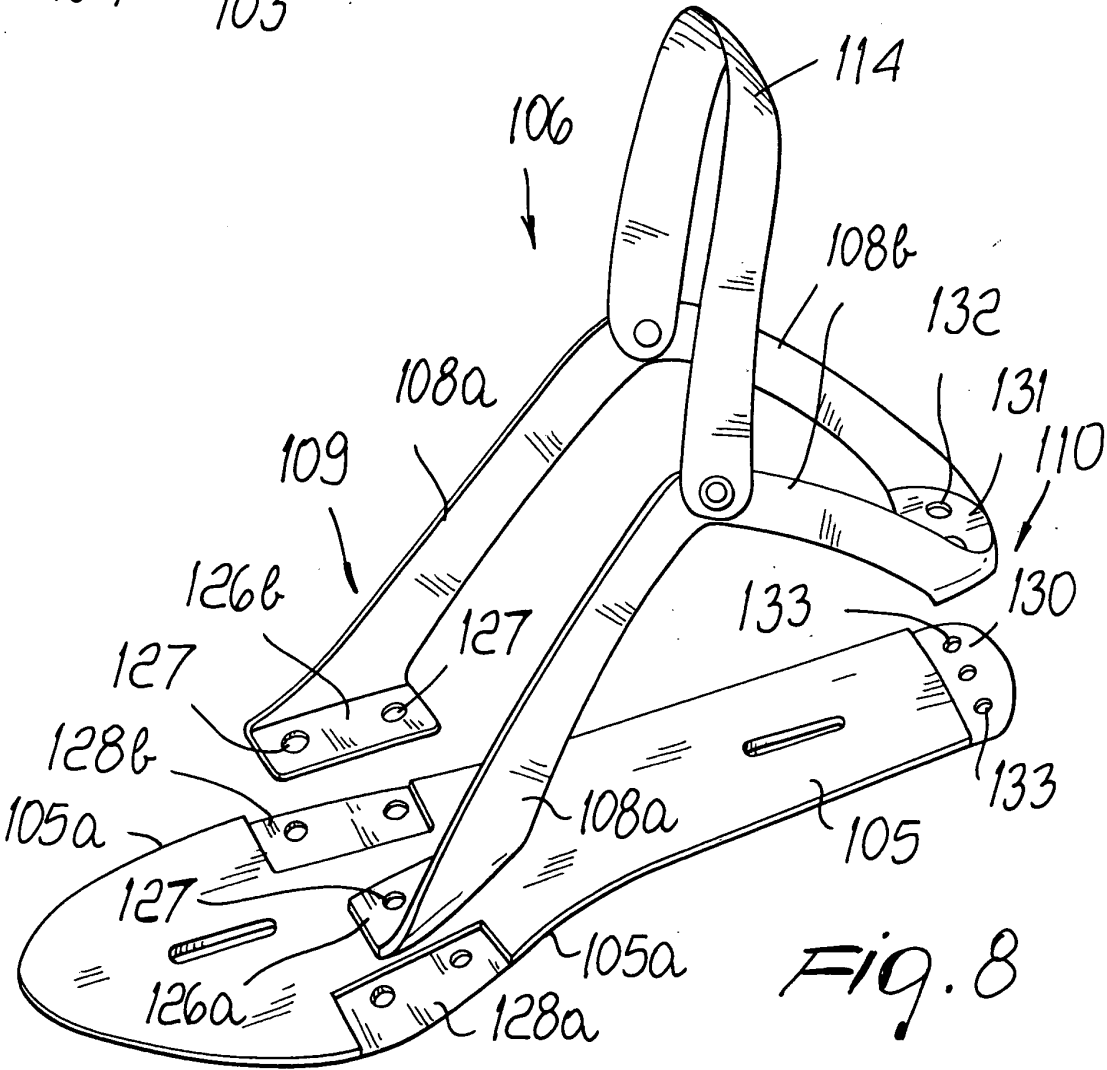


Fig. 8

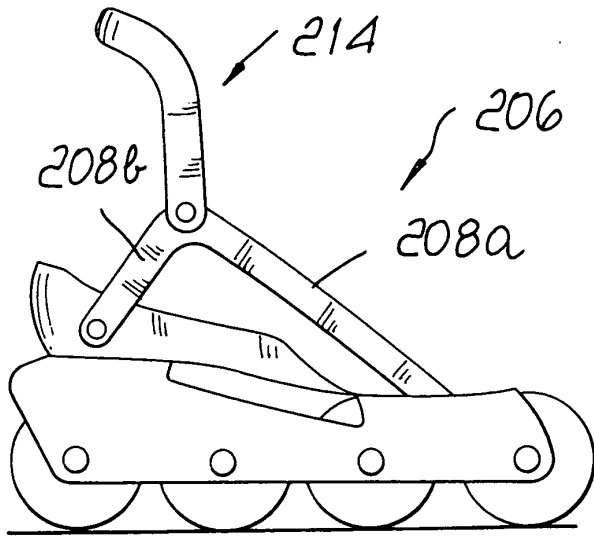


Fig. 9

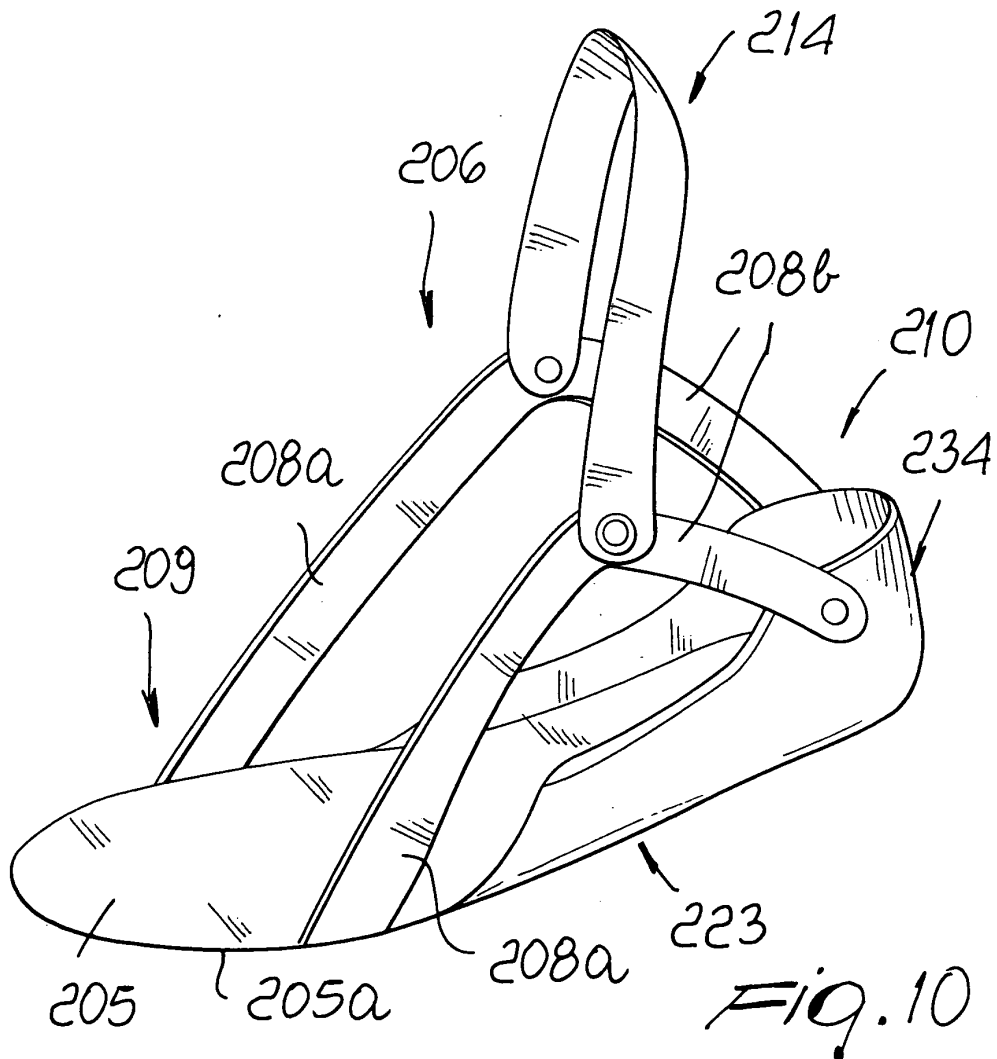


Fig. 10

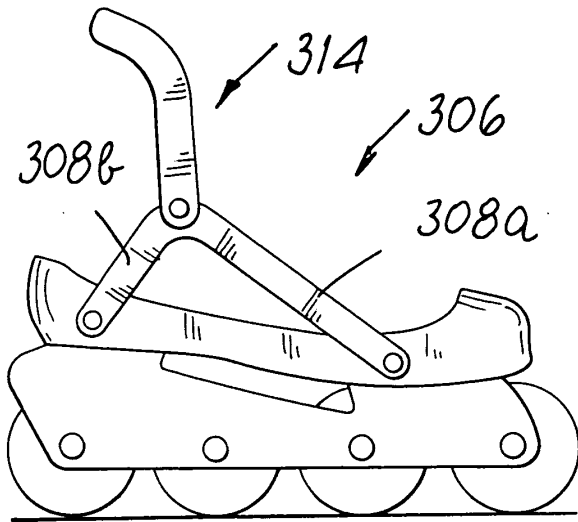


Fig. 11

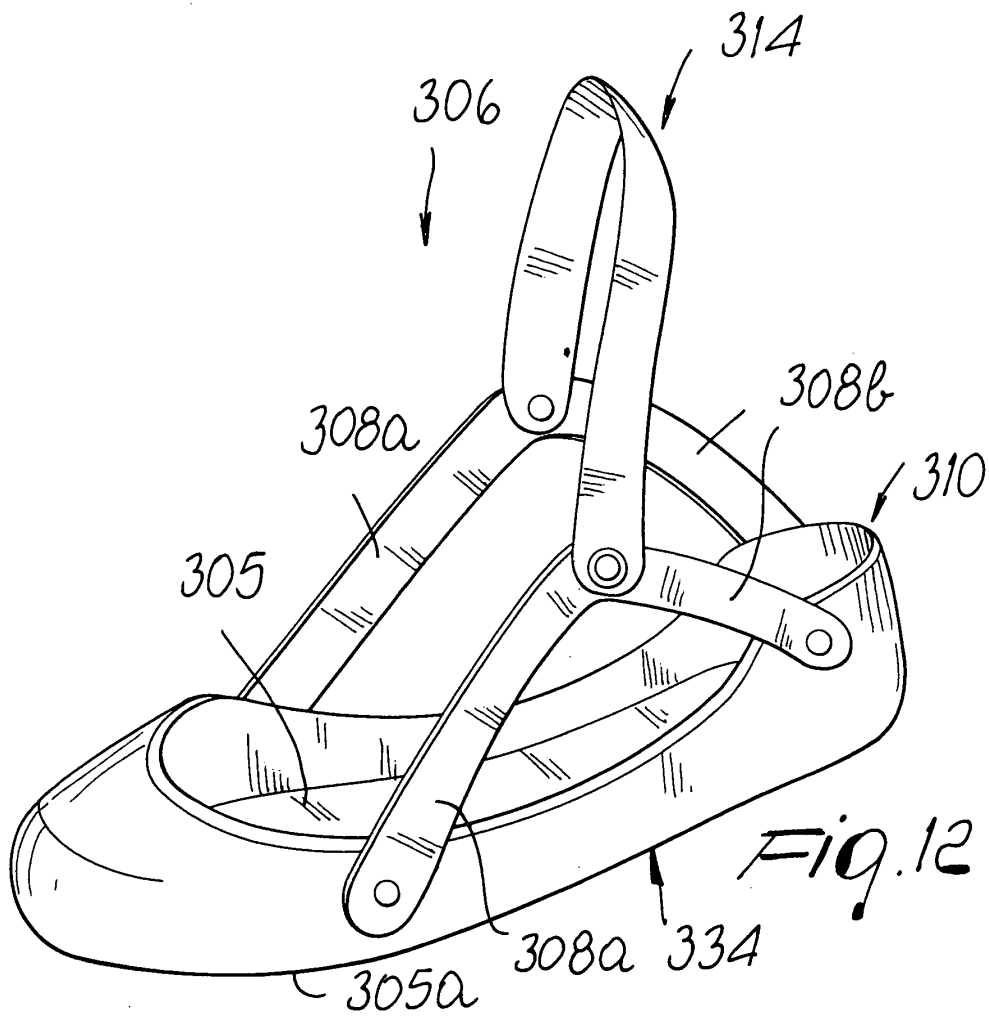


Fig. 12



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Application Number  
EP 03 00 9810

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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