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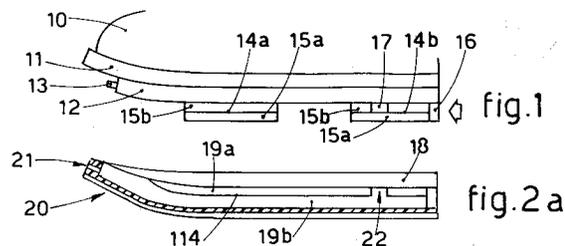
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54 **Shoe/boot system with a speedily changeable sole element.**

57 Shoe/boot system with a speedily changeable sole element, the shoe/boot system comprising advantageously an extractable slipper, in which system reciprocal mating anchorage means (12-14-114-18) and reciprocal clamping assembly means (16) capable of being quickly released from the exterior are included in the lower side of the shoe/boot system (10) and in the upper side of the sole (20).



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This invention concerns a shoe/boot system with a speedily changeable sole element according to the main claim.

To be more exact, the invention concerns a shoe/boot system, advantageously with a skiing-type extractable inner slipper, together with a sole element which can be replaced with soles formed for special uses.

The shoe/boot systems of the type of this invention are shoes/boots with a substantially rigid lower element and with an inner slipper which advantageously can be extracted.

Shoe/boot systems which have an extractable inner slipper and of which the sole element can be changed are known.

A shoe/boot system made of a thermal resistant material and including an extractable inner slipper and a changeable sole element is known. It comprises two sole elements, one of which is equipped with a skate for skating on ice, whereas the other has a plurality of rollers for practising on roads so as to simulate ice skating.

This known boot entails the drawback that the sole elements with their two special forms are connected to the boot with screws.

This involves many shortcomings such as long replacement times; the need of tools to screw up and unscrew the screws; the risks of jamming the screws owing to the infiltration of water and/or ice; the risk of excessive pressure of the head of the screw with resulting breakages or small cracks in one or another of the plastic parts; the need to remove the shoe or boot from the foot so as to make the change, etc.

Moreover, the structure of the sole element is expressly designed for the function it has to perform and does not allow the application of different equipment.

To obviate these shortcomings and to be able to widen the uses of the shoe/boot system in question, the present applicant has designed, tested and embodied this invention.

The shoe/boot system with an extractable inner slipper and with a speedily changeable sole element according to the invention is set forth and characterized in the main claim, while the dependent claims describe variants of the idea of the embodiment.

According to the invention the base element of the shoe or boot comprises on its lower side lengthwise guides, which cooperate with mating means included on the upper side of the sole to be changed.

The reciprocal guide means serve at least for the correct lengthwise and lateral positioning of the shoe/boot and changeable sole in relation to each other.

These guide means, as regards their conforma-

tion, have the purpose also of providing a constraint operating on a plurality of axes.

According to the invention a quick-release reciprocal clamping and unclamping assembly is included in cooperation with the guide means.

This reciprocal clamping assembly includes a quick actuation means such as a push button, a lever or a threaded element which acts on at least one retaining and/or positioning element.

The retaining and/or positioning element creates a reciprocal locking together of the shoe and sole, and this locking can be obtained in a vertical or horizontal direction.

Let us now see a preferred embodiment of the invention with the help of the attached figures, of which:-

Fig.1

is a side view of the lower part of a shoe/boot system according to the invention;

Figs.2a to 2e

show lengthwise sections of some specially formed changeable soles able to cooperate with the shoe/boot system of Fig.1;

Fig.3

shows a cross section of a connection made with lengthwise guide means between a sole and a shoe/boot system;

Figs.4a and 4b

show a possible reciprocal speedy clamping and unclamping assembly;

Figs.5a and 5b

shows a further possible reciprocal speedy clamping and unclamping assembly;

Fig.6

shows a variant of the assemblies of Figs.4 and 5.

In the figures a shoe/boot system is referenced generically with the number 10.

The lower part of the system is referenced with 11 and in this case comprises a lengthwise positioning and guide element 12 including a frontal retaining prong 13.

Guide means 14 are firmly secured to, and cooperate with the lengthwise element 12 and are two in number in this example, namely front guide means 14a and rear guide means 14b respectively, and in turn comprise lateral male guide means 15a and lateral female guide means 15b.

In this example the rear guide means 14b include a reciprocal clamping assembly 16 with positioning and anchorage teeth 17 acting on a horizontal plane.

The reciprocal clamping assembly 16 can be actuated quickly from the rear, as we shall see later.

A changeable sole is referenced generically with 20 and comprises in this case lateral elements 18 which include mating guide means 114 with

lateral guides 19, which are a male guide 19a and female guide 19b respectively.

The mating guide means 114 with their relative lateral guides 19 mate with the guide means 14 and lateral guides 15 of the shoe/boot system 10.

In this example the changeable sole 20 includes at its front a space 21 which contains and positions the frontal prong 13 of the shoe/boot system 10, thus creating a rigid reciprocal joint.

The changeable sole 20 comprises in congruent cooperation with the positioning and anchorage teeth 17 of the shoe/boot system 10 a seating 22 to receive the relative positioning and anchorage tooth 17.

In the example shown the changeable sole 20 is inserted or withdrawn lengthwise at the front of the shoe/boot system 10, and the device to cause its connection or release is located at the rear in a protected zone.

The changeable sole 20 can be embodied with various forms. Thus there can be skiing soles (Fig.2a), ice skating soles (Fig.2b), roller skating soles for training purposes (Fig.2c), soles with tracks for training purposes (Fig.2d), soles with slides for use on roads (not shown here), soles for walking with their lower part made of rubber (Fig.2e), etc; the soles 20 remain the same, and only their lower special form is varied and meets with a broad area of connection, readily made suitable for the specific purposes and for the specific technical and functional requirements.

Other special forms of the sole 20 can therefore be provided, so that a user can readily equip himself according to his momentary personal requirements owing to the speed and great ease of assembling or dismantling the system thus existing.

Figs.4 and 5 show two possible reciprocal clamping assemblies 16.

According to Fig.4 a push button 23 is solidly secured to a frontal body 24 that contains two inclined slots 25; the push button 23 is resisted resiliently by a spring 27.

Pins 26 cooperate with the slots 25 and are integrally fixed to sliders which comprise at their ends the positioning and anchorage teeth 17.

When the push button 23 is pressed, the positioning and anchorage teeth 17 are retracted and the sole 20 is free and can be withdrawn.

The frontal conformation of the positioning and anchorage teeth 17 enables the sole 20 to be inserted simply by being thrust, or else by thrusting the shoe/boot system 10 within the sole 20.

In this example the reciprocal clamping assembly 16 contains means 28 for the insertion of fixture screws into the lengthwise positioning and guide element 12, which includes an appropriate seating. This enables corrective action to be taken on the

reciprocal clamping assembly 16 speedily and easily whenever maintenance is required.

In the example of Figs.5 the reciprocal clamping assembly 16 is shown diagrammatically and has an analogous function, but the positioning and anchorage teeth 17 consist of a resilient material.

According to the invention the positioning and anchorage teeth 17 can have different conformations, such as that shown in Fig.6 for instance.

In Fig.6 the positioning and anchorage teeth, or catch, 17 are kept resiliently in position by springs 29, which cooperate with recesses 30 included in the push button 23 for their disactuation.

The sole 20 includes at its front end a bevel 31 for independent insertion.

The positioning and anchorage teeth 17, whatever their conformation may be, can act not only at the sides but also vertically at the bottom of the shoe/boot system 10.

Likewise, instead of two positioning and anchorage teeth 17 there may be one or more teeth 17.

Furthermore, the reciprocal clamping assembly 16 can be positioned in the sole 20 instead of the shoe/boot system 10.

Moreover, the reciprocal clamping assembly 16 may comprise a crank, a lever or a handle which works, for instance, on a threaded shaft with a circular cam element having an axial tapered extent, or else on a shaft conformed peripherally with a cam so as to position the means which disactuate the positioning and anchorage teeth 17.

According to a variant the lower part 11 of the shoe/boot system 10 comprises a positive or negative peripheral impression, with which there cooperates peripherally a plurality of positioning and anchorage teeth 17. This impression covers the lower part 11 of the shoe/boot system 10 substantially along the whole periphery apart from the space necessary for actuation of the reciprocal clamping assembly 16.

These positioning and anchorage teeth 17 comprise a self-actuation lead-in for insertion in the lower part of the shoe/boot system 10.

The sole 20 includes an impression which mates with the impression in the shoe/boot system 10 and is inverted in relation thereto so that one impression is tightly contained in the other.

To combine the sole 20 with the shoe/boot system 10 it is enough to position the system 10 substantially vertically on the sole 20 so that one impression enters the other, actuating in retraction the positioning and anchorage teeth 17.

The positioning and anchorage teeth 17, when the two impressions have been positioned reciprocally, are anchored in appropriate peripheral seatings 22, thus joining firmly together the sole 20 and the shoe/boot system 10.

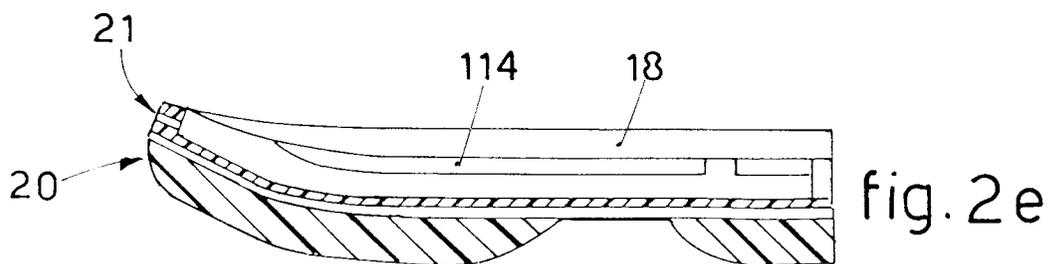
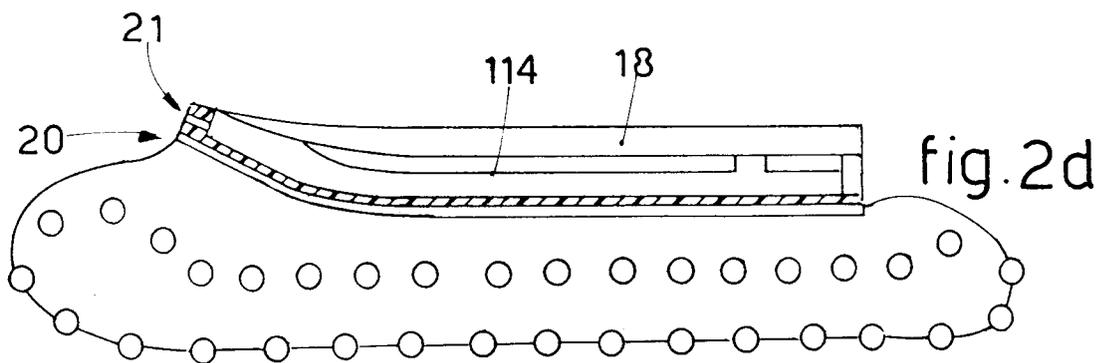
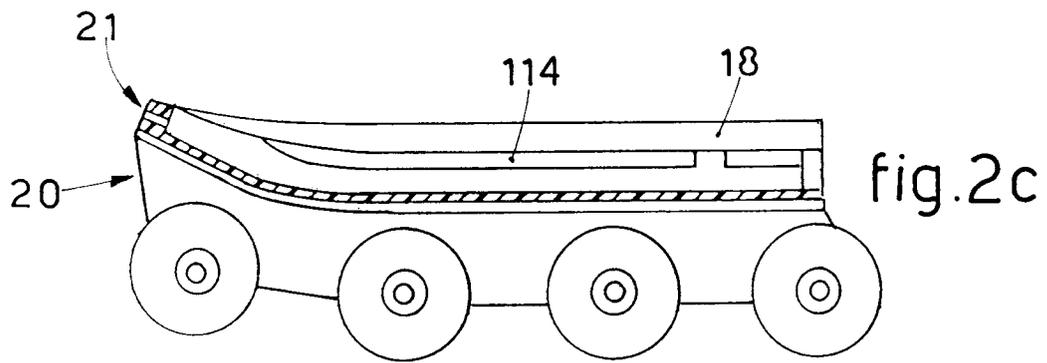
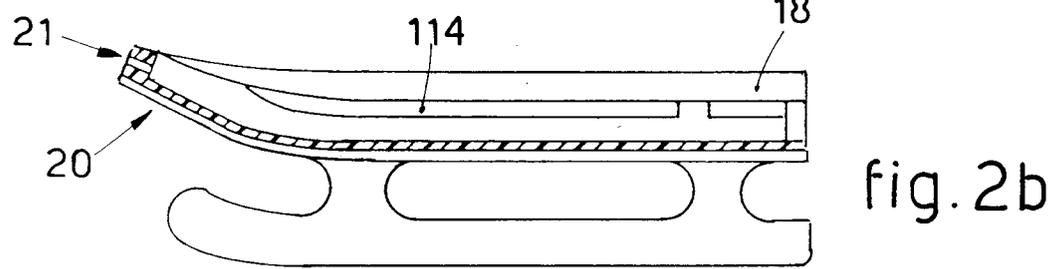
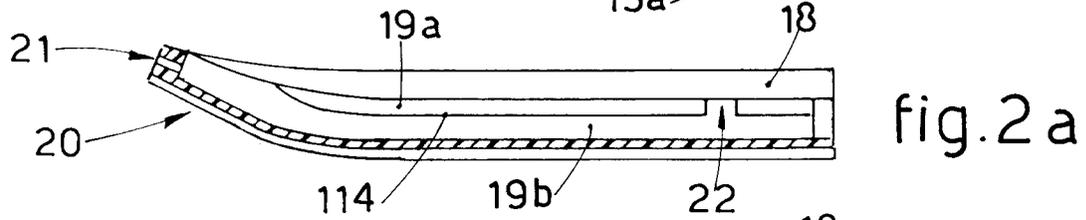
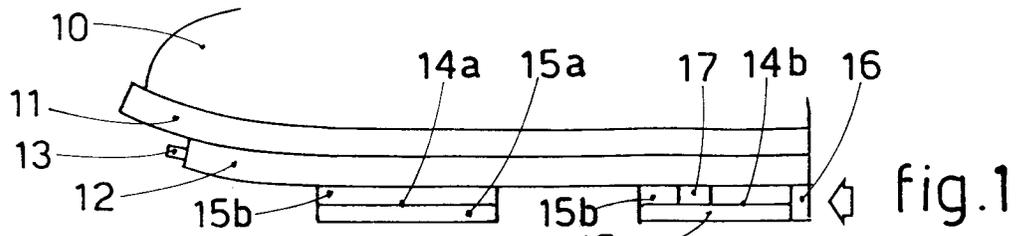
The reciprocal clamping assembly 16 then takes action to disactuate the positioning and anchorage teeth 17, thus enabling the sole 20 to be separated from the shoe/boot system 10.

### Claims

1. Shoe/boot system (10) with a speedily changeable sole element, the shoe/boot system comprising advantageously an extractable slipper and being characterized in that reciprocal mating anchorage means (12-14-114-18) and reciprocal clamping assembly means (16) capable of being quickly released from the exterior are included in the lower side of the shoe/boot system (10) and in the upper side of the sole (20).
2. Shoe/boot system (10) as claimed in Claim 1, in which the reciprocal anchorage means (12-14-114-18) are anchored by lengthwise insertion.
3. Shoe/boot system (10) as claimed in Claim 1 or 2, in which a frontal retaining prong (13) is included in the frontal lower part (11) of the shoe/boot system (10) and cooperates with a mating space (21) positioned at the front of the sole (20).
4. Shoe/boot system (10) as claimed in any claim hereinbefore, in which the lower part (11) of the shoe/boot system (10) comprises a lengthwise element (12) mating with lateral element (18) included in the sole (20).
5. Shoe/boot system (10) as claimed in any claim hereinbefore, in which the lengthwise element (12) comprises guide means (14a-14b) cooperating with mating guide means (114) included in the sole (20).
6. Shoe/boot system (10) as claimed in Claim 1, in which the reciprocal anchorage means are conformed with a peripherally mating impression and are anchored by substantially vertical insertion.
7. Shoe/boot system (10) as claimed in any claim hereinbefore, in which the lengthwise element (12) containing a peripheral impression comprises at least one reciprocal clamping assembly (16) which can be actuated quickly and comprises at least one positioning and anchorage tooth (17) cooperating with a relative seating (22) included in the sole (20).
8. Shoe/boot system (10) as claimed in any claim

hereinbefore, in which the reciprocal clamping assembly (16) comprises a quick-actuation push button (23).

9. Shoe/boot system (10) as claimed in any of claims 1 to 7 inclusive, in which the reciprocal clamping assembly (16) comprises a quick-actuation lever/handle.
10. Shoe/boot system (10) as claimed in any of claims 1 to 8 inclusive, in which the reciprocal clamping assembly (16) includes linear displacement cam means (24).
11. Shoe/boot system (10) as claimed in any of claims 1 to 8 inclusive, in which the reciprocal clamping assembly (16) includes shaft means with a peripheral cam.
12. Shoe/boot system (10) as claimed in any of claims 1 to 8 inclusive, in which the reciprocal clamping assembly (16) comprises threaded means with a circular cam.



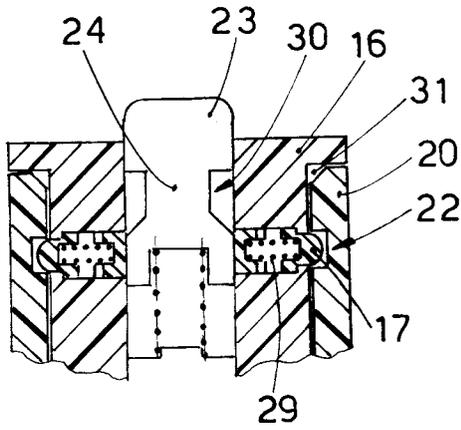


fig.6

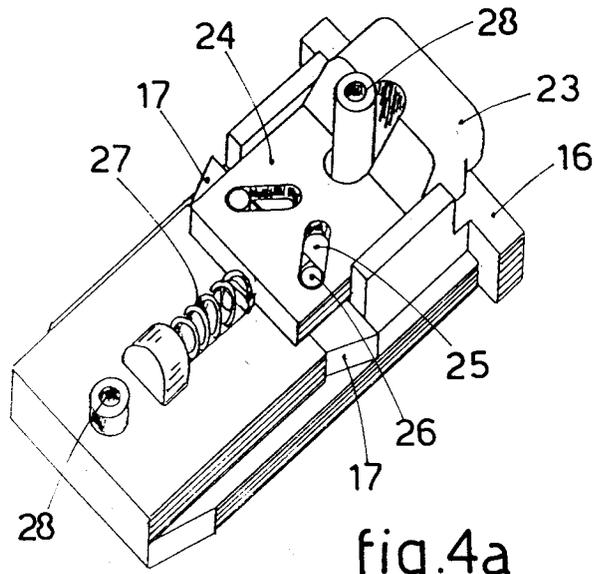


fig.4a

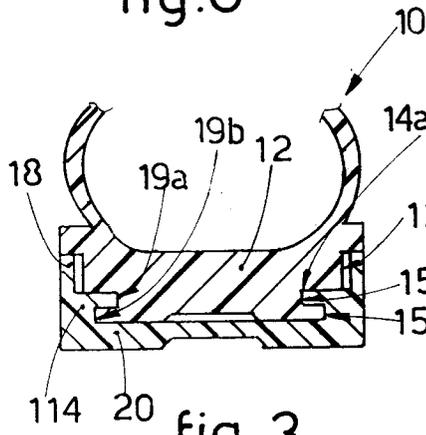


fig.3

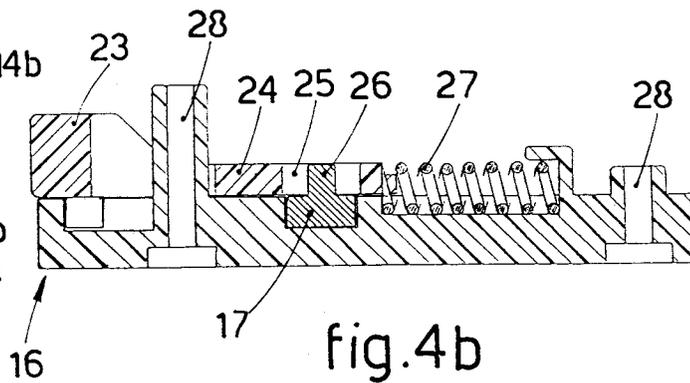


fig.4b

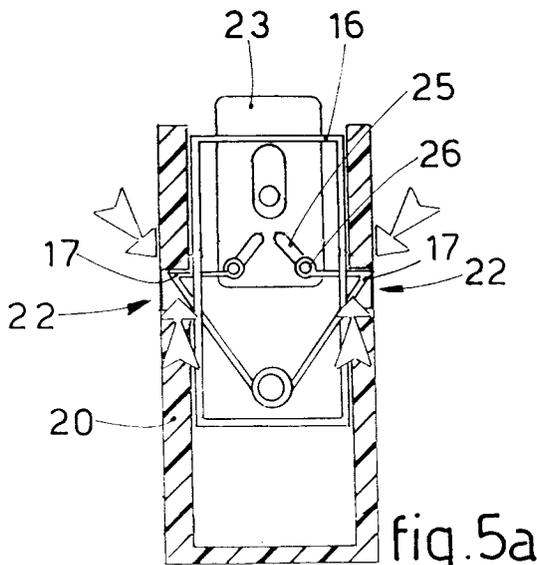


fig.5a

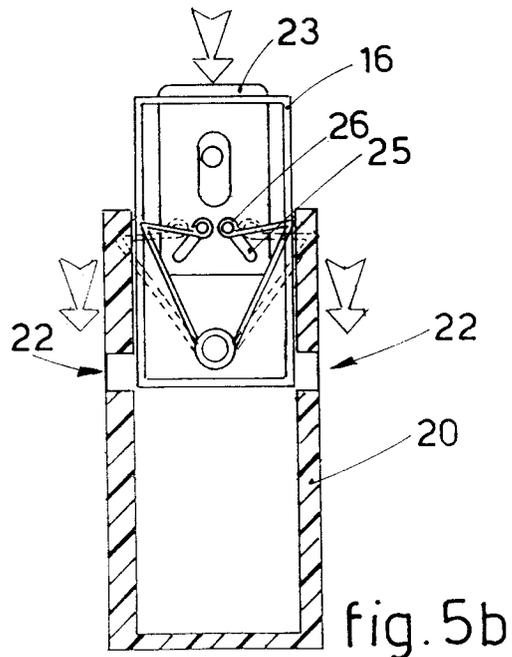


fig.5b



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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 5431

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 606 139 (S. SILVER) * the whole document * ---	1	A43B13/36
A	LU-A-29 186 (W. EPSZTEIN) * the whole document * ---	1	
A	FR-A-2 615 366 (M. DELERY) * the whole document * ---	1	
A	US-A-4 267 650 (P. BAUER) * the whole document * ---	1	
A	US-A-4 062 132 (C. KLIMASZEWSKI) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 JUNE 1992	Examiner DECLERCK J. T.
<b>CATEGORY OF CITED DOCUMENTS</b> 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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