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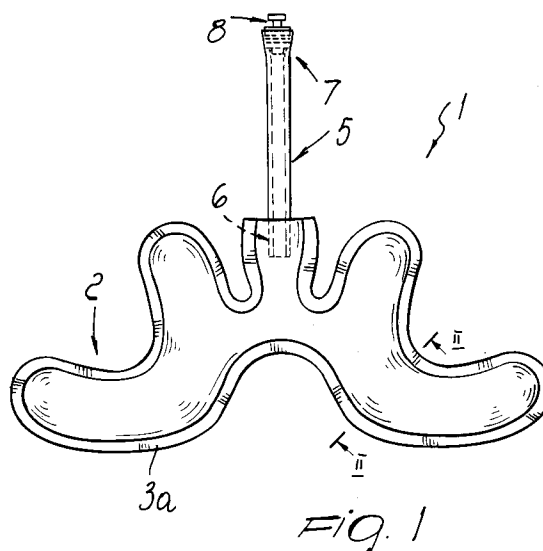
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I-20123 Milano (IT)(54) **Fit adapter, particularly for sports shoes.**

(57) Fit adapter, for example usable in sports shoes such as boots, skates, and shoes for soccer, basketball or gymnastics. The adapter (1) includes a chamber (2) that can be arranged inside the shoe and is connected to the outside by means of a single valve (8) for the venting and intake of air. An element (9) made of open-cell material is placed inside the chamber and allows to simplify the pump system, reducing the number of components and thus limiting the manufacturing costs.

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The present invention relates to a fit adapter particularly usable in sports shoes.

The problem related to the need to achieve optimum fit and securing of the foot inside a shoe by virtue of pneumatic means is currently strongly felt.

On this subject, U.S. Patent No. 4.232.459 granted on November 11, 1980 discloses a closure device for ski boots comprising a reservoir chamber element that can be arranged between the shell and the innerboot and is connected to pump means built into the ski boot. The device had the characteristic that it connected the pump means to the reservoir chamber element by virtue of an air delivery duct. An air venting means connected to the plenum-chamber element was also provided.

Although this solution is undoubtedly valid, it has been observed that it has high industrialization costs due to the presence of separate ducts and to the need to apply separate venting and intake valves for the operation of the device.

Furthermore, the user must act either on the pump means, compressing it one or more times, or on the air venting valve, which are usually located in different positions, in order to adapt the fit.

The aim of the present invention is therefore to solve the described technical problems, eliminating the drawbacks of the prior art, by providing a device that has low production costs and uses a limited number of components.

Within the scope of the above aim, an important object is to provide a device which is reliable and safe in use and allows to improve the internal fit of a shoe.

Another important object is to provide a device which is easy to operate for the user.

Another important object is to provide a device that can also be applied to conventional types of shoes.

This aim, these objects and others which will become apparent hereinafter are achieved by a fit adapter, particularly for sports shoes, characterized in that it comprises at least one air chamber and at least one element made of an open-cell material arranged inside said chamber, said at least one chamber being connected to the outside by means of a single valve for the venting and intake of air.

Further characteristics and advantages of the invention will become apparent from the detailed description of a particular but not exclusive embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a plan view of the adapter according to the present invention;

figure 2 is a sectional view, taken along the plane II-II of figure 1;

figure 3 is a perspective view of a ski boot having an adapter according to a further aspect

of the invention;

figure 4 is an exploded perspective view of the adapter of figure 3;

figure 5 is a partial section view according to the line V-V of figure 3.

With reference to the above figures, the reference numeral 1 designates the fit adapter, which is particularly usable for sports shoes such as ski boots, ice or roller skates, shoes for basketball, soccer, rugby or other sports.

Said adapter comprises a chamber, designated by the reference numeral 2, which is obtained by coupling sheets 3a and 3b made of plastics along their perimeter so as to internally form at least one chamber 4. Said chamber 2 can be placed inside the shoe and is connected to the outside of the shoe by means of at least one duct 5 which has a first end 6 connected to the chamber 4 and a second end 7 with which a single valve 8 for air venting and intake is associated.

At least one element 9 made of open-cell material is placed within the chamber 4; the density of the material is the most appropriate according to the technical level of use of the sports shoe.

This solution allows to eliminate the conventional pump system provided with intake and delivery valves, because, when inactive, the chamber 2 is inflated with air at atmospheric pressure as the element 9 is substantially sponge-like.

Once the foot is inserted in the shoe that includes the chamber, a given amount of air contained in the chamber 4 is expelled through the valve 8, which is kept open by the user, due to the pressure of the foot on said chamber. The user keeps the valve open until the desired degree of fit is reached.

During this step, the pressure inside the chamber 2 is below the atmospheric value and determines the thrust applied by the material of the element 9 to the volume set by the chamber, so that the subsequent removal of the foot, or the reduction in pressure on the chamber, and the opening of the valve allow to restore the initial conditions or in any case to reduce the fit with respect to the one previously selected, as air is drawn back into the chamber 4, thus inflating the element 9 until it regains its initial shape and again reaches the atmospheric pressure.

It has thus been observed that the invention has achieved the intended aim and objects, a fit adapter having been obtained which is constituted by a limited number of components and is very simple to activate or deactivate without requiring particular operations on the part of the user.

The use of the element 9 made of open-cell material allows to achieve an optimum fit, and the adapter has very low manufacturing costs.

The adapter according to the invention is naturally susceptible to numerous modifications and variations, all of which are within the scope of the same inventive concept.

The adapter, according to the invention, may in fact be used in any situation where an item has to be adapted to the user: clothing, gloves, hats and helmets, underwear, etc.. The adapter can also be advantageously used for seats, such as vehicle seats, for example.

Figures 3-5 illustrate a particular embodiment of the adapter 101 for a ski boot 100.

The adapter 101 is constituted by two separate chambers 102a and 102b which can be provided as two separate pieces or in one piece divided by a welding.

A cover member 110 is associated to the chambers 102a and 102b by means, for example, of a welding 111.

Valves 108 are connected to the cover 110 at the corresponding air openings provided at the chambers 102a, 102b.

The cover member 110 lies outside the boot 100, as illustrated in figure 5 and is adapted to support and to cover the adapter which is arranged inside the boot.

The cover member may also be associated with a lining 112, for example by stitching.

The materials and the dimensions of the components of the adapter may naturally also be the most pertinent according to the specific requirements.

The device according to the invention can furthermore be applied in other forms, such as for example in an item of clothing; it can thus be applied, for example, to the lumbar region, to the knees, seat or elbows.

Likewise, its use can be extended to other fields, such as for example the field of motor vehicle seats, placed in or adjacent to the horizontal portion or the back; it can also be combined with a helmet as a protective element placed beneath the internal padding.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Fit adapter, particularly for sports shoes, characterized in that it comprises at least one air chamber (2,102a,102b) and at least one element (9) made of an open-cell material ar-

ranged inside said chamber, said at least one chamber being connected to the outside by means of a single valve (8,108) for the venting and intake of air.

2. Adapter according to claim 1, characterized in that it comprises at least one chamber (2,102a,102b) obtained by coupling sheets (3a,3b) of plastics along their perimeter so as to form internally at least one chamber.

3. Adapter according to claim 1, characterized in that said element can be compressed elastically.

4. Adapter according to claim 1, characterized in that said open-cell element, once compressed, by means of the escape of a given amount of air through said single valve, forces said at least one chamber to expand, drawing air from outside through said single valve.

5. Adapter according to claim 1, characterized in that the compression of said open-cell element is allowed by said single valve, which allows the outside venting of the corresponding air.

6. Adapter, according to claim 1, characterized in that it comprises a cover member (110).

7. Boot comprising a shell and characterized in that it comprises a fit adapter (101) having at least one chamber (102a,102b) and at least one open-cell element arranged inside each of said at least one chamber, said at least one chamber being connected to the outside by means of a single valve (108) for the venting and intake of air.

8. Item of clothing characterized in that it comprises a fit adapter according to claim 1.

9. Seat characterized in that it comprises a fit adapter according to claim 1.

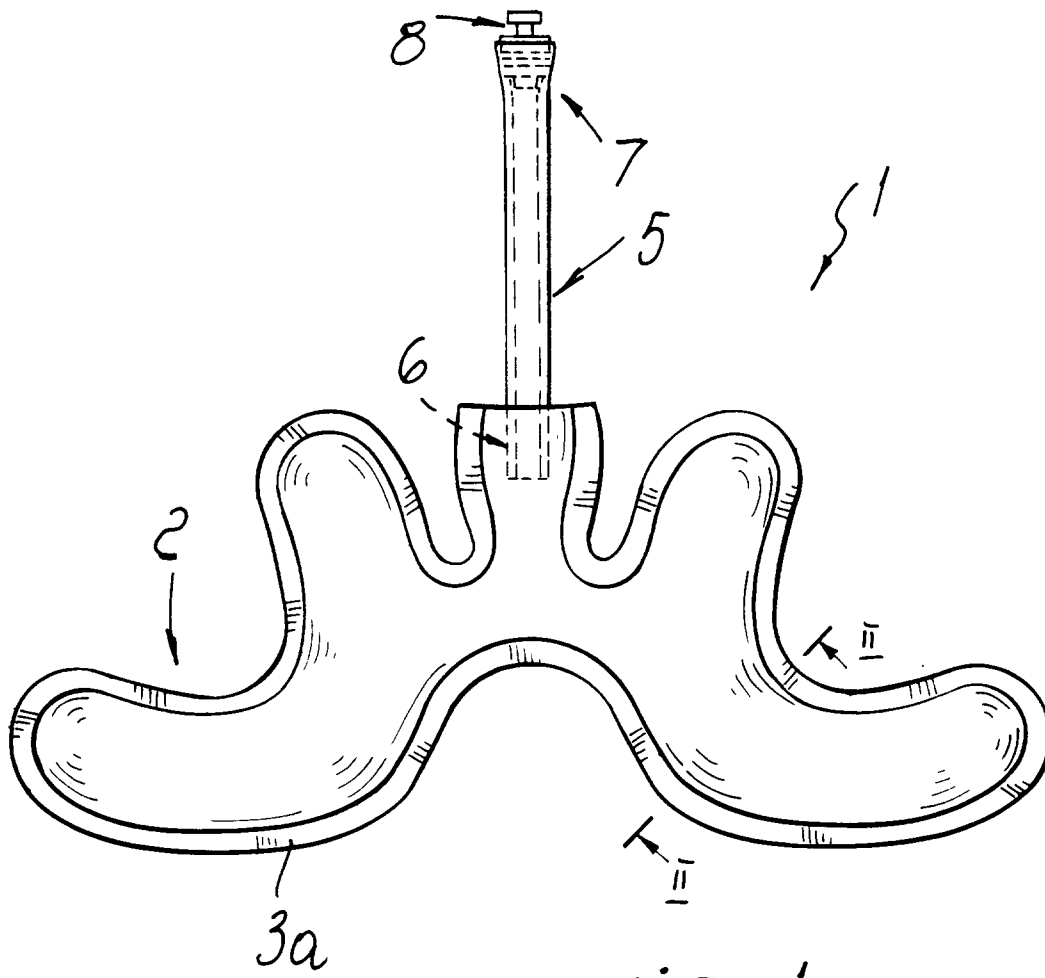


Fig. 1

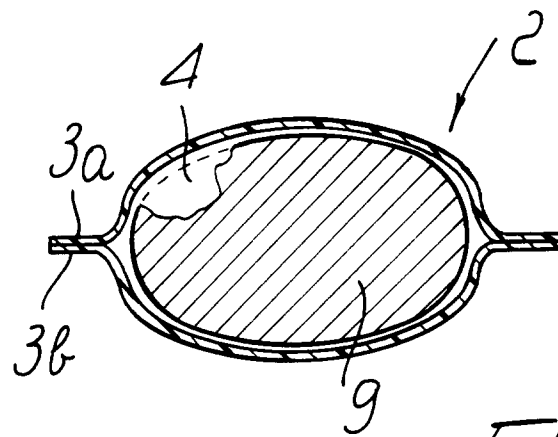


Fig. 2

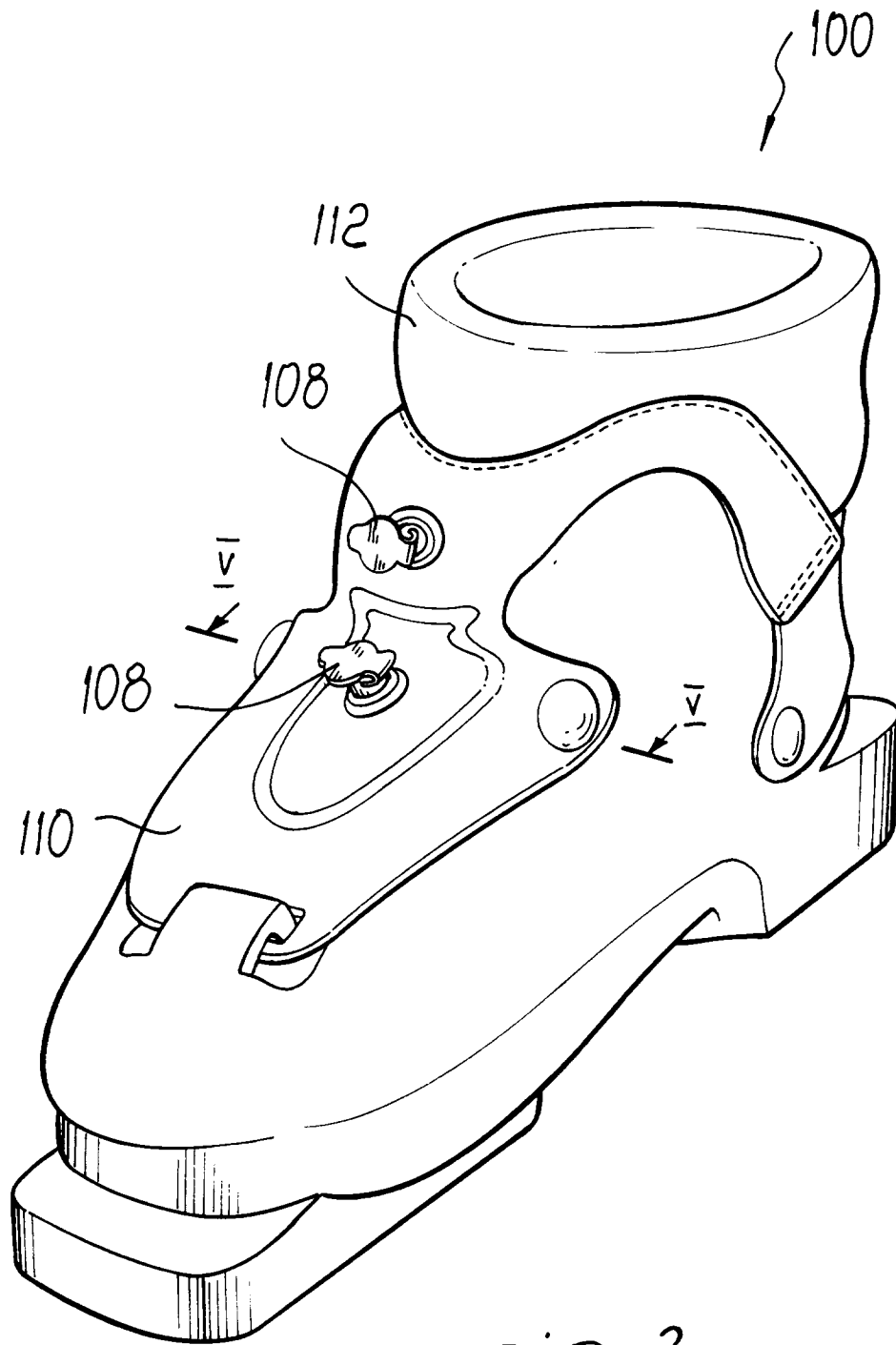


Fig. 3

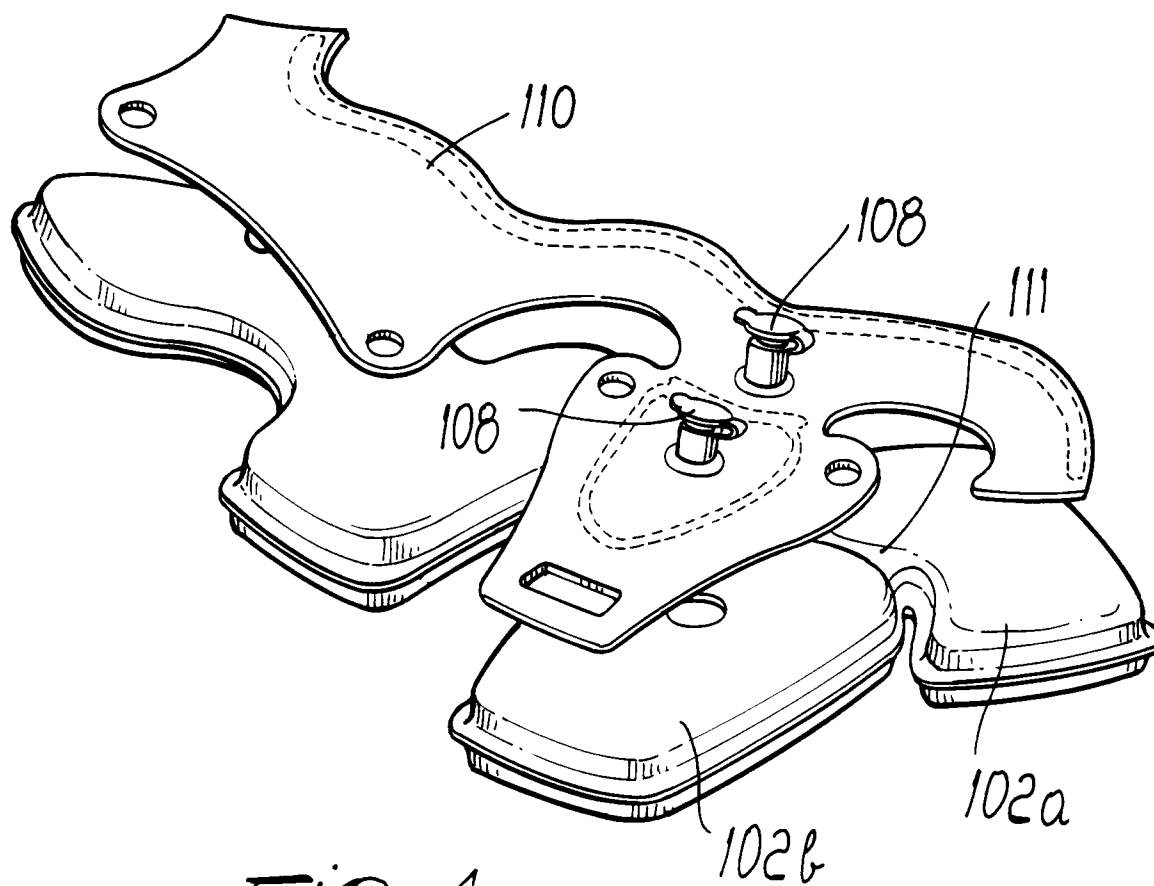


Fig. 4

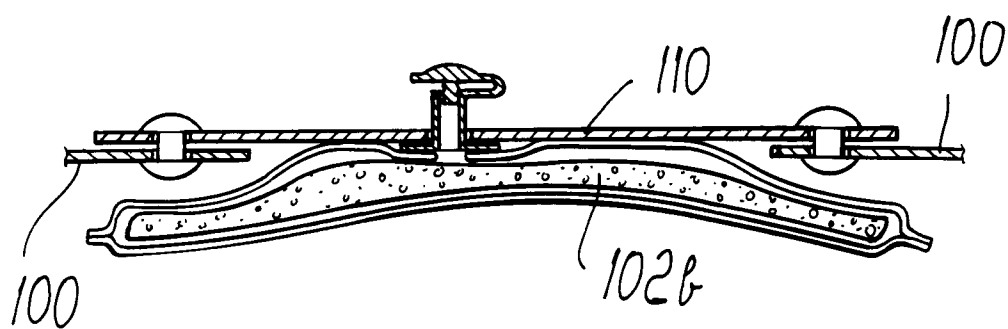


Fig. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 7480

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)
X	WO-A-90 04323 (REEBOK) * the whole document * ---	1-3,7-9	A43B5/04
X	DE-A-19 10 244 (L. WINTERSBERGER) * the whole document * ---	1,7	
A	FR-A-2 216 757 (HESCHUNG) * the whole document * ---	1	
A	EP-A-0 040 189 (K. LITSCHAUER) * the whole document * ---	1	
A	GB-A-2 118 428 (KARA INT.) * the whole document * ---	1-3	
A	US-A-4 590 689 (D. ROSENBERG) * the whole document * -----	1-3	
			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 30 August 1994	Examiner Declerck, J
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