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[54] **ACCESSORY FOR FOOTWEAR**

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[58] Field of Search 36/54, 71

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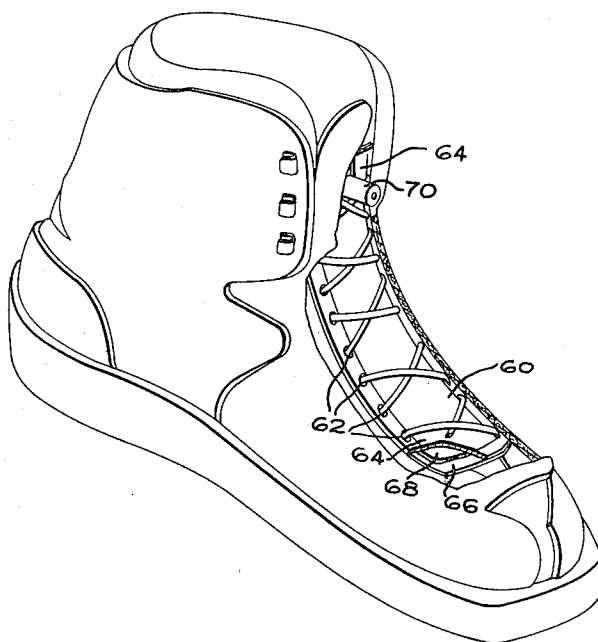
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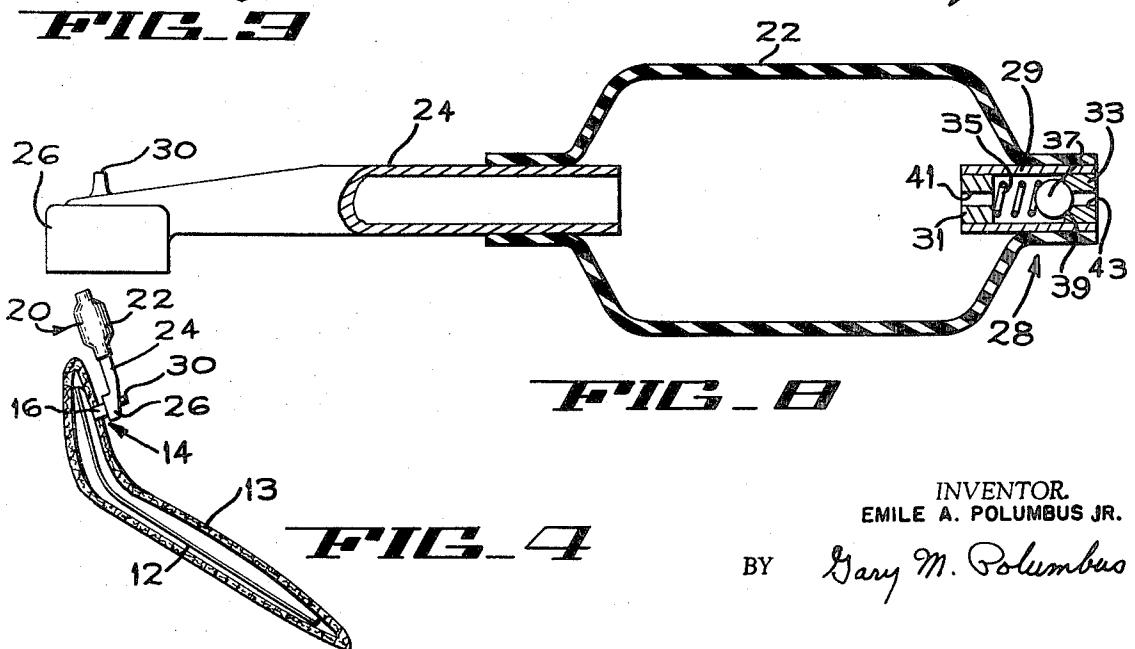
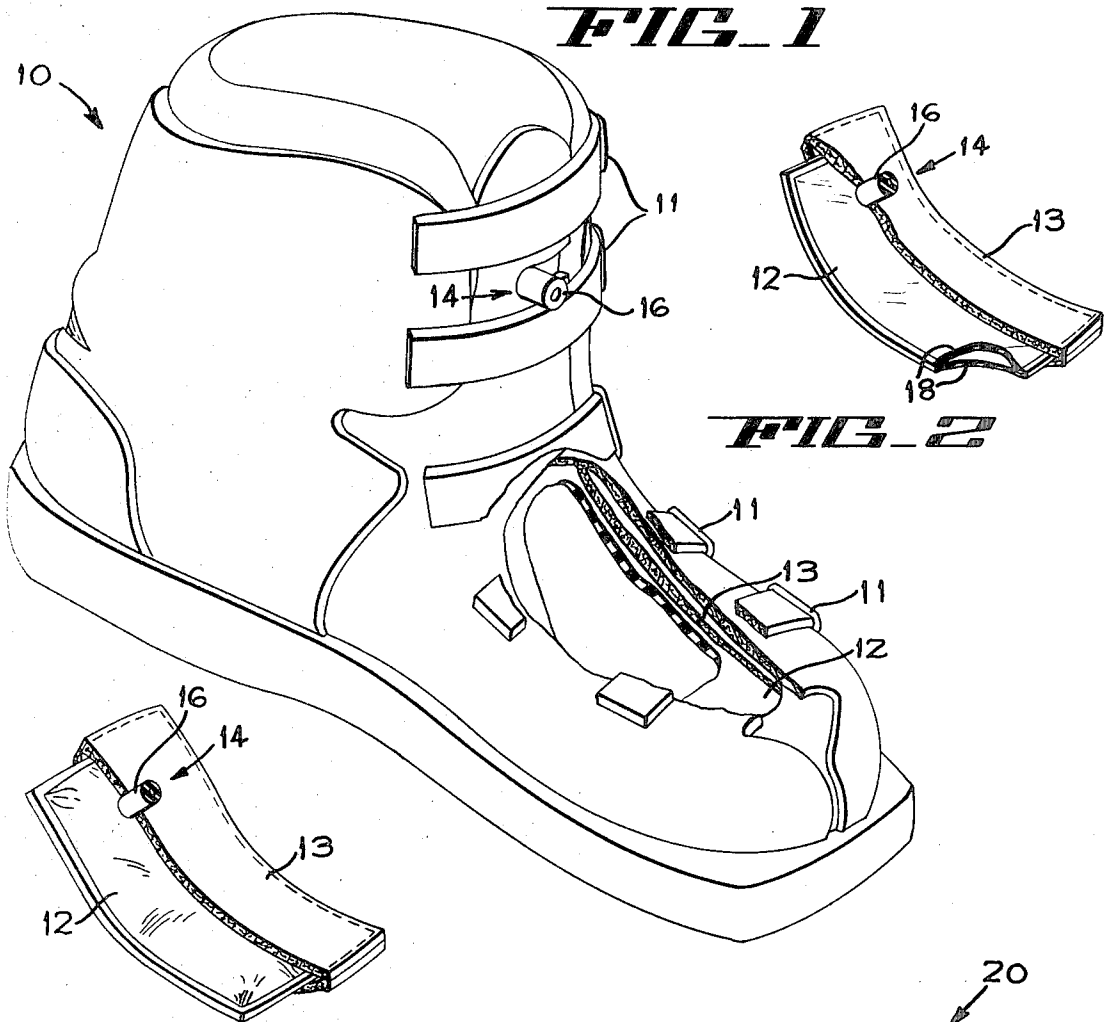
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[57] **ABSTRACT**

A tightening device for footwear includes an elongated air tight inflatable pad enclosed in the footwear and means for injecting compressed air into the pad so that it expands drawing the footwear tightly to the foot. Valve means are also provided to release the compressed air from the pad when it is to be deflated. An arrangement wherein the inflatable pad can be removably secured to the footwear is also disclosed.

2 Claims, 9 Drawing Figures





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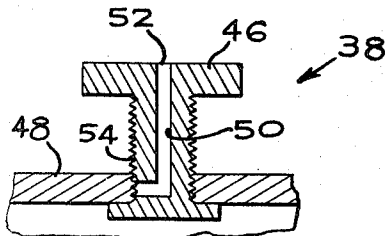
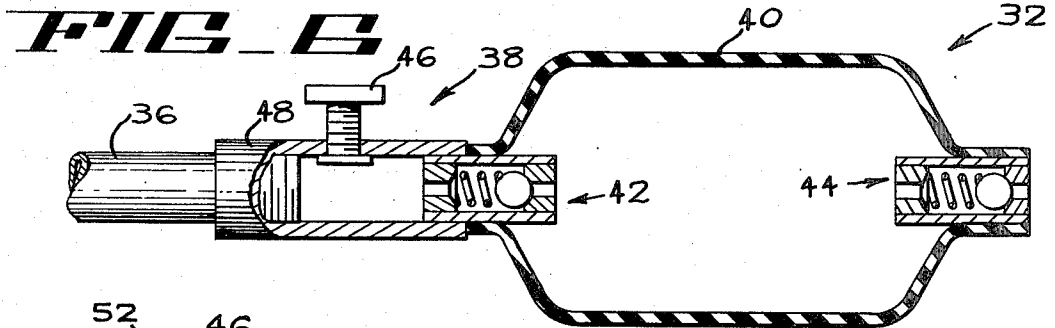
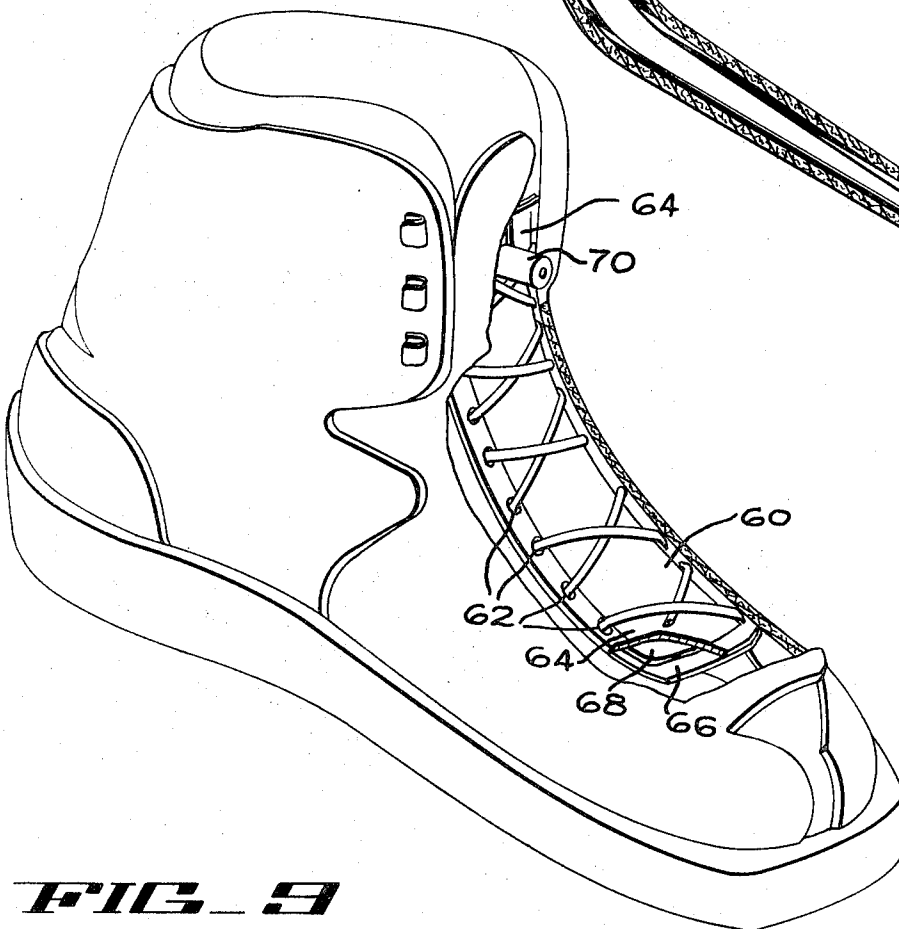
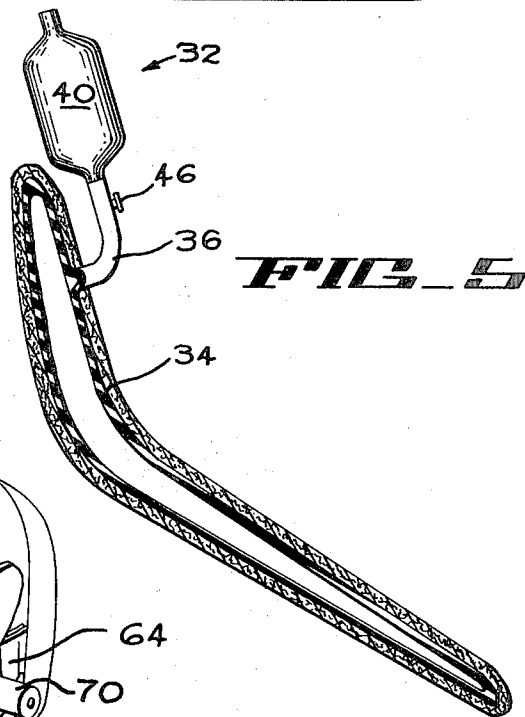


FIG. 7



ACCESSORY FOR FOOTWEAR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is generally concerned with a device for tightening footwear but more particularly concerns an air inflatable tongue for footwear such as ski boots, ice skates, and the like.

2. Description of the Prior Art

In certain sports such as skiing and ice skating it is important that the footwear of the participant be fitted to feel like an integral part of his body. It is desirable, therefore, that the footwear form fit the participants foot and also that it be very snug so as not to move relative to the foot.

The most common means for tightening and securing footwear to an individuals foot is the shoe lace. By stringing the lace up the front part of the footwear, the individual can draw the footwear relatively tight onto his foot. However, he is very dependent on strength and dexterity as it is difficult to obtain the desired tightness throughout the length of the lace, particularly while securing the ends of the lace to maintain the obtained tightness.

It is important in both skiing and ice skating that the ankles of the participant be firmly supported. To meet this end, ski boot and ice skate manufacturers have for a long period made their respective footwear with high tops, which extend up over a good portion of the ankle. In some styles rear laces are provided up a portion of the back of the footwear to provide means to increase the ankle support by further tightening of the footwear in the ankle region.

More recently, buckles have gained acceptance as a desirable form of footwear tightener. Their acceptance is due partly to the ease with which they can be manipulated but probably more importantly is due to the fact that the tightness to which the footwear is drawn to the foot can be varied from point to point up the front of the boot and also around the ankle. In other words, one buckle may be drawn very tightly while another is left relatively loose. By appropriately manipulating the buckles, the comfort of the footwear becomes manageable without sacrificing snugness in the areas where it is most important.

Buckles, however, are not completely without fault. Due to inherent characteristics, they can only be set in one of possibly three or four tightness settings, whereas it is desirable that an infinite number of settings be available.

SUMMARY OF THE INVENTION

The tightening device of the present invention may be used in conjunction with either lace or buckle footwear and consists basically of an elongated air tight inflatable pad, preferably of rubber, which is secured removably or otherwise, into the tongue of the footwear, thereby defining an inflatable tongue. The inflatable tongue is provided with a valve assembly through which air can be compressed into the tongue and which also serves to retain the air in the tongue until it is released by the same or additional valve means. A small compact pneumatic pumping bulb is provided to compress the air into the tongue and is disclosed as being either of the type which is integral with the inflatable pad or removable.

It is readily seen that if the footwear is laced or buckled over the inflatable tongue, the tongue can be inflated with compressed air to draw the boot tightly onto the wearer's foot. It will also be apparent that by inflating the tongue of the footwear the foot is urged rearwardly in the boot so that the heel of the individual's foot is set firmly in the heel of the boot which is necessary to get the full support of the boot. An important attribute of the tightening device is that it alleviates the frustrating problem which formerly accompanied fastening footwear to the foot. In the case of lace footwear, the lace need not be drawn very tightly prior to inflating the tongue. It is only necessary that the lace be secured so that when the tongue is inflated, the footwear will be drawn tightly to the foot. In the case of buckle footwear, the buckles can be set prior to

inflating the tongue according to the tightness distribution desired for comfort and support so that when the tongue is inflated the footwear will be tight where needed for support yet will provide an overall comfortable fit.

Accordingly, it is an object of the present invention to provide an efficient and easily manageable means for tightening footwear.

It is another object of the invention to provide pneumatic means for tightening footwear.

It is another object of the invention to provide an inflatable pad for footwear that can easily be fitted into the lining of the tongue of the footwear so that when inflated, will draw the footwear tightly on the wearer's foot.

It is another object to provide a tightening device for footwear that can easily be attached and removed from conventional types of footwear.

It is still another object to provide a relatively inexpensive means for tightening footwear which is adapted for use in conjunction with conventional tightening means to provide a desirable snug and comfortable fit.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a buckle type ski boot incorporating the inflatable tongue of the present invention.

FIG. 2 is a perspective view of the inflatable tongue in a deflated state with parts of the tongue and the pad broken away for clarity.

FIG. 3 is a view similar to that of FIG. 2 with the tongue inflated.

FIG. 4 is a longitudinal section of a tongue of a ski boot having the inflatable pad of FIGS. 2 and 3 secured therein and having a pumping bulb in operable engagement with the pad.

FIG. 5 is a longitudinal section of a tongue of a ski boot having an alternative embodiment of the inflatable pad secured therein.

FIG. 6 is an enlarged longitudinal section of the pumping bulb shown in FIG. 5 showing the valve means used to compress air into the pad and to release air previously compressed thereinto.

FIG. 7 is a still further enlarged section of the release valve of FIG. 6.

FIG. 8 is an enlarged longitudinal section of the pumping bulb shown in FIG. 4.

FIG. 9 is a perspective view with parts broken away of a ski boot having still another embodiment of the invention wherein the inflatable pad can be easily attached to or removed from the ski boot.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For purposes of illustration and with no intention of limiting the scope of the invention, the tightening device of the present invention is described in connection with a ski boot 10 having buckle fasteners 11 as seen in FIG. 1. The tightening device includes an hermetically sealed inflatable pad 12 which lies arcuately up the front part of the boot and which is confined within the lining of a tongue 13. The pad can be made of any suitable material but is preferably made of a soft and flexible rubber such as is used in the manufacture of inner tubes for automobile tires.

The tightening device shown with the boot in FIG. 1 is seen removed from the boot in FIGS. 2 and 3 being in a deflated and inflated state respectively. The device includes an ordinary check valve 14 such as used on conventional automobile tires, with a valve stem 16 protruding normally away from the upper flat surface of the pad. The pad 12 is made of two elongated pieces of flexible rubber 18 which have been heat sealed along their perimeter to define an air tight enclosure. When air is compressed into the deflated pad through check valve 14, the pad expands to take the configuration shown in FIG. 3. Thus, when the pad is disposed within the tongue 13, between the buckles 11 and the participant's foot, it is readily apparent that the boot will be drawn snugly to the foot as the pad is inflated.

An important part of the invention is the pneumatic pump utilized in inflating the pad. As best seen in FIGS. 4 and 8, the pump 20 is seen to comprise a small compressible rubber bulb 22 hermetically attached to a hollow fitting 24 having an enlarged head portion 26 adapted to removably and operably connect the pump to the check valve 14. The bulb is provided with a conventional check valve 28 hermetically sealed in its outer end to permit the ingress but prevent the egress of air from the bulb. The check valve 28 includes a cylindrical casing 29 having annular rings 31 and 33, with openings 41 and 43 respectively, secured internally at either end so that small charges of air can pass longitudinally through the casing. The internal side of ring 31 defines an annular shoulder that seats a compression spring 35. The opposite end of spring 35 engages a ball 37 which is biased by the spring into an annular beveled seat 39 on the internal side of ring 33. When the ball 37 is seated in the beveled seat 39, air is prevented from passing out of the check valve through opening 43. However, when the pressure within the bulb 22 drops, as when the bulb is allowed to expand from a depressed condition, the higher atmospheric pressure outside the bulb will cause a charge of air to be forced through the opening 43 in ring 33 overcoming the bias exerted on the ball by the spring 35. This air will pass through opening 41 and into the confines of the bulb. Thereafter, when the fitting 24 is held by the participant in operable contact with the valve 14 and the bulb 22 is squeezed, the air in the bulb will be compressed through fitting 24 and valve 14 into the pad 12. When the bulb is allowed to expand, air will be again drawn into the bulb through check valve 28 as described above so that a subsequent squeezing of the bulb will cause another charge of air to be compressed into the pad. A small inflation of the pad will cause the boot to draw snugly onto the participant's foot, so it is not necessary that the bulb 22 be large. In fact, the entire pumping unit is small enough to fit conveniently in the coat or trouser pockets of the participant. A valve depressing protrusion 30 is provided on the back side of the fitting 24 so that when it is desired to deflate the pad, it is only necessary that the protrusion be inserted into the valve stem 16 of the valve 14 to release the compressed air from the pad in a well known manner.

In an alternative embodiment of the tightening device (FIGS. 5 to 7), a compressible rubber bulb 32 is permanently linked to a hermetically sealed pad 34 by a relatively stiff rubber conduit 36. The rubber conduit is substantially L-shaped so that the bulb will lie in close juxtaposition to the front part of the boot and due to the stiffness of the conduit will not move excessively relative to the boot when the participant is walking, skiing or the like.

The conduit 36 is air tight and has one end which opens into the interior of the pad 34. The other end of the conduit is hermetically connected to a release valve 38 to be explained in detail later. The bulb 32 is hermetically connected to the opposite end of the release valve. The bulb comprises a compressible and hollow elongated rubber body 40 with conventional check valves 42 and 44 hermetically sealed in either end. The check valves 42 and 44 are identical to the previously described check valve 28, so a detailed description of the valves is not deemed necessary. Check valve 42 is disposed adjacent release valve 38 and is oriented so that when the body of the bulb is compressed, air will be forced through the valve and subsequently into the pad 34. Check valve 42 of course prevents the reverse flow of air and thus the ingress of air into the bulb. Check valve 44 is oriented so that when the body of the bulb is compressed, air is prevented from flowing out of the bulb, but when the bulb is allowed to expand back to its normal configuration, a charge of air will be drawn through the valve into the bulb in the same manner as disclosed in regard to check valve 28. Thus, continuous acts of compressing the bulb and allowing it to expand will cause in-

dividual charges of air to be compressed into the pad.

The release valve 38 (FIGS. 6 and 7) is provided to allow the air in the pad when desired to escape. The valve consists of a thumbscrew 46 which is threaded into a cylindrical housing 48 and has an L-shaped passageway 50 passing therethrough. An outer end 52 of the passageway opens through the head of the thumbscrew and is exposed to the ambient atmosphere while an inner end 54 opens through the threaded side of the thumbscrew. Thus, if the thumbscrew is screwed inwardly into the cylindrical housing 48 until the inner end 54 of the passageway enters the hollow center of the housing, which is in fluid communication with the interior of the pad, the compressed air in the pad will be allowed to escape from the confines of the pad through passageway 50 and into the atmosphere. When it is desired to prevent air from escaping through the release valve, it is only necessary to screw the thumbscrew outwardly until the inner end 54 of the passageway is no longer in fluid communication with the interior of the housing 48.

An arrangement whereby the pad can be easily attached to or removed from lace type footwear is shown in FIG. 9 and can be seen to include an elongated casing 60 having a plurality of eyelets 62 up both sides so that the casing can be laced to the front part of the footwear using the lace that is normally on the footwear. The casing can be seen to comprise two rectangular shaped pieces 64 and 66 of flexible but strong material sewn along their longitudinal edges to provide an area wherein the eyelets 62 can be placed. The lower end of the pieces 64 and 66 are also sewn together to form a pocket between the pieces wherein an inflatable pad 68 similar to that of FIGS. 2 and 3 can be retained. An aperture is cut in the upper piece 64 to receive a valve stem 70 of the pad. Once the casing is laced to the footwear it is readily seen that the pad can be inflated, as with the pumping bulb shown in FIGS. 4 and 8, thereby drawing the footwear tightly to the individual's foot. The pad 68 of course could be of the type shown in FIG. 5 with the pumping bulb permanently affixed thereto.

Even though the removable pad shown in FIG. 9 is adapted solely for use with lace type footwear, it is apparent that a similar arrangement could be made which could removably fit beneath the buckles of buckle type footwear or in the case of zippered footwear underneath the zipper.

A boot tightening device has herein been described which is simple in construction, inexpensive to manufacture and which can conveniently be incorporated into or onto a conventional ski boot, ice skate, hiking boot, or the like, with minimum alteration. It will be apparent to those skilled in the art that modifications to the herein described device can be made without departing from the spirit of the invention. For example, it is contemplated that other means for inflating the tongue could be utilized such as miniature compressed air cylinders. Also various types of valves known to those skilled in the art could be used in place of those specifically described. Accordingly, applicant does not wish to be limited to the specific embodiments described in detail herein.

What I claim is:

1. An accessory for footwear comprising in combination an elongated casing having a pocket portion along its longitudinal center, elongated strip portions along the longitudinal edges of the casing adjacent the side edges of the pocket portion, said elongated strip portions including attachment means for releasably attaching the casing to footwear, and an inflatable pad received in the pocket having valve means through which the pad can be inflated.

2. The accessory of claim 1 wherein said attachment means comprises a plurality of longitudinally aligned openings through the strip portions through which laces can be threaded to secure the casing to the footwear.

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