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2,329,209

FLYING BOOT

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FIG. 2.

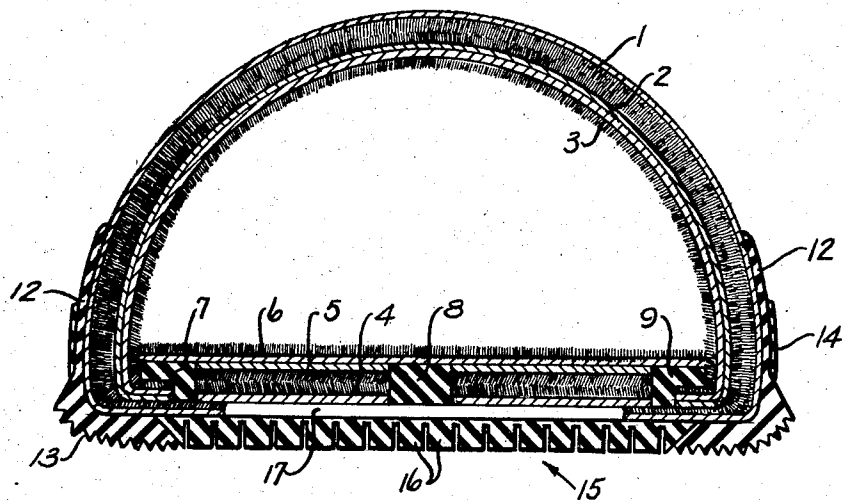
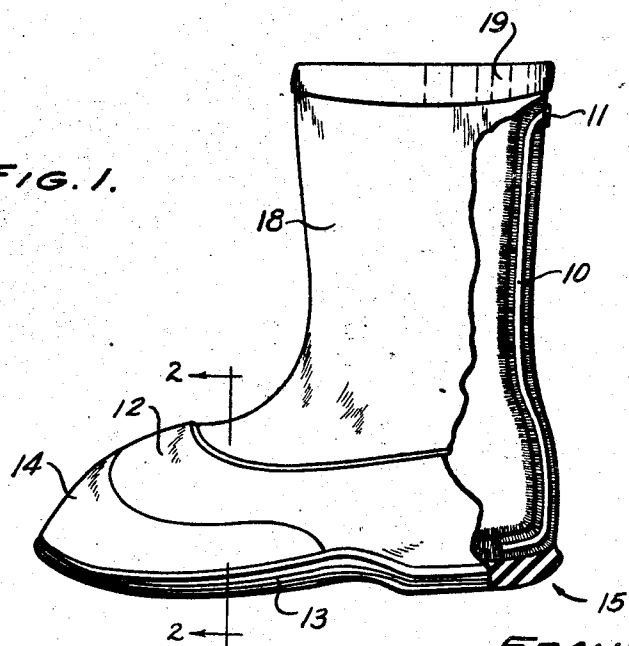


FIG. 1.



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FLYING BOOT

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6 Claims. (Cl. 36—9)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for Government for governmental purposes, without the payment to us of any royalty thereon.

This invention to improvements in cold-weather footwear and more particularly to a shoe or boot designed for use by the crew members of an aircraft flying at high altitudes or through arctic climates.

Our improved boot is constructed of a plurality of layers of fleeced material which layers are arranged in such a manner as to provide the maximum possible insulation between the foot of the wearer and the surrounding atmosphere thus keeping the foot of the wearer warm even at extremely low temperatures. In addition, a means has been provided for ventilating the inside of the boot so as to aid in keeping the foot dry and hence, improving foot sanitation.

Also a cushioning device has been placed in the insole of our boot so as to take up the shock of the foot striking the ground and thus reducing foot fatigue to a minimum. The importance of this feature becomes apparent when the possibility of a forced landing in the desolate wastes of the arctic regions is considered since this would necessitate a journey by foot to the nearest town or village. Accordingly, it is essential that the crew of the aircraft be supplied with footgear which is not only warm but which is also comfortable and serviceable. Another feature of our boot is the provision of a nonskid outsole, this sole being formed with a plurality of strips of rubber extending the length of the boot. When walking, these strips will produce a squeegee action upon the wet surfaces of the ice, ground, etc., and so afford a firm and positive foothold on what would otherwise be a treacherous surface.

Accordingly one of the objects of our invention is to provide a cold-weather boot constructed in a novel manner of a plurality of laminations of insulating material.

A more particular object of our invention lies in the provision of a cold-weather boot constructed of a plurality of fleeced laminations, two of the laminations being disposed with their fleeced surfaces facing one another.

A further object of our invention is to provide a boot having a cushioned insole which renders the boot extremely comfortable on the foot of the wearer and makes it possible to walk long distances with a minimum of fatigue.

Still a further object of our invention is to provide a boot of the nature described above having a rubber sole provided with a nonskid tread

so as to prevent slipping when walking on ice or other wet surfaces.

With the above and other objects in view, the invention consists in the construction, combination, and arrangement of parts hereinafter set forth in the claims with the understanding that the elements comprising our invention may be varied in construction, proportion, and arrangement without departing from the spirit and scope of the appended claims.

In the drawing:

Figure 1 is a side elevation of our improved form of boot with the rear part thereof cut away so as to show more clearly the three-layer construction of the upper and also the means for ventilating the interior of the boot.

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1 and shows in detail the multiple-layer construction of the boot as well as the cushion insole and the nonskid rubber outsole.

In the drawing we have shown our invention as embodied in a short boot of the type commonly worn by the crew members of an aircraft as a protection against the extreme cold encountered in the arctic regions or at high altitudes. This boot is primarily designed for use by the members of an airplane crew and is constructed of three layers of a suitable fleeced material, the peltry of sheep known as shearling being preferred. As shown in Figure 2, the vamp of the boot is made up of three layers of the material, two of the layers 1 and 2 being disposed with their fleeced surfaces facing one another and the third, or inside layer 3, being disposed with its fleeced surface turned inward toward the foot of the wearer. The insole is likewise constructed of three layers of a fleeced material, two of the layers 4 and 5 being disposed with their fleeced surfaces abutting one another and the third layer 6 being disposed with its fleeced surface uppermost where it will be in contact with the sole of the wearer's foot. It has been found that it is extremely advantageous to dispose two of the layers with their fleeced surfaces in contact as this provides a dead-air space which has very desirable insulating properties. When the layers are thus disposed the abutting ends of the pile will mesh together and thus tend to keep the layers apart and prevent matting and compressing of the fur which would result in the elimination of the dead air space which contributes very greatly to insulating qualities of the material. By arranging the third or inner layer of the material with the

fur portion facing the foot of the wearer additional warmth and comfort is secured.

The insole is provided with supporting pads 7, 8 and 9 so as to maintain the separation between the laminations 4 and 5 and also to act as a cushion for resiliently supporting the weight of the wearer on the bottom of the boot. These pads are preferably made of sponge rubber though any other suitable resilient material may be used. As shown in Figure 1 the upper, or leg portion of the boot, is also made of three layers of fleeced material arranged in the same manner as the vamp shown in Figure 2. A flexible ventilating tube 10 extends from the bottom of the heel, where it lies between the layers 4 and 5, up the back of the boot to nearly the top thereof where it is brought out at 11 and fastened to the surface of the boot. It will be evident that a person walking in the boots will, upon stepping down, compress the rubber pads 7, 8 and 9 and force the insole layers 4 and 5 together, thus forcing the entrapped air out through the tube 10. Similarly, upon removing the weight of the foot from the insole, the rubber pads will expand and the layers 4 and 5 will be separated to draw in air from the outside atmosphere through tube 10. By this action, ventilation for the interior of the boot is secured due to the fact that a small quantity of the air will filter through the porous skin or other material used in the layers 5 and 6 and enter the interior of the boot. The tube 10 is, of course, of small dimensions and therefore offers considerable resistance to the passage of air therethrough. Consequently, when the weight of the foot is placed upon the insole, a considerable pressure will be imposed on the air entrapped between the layers 4 and 5 and a certain amount of this air will percolate up through the porous layers of skin 5 and 6 into the boot. At the same time a cushioning effect will be secured since the tube 10 will release the entrapped air rather slowly and thus provide an air cushion within the insole.

A strip of rubber foxing 12 is cemented in place around the lower part of the boot as shown in Figure 1. This foxing is provided on its under edge with ground-gripping serrations 13 and is reinforced over the toe by a thin layer of rubber 14. The rubber outsole, designated generally at 15, is constructed of a series of longitudinally extending strips of rubber 16 which are joined together along their upper edges to form one continuous sole as shown in Figure 2. These strips provide a squeegee action when walking on wet surfaces and so insure against slippage. The space 17 between the insole and the outsole is somewhat exaggerated in the present drawing and will, in practice, be much smaller than shown here. The greater part of this space will be filled with cement for the purpose of holding the laminated insole securely to the rubber outsole and preventing any relative movement between the two. The outer surface of the upper part of the boot 18 consists of the skin or hide portion of the outer layer of shearling and may be impregnated with a water-proofing material so as to aid in keeping the interior of the boot warm and dry. The top of the boot is finished off with a narrow strip of leather 19 which serves to reinforce the upper rim of the boot and to prevent it from tearing out.

It will thus be seen that we have provided a new method of obtaining increased insulation

from extreme cold by a laminated construction which results in an extremely warm and comfortable boot of a rugged and serviceable nature which will stand up under many miles of walking over rough terrain if this should at any time become necessary. At the same time the boot is light and is very well suited for use by the crew of an aircraft where a light, warm boot is desired.

While, for the purpose of illustrating the principles of our invention, we have shown and described a specific type of boot, it is to be understood that we do not wish to limit ourselves to this particular form of footwear and that we intend our invention to be limited only by the prior art and the scope of the appended claims.

We claim:

1. An article of footwear comprising two laminations of fleeced material disposed with their fleeced surfaces engaging one another to thereby prevent the fleeced material from becoming crushed and matted and rendered ineffectual as an insulating layer.

2. An article of footwear comprising an upper constructed of two layers of fleeced material disposed with their fleeced surfaces engaging one another and an outer sole secured to the unfleeced surface of the outermost layer of said two layers of fleeced material.

3. An article of footwear comprising an upper constructed of two layers of fleeced material disposed with their fleeced surfaces engaging one another, an outer sole secured to the unfleeced surface of the outermost layer of said two layers of fleeced material, and a fleeced inner lining secured to the unfleeced surface of the innermost layer of said two layers of fleeced material.

4. An article of footwear comprising an inner sole constructed of two layers of fleeced material disposed with their fleeced surfaces engaging one another and a plurality of resilient, impact-absorbing pads situated between said layers for resiliently supporting the weight of the wearer and for assisting in preventing the fleeced material from becoming crushed and matted.

5. An article of footwear comprising an upper constructed of two layers of shearling disposed with their fleeced surfaces engaging one another and a third layer of shearling having its unfleeced surface secured to the unfleeced surface of the innermost of said two layers, a rubber outer sole secured to the unfleeced surface of the outermost layer of said upper, an inner sole constructed of two layers of shearling disposed with their fleeced surfaces engaging one another and a third layer of shearling having its unfleeced surface secured to the unfleeced surface of the uppermost of said two layers of said inner sole, and a plurality of longitudinally extending strips of resilient material situated between said two layers of said inner sole for cushioning the sole of the article of footwear and for assisting in preventing the said two layers of shearling of the inner sole from becoming crushed and matted.

6. The invention as defined in claim 5 wherein the layers of shearling of said upper terminate in shouldered and overlapping engagement with the layers and pads of said inner sole so as to effectively seal out the cold from the interior of said article of footwear.

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