Nov. 11, 1947. T. E. HEDMAN 2,430,466

AIR BOOT

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Fig. 1

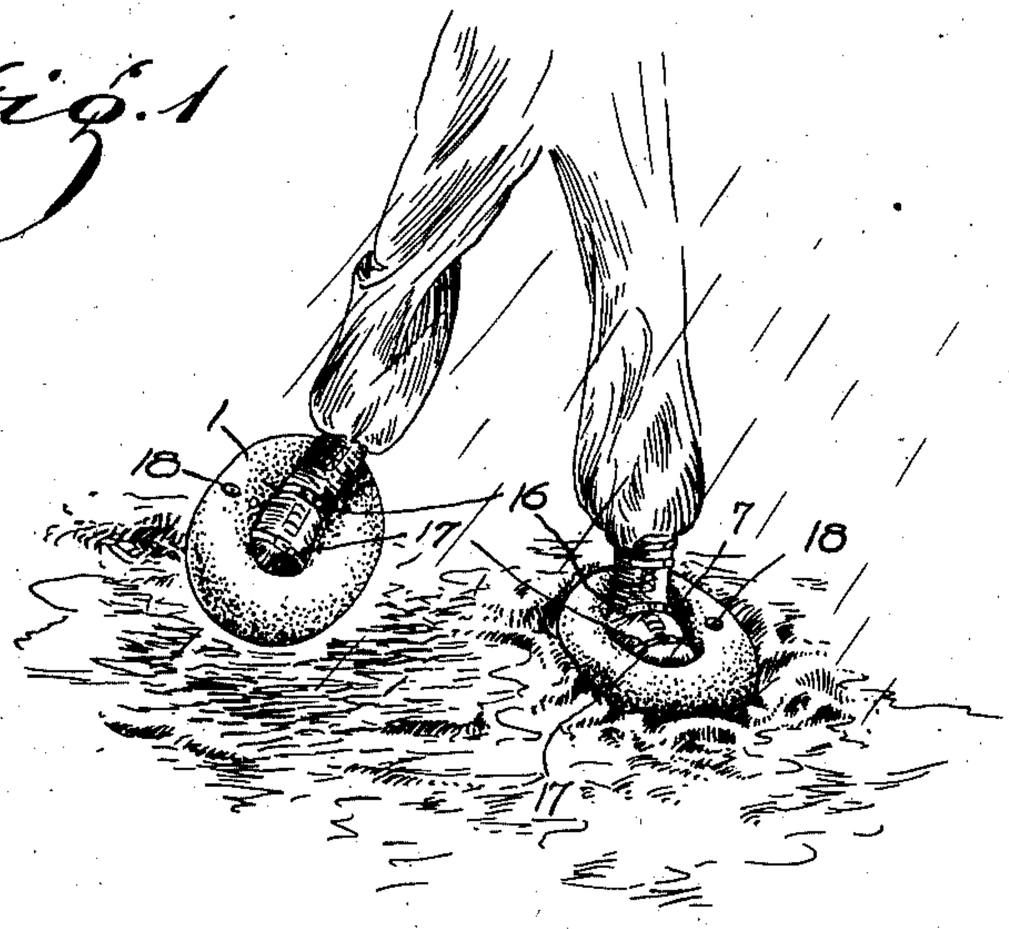


Fig. 2

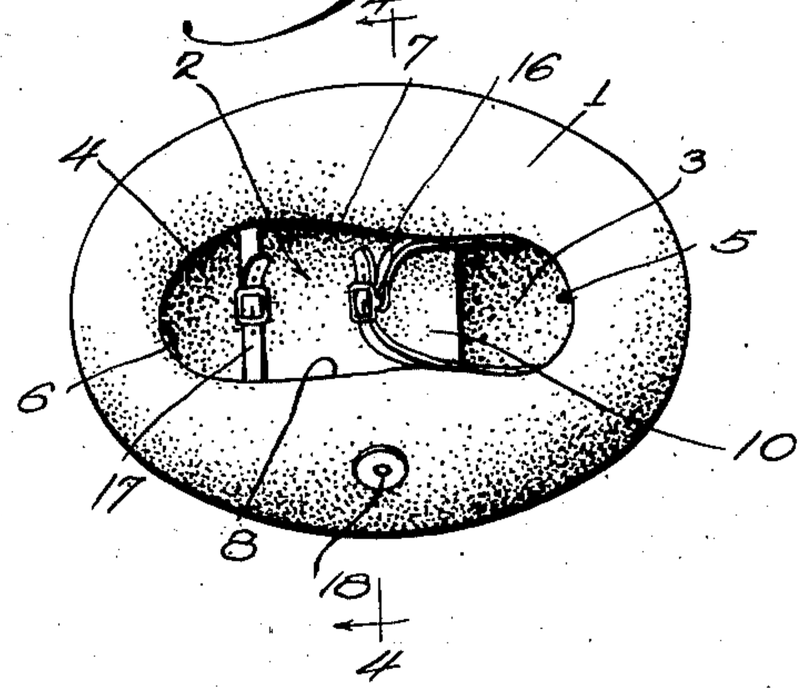


Fig. 3

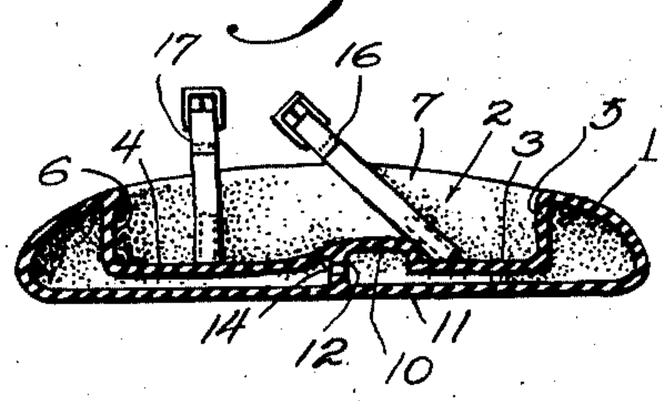
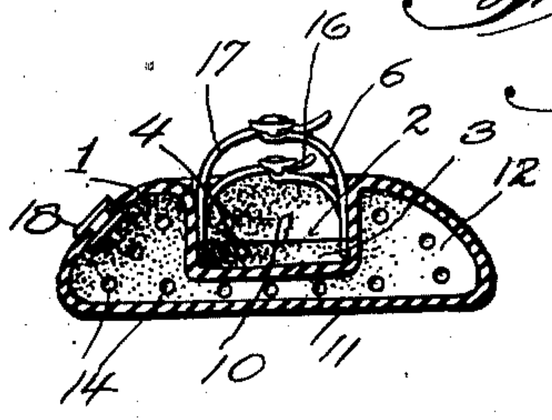


Fig. 4



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2,430,466

AIR BOOT

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

This invention relates to an air boot and more particularly to a device of the character described which is adapted for attachment to the feet of a wearer over the shoes to facilitate walking through marshes, over mud or soft ground, or over other yielding surface otherwise untraversable in ordinary footwear.

It is an object of the invention to provide a light weight, detachable air boot, capable of being collapsed into a compact form for carrying on the person and which can be quickly put into condition for use when required.

A further object of the invention is to provide an inflatable device for attachment over each shoe of a wearer to give adequate support and effectively prevent sinking in when walking over muddy or swampy terrain or similar yielding surface or through snow, sand or the like loose material.

A still further object of the invention is the provision of an air boot of simple design and rugged construction, capable of withstanding long wear and the rough usage to which such a device is likely to be subjected.

The above and other objects of invention are accomplished by the provision of an inflatable boot structure, formed of rubber or other similar material possessing the requisite qualities of flexibility and elasticity, of such configuration as to adapt it for ready attachment to the foot of a wearer over the shoe, and of such size as to give adequate support to the individual when in use.

The supporting effect obtained by the boots of the present invention is believed to be due at least in part to the operation of Archimedes law: "The weight of an object immersed in a fluid is decreased by the weight of the displaced fluid."

In practical application the boots are employed in the same manner as snowshoes and can be made of such size that they will support any individual on the softest terrain.

By the way of example, if the bearing pressure of the land on which the air boots are to be used were found to be 2 pounds per square inch, two elliptical shaped boots, each approximately 6 inches wide and 16 inches long, would support an individual equipped with a full pack and having a total weight approximating 280 pounds.

The invention can best be understood from the

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following detailed description constituting a specification thereof, taken in conjunction with the accompanying drawings wherein:

Figure 1 is a perspective view showing a pair of air boots made in accordance with the invention, and the manner of their use when applied to the feet of a wearer;

Figure 2 is a plan view of one of the air boots in inflated condition;

Figure 3 is a longitudinal central section through the air boot of Figure 2, and

Figure 4 is a transverse central section through the air boot, taken on line 4—4 of Figure 2.

In the drawings, 1 represents the body of the air boot of the invention, which is preferably formed of rubber or similar flexible and elastic material. 2 is an upwardly opening recess formed in the upper wall of the boot, which recess is preferably of such shape and size as to conform to the shoe of a wearer. Thus the recess 2 may have a heel portion 3 and a toe portion 4 closely conforming to the configuration of the like parts of the wearer's shoe with the end walls 5 and 6 and side walls 7 and 8 rising from the bottom of the recess. Between the heel 3 and toe 4 of the recess 2 an upwardly extending portion 10 is provided for engaging the shank of the shoe.

Midway of the ends thereof a partition 12 extends transversely across the boot, as can best be seen in Figure 4 of the drawings, joining the mid-portion of the bottom 11 of the boot to the portion 10 of the bottom of the recess 2, and also connected to the sides 7 and 8 of the recess and the top and sides of the outside wall of the boot. The partition 12 is provided with perforations 14 for a purpose later to be pointed out.

The above described structure may be made in any convenient manner, as by moulding or fabricating from sheet material and is formed with walls of sufficient thickness to give the same the necessary strength and rigidity to withstand the use for which the article is adapted.

Straps 16 and 17 are provided for securing the boot to the wearer's foot, these straps being preferably attached at their lower ends to the insides of the side walls 7 and 8 of the recess 2. The strap 17 preferably extends vertically upwardly to engage the toe of the wearer's shoe while the strap 16 extends forwardly and upwardly of the boot, as shown in Figure 3, to engage the instep of the shoe as can be seen in Figure 1.

The boot is adapted to be inflated with air in

any convenient manner, as by the use of a conventional air pump attached by means of a valve 18 of usual design.

In using the invention a pair of the boots made as above described are more or less inflated with air and the wearer's shoes placed in the recesses 2 thereof. The straps 16 and 17 are then fastened to securely hold the boots in position on the shoes and the wearer is ready to walk over any kind of soft terrain without unduly sinking beneath the surface. When applied to the shoe, the boot may be further inflated in order to assure a snug engagement between the recess 2 and the shoe, and especially between the upright walls 5, 6, 7 and 8 and the adjacent shoe surfaces.

Because of their buoyancy and increased area the air boots can be made to sustain an individual of any weight and carrying any practical load. When the wearer lifts his foot in walking the pull on the straps 16 and 17 is transmitted through the diaphragm or partition 12 to the mid portion of the bottom 11, and through the side walls 7 and 8 and end walls 5 and 6 to the body of the boot and the outer margins of the bottom 11.

It will of course be understood that the walls of the boot are so proportioned and of such thickness as to withstand excessive distorting effects of inflation with air and the forces applied thereto by the wearer in walking. In order to give additional strength to the boot when designed for supporting heavy loads, additional partitions similar to the partition 12 may be positioned at suitable locations to connect the bottom 11 to other portions of the recess 2 and the outside walls of the boot.

It will be apparent that when not in use the air boots can be deflated and folded or rolled into a compact form for convenient carrying or storage.

The invention as above described provides a convenient means of simple design for enabling an individual to cross terrain which would otherwise be inaccessible.

Having thus clearly shown and described the invention, what is claimed and desired to secure by Letters Patent is:

1. An air boot comprising a hollow inflatable structure having a flat bottom, an upwardly open recess in the top of said structure shaped to fit a shoe, a partition extending across the inside of said structure connecting said bottom and the bottom of said recess.

2. An air boot comprising a hollow inflatable structure having a ground engaging portion and

a shoe engaging portion, said ground engaging portion having a substantially greater area than said shoe engaging portion, and a partition extending across the interior of said structure connecting said portions.

3. An air boot comprising a hollow inflatable structure having a ground engaging portion and a shoe engaging portion, said shoe engaging portion having a bottom and a vertical wall, a curved wall joining said ground engaging portion with the top of said vertical wall, and a partition extending across the interior of said structure connecting said ground engaging portion and said bottom.

4. An air boot comprising a hollow inflatable structure having a top wall, a bottom wall, a shoe receiving recess formed in said top wall, and straps associated with said recess and adapted to be fastened around a shoe in said recess.

5. An air boot comprising a hollow inflatable structure having a top wall, and a shoe receiving recess formed in said top wall, said recess being provided with substantially vertical side walls to facilitate entry of a shoe into said recess.

6. An air boot comprising a hollow, flexible, inflatable structure having a top wall, a ground engaging wall, a side wall interconnecting said top and ground engaging walls to form an air chamber, and a shoe engaging portion formed on said top wall, said shoe engaging portion being separated from said ground engaging wall by the air space in said chamber.

7. An air boot comprising a hollow, flexible, inflatable structure having a top wall, a ground-engaging wall, a side wall interconnecting said top and ground-engaging walls to form an air chamber, a shoe-engaging portion formed on said top wall, said shoe-engaging portion being separated from said ground-engaging wall by the air space in said chamber, and a perforated partition extending across said air chamber and connected to said top and ground-engaging walls.

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