July 9, 1940. P. A. SPERRY 2,206,860

SHOE

Filed Nov. 30, 1937

Fig. 1.

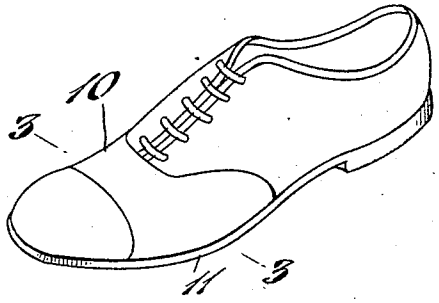


Fig. 2.

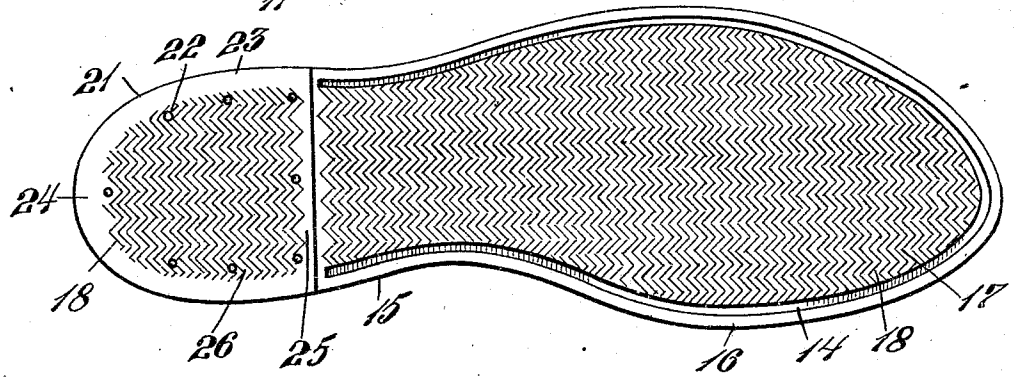


Fig. 3.

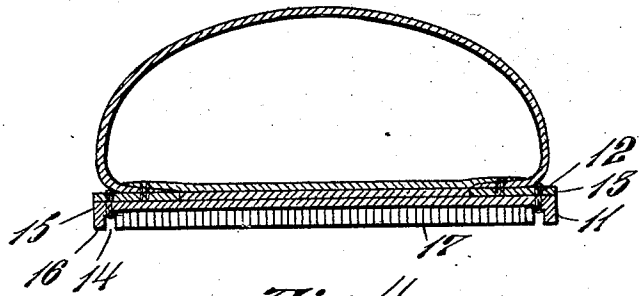
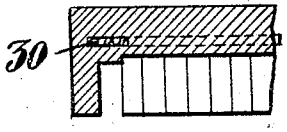


Fig. 4.



Fig. 5.



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SHOE

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Application November 30, 1937, Serial No. 177,237

4 Claims. (Cl. 36—59)

This invention relates to footwear; and has for one of its objects the provision of a non-slipping tread surface for the footwear which will be effective and provide anti-slipping properties particularly on wet surfaces upon which surfaces the usual footwear will slip.

Another object of the invention is the provision of a sole for footwear which will enable the sole to be readily and securely attached to the upper by stitching, cementing or the like.

Another object of the invention is the provision of a plurality of single cuts extending generally across the shoe but which will follow a path to prevent slipping by reason of force being applied in different directions without the necessity of forming separate cuts or slits in different directions to resist slipping pressure in different directions.

Another object of the invention is the provision of sections in contact when in normal position but which will flex to expose the corners of the sections upon a tendency to slip when pressure is applied to the shoe.

Another object of the invention is the provision of slits or cuts in the shoe sole which will extend transversely across the same and terminate in a groove or recess which will be spaced inwardly from the edge of the shoe.

Another object of the invention is the provision of a groove or recess located inwardly from the edge of the shoe providing an uncut marginal edge and separating the uncut marginal edge from the slit or cut portion of the sole.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a perspective view of the shoe;

Fig. 2 is a bottom plan view of the sole of the shoe;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a sectional view showing the sole alone detached from the upper;

Fig. 5 is a modified sectional view showing a reinforcing strip of canvas in the shoe sole.

It is a frequent happening for slipping to occur on smooth surfaces such as stairways, floors, public walks, stone or other pavings, or upon the decks of boats, particularly when these surfaces are wet, and the person walking over the surfaces has on a rubber sole, especially when this rubber sole is smooth and there occurs a film of water between the sole and the surface which is not squeezed out by the pressure of the foot; and it is found that on the wet deck of a boat when the same is in motion that great danger occurs to the person walking thereon with rubber footwear, which is usual on boats, in order that the scratching of the finished surfaces may not occur. I provide an anti-slipping construction for the sole of the shoe, and at the same time I also provide improved cushioning qualities. The slits which I provide form a multiplicity of narrow sections extending in wavy lines across the shoe which increase the flexibility of the sole, especially when under pressure tending to cause the shoe to slip whereby the section corners tilt upwardly and wipe the surface upon which the shoe rests dry to give it a firm and secure grip upon this dry surface and thus prevent any relative movement of the shoe and surface when the pressures of walking with a tendency to slip is provided; and I have formed a groove spaced inwardly from the outer edge of the shoe dividing the cut and uncut portions of the shoe and affording greater flexibility of the wavy sections by reason of this arrangement; and also by means of this groove stitching is housed in a position where it will not contact the surface walked on to thereby become worn; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, 10 designates the shoe upper to which a sole 11 of some elastic material, such as rubber or imitation rubber is applied, the sole here illustrated being that which is stitched to the welt or upper by means of stitchings 12 extending through the welt portion 13 and the sole 11.

This sole 11 has a groove or recess 14 located inwardly from its edge 15 and following the edge about its contour to provide a convenient location in which the stitchings 12 are located for attachment to the welt. The marginal edge 16 of the sole located between the groove 14 and the edge 15 is plain or uncut, while the tread surface proper 17 is cut with wavy lines 18 extending generally transversely across the sole, all of which are parallel and evenly spaced. These cuts extend from the groove 14 on one side of the shoe to the groove 14 at the other side of the shoe in the sole.

The material of which this sole is made is of a very flexible character, it being of soft cushion rubber, sometimes known as gum rubber, which at the time that the cuts are made is partially cured and has the following characteristics according to the specifications of the American Society of Testing Materials: When a preliminary load of five pounds is placed upon an anvil of five-eighths of an inch diameter for ten seconds followed by the placing of a three pound weight upon a ball of three thirty-seconds of an inch in diameter for an equal period of ten seconds the depression into the rubber of the penetrating ball is .125 inch upon the uncut portions 16, whereas, when the same tests are applied to

the cut area the penetration is .127 inch. In taking a series of tests at different locations it is found that the several readings in the uncut area varied only in .004 thousand, whereas the variation in the cut area varied more, such for instance as up to .010 inch, this being due possibly to the location of the ball over a slit or between slits.

In practice, the thickness of the sole is substantially five sixteenths of an inch and the cuts extend to a depth of a quarter of an inch, leaving substantially one sixteenth of an inch as the uncut depth 19. The cuts 18 are placed about one sixteenth of an inch apart and as no stock is removed they form sections substantially one sixteenth of an inch wide. The width of each section is such as to afford it substantial flexibility and may vary with the different materials used.

The groove 14 may be formed in any desired manner, but preferably by molding and when molded there may be a fabric 30 formed in the rubber to reinforce the same at the location where the stitches pass through the sole, or this fabric may extend throughout the entire area of the sole if desired for this purpose.

When pressure is applied to the sole and there is a tendency to slide the same upon the surface the sections open out, the sections flex and each of the corners of the sections tend to wipe the surface and obtain a grip through each of these corner edges throughout the area upon which pressure is applied.

The density of the rubber may be varied throughout a considerable range, although the specific flexibility and density provided by the above tests is found to be satisfactory. The cutting of the sole occurs usually after the sole is partially cured or partially vulcanized, although the cutting may occur after complete vulcanization, it being preferable to partially vulcanize in instances where a further vulcanizing of part of the shoe is required for the finishing operation, although where no such vulcanizing occurs the vulcanizing will be done before the cutting occurs so that the sole after cut may be completely assembled upon a shoe upper.

The heel of the shoe 21 is also of rubber with recesses 22 therein for the reception of nails. Slits 18 are also formed in this heel and extend short of the edge to leave a marginal uncut portion 23. These also extend short of the opposite ends of the heel leaving areas 24 and 25 uncut which give to the sections 26 thus formed a very good support for this portion of the shoe which receives considerable wear.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a shoe, an outsole of elastic cushion rubber having a tread surface provided with a multiplicity of slits extending generally transversely of the shoe and in a wavy path and providing tread sections, each section being a continuous section extending from a point adjacent one margin to a point adjacent the opposite margin, the surfaces of said tread sections formed by said slits being normally in contact when the outsole is at rest, said slits extending inwardly but partially to leave an uncut base integral with the sections, and said slits being of such a spacing and depth as to enable the tread sections to flex on the uncut base of the outsole to an extent to tilt up and expose the corner of the section when the foot wearing the shoe and applying weight on the tread surface tends to slip upon some desired supporting surface with which the tread surface is in contact.

2. In a shoe, an outsole of elastic cushion rubber having a tread surface provided with a multiplicity of slits extending generally transversely of the shoe and in a wavy path and providing tread sections, each section being a continuous section extending from a point adjacent one margin to a point adjacent the opposite margin, the surfaces of said tread sections formed by said slits being normally in contact when the outsole is at rest, said slits extending inwardly to a depth greater than the width of the section and but partially through the sole to leave an uncut base integral with the sections, and said slits being of such a spacing and depth as to enable the tread sections to flex on the uncut base of the outsole to an extent to tilt up and expose the corner of the section when the foot wearing the shoe and applying weight on the tread surface tends to slip upon some desired supporting surface with which the tread surface is in contact.

3. In a shoe, an outsole of elastic cushion rubber having a tread surface provided with a groove inward of its periphery and a multiplicity of slits extending generally transversely of the shoe and in a wavy path and terminating in said groove to provide tread sections, each section being a continuous section extending from the groove adjacent one margin to the groove adjacent the opposite margin, the surfaces of said tread sections formed by said slits being normally in contact when the outsole is at rest, said slits extending inwardly but partially to leave an uncut base integral with the sections, and said slits being of such a spacing and depth as to enable the tread sections to flex on the uncut base of the outsole to an extent to tilt up and expose the corner of the section when the foot wearing the shoe and applying weight on the tread surface tends to slip upon some desired supporting surface with which the tread surface is in contact.

4. In a shoe, an outsole of elastic cushion rubber having a tread surface provided with a groove inward of its periphery and a multiplicity of slits extending generally transversely of the shoe and in a wavy path and terminating in said groove to provide tread sections, each section being a continuous section extending from the groove adjacent one margin to the groove adjacent the opposite margin, the surfaces of said tread sections formed by said slits being normally in contact when the outsole is at rest, said slits extending inwardly but partially to leave an uncut base integral with the sections, and said slits being of such a spacing and depth as to enable the tread sections to flex on the uncut base of the outsole to an extent to tilt up and expose the corner of the section when the foot wearing the shoe and applying weight on the tread surface tends to slip upon some desired supporting surface with which the tread surface is in contact, and a reinforcing member in said sole at the location of said groove to strengthen the sole at the location of its attachment to the upper.

PAUL A. SPERRY.