July 31, 1962 L. T. HILL ET AL 3,046,680

RUBBER-SOLED SAFETY SHOE

Filed May 2, 1960

Fig. 1.

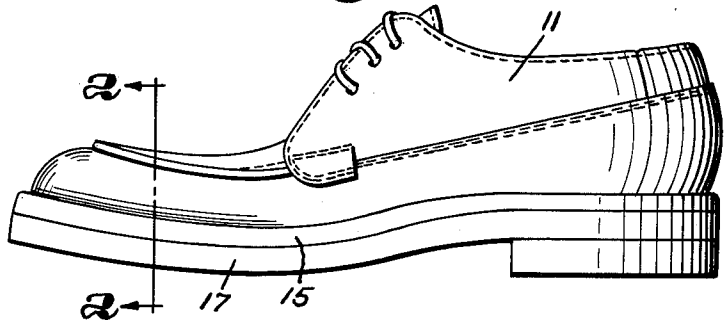


Fig. 2.

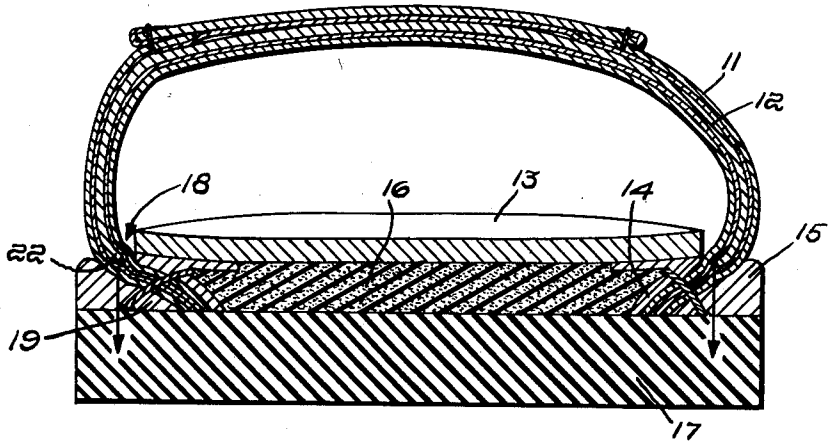
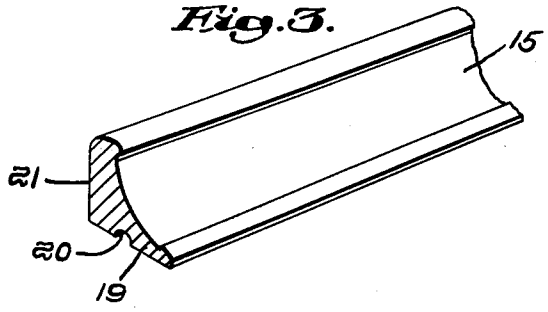


Fig. 3.



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RUBBER-SOLED SAFETY SHOE

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This invention relates to improvements in safety shoes equipped with protective metal reinforcements at the box toe portions thereof, and pertains more particularly to safety shoes having soles of rubber or equivalent resilient material.

The principal purpose of the invention is to provide a safety shoe affording the desirable flexibility, lightness in weight and comfort of a resilient outsole, and also possessing the necessary rigidity in the toe portion required to satisfy the specifications of a steel box safety shoe.

So far as we are aware, no rubber-soled safety shoe had met the required standards, prior to the development of the shoe herein disclosed. In tests of previous shoes having a steel box and a resilient outsole, the shoes would break out at the juncture of the upper and sole, or the box would be pressed downwardly onto the cushion sole and tend to crush the toes of the wearer, under the standard drop test or compression test.

It is accordingly an object of this invention to provide a welted safety shoe equipped with the usual type of steel box and having a resilient outsole so attached to the welt and upper that the welt supports the bottom margins of the steel box and prevents excessive depression of the box toward or into the cushion sole under such tests.

Another object is to provide such a shoe with a bottom filler of foam rubber or other highly compressible materials, so that the insole of the shoe may move downwardly under pressure on the box toe and the foot of the wearer, thereby materially decreasing the likelihood that the toes and forepart of the foot will be crushed by such pressure. For this purpose, the insole of the shoe is preferably reduced in width at the forepart of the shoe, so that a welt platform may be located under the bottom edges of the steel box.

A recommended embodiment of the invention is illustrated in the accompanying drawing, in which:

FIG. 1 is a side elevation of a rubber-soled safety shoe incorporating the aforesaid structural features;

FIG. 2 is a transverse section through the toe portion, taken on line 2—2 of FIG. 1; and

FIG. 3 is a perspective view of a platform welt used in welting the outsole to the upper, and designed and arranged to provide a supporting base for the conventional steel box.

In the embodiment chosen for the purpose of illustration, the safety shoe comprises a leather upper **11** of Blutcher cut, assembled in any usual or ordinary manner to incorporate a conventional steel box **12** in its toe portion; an insole **13** of leather or other suitable material, having the customary sewing lip **14**; a platform welt **15** stitched as usual to the lasting margin of the upper and to the lip of the insole; a sheet-like bottom filler **16**, preferably of foam rubber or other soft and easily compressible material; and an outsole **17** of rubber, imitation rubber, or other resilient material which is relatively flexible and light in weight, as compared with the leather outsoles heretofore used in safety shoes, and which is cemented to the wide base of the platform welt.

It will be understood that the upper **11** may be made of any material suitable for the purpose, and in any desired style; for the details of upper construction are not material to the present invention, and the steel box **12** in the toe portion is conventional, as aforesaid. The insole

13 is also of ordinary construction except that it is preferably narrower at the forepart than would be usual for the ordinary shoe or safety shoe. As shown in FIG. 2, the edge of the forepart of the insole is spaced transversely at **18** from the lining of the lasted upper, so that the resistance to downward movement of the insole, under pressure on the forepart of the foot, is decreased by such spacing.

Such downward movement of the insole is further accommodated by using the relatively soft and easily compressible, foam rubber bottom filler **16** which offers less resistance to depression of the insole than a harder filler or cork or composition material.

An important feature of the improved safety shoe construction is the platform welt **15** which, as shown in FIG. 3, is formed with a relatively wide platform base **19** provided with the stitch groove **20** preferably spaced remote from the inner edge of said base portion, and an upstanding flange **21** providing a weather seal and frame support for the upper. In the completed shoe, the platform **19** of the welt extends inwardly a substantial distance beyond the bottom edges **22** of steel box **12**, and well under the margin of the insole **13**. The relative narrowness of the insole with respect to the width of the upper **11** at the forepart of the shoe readily permits such inward extension of the wide welt platform, particularly when, as aforesaid, the sewing lip **19** is spaced further inwardly from the edge of the insole than is customary in such shoes.

As indicated by the arrows in FIG. 2, downward pressure on the toe portion and steel box tends to move the steel box edges **22**, toward the welt in a region remote from the inner edge of its platform **19**, so that a relatively thick portion of the welt affords a supporting brace for the bridge of the arched box. Thus, the metal box and the overlying portion of the upper are not forced directly against the resilient outsole **17**, or toward the welt stitching, an excessive downward movement of the toe portion of the shoe, under a blow or heavy pressure on the top of the box toe, is avoided. Thus, the toe portion of the wearer's foot is not crushed by such force, and the welt stitches are not broken by the bottom of the steel box. Moreover, as previously pointed out, the yielding of the cushion filler **16** further contributes to relief of excessive pressure on the foot, for when the foot is in the shoe, pressure on the top of the box toe will cause the insole to flex downwardly into the resilient filler, so that the toes of the foot are not pinched against an unyielding insole by such pressure.

Insofar as applicants have been informed, a safety shoe constructed as above described is the first and only safety shoe having a resilient outsole which has met the specifications and requirements established by the American Standards Association and preserved its structural integrity under the tests prescribed by that association. A safety shoe thus constructed may be made with a cushion outsole of crepe or blown rubber, natural or synthetic, without detracting from its performance under such tests; and a light weight crepe sole is much preferred by users of safety shoes.

We claim:

A safety shoe comprising an upper, a metal box incorporated in the toe portion of the upper and having a downwardly directed bottom margin, a flexible insole, a leather welt stitched to the upper and insole, a resilient outsole secured to said welt, and a bottom filler of soft, resilient material disposed between the insole and outsole at the forepart of the shoe; said welt having a base portion extending inwardly of the shoe a substantial distance relative to said bottom margin of the metal box, and having a stitch groove disposed inwardly of the shoe a

substantial distance relative to the edge of said margin; said welt base having an outer portion of substantial thickness in the path of downward movement of said box margin, whereby such downward movement of the box relative to the outsole causes said box-edge to engage the thick portion of the welt at a region remote from said stitch groove and remote from said resilient bottom filler; said insole flexible downwardly on the resilient filler when pressure is applied to the top of the metal box with the foot in the shoe.

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