Oct. 14, 1952 E. F. McLAUGHLIN 2,613,457

INSTEP GUARD FOR SAFETY SHOES

Original Filed April 25, 1947

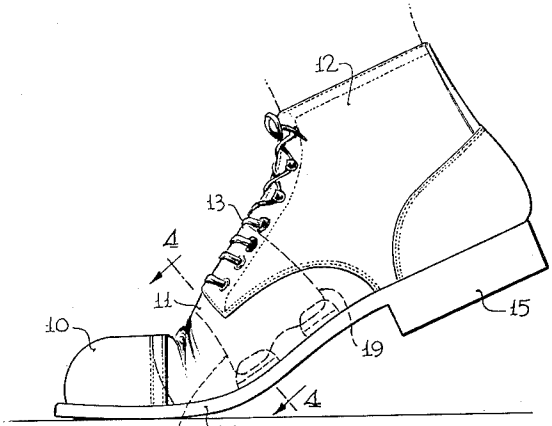


FIG. 1

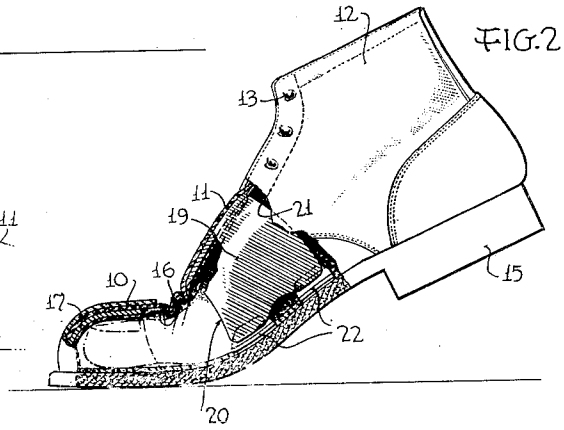


FIG. 2

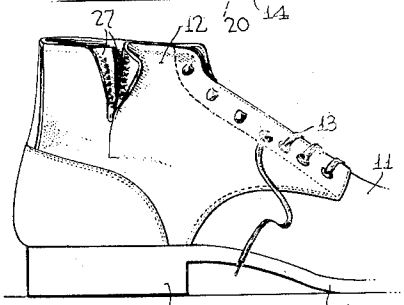


FIG. 7

FIG. 3

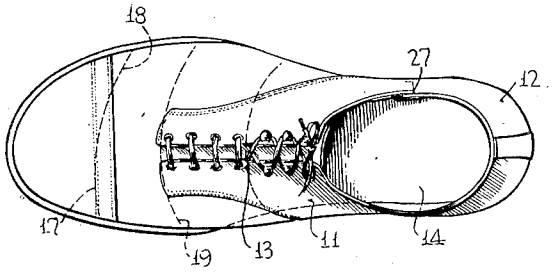


FIG. 6

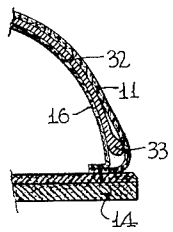


FIG. 4

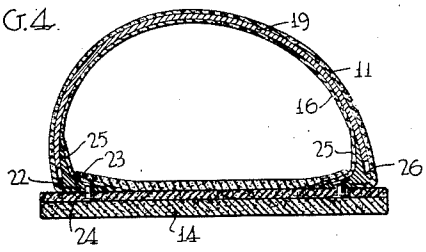
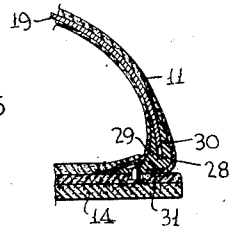


FIG. 5



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INSTEP GUARD FOR SAFETY SHOES

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Original application April 25, 1947, Serial No. 743,780. Divided and this application September 10, 1951, Serial No. 245,818

14 Claims. (Cl. 36—72)

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This is a division of applicant's co-pending original application Serial No. 743,780, "Safety Shoe," filed April 25, 1947.

The invention relates to a safety shoe, that is, a shoe provided with reinforcements, mostly of sheet steel or other metal, for protecting at least parts of the feet of the wearer against injury by objects hitting the shoe.

The most widely used safety shoes have merely a built-in metal toe cap. The protection afforded by such cap extends to about the base of the great toe and to parts of the second and third toes. It offers, however, no protection for the remainder, that is, the larger part of the foot.

So as to give more adequate protection, outer guards have been devised which are permanently or removably attached to the shoes. As these outer guards are cumbersome and unsightly, they are, as experience has proven, mostly not worn by the workmen.

The consequence of the outlined state of art is that a great many accidents lead to injuries of the feet which are not prevented or mitigated by the commonly worn safety shoe with a metal toe cap.

The main object of the invention is to overcome the above outlined situation by a shoe which gives greatly added protection, which is comfortable, and which in appearance is practically indistinguishable from an ordinary shoe or from the known types of safety shoes.

The aforesaid objects of the invention are achieved by a second reinforcement, guard or protector built into the shoe, extending over the instep region and being spaced from the cap so as to leave the break-line free of reinforcements and permit proper flexing.

The new shoe protects the foot of the wearer nearly perfectly. The small gap left for the flexion between the toe cap and the protector over the instep will be vulnerable only if a pointed object happens to strike in just this gap. However, most foot injuries are caused by heavy, blunt objects and said space would be of no consequence in such accidents.

The invention, its objects, advantages and special details thereof will be more fully and easily understood from the several embodiments illustrated in the attached drawing and described hereinafter.

In the drawing:

Figure 1 is a side elevation of a shoe partly flexed, indicating in dotted lines the arrangement of the toe cap and the new instep protector;

Figure 2 is an elevation corresponding to Figure 1 yet with certain parts shown in section or broken away so as to illustrate the essential features of the construction;

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Figure 3 is a plan view of the shoe shown in Figures 1 and 2;

Figure 4 is a section along line 4—4 of Figure 1;

Figures 5 and 6 are fragmentary sections, corresponding to Figure 4, of two modifications of the invention; and

Figure 7 is a fragmentary outside elevation of the shoe shown in Figures 1 to 3.

The invention is illustrated for a shoe having a leather cap 10, a vamp portion 11, an ankle portion 12 with lacings 13 of the Blucher type, a sole 14 and a heel 15. Inserted between the leather cap 10 and the inner lining 18 is a metal toe cap 17. The rear margin of this cap extends on the outside rearwardly at 18 as shown by the dotted line in Figure 3 so as to give more complete protection to the toes, especially to the outer toes. This toe cap forms the subject matter of applicant's aforesaid original application.

Held between the upper 11 and the inner lining 16 is a second reinforcing metal band 19 which extends over the foot in the instep region. The front margin 20 of this band 19 is spaced from the rear margin of the metal cap 17 and is also rearwardly spaced from the so-called "break-line," that is, the line where the shoe flexes. The rear margin 21 of the instep reinforcement, guard or protector 19 extends approximately across the top of the arch of the foot. In cross sections in planes transversely to the length of the foot, the protector 19 is arched so as to correspond approximately to the form of the top of the foot in this region.

The lining 16 is preferably of a relatively heavy and soft material so as to form a cushion between foot and protector, or additional cushioning material may be provided.

The protector 19 does not constitute a rigid closed-figure structure with the sole 14. In the illustrated embodiments, one or both ends of the protector 19 are not rigidly secured to the sole as is the case with the toe cap but they movably engage brackets 22 which in their turn are secured to the sole. These brackets are preferably of a hard material, e. g. metal, and are firmly held in place. In the embodiment illustrated in Figure 4, these brackets 22 each have a horizontal arm 23 overlying and secured by rivets 24, to the sole, an upstanding arm 25 extending between the lower part of the protector 19 and the inner lining and a shoulder 26 extending outwardly from the lower part of the arm 25.

Ordinarily, the protector 19 may move up and down relative to the brackets 22 with the movements of the foot. If the shoe should be hit by a heavy object in the region of the protector 19, the protector will be pushed down and the lower margin of the protector will engage the shoulders 26, whereupon the protector will act in the same manner as the toe cap and will prevent injury to the foot.

Obviously, the protector 19, in spite of the loose connection of its ends, may impede the putting on and taking off of the shoe because it prevents the shoe from being spread apart after opening the front lacings 13. To facilitate the putting on and the taking off, the shoe may be provided, preferably on its outside, with an additional closure means. In the illustrated embodiment, such means consists in a slot provided with a slide fastener 27. For putting on or taking off the shoe, the slide fastener closure, as well as the lacing, is used. The slide fastener 27 does not actually tighten the shoe but such tightening to fit the foot of the wearer is done by the lacings 13, as usual.

In the embodiment illustrated in Figure 5, the ends of the protector 19 are held in a slot 28 between two upstanding arms 29 and 30 of a bracket 31, the outer arm 30 fitting between the outside of the protector 19 and the outer shoe leather 11.

In the embodiment illustrated in Figure 6, the brackets at the bottom of the protector 19 of the preceding embodiments are dispensed with. In this embodiment, the protector 32, which otherwise may have the same form as the protectors 19 of the preceding embodiments, has its lower margin thickened at 33. This thickened end 33 is ordinarily raised slightly above the sole 14 but when the protector is hit by an object and thereby pushed down, the thickened end will engage the sole and will distribute the load over an area of the sole greater than the cross-sectional area of the protector 32, without cutting into the sole.

The invention is not restricted to the illustrated embodiments but is subject to further embodiments, and protection is sought for the invention as expressed by the spirit and the language of the attached claims.

What is claimed is:

1. Safety shoe having an impact-resistant, stiff, substantially rigid protector, such as a protector of sheet steel, embedded in the shoe upper over and continuously across the instep between the break line and the ankle portion of the shoe.

2. In a safety shoe, an instep guard embedded in the shoe upper, said guard consisting of an essentially hard, impact-resistant material such as sheet metal, extending across the instep from the margin of the sole on one side to the margin of the sole on the other side and having an extensible joint between said margins so as to give sufficient flexibility to the shoe for walking and for putting on and taking off of the shoe.

3. A safety shoe having embedded in its upper an instep guard in the form of a transversely arched band arranged between the break line and the ankle portion consisting of a hard, impact-resistant material such as sheet metal, said guard extending between the opposite margins of the shoe sole, at least one of the lateral margins of the guard being movable up and down relative to the sole so as to afford a certain amount of flexibility of the shoe upper provided with the guard.

4. Safety shoe comprising an instep guard in the form of a stiff web of a hard, impact-resistant material such as sheet metal, said web extending in an upward arch from one margin of the sole to the opposite margin, at least along one of said margins the instep guard consisting of two pieces, one of which is secured to and supported by the adjoining marginal portion of the sole and adapted for engagement by the adjoining other piece of the guard when the instep region of the shoe is forced down as by a heavy falling object while permitting upward movement of said other piece.

5. Safety shoe comprising an instep guard in the form of a stiff band embedded in the shoe upper arranged between the break line and the ankle region of the foot and extending in an arch from one margin to the opposite margin of the sole, both ends of said band being held by the upper closely adjacent portion of the sole while permitting up and down movement of the band relative to the sole, the arrangement being such that the instep guard engages by its margin said portions of the sole when the mid portion of the guard is pressed down as by a heavy falling object.

6. A safety shoe having embedded in its upper an instep guard in the form of a transversely arched impact-resistant band arranged between the break line and the ankle portion, said guard extending between the opposite margins of the shoe sole, at least one of the lateral margins of the guard being movable up and down relative to the sole so as to afford a certain amount of flexibility of the shoe upper provided with the guard, and means for distributing a load exerted on the instep guard from the latter over an area of the sole which is greater than the cross sectional area of said guard.

7. Safety shoe according to claim 6 in which said means comprise a bracket in permanent firm engagement with the sole and in loose engagement with the remainder of the guard.

8. Safety shoe according to claim 6 in which said means comprise a bracket secured to the sole and provided with guiding means for the adjoining margin of the guard and with a shoulder for abutment by said margin.

9. Safety shoe according to claim 6 in which the said means consists of a bracket secured to the sole and provided with a slot telescopingly receiving the marginal portion of the adjoining part of the guard.

10. As an article of manufacture, an instep guard adapted for embedding in the shoe upper, said instep guard consisting of a transversely arched band of a stiff, impact-resistant material such as metal, said band being formed along its lateral margins for engagement with lateral marginal portions of the shoe sole and between said margins for extending across the instep between break line and ankle of a wearer of a shoe provided with said guard.

11. As an article of manufacture, an instep guard adapted for embedding in the shoe upper, said instep guard consisting of a transversely arched band of a stiff, impact-resistant material such as metal, said band being formed along its lateral margins for engagement with lateral marginal portions of the shoe sole and between said margins for extending across the instep between break line and ankle of a wearer of a shoe provided with said guard, said band having at least one of its margins adapted for engaging the top of the sole and laterally widened for distributing the load over a large area of the shoe sole.

12. As an article of manufacture, an instep

guard adapted for embedding in the shoe upper, said instep guard consisting of a transversely arched band of a stiff, impact-resistant material such as metal, said band being formed along its lateral margins for engagement with lateral marginal portions of the shoe sole and between said margins for extending across the instep between break line and ankle of a wearer of a shoe provided with said guard, and at least one bracket having a first arm adapted for engagement with the sole of a shoe at one side thereof and having a second upstanding arm providing a slot for telescopingly receiving and guiding an adjoining portion of a lateral margin of said instep guard.

13. A safety shoe of the Blucher type having lacings and embedded in its upper an instep guard in the form of a transversely arched band arranged between the break line and the ankle portion, said guard extending between the opposite margins of the shoe sole in an upward arch across the instep region, at least one of the lateral margins of the guard being movable up and down relative to the sole so as to afford a certain amount of flexibility of the shoe upper provided with the guard.

14. A safety shoe having embedded in its upper an instep guard in the form of a transversely arched band arranged between the break line and the ankle portion, said guard extending between the opposite margins of the shoe sole, at least one of the lateral margins of the guard being movable up and down relative to the sole so as to afford a certain amount of flexibility of the shoe upper provided with the guard, and a pair of brackets secured to the sole at longitudinally spaced locations and in loose engagement with said movable margin of the guards, said spacing of the brackets permitting the sole to flex in the region between them.

EDWARD F. McLAUGHLIN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
564,966	Brewer	Aug. 4, 1896
1,742,763	Gerard	Jan. 7, 1930
2,393,810	Purinton	Jan. 29, 1946