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2,817,841

SHIN GUARD

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Fig. 1.

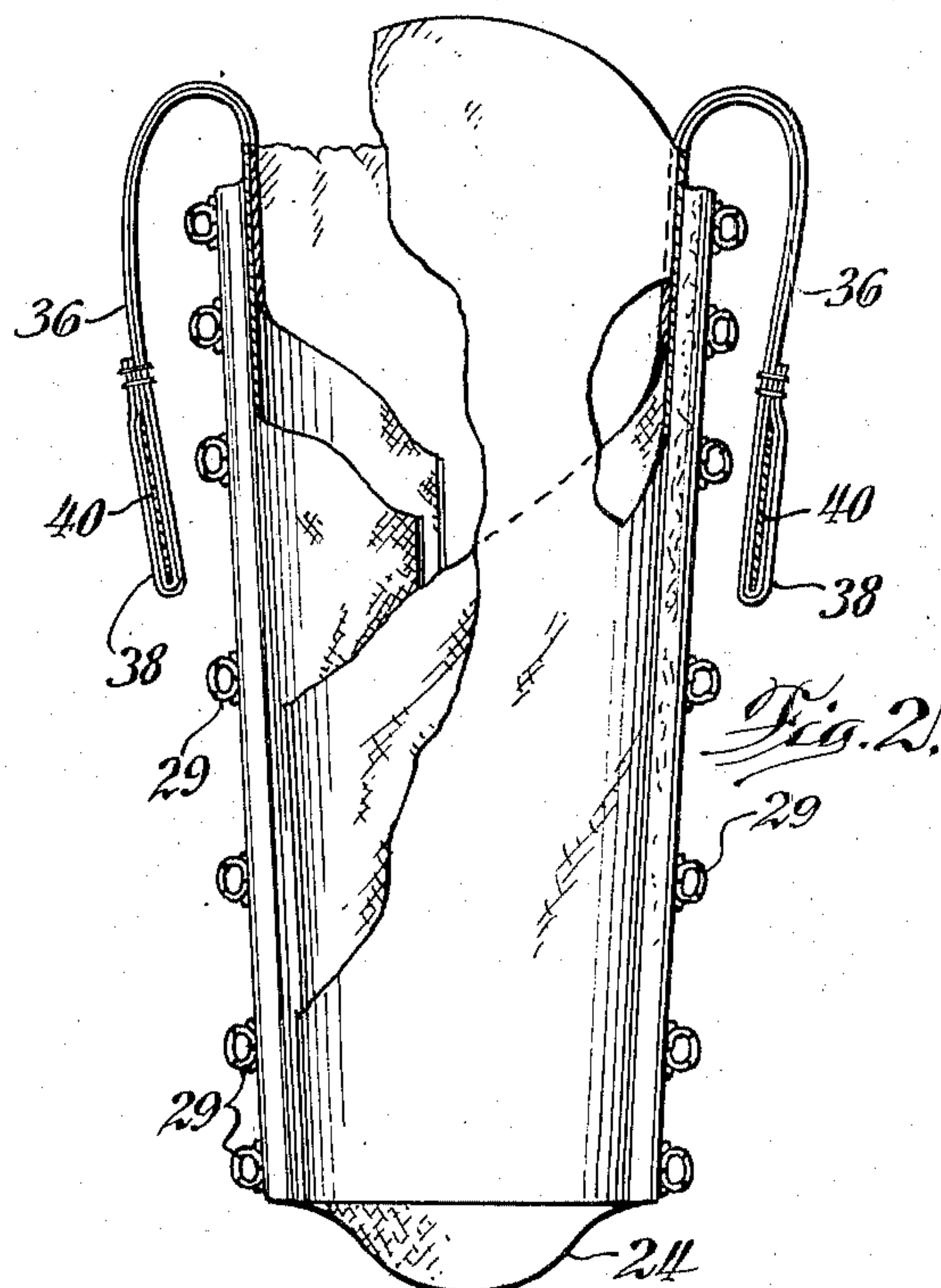
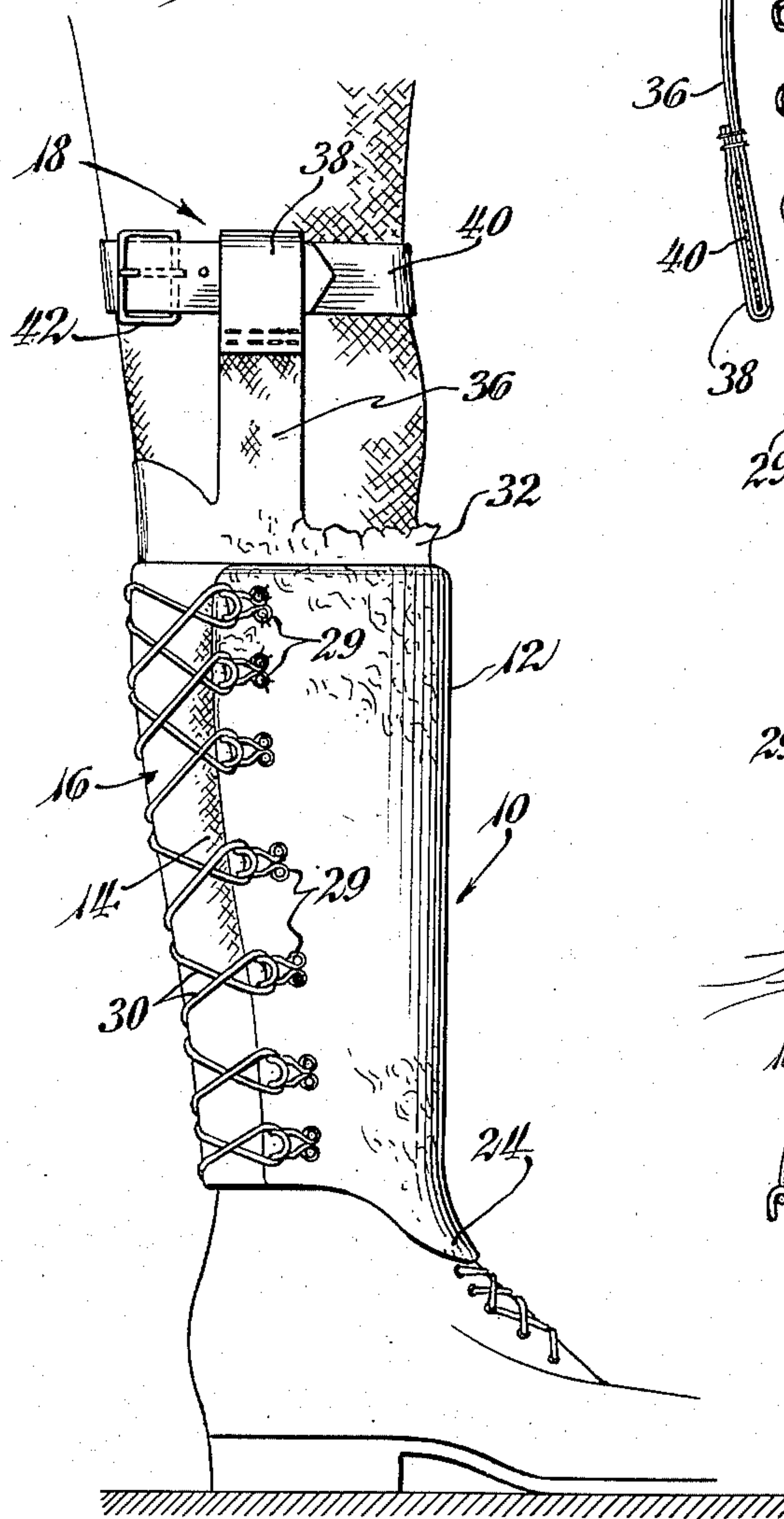


Fig. 2.

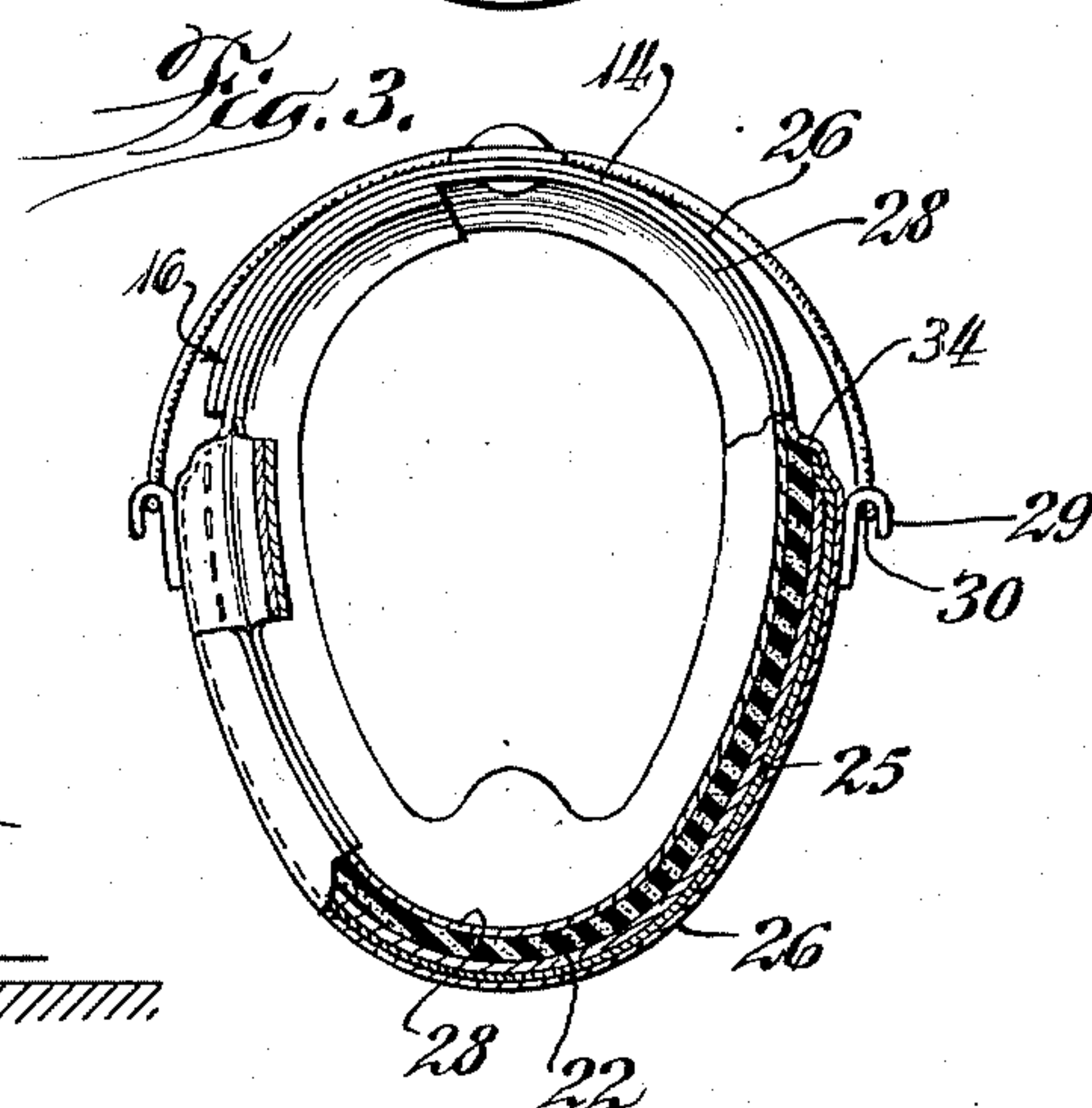


Fig. 3.

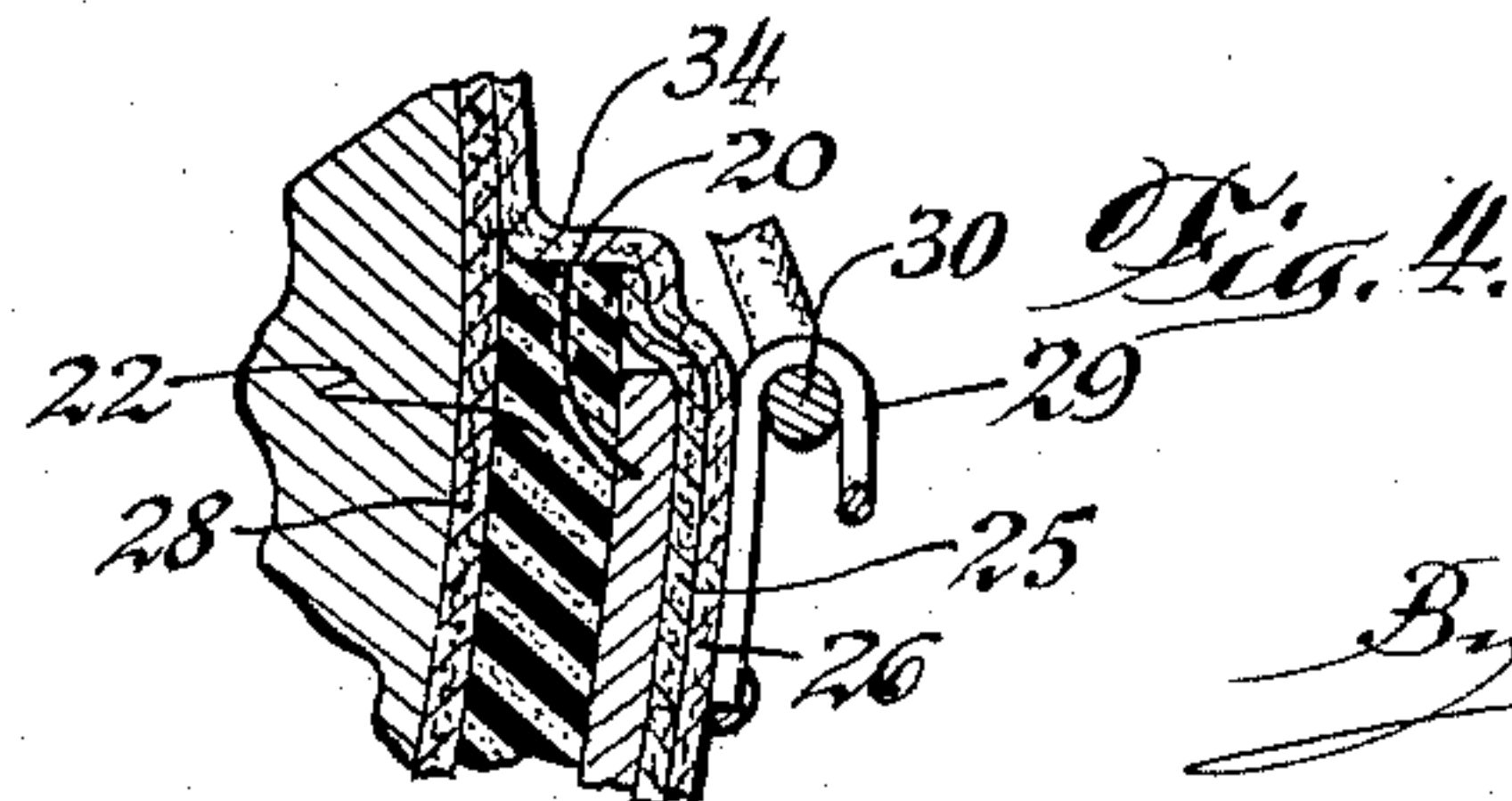


Fig. 4.

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2,817,841

SHIN GUARD

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5 Claims. (Cl. 2—22)

The present invention relates to improvements in protective apparel and more particularly to apparel affording protection against impact to the body. Specifically, the invention pertains to improvements in shin guards.

In certain types of occupations, as in railroading and other such work, one encounters many instances in which the body is subjected to excessive impact against objects or from accidental blows or the like, and particularly blows on the shins. Previously known shin guards for use in such instances have not been entirely satisfactory from the standpoint of providing maximum protection with minimum discomfort.

An object therefore of the present invention is to provide a shin guard having novel construction of such nature that it provides maximum protection with minimum discomfort.

Another object is to afford a shin guard having a novel construction including a steel piece for maximum protection.

A further object is to provide a shin guard having novel laminated construction, including a steel layer or lamina, providing great strength while being unusually light.

A still further object is to afford a shin guard of laminated construction having an inner resilient layer and an outer steel layer providing hardness and toughness as against external blows but providing a cushioning effect against the body of the wearer.

Another object is to provide a shin guard having a relatively rigid portion covering the shin but an entirely flexible supporting portion engaged with the leg above the knee, thus providing complete freedom of the leg in bending at the knee.

A still further object is to provide a shin guard of the general character noted above having a covering of leather providing resistance to scuffing and similar action while also being arranged in a novel manner to provide flexible flaps which surround that portion of the leg not surrounded by the rigid steel shin covering portion.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of my invention, I have illustrated in the accompanying drawing a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, my invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding

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or similar parts throughout the several figures of the drawing:

Fig. 1 is a side elevational view of the novel shin guard of the invention applied to the wearer;

Fig. 2 is an elevational view from the rear, with a portion of the flaps broken away;

Fig. 3 is a top plan view, with a part of the rigid shin-covering portion broken away; and

Fig. 4 is an enlarged detail view in section of the portion encircled in dot-dash lines in Fig. 3.

Referring now in detail to the drawings, reference numeral 10 indicates generally the shin guard as shown in Fig. 1 and as applied to the leg of the wearer. It includes, as principal members, a shin-covering portion 12, rear flaps 14 and 16, and a supporting portion indicated generally at 18 engaging the leg above the knee.

The shin-covering member, or guard proper, 12 affords the major portion of the protection against excessive impact and hard blows, and accordingly is of rigid and tough construction. This portion includes a layer or lamina 20 of hard tough material such as steel and a layer or lamina 22 of resilient material on its inner surface. Preferably such material may comprise sponge rubber. The rubber layer 22 is slightly larger in area than the steel layer and extends beyond the edges of the latter, whereby to prevent the edges of the steel from digging or gouging into the leg. These layers are preferably secured together by suitable means, such as by an adhesive or bonding material or by vulcanizing. The shin-covering portion 12 is of suitable shape and dimensions to cover the front portion of the lower leg; a maximum extent consistent with other considerations, such as comfort and freedom of movement. For example, in circumferential direction, it encompasses substantially half the leg so as not to produce a binding effect on the calf.

The guard proper portion 12 has a projection or tongue 24 extending down over a portion of the instep, of such size and shape as to cover as much of the instep as possible without interfering with the flexing of the foot in walking. It will be understood that the shape and dimensions mentioned above are those considered with respect to any given size, since there may be a number of different sizes, i. e., a large guard for a large person, a small one for a small person, etc. At any rate, in any given size, the guard should cover as much of the leg as possible without impairing freedom of movement.

It is desired to have the steel layer 20 embedded in the midst of other non-steel layers. To this end, a layer of leather-like material 25 is applied to the outer surface of the steel layer. This layer is preferably of the same dimensions as the resilient layer 22 and hence slightly larger than the steel layer. It is preferably secured to the steel as by gluing or the like, and its outer perimeter portion is similarly secured to the resilient layer 22.

The layer 25, and the outer covering layers 26 and 28 described in detail hereinbelow, are of leather-like material, i. e., they may be of actual leather, imitation leather, impregnated fabric, such as "rubberized" or "leatherized" fabric. The material is flexible, tough and highly wear-resistant, and lends itself well to fabrication such as is desirable in constructing an article such as the guard; for example, it enables effective lamination of plural layers of itself and of layers of other material such as the steel and rubber.

The layers described hereinabove, namely, steel 20, rubber 22 and leather 25, together form the body or core of the guard proper, and substantially determine the dimensions thereof. The steel-rubber-leather laminated core construction is enclosed in a casing of additional layers consisting of the outer covering 26 and the inner covering 28 mentioned hereinabove. The material is

not only strong and tough, but provides a pleasing appearance. These leather covering layers are secured together around and beyond the edges of the core by suitable means, such as by stitching. They need not be otherwise secured to the core unless desired. These covering layers are extended rearwardly beyond the side edges of the core to form the flaps 14 and 16 referred to above. These extended portions, on each side may be secured together, as by stitching, along the edges of the core, but need not be secured together beyond that unless so desired. The flaps are of suitable circumferential extent, preferably so as to completely cover the calf in addition to actually overlapping a substantial extent.

Hooks 29 may be secured to the shin-covering portion 12, along the lateral edges thereof, as by stitching. These hooks provide means for tying the guard by means of ties or laces such as 30. The stitching preferably is only in the outer layer 26, for convenience and economy in fabrication, although it may be extended through the complete lamination with the exception of the steel layer. The layer 26 is of sufficient strength to support the hooks for the purpose intended. The laces are hooked on the hooks, in a customary manner, over and bearing on the flaps 14 and 16. If desired, the laces may be laced from the top down and the free terminal portions wrapped around the leg to secure the extremities of the trousers.

The leather coverings 26 and 28 may be extended above the steel-rubber-leather core as at 32 to provide a certain degree of protection to the leg at that location, and also to provide a finished appearance; the outer layer of leather being turned over the edge of the core. A similar construction may be utilized at the side edges, as at 34, and at the bottom edge. This arrangement, in addition to providing a finished appearance, enables the flaps to extend circumferentially directly from the inner surface of the guard proper, as clearly illustrated in Fig. 4 of the drawings.

In addition to the portion 32, the leather coverings 26 and 28 are extended at the top to provide upwardly extending side straps 36 having loops 38 in their upper ends; the loops being formed in any suitable manner, as by stitching. A band or strap 40 is threaded through the loops and encircles the leg, to form the flexible supporting means 18 referred to above. The band 40 is provided with a suitable adjustable means such as the buckle 42. This flexible supporting means engages the leg above the knee and effectively prevents the guard from slipping or sinking. This construction is of particular advantage in preventing the tongue 24 from resting on the instep and thereby interfering with walking. The supporting means 18 is entirely flexible and enables full freedom of movement of the leg and bending of the knee, notwithstanding the rigidity of the shin-covering portion 12.

While the steel piece 20 may be of any gauge within a wide range, I find that 11-gauge is best suitable for the purpose. I also find that the resilient layer 22 produces best results if approximately $\frac{1}{4}$ " in thickness. The steel of such gauge is strong, tough, and capable of withstanding extremely hard blows; in fact, all that would normally be encountered in widely extreme conditions, and in most occupations. Such steel sheet also, is quite light, and since the steel constitutes the densest portion of the guard, the weight of the whole article is materially minimized, in keeping with comfort considerations.

The steel sheeting of the gauge mentioned hereinabove is of substantial strength so as to withstand deflection in localized areas. Thus the force of any blows struck thereon is distributed over a wide area and is absorbed by the rubber layer over that area. Hence, the guard has considerable cushioning effect. The steel is also capable of being flexed at the sides in response to transverse forces. However, in the front arcuate portion, flexing and deflection are strongly resisted.

The laminated structure of the guard also contributes

to the unusual strength thereof; the leather covering layers 26 and 28 providing a great degree of strength. The leather covering layers also are tough and withstand scuffing action. The inner leather layer 28 in addition to having the qualities mentioned above, also provides as smooth a covering as may be desired for the rubber layer 22 which may have a relatively adhesive surface because of its resiliency characteristics. It furthermore provides protection to the rubber layer against excessive wear caused by rubbing on the trousers. Furthermore, the leather covering layer affords a more comfortable touch sensation to the skin so that the guard may be worn directly on the bare leg. In addition, the flaps 14 and 16 provide a protective and comfortable covering to the calf especially when the guard is applied to the bare leg.

It is believed that my invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be manifest that while preferred embodiments of the invention have been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variations within the purview of my invention as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. A device of the character described comprising a shin-covering core including an outer steel layer and an inner soft and resilient layer approximating the steel layer in size, said core being generally semi-circular in cross section, a covering on said core including a layer on the outer surface and a layer on the inner surface, the covering layers extending circumferentially beyond the side edges of the core and secured together thereat to form flaps extending beyond the side edges a sufficient distance to be superimposed one on the other to provide a two-ply flexible covering for the rear surface of the leg of the wearer, lacing interconnecting the lateral edges of the shin-covering portion and disposed over and bearing on said flaps, and flexible means connected to the upper end of the foregoing structure and spaced thereabove for securing to the leg of the wearer above the knee.

2. A shin guard comprising a relatively rigid core portion approximating semi-circular shape in cross section and including an outer steel layer having a limited amount of flexibility at the side portion, an inner layer of resilient material, and a leather-like covering material including outer and inner layers encasing and supporting the core portion and extending circumferentially beyond the lateral edges of the core portion to form flexible flaps for covering the rear side of the leg of the wearer, tie means interconnecting the side portions of the guard, said covering material having strap portions on the sides thereof adapted to extend upwardly beyond the knee, and a flexible adjusting band threaded through said strap portions for securely engaging the leg above the wearer's knee.

3. A shin guard comprising a core including an outer layer of steel and an inner layer of resilient material secured together, said layers being of similar size with the resilient layer at least as large as the steel layer, said core being approximately semi-circular in cross section, a covering including outer and inner layers of leather-like material entirely enclosing the core and extending circumferentially beyond the lateral edges thereof to form elongate, flexible flaps overlapping one on the other and adapted each to substantially cover the rear surface of the leg of the wearer, said core and covering having a tongue at the lower front portion for extending over the instep, and lacing interconnecting the lateral edges of the core and bearing on said flaps for securing the guard to the leg.

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4. A shin guard of the character disclosed comprising a front shin-covering portion and rear flaps, said shin-covering portion being of approximately semi-circular shape and including a core having a steel layer and a layer of resilient and soft material of slightly larger dimensions than the steel, the shin-covering portion also including an outer and an inner covering layer of tough leather-like material stitched together around and immediately outwardly of the resilient material with the outer covering layer forming a covering over the edges of the core, both of said covering layers continuing from the inner surface of the resilient material circumferentially from the lateral edges of the core to form the rear flaps, said flaps substantially comprising a continuation in circumferential direction from the inner surface of the core, hooks secured to said shin-covering portion adjacent the lateral edges of said steel layer by stitching extending at least through the outer covering layer, and lacing interconnecting said hooks and bearing on said flaps along substantially the entire length of the guard.

5. A shin guard of the character described comprising a front guard portion and rear flaps, said guard portion being substantially semi-circular in cross section and having a core including a steel layer and a cushioning layer, said steel layer being flexible in lateral directions at the

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sides, but rigid at the arcuate central front portion, said cushion layer being of soft resilient material such as sponge rubber and disposed on and bonded to the inner surface of the steel layer, the marginal edge portions of said cushion layer projecting beyond the edges of the steel layer, said guard portion having outer and inner covering layers of leather-like material stitched together around and beyond the edges of the core and extending rearwardly beyond the lateral edges thereof, said latter-mentioned layers together forming said flaps, the flaps being of sufficient dimensions circumferentially to overlap on the leg of the wearer for a substantial extent, hooks secured to said outer covering layer along the lateral edges of the guard portion, lacing interconnecting said hooks over and bearing on said flaps, said covering layers together having flexible strap portions extending upwardly beyond the guard portion, said straps having loops in the outer ends thereof, and a flexible band threaded through said loops for engaging the leg of the wearer above the knee.

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