

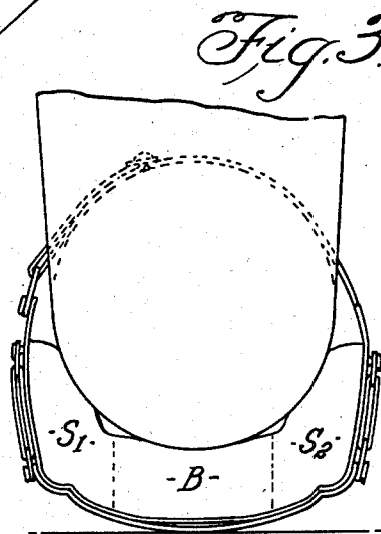
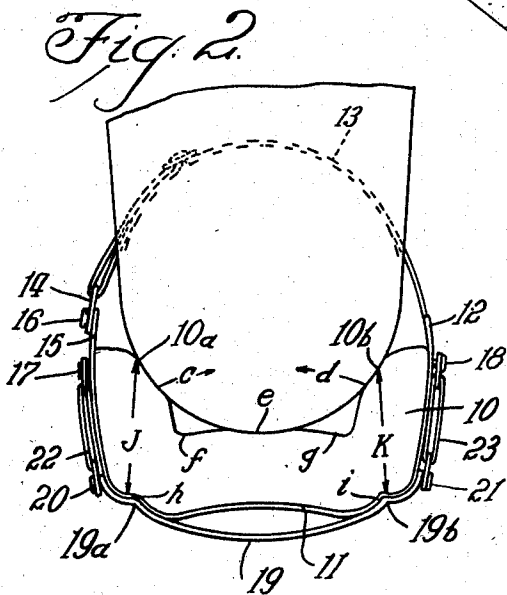
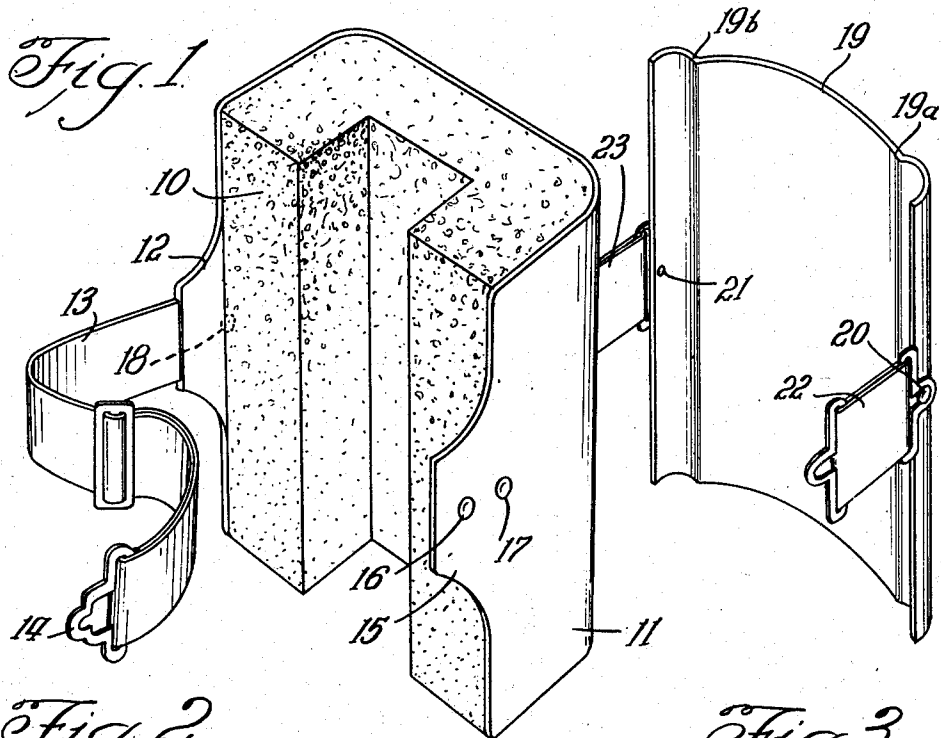
Nov. 21, 1944.

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2,363,058

KNEE PROTECTOR

Filed Nov. 14, 1941



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*Fig. 4*

# UNITED STATES PATENT OFFICE

2,363,058

## KNEE PROTECTOR

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Application November 14, 1941, Serial No. 419,147

3 Claims. (Cl. 2—24)

This invention relates to knee protectors of a type adapted to be worn by housewives, carpenters, linoleum layers, roofers, and, in fact, by all workers whose work is done on the knees. Applicant is aware that many knee protectors have been invented and many attempts to merchandise them have been made. However, no great commercial success has resulted from such efforts due, in applicant's opinion, to the ineffectiveness of these devices. It has been the applicant's experience and observation that knee workers should be supported by the portion of the leg immediately below the knee; the front or lowermost portion of the leg—the upper shin section—being quite bony and sensitive, is least adapted to support the worker's weight. Any knee protector which permits this portion of the leg to carry the operator's weight is sure to cause discomfort after an extended period of time. Even a soft pad under the shin is soon compressed and becomes hard and uncomfortable if the weight is permitted to rest at this point.

The particular object of this invention is to provide a knee protector in which the weight is largely supported from the side portions of the leg.

Another object is to provide a knee protector which naturally grips the side portions of the leg and is held securely in position by this gripping action without undue binding stress around the leg.

A still further object is to provide a knee protector of sturdy, low-cost structure which may be bought and used by housewives for ordinary home use and which may be used by male workers in the industrial arts by attaching sturdy protector shoes.

Other objects and benefits will be disclosed in the following descriptions and drawing, in which:

Fig. 1 is a perspective view of my knee protector with adjacent attachment shoe;

Fig. 2 is a top plan view of the protector attached to the upper part of the leg of the worker showing the gripping action of the inner sponge rubber, as will later be explained;

Fig. 3 is an end elevational view showing the protector as it appears with the worker's weight imposed thereon and with this weight largely supported from the sides of the leg, as will later be explained; and

Fig. 4 is a transverse cross-sectional view of an optional structure of the protector shoe, as will later be explained.

Now referring to the drawing, and at the outset particularly to Fig. 1, I designate my inner sponge

rubber pad by the numeral 10. This pad is preferably molded from comparatively soft sponge rubber in U cross section with the inner dimension of the U much narrower than the worker's leg. When the pad is bent outwardly to apply to the leg such outward movement is resisted by the springing of the pad to provide a gripping action, as will later be more fully explained. If the natural spring action of the pad is not sufficient a metallic spring should be inserted. To the outside of the pad 10 I attach a canvas cover 11, preferably by securely vulcanizing the parts 10 and 11 together. On one side of the canvas cover 11 I have an attachment tab 12 to which I stitch a conventional adjustable resilient garter member 13 having an attachment clip 14 adapted to attach to an opposite tab member 15 carrying an attachment stud 16. This is a conventional garter fastening means, although I wish it to be understood that I adjust the garter member 13 to only slight tension, so as not to unduly bind the wearer's leg and cause stoppage of circulation, as my knee protector is normally held in secured position by the gripping action of the rubber pad member 10 by its inner side edges on the sides of the legs of the wearer.

On the tabs 12 and 15 I mount two additional attachment studs 17 and 18 as shown, these studs being available for industrial workers to fasten on a protector shoe, as will now be explained. I provide a protector shoe 19 having longitudinal ridges 19a and 19b. I preferably form this shoe of a resilient fabric-reinforced phenolic condensation product, such as Bakelite, because this material is light in weight while being flexible, sturdy and highly resistant to wear. The shoe 19 also carries attachment studs 20 and 21, by which the shoe 19 is attached to the studs 17 and 18 through resilient attachment members 22 and 23, as shown. By this arrangement it will be appreciated that I provide knee protectors having a canvas covering properly adapted for the use of housewives in the ordinary household tasks but which may be readily utilized by workers in the industrial arts by the attachment of wear-resistant shoe members 19. In some cases the pad 10 and cover 11 may be formed integrally, thus eliminating the cover 11.

Now referring to Fig. 2, I show my knee protector as applied to the upper portion of a worker's leg when in seated position. It will be noted that the inner edges of the pad 10 bear on the sides of the worker's leg at the points 10a and 10b and are held there in firm gripping action by the pad as it tends to spring inwardly,

as shown by the arrows C and D. When in this position the pad 10 is distorted in a manner as shown, with the center section of the pad bearing at *e* but with the inner surface of the pad bending outwardly as at *f* and *g* and with two outwardly bent edges *h* and *i*. It is obvious that when weight is applied to the protector held in this position, the greater part of the weight will be absorbed along the lines J and K, as shown by the arrowed lines. When the worker's weight is thus applied the pad will then assume the position as shown in Fig. 3 and it will be carefully noted that the side sections S-1 and S-2 are greatly compressed while the bottom section B is more nearly of its original area. Thus it will be apparent that the major part of the worker's weight is carried by the side portions of the leg and not the sensitive lower shin portion. When the shoe 19 is applied it will be observed that the ridge sections 19a and 19b assist in holding the side sections of the rubber pad 10 and thus coact in assuring that the worker's weight is carried by the side sections S-1 and S-2, as shown.

In Fig. 4 I show an optional structure 19' for the shoe 19. In this optional arrangement I embed small conventional ball rollers 24 in the Bakelite shoe 19'. For ordinary use four of these rollers would be used but under some conditions I may use only two and under other conditions more than four. It will be appreciated that with these ball rollers the operator will be able to more easily move on his knees and thus the kneeling worker is further assisted in his work.

While I have shown a preferred embodiment of my invention, it will be appreciated that many variations may be made without departing from the spirit of the invention. It will be understood that I do not wish to be restricted to the specific disclosure except as imposed by the following claims.

I claim:

1. A knee protector comprising a pad having a base portion with upstanding opposite sides substantially U-shaped in cross-section, said base portion and sides being of appreciable thickness and formed of soft yieldable material, the outer edges of the sides being spaced apart a distance appreciably less than the width of the portion of the human leg between said outer edges of the sides when the leg is pressed against the base,

and the sides extending outwardly from the base a distance sufficient to receive and support the major portion of the weight of the leg when pressed between the sides greater than the weight supported directly on the base, and means for attaching said pad to the leg.

2. A knee protector comprising a pad having a base portion with upstanding opposite sides substantially U-shaped in cross-section, said base portion and sides being of appreciable thickness and formed of soft yieldable material, the outer edges of the sides being spaced apart a distance appreciably less than the width of the portion of the human leg between said outer edges of the sides when the leg is pressed against the base, and the sides extending outwardly from the base a distance sufficient to receive and support the major portion of the weight of the leg when pressed between the sides greater than the weight supported directly on the base, means for attaching said pad to the leg, a separate shoe abutting against the outer face of the base, tabs attached to opposite sides of said shoe, and fastenings on the outer face of each side of the pad detachably engaging said tabs for removably securing the shoe on the pad.

3. A knee protector comprising a pad having a base portion with upstanding opposite sides substantially U-shaped in cross-section, said base portion and sides being of appreciable thickness and formed of soft yieldable material, the outer edges of the sides being spaced apart a distance appreciably less than the width of the portion of the human leg between said outer edges of the sides when the leg is pressed against the base, and the sides extending outwardly from the base a distance sufficient to receive and support the major portion of the weight of the leg when pressed between the sides greater than the weight supported directly on the base, a shoe formed of resilient material and secured at the outer face of the base of the pad, said shoe having longitudinal ridges adjacent opposite edges of the pad embracing the base portion of the pad and normally confining said base portion in upwardly bowed relation therebetween in position to be deflected downward against the shoe upon the application of pressure against the pad, and means for securing the pad on the leg.

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