April 2, 1940. J. JOHNSON 2,195,817

KNEE SHOE

Filed June 10, 1938 2 Sheets-Sheet 1

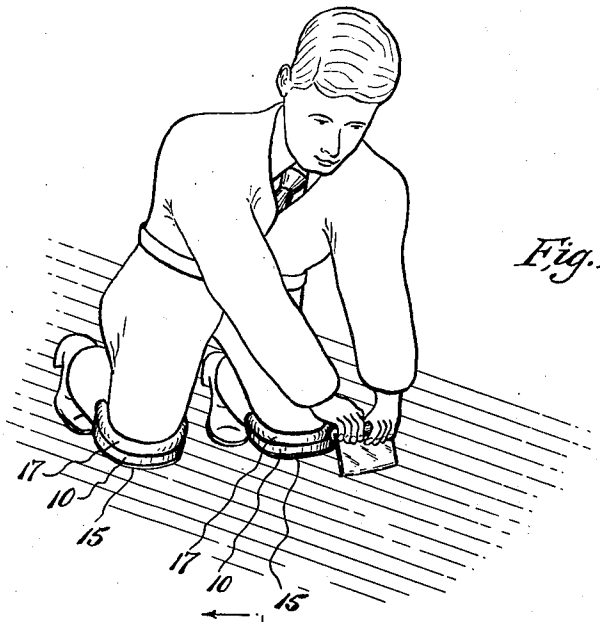

Fig. 1

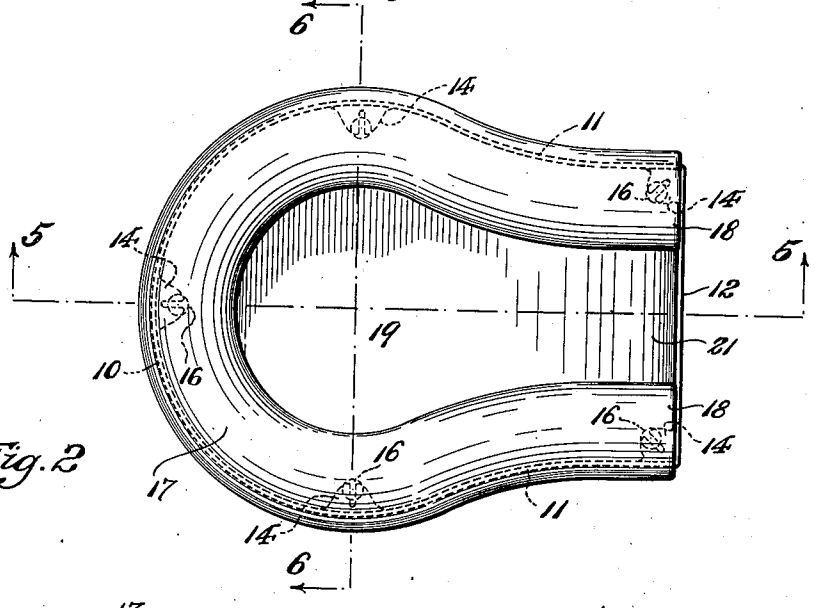

Fig. 2

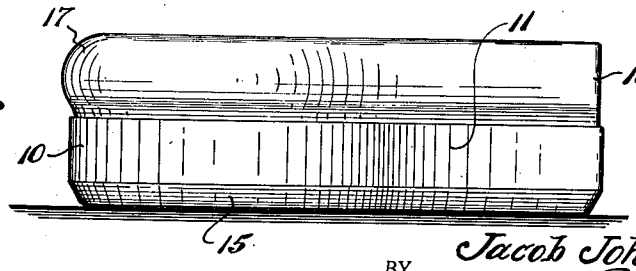

Fig. 3

INVENTOR.

BY Jacob Johnson,
George D. Richards,
ATTORNEY.

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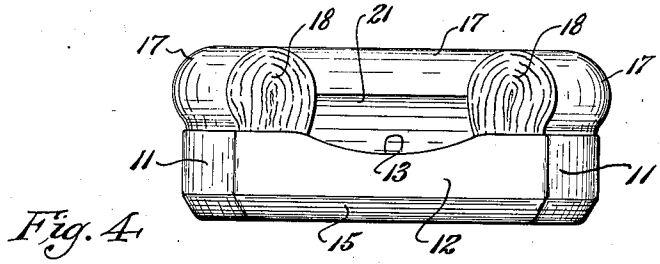

Fig. 4

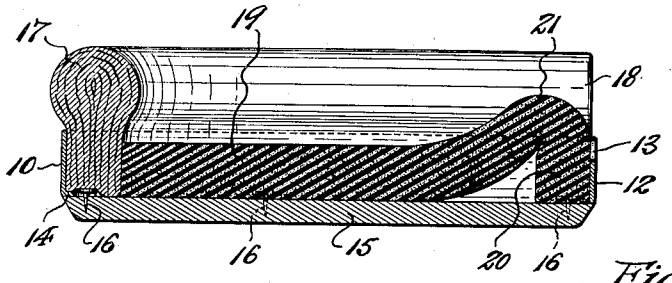

Fig. 5

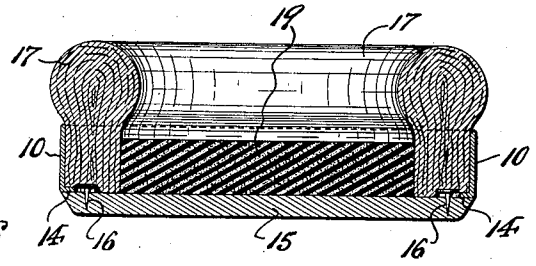

Fig. 6

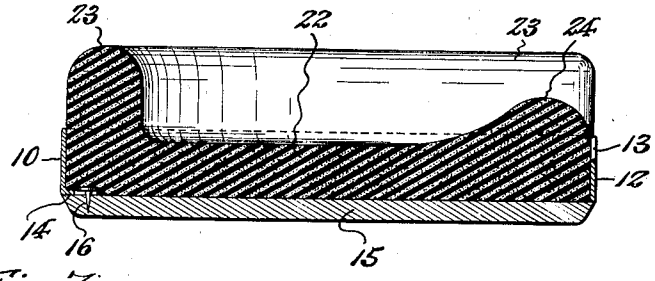

Fig. 7

INVENTOR.

BY Jacob Johnson,

George D. Richards

ATTORNEY.

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UNITED STATES PATENT OFFICE

2,195,817

KNEE SHOE

Jacob Johnson, Newark, N. J.

Application June 10, 1938, Serial No. 212,955

3 Claims. (Cl. 2—24)

This invention relates, generally, to improvements in cushioning kneeling supports; and the invention has reference, more particularly, to novel knee shoes or pads adapted to cushion and support the knees of the user when occupying a kneeling position, but in such manner as to permit free mobility of the legs for moving and shifting about without necessity of rising from such kneeling position.

This invention has for an object to provide a novel construction of knee shoe or pad, to be furnished in pairs so as to provide a shoe or pad for each knee of the user; said shoes or pads being so constructed and shaped as not only to provide soft cushioning supports for the knees of the user, when the latter works in a kneeling position, but also being adapted for easy sliding propulsion over the surface knelt upon under the user's leg movements but without necessity for employment of any fixed attachment to the user's legs, thus permitting the user, while remaining in kneeling position, to quickly and easily shift about over the surfaces knelt upon, as occasion may require.

The invention, thus generally characterized, provides novel independently mobile knee cushioning supports for each knee adapted to serve the user when working upon floor and like surfaces in a kneeling position; the novel knee shoes or pads are of especial advantage to floor-scrapers, painters, scrub-women and all others performing work which requires them to operate in a kneeling position, and to shift about over the surface knelt upon.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of the invention are shown in the accompanying drawings, in which—

Fig. 1 is a pictorial view of a worker utilizing the novel knee shoes or pads made according to this invention; Fig. 2 is a plan view of one of the novel knee shoes or pads; Fig. 3 is a side elevation of the same; Fig. 4 is a rear end elevation of the same; Fig. 5 is a longitudinal sectional view of the same, taken on line 5—5 in Fig. 2; and Fig. 6 is a transverse sectional view of the same, taken on line 6—6 in Fig. 2.

Fig. 7 is a longitudinal sectional view of a modified form of knee shoe or pad structure according to this invention.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawings, each knee shoe or pad comprises a frame member 10 of substantially rigid material, preferably made of metal in the form of an upstanding wall of suitable height. This frame member at its front or toe portion is of semicircular form, the rearwardly extending sides 11 of which are convergingly disposed to join the preferably straight transverse rear end portion 12. The upper marginal part of said end portion 12 is cutaway to provide a curvilinearly shaped indentation 13 intermediate the extremities thereof. Integral with the bottom marginal portions of said frame member 10, and disposed in suitably spaced apart relation therearound to project interiorly thereof in the plane of its bottom edges, are a series of apertured ears or lugs 14. Secured to the underside of said frame member 10 is a sole plate 15, the same being securely fastened in assembled relation to the frame member by fastening devices extending downwardly through the apertured ears or lugs 14 into the body of said sole plate. Said fastening devices, as shown, comprise nails 16, but it will be obvious that any other suitable type of fastening device may be optionally employed. The sole plate 15 may be made of any suitable material, but is preferably made of stiff leather or similar material.

The assembled frame member and sole plate provide an upwardly open socketed or chambered base, in the socket or chamber of which is disposed the knee cushioning means of the structure. In a preferred form thereof, said knee cushioning means comprises an upstanding substantially U-shaped rearwardly open marginal cushion member 17, which extends around the toe and side portions of the frame member 10 contiguous to the inner face of the walls of the latter, with the respective extremities 18 thereof terminating at the transverse rear end portion 12 of the frame member, so as to provide a rearwardly open gap therein. Said marginal cushion member 17 is formed to provide an upper portion of rounded shape in cross section, and disposed to project well above the plane of the top edges of said frame member 10. Said marginal cushion member 17 may be made of any suitable material calculated to provide comparatively soft and resilient characteristics. For example, said marginal cushion member 17 may comprise a felt body of suitable thickness and doubled transversely to form the desired top portion of rounded cross-sectional shape. The bottom portions of the felt body thus formed are inserted within the frame member 10 so as to abut the inner sides

thereof and so as to rest upon the bottom of the socketed base formed by said assembled frame member 10 and sole plate 15. When thus assembled, said felt body is suitably secured against displacement, as, e. g., by gluing the same to the surfaces of the frame member and sole plate which it abuts.

Said knee cushioning means further comprises a bottom cushion member 19, which is of a peripheral shape to conform to the interior space within and defined by said marginal cushion member 17. Said bottom cushion member is of suitable thickness, and is disposed so that its main forward portion lies flat within the socketed base and upon the sole plate 15. The rearward narrowed end portion of said bottom cushion member is of a length in excess of the length of the chamber provided by the socketed base, so that its rear extremity 20 may be down-folded into an angular relation to the main forward portion and thereupon pushed into said chamber to lie in abutting contiguous relation to the interior face of the rear end wall 12 of the frame-member 10. By such disposition and arrangement of the rearward end portion of said bottom cushion member, the same is provided with a transverse upstanding rounded cross-rib 21 which projects above the indented top margin of the rear end wall 12 of said frame member 10 and above the top surface plane of the flat lying main forward portion of said bottom cushion member. Said bottom cushion member may be made of any suitable material calculated to provide comparatively soft and resilient characteristics. Preferably the bottom cushion member is made of sponge rubber of suitable thickness. Said bottom cushion member is suitably secured against displacement from operative assembled relation, as e. g. by gluing the same in place.

It will be observed that the bottom cushion member, when in place, occupies a plane below the plane of the upwardly projected rounded top of the marginal cushioning member 17, thus providing a pocket or socket within which the knee of the user may be received.

The novel knee shoes or pads, characterized as above described, are used in pairs, one for each knee. In the use thereof, the user merely kneels upon the same, and in so doing the knees respectively enter the pocket or socket of the cushion structure of the respective shoes or pads, in such manner that the kneepan or patella will rest upon the main forward portion of the bottom cushion member 19, while the adjoining end of the femur and the tuberosity of the tibia will be embraced and cushioned by the upstanding marginal cushion member 17 and the cross-rib portion 21 of the bottom cushion member. The tapering portion of the tibia, below the tuberosity thereof, will extend outwardly over the cross-rib portion 21. It will thus be seen that the knee, as bent in kneeling position, is not only resting upon the bottom cushion member, but is also snugly embraced all around the front, sides and rear portions thereof, and consequently is not only supported and cushioned in an exceedingly comfortable manner, but also so that transmission of movement to the shoes or pads in any direction, merely by movement of the user's legs, is easily accomplished. The user, therefore, may slide the shoes or pads along the surface knelt upon so as to shift position as required without necessity of rising from kneeling position. Forward and sidewise movements are easily transmitted to the shoes or pads by corresponding leg movements by reason of the abutment of the forward and side portions of the bent knee against the upstanding marginal cushion member 17, while rearward movement is transmitted by pressure of the rearward portions of the bent knee against the cross-rib portion 21 of the bottom cushion member. Owing to the structure and mode of operation described, no devices are required for affixedly attaching the shoes or pads to the user's knees. By reason of the fact that each knee is individually equipped with a shoe or pad, free and independent mobility of the user's legs is possible, and consequently shifting of the user's position, as required, is easily attained by mere swinging or walk-like movements of the legs.

In Fig. 7 I have shown a modified form of the novel knee shoe or pad, comprising the same structure and assembly of frame-member 10 and sole plate 15, but utilizing a modified form of cushion structure. Such modified cushion structure comprises a one-piece pad body preferably formed of sponge rubber, to provide a bottom cushion section 22, surrounded at its front and sides by an upstanding marginal cushion section 23, and provided at its rear end, between the rearward ends of said marginal cushion section 23, with a transversely extending raised portion or cross-rib section 24 of less height than said marginal cushion section 23. It will be obvious that in use, such modified form of knee shoe or pad will function in the same manner and with the same advantages as already set forth with respect to the first described construction of knee shoe or pad. The knee shoe structure, especially in the above described modified form may be simplified by omitting the frame-member 10, in which case the cushion body may be cemented to the sole plate 15.

It will be understood that many changes could be made in the above described constructions, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof as defined by the following claims. It is therefore intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Strapless cushioning knee supports constituted by a pair of knee shoes, each shoe comprising a flat rigid sole plate and a rigid upstanding peripheral frame member affixed to said sole plate, an upstanding marginal cushioning element extending around and abutting the interior faces of the sides and front but terminating at the back wall of said frame member, said marginal cushioning element being of a height substantially exceeding the height of said frame member, said marginal cushioning element comprising a strip of soft resilient material folded lengthwise upon itself to provide a readily yieldable knee conforming rolled top edge portion freely projecting above the upper margin of said frame member, and a bottom cushion member supported by said sole plate within the confines of said marginal cushioning element.

2. Strapless cushioning knee supports constituted by a pair of knee shoes, each shoe comprising a flat rigid sole plate and a rigid upstanding peripheral frame member affixed to said sole plate, an upstanding marginal cushioning element extending around and abutting the interior faces of the sides and front but terminating at the back wall of said frame member, said marginal cushioning element being of a height substantially exceeding the height of said frame member, said

marginal cushioning element comprising a strip of soft resilient material folded lengthwise upon itself to provide a readily yieldable knee conforming rolled top edge portion freely projecting above the upper margin of said frame member, a bottom cushion member supported by said sole plate within the confines of said marginal cushioning element, said bottom cushioning member having its rear end portion doubled back and downwardly and disposed perpendicular thereto to lie contiguous to the rear wall portion of said frame member thereby to provide a raised resilient rearward cross rib extending between the rear ends of said marginal cushioning element but of a height less than the height of the latter.

3. Strapless cushioning knee supports constituted by a pair of knee shoes, each shoe comprising a flat rigid sole plate and a rigid upstanding U-shaped peripheral frame member including a transverse rear wall between the sides thereof, means for fastening said frame member fixedly to said sole plate, an upstanding marginal cushioning element extending around and abutting the interior faces of the sides and front but terminating at the back wall of said frame member, said marginal cushioning element comprising a strip of soft resilient material folded lengthwise upon itself to provide a readily yieldable knee conforming rolled top edge portion freely projecting above the upper margin of said frame member, a bottom cushion member supported by said sole plate within the confines of said marginal cushioning element, said bottom cushioning member having its rear end portion doubled back and downwardly and disposed perpendicular thereto to lie contiguous to the transverse rear wall of said frame member thereby to provide a raised resilient rearward cross rib extending between the rear ends of said marginal cushioning element but of a height less than the height of the latter.

JACOB JOHNSON.