Feb. 8, 1949. T. E. MEANY 2,460,895

JOINT PROTECTOR

Filed Dec. 17, 1945

FIG. 1

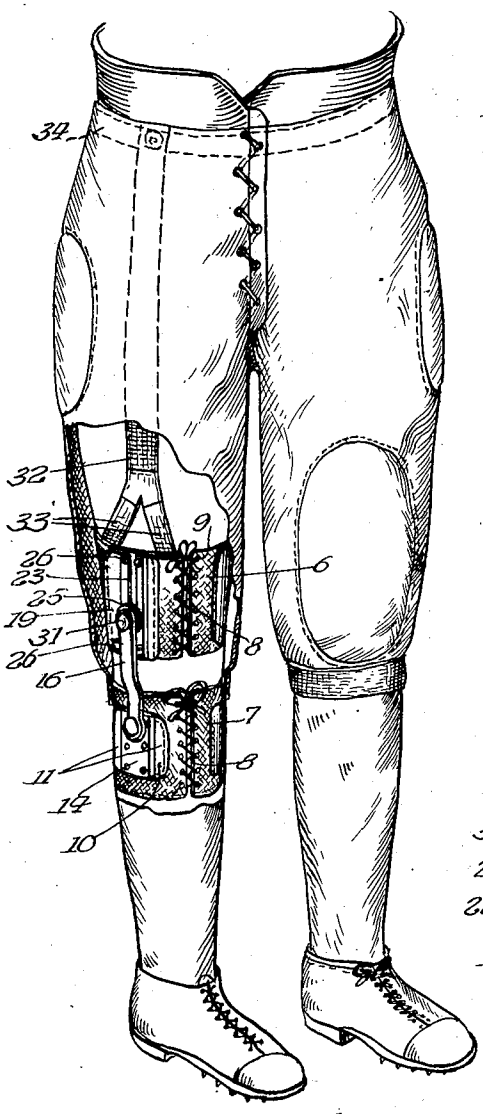


FIG. 2

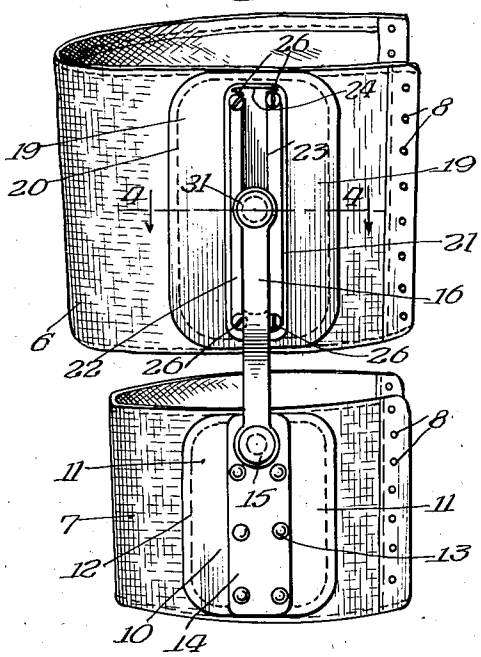


FIG. 3

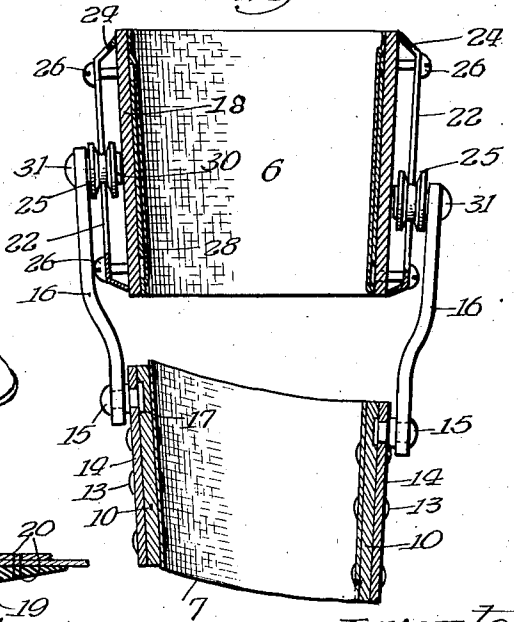
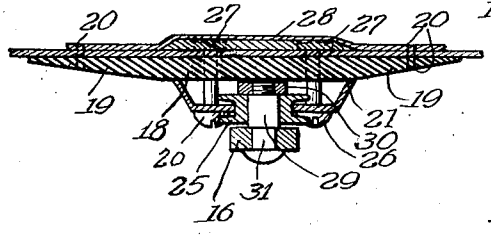


FIG. 4



Inventor:
Thomas E. Meany
By Kent M. Monnoff
Atty.

Patented Feb. 8, 1949 2,460,895

UNITED STATES PATENT OFFICE

2,460,895

JOINT PROTECTOR

Thomas E. Meany, Chicago, Ill.

Application December 17, 1945, Serial No. 635,460

8 Claims. (Cl. 2—24)

1

This invention relates in general to a protector for the elbow or knee joints of a wearer although more particularly described as a knee joint protector to prevent injury or dislocation at the knee joint.

An important object of the invention is to provide hinged and slidable supports at one or both sides of each knee, or other joint, for protecting the members of that joint against relative lateral movement or displacement without interfering with the normal hinging action of the joint.

Another object of the invention is to provide improved means for supporting a guard or pair of guards at opposite sides of the knee for free hinging movement and at the same time and in any hinged position providing a protection against relative lateral movement or dislocation of the knee joint.

A further object of the invention is to provide a knee protector having lateral braces secured above and below the joint, one end of the brace having a pivotal connection and the other end of the brace having a pivotal and sliding connection.

A further object of the invention is to provide a knee protector which has lateral braces at the sides of the knee having means for supporting the braces below and above the knee with pivotal and sliding connections and with added means for maintaining the position of the protector by supporting it from the belt or waist of a wearer.

A further object of the invention is to provide a knee joint protector having lateral braces supported above and below the knee for pivotal and sliding movement, the protector adapted to be worn below the ordinary clothing and having additional means for holding the protector in position from the waist or belt of a wearer.

A further object of the invention is to provide a knee joint protector for football and other game players which may be worn beneath the ordinary playing clothes to protect them against injury and to prevent another player from injury upon contact with the said protector.

Other objects of the invention will appear in the specification and will be apparent from the accompanying drawings in which

Fig. 1 is a perspective view with parts broken away for clearness showing the present invention as it may be applied to the leg of a football player;

Fig. 2 is a side elevation of a protector as shown in Fig. 1;

2

Fig. 3 is a longitudinal sectional view of the structure shown in Fig. 2; and

Fig. 4 is a transverse sectional view as taken on the line 4—4 of Fig. 2.

Although this invention is intended to be used to protect and prevent lateral dislocation of the knee joint, it is particularly designed and intended for protecting the knees during the playing or practicing in rough games such as hockey, football, basketball and the like, and more particularly during the practice in such games where the dislocation of a knee joint may incapacitate a player for an important game or contest. In a protector of this kind it is desirable not only that the side braces may be strongly supported but also that they provide free action without limitation of the movement of the legs, and also that the parts of the brace do not objectionably engage either the person of the wearer or the body of another person upon contact with one of the braces.

Referring now more particularly to the drawings, the knee protector of this invention comprises a pair of bands 6 and 7 for each joint, one preferably larger than the other to fit above the knee and the smaller one suitably shaped to fit over the calf and below the knee. Both of the bands are provided with eyelets or openings 8 for receiving laces 9 by which they are tightened about the legs of a wearer.

Attached to the lower band 7 are supporting pads 10 for opposite sides of the leg, preferably of leather or similar material each having a central portion of uniform thickness and side edges 11 tapering in thickness and connected by stitches 12 or any other suitable fastening means to the material of the band 7. Secured to the pad 10 by rivets 13 or other suitable fastening devices is a plate 14 preferably of metal which carries a stud 15 upon which the lower end of a brace 16 is pivoted. The stud is preferably secured through the plate 14 and at the underside thereof by means of a threaded portion and a nut 17 thereon which is received in a recess or imbedded in the pad 10 so that the nut and bolt will not protrude at the inner side of the band.

Similarly mounted on the upper band 6 are pads 18 for the inner and outer sides of the leg each having bevelled edge portions 19 and secured to the band by stitching. A plate 21 extends longitudinally of the supporting pad 18 and has a raised portion 22 with a longitudinal slot 23 closed at the lower end of the plate and having an opening 24 at the upper end of the slot through which a mounting wheel 25 may

be inserted, the wheel having opposite flanges seating it for engagement with the sides of the slot 23 against its movement in either direction and permitting the free movement of the wheel longitudinally of the slot. To attach the plate to the supporting pad 18 and also to the material of the band 6 a plurality of fastening bolts 26 are inserted through the ends of the plate 21, the pad 18 and the band 6, with flat nuts 27 at the inner side of the band where they are protected from contact with the leg of a wearer by a fabric cover 28 or any other suitable means which may also be held in place by the stitches 20.

Extending through each mounting wheel 25 is a shouldered stud bolt 29 having a fastening nut 30 at the inner end of the bolt and the inner end of the wheel and a shouldered portion 31 for pivotally engaging the upper end of the brace 16. With this construction each brace 16 will move freely in the slot 23 of the plate 21 and will turn freely about its pivot in the lower band 7 and also will rotate freely about the pivoting wheel 25 which permits both a pivoted and longitudinal movement. The upper bolts 26 by which the plate 21 is held in place are also located close to the upper end of the slot 23 so that when they are in place they will prevent the outward movement of the pivoting wheel 25. To remove the pivoting wheel from the slot these upper bolts 26 must first be removed and the wheel 25 may then be disengaged from the slot.

Since the size of the upper band 6 is somewhat larger than that of the lower band 7, each side brace 16 is formed with an offset intermediate its ends as shown more clearly in Fig. 3 and since the inner side of each leg is usually shorter than the outer side of the leg, the outer brace 16 is preferably longer than the inner side. If it should happen that the inner side of a wearer's leg is longer than the outer side, which sometimes is the case, the protectors may be reversed to place the longer braces at the inner side of the legs.

In order to insure that the upper bands 6 do not slip downwardly, a support 32 like a garter or portion of a suspender having spaced extremities 33 which are attached to the upper end of each band 6 at opposite sides of the pad 18 as shown in Fig. 1 and the upper end of each supporter is attached to a belt 34 around the waist of a wearer.

This protector is designed and intended to be worn inside of the ordinary playing clothing as shown in Fig. 1 and in direct contact with the leg of a wearer and may be adjusted and tightened to fit legs of different sizes. Since the joint action is the same, no adjustment of the brace lengths is needed except that it is preferable to have the brace at one side longer than at the other side as above stated.

It is also desirable to have the outer ends of all projecting parts as flat or rounded and with as little projection as possible so that no injury or discomfort will be caused by the ordinary wearing of the protector and no damage or injury will be caused to the wearer by forcible contact of another player with the protector, and no injury to the other player who does come in contact with the projections of the protector.

Additional padding may be provided at the inside of the bands if desired to protect the wearer and the clothing outside of the protector itself usually is sufficient for preventing injurious contact with some other person.

While the preferred construction has been described in connection with a knee joint protector, various other constructions, combinations and arrangements may be made without departing from the spirit and scope of the invention.

I claim:

1. In an athletic joint protector for a movable hinged joint, a pair of bands adapted to be tightly applied to the limb above and below the joint, a pair of braces, one for each side of the limb and having an offset therein to accommodate it to different sizes of the limb above and below the joint, means on one of the bands providing a fixed pivotal joint for each of the braces, and means connecting the other end of each brace and the other band to provide a pivotal and sliding connection of the brace therewith, the braces being relatively movable to accommodate the limb hinging action and forming a guard against displacement of the joint transversely of the hinging action.

2. In a joint protector of the class described, a pair of bands for attachment above and below the joint, a pair of side guards attachable to the bands, each side guard comprising a brace having a fixed pivotal connection at one end with one of the bands and having a pivotal and sliding connection at the other end of the brace with the other band, the pivotal and sliding connection comprising a flanged mounting wheel secured to the brace, and a slotted plate which is engaged by the wheel flanges for permitting a swinging and sliding movement of the braces and for preventing a relative movement of the joint parts at right angles to the movement of the brace.

3. In a joint protector for hinged joints, a pair of bands tightly attachable above and below the joint, a pair of side guards connecting the bands at opposite sides of the joint, each guard comprising a brace having a pivotal connection with one of the bands and having a pivotal and slidable connection with the other band to permit a normal free action of the joint, and one of the braces being longer than the other to accommodate the difference in the size of a limb at opposite sides thereof above and below the joint.

4. In a joint protector, a pair of bands for attachment about a limb above and below the joint, a pair of side guards attachable to the bands at opposite sides of a limb, each side guard comprising a brace, means comprising plates secured to one of the bands at opposite sides and each having a fixed pivotal connection with one end of the corresponding brace, means comprising a slotted plate fixed to the other band with an opening at the upper end of the slot of the plate, a mounting wheel attached to the upper end of the brace and movable in the slot and of a size to slip through the opening at the upper end of the plate for attaching and removing the mounting wheel, and means at the upper end of the slot to prevent accidental removal of the mounting wheel.

5. In a joint protector, a pair of bands adapted to be tightly attached around the leg or arm of a wearer above and below the joint, a pair of braces connecting the bands one at each side of the joint to prevent lateral displacement of the leg or arm at the joint, and mounting means for connecting each end of both braces with the supporting bands, said mounting means for one end of each of the braces comprising a plate, a pad interposed between the plate and the band and the pad having a central portion of uniform thickness to which the plate is applied and having beveled edge portions extending from the

central portion attached to the band for forming a flexible connection therewith at the edges of the pad, and means forming a pivotal and sliding connection between the other end of each brace and the other supporting band.

6. A joint protector, comprising a pair of bands adapted to be attached above and below a joint, a pair of side braces connecting the bands at the joint, means forming a pivotal connection with each brace and one of the bands, means forming a pivotal and sliding connection with each brace and the other band to permit a free hinging action of the joint, and means for supporting one of the bands to prevent it from slipping toward the joint.

7. In a joint protector, a pair of bands for tightly engaging a limb at opposite sides of a hinged joint, the bands being graduated in size to fit tightly about the limb above and below the joint, a pair of braces located at opposite sides of the joint, each brace having a pivotal connection with one of the bands and a pivotal and sliding connection with the other of the bands to permit a free hinging movement of the joint, the braces being offset intermediate their ends to accommodate the braces to limb portions of different sizes, and the opposite braces for each limb being of different lengths to accommodate the protector to limb portions of different sizes at the inside and outside of the limb.

8. A knee joint protector, comprising a pair of bands each adapted to fit tightly about the leg of a wearer above and below the knee joint, a pair of side braces, the braces of each pair being offset between their ends and one brace slightly longer than the other to accommodate them to the changes in size of the leg above and below the joint, each brace having means forming a pivotal connection with one of the bands and means forming a pivotal and sliding connection with the other of the bands, said connections permitting a free hinging action of the knee joint and providing a guard for preventing lateral displacement and injury to the portions of the joint from the sides thereof.

THOMAS E. MEANY.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
21,872	Bunce	Oct. 26, 1858
554,776	Davis et al.	Feb. 18, 1896
562,608	Herbelin	June 23, 1896
1,457,710	MacDonald	June 5, 1923
2,144,641	Snyder	Jan. 24, 1939