Sept. 9, 1969 B. J. JONES ET AL 3,465,365

KNEEPAD

Filed Dec. 15, 1967

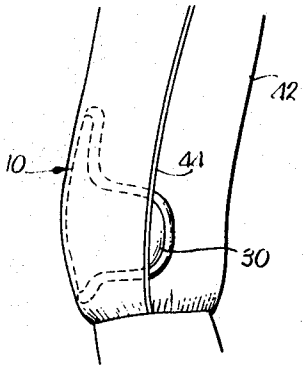


Fig.2.

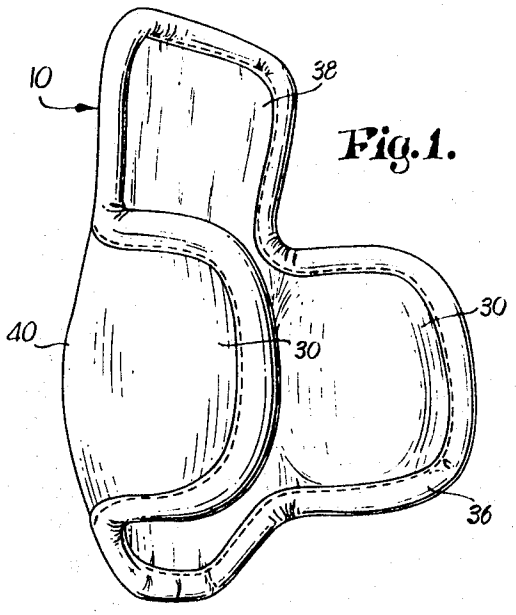


Fig.1.

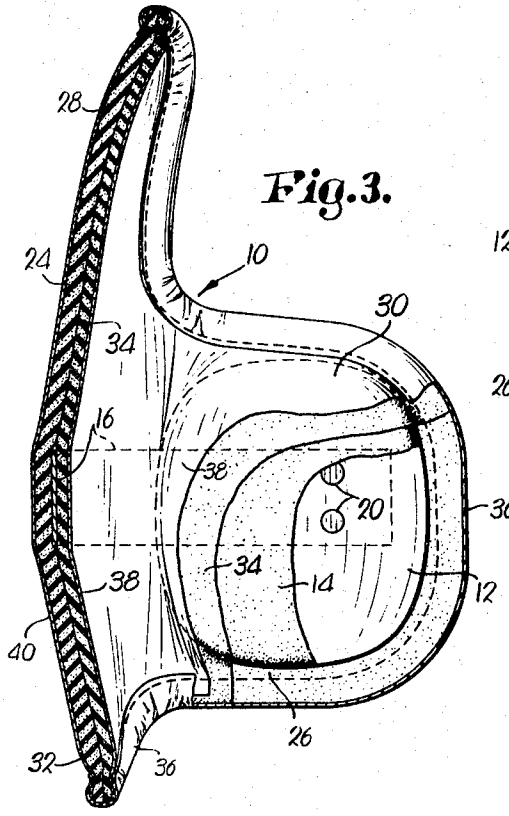


Fig.3.

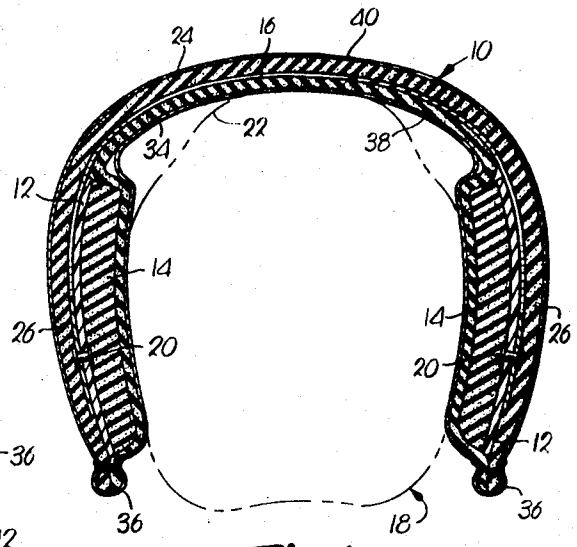


Fig.4.

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KNEEPAD

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ABSTRACT OF THE DISCLOSURE

A kneepad having a pair of spaced-apart, opposed, relatively hard plates with a cushion on the inner face of each plate in position to engage the sides of a wearer's knee. The plates are interconnected by an elongated, U-shaped band of spring material which passes around the front of the kneecap and biases the plates toward the knee. The plates are concavo-convex to conform to the shape of the knee and to cooperate with the band in presenting a convex outer surface to a covering of resilient material. The convex outer surface serves to shield the knee from direct blows.

This invention relates to protective equipment, and more particularly to a kneepad such as may be used by athletes to prevent injuries to the knees.

Considerable improvement has taken place in recent years in the protective equipment for participants in athletic contests such as football games and the like. The improved equipment has reduced the danger of injury to certain parts of the body. However, there has been very little change in the padding available for protecting against knee injuries and such injuries constitute one of the major hazards for all who participate in this sport. Restriction on the flexibility of the knees must be kept to a minimum and kneepads provided for football players have remained little more than relatively soft pads of material carried in the pants in position to cushion the shock of blows directed toward the front of the knees. No provision has been made to protect against blows to the sides of the knees.

Accordingly, it is a primary object of this invention to provide a kneepad for athletes such as football players or the like which is of improved construction for protecting the knees from side, as well as frontal blows.

It is another object of the invention to provide an improved kneepad which is capable of adding support to the members of the knee joint.

Still a further object of the invention is to provide protective equipment which surrounds the front and sides of the knee joint to present a relatively hard, convex outer surface for deflecting blows directed toward the knees.

A yet further object of the invention is to provide equipment capable of attaining the foregoing objects without sacrificing the inherent flexibility of the knee necessary for the athlete while participating in athletic events.

Still a further object of the present invention is to provide an improved kneepad which may be readily incorporated into conventional football uniforms with a minimum of modification of the uniforms.

These and other objects of the invention will be more fully explained or will become apparent from the following specification and drawings, wherein:

FIGURE 1 is a side and rear perspective view of a kneepad embodying the principles of this invention;

FIG. 2 is a fragmentary, side elevational view on a reduced scale of an athlete's leg showing the positioning of the kneepad in the football uniform pants;

FIG. 3 is a detailed, vertical, cross-sectional view through the kneepad, parts being broken away to reveal details of construction; and

FIG. 4 is a horizontal, cross-sectional view through the kneepad, an athlete's leg appearing in phantom to illustrate the positioning of the kneepad with respect to the knee joint.

A kneepad embodying the principles of this invention is broadly designated by the numeral **10** and includes a pair of spaced-apart, opposed, relatively hard, concavo-convex plates **12** which may be formed from fiber or similar material. Each plate **12** has a relatively thick cushion **14** of sponge rubber or similar resilient material adhesively secured to the inner-most concave surface thereof. The plates **12** are interconnected by an elongated, U-shaped, yieldable band **16** which may be formed from spring steel or the like for biasing the cushions **14** toward opposed sides of an athlete's knee **18** illustrated in phantom in FIG. 4.

The opposite ends of band **16** are secured to the respective plates **12** with means such as rivets **20**. It should be noted that the innermost concave faces of plates **12** generally conform to the outer convex configuration of knee **18**.

Band **16** is relatively wide and is disposed across the kneecap **22** of the wearer, and an outer covering of pliable material **24**, such as sponge rubber or the like, is disposed over band **16** and the plates **12** as illustrated in the drawing. It should be noted that material **24** is initially shaped generally in the configuration of a cross presenting a pair of side portions **26** bent back at opposed sides of kneepad **10** in covering relationship to the plates **12** whereby the outer surface of the entire kneepad **10** is generally convex by virtue of the configuration of the outer convex surfaces of plates **12** and the convexity imparted by the outer surface of the U-shaped band **16**. A portion **28** of material **24** extends substantially upwardly from sidepieces **30** of kneepad **10** or covering the upper front portion of the knee joint. Similarly, a portion **32** of material **24** extends below sidepieces **30** to protect the lower front portion of the knee joint. Material **24** is not only convex in a transverse direction, but has a longitudinal convexity whereby the entire outer surface of kneepad **10** is substantially convex for deflecting blows which might be directed against the knee joint.

Plates **12** and their associated cushions **14**, as well as band **16**, are entirely enclosed by material **24** and an inner sheet **34** of sponge rubber or the like, which is shaped substantially identically with material **24** and is glued or otherwise secured to the inner surfaces of material **24**, band **16** and cushions **14** with the band, plates and cushion sandwiched therebetween. The edges of material **24** and sheet **34** are bound in a peripherally extending binding **36** stitched to inner and outer layers of covering material **38** and **40** respectively. The covering material may desirably be nylon or vinyl for the purposes of rendering the entire kneepad **10** waterproof.

In use, kneepad **10** is adapted to be placed over the knee of a wearer with the sidepieces **30** disposed in gripping engagement on opposed sides of the knee. The force exerted by band **16** biasing the plates **12** and cushions **14** against the sides of the knee not only insures that kneepad **10** will remain securely in proper position on the knee, but also renders lateral stability to the knee joint. Any blows which are directed toward the sides of the knee are received by the relatively large, generally flat, hard plates **12** which serve to distribute the force of the blows over a substantial area. Further, the layers of resilient material absorb the shock of the blows and prevent injury to the knee. In similar fashion, the relatively wide band **16** of hard material distributes the force

of the blows which are directed to the front as well as to the sides of the knee and protect the latter. The blows are also deflected by the convexity of the outer surface of kneepad **10** to further eliminate the possibility of injury to the wearer of the kneepad.

It is contemplated that kneepad **10** will have particular utility in protecting the football players, and the kneepad **10** may be installed in the pocket provided for kneepads in conventional football pants **42**. Since conventional kneepads are not provided with the sidepieces **30** for protecting the sides of the knee, an opening (not shown) in the side seam **44** of the football pants may be provided to permit the extension of the sidepieces **30** rearwardly of the same **44** as illustrated in FIG. 2.

It should be noted that the increased protection which is provided by kneepad **10** for the knee joints and particularly for the sides thereof, is achieved without any substantial reduction in the freedom of movement available at the knee joint. Even though the sidepieces **30** are yieldably biased toward the sides of the knee joint by the resilient material of band **16**, the normal hinge movement of the knee joint is not impaired in any way. The position of band **16** across the kneecap permits flexing of the upper and lower portions **28** and **32** of material **24** to accommodate the bending action which occurs at the knee joint.

Although kneepad **10** may be utilized by football players, it is also contemplated that it will be particularly advantageous in protecting the vulnerable knee joints of any one who may be engaged in activities which are calculated to produce blows directed toward the knee joints. Accordingly, the reference specifically to football players made in this description should not be taken as limiting the applicability of this invention in any way.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A unitary kneepad comprising:

a pair of spaced-apart, opposed, concavo-convex, relatively hard plates each provided with a concave inner face having a cushion thereon for engagement with opposite sides of a wearer's knee, said plates having convex outer faces for deflecting blows directed toward the knee, said plates being sufficiently large to completely cover the sides of said knee;

a resilient band rigidly secured to each of said plates and interconnecting said plates for clamping the cushions against said sides of the knee;

said band being adapted for disposition across the kneecap; and

a unitary outer pad of yieldable material completely covering said plates and extending therebetween over said band, said pad extending upwardly and downwardly beyond the band for disposition above and below the kneecap, whereby to shield the knee from frontal blows.

2. A pad for protecting the knee of an athlete, said pad comprising:

a unitary member of pliable material, said member being generally shaped in the form of a cross and having a central portion and a pair of wing portions integral with the central portion and projecting from opposite sides thereof, said wing portions being bent back substantially normal to the main plane of said central portion rendering said material generally U-shaped in tranverse cross-sectional configuration;

a pair of concavo-convex, rigid plates, each plate being secured to the inner surface of a corresponding one of said wing portions with the concave surface of each of said plates being disposed in spaced, facing relationship to the other of said plates;

a cushion of resilient material for each plate respectively, each cushion being firmly secured to the concave surface of its corresponding plate;

means interconnecting said plates for urging the plates toward one another;

a unitary lining of yieldable material covering said plates, said cushions and said yieldable means, said lining having a shape similar to said member;

stitching interconnecting said member and said lining, said stitching extending substantially along the entire periphery of said pad; and

means securing the yieldable means to said member and to said lining for preventing relative movement between said plates and said yieldable means.

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