Oct. 22, 1968 D. M. LUTZ 3,406,406

JOINT SUPPORT

Filed Oct. 22, 1965

Fig. 1.

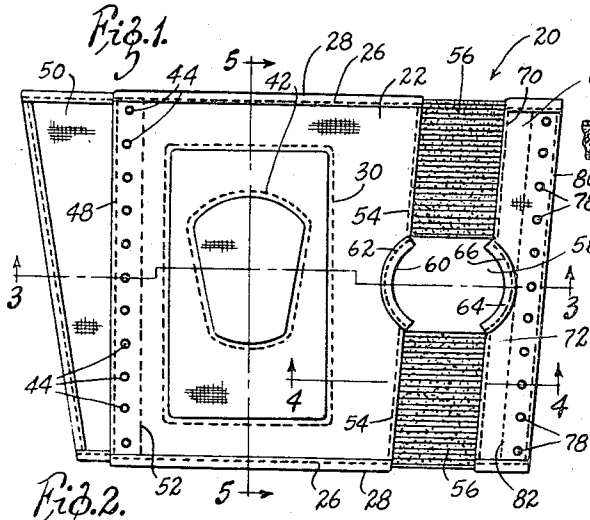


Fig. 4.

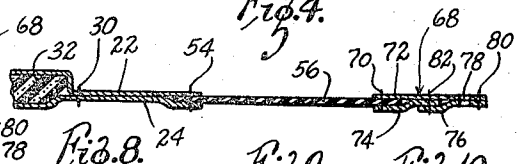


Fig. 8.

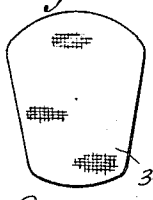


Fig. 9.

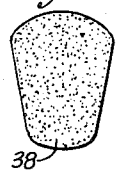


Fig. 10.



Fig. 2.

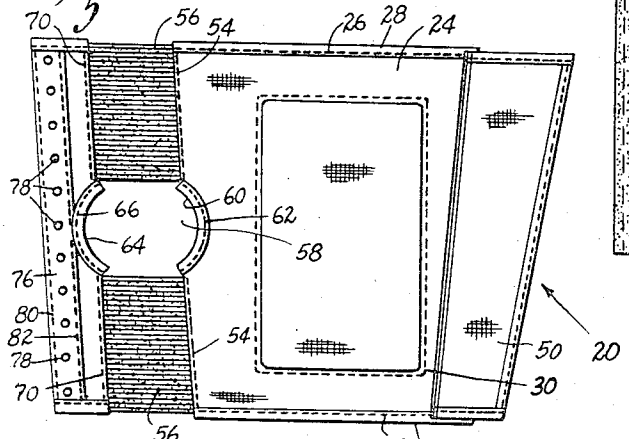


Fig. 12.

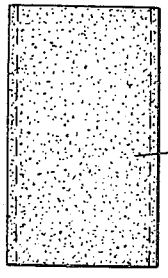


Fig. 11.

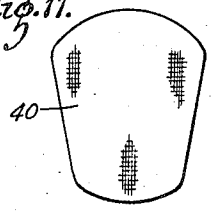


Fig. 6.

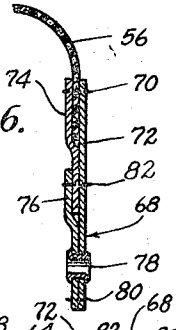


Fig. 3.

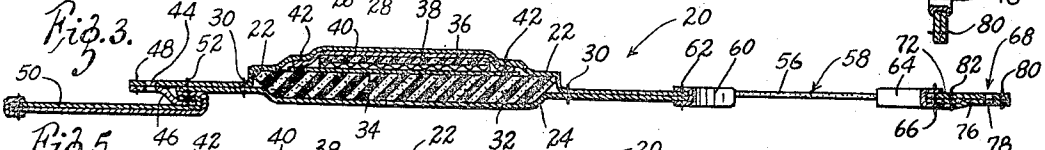


Fig. 5.

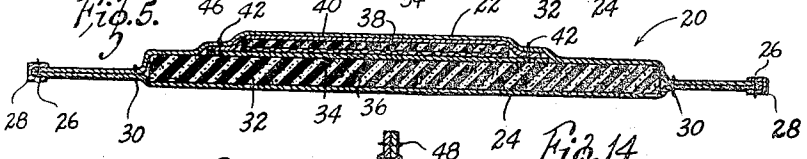


Fig. 7.

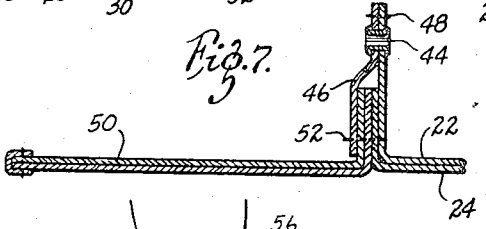


Fig. 14.

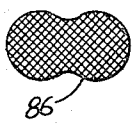


Fig. 13.

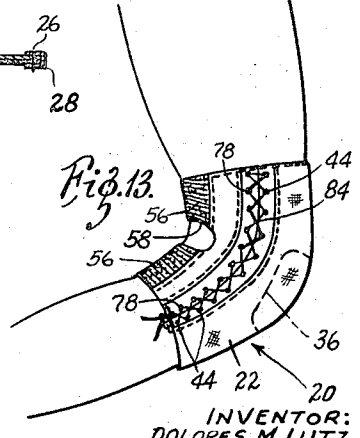
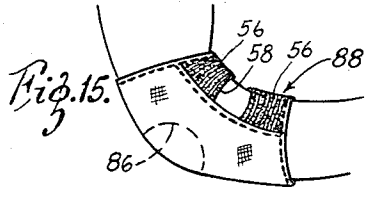


Fig. 15.



INVENTOR:
DOLORES M. LUTZ,
By Kingsland, Rogers, Ezell, Eilers & Robbins
ATTORNEYS

United States Patent Office 3,406,406
Patented Oct. 22, 1968

3,406,406

JOINT SUPPORT

Dolores M. Lutz, 3680-A Montana Ave.,
St. Louis, Mo. 63116

Filed Oct. 22, 1965, Ser. No. 501,784
2 Claims. (Cl. 2—24)

ABSTRACT OF THE DISCLOSURE

A flexible wrap-about protective and supporting structure particularly for the knee and elbow joints of the human body including an inner flexible base of substantial area, a metal force distributing member and a flexible member in contiguous relation and encased in inner and outer cover pieces disposed against the flexible base, cover pieces enclosing the base and encased members, and means uniting all of said elements.

The present invention relates generally to protective and supporting devices for joints of the human body, and more particularly to a novel supporting and protective construction for the knee and elbow before and after injury, finding wide use in athletic contests, and the like.

There has long been the need for a practical and effective supporting and protective structure for the knee and elbow of a participant in football, basketball, and other strenuous games involving physical contact. Statistics abound directed to injuries in contact sports, particularly in the knee area. The present structure supplies the long-felt need.

In brief, the present novel supporting and protective structure includes a flexible base of two layers of cloth, and the like. An outer member of soft resilient material, a metal mesh member, and the like, and an inner member of soft resilient material are trapped between said two cloth layers. Means for mounting the structure upon the knee or elbow are provided.

Hence, objects of the present invention are to provide a novel supporting and protective structure which is adapted to lend protection to the joint in contact sports, and the like, by distributing the effect of blows and which lends support to the joint at all times, which is simple in construction, yet highly effective for its intended purpose, which is adapted to fit a wide range of sizes of joints, which can be readily applied to a joint with manimum instruction in use thereof, which is relatively inexpensive, and which otherwise fulfills the objects and advantages sought therefor.

The foregoing and other objects and advantages are apparent from the following description taken with the accompanying drawings, in which:

FIGURE 1 is a top plan view of a supporting and protective structure incorporating the teachings of the present invention spread out in flat relation;

FIGURE 2 is a bottom plan view thereof;

FIGURES 3, 4 and 5 are cross-sectional views taken on substantially the lines 3—3, 4—4, and 5—5, respectively, of FIGURE 1;

FIGURE 6 is an enlarged view of the right end portion of FIGURE 4;

FIGURE 7 is an enlarged view of the left end portion of FIGURE 3 with the fastening elements at ninety degrees thereto;

FIGURE 8 is a plan view of the bottom cover for the metal member;

FIGURE 9 is a view of a resilient member for disposition over the metal member;

FIGURE 10 is a view of a metal member;

FIGURE 11 is a view of a top cover for the metal member;

FIGURE 12 is a view of a resilient member for disposition between the bottom cover for the metal member and the back of the structure;

FIGURE 13 is a view showing the structure supporting a knee in bent position;

FIGURE 14 is a view of a modified metal member, particularly adapted for use as part of a structure for supporting and protecting an elbow; and

FIGURE 15 is a view of a structure incorporating the metal member of FIGURE 14 mounted upon an elbow.

Referring to the drawings more particularly by reference numerals, **20** indicates generally a supporting and protective structure incorporating the principles of the present invention. The structure **20** includes a main outer cover **22** and a main inner cover **24**, which may be canvas, strong cloth, and the like, and are connected at top and bottom by stitching **26** extending therethrough slevage **28**. Secured between the covers **22** and **24** by stitching **30** is a large resilient member **32** of spinge rubber, or the like. Disposed between the upper surface of the resilient member **32** and the main outer cover **22** is a composite joint protective unit including a bottom cover **34**, a force distributing metal member **36**, a resilient member **38** of sponge rubber, or the like, and a top cover **40** which are secured together and to the main outer cover **22** by stitching **42**. For maximum protection, the metal member can take the shape substantially as shown in FIGURE 10.

Fastening elements **44**, best seen in FIGURE 7, are mounted in spaced relation along vertical edges of the main outer cover **22** and main inner cover **24**, extending through the main outer cover **22** and through a connecting piece **46**, said connecting piece **46** being secured to the edge of the main outer cover **22** by stitching **48**. A protective flap **50** is secured to the other edge of the connecting member **46** and to the main outer and inner covers **22** and **24** by stitching **52**. The other vertical edges of the main outer covers **22** and **24** are secured by stitching **54** to spaced elastic segments **56**. Between the elastic segments **56** is an opening **58** bounded by the elastic segments **56**, and arcuate selvage piece **60** connected to the edges of the main outer and inner covers **22** and **24** by stitching **62**, and an arcuate selvage segment **64** connected by stitching **66** to a fastener support **68** secured to the other vertical edges of the elastic segments **56** by stitching **70**. The fastener support **68** includes two strips of material **72** and **74**, the former being of greater width than the latter, as is clear from FIGURE 4. The strip **72** and a third strip **76** receive fastener members **78**, best seen in FIGURE 6, adapted to cooperate with the fastener members **44**, these strips being secured together by stitching **80**. Stitching **82** secures the strips **72**, **74** and **76** together. In FIGURE 13, lacing **84** is shown in the fastening elements **44** and **78** drawing the structure **20** into position on a knee.

In FIGURE 14 is shown a protective metal member **86** of a configuration found highly effective for use in a supporting and protective structure for application to an elbow. In FIGURE 15 there is shown a structure **88** incorporating the protective metal member **86** applied to a human elbow. The structure **88** is similar to the structure **20** internally. It may be formed as a slip-on, as illustrated, in which case the fastening elements are eliminated.

By reference to FIGURES 13 and 15, it is clear that the protective metal members **36** and **86** are dosposed in positions for most efficient protection. The opening **58** reduces binding when the limbs are bent as in FIGURES 13 and 15. The elastic segment **56** insures tight application of the supporting and protective structures **20** and **88** to a joint. It is clear that the relationship of the resilient members **32** and **38** in respect to the protective metal

member **36** is such as to protect by force distribution both the joint of the wearer and the struck individual.

It is apparent that there has been provided a supporting and protective structure which fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood that changes in form of the elements, rearrangement of parts, and substitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claims which follow.

What is claimed is :

1. In combination a supporting and protective structure for a knee joint, and the like, comprising a first flexible resilient member, means for securing said first resilient member about a knee joint, and the like, a continuous force distributing member disposed in front of said first resilient member in position for protective disposition over a knee joint, and the like, when said structure is operatively applied, a second resilient member disposed

against and forwardly of said force distributing member, separate cover pieces enclosing said second resilient member and said force distributing member forming a separable composite unit, and means maintaining said first resilient member and said composite unit in contiguous relation.

2. The combination of claim **1** in which said last means includes a main outer cover and a main inner cover enclosing said flexible resilient member and said composite unit, and means securing said elements together in operative relation.

References Cited

UNITED STATES PATENTS

194,871	9/1877	Hiester	2—62
1,896,561	2/1933	Ruth	2—24
2,280,025	4/1942	Bollinger	128—165
2,603,786	7/1952	Haines	2—24
2,759,189	8/1956	Cole	2—24

PATRICK D. LAWSON, *Primary Examiner.*

JAMES R. BOLER, *Assistant Examiner.*