H. R. HART.

KNEE GUARD.

APPLICATION FILED OCT. 20, 1913.

**1,092,836.** Patented Apr. 14, 1914.

*Fig. 1.*

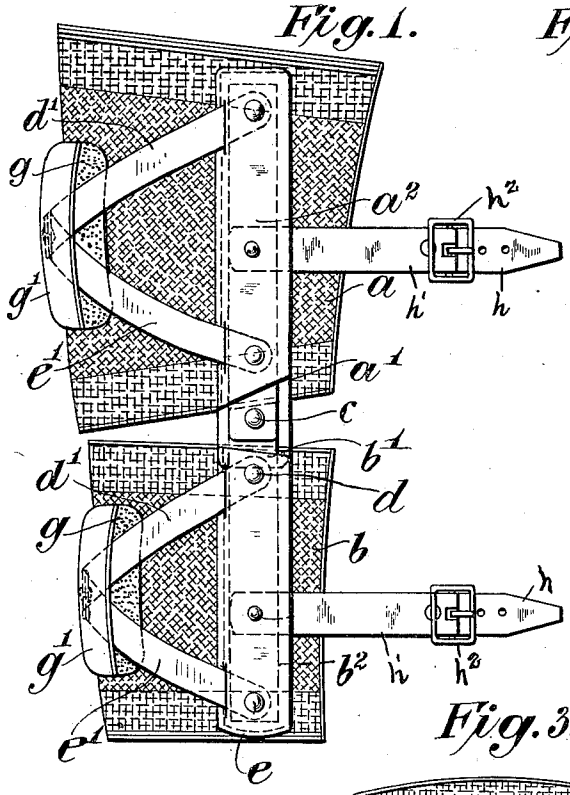



*Fig. 2.*

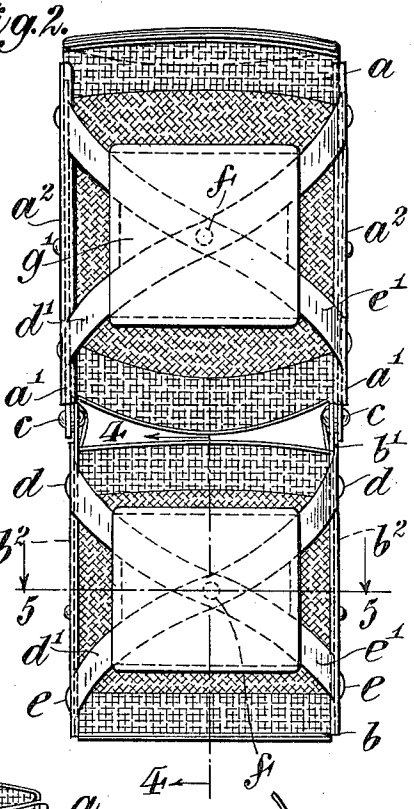



*Fig. 3.*




*Fig. 4.*

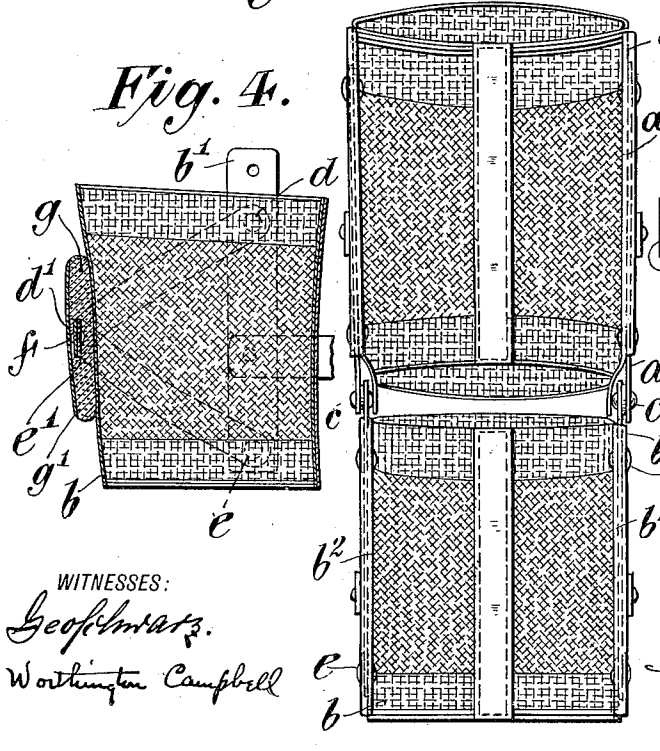
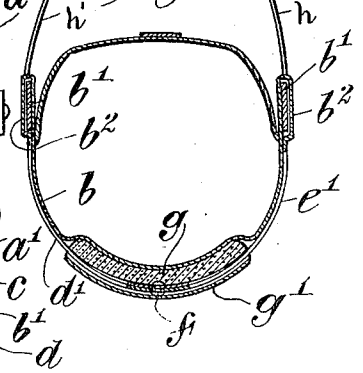



*Fig. 5.*




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# UNITED STATES PATENT OFFICE.

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## KNEE-GUARD.

1,092,836. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed October 20, 1913. Serial No. 796,099.

*To all whom it may concern:*

Be it known that I, HENRY RIDGEWAY HART, a citizen of the United States, and a resident of Montclair, in the county of Essex, in the State of New Jersey, have invented certain new and useful Improvements in Knee-Guards, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to knee-guards intended primarily for use by athletes in active competition and has for its principal object to embody in a single unitary structure a guard which shall include securing means, such as elastic bandages which also furnish support for injured muscles and strong padded frames to protect the knee from further abrasion or injury through blows.

In accordance with the invention there are preferably provided two elastic bandages encompassing the leg above and below the knee respectively, frame members disposed on opposite sides of the leg and pivotally connected on a line substantially coincident with the axis of the knee joint, and protective frames or frame members padded to absorb the shock of blows thereon.

The invention will now be described with particular reference to the accompanying drawings in which—

Figure 1 is a view in side elevation of a knee-guard embodying the present improvements. Fig. 2 is a view in front elevation thereof. Fig. 3 is a view in rear elevation of the improved guard. Fig. 4 is a sectional view of the lower portion of the guard taken on the plane indicated by the line 4—4 of Fig. 2 and looking in the direction of the arrows. Fig. 5 is a sectional view through the lower portion of the guard taken on the plane indicated by the line 5—5 of Fig. 2 and looking in the direction of the arrows.

While the invention has been illustrated herein and is described throughout as an improved knee-guard, it will be understood that other applications of the structure lie within the scope of the invention and that the guard may be adapted for use elsewhere on the body wherever the contiguous parts are constantly changing their angular relation to each other, as at the elbow.

The guard comprises preferably elastic bandages *a* and *b* of any approved type, adapted to encircle the leg above and below the knee cap respectively and carrying on their opposite sides stiff frame members *a'* and *b'*, preferably of thin steel strips, respectively extending longitudinally thereof and pivotally connected at their proximate ends through pivot pins *c*. These frame members *a'* and *b'* may be secured to the bandages *a* and *b* respectively by means of strips $a^2$ and $b^2$ of relatively strong flexible material, such as leather, buckskin, etc. These strips $a^2$ and $b^2$, by reason of their disposition with respect to the bandages *a* and *b* and the frames *a'* and *b'*, constitute secure connections, but at the same time permit such relative yielding movement between the bandages and the frame members as is necessary to insure the greatest benefits from the use of the guard. Instead of passing the strips $a^2$ and $b^2$ over the frames *a'* and *b'* respectively and securing their edges throughout their length to the bandage, it is obvious that each strip may be sufficiently wide to incase completely its frame member, and the meeting edges may then be secured to the bandages along a single line, preferably as far forward on the bandage as possible so as to insure a maximum gripping surface of bandage in contact with the rear portion of the leg to hold the frames in position.

Since the upper and lower portions of the guard are of the same construction, it will be sufficient to describe the protective frame of the lower portion of the guard, shown in section in Figs. 4 and 5. This guard has riveted securely to the side members *a'* and *b'* adjacent their upper and lower ends, as at *d* and *e*, suitable bowed strips *d'* and *e'*, also preferably of thin steel, each extending diagonally across the front portion of the elastic bandage *b* and crossing the other strip and secured thereto at substantially its midpoint by a rivet *f*. These diagonal strips *d'* and *e'* extending around the forward part of the leg in the manner described would themselves constitute adequate protection against blows which might injure the protected joint or the muscles supported by the elastic bandage *b*, but in order to cushion these blows it has been found desirable in practice to secure to these diagonal strips a

suitable pad $g$ of any approved shape and construction. This pad $g$ may be conveniently fastened on to the frame constituted by the strips $d'$ and $e'$ by disposing the cushioning portion $g$ thereof on the inner side of the frame formed by these strips and securing thereto a corresponding facing strip $g'$ disposed on the outer side of said frame. In this way, in effect, the diagonal strips $d'$ and $e'$ pass through the pad formed by the cushion $g$ and the strip $g'$ and the latter is held securely in place and by reason of its disposition serves to absorb the shock of blows which might otherwise injure the parts supported by the elastic bandage $b$ and protected by the metal frame hereinbefore described.

While the guard thus far described is entirely adequate to afford the protection desired and will maintain its position on a leg which is embraced snugly by the bandage and by the bowed frame members it has been found that if the same guard is used on smaller legs the bandage is apt to permit slipping, especially as the ends of the bowed strips $d'$ and $e'$ do not engage the leg, but project outwardly on each side and are subject to blows and twists while constituting themselves a constant danger both to the wearer and to other persons. To meet these objections and to render the guard adjustable to legs of varying sizes, within limits, straps $h$ and $h'$ are fastened to the opposite pairs of the frame members $a'$ and $b'$ and may be secured together adjustably by a suitable buckle $h^2$. The side frame members $a'$ and $b'$ may thus be drawn toward each other until they lie in snug engagement with the leg, the bowed strips $d'$ and $e'$ yielding also until they are drawn into engagement with the leg. While these straps $h$ and $h'$ thus serve an important purpose in rendering the guards useful to many wearers, it is to be understood that the function of the bandage as a support is in nowise altered by the use of these straps and that the present invention could not be used under circumstances for which it is primarily designed if the bandages were omitted and the straps relied upon as supports. The straps serve as bracing members and cooperate with the bowed strips to support the leg and they serve as adjusting means for the stiff frames but they do not, and cannot, serve as sole supports therefor.

It will be observed that in the construction employed the frame is composed of strips which do not add materially to the weight of the elastic bandages, permits free flexing of the knee and forms with the elastic bandages a unitary structure which may be readily placed on the leg or removed therefrom and in nowise impairs the free movement of the wearer while it protects the knee against injury.

Modifications in the construction of this frame and the means for connecting the same to the elastic bandages may be devised by those skilled in the art, but such modifications are to be deemed within the spirit of this invention.

I claim as my invention:

1. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively, frames supported by the elastic bandages and pivotally connected at the sides of the leg and means independent of said bandages secured to and extending between the frames to protect the leg.

2. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively, frames supported by the elastic bandages and pivotally connected at the sides of the leg, and pads carried by the frames in front of the leg.

3. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively and frames supported by the elastic bandages and consisting of frame members disposed at the sides of the leg and pivotally connected and bowed strips secured to the side frame members and extending across the front of the leg.

4. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively and frames supported by the elastic bandages and consisting of frame members disposed at the sides of the leg and pivotally connected and bowed strips secured to the side frame members and extending diagonally across the front of the leg and crossing each other.

5. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively and frames supported by the elastic bandages and consisting of frame members disposed at the sides of the leg and pivotally connected and bowed strips secured to the side frame members and extending diagonally across the front of the leg and crossing each other, and pads secured to said bowed frame members in front of the leg and disposed over the point of intersection of said bowed members.

6. A knee-guard comprising frame members disposed at the sides of the leg and pivotally connected, bowed strips secured to the side frame members and extending across the front of the leg, and pliable means adapted to encompass the leg above and below the knee respectively and to support said frames.

7. A knee-guard comprising two elastic bandages adapted to encompass the leg above and below the knee respectively, frames supported by the elastic bandages

and consisting of frame members disposed at the sides of the leg and pivotally connected and bowed strips secured to the side frame members and extending across the front of the leg and coöperating straps carried by the side frame members and adapted to be secured adjustably about the rear of the leg to draw the bowed strips in snug engagement with the leg throughout their length.

This specification signed and witnessed this 15th day of October A. D. 1913.

HENRY RIDGEWAY HART.

Signed in the presence of—

JAMES RICHARDS,

IVOR LEWIS.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**