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H. W. AUSTIN ET AL
PROTECTIVE HELMET LINING

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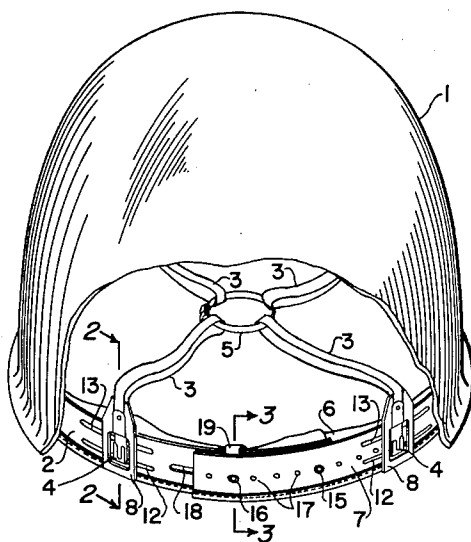


FIG. 1

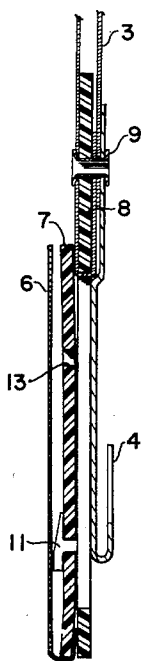


FIG. 2

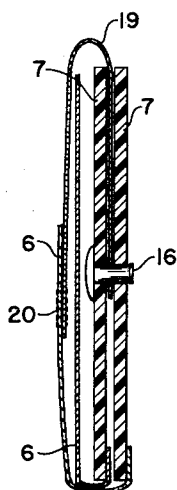


FIG. 3

FIG. 5

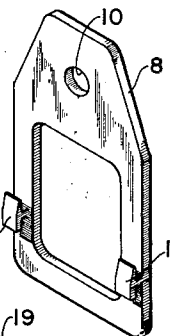
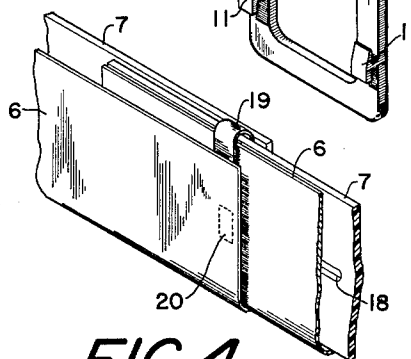


FIG. 4

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PROTECTIVE HELMET LINING

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3 Claims. (Cl. 2—3)

This invention relates to protective helmets, and more particularly to improvements in the lining which supports a helmet shell on a wearer's head.

It is well known and has been disclosed in many patents that a protective helmet consists of a helmet shell formed from a relatively rigid metal or plastic material, and a lining or suspension which supports the shell and keeps it spaced from the head of the wearer so force produced by blows to the shell will be transmitted to the wearer only indirectly through the lining.

The lining of the protective helmet usually consists of a head cradle formed from straps each connected at one end with the lower portion of the shell and tied together at their upper ends with a lace, and a headband connected with the cradle. For maximum comfort and protection for the wearer, as well as for making the providing of protective helmets as economical as possible, it is necessary to provide a lining for the shell which is both adjustable in size and the parts of which are easily replaceable. Due to the fact that human heads vary widely in size, not only in circumference at the headband area but also in crown height, which is the distance from the headband area around a head to the top of the head, an adjustment is necessary both in the circumference of the headband and in the vertical location of the headband in reference to the top of the head cradle.

In the past, many ways have been found to provide for the circumferential adjustment of the headband by permitting one end of the headband to overlap the other end. The problem with a headband of this type, however, is that within a very short period of wear, the overlapping end of the sweatband which contacts the head becomes twisted and misshapen and the headband becomes uncomfortable and unsightly and must be replaced. Further, in the past, the vertical adjustment of the headband in relation to the top of the cradle could be made only by the adjustment of the lace which ties the upper ends of the straps of the head cradle together. For heads with large crown heights this adjustment is not adequate because of the need to maintain sufficient space between the top of the head cradle and the inside of the crown of the shell.

With the foregoing in view, it is an object of our invention to provide an improved helmet lining for a protective helmet.

A further object of our invention is to provide a headband in which the overlapping ends of the headband will be held in the correct position during use and wear.

A further object is to provide for adjusting the vertical location of the headband without adjusting the loop of the lace in the top of the lining cradle.

A still further object of our invention is to provide an improved means for detaching the headband from the head cradle of the lining so that either part may be replaced easily.

These and other apparent objects are attained in a protective helmet lining which has a cradle formed from head engaging straps and means for connecting the straps to the lower part of a helmet shell; support members suspended from the straps and provided with inwardly projecting integral headed connectors; and a headband inside the cradle provided with openings at several vertical locations for removably receiving the connectors of the

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support members. The headband is folded lengthwise throughout its length to form a sweatband and an encircling stiffening band which are joined together at the bottom of the headband, and one end of the headband receives and overlaps the opposite end. Fastened to the sweatband at the overlapping end of the headband, extending over the overlapped end, and secured to the stiffening band of the overlapping end of the headband is flexible means for holding the ends of the sweatband in the correct position during use and wear. These combined parts provide a lining structure which is easily adjustable in several directions, simple to assemble and replace the parts thereof, and economical to manufacture and use.

These and other objects will be apparent from the following detailed description and accompanying drawing in which:

FIGURE 1 is a perspective view of the rear of a protective helmet with a portion of the helmet shell cut away to show the novel lining;

FIGURE 2 is an enlarged cross section as viewed along the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged cross section as viewed along the line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged perspective view of the overlapping area of the headband as viewed from the inside of the helmet; and

FIGURE 5 is a perspective view of a support member for the headband.

Referring now to the drawing, there is illustrated in FIGURE 1 a preferred embodiment of the invention which comprises a helmet shell 1, in which is positioned a novel suspension or lining structure 2. The lining includes a cradle formed from head engaging looped straps 3 having their lower ends connected with the lower portion of the shell by hook-like clips 4. The upper ends of the straps are connected together by a lace 5. As is shown in FIG. 2, one end of each strap is wrapped around the top of a frame-like support member 8 and overlaps the other end of the strap, with a clip 4 covering the overlapped ends of the strap. The clip, strap, and support member are all connected together by a rivet 9 extending through a hole 10 in the support member. The inner side of the support member is provided with a pair of laterally spaced headed connectors 11 integral with that member.

A vertically and circumferentially adjustable headband, comprising a sweatband 6 and an encircling stiffening band 7, is inside the lower part of the cradle and connected therewith by the integral headed connectors 11 that extend through horizontal slots 12 in the outer or stiffening band. To accommodate heads with high crowns without changing the adjustment of the lace 5, the connectors 11 can be pulled out of slots 12 and inserted into slots 13 which are provided in the stiffening band at a higher level. The stiffening band is flexible enough to permit the slots to be spread for insertion and removal of the headed connectors, and the lower edge of that band and the sweatband are joined together at or near the bottom of the headband in any suitable manner.

In order to connect the opposite ends of the sweatband together, one end is overlapped by the other by extending the overlapped end into the fold of the other end as shown in FIGURES 3 and 4. The ends of the stiffening band are detachably connected by studs or buttons 15 and 16 extending through two of a series of holes 17 in the overlapping end portion of the stiffening band. Button 15 also extends through a hole in the overlapped end of the same bands but button 16 goes through a longitudinal slot 18 in the overlapped end of the same band. As the overlapping ends of the sweatband are not held by the buttons, there is a tendency for them to roll or

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slide down relative to the stiffening band so that the headband becomes uncomfortable and unsightly. To prevent this, a short strip 19 of flexible material, similar to that used for the sweatband, is fastened to the overlapping end of sweatband 6 by sewing 20 or other means. This strip extends across the top of the overlapped end of the headband and between the two ends of the stiffening band 7 and is provided with a hole through which button 16 extends. The strip therefore keeps the ends of the sweatband from sagging.

It is to be understood that various alterations and additions may be made to this novel lining, its use and detailed construction without departing from the spirit and intended scope of the appended claims.

We claim:

1. A protective helmet lining comprising a cradle formed from head engaging straps and means for connecting said straps to the lower part of a helmet shell, support members suspended from said straps and provided with inwardly projecting integral headed connectors, and a flexible headband in the cradle provided with openings removably receiving said connectors, said openings being disposed at a plurality of levels to permit the headband to be detachably connected to said support members at different distinct levels.

2. A protective helmet lining comprising a headband having two ends, the headband being formed from a sweatband and an encircling stiffening band joined together at the bottom of the headband, one end of the headband receiving between the sweatband and stiffening band the opposite end of the headband to form two overlapping layers of the sweatband, one of the sweat-

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band layers being spaced by the other layer from the overlapping layers of the stiffening band, and flexible means fastened to said one layer of the sweatband near its adjoining end and extending outwardly over the other sweatband layer and the adjoining layer of the stiffening band, said means also being fastened to the stiffening band to support said one layer of the sweatband.

3. A protective helmet lining comprising a headband having two ends, the headband being formed from a sweatband and an encircling stiffening band joined together at the bottom of the headband, one end of the headband receiving between the sweatband and stiffening band the opposite end of the headband to form two overlapping layers of the sweatband, one of the sweatband layers being spaced by the other layer from the overlapping layers of the stiffening band, a flexible strip having its inner end disposed between said sweatband layers and fastened to the adjoining surface of said one layer, the strip extending outwardly over the other sweatband layer and the adjoining layer of the stiffening band, and means detachably securing the outer end of said strip to the stiffening band to support said one layer of the sweatband.

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