Nov. 14, 1933. J. B. DYM 1,935,204

PROTECTIVE HEADGEAR

Filed Oct. 21, 1932

Fig. 1.

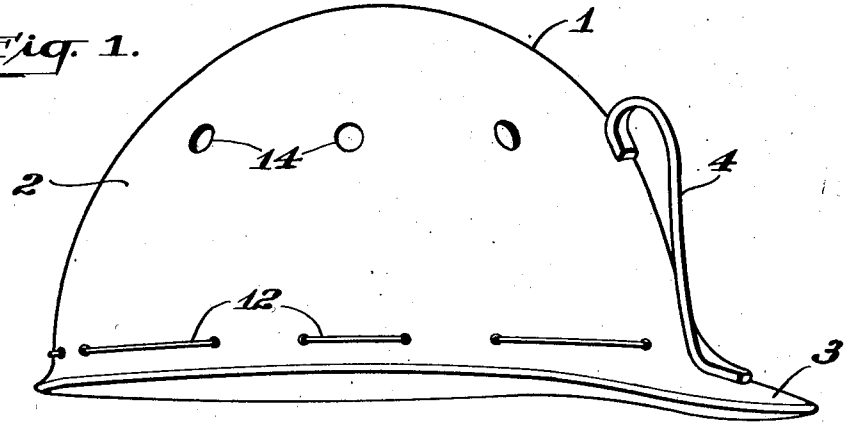


Fig. 2.

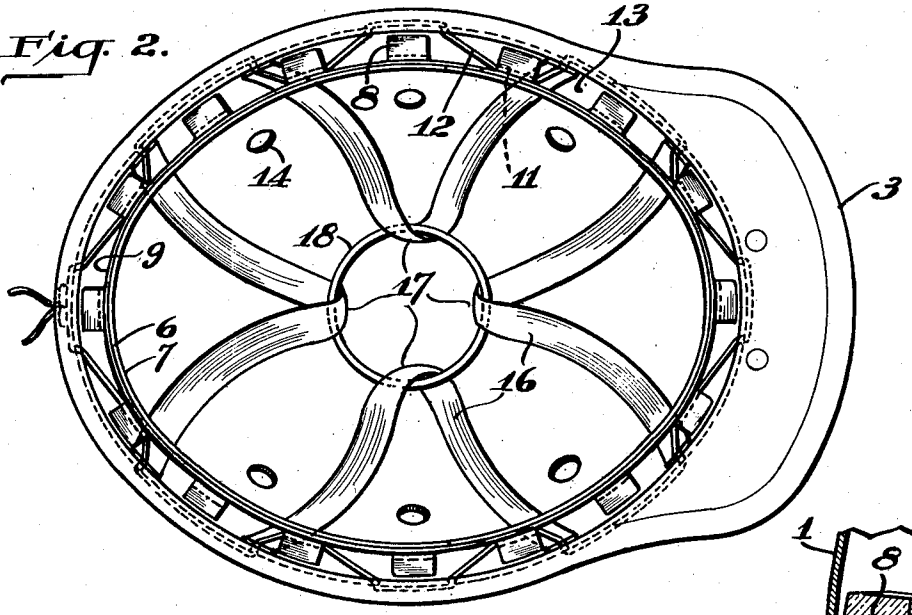


Fig. 5.

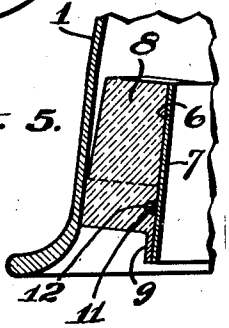


Fig. 3.

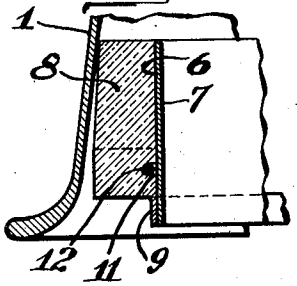
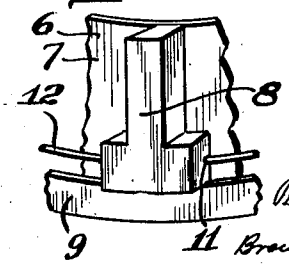


Fig. 4.



WITNESSES

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PROTECTIVE HEADGEAR

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10 Claims. (Cl. 2—3)

My invention relates to protective headgear such as employed by miners and others engaged in hazardous occupations, and it relates particularly to linings for such headgear.

When protective headgear is worn, the material of which the crown and other portions of the headgear are made is usually relatively heavy in order that the headgear may be sufficiently rigid to withstand shocks or blows. Unless special means are employed to transmit the pressure caused by the weight of the headgear to the head of the wearer, the latter may suffer considerable inconvenience because of the manner in which this weight is transmitted.

Furthermore, since the material of which protective headgear is constructed is usually substantially air-tight, additional inconvenience may be experienced by reason of the lack of ventilation. In addition to the features of inconvenience referred to above, it is very essential that any shocks or blows that may be exerted upon the headgear be transmitted to the head of the wearer with such distributed effect that danger of injury is minimized.

In accordance with the present invention, I provide an improved lining for protective caps or helmets composed of relatively rigid materials, such as treated synthetic resins or phenolic condensation products that are reinforced by duck or other suitable material. For example, such caps may be similar to that shown and described in Punton Patent No. 1,875,413 and the helmets may be such as that shown and described in Lewis Patent No. 1,835,883.

The lining for engaging the head of the wearer at the bottom portion of the crown provides a cushioned connection to the crown and also affords ventilation therebetween for circulation of air through openings provided in the upper portion of the crown.

In order to distribute the effects of shocks or blows to which the cap may be subjected, I provide a cradle composed of bands of flexible material connected by loops at their tops to form an enclosure that will space the head of the wearer from the top of the crown, and which will also effectively distribute any shocks or blows or pressure to all portions of the head of the wearer with which the several portions of the bands are in engagement.

The details of my invention will be described in connection with the accompanying drawing, in which Fig. 1 is a side view in elevation of a cap provided with linings constructed in accordance with my invention; Fig. 2 is a bottom plan view of the cap of Fig. 1; Fig. 3 is an enlarged vertical sectional view of a portion of the cap of Fig. 1; Fig. 4 is an enlarged perspective view of a portion of the band of the lining and certain of its associated parts; and Fig. 5 is a view similar to Fig. 3 showing the relative positions of certain parts when the cap is upon a wearer's head.

Referring to the drawing, a cap 1 of suitable shape for use by miners or others engaged in similar occupations comprises a crown 2 and a visor 3. A lamp holder 4 is provided upon the front of the cap 1 for supporting the usual miner's lamp. The cap 1 may be constructed of any suitable material such, for example, as a suitably treated synthetic resin or a phenolic condensation product that is reinforced by duck or other suitable fabric to constitute a substantially rigid but relatively light article.

A lining at the lower portion of the crown for engaging the head of the wearer consists of a continuous sweat band 6 that is preferably of thin rubber having on the inner surface thereof a thin layer of suitable material for engaging the head of the wearer. For example, this layer 7 may consist of artificial leather or similar material having a slightly roughened surface such as may be secured by slight graining thereof. The outer surface of the band 6 is provided at intervals therearound with a series of relatively thick spacing members 8 of sponge rubber that are of inverted T-shape. The spacing members 8 may be secured to the sweat band 6 by molding them integrally therewith or by sewing or cementing them thereto.

The sweat band 6 is provided at its lower edge portion with a reinforcing ring 9 that extends below the lower ends of the spacing members 8. This ring is for the purpose of providing a gradual application or tapering of the pressure of the band 6 to the head of the wearer when the cap is in use. This feathering of the pressure avoids the occurrence of an abrupt application of relatively heavy pressure such as would occur along the line of its lower edge if the spacing members extended to the bottom of the band 6.

In order to avoid the provision of a large number of lengths of sweat band 6 for various head sizes of caps it is preferred that a relatively small number of varying lengths of approximately half size with spacing members of varying thicknesses be manufactured and that these be adapted for the various sizes of caps by using different combinations or by slightly reducing the length of certain of these pieces and connecting

them together at their end portions to constitute a continuous band of the desired size.

Certain of the spacing members 8 are provided at the lower portions thereof with apertures 11 through which is threaded a cord 12 of suitable flexible material and which also passes through suitable apertures in the crown 2 adjacent the lower edge thereof. The lining comprising the band 6 and its connected parts is thus detachably connected to the crown 2.

As best shown in Fig. 3, the spacing members 8 are tapered vertically in order to compensate for the flaring of the side walls of the crown 2 which are generally at an angle to the head of a wearer. The tapering of the spacing members 8 provides that opposite sides of the band 6 may be substantially parallel and in position to conform more nearly to the head of the wearer while the spacing members engage the sides of the crown 2. One or more of the spacing members 8 may be removed in case of irregularities or abnormal shape of the head of a wearer in order to permit the band 6 to conform thereto without undue pressure.

As best shown in Fig. 2, the arrangement of the spacing members 8 at intervals between the band 6 and the crown 2 provides ventilating openings 13, and the cap is provided also with openings 14 which are distributed around the crown 2 at the upper portion thereof. Air may circulate through these communicating openings.

A cradle for the interior of the crown comprises a series of four bands 16 of flexible material, the eight ends of which are connected directly to the lower portion of the crown by means of the cord 12 which passes through certain of the spacing members 8.

The intermediate portions of the bands 16 form four loops 17 adjacent the top of the crown 2 and these loops are loosely connected by a suitable flexible band 18, such, for example as a heavy shoestrong, in order to form, as best shown in Fig. 2, an enclosure for the head of the wearer that will space the crown 2 therefrom when the cap is in position. The loose connection of the loops 17 permits the cradle to adjust itself to various shapes of heads and also to various positions of the cap upon the head.

Any shock or blow to which the crown 2 may be subjected is transmitted to the head by the cradle with such substantially uniformly distributed effect that no ill effects are apt to be experienced therefrom. The transmission of shocks or blows does not involve the sweat band 6 because of the direct connection of the bands 16 and the crown 2.

When the cap 1 is worn its weight is substantially supported by the cradle and the sweat band 6 is yieldingly pressed towards the side of the head. This pressure, however, is relatively light because of the resiliency of the sponge rubber of which the spacing members 8 are constructed and the pressure is substantially uniformly distributed because of the tapering of the spacing members to compensate for the angle of inclination of the sides of the crown 2. Furthermore, extension of the sweat band 6 below the spacing members provides that the pressure exerted by the band is tapered or feathered at the lower edge whereby no inconvenience is experienced by reason of such pressure.

Ample ventilation for the cap is afforded by the ventilating openings between the spacing members around the sweat band, and which communicate with the openings in the walls of the crown.

The weight of the cap and any blows that may be transmitted thereto are transmitted to the head by the bands of the cradle which extend in eight directions from the cord which connects their interior loops.

The foregoing and other advantages will be appreciated by those skilled in the art of construction and employing protective headgear.

I claim:

1. In protective headgear, the combination with a crown having an outwardly flaring bottom portion, of a continuous band for the lower inner portion of said crown having integral therewith at intervals therearound upwardly tapered spacing members of sponge rubber for engaging said crown to resist upward movement of said band therein, and means threaded through apertures in certain of said spacing members for detachably connecting them to said crown.

2. In protective headgear, the combination with a crown of relatively rigid material, of a lining therefor comprising a continuous band of flexible material having integral therewith at intervals therearound resilient spacing members of greatest cross-sectional area at their lower portions for exerting a wedging action to prevent upward movement of said band in said crown when said headgear is being worn, and means for detachably connecting certain of said spacing members to said crown.

3. In protective headgear, the combination with a crown, of a cushioning member therefor comprising an annular sweat band and resilient spacing members between said band and said crown and connected thereto at intervals therearound, the lower edge of the cushioning member being more readily yieldable to pressure from the head than the remaining portion of said cushioning member.

4. In protective headgear, the combination with a crown of relatively rigid material, of a cushioning member therefor comprising an annular sweat band and resilient spacing members between said band and said crown and connected thereto at intervals therearound, the lower edge of the cushioning member being more readily yieldable to pressure from the head than other portions thereof.

5. In protective headgear, the combination with a crown having an outwardly flaring bottom portion, a band within said bottom portion for engaging the head of the wearer and tapered spacing members having their thicker portions at the bottoms thereof between said crown and said band for permitting opposite sides of said band to remain approximately parallel when the headgear is being worn and the spacing members are in engagement with said crown.

6. In protective headgear, the combination with a crown having an outwardly flaring bottom portion, a band within said bottom portion for engaging the head of the wearer and spacing members between said crown and said band and having tapered sides with the thicker portions at the bottoms thereof and engaging said crown to approximately compensate for the flaring sides thereof whereby opposite sides of said band are approximately parallel when the tapered sides of said spacing members are in engagement with said crown.

7. In protective headgear, the combination with a crown of relatively rigid material, of a cradle therefor comprising a plurality of bands

of flexible material, each of said bands being connected at its spaced ends to said crown at its lower edge and the ends of said bands being spaced around the circumference of said crown, said bands forming loops adjacent the top of said crown, and means for connecting said loops to cause said bands to distribute pressure from said crown to the head of the wearer.

8. In protective headgear, a crown of relatively rigid material and a cradle therefor comprising a plurality of loops formed by bands of flexible material and having their ends connected directly to the lower portion of said crown at points distributed therearound, and means for loosely connecting the loops adjacent the top of said crown to form an enclosure of adjustable shape that is spaced from the crown when engaged by the head of the wearer.

9. In protective headgear, a crown having a sloping portion, a lining therefor comprising a relatively thin continuous band, and relatively thick tapered spacing members for engaging the sloping portion of said crown and thereby separating said crown and said band at intervals to provide ventilating spaces therebetween, the thicker portions of said spacing members being adjacent the brim of the crown, and said crown having a plurality of apertures distributed therearound at an intermediate portion and communicating with said spaces for the circulation of air therethrough.

10. In protective headgear, the combination with a crown of relatively rigid material, and a lining therefor comprising a continuous band of rubber having an inner facing of material having a slightly roughened surface and having integral therewith spacing members of sponge rubber and provided with tapered sides for engaging the sides of said crown, the thicker sides of said spacing members being adjacent the brim of the crown, and means comprising a cord threaded through apertures in certain of said spacing members for securing said band in position adjacent the bottom portion of said crown, said spacing members having openings therebetween and communicating with openings in said crown to provide ventilation therethrough.

JOSEPH B. DYM.