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SAFETY HAT

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2 SHEETS—SHEET 1

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2 SHEETS—SHEET 2

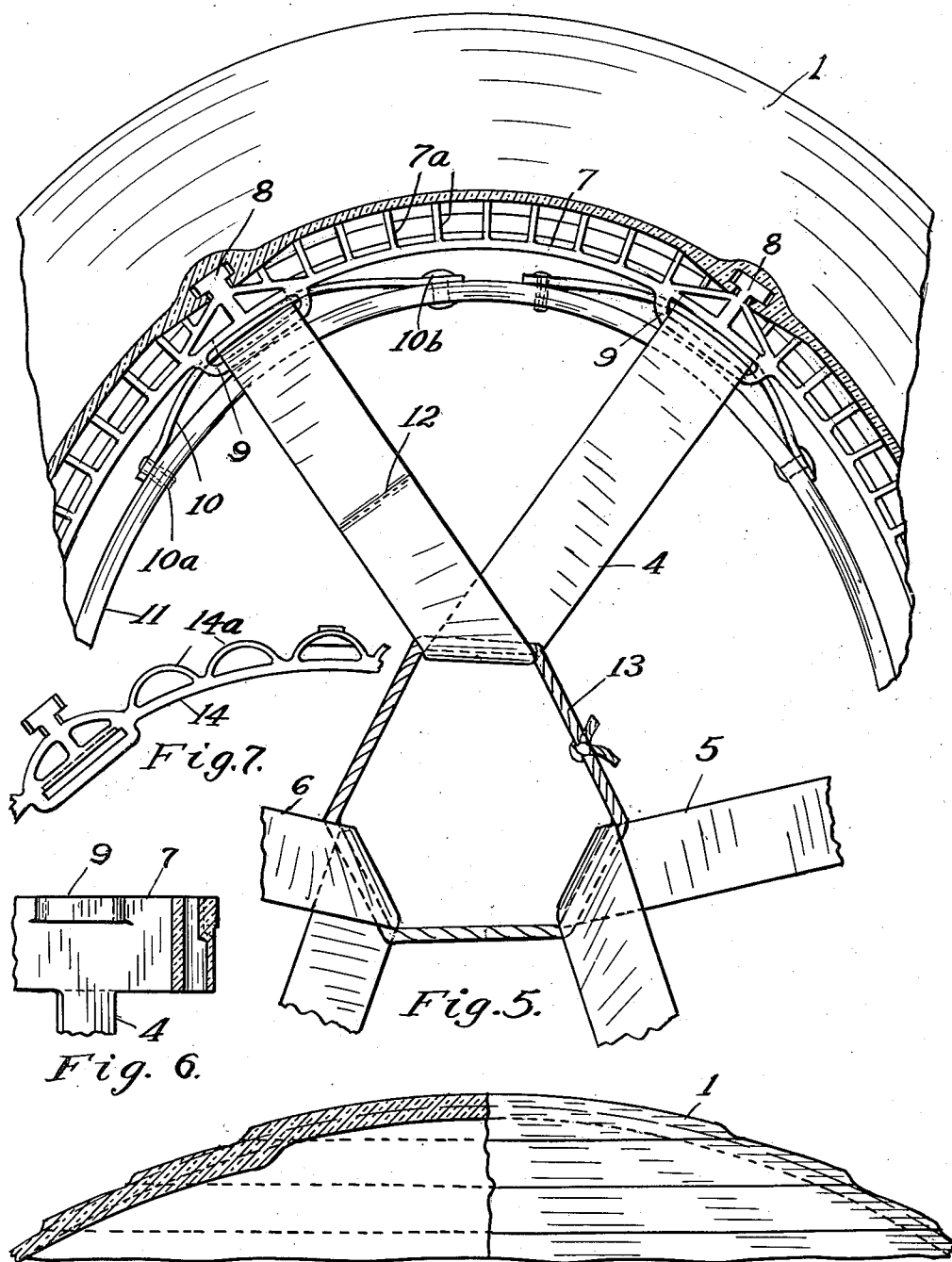


Fig. 8

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SAFETY HAT

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3 Claims. (Cl. 2—3)

1

This invention relates to protective headgear and, more particularly to hats of the safety type, such as worn by miners and others engaged in hazardous occupations, and linings therefor, to protect the head from injury from falling objects and the like hitting any part of the hat surface.

In order to minimize the possibility of injury to the head of a workman from impact with objects, it is desirable that the cradle assembly be so constructed as to absorb part of the force of impact and distribute the remainder by applying it over a large surface area of the head. Shock cushioning cradle assemblies have been used in the past, but their relatively complicated construction and the difficulty involved in attaching or detaching the crown assembly from the hat for replacement or substitution of a larger or smaller size are serious disadvantages. Another disadvantage is that in view of the thickness of the shock cushioning elements of the crown assembly, the hat must be made oversize, therefore providing an unattractive appearance as any oversize hat would.

An object of the present invention is to provide a novel safety hat which is devoid of the above named disadvantages.

A more specific object of this invention is to provide a safety hat or helmet which is sufficiently rigid as to protect the wearer's head, but of sufficiently light weight as to be worn without discomfort.

A still further object of this invention is to provide a novel shock cushioning cradle assembly which is very easily attached or detached from the brim portion of the hat and which is extremely effective in cushioning the wearer's head against shocks or blows resulting from falling of objects or collision with stationary objects irrespective of the direction of the blow.

A still further object of this invention is to provide a safety hat of plastic material which is ribbed or reinforced in a manner so as to provide maximum rigidity and strength for a given weight as well as to provide a suitable well for containing a shock cushioning ring of the cradle assembly, thereby avoiding the necessity of making the hat oversize, thus giving an attractive appearance thereto.

A still further object of this invention is to provide in a safety hat a sweat band which is easily adjustable to vary the shape and size thereof and loosely suspended from the crown assembly but always retained in place.

Other objects and advantages of the present

2

invention will become apparent from a study of the following description taken with the accompanying drawings wherein:

Fig. 1 is a side elevational view with a portion cut away of a safety hat embodying the principles of the present invention;

Fig. 2 is a cross-sectional view taken along line II—II of Fig. 1;

Fig. 3 is a fragmentary sectional view of a portion of the crown illustrated in Fig. 1, except that it is taken along a different radius of the hat;

Figs. 4a and 4b are enlarged cross-sectional views taken along line 4ab—4ab of Fig. 1, except that it shows the wedge type connection between the cradle assembly and crown of the hat in an exploded instead of interfitted condition;

Fig. 5 is a top plan view of the hat of Fig. 1 with the crown portion shown cut away in order to more clearly illustrate the cradle assembly;

Fig. 6 is an enlarged fragmentary side elevational view, partly in cross-section, showing a portion of the shock-absorbing protection ring and strap;

Fig. 7 is a fragmentary plan view of a modified form of shock-absorbing protection ring, and

Fig. 8 is an enlarged side elevational view, partly in cross-section, of the top portion of the hat.

Referring more particularly to Fig. 1 of the drawing, numeral 1 generally denotes a safety hat or helmet made of any suitable material such as a treated synthetic resin or a phenolic condensation product with or without reinforcing layers of fabric. However, we prefer to make the hat of plastic material such as, for example, nylon because of its extreme lightness and great strength as well as other desirable characteristics. To provide rigidity and reinforcement of the crown portion of the hat, rib portions, such as 2, extending somewhat radially of the crown portion, are provided and terminate at the hat band portion 3. It will be particularly noted that the hat band portion 3 is offset radially outwardly so as to provide a circumferential groove or well for receiving a shock-absorbing protection ring presently described. Also, in order to give the hat a more attractive appearance, the hat band portion 3 is ribbed or grooved in a vertical direction on its outer surface as indicated.

The top portion of the hat is preferably reinforced by circumferentially extending, stepped

3

rib portions as shown more clearly in Fig. 8, thereby providing relatively high resistance against impact from falling objects and the like.

The cradle assembly comprises a plurality of flexible straps, 4, 5, and 6 of Vinylite, or the like. The ends of the straps are integrally secured to a shock cushioning or protection ring 7 made of rubber or other resilient material. A reinforcing flange is preferably provided at the top of ring 7 as best shown in Fig. 3 to better maintain its concentricity. Through loop portions of straps 4, 5, and 6 there is tied a cord, such as a shoestring 13 whose loop may be shortened or lengthened as desired to conform the crown assembly to the shape of the wearer's head. The protective ring 7 has a plurality of radially extending fins 7a equally spaced and extending outwardly into contact with the interior surface of the crown of the hat and seated in the cylindrical well or groove formed adjacent to the bottom of the hat in order to cushion the wearer's head against shock from impact by falling objects. The spaces between fins 7a provide for ventilation of the head. Ring 7 partly absorbs and distributes over a wide surface area of contact any transmitted shocks, thereby minimizing injury to the head. Since the ring 7 is firmly seated or built into the hat it will not become displaced when the hat is struck and it will provide additional protection and distribution of the impact of blows against the head from all angles. At spaced points along the protective ring 7 integral keys or wedges 8 are provided whose sides are tapered upwardly and adapted to be fitted into a correspondingly tapered groove 15 formed in the base of the crown portion of the hat as shown more clearly in Figs. 4a-4b. Thus it will be seen that by introducing the wedges or keys 8 into the bottom of grooves 15 and lifting them relative thereto, a wedging action will take place so that by the action of gravity or by pressing the hat downwardly onto the wearer's head, a readily detachably and tight wedge fit is provided between the cradle assembly and hat. Integrally formed on the protective ring 7 adjacent each of the keys 8 there is provided a loop 9 for providing a slot through which the straps 4, 5 and 6 may be passed. More specifically, as shown in Fig. 6, the straps, such as 4, have their ends integrally formed on the protective ring 7 and have a secondary purpose of supporting the sweat band supporting straps 10 shown in Fig. 5 made of leather or any other suitable material. The end portions of bands 4, 5 and 6 are first looped around the sweat band supporting strap 10 and then extended through loop 9 as shown more clearly in Fig. 1. A plurality of sweat band supporting straps 10 are provided, each having one end, such as 10a, sewn to the sweat band 11 and the other end 10b detachably secured thereto such as by a snap fastener. Inasmuch as the ends of straps 4, 5 and 6 are preferably, although not necessarily, integrally molded to the protective ring 7, it is necessary to cut and heat weld the straps such as along line 12 of the assembly. If desired, straps 4, 5 and 6 may be attached to instead of integrally formed with ring 7.

Thus it will be seen that whenever it is desired to replace a sweat band, it is necessary merely to detach the snap fasteners 10b and remove the sweat band from the cradle assembly replacing it with a new one, perhaps of different size to adapt it for a different wearer's head. Of course, the sweat band 11 itself may be made adjustable in size in any well known manner. When it is

4

desired to remove the entire cradle assembly, it is necessary merely to pull the edges or keys 8 downwardly with respect to the crown portion of the hat so as to withdraw them from wedging relationship in grooves 15.

Fig. 7 shows a modified form of shock-cushioning or protective ring 14 comprising a plurality of arcuate loops 14a uniformly spaced and integrally formed therewith throughout the circumference thereof. Thus, instead of providing radially extending fins, such as 7a, there are provided yieldable or flexible loops which are adapted to distribute shocks over a substantially wide area of surface contact. This ring 14, as well as ring 7, may be made of plastic material, such as Vinylite, or of rubber, such as sponge rubber, or other suitable material. It will be noted that spaces are provided in rings 7 and 14 to permit ventilation.

Thus it will be seen that we have provided a relatively light but rigid and strongly reinforced safety hat having a portion simulating a hat band and providing a well for receiving a shock cushioning protective ring; also, we have provided a novel cradle assembly having a readily detachable shock-cushioning protective ring enabling easy detachment and replacement of the sweat band or of the entire cradle assembly. Furthermore, we have provided a safety hat having a novel cradle or suspension means providing adjustability or replacement of the hat band and permitting circumferential displacement of the sweat band so as to conform to the shape of the wearer's head and provide maximum comfort. Additionally, we have provided a novel shock-cushioning protective ring for effectively distributing shocks caused by impact from falling objects to minimize injury to the wearer's head, which ring is provided with wedge-like portions which are readily detachably secured to the crown portion of the hat, the ring being so shaped as to provide ventilation to provide comfort in wearing the hat in hot climates.

While we have illustrated and described certain specific embodiments of our invention, it will be understood that these are by way of illustration only, and that various changes and modifications may be made within the contemplation of our invention and within the scope of the following claims.

We claim:

1. In combination with a safety helmet, a cradle assembly comprising shock-cushioning means, said shock-cushioning means including a protective ring of resilient material having circumferentially spaced, radially extending elements, and wedge-like portions adjacent said elements and extending radially outwardly of said ring, correspondingly shaped wedge-like grooves formed in the crown portion of the helmet to provide a readily detachable wedge connection between the cradle assembly and helmet crown portion, a sweat band having a plurality of band supporting straps disposed along the outer surface thereof, at least one end of said straps being detachably secured to the sweat band and the central portions of which are adapted to be supported by straps extending radially and from the bottom of said protective ring.

2. Apparatus recited in claim 1 wherein said protective ring comprises a plurality of substantially semi-circular loops for cushioning the wearer's head against shock and for providing air spaces for ventilation.

3. In combination with a safety helmet of hard

material, a cradle assembly including a protective ring of rubber-like material having a plurality of integral circumferentially spaced, radially outwardly extending fins whose outer extremities are adapted to contact the inner surface of the helmet and which fins are adapted to flex when external shock pressure is applied to the helmet, and for distributing the shock load, a plurality of radially outwardly extending wedge-like elements integrally formed on said protective ring, said helmet having corresponding wedge shaped grooves integrally formed on the inner surface thereof into which said wedge-like elements are adapted to fit to provide a quickly detachable connection between the protective ring and the helmet.

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