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HELMET SHELL SUSPENSION

Filed July 28, 1958

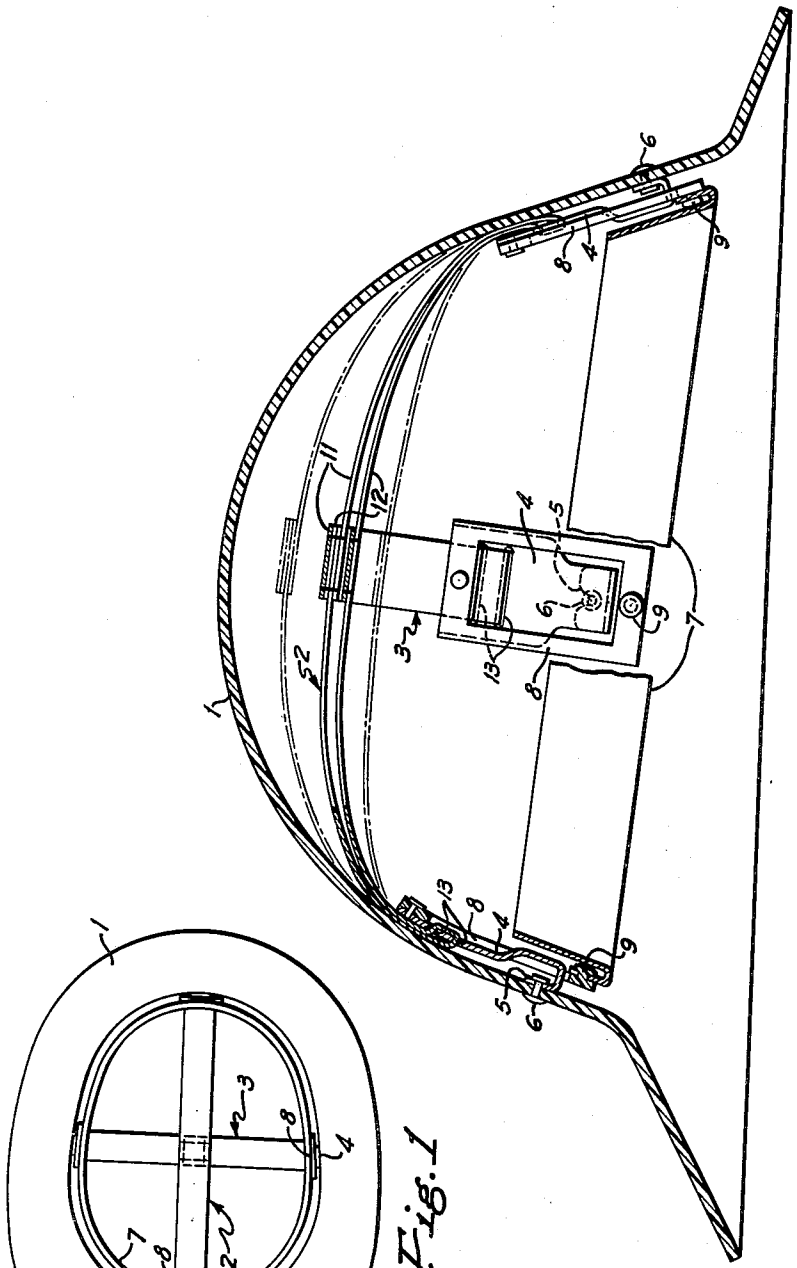


Fig. 2

Fig. 1

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HELMET SHELL SUSPENSION

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This invention relates to safety helmets, such as are worn by industrial workers, and more particularly to the suspensions for such helmets.

Most helmet suspensions include a cradle formed from straps that fit over the head. To permit adjustments to be made for heads of various heights, it is common practice to lace the upper ends of the cradle straps together so that they can be pulled toward each other or allowed to spread farther apart. To make such an adjustment, the helmet has to be removed from the head and the lace tightened or loosened. It may be necessary to do this several times before the correct adjustment is obtained.

It is among the objects of this invention to provide a helmet shell suspension which can be adjusted to practically any head in one simple operation, which always maintains at least a predetermined minimum spacing between the top of the head and the top of the shell, and which may use the friction of relatively moving parts to absorb the shock of an impact against the helmet shell.

In accordance with this invention, a head-receiving cradle is formed from straps that cross each other at the top of the cradle. Each strap is in the form of an endless flattened loop forming upper and lower lengths. At each end of the strap there is a supporting member that is provided with vertically spaced transverse slots. The strap extends back and forth through these slots to support the supporting members, which are adapted to be attached to a helmet shell to support it. Inside the cradle and supported by it is a headband. The straps are of a length to space a head a predetermined minimum distance from the top of the shell. However, the upper lengths of the strap can be pulled upward relative to the supporting members in order to slide the straps through the slots and thereby lower the lower lengths of the straps. Then, by placing the helmet on the wearer's head and pressing firmly downward, the straps will slide through the slots until a comfortable fit is reached.

The preferred embodiment of the invention is illustrated in the accompanying drawings; in which

FIG. 1 is a bottom view of a helmet provided with my suspension; and

FIG. 2 is an enlarged vertical section through the helmet.

Referring to the drawings, the shell 1 of the helmet may be made of any material that will give it the necessary strength and rigidity. Such shells are well known and generally include an integral brim. Inside the shell there is a lining that includes a cradle, which may be formed from two or more straps 2 and 3 that pass over the head and cross each other on top. Suspended from the ends of the straps in a manner that will be described presently are supporting members 4, which are attached to the lower part of the shell. Each supporting member is a flat strip of relatively stiff material, such as metal, laminated fabric or a plastic. The lower end of each supporting member can be attached to the shell in any suitable manner. One convenient way of doing this is to shape the lower part of the supporting member like a hook and provide its end with a notch 5 for removably receiving a rivet 6 projecting from the inside of the shell. The usual adjustable headband 7 is disposed inside the cradle and preferably is supported by means carried by the supporting members. For example, flexible tabs 8 may be riveted to the upper ends of the supporting members and hang down below

them, the lower portions of the tabs being provided with headed studs 9 that extend through holes or slots in the outside of the headband to support it.

It is a feature of this invention that the cradle straps are self-adjusting so that no lace is required. Accordingly, each strap is in the form of an endless flattened loop, which is formed by folding the opposite end portions of the strap inward upon itself and securing the free ends together midway between the ends of the loop. This means that each strap has upper and lower lengths 11 and 12 that normally may be substantially in engagement with each other. It is preferred to connect the lower lengths of the different straps together where they cross each other at the top of the cradle and to do likewise with their upper lengths. The straps are attached to supporting members 4 by threading them back and forth through vertically spaced transverse slots 13, with which the upper portions of those members are provided. Usually two substantially horizontal slots will be sufficient. The slots have about the same thickness as the straps so that the straps will slide against the upper and lower walls of the slots if the straps are pulled through the slots. The sharp bends that the straps make in extending through the slots create friction that offers considerable resistance to sliding of the straps in the supporting members.

The length of the straps is such that when their upper and lower lengths are together, thereby providing maximum length for the straps, there will still be a safe distance between the top of the cradle and the top of the shell, as shown in FIG. 2. In many cases, however, this clearance will be increased, such as when the crown height of the wearer is less than the maximum for which the lining is designed. In such cases the upper lengths 11 of the straps are pulled upward manually relative to the supporting members to slide the straps down through the slots and thereby lower the lower lengths 12 of the straps, as shown in dotted lines. The top of the head then will be spaced from the top of the shell a distance equal to the space between the lower lengths of the straps and the shell.

To secure the correct adjustment in every case, the upper lengths of the straps are pulled upward as just described and then the helmet is placed on the head. By pressing firmly downward on the helmet the straps will slide upward through the slots in the supporting members as the head pushes the lower lengths of the straps farther up into the shell. This movement of the straps will continue until the headband is seated in the correct position on the head. In many cases the upper lengths of the straps will remain slack. If the helmet then receives a hard blow, the lower lengths of the straps will be forced farther up into the shell and the upper lengths simultaneously pulled downward. The friction between the straps and the supporting members 4 during this action absorbs some of the shock of the impact. As soon as the upper lengths of the straps are resting on the lower lengths, both the upper and the lower lengths are operable to support the shell.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A helmet shell suspension comprising a head-receiving cradle formed from straps crossing each other at the top of the cradle, each strap being in the form of an endless flattened loop having upper and lower lengths, a supporting member at each end of the strap provided with a pair of vertically spaced transverse slots having sub-

stantially flat upper and lower walls, the strap extending back and forth through the slots in said members to support them, the end portions of said lower lengths of the straps engaging the outer side of said supporting members above the slots, said members being adapted to be attached to a helmet shell to support it, and a headband inside the cradle and supported thereby independently of the straps, the straps being of a length to space a head a predetermined minimum distance from the top of the shell, and the upper lengths of the straps being adapted to be pulled upward manually relative to the supporting members to slide the straps through said slots and lower the lower lengths of the straps, whereby to space the head farther from the top of the shell, the friction between the straps and said supporting members being such that the straps will slide through said slots if said members are pressed firmly downward while said lowered lower lengths of the straps rest on a head.

2. A helmet shell suspension comprising a head-receiving cradle formed from straps crossing each other at the top of the cradle, each strap being in the form of an endless flattened loop having upper and lower lengths, a supporting member at each end of the strap provided with a pair of vertically spaced transverse slots having substantially flat upper and lower walls, each slot having substantially the same thickness as the strap therein, the strap extending slidably back and forth through the slots in said members substantially perpendicular to those members to support them, the end portions of said lower lengths of the straps engaging the outer side of said supporting members above the slots, said members being adapted to be attached to a helmet shell to support it, a headband inside the cradle, and flexible members independent of the straps suspended from said supporting members and connected to the headband to support it, the straps being of a length to space a head a predetermined minimum distance from the top of the shell, and the upper lengths of the straps being adapted to be pulled upward manually relative to the supporting members to slide the straps through said slots and lower the lower lengths of the straps, whereby to space the head farther from the top of the shell, the friction between the straps and said supporting members being such that the straps will slide through said slots if said members are pressed firmly downward while said lowered lower lengths of the straps rest on a head.

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