Jan. 30, 1968 D. D. WEBB 3,365,725

SAFETY HELMET

Filed Feb. 10, 1966

FIG. 1

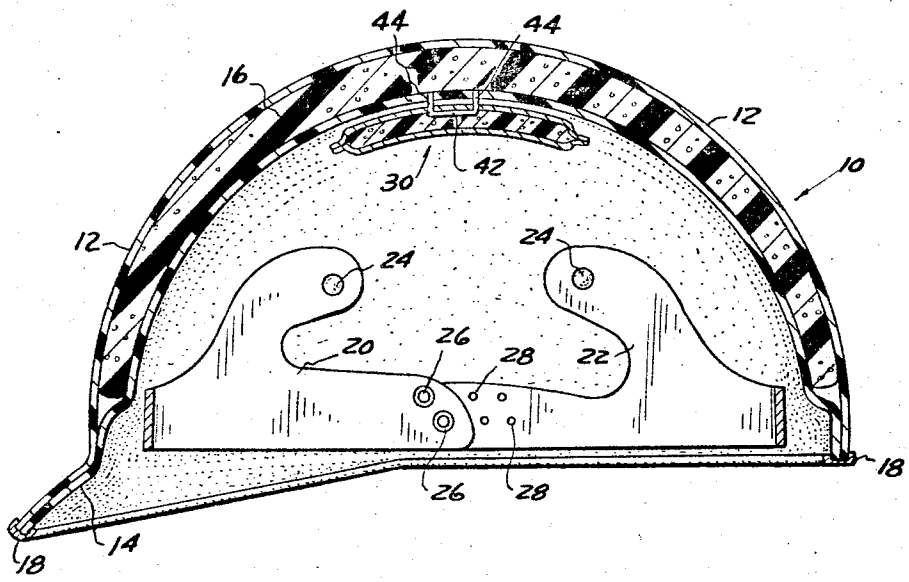


FIG. 2

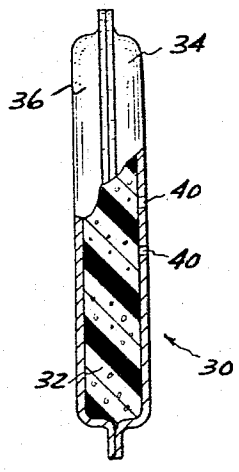
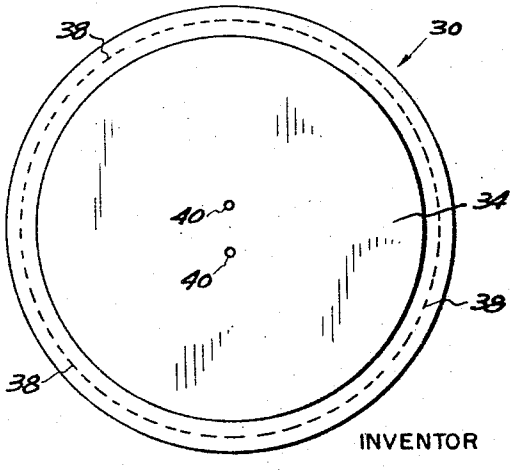


FIG. 3



INVENTOR

DANIEL D. WEBB

BY Cullen, Sloman & Cantor

ATTORNEYS

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SAFETY HELMET

Daniel D. Webb, Birmingham, Mich., assignor to American Safety Equipment Corporation of Michigan, Southfield, Mich.

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This invention relates to a crown pad for a safety helmet.

Safety helmets may be provided with padding at the dome or top of the interior of the helmet, so that the hard interior surface of the helmet rests more comfortably upon the top of the wearer's head during use.

It is an object of this invention to provide a safety helmet crown pad which is readily capable of deflection to accommodate heads of different shapes, and which traps air contained therein at times of impact to form a substantially sealed pneumatic cushion for absorbing externally applied loads due to impact.

This and other objects and advantages of this invention will become apparent from the following specification when considered in conjunction with the accompanying drawings.

In these drawings:

FIG. 1 is a cross-sectional elevation through a safety helmet embodying the crown pad of this invention;

FIG. 2 is a partially fragmented side elevation of the crown pad; and

FIG. 3 is a top plan view of the crown pad.

Referring now to FIG. 1 of the drawings, safety helmet **10** generally comprises an outer shell **12**, an inner shell **14** spaced from the outer shell, and a relatively thick resilient liner **16** substantially filling the space between the inner and outer shells.

The inner and outer shells are formed of semi-flexible, relatively stiff, material which will flex or bend only under considerable pressure and which will return to its initial shape on release of that pressure. Such a material may be acrylonitrile butadiene styrene (commonly known as ABS), which is a thermal-forming plastic sheet approximately .05 to .06 inch in thickness.

The intermediate resilient liner **16** is preferably formed of a foamed plastic material, such as foamed polystyrene. Such a material is characterized by being resilient and compressible under pressure while having a relatively slow recovery rate in returning to its original shape upon release of pressure. The lower peripheral edges of the inner and outer shells are covered by an edge bead **18**.

Within the helmet is positioned a cradle comprising a front head band **20** and a rear head band **22**, each part being secured to inner shell **14** by means of padded rivets **24**. The head band components are secured to each other by means of snap fasteners **26**, which may pass through any one of a plurality of holes **28** in the rear head band so as to adjust the head band circumference to various sizes.

A chin strap (not illustrated) may be provided to insure that the helmet will not be forced off the head of the wearer under impact.

Crown pad **30**, as illustrated most clearly in FIGS. 2 and 3, comprises a resilient shock absorbing filler **32** which is encased between top cover **34** and bottom cover **36**. The filler **32** is preferably fabricated of urethane foam, but can alternatively be made from foamed vinyl or other foamed plastic or the like. Both top and bottom covers **34** and **36**, respectively, may be vinyl sheets heat sealed together at their periphery in the form of simulated stitches **38**. Covers **34** and **36** are non-porous, and

the heat sealed seam between them prevents the passage of air therebetween.

A pair of holes is provided near the center of top cover **34**. These holes loosely receive a loop **42** (see FIG. 1) which also passes through a pair of holes **44** in the inner shell, so that crown pad **30** is suspended from the inner shell by loop **42** which may be formed of a suitable cord material.

The upper face of the pad **30** is normally spaced slightly from inner shell so that air can enter the pad through holes **40**. When the helmet is placed on the head of a wearer, the pad is displaced upwardly by contact with the head, thus reducing or eliminating this space. The weight of the helmet on the head of the wearer and the tension in the chin strap tend to expel some of the air within the pad through holes **40**. The expulsion of some of the air facilitates the conformance of the crown pad to the head during normal wear. However, under sudden heavy impact to the helmet, the pad is jammed against the inner shell with sufficient force to seal holes **40** against the under surface of inner shell **14**, thus trapping the air remaining within the pad. At that moment the pad acts as a pneumatic cushion, absorbing applied loads resiliently.

Thus, the novel crown pad of this invention combines the desired features of conformability to heads of different shapes while functioning as a pneumatic shock absorber under impact.

This invention may be further developed within the scope of the following claims. Accordingly, the above specification is to be interpreted as illustrative of only a single embodiment of this invention, rather than in a strictly limited sense.

I now claim:

1. In a safety helmet comprising a generally dome-shaped shock resisting and shock absorbing shell, the improvement which comprises:

a resilient crown pad of sufficient thickness to provide cushioning between the head of the wearer and the inner surface of the helmet shell;

means suspending said pad from the apex of the shell interior;

an envelope encasing said resilient pad, said envelope being non-porous except for a small orifice in the top central portion thereof, said orifice being normally free from contact with the interior surface of the shell, thereby to allow free air flow to and from the interior of said pad, said orifice upon sudden downward impact to the helmet being closed by face to face contact between the top of said envelope and the interior surface of the shell, thereby to prevent the escape of air from said pad.

2. A construction as defined in claim **1** wherein said suspension means comprises a flexible member anchored to the helmet shell and passing through said orifice and anchored within said crown pad.

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JORDAN FRANKLIN, *Primary Examiner.*

J. R. BOLER, *Assistant Examiner.*