

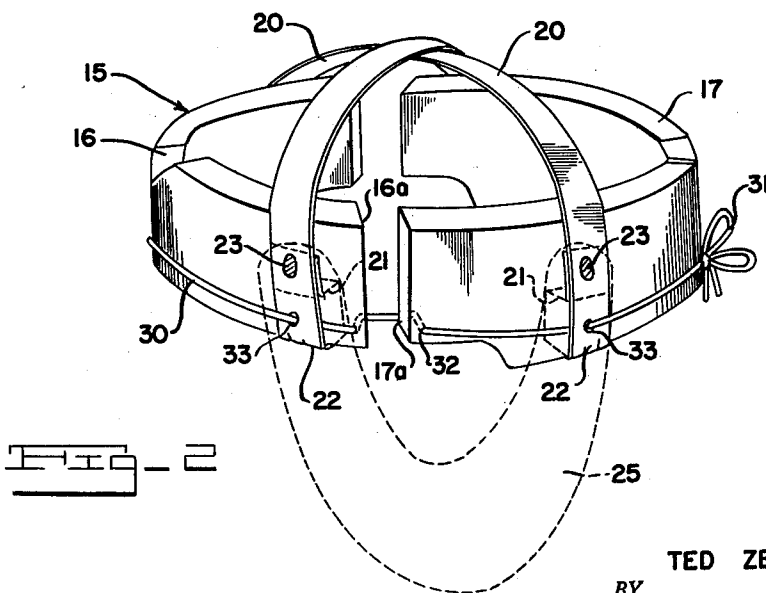
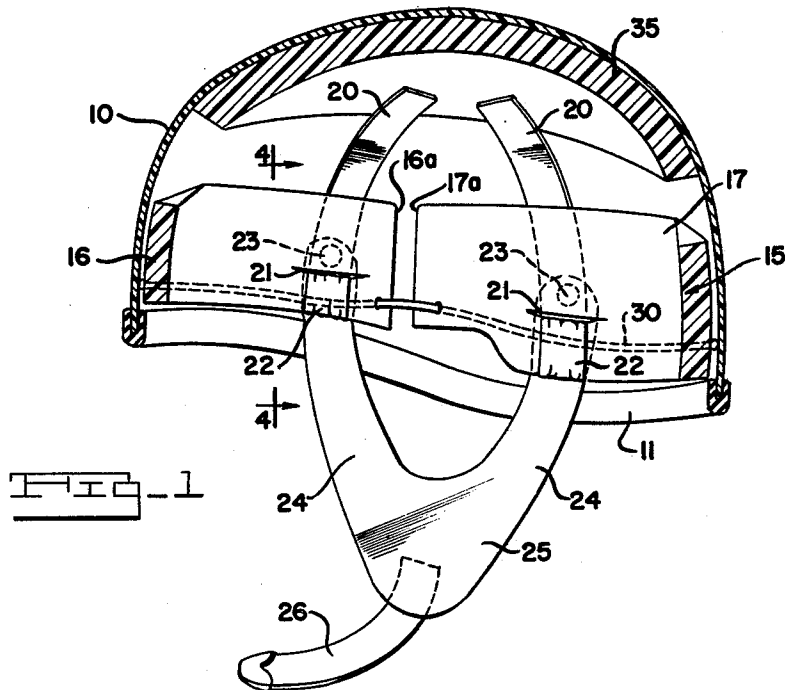
March 26, 1963

T. ZBIKOWSKI
SAFETY HELMET

3,082,428

Filed March 6, 1961

2 Sheets-Sheet 1



INVENTOR.
TED ZBIKOWSKI
BY *Cullen & Cantor*
ATTORNEYS

March 26, 1963

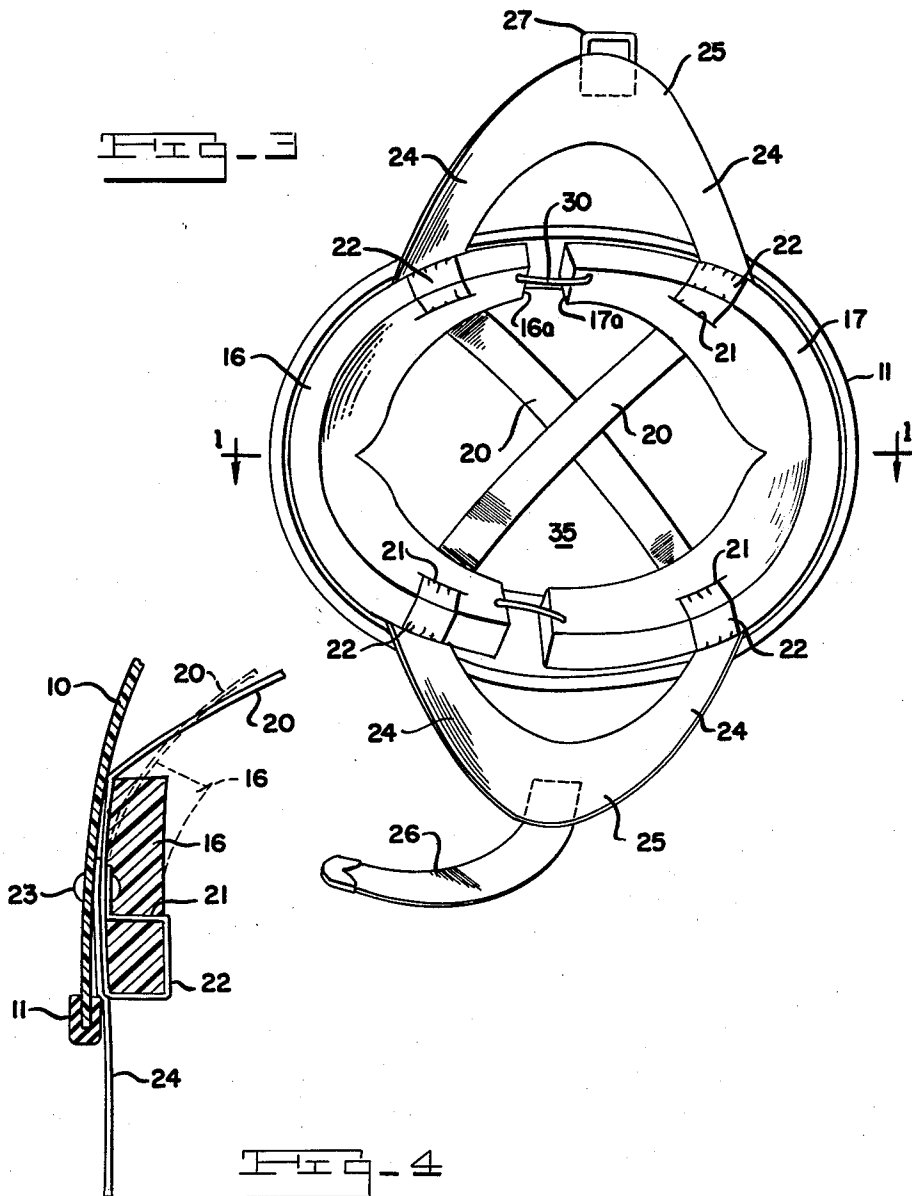
T. ZBIKOWSKI

3,082,428

SAFETY HELMET

Filed March 6, 1961

2 Sheets-Sheet 2



INVENTOR.

TED ZBIKOWSKI

BY

Cullen & Cantor
ATTORNEYS

1

3,082,428

SAFETY HELMET

Ted Zbikowski, Detroit, Mich., assignor to Joseph Buegeleisen Company, Southfield, Mich.

Filed Mar. 6, 1961, Ser. No. 93,742

4 Claims. (Cl. 2—3)

This invention relates to a safety helmet such as the type shown in my earlier filed application, Ser. No. 814,707, filed May 21, 1959, now Patent No. 3,015,103, granted January 2, 1963, and more particularly, relates to a suspension for supporting the helmet shell upon a head.

In manufacturing safety helmets, a considerable amount of hand labor is required in assembling various parts and particularly in assembling the suspension parts together and to the shell. While some simplified suspensions have been made which considerably reduce the hand labor required, these suspensions provide little, if any protection to the head of the wearer when the helmet is subjected to an impact.

Hence, it is an object of this invention to form a suspension for safety helmets which is extremely simple in construction and can be assembled together and to the helmet shell with a minimum of hand labor but wherein the suspension functions to absorb a maximum amount of impact load and to tightly package the head against impact.

A further object of this invention is to form a safety helmet suspension having a headband which is formed to provide the usual function of a headband, namely, to position the head comfortably within the helmet, but also is formed to tightly envelope the head and evenly distribute loads upon the head when the helmet is subjected to impact.

These and other objects and advantages of this invention will become apparent upon reading the following description, of which the attached drawings form a part.

In these drawings:

FIG. 1 is a cross-sectional, elevational view of the helmet taken as if in the direction of arrows 1—1 of FIG. 3.

FIG. 2 is a perspective view of the suspension, per se.

FIG. 3 is a bottom view of the helmet taken in the direction of arrows 3—3 of FIG. 1.

FIG. 4 is an enlarged, cross-sectional view, taken in the direction of arrows 4—4 of FIG. 1.

The helmet includes an outer shell 10, formed in the shape of an inverted bowl having thin walls and made out of rigid, impact-resistant plastic material such as a fibrous glass reinforced plastic resin. The bottom edge of the shell is provided with an edge beading 11 which may be in the form of a rubber or a rubber-like plastic channel which receives the raw bottom edge of the shell.

The suspension for the helmet includes a headband 15 formed of a strip of thick, resilient material such as a foamed plastic, as for example, foamed polystyrene or the like. The headband is formed in two parts, namely, front part 16 and rear part 17, with the parts having their respective ends 16a and 17a aligned and adjacent one another, although spaced apart a short distance.

The suspension also includes head or suspension straps 20 which have their center portions arranged just below the top of the shell and may be criss-crossed as shown in FIG. 2, with their ends positioned between the headband parts and the shell.

Each of the headband parts is provided with horizontal slits 21 near its bottom edges and the straps are bent around the bottom edge of the headband and back through the slits 21 to form loops 22 with the ends of the straps being overlapped upon the strap bodies at a point con-

2

siderably below the top edge of the headband and between the headband and the shell (see FIG. 4). At these overlapped points, the straps are secured by rivets 23 to the shell 10.

The headband is secured to the shell only by being secured to the loops 22 and the portions of the straps located between the rivets and the top edges of the headband are inwardly movable to bias the top portion of the headband inwardly. When the helmet is subjected to an impact, the helmet is forced downwardly upon the head, or vice versa, and the center portions of the straps move upwardly relative to the top of the helmet shell to bias the top portion of the headband inwardly and into tight circumferential contact with the human head wearing the shell to thus evenly distribute the load and tightly package the head and to prevent the head from banging against the shell.

To secure the helmet to the head of the wearer, chin straps 25 are provided. These straps are formed in a U-shape having legs 24 which are secured to the shell by the same rivets 23 that secure the straps to the shell. These U-shaped portions are provided with a chin band 26 and a buckle 27 respectively (see FIG. 3) so that the chin band 26 may surround the chin of the wearer and connect to the buckle, with the U-shaped portions being at the sides of his head.

Means are also provided for adjusting the opening defined by the headband to fit various size heads. This means is in the form of a drawstring or cord 30 whose ends are knotted together at 31 so that by tightening or loosening the cord 30, the headband may be contracted or expanded for any particular size. The cord horizontally surrounds the headband and to hold it in place, it passes through holes 32 at the adjacent end portions of the two headband parts and also passes through holes 33 formed in each of the straps 20 at their looped portions.

In addition, a padding 35, made of the same material as is the headband, is located at the top of the shell and functions as a safety padding in the event that the blow is sufficient to cause the head to closely approach the top of the shell.

With this construction, the entire suspension can be easily and quickly assembled simply by bending the strips forming the headband parts into position, looping the straps 20 in place through slits 21, inserting the rivets through the straps and also through the legs of the chin strap, and then fastening the four rivets to the shell. Despite the simplicity of construction, the headband is adapted to absorb great loads to distribute these loads evenly around the head, and to prevent the head from striking the shell, due to the pivoting or bending action of the top edge portion of the headband when the strap center portions are forced upwardly relative to the shell.

This invention may be further developed within the scope of the following claims. Accordingly, it is desired that the foregoing description be read as being merely illustrative of an operative embodiment of this invention and not in a strictly limited sense.

I now claim:

1. A head suspension for a safety helmet formed of an inverted bowl-like shell, comprising a headband formed of a wide strip of thick, resilient, sheet material arranged horizontally around the inside wall of the shell and adapted to substantially completely surround a head wearing the helmet, the headband having a top edge and a bottom edge and having a predetermined number of spaced apart horizontally arranged slots located between said top and bottom edges, but nearer to said bottom edge, the slots each extending completely through the strip; flexible suspension straps having center portions arranged within, but spaced a distance beneath the top

3

of the shell and having end portions passing downwardly between the headband and the shell in face to face contact with the outer face of the headband, that is, the headband face which is adjacent to the wall, and passing around the bottom edge of the headband and upwardly in contact with the opposite face of the headband, then through one of the slots and terminating in ends which overlap the respective strap bodies at points located between the headband and the shell and approximately midway between the top and bottom edges of the headband, and mechanical fasteners securing each of the strap ends and its respective strap body together and to the shell, the straps and the headband being otherwise free of securement to the shell and the strap portions located above the mechanical fasteners being movable upwardly and inwardly relative to the shell under load applied to the shell to thus bias radially inwardly of the shell the portion of the headband located above the mechanical fasteners.

2. A construction as defined in claim 1, and said headband being formed in at least two sections arranged end to end to form the complete headband, with the abutting ends being spaced apart a short distance, a continuous, horizontally arranged, flexible cord encircling the headband below the mechanical fasteners and above the bottom edge, the opposite ends of the cord being releasably secured together for adjusting the length of the cord and the headband portion located beneath the mechanical fasteners being inwardly movable under contraction of the cord when the cord length is shortened.

3. A construction as defined in claim 1 and including a chin strap having its opposite ends positioned between the shell and two of the strap end portions and fastened to the shell by the same two mechanical fasteners which fasten the two strap ends of said two strap end portions to the shell.

4

4. A head suspension for a safety helmet formed of an inverted, bowl-like shell comprising a headband formed of a wide strip of thick, resilient, sheet material arranged horizontally around the inside wall of the shell and adapted to substantially completely surround a head wearing the helmet; the headband having a top edge and a bottom edge; flexible suspension straps having center portions arranged within, but spaced a distance beneath the top of the shell and having end portions passing downwardly between the headband and the shell, and mechanical fasteners securing each of said end portions to the shell at a location approximately midway between the top and bottom edges of the headband, each of the end portions terminating in an end which is secured to the headband below said fasteners, the headband and straps being otherwise free of securement to the shell; each of the strap end portions overlapping the upper half of the headband face which is adjacent to the shell inside wall in full face to face contact with said headband face for the entire width and height of the strap end portion between said mechanical fasteners and the top edge of the headband; the strap portions located above the fasteners being movable inwardly and upwardly relative to the shell under applied load to thereby bias the upper half of the headband portion, that is, the headband portion located above the fasteners, radially inwardly of the shell.

References Cited in the file of this patent

UNITED STATES PATENTS

2,706,294	Sprinkle	Apr. 19, 1955
2,855,605	Aileo	Oct. 14, 1958
3,025,525	Larson	Mar. 20, 1962

FOREIGN PATENTS

209,252	Australia	July 19, 1957
---------	-----------	---------------