Feb. 11, 1930. T. J. HOWLAND 1,746,427

BATHING CAP

Filed Dec. 2, 1929

Fig. 1.

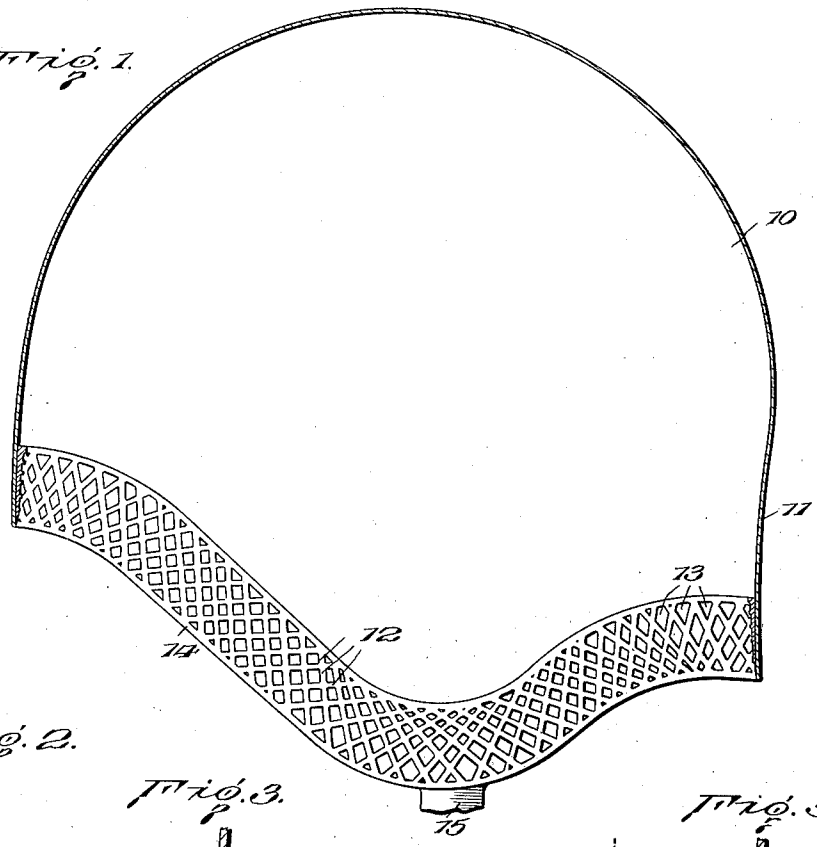


Fig. 2.

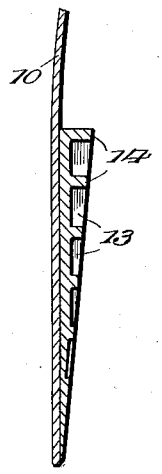
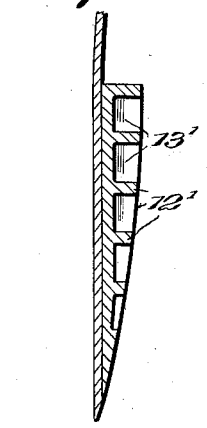


Fig. 3.



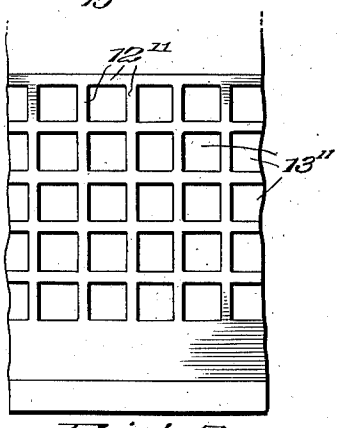
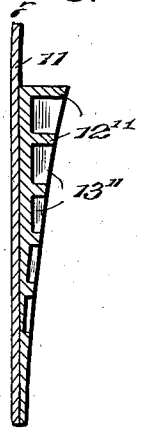


Fig. 4.

Fig. 5.



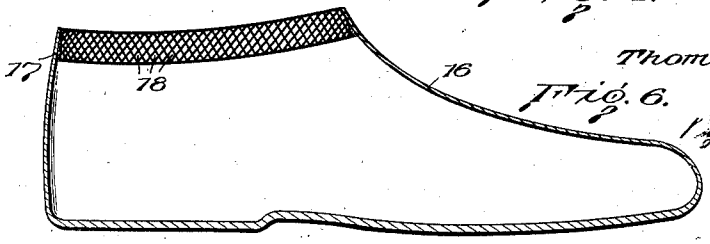


Fig. 6.

Inventor
Thomas J. Howland,
By Purnis Davis
Marvin Cummings
Attorneys

Patented Feb. 11, 1930 1,746,427

UNITED STATES PATENT OFFICE

THOMAS J. HOWLAND, OF LONG BRANCH, NEW JERSEY

BATHING CAP

Application filed December 2, 1929. Serial No. 411,101.

This invention relates to bathing caps and provides for a cap which forms a watertight seal along its edge and prevents moisture from penetrating within the interior of the cap.

A great variety of methods have been proposed for rendering bathing caps watertight but none of them have proved very satisfactory as is witnessed by the fact that bathing caps at present on the market usually consist of a simple rubber cap. A simple rubber cap is far from satisfactory and moisture generally seeps in at the edge of the cap rendering the cap totally ineffective for the purpose for which it is used.

The present invention provides a bathing cap which is adapted to form a watertight seal along the edge of the cap. This is accomplished without excessive tightening at the edge portion which would bind the head and cause discomfort to the wearer.

A plurality of caps or air pockets are provided around the inside edge of the cap. These are formed by ribs projecting inwardly from the cap and are adapted to contact with the head of the wearer. The hollows or cups between the ribs tend to increase the effectiveness of the seal due to the suction effect of these cups which act as vacuum cups.

The ribs which are in close engagement with the skin along the edge of the cap present a series of sealing surfaces separated by air pockets. The ingress of water or moisture is prevented therefore by a series of effective barriers.

The elasticity of the material comprising the cap may be taken advantage of to press the ribs into close engagement with the skin and, if desired, a chin band may be used.

A bathing cap having a plurality of cups or air pockets arranged around the inside of the edge of a bathing cap is disclosed in my copending application Serial Number 356,942, filed April 22, 1929.

The present invention is an improvement upon the invention forming the subject matter of my aforesaid application in that the band of air cups or pockets taper out to practically no depth at all at the extreme edge of the cap.

It has been found that when a wave strikes a cap having a thin flat edge it tends to flatten, but upon striking a blunt edge there is a tendency to lift the edge away from the head. Therefore, if the edge of the cap is thin the force of the impact of the waves will flatten the edge against the skin and cause it to adhere closer instead of tending to lift it away from the head.

For an example of a bathing cap embodying my invention reference is made to the accompanying drawing in which

Fig. 1 is a vertical sectional view through the bathing cap;

Fig. 2 is an enlarged cross section taken through line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2 but showing a modification;

Figs. 4 and 5 are respectively face and cross sectional views of a further modification, and

Fig. 6 is a cross sectional view showing the invention applied to a bathing shoe.

The bathing cap 10 comprises a main portion 11 of elastic material. This main portion is shaped to fit the general contour of the head.

Along the inside of this main portion 11 is attached a band comprising a series of crossed ribs 12 forming hollows or cups 13 therebetween. In Fig. 2 a section of this band of crossed ribs is illustrated.

The hollows or cups 13 are shown as diamond shaped and while this particular form has been found effective other forms can be used with good results, e. g., the hollows or cups 13 may be round or square, or oval shaped, etc. Furthermore, while the band of crossed ribs 12 comprises several rows of hollows or cups 13, I do not wish to restrict myself to the form shown, as even a single row of cups due to the suction effect of the cups will tend to maintain the edge of the cap in close engagement with the skin and form a watertight seal.

The elasticity of the material composing the main portion 11 of the cap will tend to press the crossed ribs 12 into close engagement with the skin and the cups 13 by their suction effect will tend to maintain this engagement.

The ribs 12 should have sufficient rigidity so that when stretched they will not upset and destroy the vacuum effect of the cups. The rigidity of the ribs 12 depends on the material of which they are formed, their width and the depth of the cups. The ribs are more effective as sealing surfaces if they are narrow, but the invention is not limited to this form and the width of the ribs 12 need not be uniform.

As shown in the drawings the band of crossed ribs 12 consists of a separate strip 14 attached to the edge of the main portion 11 in some convenient manner, but it is evident that the crossed ribs 12 might be formed directly in the main portion 11. The band 12 is shown as being disposed along the entire inside edge of the main portion 11 of the cap and this is the most effective arrangement. But the band may be interrupted, for instance, at the point covering the forehead, without materially affecting the result. The shape of the head at this point is such that the edge of the cap is in such intimate contact with the skin that there is little danger of any seepage of water at this point and the gripping effect of the ribs at other points will prevent the cap from being jerked off.

The suction effect of the cups 13 tends to maintain the engagement of the edge of the cap with the skin and will prevent the cap from being pulled off the head thus eliminating the necessity of a chin band. A chin band 15, however, may be attached to the outer edge of the main portion 11 to increase the pressure along the edge of the cap.

In order to prevent the water from tending to lift the edge of the cap away from the skin the ribs 12 as shown in Fig. 2, have a greater height at the upper portion of the band of cups 13 and gradually taper out to practically no depth at the extreme edge of the cap. When the ribs are tapered in this manner a wave upon striking the thin flat edge of the cap will flatten out and press the edge tighter against the skin and thereby increase the adhesion between the edge and the skin.

While any shape cup will act to keep the edges of the cap firmly gripped to the head, differently shaped cups react differently under tension. For instance, the tendency of square cups when under tension, is to bulge inward, while the tendency of diamond shaped cups under a similar condition is to bulge outwardly from the head. This tendency may be overcome by varying the cross sectional shape of the band.

In Fig. 3 I have shown a tapered band of cups or air pockets 13′ similar to the band of cups 13 of Fig. 2, but in which the inner contour of the band formed by the ribs 12′ is convex in a vertical cross section normal to the edge of the cap. This shape is obtained by varying the depths of the cups and the height of the ribs. By thus varying the depths of the cups and the height of the ribs, the outward bulge of the diamond shape cups is counteracted and a better seal obtained.

In Figs. 4 and 5 I have shown a band in which the ribs 12″ intersect at right angles and form square cups 13″. The tendency of cups of this shape is to bulge inwardly towards the head under pressure and this inward bulge is counteracted by forming the inner contour of the band formed by the ribs concave in a vertical cross section normal to the edge of the cap. In like manner the distortion of cups of other shapes may be counteracted.

The invention, so far, has been particularly described in connection with bathing caps which are adapted to be worn upon the head. It is, of course, obvious that the invention may be applied to bathing caps which may be worn upon other portions of the body.

In Fig. 6 the invention is shown applied to a bathing shoe 16, and the band 17 of the cups or air pockets 18 is shown as applied to the inside of the edge of the upper. In this case, as in the bathing caps shown in Figs. 1 to 5 inclusive the band of cups will taper out to practically no depth at the edge.

I claim:

1. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with a shallower cup adjacent the edge whereby a relative thin edge may be obtained.

2. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets formed by ribs projecting from the article towards the inside and adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained.

3. A bathing cap for use upon the head comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained.

4. A bathing cap for use upon the head

comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets formed by ribs projecting from the article toward the inside and adapted to contact with the skin, the air cups or pockets being of varying depths along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained.

5. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained, said cups having the walls thereof of such dimensions that their projecting edges will be brought into substantial coplanar position when under tension.

6. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained, said cups having the walls thereof of such height that the contour formed by their projecting edges is curved along a line normal to the edge of the article.

7. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article with the shallower cups adjacent the edge whereby a relative thin edge may be obtained, said cups having the walls thereof of such height that the contour formed by their projecting edges is convex along a line normal to the edge of the article.

8. An article of bathing apparel comprising a substantially water-tight pocket having a main portion of elastic material and having at least a portion of the inside of its edge provided with a plurality of rows of air cups or pockets adapted to contact with the skin, the air cups or pockets being of varying depth along a line normal to the edge of the article.

In testimony whereof I affix my signature.

THOMAS J. HOWLAND.