R. E. RILEY.

METHOD OF MANUFACTURE OF RUBBER BATHING CAPS AND ANALOGOUS ARTICLES.

APPLICATION FILED SEPT. 11, 1919.

1,353,421.

Patented Sept. 21, 1920.

Fig. 1.

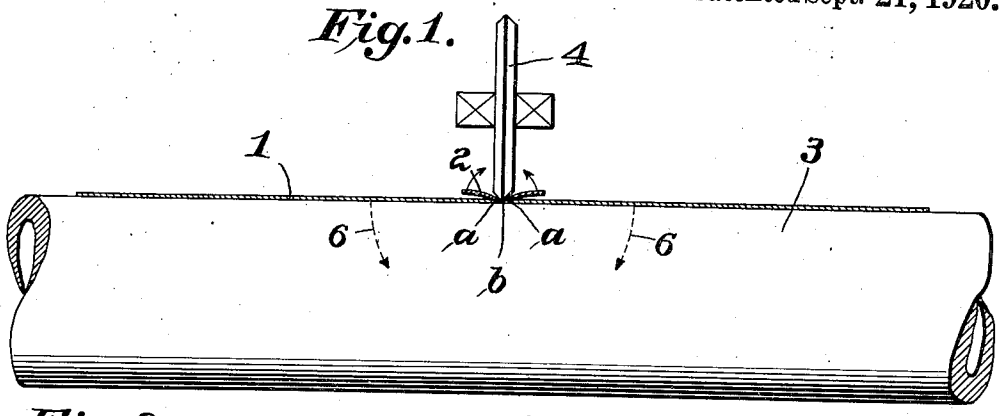


Fig. 2.

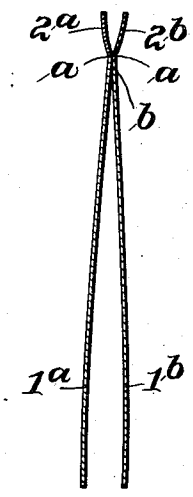


Fig. 3.

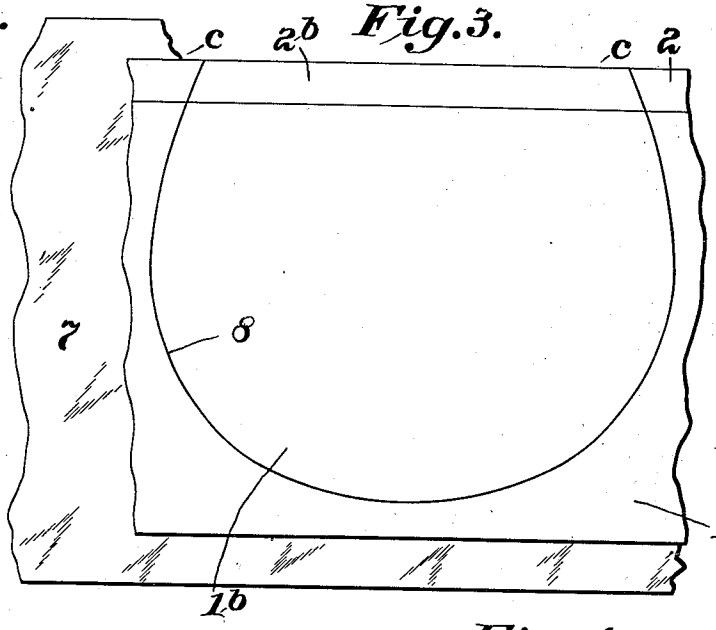


Fig. 3a.

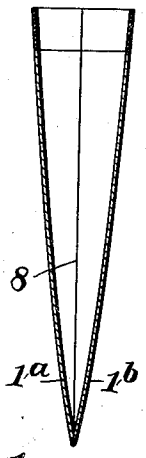


Fig. 5.

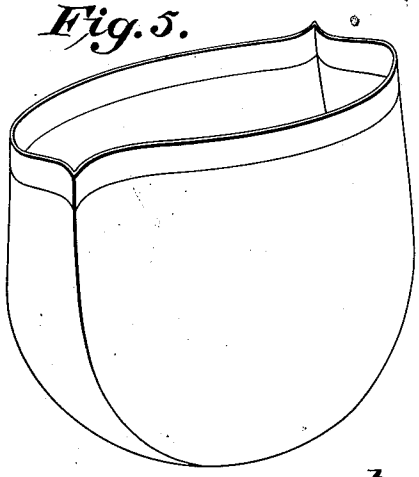
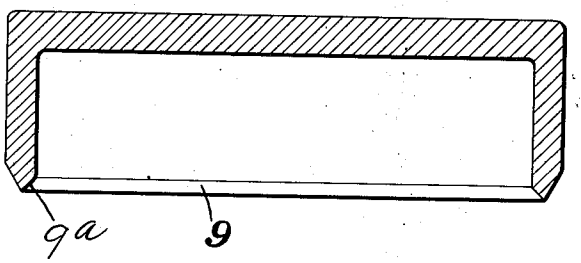


Fig. 4.



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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURE OF RUBBER BATHING-CAPS AND ANALOGOUS ARTICLES.

1,353,421. Specification of Letters Patent. **Patented Sept. 21, 1920.**

Application filed September 11, 1919. Serial No. 323,095.

To all whom it may concern:

Be it known that I, RALPH E. RILEY, a citizen of the United States, and resident of Akron, Ohio, have invented certain new and useful Improvements in Methods of Manufacture of Rubber Bathing-Caps and Analogous Articles, of which the following is a specification.

My present invention relates to an improved method of making rubber bathing caps and similar articles and aims to provide a process by which such caps may be made in a much more expeditious and economical manner than heretofore.

The invention includes the novel process hereinafter described and particularly defined by the appended claims.

In order that the manner of carrying out the process may be better understood I have appended hereto drawings in which—

Figure 1 is a sectional view of a conventional or diagrammatic nature showing the rubber material of which the cap is made between a suitable cutting die and platen or roll.

Fig. 2 is a view of the folded sheet.

Fig. 3 is a view illustrating the manner of cutting the folded sheet.

Fig. 3ª is a sectional view of the complete article.

Fig. 4 is a detail view of a form of cutter.

Fig. 5 is a view of a complete cap.

I have referred herein to the method as used in making what is known as a shower cap, to wit, a cap which is of the skull fitting type, and in the manufacture of these caps it is customary to make the body of the cap of one color and to provide it with a border of a different color. As the cap cannot be conveniently colored in part after manufacture, the colored border is preferably made as a separate strip which is applied to the sheet from which the cap body is made and the method of applying this border strip forms a part of my present invention. An important feature of my invention consists in folding a sheet of the unvulcanized rubber compound of approximately double the width of the cap upon itself and then cutting from the double sheet an approximately horse-shoe shaped or semi-circular segment in such a manner that this segment is not only severed from the body of the superposed sheets, but the edges are joined together by the severing action, the severing action only taking place on the segment of a circle which intersects one side of the superposed sheets, the free edges of which are not joined together and which constitute the head opening of the cap.

In proceeding according to my invention, I preferably take a sheet of unvulcanized material of double the width of the cap which is indicated at 1 and support this in a flat position upon a stationary mandrel of hard material such as hardened steel. Upon this is laid a strip of unvulcanized rubber indicated at 2 which is of double the width of the edging strip for the cap, said strip being disposed centrally on the sheet, and I then subject the two sheets to the action of a suitable tool or device which will have the combined pressing and cutting effect. Preferably I feed the two sheets in superposed position as shown in Fig. 1 between the platen in the shape of the hardened steel roller 3 and a circular cutter 4 having a wedge shape or blunt edge and under a degree of pressure which severs the strip of rubber along its central longitudinal line into two strips and also almost severs the main sheet of rubber 1 into two strips but leaves these slightly united so as to be easily separable. The pressure of the combined pressing and cutting device 4 causes the severed edges of the strip 2 to be pressed against the sheet 1 and firmly unite thereto. After having thus severed and united the strip 2 to the main sheet of rubber 1, I fold or double the main sheet 1 upon itself, the line of fold being along the line of action of the cutter, the outer portions of the sheet being swung toward each other. Where a circular mandrel and cutter are used this folding action may be done continuously and in immediate succession to the cutting action, the sheet being fed from any suitable source to and between the cutter and mandrel roller, and as the slightly united half sheets leave the cutter, to carry them upon any suitable endless conveyer means which gradually turns the half sheets until they are brought into the position shown in Fig. 2 in which 1ª and 1ᵇ designate the two half sheets, 2ª and 2ᵇ the corresponding halves of the edging strip *a* indicating the points where the edging strips have been firmly united to the folded main strip and *b* indi-

cating the point where the main strips are only slightly united, due to the partial severing by the tool 4.

It will be understood that in the folding action sheet portions 1^a and 1^b are swung toward each other in the direction of the dotted arrows 6, Fig. 1. It will also be understood that the portions of the sheets which are not designed to adhere to each other are dusted over lightly with powdered starch or other similar material to remove the adhesiveness of the unvulcanized rubber prior to the operations hereinbefore described.

After the sheets have been brought into the position and condition shown in Fig. 2 they are placed upon a flat mandrel of hard material, preferably of hardened steel as indicated at 7, and subjected along a substantial semi-circular or horse-shoe shaped line indicated at 8 to the action of a suitable cutter having a blunt edge which acts to simultaneously sever the cap forming portion included within the line 8 from the main sheet, this line 8 intersecting the edge of the folded sheet at points indicated by the reference characters *c*, this portion of the super-posed sheets between the ends of the semi-circular cut forming the head opening. The cutting and joining action along the line 8 may be performed in any suitable manner, as for example, by the rolling action of a cutter similar to that shown in Fig. 1, but I prefer to accomplish it by feeding the die plate with an intermittent action to a suitable die press in which the sheet is subjected to an intermittently acting cutter of semi-circular or horse-shoe shape such as shown at 9 having a cutting edge of the shape shown at 9^a. The action of this cutting edge severs the duplicate cap forming blanks from superposed sheets along the line 8 and simultaneously joins these edges firmly together and produces thereby the complete cap excepting that it is now necessary to sever the two sides from each other at the point *b* and then to subject the cap to the ordinary vulcanizing process to put it in condition for marketing and use.

I find that the joining process may be facilitated by heating the platens which may be accomplished in any suitable manner as for instance, by making the platens hollow and admitting steam thereto.

While I have described my invention in connection with a rubber bathing cap, it will be understood that it is not limited in this respect, but is applicable to the manufacture of any article of a similar or analogous nature.

I claim:

1. The herein described method of making rubber bathing caps and analogous articles which comprises folding a rubber sheet upon itself, supporting it upon a suitable mandrel and subjecting it to the pressure of a blunt cutting device over a substantially semicircular line, the ends of which extend through the folded edge of the sheet, uniting the cut edges simultaneously with the cutting action and by pressure from the cutter and then separating the sheet at its fold to provide the head opening.

2. The herein described method of making rubber bathing caps and analogous articles which consists in super-posing a strip of rubber upon a sheet of rubber intermediate the width of the same, subjecting the superposed strip and sheet along a line disposed centrally and longitudinally of the strip to the action of a blunt cutting instrument, folding the side portions of the main sheet toward each other in one direction and the side portions of the strip toward each other in the opposite direction, and cutting the super-posed sheets thus formed along a substantially semi-circular line, the end of which terminates at the free edge of the strip.

3. The herein described process of making bathing caps consisting in attaching a strip of rubber at its middle portion to the middle portion of a sheet, folding the sheet upon itself from the point where the strip is attached, cutting the cap shaped parts from the folded sheet and attached strip and simultaneously uniting the cut edges and then severing the sheet at its fold, substantially as described.

4. The herein described method of making bathing caps comprising forming a blank composed of two main sheet portions each having a rubber strip attached thereto and attached to each other adjacent the point of attachment of the strips, dieing out the rubber sheets and strip and simultaneously uniting the cut edges, and then separating the sheets at their point of attachment, substantially as described.

5. The herein described method of making rubber bathing caps consisting in superimposing a rubber strip upon a sheet of rubber at a point intermediate the width thereof, subjecting the strip and sheet to pressure of a tool which divides the strip into two parts, unites them to the sheet and at the same time partly severs the sheet, folding the sheet to make the portions on opposite sides of the line of partial severance lie face to face, then cutting the folded sheet along a curved line to define the crown, said line terminating at the free edges of the attached strip portion and then severing the sheet at the line of partial severance, substantially as described.

6. A rubber bathing cap having a main body or crown portion and a strip attached at the edge, said body portion being in two parts and the strip being in two parts the

line of junction of the two body parts being continuous with the lines of junction of the strips at the ends thereof, substantially as described.

7. A blank for forming bathing caps of rubber comprising a sheet folded upon itself and two strips attached at the fold.

8. A bathing cap comprising a crown made up of two pieces united at their edges by an outwardly directed seam and strips secured to said sheets by an inwardly directed seam and to each other at their ends by an outwardly directed seam forming a continuation of the outwardly directed seam of the sheets.

In testimony whereof I affix my signature.

RALPH EARL RILEY.