April 7, 1970 R. SANCHEZ 3,505,149

APPARATUS FOR MANUFACTURING SHOWER CAPS

Original Filed Sept. 30, 1966 2 Sheets-Sheet 1

FIG. 1

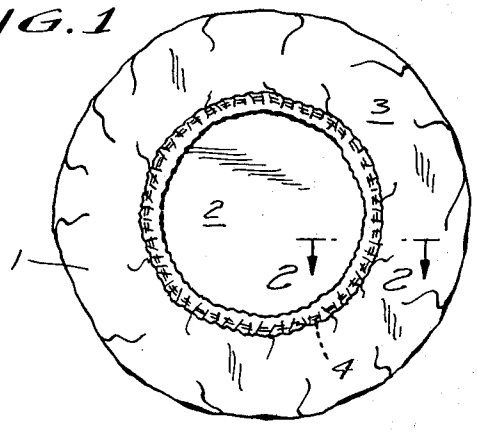
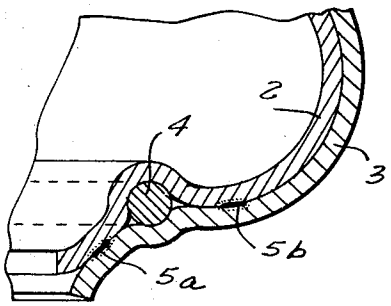


FIG. 2



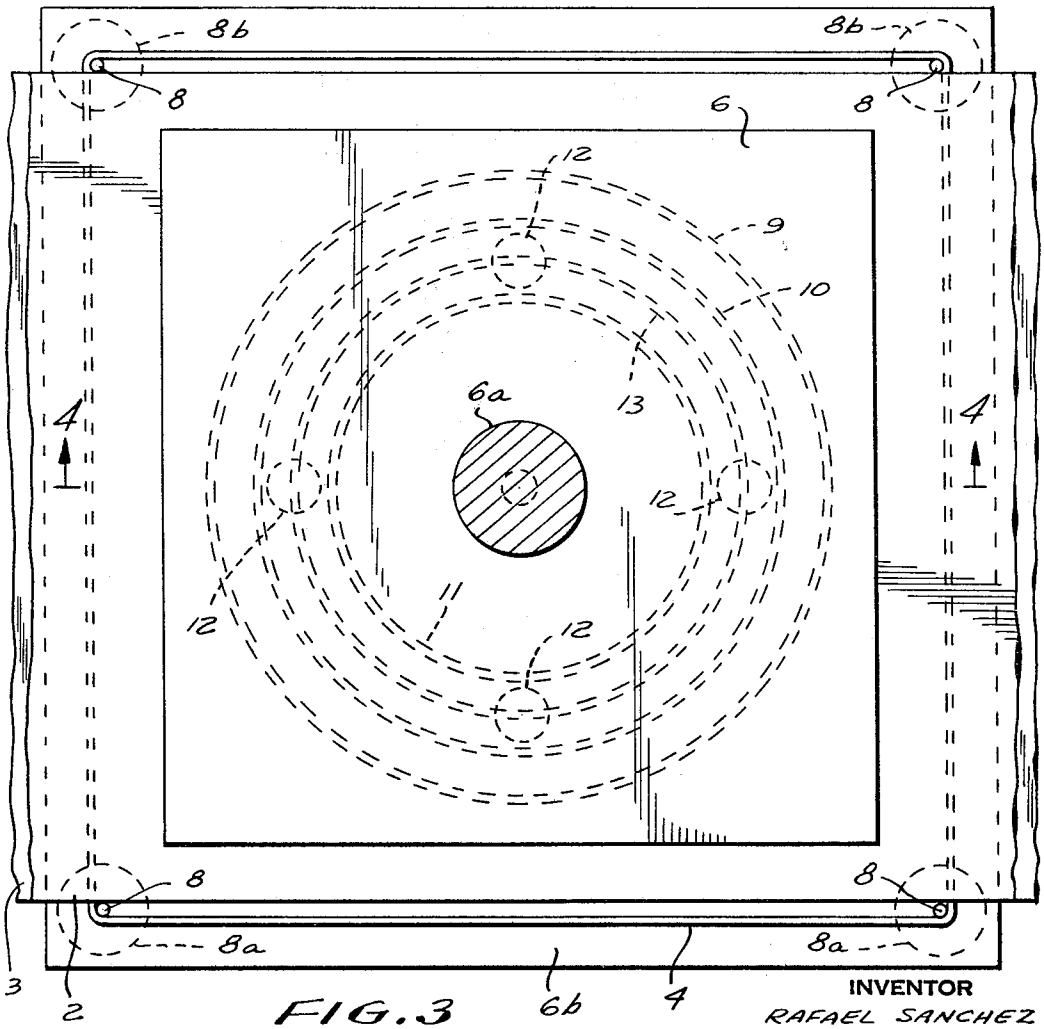


FIG. 3

INVENTOR
RAFAEL SANCHEZ
BY Arthur O. Klein
ATTORNEY

April 7, 1970 R. SANCHEZ 3,505,149

APPARATUS FOR MANUFACTURING SHOWER CAPS

Original Filed Sept. 30, 1966 2 Sheets-Sheet 2

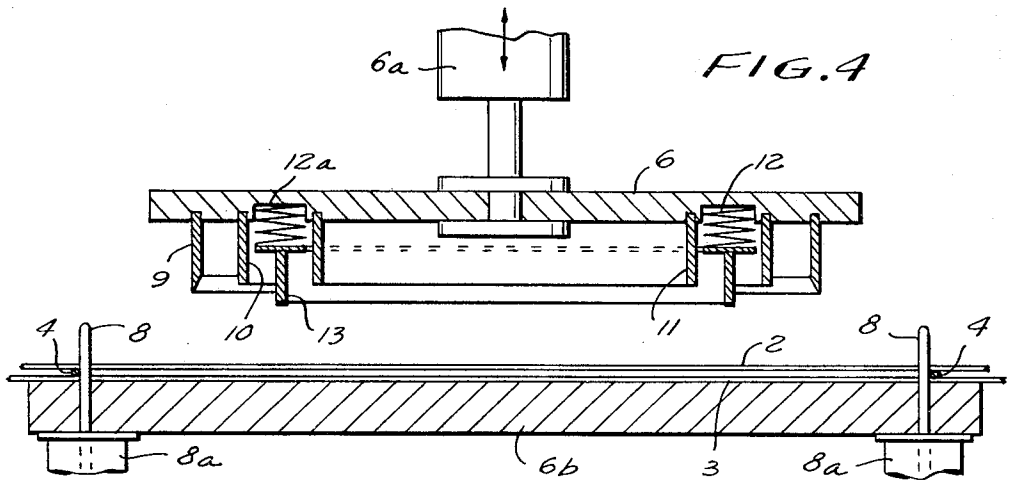


FIG. 4

FIG. 5

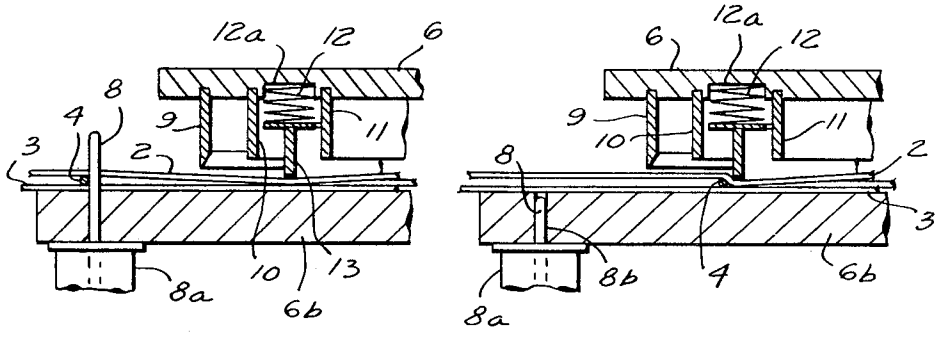


FIG. 6

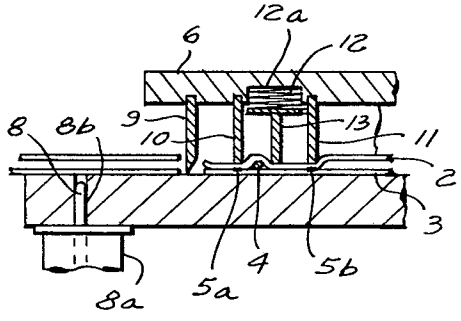


FIG. 7

INVENTOR
RAFAEL SANCHEZ
BY Arthur O. Klein
ATTORNEY

United States Patent Office 3,505,149 Patented Apr. 7, 1970

3,505,149

APPARATUS FOR MANUFACTURING SHOWER CAPS

Rafael Sanchez, 41—57 71st St. W., Woodside, N.Y. 11377

Original application Sept. 30, 1966, Ser. No. 583,307. Divided and this application Mar. 10, 1969, Ser. No. 827,080

Int. Cl. B29d 3/02

U.S. Cl. 156—383 7 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for making shower caps comprises a press having an upper punch provided with annular means for heat sealing plastic sheets about an elastic band placed between the sheets. The lower punch has pins for holding the elastic band in an expanded position. The upper punch has annular means for holding the band in a second position when the pins release the band.

This is a division of application Ser. No. 583,307, filed Sept. 30, 1966, now abandoned.

This invention relates to an improved shower cap and a novel method and apparatus for manufacture of said shower cap.

Shower caps are generally used for protecting the hair of the wearer from water when taking a shower. The shower caps known in the art are generally manufactured out of circular pieces of plastic water repellient material, such as for example, polyvinylchloride. An elastic band is sewed to the periphery of the opening of the shower cap and serves to keep the cap in place on the wearer's head thereby covering the hair.

The aforedescribed known type of shower caps have the following disadvantages:

The thread connecting the elastic band to the body of the shower cap and usually the band itself are not water repellent. Consequently, they absorb water and become, after a short use, musty and dirty. Furthermore, the stitches in the plastic film cause frequently structural failures in the P.V.C. sheeting because the needle perforations form weak points therein.

It is a general object of this invention to provide an improved shower cap having an improved construction and better appearance which eliminates all of the aforementioned disadvantages of the known type of shower caps.

It is another object of this invention to provide a novel method of manufacturing the shower cap of this invention.

It is a more specific object of this invention to provide a shower cap consisting of a pair of sheets of plastic material between which there is interposed an elastic band, whereby the pair of sheets of plastic material define a sealed compartment therebetween which contains said elastic band.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description when read in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of the shower cap forming part of this invention;

FIG. 2 is a cross-sectional view on an enlarged scale along line 2—2 of FIG. 1;

FIG. 3 is a plan view of the apparatus for manufacturing the shower cap of this invention;

FIG. 4 is a cross-sectional view along line 4—4 of FIG. 3; and

FIGS. 5 to 7 are partial cross-sectional views of the apparatus illustrated in the FIG. 4 showing various steps in the manufacture of the shower cap of this invention.

Referring now specifically to the drawing, there is illustrated a shower cap **1**, having a circular opening, which consists of two sheets **2** and **3** of thermo-plastic material, such as for example polyvinylchloride. A preferably round elastic band **4** is disposed between the two sheets of plastic material and is maintained in position by means of a pair of welded seams **5***a* and **5***b*.

In FIG. 3 there is illustrated the apparatus for manufacturing the shower cap of this invention which comprises a press of an automatic dielectric heat sealing and die cutting machine. Other types of heat sealing presses may also be used for the method of manufacture of this invention. Examples of presses that can be used in the process of this invention are illustrated in the book entitled "Heat Sealing," published and authored by R. Furkas. The press comprises the usual upper punch **6** which is axially secured to a reciprocally actuated shaft **6***a* actuated by hydraulic or mechanical means (not illustrated). A lower, preferably stationary, punch **6***b* is mounted in axial alignment with the upper punch **6**. Four substantially parallel pins **8** are slidably or pivotally (not illustrated) mounted in the lower punch **6***b*, so that they can be withdrawn into tubular passages **8***b* located in the punch **6***b* or pivoted into the plane of the punch **6***b* by mechanical means (not illustrated). Four solenoids **8***a* are secured to the underside of the stationary punch **6***b* in axial alignment with the tubular passages **8***b*. The pins **8** are made at least partially of ferrous material so that when the solenoids **8***a* are simultaneously connected by switching means (not illustrated) to an electrical source they are simultaneously withdrawn into the passages **8***b*.

An annular cutting and stripping member **9** is axially secured to the underside of the upper punch **6**. An outer annular dielectric heat seal member **10** and an inner annular heat seal member **11** are coaxially securely mounted to the underside of the upper punch **6**. Preferably four coil springs **12** are respectively mounted in four grooves **12***a* in the underside of the punch **6**. The grooves **12***a* are equidistant from the axis of the punch **6** and are spaced from each other by 90°. An annular retaining member **13**, having a T-shape in cross-section, and being made preferably of a non-conductive material such as nylon is secured to the four springs **12**. The member **13** projects below the members **10** and **11**.

The apparatus of this invention operates as follows:

A lower pre-cut sheet of plastic material **3** is positioned on the lower punch **6**. The elastic band **4** is then positioned by stretching it around the four pins **8**. An upper pre-cut sheet of plastic material **2** is then placed over the lower sheet **3** and the elastic band **4**. The upper press punch **6** is then moved downwardly by hydraulic or mechanical means (not illustrated) to a first stage position wherein the retaining member bears against the upper plastic sheet **2** while the spring **12** is slightly compressed by a small predetermined pressure exerted by the upper press punch **6** (FIG. 5) It should be noted that the member **13** cannot seal the plastic sheets **2** and **3** together when it is positioned as illustrated in FIG. 5 because the member is made out of a non-conductive material such as nylon. An electric switch (not illustrated) or mechanical lever means (not illustrated) are then activated causing respectively the solenoids **8***a* to withdraw the pins **8**, or the pins **8** to pivot into the plane of the lower punch **6***b*. The stretched elastic band **4** is thereby released and snaps into the position illustrated in FIG. 6. The press punch **6** is then lowered to a second stage wherein the outer portions of the sheets **2** and **3** are cut off by the member **9** while the heat seal members **10** and **11**, which firmly press down on the sheets **2** and **3**, form the seals **5***a* and **5***b* (FIG. 7)

due to thermal, impulse, dielectric, ulrasonic actions or other known techniques.

The entire aforedescribed operation can be adapted to a progressive feeding operation, wherein two rolls of P.V.C. sheet material of appropriate width are passed over the lower press punch where they are precut.

Although the present invention has been described in conjunction with a preferred embodiment of a shower cap and the apparatus and method for manufacturing the same, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modification and variations are considered to be within the purview and scope of the invention and appended claims.

What I claim is:

1. An apparatus for manufacturing shower caps having an elastic band comprising press means having an upper reciprocally mounted punch and lower stationary punch; first and second substantially concentric annular sealing means secured to the underside of said upper punch; first elastic band retaining means mounted on said upper punch between said first and second sealing means and displaceable relative to said upper punch; biasing means disposed between said upper punch and said first retaining means for biasing said first retaining means to a rest position whereat said first retaining means projects axially beyond said first and second sealing means while permitting displacement thereof toward said upper punch; and second retaining means mounted in said lower punch for retaining in a first position said elastic band outside of said first and second annular sealing members and being adapted to assume a second position whereat said elastic band is released for retention by said first retaining means.

2. An apparatus for manufacturing shower caps as recited in claim **1**, wherein said first retaining means is formed from a nonconductive material.

3. An apparatus for manufacturing shower caps as recited in claim **1**, wherein said first and second sealing means comprise heat sealing means.

4. An apparatus for manufacturing shower caps as recited in claim **1**, wherein said second retaining means includes a plurality of retaining members operatively mounted on said lower punch for displacements between a first position whereat they project above said lower punch and a second position at which they are withdrawn into said lower punch.

5. An apparatus for manufacturing shower caps as recited in claim **4**, wherein said second retaining means includes a plurality of solenoid means, each operatively connected to one of said retaining members for the displacement thereof between said first and second positions.

6. An apparatus for manufacturing shower caps as recited in claim **4**, wherein said second retaining means includes at least three of said retaining members.

7. An apparatus for manufacturing shower caps as recited in claim **1**, including annular cutting means mounted on said upper punch and substantially concentrically disposed about the axis of said press means, said annular cutting means being of a greater diameter than said first and second annular sealing means.

References Cited

UNITED STATES PATENTS

1,544,312	6/1925	Gray	156—163
2,125,495	8/1938	French	156—163
2,432,662	12/1947	Gardner	2—68 X
2,768,107	10/1956	Magid	156—70 X
2,957,792	10/1960	Magid	156—251
2,988,221	5/1961	Magid	156—383 X
3,225,764	12/1965	Magid	156—251 X

REUBEN EPSTEIN, Primary Examiner

U.S. Cl. X.R.

156—160, 251, 306, 494, 515