

[54] **BOTTLE CAP HAVING A PRESHRUNK FOIL PORTION**

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 1972, abandoned.

[30] **Foreign Application Priority Data**

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 215/355

[51] Int. Cl.<sup>2</sup> ..... **B65D 45/32**

[58] Field of Search ..... 215/246, 253, 254, 256;  
 53/41; 156/84, 85, 86

**References Cited**

**UNITED STATES PATENTS**

1,712,103 5/1929 Carvalho..... 215/256

1,982,567	11/1934	Blanchard.....	215/256
2,790,286	4/1957	Snyder.....	215/246 X
3,417,539	12/1968	Hirohama.....	215/246 X

**FOREIGN PATENTS OR APPLICATIONS**

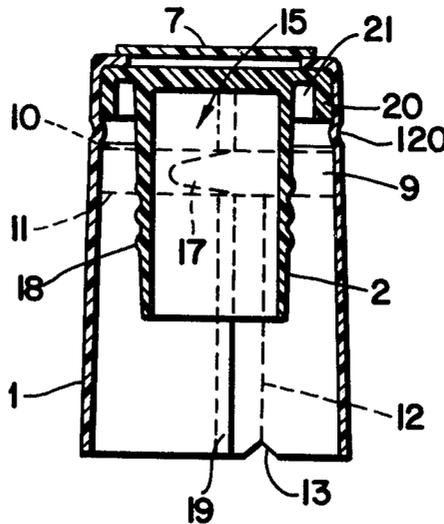
1,088,552	10/1967	United Kingdom.....	215/246
821,626	8/1937	France.....	215/256
69,938	10/1958	France.....	215/256

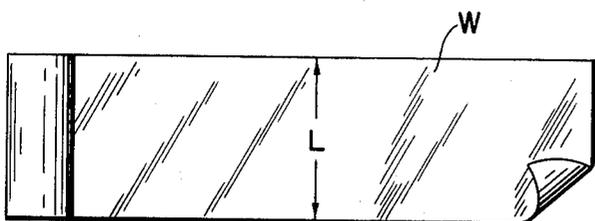
*Primary Examiner*—Donald F. Norton  
*Attorney, Agent, or Firm*—Strauch, Nolan, Neale, Nies & Kurz

**ABSTRACT**

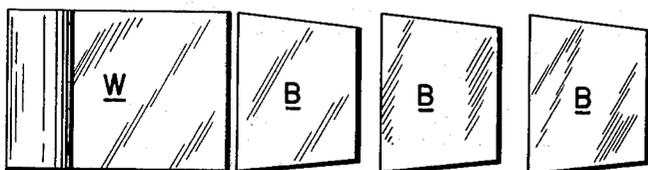
A bottle cap containing a preshrunk wall of heat shrinkable plastic foil prestretched in the direction of the circumference of the tubular wall of the cap and capable of being readily mounted upon and shrunk to final condition on a bottle to be capped, the preshrunk tubular wall having longitudinal portions of different residual shrinking capacity according to a predetermined pattern.

**19 Claims, 20 Drawing Figures**

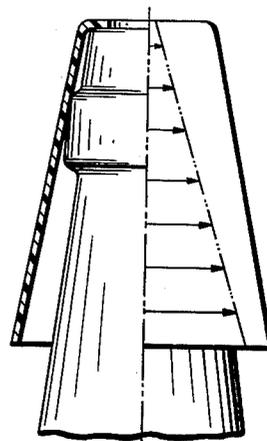




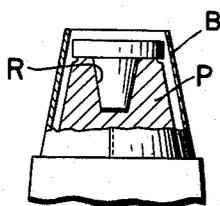
**FIG. 1**



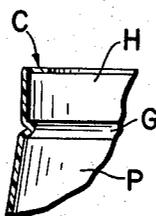
**FIG. 2**



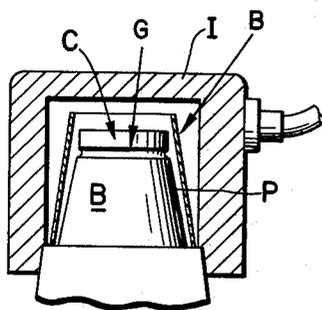
**FIG. 6A**



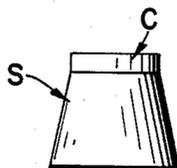
**FIG. 3**



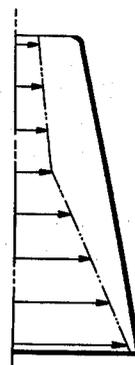
**FIG. 5**



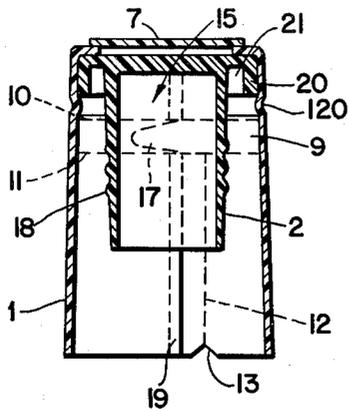
**FIG. 4**



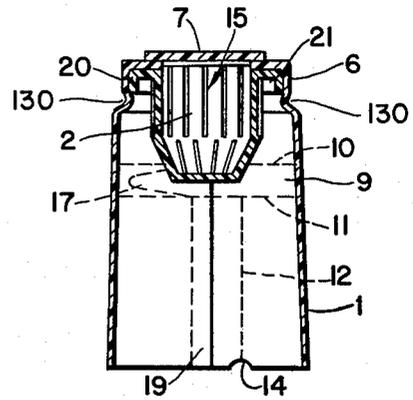
**FIG. 6**



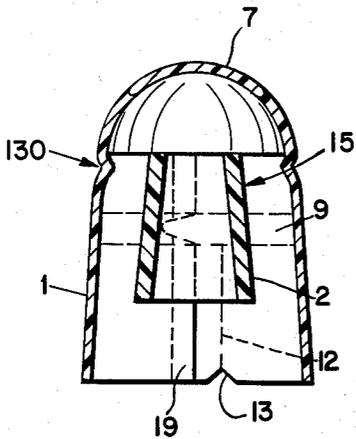
**FIG. 6B**



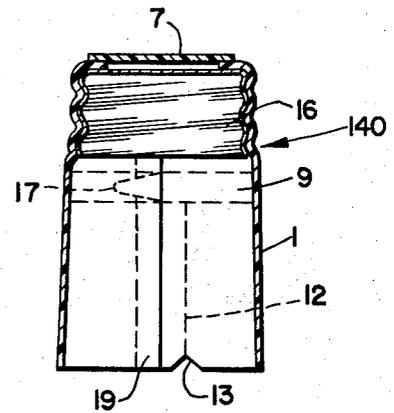
**FIG. 7**



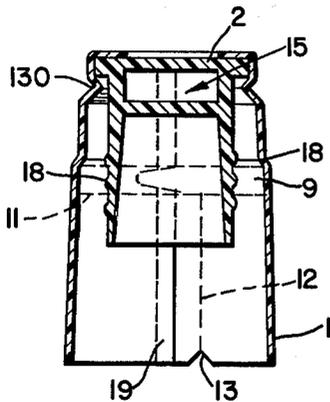
**FIG. 8**



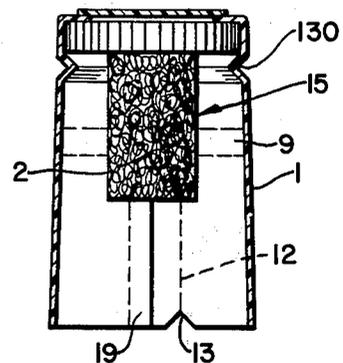
**FIG. 11**



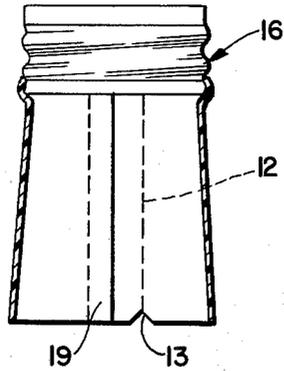
**FIG. 12**



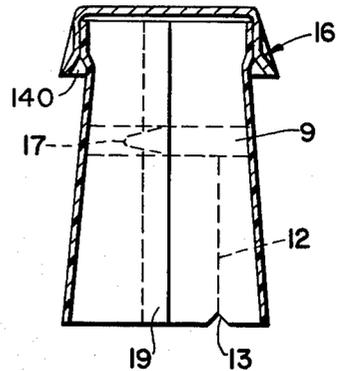
**FIG. 9**



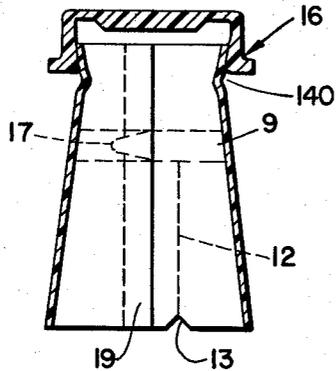
**FIG. 10**



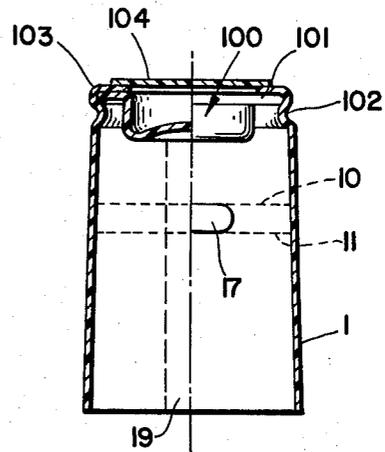
**FIG. 13**



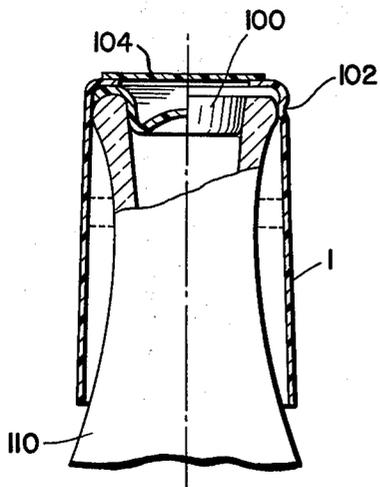
**FIG. 14**



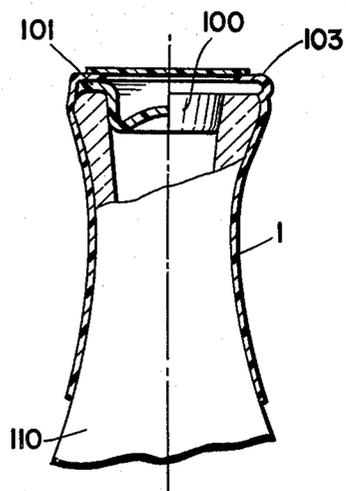
**FIG. 15**



**FIG. 16**



**FIG. 17**



**FIG. 18**

## BOTTLE CAP HAVING A PRESHRUNK FOIL PORTION

This is a continuation-in-part of pending application Ser. No. 275,252 filed July 26, 1972 for Bottle Cap Made Of Plastic Shrink Foil, now abandoned.

The invention relates to a bottle cap containing a controllably preshrunk plastic foil portion that is to be shrunk to final encapsulating condition when the cap is placed on a bottle to be closed, and to methods of making the same.

Bottle caps made of plastic are relatively inexpensive and they can be readily and simply applied on a bottle neck, so that they are used more and more instead of metallic bottle caps.

Known bottle caps made of plastic shrink foil, however, have the disadvantage that the caps, upon shrinking onto the bottle neck, often pull up somewhat above the bottle neck and form an undesirable mushroom-like projection above the bottle neck. This phenomenon, on the one hand, has a poor effect on the appearance of such capped bottles and, on the other hand, it reduces the hold of the bottle cap on the bottle neck, so that bottle caps of this type may readily fall off the bottle neck in the course of transportation or storage.

The invention provides a bottle cap containing a plastic shrink foil cap wall, which does not have the foregoing disadvantages and which holds firmly and reliably on the bottle neck, as well as being inexpensive to manufacture and process. In the invention the cap wall is controllably preshrunk to attach it to the closure member and at the same time condition it for efficient encapsulation of the bottle neck when installed. While prior art such as the British patent to Jowett No. 1,088,552 discloses a bottle cap made of a closure member and a heat shrinkable cap wall, the latter is not preshrunk and the cap is subject to many of the objectionable features of the prior art bottle caps mentioned above.

The invention provides as a further object a combination cap having a non-shrinkable closure member adapted to be seated on the bottle opening and a cap wall or skirt formed of a heat shrinkable foil prestretched in only one direction, preferably with the stretch direction oriented in the peripheral direction of the cap wall, and the skirt is partially shrunk in a controlled manner whereby the combination bottle cap can be finally applied and shrunk cleanly, efficiently and without waste on the bottle neck.

In an advantageous form of the foregoing invention there are axially disposed retaining ribs provided on the inner side of the closure member permitting an exchange of the air enclosed by the cap, so that air expanding during the final shrinking operation will entail no damaging rise in internal pressure.

The foregoing combination cap is suited especially for bottles which are to be closed with closure members such as stoppers or corks that are introduced entirely or partly into the bottle neck, for example, as in the case of wine bottle corks.

In the various embodiments of the invention there may be in the cap wall or skirt a peripherally extending horizontal tear strip, defined by two score lines along the periphery of the cap wall and having at least one gripping tab preferably located in the region of the longitudinal cap wall seam. In this connection it is advantageous within the scope of the invention if there is formed a score line which extends essentially in an axial

direction with reference to the cap from the free end of the cap wall on an essential part of the length of the cap wall. In this way even the lower part of the bottle cap can be removed from the neck of the bottle without trouble.

### BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a plan view showing a web of thermoplastic foil with the prestretch direction indicated;

FIG. 2 is a plan view similar to FIG. 1 but showing cap wall or skirt blanks cut from the web;

FIG. 3 is an elevation partly broken away and in section showing a shaping plug or mandrel that seats the closure member and on which the cap skirt or wall blank is placed prior to preshrinking;

FIG. 4 shows diagrammatically the preshrinking operation;

FIG. 5 is an enlarged fragmentary view partly in section showing the closure member and cap wall or skirt after preshrinking;

FIG. 6 is an elevation showing the combination cap as removed from the shaping and preshrinking station;

FIGS. 6A and 6B illustrate relatively diagrammatically a phase of the invention wherein the cap is preshrunk in different patterns;

FIG. 7 is an elevation showing in section a combination bottle cap having a closure member in the form of a stopper;

FIG. 8 shows in section a bottle cap similar to that of FIG. 7 but having a different stopper;

FIG. 9 shows in section a further embodiment of the bottle cap;

FIG. 10 shows in section a bottle cap having a gripping cork as the closure member;

FIG. 11 shows in section a bottle cap having a champagne type cork as the closure member;

FIG. 12 shows in section a bottle cap having a screw form closure member;

FIG. 13 shows in section a bottle cap having a screw closure member arranged on the lower edge zone thereof;

FIG. 14 shows in section a further embodiment wherein a bottle cap is fixed on the inner side of a crown cork type closure member;

FIG. 15 shows in section a further embodiment wherein a bottle cap is fixed to the inner side of a crown cork type closure member;

FIG. 16 shows in section a combination bottle cap of the invention bottle closure according to a further embodiment;

FIG. 17 shows the combination preshrunk bottle cap according to FIG. 16 when pressed onto a bottle neck before finally shrinking the bottle cap wall; and

FIG. 18 shows the bottle cap of FIGS. 16 and 17 in the final encapsulated condition closing the bottle neck opening when the wall is finally shrunk upon the bottle neck.

### PRESHRINKING

An essential feature of the invention is that when installed on a bottle the bottle cap consists essentially of a bottle closure member combined with a specially preshrunk foil of a heat shrinkable plastic material forming the circumferential cap skirt or side wall.

The cap is prepared prior to its assembly with the bottle to be capped by mounting a blank cut from a prestretched thermoplastic foil upon a special shaping plug or mandrel which also mounts the closure mem-

ber, and then subjecting the mounted blank to sufficient heat to preshrink it into conformity with the plug and closure member, and then removing the preshrunk cap from the plug for later assembly with and final shrinking and encapsulation upon the bottle neck to be capped.

Thus in the invention the foil material of the cap is subjected to two stage shrinking. In the first stage it is mounted on the shaping plug which controls and limits the degree and character of shrinking while forming and shaping the cap for convenient assembly with the bottle neck. After preshrinking the cap wall retains residual shrinking capacity. In the second stage the preshrunk cap is secured and further shrunk in final encapsulated condition on the bottle neck.

During the preshrinking operation the application of shrinking heat may be so controlled and distributed as to provide regions of different residual shrinking capacity in the preshrunk cap wall. This may take the form of a temperature gradient which may be modified to provide a desired pattern suiting the preshrunk cap to special bottle neck shapes.

This preshrinking feature will be diagrammatically described in connection with FIGS. 1-6, 6A and 6B which illustrate the various steps in applying it to a combination cap wherein the foil is preshrunk and secured to a bottle closure member.

FIG. 1 shows a web W of heat shrinkable thermoplastic foil that is prestretched in the direction indicated by the arrows L. As shown in FIG. 2 the web is severed into blanks B which may be of desired shape. For example in this case it is desired that the cap skirt be conical, and so the blanks are trapezoidal with the long and short edges parallel to the direction of stretch.

A shaping mandrel or plug P is provided having a recess R. The periphery of the plug P is conical, of the desired preliminary shape and dimension for the cap skirt, and the recess freely receives the stopper part of closure member C so that the head H of the closure member will seat on the plug in proximity to the upper edge of the plug periphery. As shown in FIG. 4 the upper edge of the plug may have an external continuous groove G adjacent the head of the closure member.

The foil blank B is now mounted on the plug, with the direction of stretch extending circumferentially of the conical surface of the plug and with the upper edge of the blank extending substantially beyond groove G to about the upper edge of the cap head and preferably a slight distance above. At this point the opposite lateral edges of the blank are preferably secured adhesively in a slight overlap seam.

Now preshrinking heat is applied, as by the instrument I shown in FIG. 4. This is an electrically powered heater having a cavity fitting over the shaping station which seats on a support. The foil shrinks upon and about the closure member head H and plug P and, as shown in FIG. 5, an annular region of the foil shrinks into groove G to tightly bind the closure member and the foil skirt into a cap unit. Now the combination cap which includes the closure member which of course has not changed form or dimension and the controllably preshrunk conical foil skirt or wall indicated at S in FIG. 6 is removed from the preshrink station and is ready for installation on the bottle to be capped.

The preshrunk caps may be used right away or stored until use is desired. They may for example be placed in nested relation and fed one at a time to bottle necks in automatic filling and capping machines.

The shape and dimensions of the plug or mandrel P are such that the open end of the preshrunk cap unit will fit easily and fairly loosely over and upon the bottle neck while the closure member is being firmly and finally seated in or around, in the case of a threaded neck, the bottle neck opening. Once the closure member is seated, the second stage of shrinking heat is applied whereby the cap unit skirt shrinks to final encapsulating holding and sealing condition around the bottle neck.

Control is exercised by using a preshrinking temperature which is such that the initial stretched condition of the foil is only partially recovered and that a substantial residual shrinking capacity is retained in the thermoplastic foil material. When using a relatively high preshrinking temperature the stretch condition of the thermoplastic foil is mainly recovered and only a small residual shrinking capacity is retained. When using a relatively low preshrinking temperature only slight recovery of the prestretched condition in the foil material is obtained, and there is retained a relatively large residual shrinking capacity. Therefore prestretching may be a measure to prepare different types of bottle caps with respect to the retained residual prestretched condition of the preshrunk foil. As can be seen from FIG. 6B modification of prestretching may be performed so that the retained residual shrinking capacity of the foil has a special desired pattern. Such special pattern may be important to adapt the bottle cap residual shrinking conditions to particular shapes of bottle necks or the like. In the example of FIG. 6A the foil is uniformly prestretched and there had been used a preshrinking temperature having a gradient increasing toward the top. This means that in the upper part of the bottle cap wall the used preshrinking temperature is relatively low and at the lower part the preshrinking temperature is relatively high. In the example of FIG. 6B the pattern could be obtained by the preshrinking temperature having a gradient toward the middle part of the bottle cap wall and in the upper part providing a relatively constant and higher shrinking temperature. Therefore in FIG. 6B the retained shrinking capacity of the foil is relatively small at the upper bottle cap part but it increases from the central part downward.

#### PREFERRED EMBODIMENTS

FIG. 7 illustrates a cap that consists essentially of an integral plastic closure member 15 combined with a preshrunk foil cap wall 1. Closure member 15 may be of a conventional molded type made of substantially non-shrinkable material such as polyethylene and it is adapted with a central cylindrical stem portion 2 adapted to extend sealingly into the mouth of the bottle to be sealed and an outwardly disposed rim 20 adapted to seat upon or surround the upper edge of the bottle mouth. Member 15 is to be the primary seal when the cap is installed on the bottle, and the final seal and increased holding of the closure member are obtained when the preshrunk wall 1 of the installed cap is further shrunk to encapsulated final condition around the bottle neck. Wall 1 may be a blank of heat shrinkable material such as polystyrene or polyvinylchloride foil wrapped around the shaping plug with its opposite edges overlapped in a seam at 19 and usually adhesively secured prior to the preshrink operation. When the cap is eventually installed on a bottle the upper end of the bottle neck will be enclosed in the channel 21 between rim 20 and projection 1 when the rim surrounds

the bottle neck. Stem 2 may be formed with one or more external ribs 18 for good friction fit within the bottle neck.

The cap of FIG. 7 is made by the method and apparatus above described, closure member 15 being mounted on a suitable shaping plug or mandrel and a suitable blank of heat shrinkable plastic foil being wrapped around the combined plug and closure member for preshrinking to the condition shown in FIG. 7. After the preshrinking operation is complete it is preferable to adhesively secure a circular wafer 7 of plastic material over the upper end of the cap, this wafer providing a smooth finished appearance and it may bear printing decoration, or the like.

As shown in FIG. 7 a tear strip 9 is provided in the preshrunk cap wall by parallel score lines 10 and 11 extending around the wall, cuts being formed to provide an end tab 17 by which the tear strip may be pulled. Tab 17 may be of any desired shape, triangular, U-shaped or even I-shaped for tearing in opposite directions. Also from the lower edge of cap wall 1 extends a longitudinal score line 12 at right angles to the tear strip. Advantageously score line 12 is located adjacent and parallel to the overlap seam 19 formed by the opposite edges of the blank wrapped around the shaping plug. In the lower edge of wall 1 a recess 13 is formed for easy starting access to the end of score line 12.

As shown in FIG. 7 it may be preferable to form in the upper part of wall 1 just below closure member rim 21 an annular series of depressions 120 that internally provide bottle surface engaging projections. These depressions are usually formed by heated tools after the preshrink operation and before removing the combination cap from the shaping plug.

FIGS. 8 and 9 show caps comprising the forms of closure members 15 each combined similarly with a preshrunk wall or skirt 1. In these embodiments the shaping plug may be formed with an annular groove as at G in FIG. 5 whereby an internally projecting annular bead 130 is provided in the preshrunk wall for engagement with the outer surface of the bottle neck.

It should be understood that in the embodiment shown in FIG. 8 an internally projecting annular bead 130 may be provided instead of the annular series of depressions 120.

In each of the FIG. 7-9 embodiments the closure member is closed, preferably integrally, across its upper end and the stem 2 has friction tight surface fit within the bottle neck opening. The preshrunk wall 1 attaches itself to the closure member during the preshrink operation and its lower end and circumferential dimensions are such that the cap may be readily placed over the open neck of a bottle to be capped and the closure member forced or screwed into final assembly with the bottle prior to the final shrink operation when the preshrunk wall 1 subjected to a heating operation that shrinks it into tight encapsulated conformation with the bottle neck.

FIGS. 10 and 11 illustrate commercially available closure members of the champagne cork type where the stem 2 may be a cork element fixed to a relatively rigid head.

FIGS. 12-15 illustrate the cap as comprising closure members 16 that close the bottle mouth from the outside, rather than by the friction fit stem 2 shown in FIGS. 7-11. In each of these the wall 1 of shrinkable foil is secured to the closure member during a preshrinking operation as described, and as shown in FIG.

12 an internal annular bead 140 may be formed either during preshrinking or by a later applied hot tool.

In FIGS. 12 and 13 the closure member is of the screw thread type preferably made of sheet metal, the cap wall 1 being preshrunk onto the outside of said closure member while in FIGS. 14 and 15 the closure member is of the crown type and the upper edge of wall 1 is fixed preferably adhesively secured to the inside of the closure member and clamped between the skirt of the closure member and the shaping plug during the preshrink operation.

As shown in FIGS. 16-18 the bottle cap wall 1 is made of shrinkable thermoplastic foil material. The bottle cap is prepared in the manner above described and consists essentially of the closure member 100 and the attached preshrunk wall 1. The closure member 100 is formed as by molding of thermoplastic material with inherent resilience, and it has a circumferential radially directed rim 101 which is downwardly crimped around its outer edge. Within the rim 101 closure member 100 contains a depressed portion 105 intended to be frictionally introduced into the mouth opening of the bottle (see FIGS. 17 and 18) to effect primary seal under somewhat radial compression.

To make this bottle cap according to a preferred embodiment of the invention the closure member 100 is inserted into the recess of a suitable shaping plug and then a blank of stretched thermoplastic foil is wrapped around the shaping plug and closed at an axial overlapping seam 19 as by adhesive. Thereafter the thermoplastic blank so closed around the shaping plug and closure member is preshrunk. By such preshrinking a circumferential inwardly directed bead 102 may be formed directly beneath the outer marginal part of the closure member rim 101. At the same time the upper rim portion of the closed blank extending upwardly beyond the closure member rim portion 101 is shrunk as a circumferential radially extending flange 103 over the rim 101 of closure member 100. Thereby the closure member is axially held at its rim portion 101 between the flange 103 and the bead 102 of the cap wall 1. After preshrinking a circular decorative sheet 104 made of metallic or plastic foil may be sealed onto the flange 103 of the cap wall 1. Finally two lines of perforations 10 and 11 and a fully cut out tab 17 are prepared in the bottle cap wall 1. After this is done the finished bottle cap is removed from the shaping plug.

In FIG. 17 the combination bottle cap of FIG. 16 is shown as pressed axially onto the neck 110 of a small champagne bottle containing about 0.2 liter champagne. When pressing axially down into the mouth opening the middle portion 105 of the closure member 100 is radially compressed and forms a fluid tight primary seal. When the combination bottle cap 1 is pressed onto the bottle neck 110 the circumferential bead 102 may be deformed outwardly as shown in FIG. 17 but this offers no problem because immediately after pressing on the bottle neck the cap wall 1 is finally shrunk so as to conform with the outer surface of the bottle neck 110 as shown in FIG. 18. Thereby the cap wall 1 is securely held against any axial movement with respect to the bottle neck 110, and also the bottle closure member 100 is held in closed condition by the bottle wall flange portion 103 overlying the rim 101 of the closure member 100.

In all its phases when installed on a bottle the invention as installed on a bottle contains a bottle cap of a non-shrinkable closure member with an attached novel

shrinkable encapsulating element that during installation fits with clearance over the bottle neck. In practice the closure member is fitted to the bottle orifice as a primary seal and then the preshrunk encapsulating wall portion is heat shrunk to final assembly on the bottle neck. This combination induces mutual effects. The encapsulating element provides decoration, but it is also functional when installed in the sense of aiding in maintaining the closure element in the position of closing the bottle orifice. Mutual fixation and preshrinking of the encapsulating element results in the sealing and encapsulating elements forming one cap unit even if they should be of different materials.

The encapsulating element is precisely centered in installation by the closure member to which it is secured, and it is prevented from axially slipping upwards over the bottle orifice when heat shrunk upon the bottle neck.

The bottle cap of the invention is of special significance for those bottles in which there is or may be generated internal pressure. When shrunk upon the bottle, the encapsulating element in tubular wall form and solidly connected to the closure member will so tightly maintain the bottle cap upon the bottle orifice that even for high internal pressures, the closure member will be maintained reliably in the sealing position. This feature is especially applicable to plastic bottles which may be easily compressed at their side walls to cause a corresponding hydraulic pressure from the liquid inside against the bottle cap. However, the cap will be maintained in its closing position by virtue of the encapsulating element being shrunk tight against the outer side of the bottle neck. An additional feature is provided as regards plastic bottles, namely that the foil shrunk upon the bottle neck causes an appreciable stiffening of the bottle neck, so that a plastic bottle neck will be clamped firmly due to between the closure member reaching into the bottle neck and the surrounding encapsulating element.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A bottle cap for a bottle having a neck containing an orifice to be closed by said cap comprising an encapsulating element of heat shrinkable foil material that has been preshrunk in the form of a thin tubular wall containing substantial residual shrinking capacity and adapted for fitting with clearance over the outer side of said bottle neck during initial assembly, said preshrunk tubular wall having longitudinal portions of different residual shrinking capacity according to a predetermined pattern.

2. A bottle cap as defined in claim 1 for a bottle wherein the orifice is closed with a primary sealing fit by a substantially non-shrinkable closure member, characterized by said encapsulating element being connected at least around its upper part to said closure member.

3. A bottle cap defined in claim 2 wherein said closure member and said encapsulating element are af-

fixed together prior to installation of the cap on a bottle neck.

4. A bottle cap as defined in claim 2, characterized in that said tubular wall is substantially frusto-conical and is fastened around its smaller end to said closure member.

5. A bottle cap as defined claim 2, characterized in that said tubular wall is made from a prestretched blank sheet of heat shrinkable foil connected at opposite lateral edges for providing a seam approximately parallel to the axis of said cap and preshrunk into the desired tubular shape, the stretching direction of said foil being around the periphery of the tubular wall.

6. A bottle cap as defined in claim 2, characterized in that said closure member is shaped with a part for projecting beyond the bottle orifice, and that the tubular wall of the encapsulating element is fastened to said projecting part of the closure member.

7. A bottle cap as defined in claim 6, characterized in that the closure member is provided with an internal shoulder so dimensioned as to fit over the bottle orifice.

8. A bottle cap as defined in claim 2, characterized in that said closure member is fitted between a preshrunk flange and a preshrunk bead of said encapsulating element.

9. A bottle cap as defined in claim 2, characterized in that a score line essentially axial with respect to the encapsulating element extends in said encapsulating element from the lower rim of said tubular wall to approximately the connecting location of said wall with said closure member.

10. A bottle cap as defined in claim 2, characterized in that said encapsulating element is made from a prestretched blank cut from a heat shrinkable foil sheet and solidly joined at two oppositely located wall regions into an axial seam to form said tubular wall, said foil being stretched only in the direction of the circumference of said tubular wall, and an essentially axial score line is provided laterally of said axial seam and extending to the vicinity of the connection of the tubular wall to said closure member.

11. A bottle cap as defined by claim 10, characterized in that the axial perforated line is located adjacent the internal edge of said encapsulation seam.

12. A bottle cap as defined in claim 1, characterized in that said closure member comprises a stopper so dimensioned as to allow introduction into the bottle neck orifice when the combination cap is installed on the bottle.

13. A bottle cap as defined in claim 1, characterized in that the closure member is so constructed as to project beyond the outer end of the bottle orifice.

14. A bottle cap as defined in claim 13, characterized in that the wall of said encapsulating element is fastened to the inside of the closure member.

15. A bottle cap as defined in claim 14, characterized in that the wall of the encapsulating element is fastened in the region of the lower edge of the closure member.

16. A bottle cap as defined in claim 1, characterized in that the encapsulating element is provided with two circular score lines around the circumference of the tubular wall, said two score lines bounding a tear-strip, and at least one gripping flap within the two score lines.

17. A bottle cap as defined in claim 16, characterized in that the tubular wall of the encapsulating element is made from a blank of shrinkable foil connected at opposite edges to provide a seam extending essentially parallel to the axis of the bottle cap and forming

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thereby said tubular wall, said foil being stretched in one direction and thereby being heat shrinkable only in that direction, said one direction essentially extending around the circumference of the tubular wall and said gripping flap being located adjacent said seam.

18. A bottle cap as defined in claim 1, characterized in that two parallel perforated lines are provided in said tubular wall of the encapsulating element, said lines being parallel and extending along the circumference of the tubular wall to thereby bound a tear flap, and that a perforated line essentially axial with respect to

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the tubular wall runs from the lower rim of said wall to the peripheral perforated line facing said lower rim.

19. A bottle cap as defined in claim 1, characterized in that said encapsulating element is made from a pre-stretched blank cut from a heat shrinkable foil sheet and solidly joined at two oppositely located wall regions into an axial seam to form said tubular wall, said foil being stretched only in the direction of the circumference of said tubular wall, and an essentially axial score line is provided laterally of said axial seam.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,924,771 Dated December 9, 1975

Inventor(s) Gunther Cleff

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, line 66, (claim 3, line 1) after "cap" add --as--.

Column 8, line 7, (claim 5, line 1) after "defined" add --in--; change "2" to --1--.

Signed and Sealed this

*thirtieth* Day of *March* 1976

[SEAL]

*Attest:*

RUTH C. MASON  
*Attesting Officer*

C. MARSHALL DANN  
*Commissioner of Patents and Trademarks*