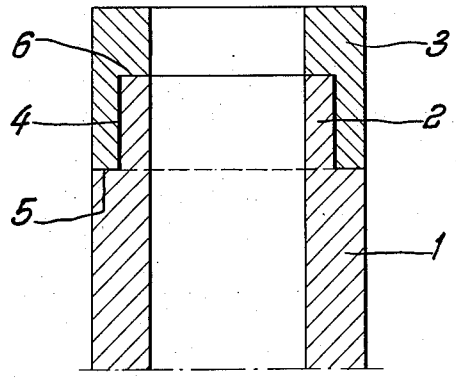
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PROCESS FOR THE MANUFACTURE OF CONTAINERS

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Fig. 1



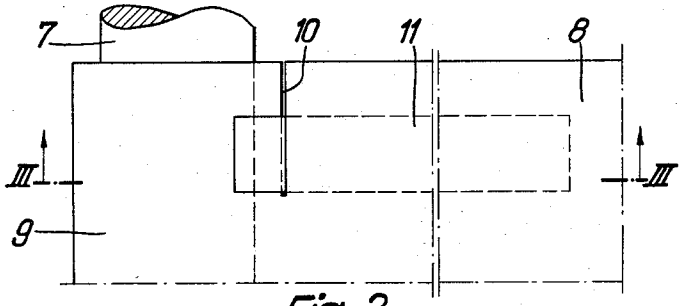




Fig. 2

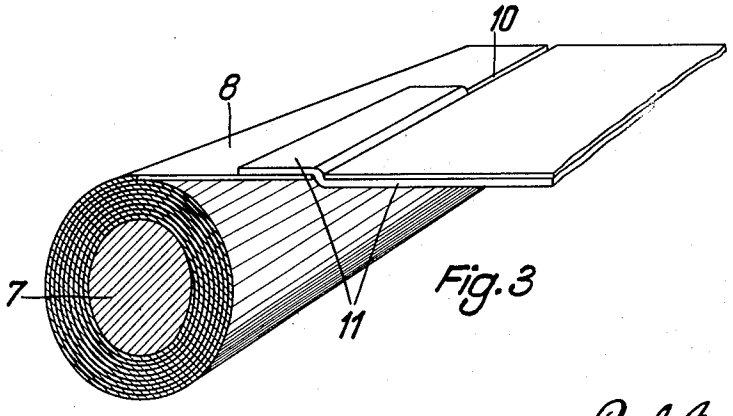



Fig. 3

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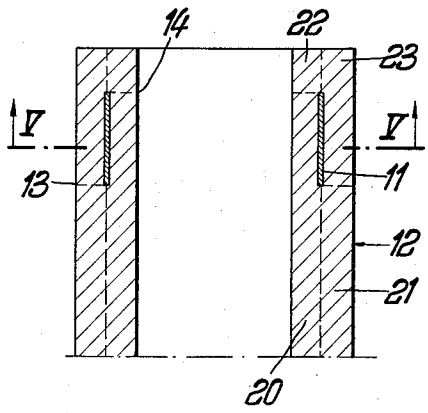



Fig. 4

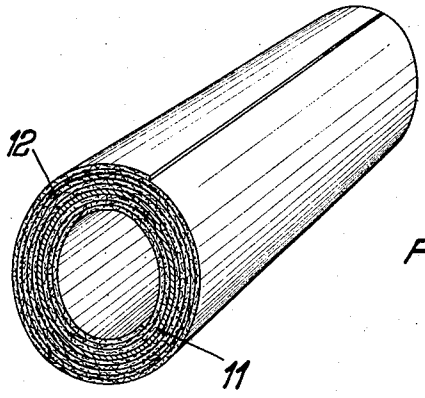



Fig. 5

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United States Patent Office 2,906,180 Patented Sept. 29, 1959



2,906,180

# PROCESS FOR THE MANUFACTURE OF CONTAINERS

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Application January 10, 1958, Serial No. 708,302

Claims priority, application Germany January 21, 1957

2 Claims. (Cl. 93—94)

The invention relates to a method of making a container consisting of a cylindrical lower part with a stepped-down neck and a cylindrical fit-on cap engaging over the said neck. The invention relates more particularly to a container whose lower part and fit-on cap consist of wound layers of thin strip material which are glued together. The strip material can be paper, cardboard, pasteboard, synethetic plastic material or metal; however it is also possible to use wood veneers or foils of other materials suitable for the same purpose.

Containers of the type specified hereinbefore and also processes for the manufacture thereof are already known, wherein a wound cylindrical container case is divided into a relatively long section forming the lower part of the container and a shorter section forming the fit-on cap, and then a second cylinder is wound which fits tightly into the container case and is fitted into the lower part to act as a projecting neck, being glued or stapled into position. The disadvantage of this process is that in order to manufacture a container two cylinders have to be so wound independently of one another that one of them fits tightly into the other. Naturally such a process of production is difficult and time-consuming.

It has also been proposed to produce a tubular wound body by helically winding and simultaneously glueing a strip material, and not introducing any glue between one central layer and the next during the winding operation, or else winding-in a separating strip which does not take glue, resulting in the production of an inner cylinder and an outer cylinder wound over the inner cylinder, but the two cylinders are not glued to one another. Then the outer cylinder is divided into two parts at a certain distance along its length by a radial separating cut effected from the exterior, one part being adapted to be pulled off and used as a fit-on cap. The disadvantage of this process is that the inner and outer cylinders are not fixedly connected together over their whole length, or at least not in the vicinity of the separating cut, since the separating strip or the glue-free length of the wound strip extends helically and therefore to both sides obliquely over the separating cut.

The object of the invention is to provide a process for the manufacture of a container wound from a thin strip material, wherein the lower part of the container and the fit-on cap are produced in a single winding operation, and which obviates the aforesaid disadvantages.

According to the invention, a strip of any of the materials is used whose width is equal to the total length of the closed container which is to be manufactured. This strip is wound in layers to form a wound package, with the continuous introduction of a glue between the layers, and when the desired outer diameter of the neck part has been reached an incision is cut into the said strip material transversely to its longitudinal direction from the edge inwards to a depth corresponding to the height of the neck. Then into this incision there is introduced a strip-like separating layer which extends over the desired



length of the neck part and is adapted to repel the glue being used, and which is wound into the form of a closed band during further winding of the wound package. Then the wound package is finish wound up to the desired outer diameter of the container which is being produced, and finally, after the glue has set, is divided into a lower part and fit-on cover of a container by a separating cut effected from the outside and a further separating cut effected from the inside in the radial direction, each at the height of the end edges of the separating layer, the cuts being taken as far as the said separating layer.

The lower part of the container and the fit-on cap thus produced are each glued sections which consist of wound layers all the way through from the inside to the outside, and, more particularly at the edges which are subjected to considerable stress when the container is opened and closed, said sections having adequate strength and furthermore this strength is not reduced by glue-free portions in the interior of the container walls.

In the case of a container according to the invention, the lower part and the fit-on cap are unitary wound packages of identical internal diameter, the width of the strip forming the lower part at an inner layer which also comprises the neck being equal to the total length of the lower part of the container, whereas in the subsequently wound outer layer it is reduced by the length of the neck, and the width of the band forming the fit-on cap at an inner layer is at the most equal to the total length of the closed container minus the total length of the lower part of the container, whereas on the other hand at the subsequently wound outer layer it is equal to the total length of the whole container minus the length of the outer layer of the lower part of the container. If the height of the inner layer of the fit-on cap is less than the total length of the closed container minus the length of the lower part of the container including the neck, the cap when fitted-on only bears externally on the shoulder of the lower part of the container.

Preferably, however, it is proposed that the difference in length between the outer and the inner wound layers of the fit-on cap is to be equal to the difference in length between the inner and outer wound layers of the lower part of the container. In this case the fit-on cap bears both at the inside and at the outside against the corresponding supporting edges of the lower part of the container, so that the closed container is given a substantially higher compressive strength in the axial direction.

The lower part of the container is provided in a manner known per se with a base, while a cover plate is fixed on the fit-on cap. Metal reinforcements can be provided in a manner known per se on the base and on the cover.

One example of embodiment of the invention will be explained in more detail hereinafter with reference to the drawings wherein:

Figure 1 is a longitudinal sectional view of the container case which is to be manufactured, the wall thickness of the case being considerably exaggerated;

Figure 2 is a plan view of the wound package during its manufacture;

Figure 3 is a perspective view of the part of the wound package situated behind the section line III—III of Figure 2, and of the strip material forming the said package, with an inserted separating foil;

Figure 4 is a longitudinal sectional view through the finished wound package with the wound-in separating foil and

Figure 5 is a sectional view taken on the line V—V of Figure 4.

The container case which is to be manufactured and which is illustrated in Figure 1 comprises a lower part 1 which is stepped in the radial direction at 5 and con-

tinues from this point onwards with a reduced outer diameter as the neck **2**. The container case also comprises a fit-on cap **3** which forms a continuation in the axial direction of the lower part and has the same internal and external diameters and is stepped internally at **6**. Situated between the neck and the part of the fit-on cap surrounding the neck, where appropriate, is a narrow annular gap **4**.

As will be seen from Figures 2 and 3, the container case is produced by winding a thin strip material **8** onto a cylindrical mandrel **7** which is of circular or any other cross-section. The strip material **8** as it is fed on is continuously coated with a suitable glue so that the superjacent layers become connected fast to one another. As soon as the wound package has reached the outer diameter of the neck of the lower part of the container which is to be produced (reference numeral **9** in Figure 2) the strip material is cut into transversely to its longitudinal direction from the edge inwards to a depth corresponding to the height of the neck. Into this incision **10** there is laid a strip-like separating foil **11** which does not take the glue being used and whose width is equal to the height of the desired neck part and whose length is somewhat greater than the circumference of the neck part. Figures 2 and 3 show how the separating foil can be inserted most conveniently. Then the winding of the package is continued, the separating foil being wound about the package into the form of a closed band. Then the wound package is further wound until finally the outer diameter of the container being manufactured is reached.

Figure 4 is a longitudinal sectional view through the finished wound package **12** with a separating foil **11** inserted therein. The position of the separating foil is shown particularly in Figure 5.

The wound package **12** is then separated into the lower part of the container and the fit-on cap by a separating cut which is effected from the exterior (at **13**) at the lower end edge of the separating foil in the radial direction, and taken as far as the said separating foil, and also by a second separating cut which is taken as far as the separating foil from the interior at the level of the upper end edge of the separating foil (at **14**).

The lower part of the container thus produced consists of an inner layer **20** which also comprises the neck, and of a subsequently wound outer layer **21** whose height is however reduced by the length of the neck relatively to the height of the inner layer **20**. In corresponding manner, the fit-on cap comprises an inner layer **22** and a subsequently wound outer layer **23** of correspondingly increased height. When the lower part and fit-on cap are pulled apart in the axial direction, the separating foil **11** falls out. By using a very thin separating foil it is possible to achieve the result of allowing practically no annular gap (at **4** in Figure 1) so that the fit-on cap sits very securely on the lower part and thus provides a good sealing effect over the whole length of the neck part. Instead of a separating foil it is also possible to use a separating layer consisting of a film of wax, appropriate synthetic resin varnish or the like, which is applied in liquid form, dries quickly and repels the particular glue which is used. The choice of the chemical composition and the particular manner of applying the separating layer are optional and do not come within the scope of the invention.

A particular advantage of the container produced according to the invention lies in the high precision with which the fit-on cap and lower part of the container can be manufactured. Consequently the fit-on caps and lower container parts of different containers can generally be easily interchanged with one another. The container is provided in a manner known per se with a base and a cover (not shown).

I claim:

1. The method of simultaneously making from a continuous strip of flexible material the side wall of a container having a neck of reduced diameter and the side wall of the corresponding fitted cap, comprising spirally winding a thin strip of the material of the width of the combined height of container and cap, to form a tube having the width of the container neck, continuously applying adhesive between the adjacent plies of material during the winding, interposing a separating, adhesive-repellant layer around the tube over the extent of the container neck, continuing the spiral winding and adhesive applying steps until the tube is the desired thickness and finally severing the outer plies to the lower edge of the separating layer and severing the inner plies to the upper edge of the separating layer to permit separation of the cap wall from the container wall.

2. The method as defined in claim 1 in which the strip, at the end of the initial winding, is cut transversely to the inner end of the neck portion and the separating layer is inserted through said cut prior to the continued spiral winding.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,877,144 | Oliver et al. | Sept. 13, 1932 |
| 2,350,271 | Braloff | May 30, 1944 |
| 2,457,198 | Bell | Dec. 28, 1948 |
| 2,581,539 | Keith | Jan. 8, 1952 |