Nov. 19, 1935. A. C. SPAHN 2,021,205

CAP AND METHOD OF MAKING SAME

Filed May 31, 1932

Fig. 1

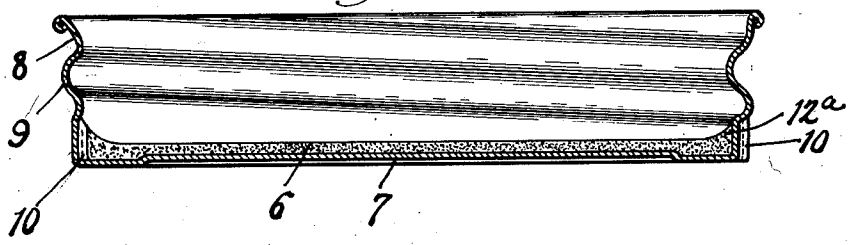


Fig. 2

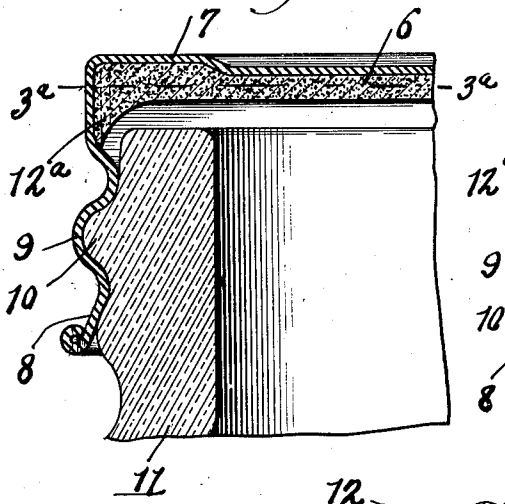
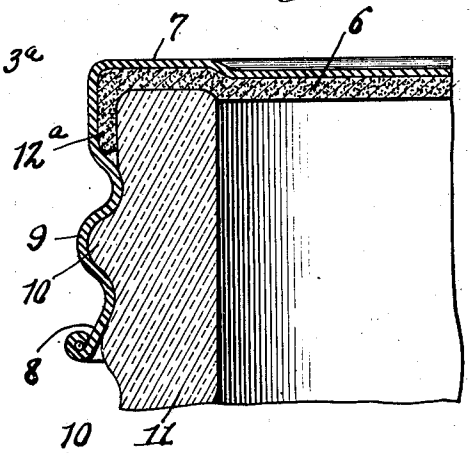


Fig. 3



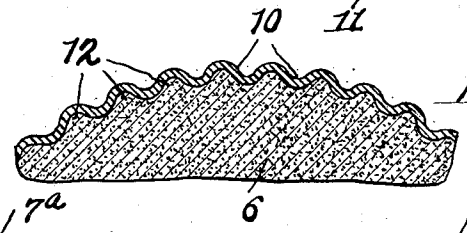


Fig. 3a

Fig. 4

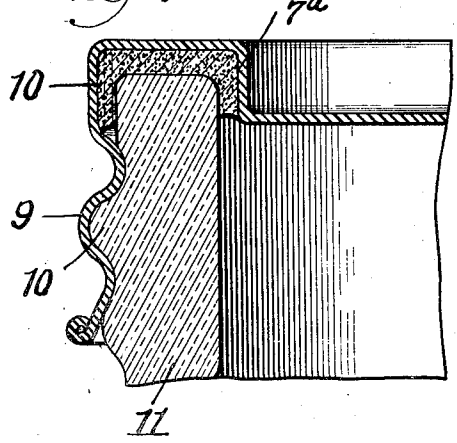
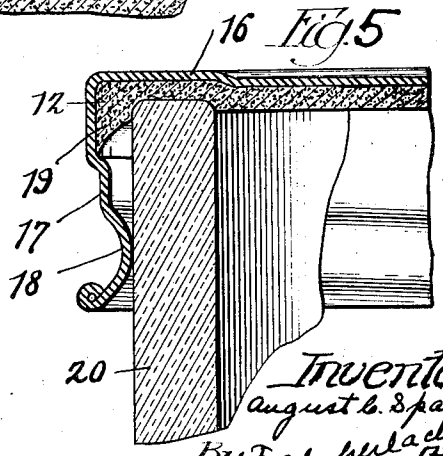


Fig. 5



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2,021,205

CAP AND METHOD OF MAKING SAME

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Application May 31, 1932, Serial No. 614,387

5 Claims. (Cl. 113—80)

The present invention has reference to caps for closing jars and like containers.

One object of the invention is to provide an improved metal cap having a sealing member of plastic material, such as a wax, which unites with the metal cap while liquid and permits the mouth of the container, during the sealing or cap-applying operation to become embedded therein to form an efficient or hermetic seal.

Another object of the invention is to provide a metal cap which has cast therein a quantity of plastic wax in which the mouth of the container can be embedded to form an efficient or hermetic seal when the cap is secured on the container.

A further object is to provide a screw-cap which has cast therein a quantity of wax, which will be compressed between the side and top of the container and the skirt and top of the cap, to prevent corrosion of the cap.

A still further object of the invention is to provide a simple and efficient method of manufacturing a cap of the aforementioned character.

Other objects of the invention and the various advantages and characteristics of the present cap construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views: Fig. 1 is a section of an inverted screw-cap illustrating the manner of casting the wax in the cap. Fig. 2 is a section illustrating the cap being applied on a container. Fig. 3 illustrates the cap secured on the container. Fig. 3ª is a section on the line 3ª—3ª of Fig. 2. Fig. 4 illustrates the invention applied to a screw-cap with the wax cast in an annular groove in the top. Fig. 5 illustrates the invention applied to a friction cap.

The invention contemplates casting a mass of plastic wax in a metal cap for sealing a jar or like container. The wax is of such character when it has set, that it will adhere or unite with the cap and coat it against corrosion, and will possess sufficient plasticity to permit the mouth of the container to be embedded therein, when the cap is applied to the container, to form an efficient or hermetic seal. The invention also contemplates flowing the wax where it will be pressed around the outside of the container and the inside of the skirt of the cap.

In Figs. 1 to 3 the invention is shown by way of example in connection with a metal screw-cap comprising a top-wall 7 and an integral skirt or depending flange 8. The latter is spirally grooved to form a screw-thread 9 to interlock with a thread or rib 10 on a container 11. Between the screw-thread 9 and the top 7, the skirt is vertically corrugated or knurled, as at 10, to form a gripping surface whereby the cap may be turned onto and off the container and also to provide marginal pockets into which the wax will flow to aid in uniting it to the cap.

The invention contemplates the use of a wax which is produced from crude or other suitable oil and has a melting point of approximately 135° Fahr. for materials packed while cold. A suitable paraffine wax produced from crude oil is subjected to a sweating process, during which it is stored in oven-like containers with the temperature held at a relatively high point, to cause the lower melting point fractions to sweat or exude from the wax, and leave only the higher melting point fractions.

The inside of the cap is lacquered to form a surface to which the wax will adhere. The wax is first melted so it will flow freely and brought to a temperature ranging from 300° to 380° Fahr. and the cap is preheated to approximately the same temperature. While the wax and cap are hot, a sufficient quantity of the liquid wax 6 is poured into the cap, as shown in Fig. 1, to cover evenly the top wall of the cap which is inverted while the wax is poured into it. This wax is sufficient in quantity to provide a mass of sufficient thickness to permit the mouth of the container 11 to embed itself in the wax. In its heated and liquid state, the wax will flow into the grooves of the vertical corrugations or knurled portions 10. As the wax and cap cool, the wax shrinks, and the wax is cast in and united to the cap. During this cooling, capillary attraction retains the wax in the grooves of the corrugations to a point somewhat higher than the level of the mass over the top 7, substantially as indicated at 12ª. The lacquer on the cap assists, when the wax is cooled, firmly to unite the wax to the inner faces of the cap. As the result of this casting process, the mass of plastic wax will be united to or amalgamated with the cap and form a mass of sufficient quantity to cover the top-wall of the cap and fill the corrugations, and this casting of integral portions of the wax in these grooves produces an interlock between the cap and wax, whereby the wax and cap will be secured against relative movement. This wax, when it has set,

is sufficiently plastic to permit the mouth of the container to embed itself therein, as the cap is screwed onto the container, and sufficiently stable to retain its form in the cap. The screwing of the cap on the container causes the wax between the top of the cap and the mouth of the container to be compressed, and also spreads some of the wax between the skirt of the cap and the side of the container, so as substantially to fill the space between the corrugated portion of the skirt of the cap and the side of the container. All portions of the cap, which sometimes catches some of the spill from the container, are coated with wax, so corrosion of the cap is prevented.

The present cap may be used for sealing under vacuum. In sealing containers under vacuum they are placed in a vacuum-chamber while the caps are placed loosely thereon, and after the container has been subjected to vacuum the screw-cap is turned onto the container into the position indicated in Fig. 3. By embedding the mouth of the container in the wax molded in the cap, a hermetic seal is formed which efficiently excludes air from the container.

In Fig. 4, the invention is illustrated as applied to a screw-cap in which an annular groove or channel 7a is formed on the top of the screw-cap to receive and retain the wax in accordance with the method hereinbefore described.

In Fig. 5 the invention is illustrated as applied to a friction cap comprising a top 16, a skirt 17 with vertical corrugations 18 adjacent the top, and an annular inset or bead 19 for frictionally gripping the side of a container or jar 20.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. That improvement in the cap art, which consists in heating a sheet metal cap having a top and a continuous skirt with means to hold it on the neck of a container, heating plastic wax to make it liquid, pouring into the cap while the latter is heated and stationary and in an inverted position, a sufficient quantity of the liquid wax to form a layer around the inner face of the top of such depth as to permit the container neck to embed itself therein when the cap is applied to the container, and then allowing the cap and wax to cool so as to set the layer into a plastic mass and unite it firmly to the cap.

2. That improvement in the cap art, which consists in heating an interiorly lacquered, sheet metal cap having a top and a continuous skirt with means to hold it on the neck of a container in order to soften the lacquer, heating plastic wax to make it liquid and pouring the liquid wax into the cap while the latter is heated and in an inverted position in sufficient amount to form a layer around the inner face of the top of such depth as to permit the container neck to embed itself therein when the cap is applied to the container, and then allowing the cap and wax to cool so as to set the layer and unite it firmly to the lacquer in the cap.

3. That improvement in the cap art, which consists in heating to a temperature ranging approximately from 300° to 380° F. an interiorly lacquered, sheet metal cap having a top and a continuous skirt with means to hold it on the neck of a container in order to soften the lacquer, heating plastic wax to substantially the same temperature to make it liquid and pouring the liquid wax into the cap while the latter is heated and in an inverted position in sufficient amount to form a layer around the inner face of the top of such depth as to permit the container neck to embed itself therein when the cap is applied to the container, and then allowing the cap and wax to cool so as to set the layer and unite it firmly to the lacquer in the cap.

4. That improvement in the cap art, which consists in heating to a temperature ranging approximately from 300° to 380° F. an interiorly lacquered, sheet metal cap having a top and a continuous skirt with means to hold it on the mouth of the container in order to soften the lacquer, heating plastic wax having a melting point of approximately 135° F. to a temperature the same as that of the cap in order to liquefy the wax and pouring the liquid wax into the cap while the latter is heated and in an inverted position in sufficient amount to form a layer around the inner face of the top of such depth as to permit the container neck to embed itself therein when the cap is applied to the container, and then allowing the cap and wax to cool so as to set the layer and unite it firmly to the lacquer in the cap.

5. As a new article of manufacture, an interiorly lacquered cap comprising a top and a depending continuous skirt provided with corrugations adjacent the top and means for holding it on the neck of a container, and a layer of plastic wax having a melting point of approximately 135° F. cast directly against and completely covering the inner lacquered face of the top, extending into the corrugations and of sufficient thickness to permit the neck of the container to be embedded in the wax to form a seal.

AUGUST C. SPAHN.