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H. H. REPLOGLE ET AL
METHOD FOR PRODUCING CANDLES

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Fig.1.

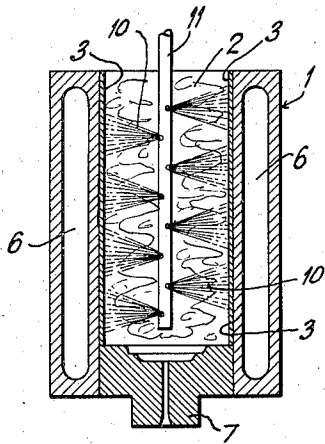


Fig.2.

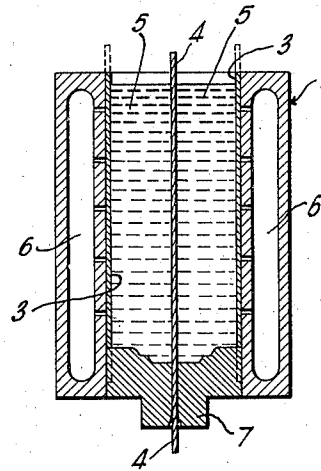


Fig.3.

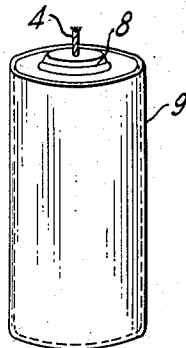
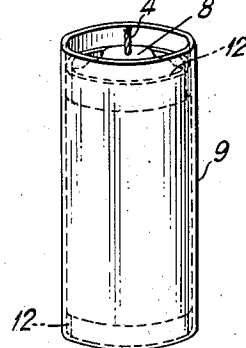


Fig.4.



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METHOD FOR PRODUCING CANDLES

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9 Claims. (Cl. 18—48)

The invention relates in general to a process for molding candles and in particular to a process for forming and packaging candles in a transparent casing, and to correlated improvements in the product of this process.

It has been proposed to form a cylindrical candle and insert the formed candle in a wet non-fibrous cellulose tube, thereafter shrinking the tube onto the candle by drying. The product obtained from this process has a multiplicity of air cells between the surface of the candle and the casing which, of course, detracts enormously from the appearance of the final product. These air cells are developed in the step of shrinking the cellulose casing onto the candle. As the casing is initially wet, liquid is entrapped between the casing and the candle, and frequently the casing dries and takes its final shape before the globules of liquid are completely absorbed. After the casing has dried, the liquid slowly passes through the casing, thus leaving air pockets between the candle and the casing. Furthermore, this process is costly as it involves two steps, viz., forming the candle and applying the casing to the formed candle. Time must be allowed for drying the casings before the candles are packed for shipping, as otherwise the casing tends to slip and become wrinkled.

It has now been found that a candle having a transparent cellulose casing free of air cells between the casing and the candle may be formed in one step.

The general object of the invention is to provide a process in which a candle may be formed and packaged in one step.

A specific object of the invention is to provide a process in which a candle is formed in a transparent cellulose casing.

Another object of the invention is to provide a method of producing an encased candle having a smooth, closely adhering casing thereon.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

According to the invention, candles are made by the process which comprises introducing a suitable heated wax into a hollow, non-fibrous, cellulosic body preferably while the body is in a flaccid condition and is surrounded by a form limiting member, and cooling the wax.

The invention accordingly comprises the improved candle unit and a process having the steps and the relation of steps, one to another, all as exemplified in the following detailed description and the scope of the application of which will be indicated in the claims.

For a more complete understanding of the nature and objects of the invention, reference should be had to the accompanying drawing, in which:

Fig. 1 is a cross-section of a mold suitable for carrying out the process of the invention;

Fig. 2 shows a cross-section of the mold of Fig. 1 after the pouring of wax;

Fig. 3 illustrates one embodiment of the candle unit; and

Fig. 4 illustrates a second embodiment of the candle unit.

Referring to Fig. 1 and Fig. 2, the candle may be molded in a suitable mold 1 having a molding cavity 2 in which is disposed a casing 3 in the form of a tubular body of a non-fibrous, transparent material. The casing 3 has an outside diameter substantially equal to the internal diameter of the cavity 2. A suitable wick 4 is drawn up through the mold, as shown in Fig. 2. A mass 5 of molten wax is now poured into the casing which presses the casing against the walls of the cavity 2 which limit the form of the candle. During the pouring of the wax, the mold is heated, for example, by means of hot water passing through the passages 6 in the walls of the mold, and thereafter cold water is passed through the passages 6 until the wax is set in the mold. When the wax is sufficiently solid, the candle is ejected from the cavity by an upward thrust of the movable base 7 of the mold.

As shown in Fig. 3, the candle unit in its final form comprises a candle 8 encased in a transparent, non-fibrous tube 9.

It is obvious that any suitable combustible animal, mineral or vegetable wax may be employed for the candle such, for example, as beeswax, paraffin, carnauba, etc., or any composition derived from the mixture of waxes and other desirable agents. The term "wax" as herein employed is used to designate any suitable combustible waxy solid or composition.

The casing 3 may be formed of any suitable non-fibrous cellulosic material. The casing is formed preferably of regenerated cellulose which may be derived from alkali cellulose xanthogenates or by the de-esterification of cellulose esters by known processes. The casing may be formed also of cellulose derivatives such as cellulose esters, cellulose ethers and cellulose oxyethers, as well as mixed ether-esters of cellulose. The casing may be transparent, translucent and/or colored and may have fillers and/or fireproofing agents added thereto.

It has been found that the molding of the wax

in the casing 3 is facilitated by first conditioning this body to render it flaccid, whereby the casing easily takes the form of the cavity. For example, before or after the casing 3 has been inserted in the cavity 2, it is subjected to the action of a softening or swelling agent, preferably in the form of a vapor or gas. As shown in Fig. 1, the casing 3 may be conditioned after it is inserted in the mold by a blast 10 of vapor supplied through a perforated pipe 11 which is thrust into the interior of the casing. The softening agent is selected with regard to the particular non-fibrous material to be employed. For regenerated cellulose, the following are suitable tumefying or swelling agents: water, aliphatic alcohols, such as methyl and ethyl alcohol; ketones, such as acetone; amino compounds such as ethyl amine, triethanolamine, etc. Suitable swelling agents for cellulose esters, such as nitrocellulose, may comprise mixtures of aliphatic alcohols, such as methyl alcohol with aromatic hydrocarbons, as benzene; ketones, also acetone, cyclohexanone and also mesityl oxide, and aliphatic esters of alcohols and acids with a small number of carbon atoms, for example, ethyl acetate.

It is preferred to have the casing extend beyond the extremity of each end of the candle. While the casing is substantially self-sustaining, it may be reenforced by providing it with rings 12 which may be applied on the inside or outside and to either or both ends of the casing. These rings 12 are made preferably of a stiff, resilient strip of a transparent, non-fibrous material of the class from which the casing is made. Supporting rings may be embedded in the surface of the wax at any point or points along the length of the candle. Since these rings are transparent, they do not detract from the appearance of the casing.

The casing serves as a chimney during the burning of the candle and since it is impermeable to wax and grease, it fully retains the candle composition whether it is in a solid or molten state. Any foreign fluid that may exist on the inner surface of the casing during the molding operation is expelled or displaced by the molten wax as it is poured into the casing. Inasmuch as no foreign fluid exists between the candle and the casing, the casing is smooth and the candle surface appears very clearly through the casing, thus yielding a candle unit which has a very attractive appearance.

The hereinbefore described process may be carried out in an apparatus other than that shown in the drawing. The drawing shown may be modified, as by providing other means for injecting the conditioning agent, for example, injecting nozzles may be positioned on the top surface of the element 7, or the upright walls of the mold may be perforated or foraminous for the purpose of injecting the vapor or gas. It is obvious that the mold may be of any configuration to yield a candle unit of any shape desired. The candle may be circular, square, triangular or polygonal in transverse cross-section and the longitudinal cross section may be straight, tapering, curved or may have projections and/or indentations. In a case where the shape of the candle is such that it cannot be ejected by pushing, a split mold may be employed.

In Fig. 2 of the drawing, it is shown that the candle is molded so that the top thereof is at the bottom of the mold. However, the candle may be so molded that its top is at the top of the

mold, in which case the casing may be in the form of a hollow body open only at the top.

Since certain changes may be made in the method and article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

We claim:

1. A method of forming and packaging candles which comprises introducing a suitable molten wax into a flaccid, hollow, non-fibrous cellulosic body surrounded by a form-limiting member.
2. A method of forming and packaging candles which comprises lining a mold with a non-fibrous, cellulosic material, conditioning said lining to render the cellulosic material flaccid, introducing a suitable molten wax into said lined mold and cooling the wax.
3. A method of forming and packaging candles which comprises inserting a preformed tube of regenerated cellulose into a candle mold, subjecting the tube to a conditioning treatment to render the tube flaccid, introducing a suitable molten wax into said tube and cooling the wax.
4. A method of forming and packaging candles which comprises subjecting a preformed, hollow, non-fibrous, cellulosic body to the action of liquid vapor to render the same flaccid, surrounding the body with a form-limiting member, introducing a suitable molten candle composition into the body and cooling the composition.
5. A method of forming and packaging candles which comprises subjecting a preformed, tubular body of regenerated cellulose to water vapor to render the body flaccid, surrounding the body with a form-limiting member, introducing a suitable molten wax into the body and cooling the wax.
6. A method of forming and packaging a candle which comprises inserting a seamless, tubular, non-fibrous, cellulosic body into a mold, subjecting the body to water vapor to render the same flaccid, introducing a suitable molten wax into the body and cooling the wax.
7. A method of forming and packaging a candle which comprises subjecting a preformed, hollow, non-fibrous, cellulosic body to water vapor to render the body flaccid, inserting the flaccid body into a mold, introducing a suitable molten wax into the body and cooling the wax.
8. A method of forming and packaging a candle which comprises subjecting a seamless, tubular body of regenerated cellulose to water vapor to render the body flaccid, inserting the flaccid body into a mold, introducing a suitable molten wax into the body and solidifying the wax.
9. A method of forming and packaging a candle unit which comprises inserting into a mold a seamless tube of a non-fibrous, cellulose derivative, subjecting the tube to a liquid vapor to render the tube flaccid, pouring a suitable molten wax into the tube and solidifying the wax.

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