United States Patent Office 3,266,272 Patented August 16, 1966



3,266,272

# COLORED FLAME CANDLE AND THE METHOD FOR MAKING SAME

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No Drawing. Filed Feb. 17, 1965, Ser. No. 433,472
6 Claims. (Cl. 67—22)

This invention relates to a new and improved colored flame candle which burns with a solid and full and true selected color in the flame, and the method for making same.

The use of metals or metallic salts which impart even a meager color to a flame, are well known in the prior art, and I disclaim any invention for them.

It is well known that certain metallic salts impart colors to a flame, such as the nitrates, chlorides, chlorates, perchlorates, oxides and others or mixtures thereof.

What I claim as new, is the use of certain other ingredients, so as to improve the performance and which will give a superior yield of a color or colors in a candle flame, as a step forward, and a definite improvement over the prior art.

What has been found to be the most difficult is to find the proper ingredients of which to compose the candle body in which to blend or homogeneously admix the metallic salts, so as to get a solid, vivid and true color, such as a green color or a blue color and so forth, in the flame, with a minimum or the least possible white light in the candle flame from this combination of ingredients.

In order to bring out the maximum amount of a selected color in a candle flame, I have found that the ingredients composing the candle body mass are of the first importance.

Materials which burn with a highly luminous flame like from an ordinary wax candle might be prized for its brightness and white light flame, but such white light producing ingredients are used but sparingly in my process or method for making colored flame candles.

Instead I use mostly candle body materials which burn with more of a non-luminous flame, such as is produced by an alcohol flame, or the like.

The favored candle body materials I use are solid, alcohol derivatives of urea, such as dibutylthiourea, diethylurea, ethylthiourea, dimethylurea, and the like, and mixtures thereof.

Small additions of other ingredients such as urethane, waxes, Du Pont "Elvax," etc., are used to give stiffness, strength and rigidity to the finished colored flame candle.

Most of these favored candle body materials are light colored, and can be tinted the color wanted, such as a red tint or a green tint, so that the candles can burn with the same color as the tinted body, or the candle body can be of a different color than that yielded by the metallic salts used.

*Example No. 1.*—As an example of a mixture of ingredients and the method used in my process: For a colored flame candle which burns with a red full-bodied red color in the flame, first, dissolve or disperse in a suitable solvent such as an alcohol, about ¼ (one quarter) part by volume of strontium perchlorate, with or without the addition of about 1/32 (one thirty-second) part by volume of strontium chloride, in about ½ (one half) part by volume of the solvent.

As a second step, melt together at medium temperature, about 7 (seven) parts by volume of ethylthiourea, about 1 (one) part by volume of urethane, and about 1 (one) part by volume of a wax.

To this melt add about 1% (one percent) to about 5% (five percent) by volume of the solution containing the metallic salts from step No. 1.



At this point some red tint can be added to suit the tint wanted. When the whole melt is fluid, mix in a few pieces or a small amount of Du Pont "Elvax," and stir well to dissolve some "Elvax" in the melt, and remove the excess "Elvax" for re-use. About 1/10 of 1% (one tenth of one percent) to about 5% (five percent) by volume of "Elvax" is sufficient, but a slight excess is harmless. The "Elvax" is a further hardener and stiffening agent for the candle body. Cast, mold or dip etc. the candles to the size and diameter wanted from this melt, and allow to cool.

When cool, a fast immersion in a melted wax, or a light spray of a soluble plastic or resin, will give still further rigidity to the candle body, and also act as a seal coat for the finished candle.

As another example: For a green colored flame candle, use barium perchlorate as the metal salt source of color for the flame, and follow the same general procedure as outlined in Example No. 1.

A multicolored flame candle can be made by building up the candle body slightly under full size in diameter, with a melt which burns with one color such as a red color, and then by dipping or by any suitable means, adding one or more layers of a melt which burns with a different color in the flame, such as blue color in the flame, and sealing the candle when cool, by dipping it in a melted wax, or spraying it with a soluble resin or plastic.

Colored flame candles made by this method burn with the chosen full-bodied color or colors in the flame, are non-smoky, do not have an objectionable odor, and are suitable for bithday size candles on up to parlor size candles.

The wicking can be plain cotton wicking commonly used in regular candle manufacture, or the cotton wicking can be pre-treated before use, by immersion or impregnation in a liquid oxidizing agent and allowed to dry.

This impregnation will help to decompose the wick in the flame, as well as dispose of any residue which may build up on the wick, while the candle is burning.

Among the oxidizing agents used are water solutions of potassium nitrate, potassium chlorate, perchloric acid, ammonium perchlorate etc. in the proportion of about ¼ part by volume of the oxidizing agent, to about 1 (one) part of water, by volume.

It is understood that the proportions given in the examples can be varied to suit a particular taste or effect desired, without departing from the scope and spirit of this invention. A person versed in the art can readily devise other mixtures and proportions based on this disclosure.

Having thus described my invention, what I claim is:

1. A colored flame candle consisting of a wick, flame coloring metallic salts in a body of a solid, alcohol derivative of urea, small additions of a combustible stiffening agent for added strength and rigidity, and a combustible sealing and coating agent.

2. A candle which burns with full color in the flame, comprising a wick which has been pre-treated with an oxidizing agent, contained in a body composed of a solid, alcohol derivative of urea, metallic salts homogeneously dispersed in the candle body mass, small amounts of combustible stiffening agents, and a combustible seal coat.

3. A colored flame candle which burns with more than one color in the flame, containing a wick, in a candle body composed of a solid, alcohol derivative of urea, flame-coloring metallic salts which burn with a selected color in the flame, homogeneously dispersed therein, small amounts of combustible materials to give rigidity to the body, and additional layer or layers of similar candle body material which contain flame-coloring metallic salts which burn with a different color in the flame, and a combustible seal coating.

4. A method of producing a colored flame candle, containing a wick, which comprises melting together and combining at moderate temperature, a solid, alcohol derivative of urea, small additions of combustible candle body stiffening agents, flame-coloring metallic salts homogeneously admixed in the melt, and building up the candle body by dipping or molding to the desired size, and applying a seal coat to the candle.

5. The method of making a colored flame candle, containing a wick which has been pre-treated with an oxidizing agent and dried, which burns with more than one selected color in the flame, which comprises melting together homogeneously a candle body mass consisting of flame-coloring metallic salts which burn with a single chosen color in the flame, small additions of combustible body stiffening materials, a solid, derivative of urea and an alcohol, as the principal candle body material, and building up the candle body just under the diameter of the finished size, then adding to the candle body one or more coats or layers of a melt containing similar candle body materials, but containing flame-coloring metallic salts which burn with a different color in the flame, to the desired size, and a seal coat to the finished candle, by spraying or immersion.



6. The method of making a colored flame candle containing a plain cotton wick, which consists of melting together and combining at medium temperature, about 7 (seven) parts by volume of a solid, alcohol derivative of urea about 1 (one) part by volume of urethane, about 1 (one) part by volume of a wax, about 1/10 (one tenth) of 1 (one) percent up to about 5 (five) percent by volume of melted "Elvax," and about ½ (one-half) of 1 (one) percent to about 5 (five) percent by volume of flame-coloring metallic salts, and building up the candle from this melt by dipping, casting, molding or other suitable means, and then adding a final combustible seal coat.

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