Nov. 28, 1933. H. H. ROOT 1,937,393

CANDLE AND METHOD OF MAKING SAME

Filed April 22, 1932 2 Sheets-Sheet 1

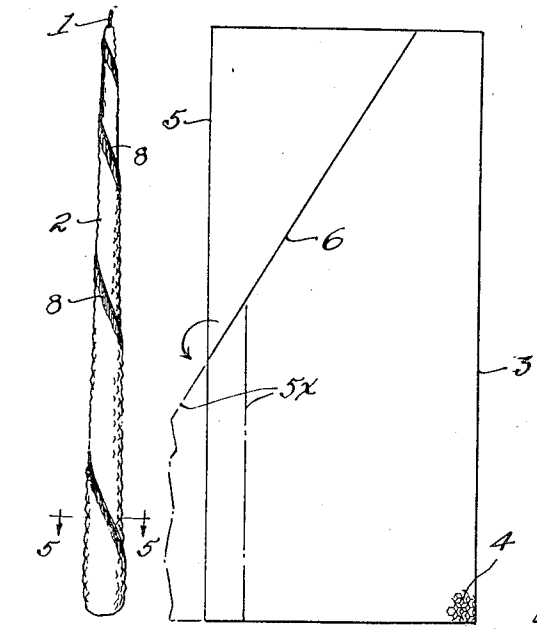


FIG. 1

FIG. 2

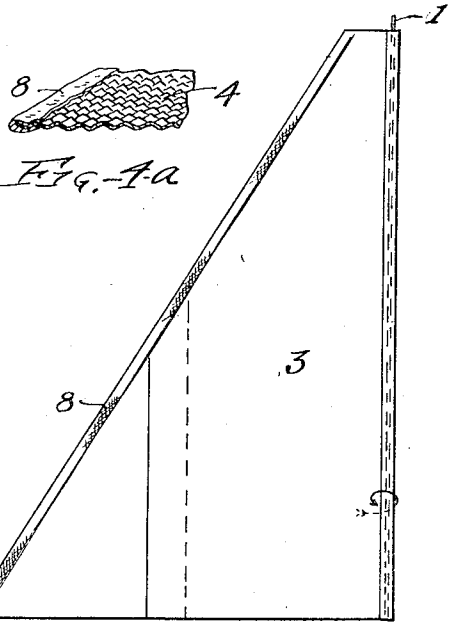


FIG. 4a

FIG. 3

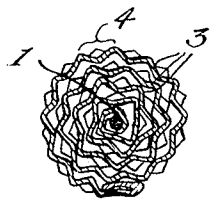


FIG. 5

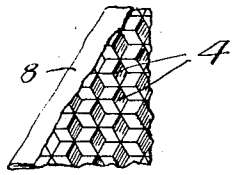


FIG. 4

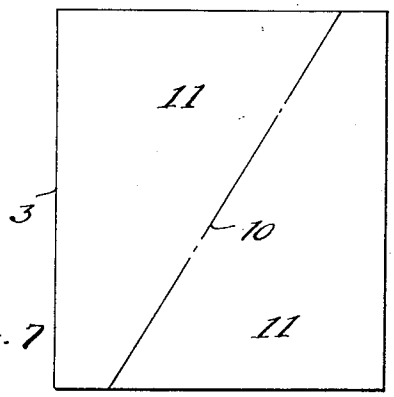


FIG. 7

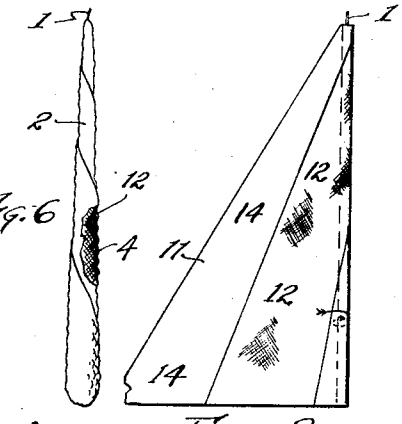


FIG. 6

FIG. 8

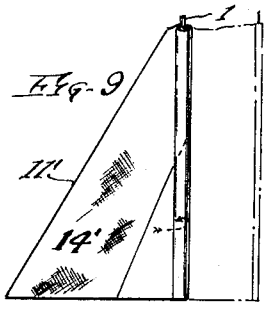


FIG. 9



FIG. 10

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CANDLE AND METHOD OF MAKING SAME

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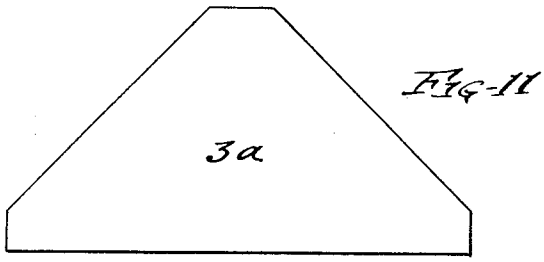


FIG.-11

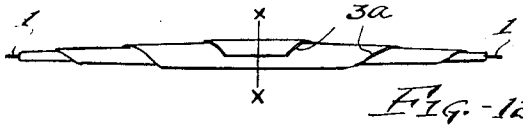


FIG.-12

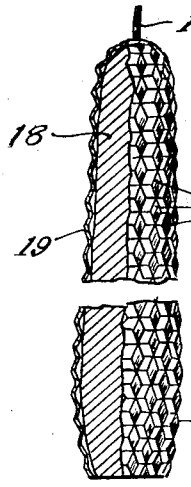


FIG.-13

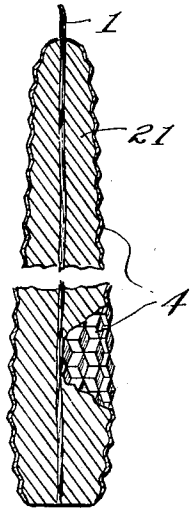


FIG.-15

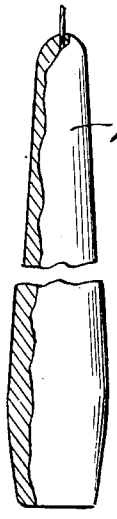


FIG.-16

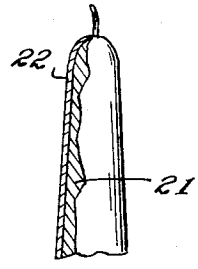


FIG.-17

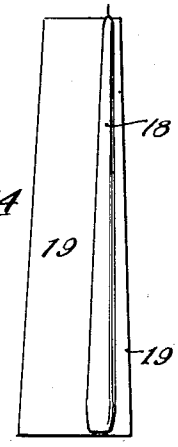


FIG.-14

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Patented Nov. 28, 1933 1,937,393

UNITED STATES PATENT OFFICE

1,937,393

CANDLE AND METHOD OF MAKING SAME

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Application April 22, 1932. Serial No. 606,807

12 Claims. (Cl. 67—22)

This invention relates to candles and a method of making the same, and is a continuation in part of my copending application Ser. No. 459,867, filed June 9, 1930.

One of the principal objects of this invention is to provide a candle of considerable bulk but light weight, requiring a very small amount of fuel material.

Another object is to provide a candle which will stand erect under very high degrees of temperature without warping or bending.

Another object is to provide a new and effective method of manufacturing candles.

Another object is to provide a candle, the configuration of the outer surface of which is such as to reflect light directed thereon from any angle to produce a scintillating effect.

Another object is to provide decorative candles having half-tone colors of regularly variegated intensities over the entire color areas.

Other important features of the present invention reside in the manner in which the coloring of the candles is effected and in the economical manner in which the candles may be manufactured.

Other objects and advantages will become apparent from the drawings, wherein—

Fig. 1 is an elevation showing one form of candle embodying the principles of this invention; Figs. 2 and 3 are diagrammatic illustrations of successive steps in one method of forming the candle illustrated in Fig. 1; Figs. 4 and 4*a* are detail views of the preferred form of sheet wax material used to make the candle shown in Fig. 1; Fig. 5 is a transverse sectional view through the candle as indicated by line 5—5 on Fig. 1; Fig. 6 is an elevation of a candle similar to Fig. 1, but embodying other principles, particularly with relation to decorating the surface; Fig. 7 is a diagrammatic view showing another form of blank for forming candles according to Fig. 6; Figs. 8 and 9 are diagrams showing two very similar methods of forming the candle according to Fig. 6, particularly in order to obtain distinctive decorative effects; Fig. 10 is a detail cross-sectional view of the exterior portion of the candle body made up according to Fig. 9; Figs. 11 and 12 are diagrammatic illustrations of a still further modified method of forming candles; Fig. 13 is an elevation, partly in section, of a candle showing a further modification of the invention; Fig. 14 is a diagram showing the manner in which the candle according to Fig. 13 may be manufactured; Fig. 15 is a sectional view of still another modification of decorated candle, and Figs. 16 and 17 are diagrammatic illustrations of steps in the manufacture of the form shown in Fig. 15.

Referring to Fig. 1, the candle may comprise a wick 1 about which is spirally wrapped a fuel body 2. The fuel body 2 may be formed of a wax sheet 3, preferably wax extruded from a suitable wax sheeting machine to condense the grain of the wax, which sheet is afterward further worked as by rolling. In order that the candle may be comparatively light and formed from a small amount of material and yet have the appearance of considerable bulk, it is preferable to use wax in the form of honeycomb foundation, such as described in my copending application. Such material comprises sheets of wax corrugated in a plurality of directions by rolling them under heavy pressure dies, the corrugations being evenly disposed angularly with respect to each other so as to form the sheet into evenly distributed contiguous alternately downwardly and upwardly disposed triangular pyramids, as indicated at 4 in Fig. 4. Thus each face of an upwardly extending pyramid has a common base with an adjacent face of the contiguous downwardly extending pyramid, the two faces lying in a common plane and together forming a rhomb. The sheets so formed are commercial honeycomb foundation.

The wax is preferably fully refined before working and rolling in order that the finished sheets will be of uniform translucence.

By corrugating the sheets as described, the overall thickness taken normal to the plane of the sheet is greatly increased and the greatest increase possible for a given amount of wax material is effected by using the particular corrugations described. Consequently, when the sheet is wrapped about a wick to form a candle or about the outer surface of a solid candle, it will give the appearance of far greater bulk for a given amount of material than is otherwise obtainable.

In the usual production of such sheets for apiarian purposes, these sheets are rolled in the

form of rectangles of substantially the proportions illustrated in Fig. 2. In order to utilize the rectangular sheets for candles of suitable proportions for home use, corner portions, indicated at 5, may be severed from the sheet along a diagonal line indicated at 6. This severed section 5 is turned, as indicated by the arrow, and placed with one margin in juxtaposition with the margin of the original sheet, as indicated by the dot-dash line 5*x*, the edges formed by the cutting operation being aligned with each other so as to form a roughly triangular or right trapezoidal sheet of decreasing width away from the base. The wick 1 is then disposed along one of the shorter edges of the triangular sheet, say as illustrated in Fig. 3, and the sheet is wrapped about the wick by rolling in a direction normal to the wick, thus forming a spirally laminated fuel body tapering toward one end, the hypotenuse of the sheet defining a helix coaxial with the wick.

In many cases, it is desirable, for decorative purposes, to have a colored helical stripe on the outer surface of the candle and by forming a candle in this manner, the striping can be effected by dipping the long edge or hypotenuse of the triangular sheet thus formed into suitable color material before rolling, say wax of the desired color, so as to color the margin, as indicated at 8 in Fig. 3. The candle thus formed tapers upwardly from the base, the thickness being decreased helically by successive layers. The appearance of a comparatively sudden break in thickness along the helically disposed edge or closure seam of the wrapped sheet is rendered practically unnoticeable due to the effect of the colored stripes. If a subdued stripe only is required, one side only of the sheet receives the coloring matter indicated at 8, and this is disposed inwardly so that one thickness of the wrapped translucent sheet, disposed outwardly of the candle therefrom lies over the coloring matter. By forming the candle from the wax above described, alternate inwardly and outwardly embossed trangular pyramids are regularly and evenly disposed over the outer surface of the candle, and produce a scintillant effect, due to the fact that the roundness of the candle and the angularly disposed surfaces will reflect light striking the candle from almost any direction, and further because the facets of the rolled and corrugated material have a light gloss finish imparted thereto during the embossing operation.

The interior body of the candle is highly cellular, as best illustrated in Fig. 5, pockets being formed between the embossed figures 4 of the different layers of sheet wax 3 which assist in the operation of burning the candle, as set forth in my copending application above identified.

Since the bottom end or base portion of the candle also incorporates the embossed extruded sheet wax (as an example of cellular fuel body rendered pliable at normal room temperatures), no special base shape, such as the usual base taper, has to be provided because the user may very easily squeeze or pre-form the base between the thumb and fingers of one hand to provide any desired base shape or to decrease or increase the base diameter as required. Such preforming or squeeze-fitting does not crack the wax because of the strengthening effects of working the wax, particularly extruding the wax in sheet form.

Referring now to Fig. 6, a candle similar to that described in Fig. 1, except that it is decorated with veiled half-tone colors of regularly variegated intensities over large areas. This candle may be formed from sheets such as above described or a single sheet, as illustrated in Fig. 7, may be cut along a diagonal line 10, slightly offset from the corners to form two substantially triangular sheets, so that one sheet provides just enough material for two candles. Further, if desired two tapered candles may be formed in one operation, as suggested in Figs. 11 and 12, rolling the sheet around the wick starting with the wick disposed along the longest side of the generally triangular sheet 3*a*, namely the base as shown. Thereupon the resulting body which tapers toward both ends may be severed say at the line *x*—*x*, Fig. 12, to provide two candles.

One manner of obtaining the veiled half tone coloring is to paint a stripe 12, of the color desired, on one side of the sheet 11 intermediate the margins, as indicated in Fig. 8, say with colored wax, the sheet being then wrapped about the wick 1 in the manner formerly described. As illustrated in Fig. 8, the wick is positioned on the opposite face of the sheet from the coloring material and is rolled in a direction (see arrow) such as to dispose the colored surface 12 outwardly from the wick, the uncolored transluent margin 14 of the sheet being of sufficient width to completely surround and form the outer surface of the body of the candle. The color layer 12 may be of any color intensity and any design desired and may extend all around or partially around the candle, depending upon the effects desired. Using a very brightly colored band as at 12 results in half-tone variegated color effects, principally through the agency of the regularly distributed pyramids, that is unusually pleasing, subdued and uniform.

Another manner of accomplishing substantially this same result is indicated in Figs. 9 and 10 wherein the margin 14′ of the sheet 11′ is colored on one side and the sheet rolled around the wick in a direction opposite to that in Fig. 8, (see arrow Fig. 9) so as to dispose the colored material directly on the inner face of the outer layer of wax. The translucent wax material is thereby disposed on the outer surface of the body over the colored matter, producing the half-tone effect. By using the embossed or corrugated translucent wax, a half-tone color of regularly variegated intensity or hue is produced by either procedure, as well as a scintillant surface, any blotches or irregularities in the coloring material being diffused by the translucent superimposed layer.

In the usual manufacture of candles, the wax of which the body is formed is colored throughout or the candle is formed and then dipped into a color wax to provide the decorative effect desired. Great difficulty has been encountered in obtaining an even distribution of the color over the surface of the candle by these methods.

With the present method, however, since the coloring matter is disposed beneath the layer of translucent wax and preferably beneath the polyfaceted sheet, the diffusion of the color resulting therefrom imparts to the candle an appearance of being very evenly colored or blended; notwithstanding that the actual color layers or sheets are very carelessly applied or colored. A somewhat similar effect can be obtained by treating the usual colored candles by the method indicated by Figs. 13 and 14.

In the preferred practice of this method, the

usual solid candle 18, say of a bright color or the desired color, is wrapped with a sheet of translucent wax 19, preferably embossed or corrugated in the manner described, the candle 18 being rolled so as to dispose the embossed surface outwardly, if only one surface of the sheet 19 is embossed. Either a generally rectangular sheet, entirely enveloping the candle, Fig. 14, or a spiral sheet similar to that above described, Fig. 3 e. g., may be used and the effect produced will be somewhat similar to that of candles formed according to the above methods. The decorative effects are especially pleasing if the sheet material is of the pattern illustrated and embossed on both sides.

The finished candle 20 thus formed is strengthened and will withstand somewhat higher temperatures without bending or warping than will an ordinary candle, even though of the same diameter as the candle 20, due to the fact that the surrounding coat of wax, which may either be corrugated as described or embossed, provides a large number of heat insulating air pockets between the candle body and the outside air. The effect of these heat insulating pockets is to cause very pronounced lag in the transmission of heat from the outside to the interior of the candle body as result under all practical room temperatures or excessive room temperatures maintained for reasonable periods. The interior of the body remains sufficiently cool to resist bending or warping. In addition, the candle 20 has considerably more volume of wax for given outside dimensions than have the candles formed entirely of sheet wax entirely or partly embossed.

Referring to Figs. 15 to 17 inclusive, a fair result can be obtained by dipping a solid candle 21, colored as desired, into molten translucent wax so as to coat it with a thin outer shell 22 which may then be embossed and indented, or either by molding to form a finished candle. The candle 23 thus formed, however, is not as satisfactory as that previously described, due to the fact that no air pockets are provided between the outer shell and main body of the candle, nor is a reinforcing casing of heavy compacted fuel material provided. The outer surface will produce fair scintillant effects, but some of the tones are missing due to the absence of the air pockets, that is, due to the fact that the main color body is in direct uniform contact with the inner surface of the translucent cover.

It is apparent from the foregoing description that candles formed with the embossed sheet wax will have a much more bulky appearance for a given amount of wax than could be obtained by other methods; in fact, the ratio of the average weight of the candle in ounces for an inch length to the average diameter of the candle in inches is between the limits 10/100 and 20/100. For example, a tapered candle such as illustrated in Fig. 1 which is 14½" long, weighs 1.5 oz., the diameter at the base being 0.9" and the diameter at the op being 0.25". Consequently, the average weight in ounces for an inch length of the candle is 1.5/14.5 and the average diameter is 1.15/2. Consequently, the ratio of the average weight per inch length to the average diameter equals 1.5/14.5, divided by 1.15/2, the average diameter, equals approximately 18/100. The ratio of the length in inches to the weight in ounces to the average diameter in inches is about 30/3/1. The utilization of the embossed outer cover of wax not only strengthens the candle but provides air pockets between the main body and the outer surface, which protect and insulate the main body from outside temperatures.

Having thus described my invention, I claim:

1. A candle, comprising a fuel body, a wick incorporated in the body, the outer surface of said body being embossed to present a multiplicity of small plane surfaces each angularly disposed with respect to the small plane surfaces adjacent thereto and distributed uniformly over the outer surface for reflecting light therefrom in different directions whereby the candle appears to radiate light from spaced points on the surface thereof.

2. A candle, comprising a wick, a fuel body incorporating the wick, said body comprising a sheet of decreasing width from one edge toward the opposite edge, said sheet being wrapped around the wick with the first mentioned edge disposed substantially normal to the wick whereby a tapering fuel body is formed.

3. A decorated candle, comprising a wick, a fuel body incorporating the wick and having a colored surface, a sheet of translucent wax embossed and indented both interiorly and exteriorly with a uniform pattern, said sheet enveloping said body and forming the outer surface of the candle for diffusing said color.

4. A candle, comprising a wick, a colored body, a layer of translucent wax covering the exterior of the body, said translucent layer being embossed with a small regular pattern for diffusing the color in regularly variegated intensities.

5. A candle, comprising a wick, a fuel body incorporating the wick, said body comprising a sheet of decreasing width from one end, said sheet being wrapped around the wick to form a candle of spirally-decreased diameter from the base to the top, the outwardly disposed layer of said sheet being embossed with a regular and uniform light diffusing pattern.

6. A candle, comprising a fuel body, a wick incorporated in the body, a sheet of wax forming the outer layer of said body, said sheet being embossed to form uniform evenly distributed triangular pyramids, the contiguous pyramids being alternately oppositely disposed with respect to each other and the adjacent sides of the oppositely disposed contiguous pyramids lying in a common plane.

7. A method of making candles, which comprises forming the fuel material into a translucent sheet, coloring a portion of the sheet in spaced relation to one edge and wrapping the sheet around the wick to form the candle body and to dispose the colored portion beneath an uncolored outer layer of the sheet.

8. A method of forming decorative candles, which consists of forming sheets of fuel material into substantially trapezoidal outline, coloring the margin of the sheet along a sloping side and rolling the sheet about a wick in the direction parallel to the base to dispose the sloping side on the outer surface of the candle, whereby a helical colored edge is exposed in the finished candle.

9. A method of forming candles which comprises forming a sheet of fuel material into substantially triangular outline, and rolling the sheet about a wick in a direction parallel to the base of the sheet.

10. A method of forming candles, which consists of cutting a corner portion from a substantially rectangular sheet, disposing the severed portion with a margin in juxtaposition to a margin of said sheet and with the edges of the sheet and severed portion defined by said cutting operation

in alignment with each other, and wrapping the sheet about a wick to dispose the margins adjacent the cut edges helically around the outer surface of the finished candle.

11. A method of forming candles which comprises forming a substantially triangular sheet of material, disposing a wick along the longest side of the triangular sheet and rolling the sheet about the wick in a direction normal to said longest side to form a roll of material tapering toward both ends and cutting the material apart intermediate the ends and normal to the wick whereby two tapered candles are formed.

12. A candle having a fuel body including a base portion of cellular fuel material of sufficient pliability at normal room temperatures to be worked or compressed by pressure of the human fingers and thereby pre-formed to fit various shapes and sizes of holding receptacles.

HUBER H. ROOT.