Feb. 15, 1955 J. H. LEMELSON 2,701,929

ADVERTISING AND DISPLAY DEVICE

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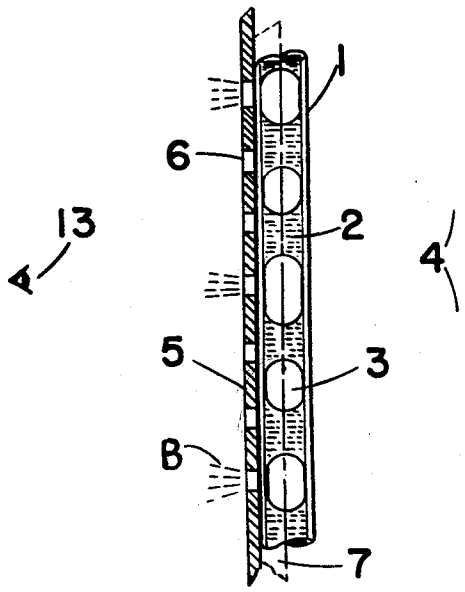


Fig. 1

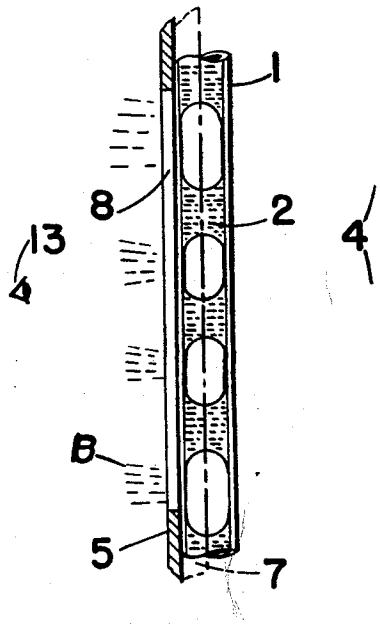


Fig. 2

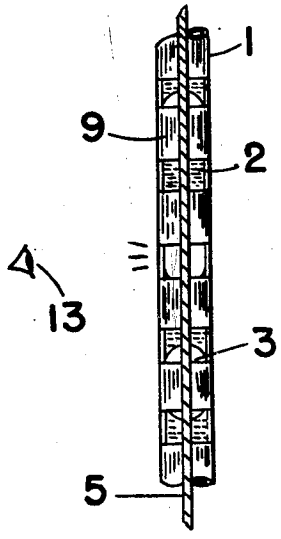


Fig. 3

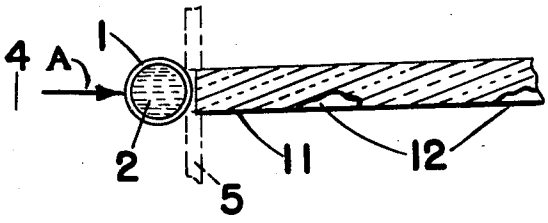


Fig. 4

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ADVERTISING AND DISPLAY DEVICE

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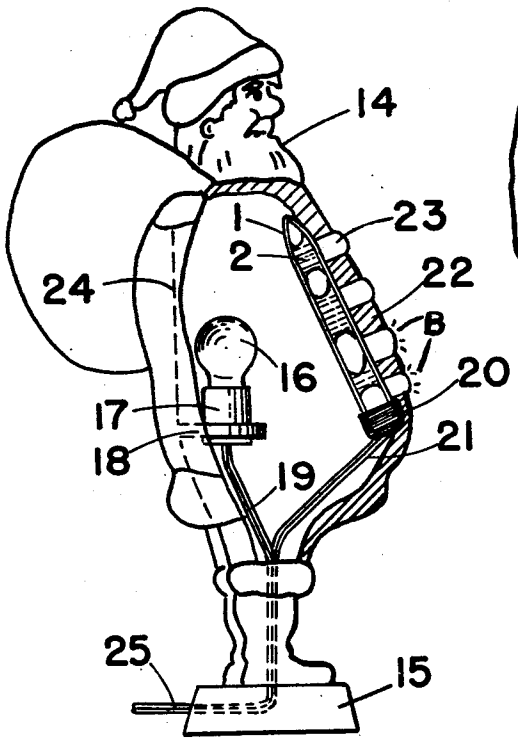


Fig. 5

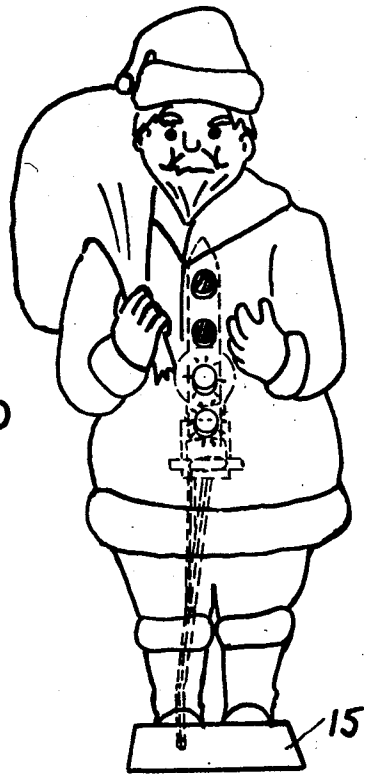


Fig. 6

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ADVERTISING AND DISPLAY DEVICE

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Application September 21, 1950, Serial No. 185,960

6 Claims. (Cl. 40—130)

My invention relates to a new and improved lighting device which is especially suitable for advertising and display purposes, in toys and for many other purposes.

It is well-known to form large bubbles in a light-impermeable liquid which has a low boiling point, by applying heat to the bottom of a column of such liquid. Reference is made to United States Patents No. 2,383,941 and No. 2,353,063 as illustrating the formation of bubbles.

According to my invention, I utilize a liquid which is light permeable per se, and which is given the necessary blocking action against light by dissolving a dye therein.

For example, the liquids which I use may be clear and transparent liquids such as chloroform and carbon tetrachloride, or any other liquid with a low boiling point which will bubble satisfactorily. As one example, chloroform can be given a suitable light-blocking power by dissolving a black nigrosine dye therein, and diazine black can be dissolved either in carbon tetrachloride or in chloroform for the purposes above-mentioned.

The dissolved dye does not make the volatile liquid wholly light-impermeable. When a bubble is formed in a liquid of this type, the bubble moves upwardly through the body of liquid. The bubble is of substantially the same diameter as the tube in which the bubble rises so that there is a thin film of liquid which is located laterally between the rising bubble and the wall of the tube. I preferably utilize a liquid-containing tube with a mask which has a series of openings. When a bubble is alined with an opening, the bubble is designated as being in an "on" or light-transmitting position. When a bubble is alined with an imperforate part of the mask, the bubble is designated as being in the "off" position.

For example, the internal diameter of the tube may be 6 mm., and it may contain a solution of 2 milligrams to 4 milligrams of Nigrosine SS in 10 cc. of methyl chloroform, whose formula is CH_3CCl_3. The boiling point of methyl chloroform is 74.1° C. In this embodiment, a 25 watt bulb was placed behind the tube and the inner walls of the shell or container were provided with a bright reflecting coating of aluminum for maximum reflection.

If the inner diameter of the tube is increased, the concentration of the dissolved dye is decreased. Otherwise, there would not be enough contrast between the bubbles and the bubble-free liquid. The concentration of the dye is critical, in order to secure a clear flash of light at each bubble, which is substantially transparent to get clear contrast.

If the intensity of the light source is increased, the concentration of the dye may be slightly increased, while preserving said clear contrast between the bubbles and the bubble-free liquid.

Other objects and features of my invention are described in the annexed description and drawings which illustrate a preferred embodiment thereof.

In the drawings,

Fig. 1 is a vertical section partially in elevation, which shows a mask which has a series of holes;

Fig. 2 is the same as Fig. 1, save that the mask of Fig. 2 has a single slot instead of a series of vertical alined holes;

Fig. 3 is a vertical section showing the combination of a mask which has a vertical slot as in Fig. 2, and in which the tube has a series of light-impermeable sections in order to give the effect of a series of holes;

Fig. 4 is a horizontal cross-section of another embodiment;

Fig. 5 is a side elevation, partially in cross-section, which illustrates a toy which is provided with the improved device; and

Fig. 6 is a front view of Fig. 5.

Fig. 1 illustrates a tube 1 which is closed at its top and bottom in the usual manner and which is provided at its bottom end with any suitable heater. These details are old and require no specific detailed illustration. The wall of this tube 1 can be made of glass or any suitable light-permeable material.

By using a volatile liquid with a suitable dark dye dissolved therein, the heat of said liquid at the bottom thereof produces large bubbles 3 whose width is substantially the same as the width of the tube 1. In this embodiment, the tube 1 is cylindrical and it is provided at its top above the liquid 2 with the usual space in which the vapor of the liquid 2 condenses and drops back into the column of liquid.

Fig. 1 shows a series of bubbles 3, some of which are horizontally alined with the holes 6 in a mask 5 which is located in front of the tube 1. Numeral 4 indicates a source of light which passes beams of light B through the holes 6 when a bubble 3 is in the "on" position relative to the holes 6. The station 13 indicates the eye of the observer.

As the bubbles 3 rise through the column of liquid 2, alternately blocking and unblocking the vertical alined holes 6, an "on" and "off" effect of the light is secured because light passes freely through an opening 6 when it is alined with a bubble 3, and little or substantially no light passes through an opening 6 when it is alined with the liquid.

The reference numeral 7 indicates an additional mask, used optionally, for the purpose of preventing any passage of light through the tube 1, save through a bubble 3 which is alined with the opening 6.

Fig. 2 is the same as Fig. 1, save that a single vertical slot 8 replaces the holes 6 of the mask 5, giving the effect of a series of light sources moving upwards as light passes through each bubble.

Fig. 3 shows a vertically slotted maks 5, combined with a tube 1 which has a series of sections 9 which are spaced vertically from each other. Said sections 9 are substantially light-impermeable and the vertical spaces between adjacent spaces 9 are light-permeable and preferably wholly transparent. The embodiment of Fig. 3 gives the same effect as the embodiment of Fig. 1.

In the embodiment of Fig. 4, the light is transmitted horizontally from the source 4 in the direction of the arrow A. The light passes through a tube 1 which is provided with a mask 5 which has a vertical slot 8 or the vertically superposed holes 6 as previously illustrated in Figs. 1 and 2. Light thus passes in a series of pulses or moving bands through a transparent sheet 11 which can be made of glass, various plastics or the like.

The reference numerals 12 respectively indicate respective depressions in the transparent sheet 11. These depressions 12 are located so as to provide the outline of an advertising display. One way of providing these depressions 12 is to form the same in the process of molding the sheet 11 of glass and then to etch or grind the walls of the recessed walls 12 in order to provide the desired light diffusing effect. If the sheet is made of plastic, the recesses or depressions 12 can be made by grinding.

The flashing or moving light escapes through the recesses 12, thus providing a superior display effect.

The embodiment of Figs. 5 and 6 illustrates a toy figure which has a pedestal 15 and an interior lamp 16 which is mounted in a base 17 which is fixed to a projection 18 of the hollow body 14. The reference numeral 19 indicates one of the wire connections. The tube 1 is located as shown best in Fig. 5, and said tube is provided at its bottom with a heater 20 which is an electric heater to which heat is supplied through the wires 21. The wires 19 and 21 are combined to form a cable 25 which extends out of the base 15.

In this embodiment, the hollow body 14 is provided with openings 23 which correspond to the openings 6 of Fig. 1. These openings 23 may have plastic button inserts of various colors. The front of the body 14 is provided with opaque portions 22 which correspond to the opaque portions of the mask 5.

A low cost, superior advertising effect is thus produced.

I claim:

1. A lighting device which comprises a tube which is closed at both ends, said tube being made of light-permeable material, said tube being partially filled with a solution of a light blocking dye in a volatile and light-permeable liquid, the lower end of said tube having a heater to form light-permeable bubbles of the vapor of said liquid which pass upwardly to the other end of said tube to be condensed in the upper end part of said tube, and a mask associated with said tube, said mask having an open part through which light can be transmitted, and means for transmitting a beam of light through said bubbles and said open part, said open part being a single slot.

2. A tube which is closed at both ends, the wall of said tube having a series of sections which are respectively light-permeable and light-impermeable, said tube being partially filled with light-permeable liquid in which a light blocking dye is dissolved, and a heater located above the lower end of said tube and adapted to produce light-permeable bubbles which pass upwardly through said liquid to be condensed at the upper end of said tube.

3. A tube which is closed at both ends, the wall of said tube having a series of sections which are respectively light-permeable and light-impermeable, said tube being partially filled with light-permeable liquid in which a light blocking dye is dissolved, and a heater located above the lower end of said tube and adapted to produce light-permeable bubbles which pass upwardly through said liquid to be condensed at the upper end of said tube, and means to transmit light through said bubbles.

4. In combination, a sheet made of light-permeable material, said sheet having a face which has depressions therein, a tube located at one edge of said sheet, said

tube being partially filled with a light-permeable liquid which has a light-blocking dye dissolved therein, said tube having a heater at one end thereof which is adapted to form light-permeable bubbles in said liquid which move in said liquid away from said heater to be condensed in said tube, and means for producing a flashing effect by the passage of said bubbles.

5. A lighting device which comprises a tube which is closed at both ends, and which extends longitudinally, said tube being made of light-permeable material, said tube being partially filled with a solution of a light blocking dye in a volatile and light-permeable liquid, the lower end of said tube having a heater to form light-permeable bubbles of the vapor of said liquid which pass upwardly to the other end of said tube to be condensed in the upper end part of said tube, said bubbles substantially conforming in cross-sectional area to the cross-sectional area of said tube, and a longitudinally extending mask postioned opposite one side of said tube, said mask having at least one open part in registration with said side of said tube and through which light can be transmitted, and means for transmitting a beam of light toward said side of said tube and said open part of said mask, said light passing through both said tube and said open part of said mask when a bubble is positioned opposite said open part of said mask.

6. A device in accordance with claim 5, in which said mask has a plurality of longitudinally alined and spaced open parts through which light can be transmitted, said beam of light being directed toward all of said open parts.

References Cited in the file of this patent

UNITED STATES PATENTS

1,382,232	Pyper	June 21, 1921
1,972,155	McMaster	Sept. 4, 1934
2,029,183	Mukasa	Jan. 28, 1936
2,159,277	Lee	May 23, 1939
2,162,897	Rosenblatt	June 20, 1939
2,177,641	Evans	Oct. 31, 1939
2,252,124	Hanson	Aug. 12, 1941
2,506,683	Rankin	May 9, 1950