

# PATENT SPECIFICATION

1,034,255

DRAWINGS ATTACHED.

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## COMPLETE SPECIFICATION.

### Display Device.

We, CRESTWORTH LIMITED, a British Company, of 59 Kennington Road, London, S.E.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to display devices wherein a globule or globules of one liquid is or are suspended in another liquid and the application of heat to a transparent or translucent container for these liquids gives rise to what will hereinafter be referred to simply as display properties, namely, it causes the globule or globules to ascend and circulate in the container and produce shapes and/or patterns which are fascinating and relaxing to observe, particularly if the device is illuminated and if at least one of the liquids is coloured.

One aspect of the invention concerns the liquids that are used in the container. The liquid in which the globule is suspended is usually dyed water, but not necessarily so. The other liquid is chosen with very many considerations in mind, including the relative densities of the liquids at the desired operating temperature of the device and at room temperature; the fact that the liquids must be immiscible; the fact that the surface tension must be such that the globule does not adhere to the walls of the container; the material of the container; the relative coefficients of thermal expansion of the liquids; and the shapes that are to be obtained during operation. A suitable liquid for the globule has been found to comprise mineral oil, paraffin and a dye when it is intended to suspend it in water, for example, Ondina 17 with a light paraffin (Ondina is a Registered Trade Mark), carbon tetrachloride

and a dye or dyes. However, undue shaking or sharp impacts, especially during transport of the display device, can cause total or partial emulsification of the globule.

According to the invention, the display device comprises a transparent or translucent container for two components which, upon the application of heat to the container, are in a liquid state, the first component being at least one globule of liquid suspended in the second component which is immiscible with the first component, said application of heat giving rise to display properties (as hereinbefore defined), wherein one of the components has a melting point above room temperature or is so viscous at room temperature that emulsification cannot take place at room temperature. Preferably, the said one component is such that the display properties (as hereinbefore defined) are attained at about 45°-50°C.

In one form of the invention, the one component includes an additive in the form of a thickening or gelling agent which is soluble therein and causes it to have an increased viscosity or to gel at room temperature, i.e., when the heat source is turned off. At the operating temperature when the heat source is on, say 45°-50°C, the component becomes fluent so that the device may then carry out its proper function as far as the display properties are concerned. An example of a gelling agent for globules of the aforementioned mineral oil composition is a wax, such as paraffin wax, or petroleum jelly.

An open-topped container for the components can be sealed and made leak-proof by providing a stopper comprising upper and lower relatively movable members and a sealing ring such as an O-ring, the upper

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member being adapted to fit into the mouth of the container and rest on the edge thereof and having a frusto-conical surface on which the sealing ring can be located, and the lower member carrying an annular projection of substantially the same diameter as the sealing ring, the arrangement being such that, when the stopper is located in the mouth of the container and the lower member is moved towards the upper member, the annular projection causes the sealing ring to be compressed between the frusto-conical surface and the wall at the mouth of the container.

15 An example of a display device according to the invention is illustrated in the drawing accompanying the Provisional specification wherein:—

20 Fig. 1 is a side elevation, and Fig. 2 is a sectional side elevation.

An open-topped glass container 1 contains a stopper comprising a metal plug 2, which is formed with a peripheral flange 5 for resting on the glass edge at the mouth 10 of the container and a conical surface receiving a resilient O-ring 3. A disc 4 carrying an annular projection 6 of substantially the same diameter as the O-ring is secured to the plug 2 by a screw-threaded stud 7 and a nut 8, the nut being received in a recess 15 in the plug 2 and the stud passing freely through the plug but being engaged in a screw-threaded blind hole 16 in the disc 4.

35 Into the container, there are placed dyed water and a solidified globule of mineral oil, paraffin and a dye as well as paraffin wax or petroleum jelly, preferably Ondina (R.T.M.) 17 with a light paraffin, carbon tetrachloride, a dye and the paraffin wax or petroleum jelly.

40 After the components have been introduced, the stopper is inserted in the container with the flange 5 resting on the edge of the glass at the mouth 10 and the container is sealed as follows. The disc 4 suspended from the plug 2 by the stud 7 and nut 8 is moved upwardly by rotating the stud, until the projection 6 has considerably compressed the ring 3 between the plug 2 and the container wall. The excess length of stud (as indicated in chain dotted lines) is then cut off and a decorative cap 9 is applied to the container.

55 The container 1 rests in a hollow conical metal seating 11 which, in turn, may be supported in any suitable stand, such as the frusto-conical hollow metallic stand shown at 12 in chain dotted lines. The seating 11 accommodates and may act at a reflector for an electric bulb 13 of suitable wattage for the capacity of the container. The bulb not only illuminates the device from underneath the container but also causes heat to be applied slowly so as to avoid excessive convection currents in the liquids. A suitable

operating temperature at which the globule will be fluent is 45° to 50°C. The position of the bulb may be adjustable.

The illustrated shape of the container has been found particularly advantageous in avoiding shadows and in the proper functioning of the device but modifications can be made.

70 To counteract any tendency of the globule to rise in the form of unattractive small bubbles rather than columnar or mushroom like larger shapes, a surface tension breaker in the form of the illustrated spiral wire ring 14 or a ring of spikes rests on the base of the container 1. This causes any descending small bubbles to re-unite each time they reach the base of the container.

#### WHAT WE CLAIM IS:—

1. A display device comprising a transparent or translucent container for two components which, upon the application of heat to the container, are in a liquid state, the first component being at least one globule of liquid suspended in the second component which is immiscible with the first component, said application of heat giving rise to display properties (as hereinbefore defined), wherein one of the components has a melting point above room temperature or is so viscous at room temperature that emulsification cannot take place at room temperature.
2. A device according to claim 1 wherein the said one component is such that the display properties are attained at about 45°-50°C.
3. A device according to either preceding claim wherein the said one component contains an additive in the form of a thickening or gelling agent which is soluble therein and causes it to have an increased viscosity or to gell at room temperature.
4. A device according to any preceding claim wherein the said one component is at least one globule of mineral oil, paraffin and a dye and the other component is water.
5. A device according to claim 4 wherein the globule contains an additive of wax.
6. A device according to claim 5 wherein the wax is paraffin wax.
7. A device according to claim 5 wherein the wax is petroleum jelly.
8. A device according to any preceding claim wherein the container is sealed by a stopper comprising upper and lower relatively movable members and a sealing ring, the upper member being adapted to fit into the mouth of the container and rest on the edge thereof and having a frusto-conical surface on which the sealing ring can be located, and the lower member carrying an annular projection of substantially the same diameter as the sealing ring, the arrangement being such that, when the stopper is located in the mouth of the container and

- the lower member is moved towards the upper member, the annular projection causes the sealing ring to be compressed between the frusto-conical surface and the wall at the mouth of the container.
- 5 9. A device according to any preceding claim, including an electric light bulb mounted beneath the container.
- 10 10. A device according to claim 4, wherein the water is dyed.
11. A device according to any preceding claim, including a surface tension breaker at the bottom of the container.
- 15 12. A device according to claim 11, wherein the surface tension breaker is a spiral wire ring resting on the base of the container.
13. A display device according to claim 9 wherein the container rests in a seating accommodating the light bulb.
- 20 14. A display device substantially as described herein with reference to the drawing accompanying the Provisional specification.

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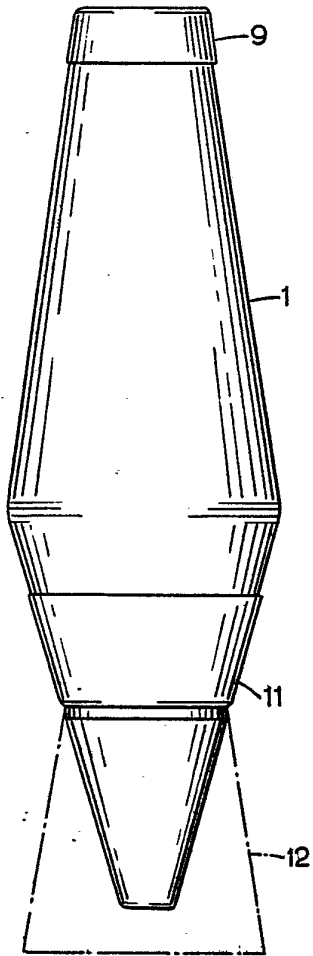


FIG. 1.

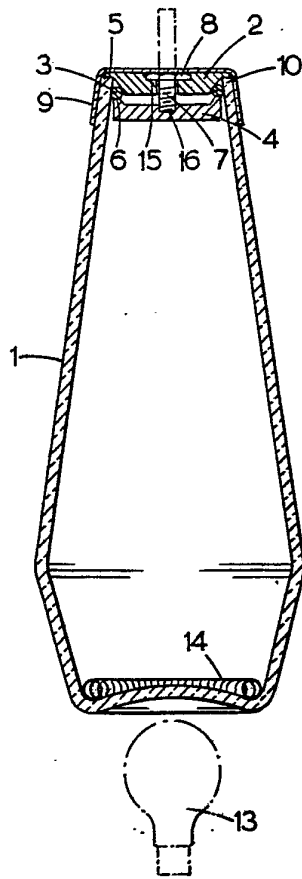


FIG. 2.