

PATENT SPECIFICATION

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(54) FIBRE OPTICS DISPLAY DEVICE

(71) We, CRESTWORTH LIMITED, a British company, of Sterte Avenue, Poole, Dorset, BH15 2BD, do hereby declare the invention for which we pray that 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 a fibre optics display device, i.e. a device used for attracting the attention of passers-by and/or as a decorative article and operating on the principle known as fibre optics.

In fibre optics, light introduced at one end of a usually cylindrical transparent or translucent filament, strand or tube (hereinafter generically referred to as 'fibre') is invisibly transmitted therealong and visibly emitted at the other end, even if the fibre is curved or bent. Special so-called fibre optic transparent or translucent glass and plastics materials are commercially available which exhibit this phenomenon; for example a composite glass or plastics comprising a core having a high refractive index surrounded by a thin coating of low refractive index. Fibre optics has found many important beneficial applications and the purely decorative effect of light emanating from the end of a fibre without any apparent light input has also already been suggested in display devices. In this connection, attention is drawn to our co-pending cognated Patent Specifications Nos. 33135/71 and 4149/72, (Serial No. 1,332,077) several of the features of which may also be employed in conjunction with the present invention which aims to enhance the display effect obtainable with such devices.

According to the present invention there is provided an optical fibre for a display device, comprising a core having a high refractive index surrounded by a thin coating of low refractive index wherein at one or more places along the length of the fibre the coating is not present, so that when light is introduced at one end of the fibre the light is transmitted invisibly along the fibre and emitted at the or each said place.

The invention extends to a display device incorporating such optical fibres and, if desired, also incorporating some conventional optical fibres which emit light only at their tips, all the fibres being bunched together at one end and a light source such as a lamp bulb being located adjacent the bunched ends, the fibres being mounted in relation to a support so that the bunched ends and the light source are hidden from view by the support.

Since the optical fibres of the invention will emit light at the bared portions intermediate their length, it is no longer necessary for the tips of these fibres to be visible and this enables a far greater number of variations in the fibre arrangements to be obtained. For example, in one form of display device according to the invention, the fibres which have bared surface portions are looped so that both ends are bunched adjacent the light source and only the loops are visible. With this arrangement, light emission at the bared portions is particularly pronounced because the light is introduced at both ends instead of at only one end as hitherto.

An example of the invention will now be described with reference to the diagrammatic drawing accompanying the Provisional specification, which is a perspective view of an arrangement of optical fibres. In practice, the arrangement would contain a far greater number of fibres than that illustrated.

In the drawing, a plurality of fibres 1 which are looped to resemble leaves or flower petals have both their ends bunched together and retained in a sleeve 2 by which the fibres are mounted in a display device in which a light source (not shown) is located adjacent the bottom of the sleeve in a support (not shown) which hides the lower end of the sleeve and the light source from view. Intermediate their ends, the fibres 1 have bared portions (shown at 5 for only one of the fibres) where the surface of the fibre material has been omitted or has been removed by scraping. As a result, light from the source will be emitted by the fibres 1 only at the bared portions 5, which may be short and

numerous or long and correspondingly less numerous on each fibre, depending on the display effect that is desired. For example, the bared portions may be located at the apices of the loops so that the emitted light will produce the overall effect of a striated hemisphere.

A few fibres 3 are included which have only one end extending into the sleeve 2 and will therefore be lit up at their tips, although these fibres may also contain bared portions intermediate their length. Further, some of the tips of the fibres 3 carry translucent or transparent bobbles or beads 4 which will glow from light emitted at the fibre tips. A displaceable ring 6 is provided around the fibres to permit the fibre arrangement to be altered by varying the extent to which they are splayed apart. For further particulars of the display device, especially in connection with producing colour changes, attention is directed to our aforementioned application No. 1,332,077.

WHAT WE CLAIM IS:—

1. An optical fibre for a display device, comprising a core having a high refractive index surrounded by a thin coating of low refractive index wherein at one or more places along the length of the fibre the coating is not present, so that when light is introduced at one end of the fibre the light is transmitted invisibly along the fibre and emitted at the or each said place.

2. A display device including a plurality of optical fibres according to claim 1, all the fibres being bunched together at one end and a light source being located adjacent the bunched ends, the fibres being mounted in relation to a support so that the bunched

ends and the light source are hidden from view by the support.

3. A display device including a plurality of optical fibres according to claim 1 looped so that both ends are bunched together, and a light source located adjacent the bunched ends, the fibres being mounted in relation to a support so that the bunched ends and the light source are hidden from view by the support.

4. A display device according to claim 3, including unlooped fibres incorporated with the bunched ends of the looped fibres by one end and adapted to emit light at the other end.

5. A display device according to claim 4, wherein some of the tips of the unlooped fibres carry translucent or transparent bobbles or beads which will glow from light emitted at the fibre tips.

6. A display device according to any one of claims 2 to 5 including a displaceable ring provided around the fibres to permit the fibre arrangement to be altered.

7. A display device according to any one of claims 2 to 6, wherein the bunched fibre ends are retained in a sleeve.

8. Optical fibres substantially as hereinbefore described with reference to the drawing accompanying the Provisional specification.

9. A display device substantially as hereinbefore described with reference to the drawing accompanying the Provisional specification.

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