A light column is made up of signalling units arranged, one on top of the other, each of the units comprising inside a transparent glass casing of cylindrical shape, fixed conductors which pass through it. The number of said conductors corresponds to the maximum number of signalling units that can be accommodated plus one return conductor common for all signalling units, each of these units being closed at one end by an opaque solid partition comprising support means for the said electric bulb and fastening means of a first type, while the other end comprises an annular partitioning portion which gives access to the electric bulb and includes fastening means of a second type whose shape enables them to engage with said fastening means of the first type, when the two adjoining signalling units are in one particular relative position, obtained by partial relative rotation of the said two adjoining units.

Application: Indicating failures in operation of automatic machines.

5 Claims, 3 Drawing Figures
LIGHT COLUMN HAVING STACKED ELEMENTS

The invention relates to light columns designed to indicate to staff supervising automatic machines installed in large areas the occurrence of incidents such as fault conditions.

BACKGROUND OF THE INVENTION

In workshops where large numbers of automatic machines are working, it has become customary to install light signals which indicate the operational status.

As the supervisory staff is small, due to the automatic nature of the plant, it is important that these signals be visible from a considerable distance and in all directions.

Towards this end, a light column has already been suggested which is made up of annular-shaped signalling units, at least partly transparent, positioned coaxially one above the other, wherein an electric bulb is fitted in each of the units so that the latter is only lit up when the line which feeds it becomes energized, the various feed lines coming from a base which supports the device.

This known device comprises many faults. First of all, a single device for holding the units is provided, which makes dismantling tedious when only one bulb has to be replaced, especially if it is the bulb at the bottom; then the column is usually overheated at the top due to the internal shape of the units, which allows hot air to rise; finally, the network of conductors making up the feed lines, together with the fixing system, form an opaque screen, so that there are large shaded areas in certain zones. It may also be mentioned that it is not possible, to combine these units, all of the same color or any combination whatever of colors, without making mechanical adjustments.

It is an object of the invention to provide a light column of the general type aforementioned, but in which the above faults have been overcome. In particular, this column constitutes a device comprising removable light units which can be assembled and dismantled quickly and in any order without special tools.

In accordance with the invention each signalling unit in the column comprises fixed conductors inside a transparent glass casing of cylindrical shape, the number of these conductors corresponding to the maximum number of signalling units that can be accommodated in one column plus one return conductor common for all units, the casing being closed at one end by a solid opaque partition comprising support means for an electric bulb and a first type of fastening means, while the other end of the casing comprises an annular partitioning portion which gives access to the electric bulb and includes a second type of fastening means whose shape enables it to be engaged with the first type of fastening means when the two adjoining signalling units are in one particular relative position.

In accordance with another feature of the invention, the fixed conductor units consist of metal blades parallel to the axis of the column, said blades being anchored in the said solid opaque partitions and said annular partitioning portions and having at their ends complementarily shaped means of electrical connection which become operative when two adjoining signalling units are fastened together.

BRIEF DESCRIPTION OF THE DRAWING

A better understanding of the invention will be obtained from the following description. In the attached drawing:

FIG. 1 shows an elevational view of a light column in accordance with a preferred form of embodiment of the invention;

FIG. 2 is a partial sectional view of this column in an axial plane;

FIG. 3 is a view from above of one of the fixed conductors comprised therein.

FIG. 1 shows a complete light column mounted on a machine frame 6.

DESCRIPTION OF THE INVENTION

The device consists of a base 1, on which is fixed a leg 2, generally cylindrical, which in turn supports a collar 3 on which the first of a set of super-imposed signalling units 9 is fitted. The last unit is closed with a cover 5. As an example, the column shown comprises five units, but this is by no means the maximum number. A certain number of electric leads 7 terminate at the device and feed the bulbs (described below) when two or more of these leads are energized due to the occurrence of the phenomenon or fault to be indicated.

The units in the column are identical, except that the colours of the transparent glass casings (4, FIG. 2) can be different. At the bottom of the glass casing 4 a solid, non-transparent partition 8 is fixed (FIG. 2). Electric conductors 17 and 19 are fixed on this partition, these conductors 17 are equal in number to the leads 7, their number corresponding to the maximum number of signalling units that can be accommodated, plus one return conductor common for all units, the said common conductor and a specific conductor permitting current to flow through a specific removable bulb 15 to illuminate the associated glass casing. The glass casing is, moreover, designed to provide two different illuminated areas: on the one hand, a central translucent annular focusing area for the light from the electric bulb, this area being obtained by means of an annular spherical inner surface 20 placed in the central area and acting as a lens; on the other hand, two diffusing translucent annular areas for the light from said bulb, consisting of two annular portions 21 and 22 positioned on either side of the spherical surface 20 and with pyramidal-shaped points placed on their inside surface.

The conductors 17 and 19 of each electric bulb 15 are connected, in a way not shown, to two of the conductors in a set of fixed conductors 11. The latter are housed inside the glass casing and anchored at their respective ends in the solid bottom partition 8 and in an annular partitioning portion 10 at the top of the unit. Each conductor 11 is made up of a blade plane of which passes through the axis of the column; at the bottom, it has a male portion 13 and at the top, a flexible female portion 14, and the portions 13 and 14 constitute the aforementioned means of electrical connection. The shapes of these two portions are complementary, so that superimposing two signalling units (as shown in FIG. 2) un failingly causes two conductor ends belonging to these two units to make contact.

In the non-limiting example of embodiment shown, the male portion 13 is obtained by making a 90° twist
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at the bottom end of the blade 11. The flexible female portion 14 is shown more clearly in FIG. 3.

The shape of the electrical connection means is designed so that their connection is achieved by way of a limited relative rotation of two adjoining signalling units.

The mechanical fastening of the two units is, moreover, carried out during this rotation, by collaboration between fastening means of a first type 16 and fastening components of a second type 12. The means 16 are portions of helicoidal ramps connected to a crown 18 fixed to the partition 8 so as to give a certain amount of axial flexibility. FIG. 2 shows that one of these ramps 16 is simply applied against a helicoidal projection 12 being part of the partition portion 10.

It will be noted that the top partition of the unit should not be completely closed, so that the bulb can be changed. Moreover, a solid partition at this level would serve no purpose, in view of the immediate proximity of the solid partition 8 of the superimposed unit, which partition 8 prevents a glass casing from being lit up by the bulb in the adjoining glass casing. It also prevents hot air from rising which would shorten the life of the bulbs.

In a light column of the type described, certain relative positions should be observed when assembling the signalling units one on top of the other, to avoid the feed lines to the different bulbs interfering with one another. This is achieved by means of a system of staggering of conductors and connection means well known in itself.

For example, the fastening components can be spaced irregularly around the axis of the column; one of the ramps 16 can also be externally shaped so that its profile corresponds with a single notch in the complementary fastening component, through which it will have to penetrate.

It will be noted that the areas 20 and 21 which yield the two types of lighting are inside the glass casing.

This is essential in order to avoid the necessity of frequent cleaning, whereby relative rotation of two units could be caused, these units could then come apart.

In particular, the signalling units may not be annular. The first and second type fastening components can consist of various devices known in themselves, such as: fixing by means of a catch, by passing a dead point, by screwing, by radial movement, or even by means of suction discs or magnetic components.

Similarly, the means of electrical connection can consist of contact devices with axial flexibility, while the fixed conductors can be cylindrical and, possibly, by embedded in the material of the glass casing. A unit can also be made entirely of the transparent material of the glass casing, providing it is equipped with a non-transparent solid partition, e.g. by metal plating, painting or any chemical treatment.

Finally, the number of fixed conductors can be increased to allow a corresponding number of signalling units to be fitted. Although this type of device is particularly well suited to indicating operational faults in ma-