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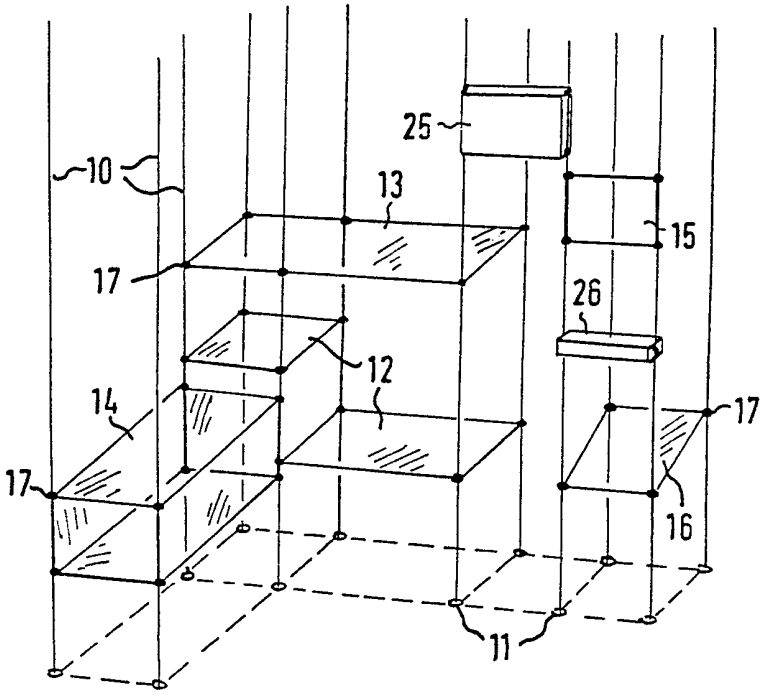
(54) Display lighting apparatus

(57) Cable display apparatus consists of a plurality of vertical cables 10 (flexible cables or rods) on which display devices (shelves 12 and 13, box 14, sloping panel 16, vertical panel 15) are supported. Some or all of the cables are energized with a low voltage from a transformer, and lighting units such as unit 25 (an internally lit vertical display panel) and 26 (which illuminates panel 16 below it) are attached to and energized through the cables. A TV or the like (not shown) in the display, requiring a mains voltage supply, is energized via the cables by means of a step-up transformer.



The claims have been amended to comply with Sections 15(4) and 76(1) of the Patent Act 1977 as amended by the Copyright, Designs and Patents Act 1988. The search under Section 17 has been carried out on the amended claims only.

The date of filing shown above is that provisionally accorded to the application in accordance with the provisions of Section 15(4) of the Patents Act 1977 and is subject to ratification or amendment.

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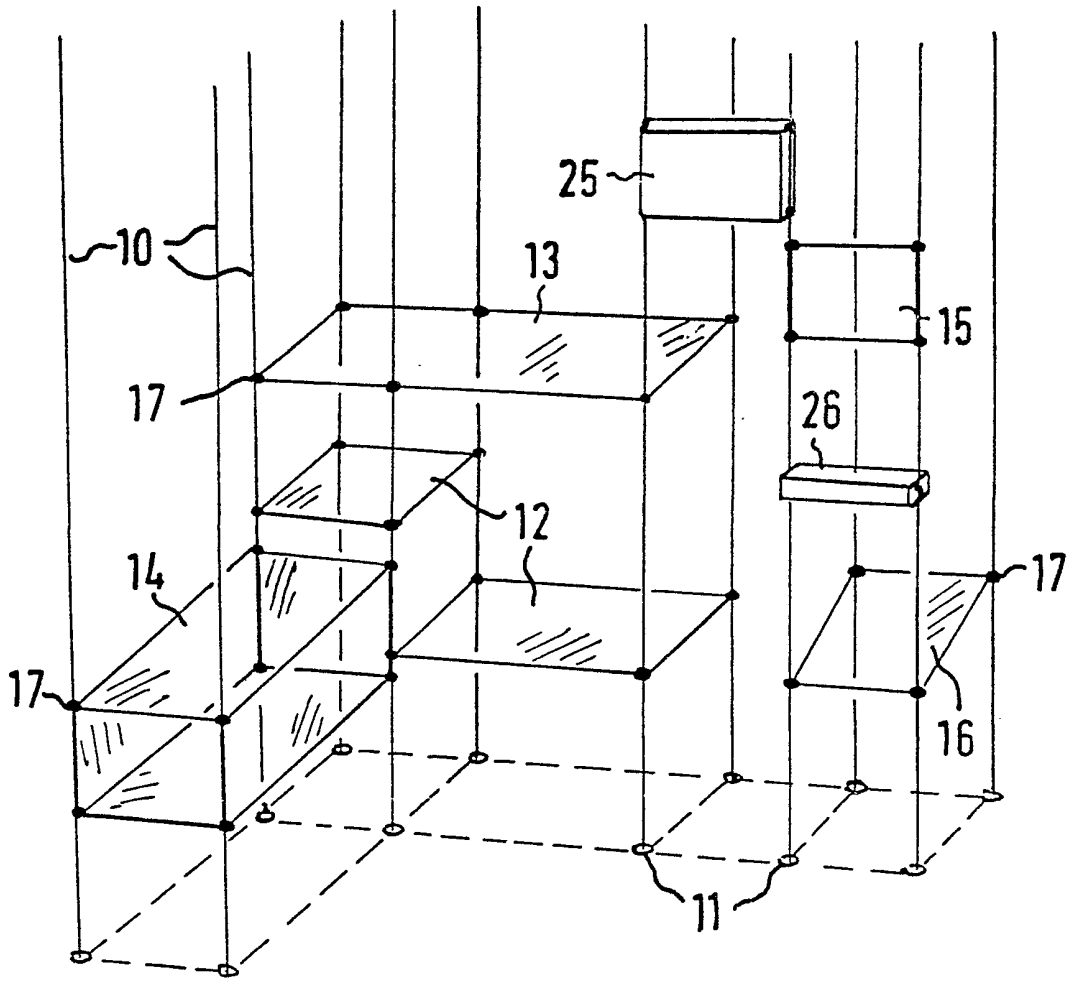
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Display Apparatus

The present invention relates to display apparatus, and more specifically to such apparatus incorporating lighting means.

Display apparatus is apparatus which supports display material, such as merchandise and descriptive placards, in an attractive way. It is often desirable or essential for such apparatus to be free-standing and unobtrusive - that is, not directly supported by a wall or panel.

One known form of such apparatus is the cable or rod system, in which a plurality of thin steel cables or rods extend vertically, with shelves and/or display panels attached to them. (For brevity, the term "cable" alone will be used, but it will be understood that rods are included within the scope of this term.) The cables may be mounted on a free-standing frame or between floor and ceiling, and the shelves and panels themselves are generally of glass or clear plastic.

It is also often desirable for the display material (merchandise and/or descriptive placards) to be illuminated. This is generally done by means of lights (e.g. spotlights) which are separate from the display apparatus, being fixed to adjacent solid surfaces such as floors, walls, or ceilings.

The parent application, no. 88.18754.7, spec no 2 208 425 A, of which the present application is a divisional, describes a system for providing such illumination. That specification describes cable display apparatus comprising a plurality of vertically extending cables supporting insulating shelves and/or display panels and like, with a low voltage being applied to the cables and lighting units attached to and powered through the cables.

With such a display system, it may on occasion be desirable to include a television or other apparatus requiring a mains voltage supply, carried on a display panel. Such apparatus would normally be powered by a mains lead connecting it directly to the mains supply.

According to the present invention there is provided cable display apparatus comprising a plurality of vertically extending cables supporting insulating shelves and/or display panels and the like, with a low voltage being applied to the cables and at least one mains voltage device fed by a step-up transformer fed from the cables.

The present invention thus takes advantage of the fact that an electrical power supply is already available on a suitable cable display system. For safety reasons, such a power supply is of low voltage, and therefore unsuitable for energizing televisions or other apparatus requiring a mains voltage supply. However, by providing a step-up transformer, this unsuitability can be overcome. The need for a lead giving a direct connection from the television or other apparatus requiring a mains voltage supply to the mains is thus overcome.

It may be desirable for such a transformer to incorporate some form of voltage regulation or to produce a nominal voltage above normal mains voltage, to compensate for the voltage loss which is likely to occur in the 12 V transmission path between it and the mains transformer 31.

The description in the present specification is concerned primarily with the features claimed in the leading claims herein. Thus various features of this general apparatus which are not specifically described in the present application are described in the parent specification, the contents of which are incorporated herein by reference.

An embodiment of the present invention will now be described, by way of example, with reference to the drawing, which is a general view of a cable display apparatus with lighting units.

The drawing is a general view of a cable display apparatus. The cables are preferably arranged in a linear or rectangular pattern; in the arrangement shown in the drawing, there are twelve cables 10 arranged in an L-shaped rectangular array. Each cable is stretched between a floor fixing 11 and a similar ceiling fixing (not shown).

Various display shelves, panels, and the like are attached to the cables; thus there are two shelves 12 of different lengths each held by four cables, a longer shelf 13 held by six cables, a box 14 of glass or plastics material, a

vertical panel 15, and a sloping shelf 16. These display devices are fixed to the cables by device mounting elements 17. The shelves 12 and 13 may rest on the elements 17, being provided with short slots near their corners through which the cables pass.

The apparatus also includes two lighting units 25 and 26, each attached between two adjacent cables 10.

Unit 25 is a "light box" - an internally illuminated vertical display panel which is intended to have a transparency mounted on its front face (and optionally another one on its rear face). It consists essentially of a flat box of translucent plastics material containing a low voltage fluorescent tube (which is preferably folded or zig-zag, to give a more uniform illumination of the faces of the box) and four integral device mounting elements, with the two top (or bottom) ones connected to the tube.

Unit 26 is a lighting unit for illuminating the sloping shelf 16, and consists essentially of an opaque housing of insulating material in which an incandescent or fluorescent lamp is mounted and which forms a reflector, and has two integral device mounting elements connected to the lamp.

The cables to which the two lighting units 25 and 26 are energized via the cables 10. The two lighting units therefore provide internal illumination in the light box 25 and illuminate the shelf 16. The cables 10 serve the dual functions of supporting the display devices 12 to 16 and 26 and energizing the lighting units 25 and 26 (unit 25 being not merely a lighting unit but also a display device).

The cables are energized with an AC supply voltage of 12 V, obtained from a mains transformer. A voltage of 12 V is convenient, being low enough to be safe but high enough to energize the lighting units 25 and 26 without excessive resistance loss in the cables and other connections. The system is preferably fused for relatively low power, less than 100 W, particularly if flexible cables rather than rigid rods are used. This is because if higher power is allowed, the system cannot discriminate reliably against a short circuit between points at the other ends of two cables from the ends to which the power is connected. If the lighting units are substantially closer to one end of the cables, it is also desirable, all other things being equal, to feed the cables at that end.

It is possible to energize only those particular cables to which the lighting units are connected. It may however be desirable to energize all the cables in one line of the pattern, or the whole of the pattern, so that lighting units can be attached between any adjacent pair of cables. This is achieved by connecting the cables alternately (either along the line or in both directions through the rectangular array) in two groups to which the two sides of the supply are respectively connected.

The cables are therefore connected and energized in such a way that along a row or line of cables, the individual cables are connected alternately to one side and the other terminal of the low voltage side of the transformer. In other words, if the two low voltage terminals of the transformer are labelled R and G, the cables will be connected in a RGRGRG... pattern along the row or line of cables. Preferably the cables are so connected and energized in both directions, thus enabling the lighting units to be connected between any two adjacent cables.

When a television or other apparatus requiring a mains voltage supply is carried on a display panel, it is energized from two energized cables via a step-up transformer. It may be desirable for such a transformer to incorporate some form of voltage regulation or to produce a nominal voltage above normal mains voltage, to compensate for the voltage loss which is likely to occur in the 12 V transmission path between it and the mains transformer 31.

Claims

1 Cable display apparatus comprising a plurality of vertically extending cables supporting insulating shelves and/or display panels and like, with a low voltage being applied to the cables and at least one mains voltage device fed by a step-up transformer fed from the cables.

2 Cable display apparatus according to claim 1 wherein the transformer incorporates voltage regulation.

3 Cable display apparatus according to claim 1 wherein the transformer produces a nominal voltage above normal mains voltage.

4 Cable display apparatus according to any previous claim wherein the high voltage device or devices include a lighting unit consisting of an internally illuminated display panel.

5 Cable display apparatus according to claim 4 wherein the lighting unit consists of an opaque housing of insulating material in which a fluorescent lamp is mounted and which forms a reflector, and has two integral device mounting elements connected to the lamp.

6 Cable display apparatus according to any previous claim wherein all the cables along a line, or in both directions through a rectangular array, are connected alternately in two groups to which the two sides of the supply are respectively connected.

7 Cable display apparatus according to claim 6 wherein the cables of a line extend between two conductive mounting strips, each cable having an insulating support at one end and a conductive support at the other.

8 Cable display apparatus according to claim 7, wherein the supply is connected directly to one mounting strip and to the other mounting strip via a connection to a cable.

9 Cable display apparatus according to claim 6 wherein the cables of a line extend from a mounting strip carrying two internal conductors to which the cables are alternately connected.

10 Cable display apparatus according to any one of claims 6 to 9 wherein at least one connection between cables is formed by means of a metal strip forming part of a display panel.

11 Cable display apparatus substantially as herein described and illustrated.

AMENDMENTS TO THE CLAIMS HAVE BEEN FILED AS FOLLOWS.

1 Cable display apparatus comprising a plurality of vertically extending cables supporting insulating shelves and/or display panels and like, with a low voltage being applied to the cables and at least one mains voltage device fed by a step-up transformer fed from the cables.

2 Cable display apparatus according to claim 1 wherein the transformer incorporates voltage regulation.

3 Cable display apparatus according to claim 1 wherein the transformer produces a nominal voltage above normal mains voltage.

4 Cable display apparatus according to any previous claim wherein all the cables along a line, or in both directions through a rectangular array, are connected alternately in two groups to which the two sides of the supply are respectively connected.

5 Cable display apparatus according to claim 4 wherein the cables of a line extend between two conductive mounting strips, each cable having an insulating support at one end and a conductive support at the other.

6 Cable display apparatus according to claim 5, wherein the supply is connected directly to one mounting strip and to the other mounting strip via a connection to a cable.

7 Cable display apparatus according to claim 4 wherein the cables of a line extend from a mounting strip carrying two internal conductors to which the cables are alternately connected.

8 Cable display apparatus according to any one of claims 4 to 7 wherein at least one connection between cables is formed by means of a metal strip forming part of a display panel.

9 Cable display apparatus substantially as herein described and illustrated.

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