(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 065 440 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.01.2001 Bulletin 2001/01

(51) Int. Cl.[7]: **F21V 33/00**

(21) Application number: **00202070.9**

(22) Date of filing: **14.06.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **02.07.1999 IT GE990022 U**

(71) Applicant: **Vena, Giuseppe**
17021 Alassio (SV) (IT)

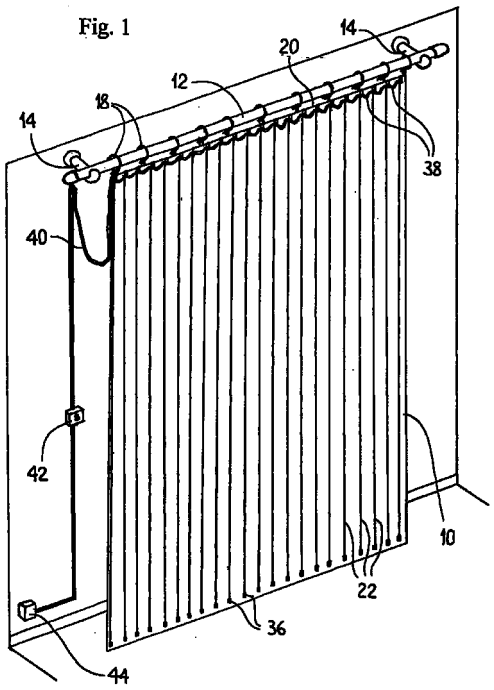
(72) Inventor: **Vena, Giuseppe**
17021 Alassio (SV) (IT)

(74) Representative:
Spandonari, Carlo, Dr. Ing.
Spandonari & Modiano s.r.l.
corso Duca degli Abruzzi 16
10129 Torino (IT)

(54) Light-emitting curtain

(57) A curtain (10,60,92,94) comprising at least one piece of fabric is arranged for hanging from a rail (12,80,92,94). A plurality of electroluminescent strands (22,70,96) are provided with respective pairs of biasing wire electrodes (28,30) arranged along their length. The pairs of electrodes (28,30) of the respective strands (22,60,86) are chain-connected to one another and are connectable to an electric power supply (50,52,54). The electroluminescent strands (22,70,96) hang from respective supports (24,68) spaced at intervals along the width of the curtain (10,60,92,94).

Fig. 1



EP 1 065 440 A2

Description

[0001] This invention is concerned with a curtain or tapestry capable of acting as a light-source for providing lighting and/or decoration to rooms in private homes and public places.

[0002] Curtains have generally been used in connection with windows and doors, as a screen intended to shade or filter natural light pouring into a room through the window, although sometimes curtains are also used as hanging tapestries to decorate otherwise bare wall surfaces or to temporarily divide large rooms into smaller compartments. Curtains are mostly hung on rings or blocks which are slidable along a horizontal rail, so that they can be shifted to fold the curtain open or closed, in order to allow more or less outdoor light into the room.

[0003] When, at nighttime, the natural light provided by the window is not available, artificial lighting is used to replace it. The artificial light, however, is provided by lamps which are placed at points in the room which are far from the window. This may be undesirable, since the decoration of the room is usually designed for best appearance under daylight conditions.

[0004] It is now the main object of the invention to provide a curtain which can act as a source of artificial light when the natural light is not available, so that, when the curtain is associated with a window, the artificial lighting will be irradiated from the same direction of natural lighting.

[0005] Another object is to provide a light-emitting curtain as above, which can be hung, folded, and removed for washing, similarly to a conventional curtain.

[0006] The above and other objects and advantages are achieved by the invention with a light-emitting curtain having the features set out in claim 1.

[0007] The invention will be further described in more detail in the following disclosure, with reference to a few preffered embodiments, and with the help of the attached drawings, wherein:

Fig. 1 is a perspective view of a light-emitting curtain according to a first preferred embodiment of the invention, shown as installed along a wall of a room;

Fig. 2 is a side view of the curtain of Fig. 1;

Fig. 3 is a strongly enlarged side view in cross-section, partially broken-away, of a fragment of an electroluminescent strand used in the curtain of Fig. 1;

Fig. 4 is a circuit diagram of the light-emitting curtain shown on Figs. 1 to 3;

Fig. 5 is a perspective, exploded view of a second preferred embodiment of the invention;

Fig. 6 is a side view of a third preferred embodiment of the invention.

[0008] With reference to Figs. 1 and 2, a curtain 10 is made of a substantially rectangular piece of fabric which is hung from a conventional curtain rail 12 borne by wall brackets 14 to extend horizontally above a window opening 16 (only visible on Fig. 2), by means of rings 18 that are sewn or otherwise fastened at uniform distances to the upper edge 20 of the curtain. Rings 18 are slidable along rail 12, in a way known per se, so that the curtain can be folded closed or open as a conventional curtain.

[0009] Respective electroluminescent strands 22, which will be described below in more detail, are hooked at regular intervals, e.g. 5 to 20 cm, to the upper edge of curtain 10 by means of hooked brackets 24, as shown in more detail on Fig. 3.

[0010] Having now reference to Fig. 3, each strand 22 comprises an elongated, flexible, thin filament 26 of an electroluminescent material, having a central wire electrode 28 extending along its axis and a peripheral wire electrode 30 wound helically around filament 26 along its entire length. A sheath 32 of a clear artificial resin surrounds filament 26 and its helical electrode 30, for insulation and protection. At its upper end, each electroluminescent strand 22 is gripped by a enlarged collar 34, which is supported on a respective bracket 24 as described above. The lower end of each strand 22 is preferably weighted with a respective collar 36.

[0011] With further reference to Fig. 1 and 2, the respective upper ends of electrodes 28, 30 project from each strand 22 and are chain-connected to the ends of the corresponding electrodes of adjacent strands, preferably by means of slack cable lengths 38. A terminal cable 40 is connected to an electric power supply comprising (see also Fig. 4) a switch 50, a voltage-reducing electric transformer 52, and a frequency converter 54, all connected in cascade and preferably assembled into a single control box 42 which is supplied from the electric network through a junction box 44.

[0012] The electroluminescent strands only require a low voltage for operation, and consume very little power. Moreover, if driven with an alternate voltage, their efficiency has a peak at a supply frequency of 400 Hz. Accordingly, electric transformer 52 preferably reduces the voltage to 12 volts, and frequency converter 54 provides an output voltage at 400 Hz, although other values could also be chosen. The low voltage insures that the curtain can be used with safety in all conditions.

[0013] The above curtain can be used normally during daytime as a screen against outdoor light, including folding the curtain closed or open to vary the amount of light allowed into trhe room, without hindrance due to the electroluminescent strands. At nighttime, the curtain can be drawn open in front of a window and the electroluminescent strands can be activated to provide a large area of lighted surface. When desired, the strands can be removed, the curtain can be taken down for normal

washing, and then it can be hung and reassembled again with the strands.

[0014] According to another embodiment of the invention, as shown in Fig. 5, a curtain 60 is made of two superimposed pieces of fabric 62, 64, which are sewn together along their edges with stitches 66. Further stitches 68 define uniformly spaced, narrow pockets or holsters, extending vertically from the upper edge of the curtain. The stitches defining the pockets may extend for the entire height of the curtain or, preferably, only for a short length as shown.

[0015] Electroluminescent strands 70, similar to strands 22 of Figs. 1 to 3, are received in pockets 68, and they also are chain-connected similarly to Figs. 1 and 2 by means of a connecting cable 72, which rests on top of the curtain and retains the strands hanging. Cable 72 is arranged to be connected to an electric power supply similarly to the previous embodiment. The strands can be easily pulled out of their pockets when the curtain is to be washed.

[0016] Fig. 6 shows a further embodiment of the invention, giving maximum flexibility. Three rails 80, 82, 84 are fastened side by side to the ceiling of a room, and accommodate respective sets of sliders 86, 88, 90, which can be run along their respective rails by mechanisms well known in the art. The sets of sliders 86, 90, belonging to the outer rails, support respective curtains 92, 94, each comprising a single piece of fabric. Each of the sliders 88 running in the middle rail supports a hanging electroluminescent strand 96. Strands 96 are identical to the strands of the previous embodiments and are connected to one another and to the electric supply similarly to what has been described above and shown on Fig. 4.

Claims

1. A curtain system comprising at least one piece of fabric having holding members at one end for slidably hanging the curtain from a curtain-support, characterized in that it further comprises a plurality of electroluminescent strands (22, 60, 86) hanging from respective supports (24, 78) spaced at intervals along the width of the curtain (10) and provided with pairs of biasing wire electrodes (28, 30) arranged along their lengths, the pairs of electrodes of the respective strands being chain-connected to one another and being connectable to an electric power supply (50, 52, 54).

2. The curtain system of claim 1, characterized in that the electric power supply comprises a voltage-reducing electric transformer (52) having an input connectable to a source of alternating voltage.

3. The curtain system of claim 2, characterized in that the the electric power supply further comprises a frequency converter (54) driven by the output of said transformer.

4. The curtain system of one of claims 1 to 3, characterized in that the pairs of electrodes (28, 30) of the respective electroluminescent strands are connected to one another by slack cables (38).

5. The curtain system of any of claims 1 to 4, characterized in that the electroluminescent strands are uniformly spaced across the width of the curtain.

6. The curtain system of any of claims 1 to 5, characterized in that the electroluminescent strands are provided with hooked brackets (24) at their upper ends, the brackets being hung over the upper edge of the curtain.

7. The curtain system of any of claims 1 to 5, characterized in that the electroluminescent strands are received in respective elongated pockets (58) extending along said piece of fabric.

8. The curtain system of claim 7, characterized in that said pockets extend substantially vertically.

9. The curtain system of any of claims 1 to 5, characterized in that at least one piece of fabric forming a curtain (82) and the electroluminescent strands (86) hang from respective supports (76, 78) slidable along respective parallel rails (70, 72).

10. The curtain system of claim 9, characterized in that a further piece of fabric (84) hangs from supports (80) slidable along a third rail (74) opposite to said one piece of fabric.

Fig. 1

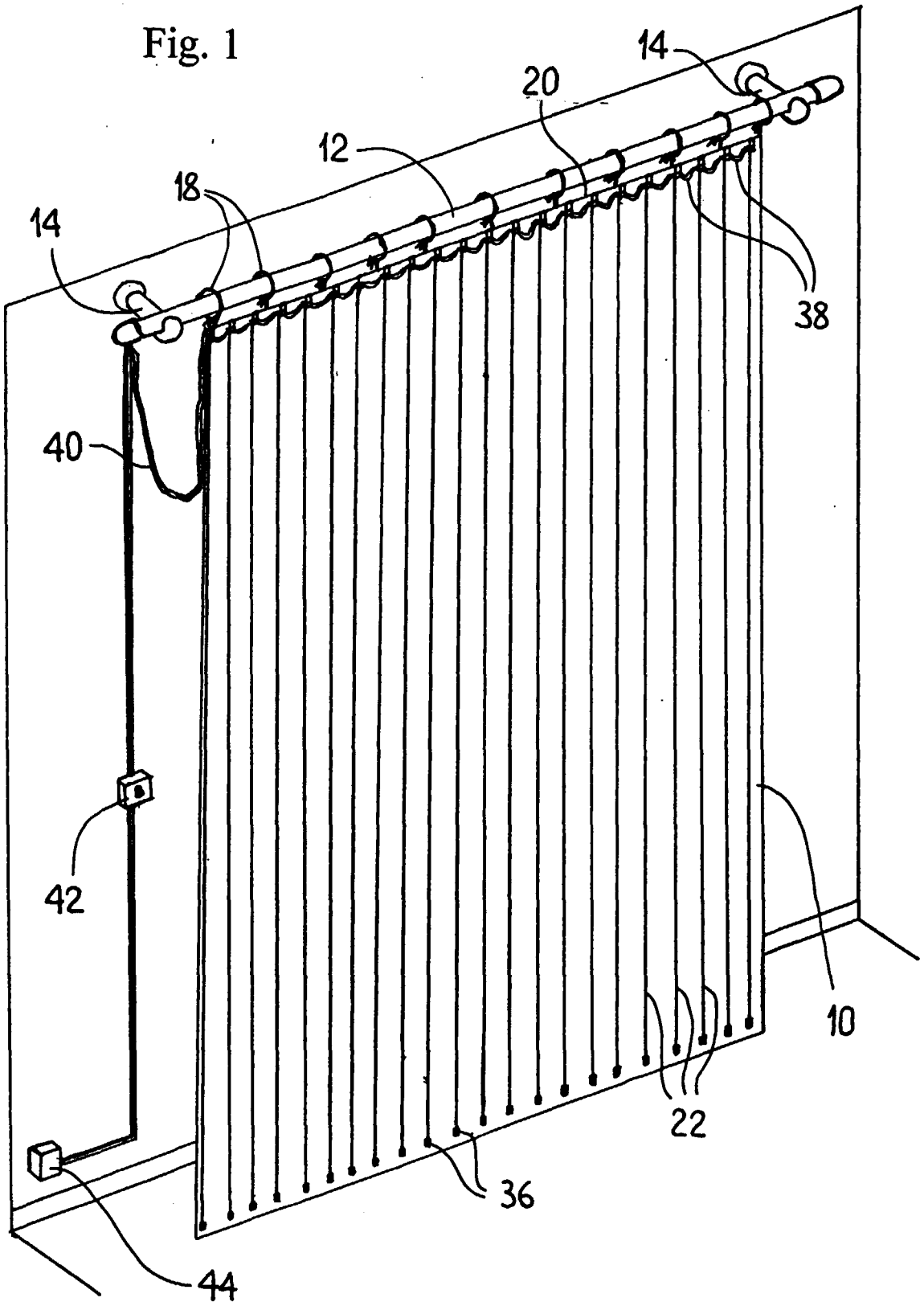


Fig. 2

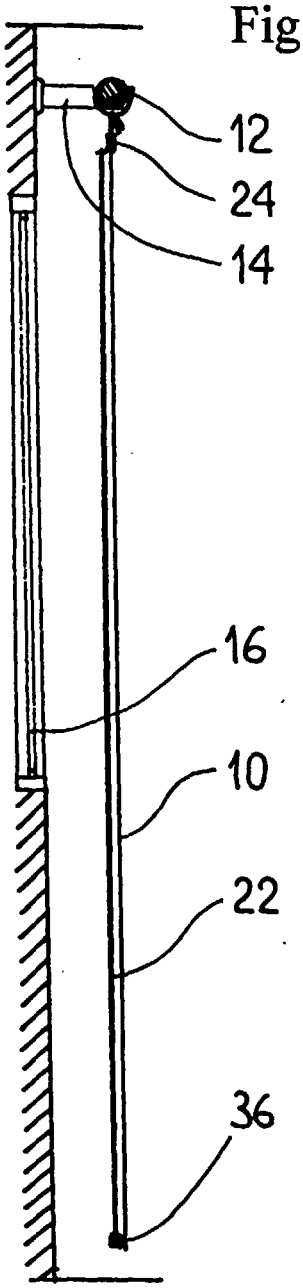


Fig. 3

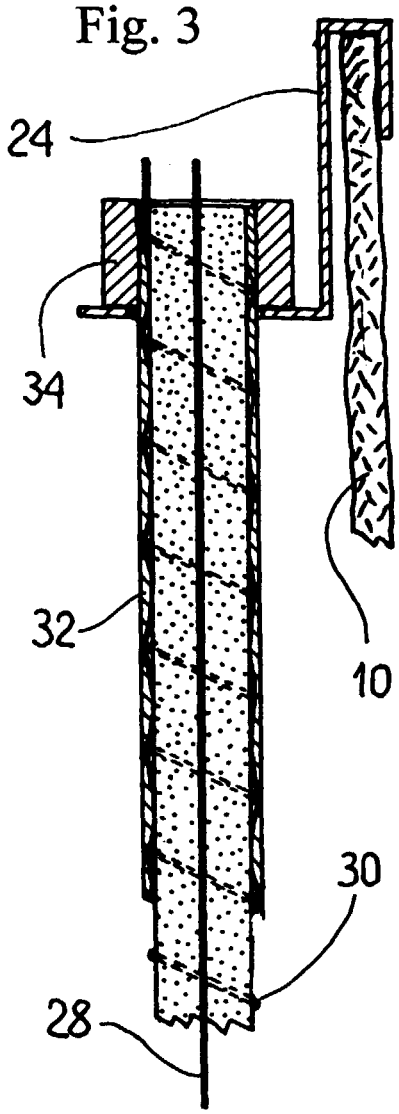
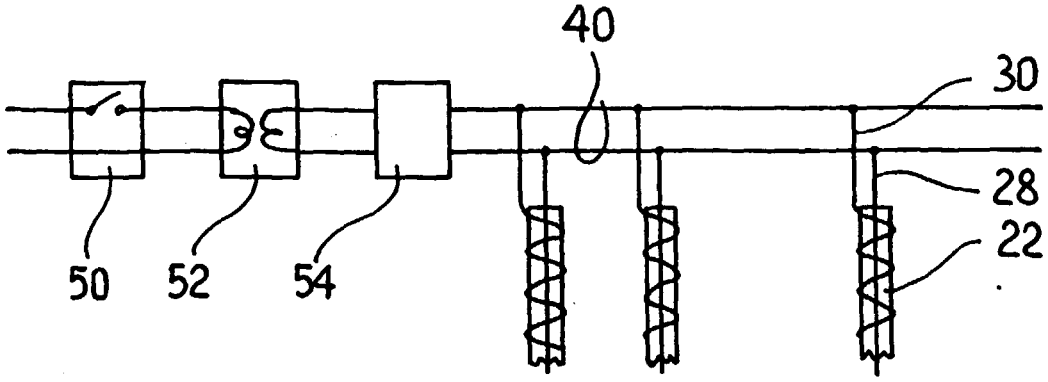


Fig. 4



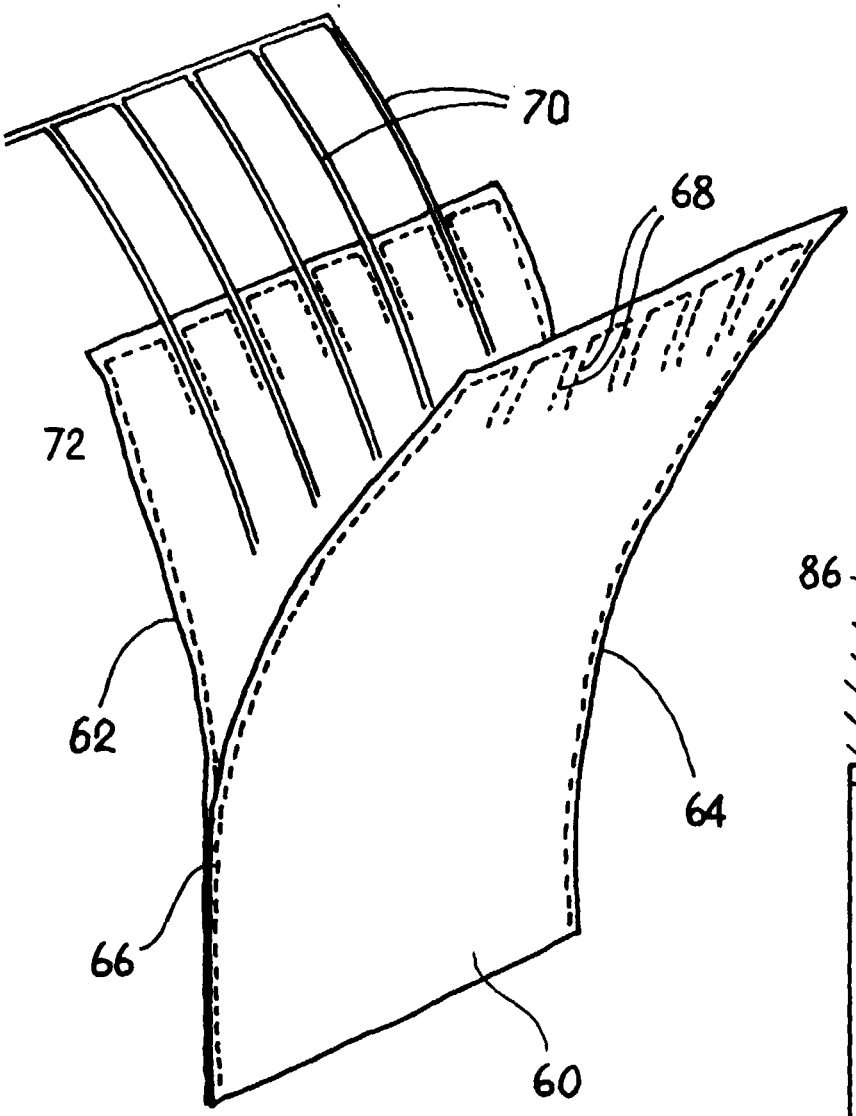


Fig. 5

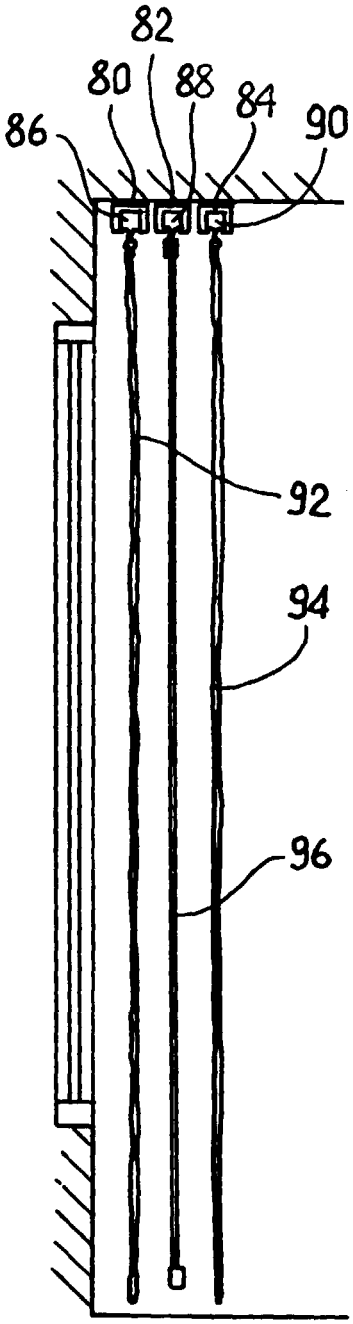


Fig. 6