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(54) **Control device for venetian blinds and curtains.**

(57) An infrared remote control device for Venetian blinds and curtains comprises an inner housing (11) in which two decelerating motors (10, 10') are mounted. One of the decelerating motors (10') includes a long shaft (12') onto which a rope-drawing wheel (26) with a groove (42) is secured. The other motor (10) includes a long shaft (12) onto which a rope-drawing wheel (14) having a groove (22) and a ball chain wheel (18) are disposed. A pair of guide rollers (32) mounted between the decelerating motors (10, 10') are associated with a pair of elongate plates (34) on the lower side thereof. Two pairs of press rollers

(36) are respectively located at the ends of the plates (34) with two springs (38) mounted across the upper and lower parts of the elongate plates (34) such that the press rollers (36) may be forced into the grooves of the rope-drawing wheels to press firmly against the rope-drawing wheels so as to provide a secure pressing against various thicknesses of rope. A circuit board (46) is disposed at the back of the inner housing (11) to handle the signals transmitted to the infrared receiver in order to control the rotary motion of the decelerating motors thereby remotely to operate the Venetian blind or curtain.

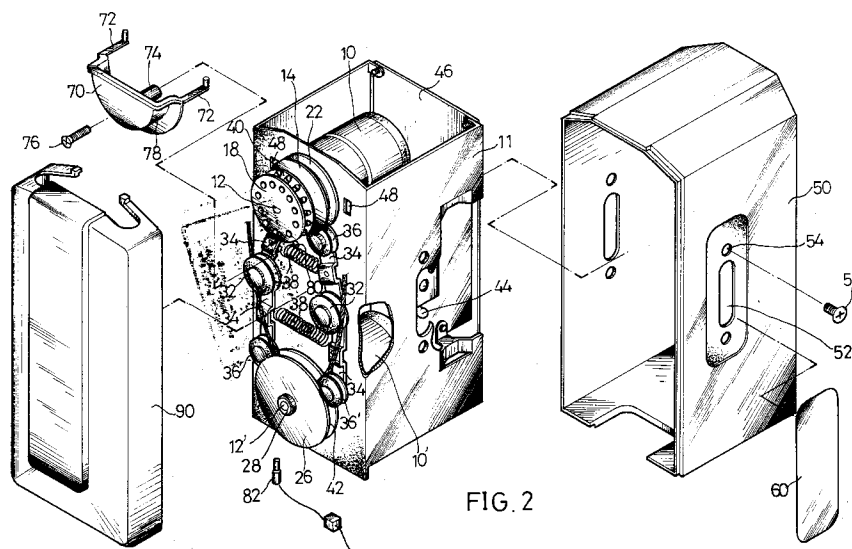


FIG. 2

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The present invention relates to control devices for Venetian blinds and curtains, and more particularly to a remote/manual infrared control device for Venetian blinds and curtains.

Venetian blinds and curtains are usually used to regulate light from outdoors shining into a house. This helps to improve the indoor atmosphere. Their variety, in terms of colour and pattern, provides a good decorative effect. Venetian blinds and curtains have therefore become favoured in the field of modern interior design.

Conventional Venetian blinds and curtains include two pull ropes. One of the pull ropes extends horizontally and pulls the slats or fabric so as to spread across a window or recess. The other rope is a directional pull rope and adjusts the angular position of the slats. Generally, these two pull ropes are controlled by manual operation and it is not difficult for a normal person to draw a blind or curtain by hand. However, it is still an inconvenience for the bedridden, for the elderly and for those who find it difficult to move, more particularly if a window is located at a high level. The associated blind or curtain is then more inconvenient to operate manually.

The present invention is based on overcoming these problems and providing a control device for Venetian blinds and curtains which no longer has the disadvantages described above.

The infrared remote control device is attached to the Venetian blind and curtain to raise or to lower the Venetian blind and to draw the curtain, and to adjust the angular position of the slats either through a remote control or through manual operation which remains as an alternative in the case of power failure.

The main object of the present invention is to provide an infrared remote/manual control device for Venetian blinds or curtains which makes drawing blinds or curtains easy for the elderly and those who are small and weak.

In accordance with the invention there is provided an infrared remote control device for a Venetian blind or curtain, comprising an outer housing, an inner housing, a ball chain wheel, two rope-drawing wheels, four press rollers, two guide rollers, two springs, an infrared remote-controlled emitter and an infrared receiver circuit, the outer housing being fitted on the inner housing whose rear part carries the infrared receiver circuit, and a first decelerating motor secured within the inner housing and having a long shaft onto which one of the rope-drawing wheels is mounted, characterised by

a second decelerating motor having a long shaft carrying the other rope-drawing wheel and the ball chain wheel, the wheels each having a groove, the ball chain wheel having a plurality of holes punched in the lateral sides thereof to receive the

ball chain of a Venetian blind, the rope-drawing wheels being made of a resilient material and having the two guide rollers horizontally disposed therebetween, the guide rollers each having an elongate plate pivotally mounted thereon whose end is provided with a press wheel, and said springs being located between the elongate plates whereby the press rollers are forced into the grooves of the rope-drawing wheels to grip the wheels firmly for various sizes of pull ropes of blind or curtain.

In order that the invention may be fully understood, a preferred embodiment will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is an exploded view of the wheel and the decelerating motor of the control device of the present invention;

Fig. 2 is an exploded view of the control device of the present invention;

Fig. 3 is a view similar to Fig. 2 showing the pull rope of an ordinary curtain getting round the wheel of the device of the present invention;

Fig. 4 is a view similar to Fig. 3 showing the ball chain of an ordinary Venetian blind getting round the ball chain wheel of the device of the present invention;

Fig. 5 is a simplified drawing of the device of the present invention installed with a Venetian blind; and

Fig. 6 is a similar drawing, showing the device of the present invention installed with a curtain.

As illustrated in Figs. 1 and 2, a first decelerating motor 10' includes at its top a long shaft 12' whose end is semi-circular in shape. A rope-drawing wheel 26 has an annular groove 42 in the rim and a semi-circular hole 28 at the centre which is a fit with the long shaft 12'.

A second decelerating motor 10 includes at its top a long shaft 12 whose end is semi-circular in shape. A rope drawing wheel 14 has an annular groove 22 in the rim and a semi-circular hole 16 at the centre which is a fit with the long shaft 12. A ball chain wheel 18 has an annular groove 40 in the rim and a semi-circular hole 20 at the centre which is a fit on the end of the shaft 12, superimposed on the rope-drawing wheel 14. A plurality of holes 24 are punched in the two lateral sides of the ball chain wheel 18. When the decelerating motor 10 is in motion the rope-drawing wheel and the ball chain wheel are simultaneously driven. The second decelerating motor 10 is specially designed such that the slats of a Venetian blind will turn at a suitable speed and manual operation is also possible in case of power failure.

The decelerating motors 10 and 10' are disposed in an inner housing 11. The rope-drawing wheel 14 and the ball chain wheel 18 are mounted

on the long shaft 12 of the second decelerating motor 10 respectively, whereas the rope-drawing wheel 26 is installed on the shaft 12' of the first decelerating motor 10'.

A pair of guide rollers 32 mounted side by side between the decelerating motors 10 and 10' are associated with a pair of elongate plates 34 on the lower side thereof, defining a pivot mechanism. Four press rollers 36 are respectively located at the ends of the plates 34 near the rope-drawing wheels 14 and 26, with two springs 38 respectively mounted across the upper part and lower part of the elongate plates such that the press rollers 36 may be forced into the grooves 42 and 22 of the rope-drawing wheels 26 and 14 respectively, to press firmly against the rope-drawing wheels. The press rollers 36 are made of resilient material so as to provide a secure pressing against various thicknesses of the rope of a curtain or the ball chain of a Venetian blind.

An infrared receiver 44 receives signals from an infrared remote emitter. A circuit board 46 is disposed at the back of the inner housing 11 to handle the signals transmitted to the infrared receiver 44 in order to control the rotary motion of the decelerating motors 10 and 10' and thereby remotely operate the Venetian blind or curtain.

An outer housing 50 tightly accommodates the inner housing 11 described above and includes two bolt holes 54 and an indicator opening 52 which permits the infrared receiver 44 to receive the signals transmitted from the infrared remote emitter. The outer and inner housings 50 and 11 can be firmly engaged by screwing bolts 56 into the bolt holes 54.

A transparent protective pad 60 is stuck onto the indicator opening 52 after the assembly of the inner and outer housings 11 and 50. It is used to protect the infrared receiver 44 and filter out any light interference, as well as covering the bolt holes 54.

A semi-circular slip-proof cover 70 has an L-shaped foot 72 on each side thereof which are inserted into mounting slots 48 in the inner housing 11. A hollow post 74 is disposed at the centre of the cover 70 to allow a screw 76 to be screwed into the hollow post 74 and secure the cover 70 onto the inner housing 11 through the bolt hole 80. The flange 78 of the cover 70 is then closely pressed onto the outer circumference of the ball chain wheel 18 to prevent the ball chain of the Venetian blind from slipping out from the wheel 18.

Referring now to Figs. 2 and 3, the device of the present invention is shown installed with a curtain. As illustrated in Fig. 3, the press rollers 36' are moved aside, and the curtain rope 86 is caught in the groove 22 of the rope-drawing wheel 14. On the other side, the press rollers 36 are moved

aside and the lace curtain rope 84 is caught in the groove 42 of the rope-drawing wheel 26. The rope is pressed under the press rollers and the cloth curtain rope 84 is wound across the two guide rollers 32 respectively. The rest of the length of the ropes is left free or fastened onto a window frame. The device is supplied with power through a plug 82.

Referring now to Fig. 4 as well as Fig. 2, the device of the present invention is shown provided on a Venetian blind (see Fig. 5). Firstly, a ball chain 88 is led into the groove 40 of the ball chain wheel 18. The slip-proof cover 70 is then engaged onto the inner housing 11 and the press rollers are moved sideways to let the rope 84 of the blind into the groove 42 of the rope-drawing wheel 26. The rope is then firmly pressed under the two press rollers and is wound round the guide rollers 32.

The control device can be secured suitably anywhere on the door frame, mounted on an ordinary Venetian blind or a curtain with pull rope, ball chain 88, then covered with a lid 90 to form an integrated unit. Rotation of the ball chain wheel 18 and rope-drawing wheels 14 and 26 is controlled by pressing the press button of a remote control device to draw the ball chain 88 of a blind (to regulate the angles of the slats) and ropes 84, 86 (to raise or lower the blind or draw a curtain) so as to accomplish the aim of remote control. In the case of power failure, the ball chain wheel and the rope-drawing wheels can be operated manually.

Claims

1. An infrared remote control device for a Venetian blind or curtain, comprising an outer housing, an inner housing, a ball chain wheel, two rope-drawing wheels, four press rollers, two guide rollers, two springs, an infrared remote-controlled emitter and an infrared receiver circuit, the outer housing being fitted on the inner housing whose rear part carries the infrared receiver circuit, and a first decelerating motor secured within the inner housing and having a long shaft onto which one of the rope-drawing wheels is mounted, characterised by

a second decelerating motor having a long shaft carrying the other rope-drawing wheel and the ball chain wheel, the wheels each having a groove, the ball chain wheel having a plurality of holes punched in the lateral sides thereof to receive the ball chain of a Venetian blind, the rope-drawing wheels being made of a resilient material and having the two guide rollers horizontally disposed therebetween, the guide rollers each having an elongate plate pivotally mounted thereon whose end is provided with a press wheel, and said springs

being located between the elongate plates whereby the press rollers are forced into the grooves of the rope-drawing wheels to grip the wheels firmly for various sizes of pull ropes of blind or curtain.

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2. A remote control device as claimed in claim 1, characterised in that the long shafts of the decelerating motors each have a semi-circular post onto which the ball chain wheel and said one rope-drawing wheel are mounted respectively, the ball chain wheel and said one rope-drawing wheel respectively controlling the blind and the curtain.

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3. A remote control device as claimed in claim 1 or 2, characterised in that the ball chain wheel is fitted with a slip-proof cover which is semi-circular in shape, having at each corner an L-shaped foot to fit into mounting slots in the inner housing, and having at the centre a hollow post to be secured to the inner housing, the slip-proof cover also having a flange which is forced to press firmly against the circumference of the ball chain to prevent the ball chain from slipping out of the groove.

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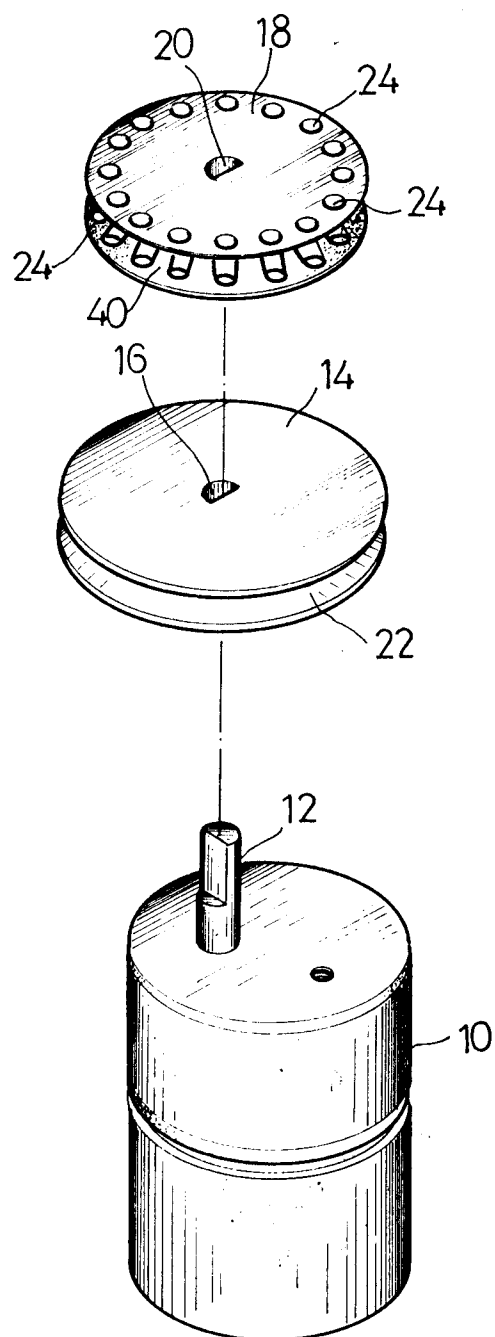


FIG. 1

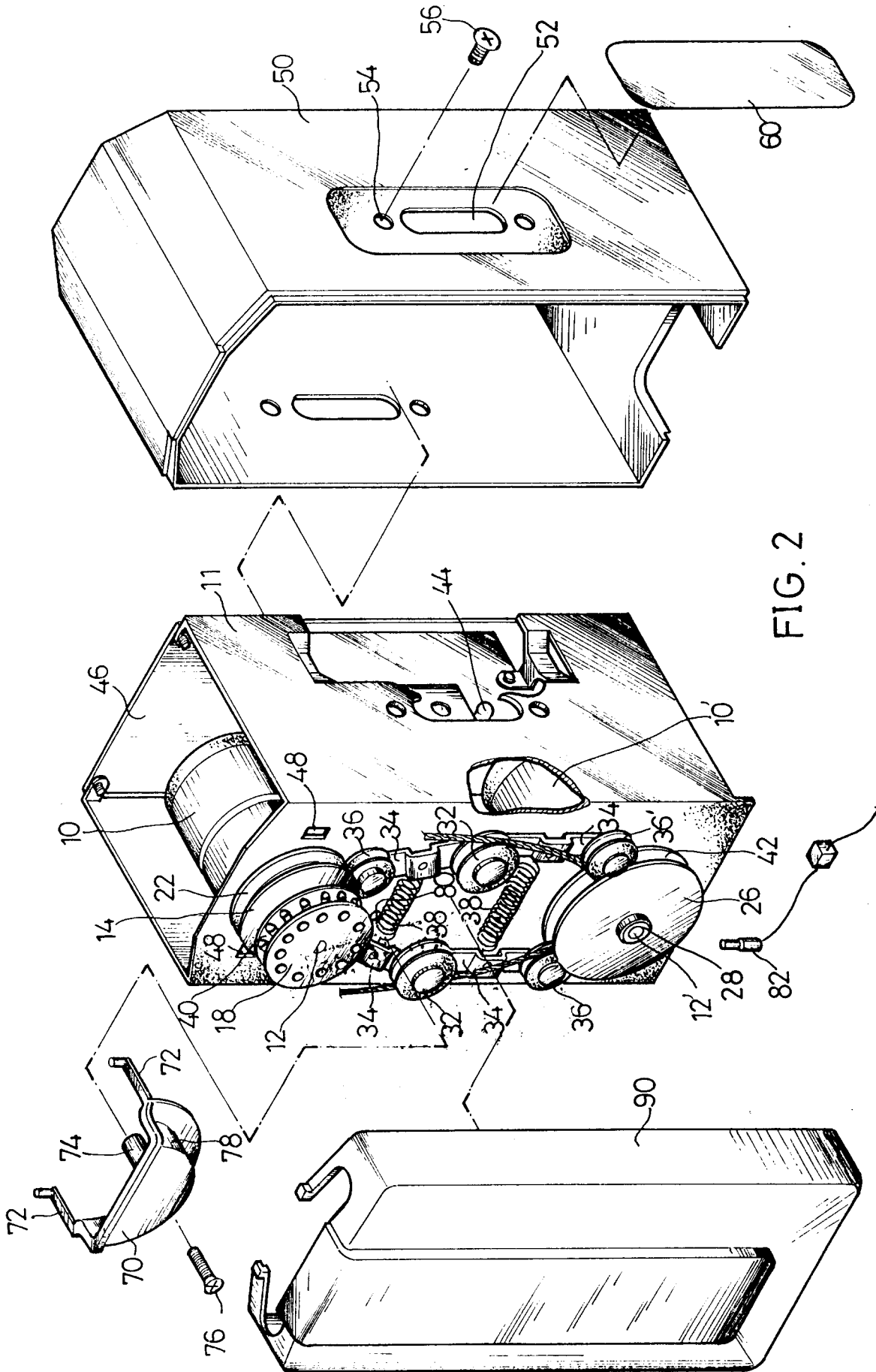


FIG. 2

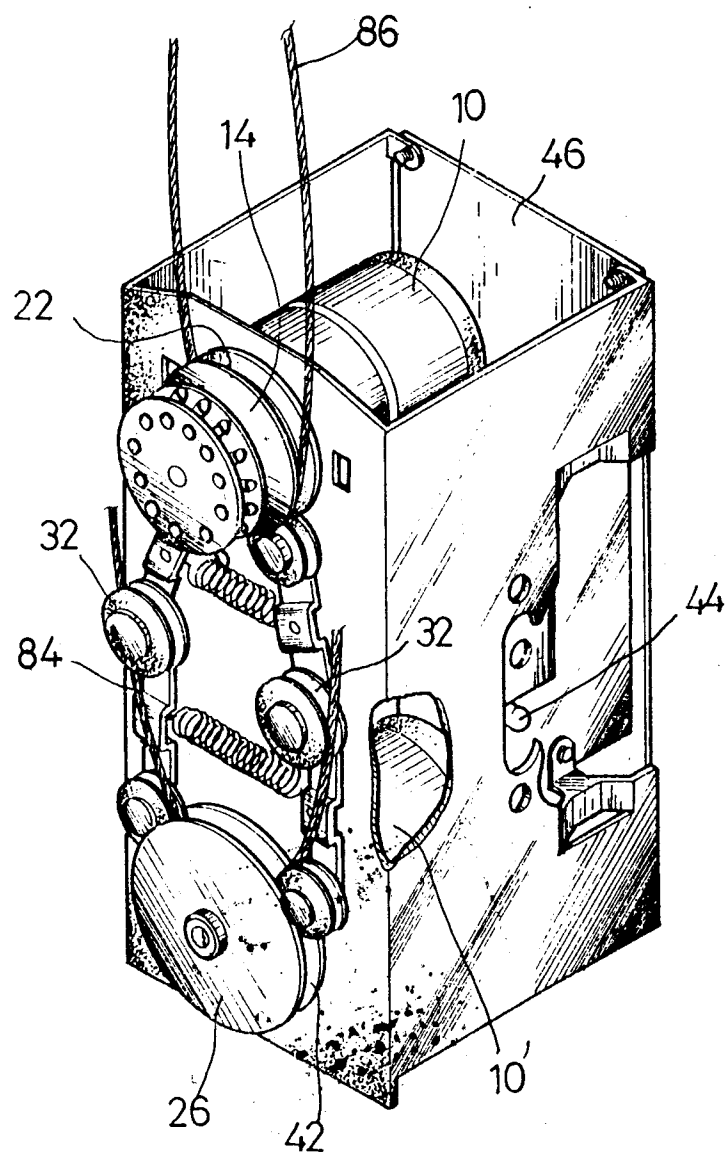


FIG. 3

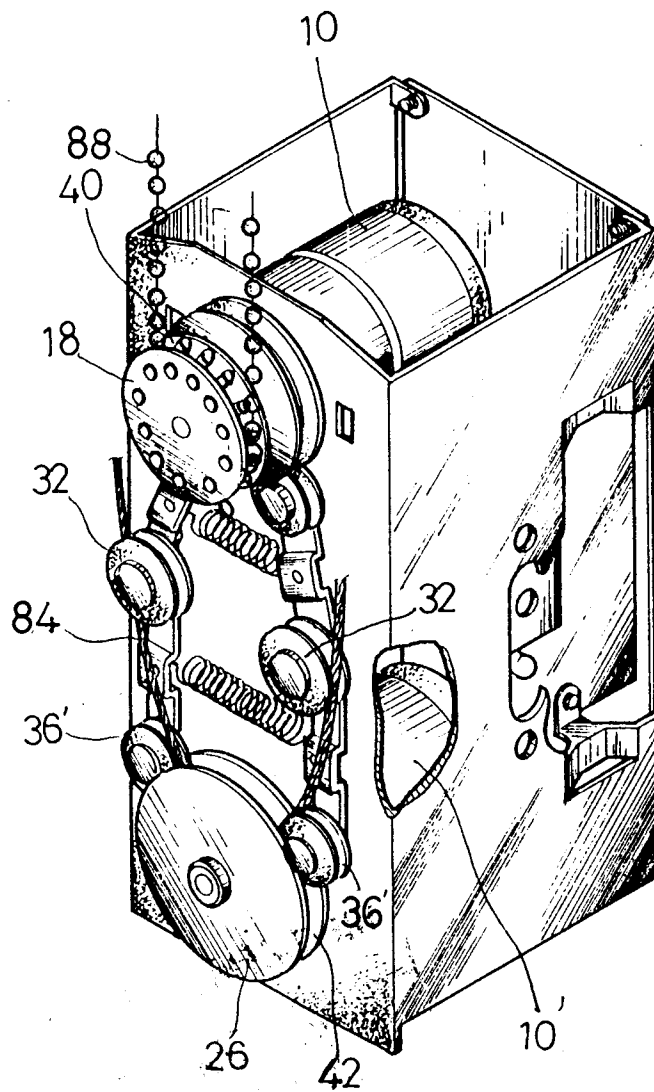


FIG. 4

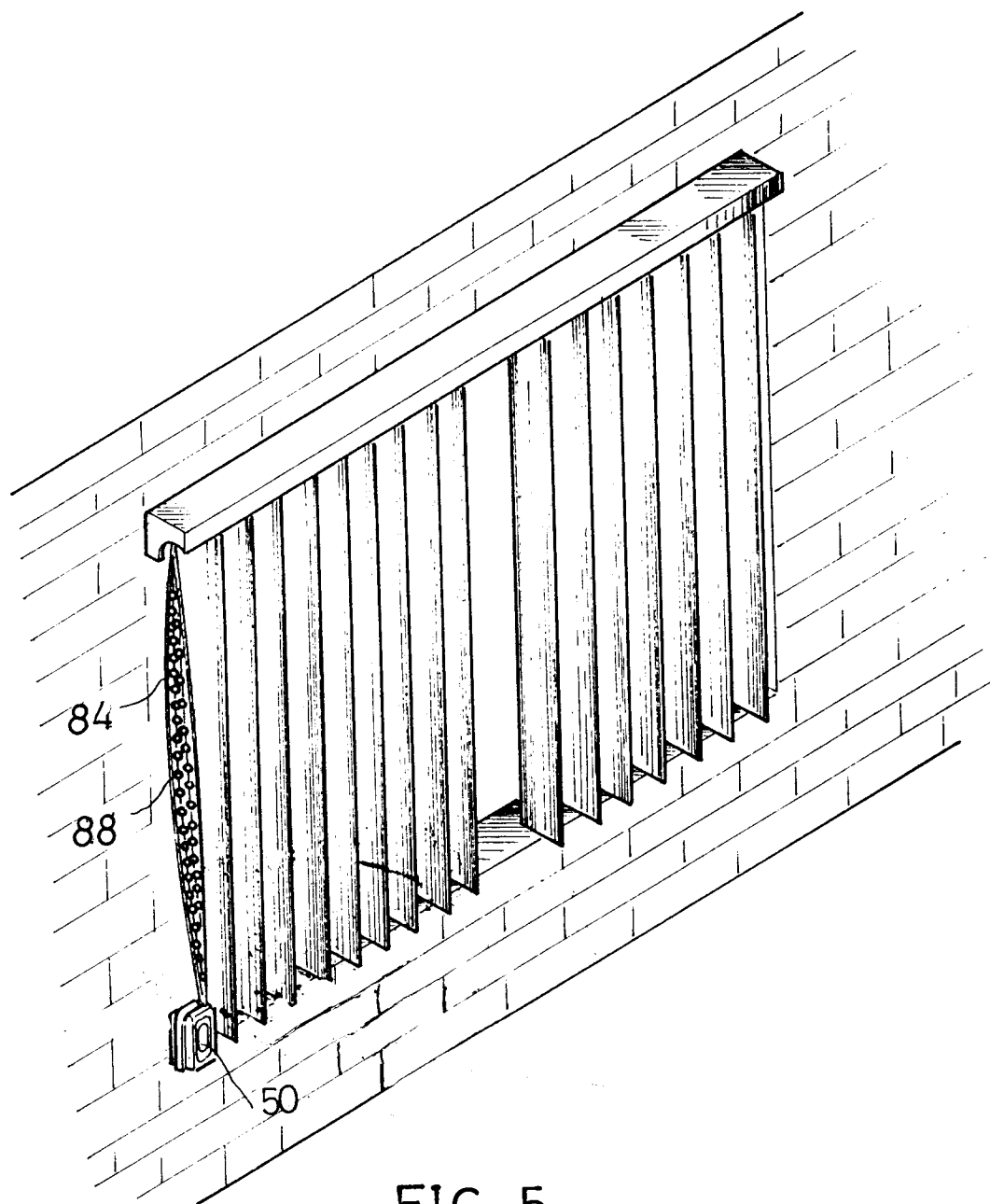


FIG. 5

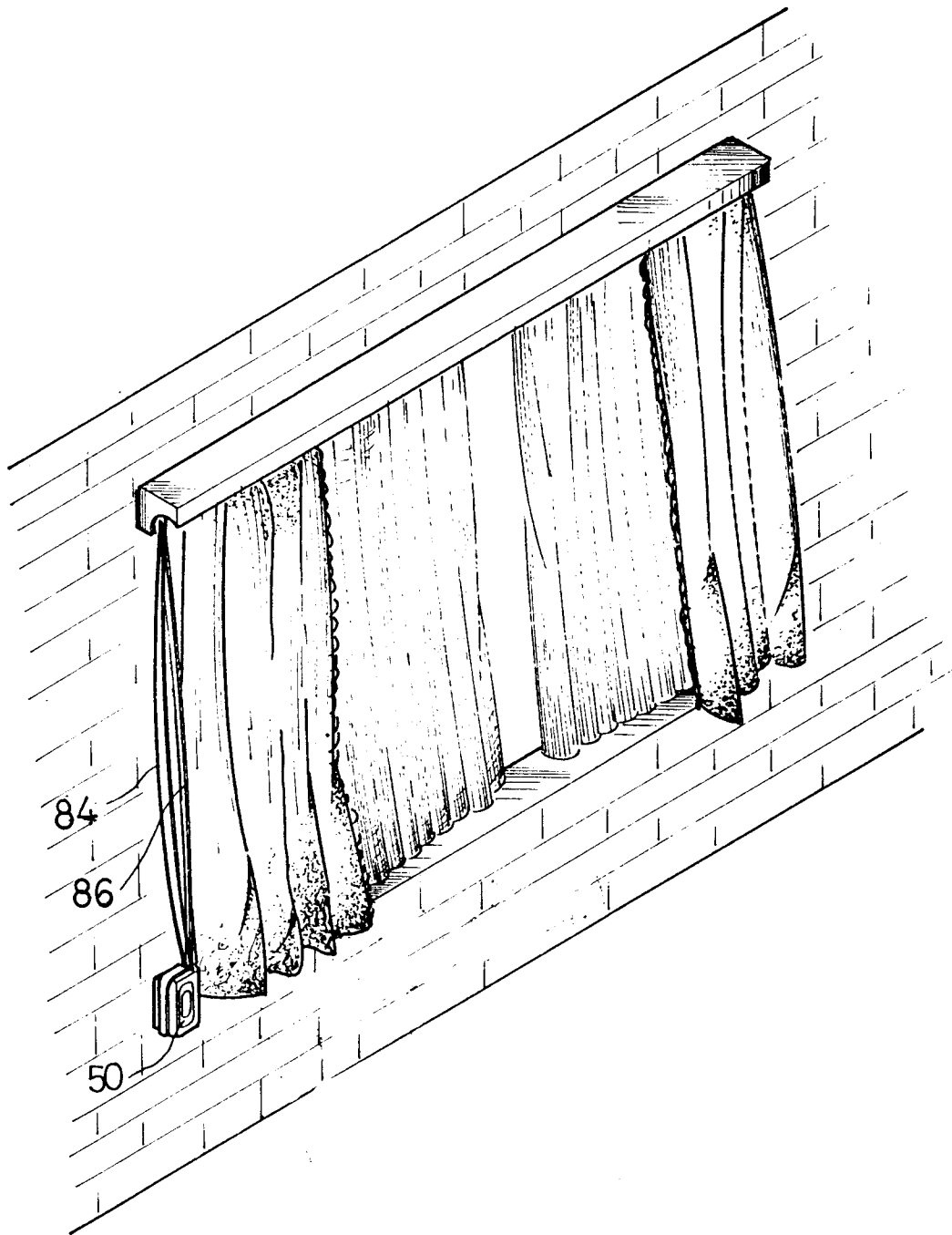


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number

EP 90 31 1604

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 956 588 (NIEN MING) * the whole document * - - -	1-3	E 06 B 9/32 E 06 B 9/36
A	US-A-4 914 360 (HSIEH ET AL.) * the whole document * - - -	1-3	
A	EP-A-0 298 217 (RADEMACHER) * column 3, line 51 - column 4, line 43; figures 1B-1C * * figures 2,3,5 * - - -	1-3	
A	FR-A-2 541 104 (ANDRESY) * page 3, line 10 - line 23 * * page 4, line 5 - line 25 * * page 5, line 28 - page 6, line 5; figures 1,5 * - - - - -	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 06 B A 47 H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 07 June 91	Examiner KUKIDIS S.
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