

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: 83303712.0

(51) Int. Cl.³: E 06 B 9/36

(22) Date of filing: 28.06.83

(30) Priority: 29.06.82 IT 1772282

(43) Date of publication of application:
11.01.84 Bulletin 84/2

(84) Designated Contracting States:
BE DE FR IT NL

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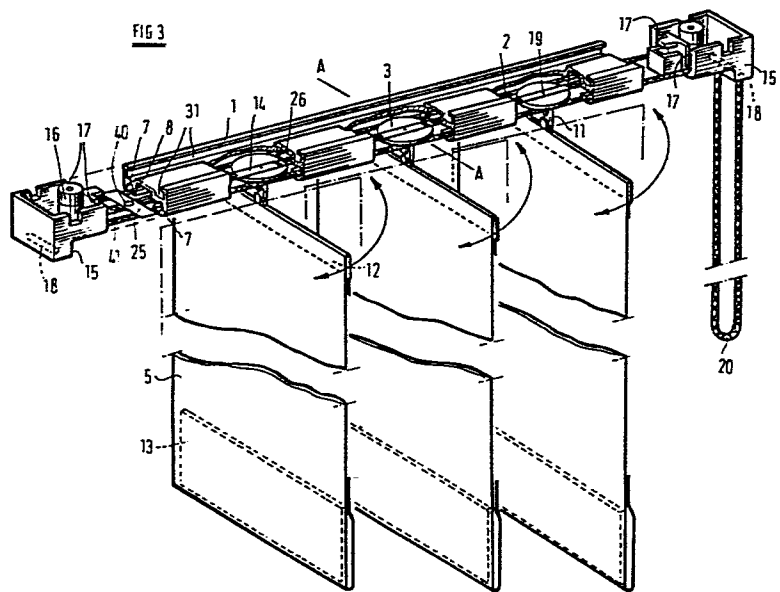
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(54) **Apparatus for suspending vertical blinds.**

(57) A vertical blind system comprises a rail (1) having two outer channels (7) and a centre channel (8). The rail ends are closed by pulley blocks (15). An endless draw cord (2) runs along channels (7) round one pulley (16) and out through the opposite pulley block to form a loop (20). Vertical blinds (5) are suspended from small discs (3) that extend across the rail (1) into the outer channels (7) and rest on both runs of the draw cord (2). Frictional contact between the cords (2) and discs (3) is increased by a weight carried by each blind (5) and by serrating the under surface (30) of the discs (3). A master slider (25) linked to one end of disc (3) extends across the rail (1) and is non-slidably attached to one run of the draw cord (2). The disc (3) are preferably linked by flat strips (14) and are attached thereto by a pivot pin (19) for rotation about a vertical axis. Each strip (14) contains a lengthwise slot (26) which is engaged by a cranked T-element (30) of an adjacent strip for movement along the slot (26). To draw back the blinds the master slider (25) under the action of draw cord (2) causes the discs (3) to move successively into contact causing the blinds (5) to gather at one side of the window, the strips (14) sliding one beneath the other. To move the blinds (5) in the reverse direction the master slider (25) pulls its attached disc (3), successive discs (3) being pulled by linking strips (14) when the T-element (30) of one strip (14) reaches the end of the slot (26) with which it is engaged.

Rotation of the discs is achieved by pulling the appropriate side of loop (20) of draw cord (2), the frictional engagement between the disc and the draw cords causing the discs (3) and associated blinds (5) to rotate.

FIG 3



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TITLE:

"APPARATUS FOR SUSPENDING VERTICAL BLINDS"

The present invention relates to a device for rotation of vertical blind strip and for moving the
5 said blinds along a horizontal rail member.

It is known to suspend vertical blinds, carried on slidable blind supports from a horizontal rail and to move the blinds along the rail by means of an endless cord operated from one end of the rail by a hanging
10 loop. The cord passes round a pulley, at the opposite end of the rail and one run is connected to a lead slider supported situated furthest away from the looped end. Adjacent blind supports are connected by sections of chain or cord of equal length such that
15 each support will pull an adjacent support in a direction away from the operating end to draw the blinds across a window. The blinds are withdrawn across the window by the lead slider causing adjacent supports to close up one against the other.

20 In order that the blinds may be rotated about a vertical axis, for example between a position at right angles to the window and position substantially parallel to the window, the supports are frequently provided with gear wheels operated by a rod at the operating
25 end of the rail.

The known devices are consequently generally complicated bulky and expensive to install.

It has been proposed in British Patent Publication No. 2.077.828A to simplify the arrangement by supporting
30 each blind on a vertical disc having convex lower face. Opposite ends of a diameter of the said face resting on a respective parallel run of the draw cord. Rotation of the blinds is achieved through frictional contact between the edge portions of the convex surface and the draw cord. In order for sufficient
35 frictional force to be available it is necessary that

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the discs have large diameter and in order for the blinds to be brought together at one end of the rail the discs are required to overlap each other.

The present invention overcomes the bulky nature of known systems and the need for sliding support discs to overlap by utilising support disc elements which are relatively small in diameter and which have flat lower surfaces that engage on, and make frictional contact with, opposite runs of the draw cord, the surface of the discs providing sufficient friction to allow the discs to be rotated when one cord is pulled. Because the discs are of small diameter it is not necessary that they be stacked, i.e. overlap, when the blinds are withdrawn.

15 A further disadvantage of known systems lies in the use of a chain or cord joining adjacent support members. Because the chain or cord is flexible it loops when the blinds are withdrawn to one side and may cause jamming by becoming locked between the blind support member and the rail.

From another aspect therefore the invention provides an improved form of device for linking adjacent blinds which comprises an elongate member of a rigid material having a closed slot extending lengthwise to a first end portion thereof, a second non-slotted end portion, a locating means formed at said second end portion and capable of slidably engaging within the slot of an adjacent member, a said disc element being positioned, for rotational movement about a vertical axis, at said second end portion and between said locating means and an end of said slot whereby, when the blinds are together, the locating means of one member slides along the slot of an adjacent member causing the said first member to slide along the slot of an adjacent member until it is in engagement with the opposite end of the said slot causing the one

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said member to slide over the adjacent said member and to allow the support discs to close one against the other; when the blinds are drawn in the opposite direction, the said first member slides to
5 the opposite end of the slot in the said second member whereafter it causes the said member and associated disc element and blind to move in the same direction.

The said locating means is preferably in the form of a T-shaped section having a cranked stem of smaller
10 diameter than the slot of an adjacent member whereby the stem is enabled to move along the said slot.

The invention will now be more fully described with reference to the accompanying drawings in which:

Figure 1 is a part sectional perspective representation of one apparatus according to the present
15 invention;

Figure 2 is an exploded representation of a blind and an associated support member of figure 1;

Figure 3 is a part sectional perspective
20 representation of a preferred apparatus according to the present invention;

Figure 4 is a section through A-A of figure 3 ;

Figure 5 is a section through B-B of figure 4 ;

Figure 6 is a diagrammatic representation of a
25 portion of the blind carrying discs and linking members of figure 4;

Figure 7 is a diagrammatic representation of one linking member and associated support disc of figure 5 viewed from the other side.

30 Referring to figures 1 and 2 of the drawings. A rail 1, formed from extruded aluminium and having a width of 30mm, comprises front and rear C-shaped channels 7 and a centre channel 8. Each end of the rail is closed by a block 15 that includes a pulley
35 16 (or other bearing surface) inlet and exit slots 17 aligned with channels 7 and a transverse slot 18 formed in the lower surface of the block 15.

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An endless draw cord 2 extends from the right hand end of the rail along channels 7, through slots 17 and round pulleys 16, of the left hand pulley block, back along the rail through slots 17 in the right hand pulley block and out through slot 18 to form a downwardly extending loop 20.

Vertical blind carrying discs 3, formed of nylon and having a diameter of 24mm, are located within the rail and extend across the rail into each channel 7 to rest upon both runs of draw cord 2. The lower surfaces 30 of discs 3 are serrated to improve the grip between the draw cords and the discs (Fig. 7).

Vertical blind strip 15 is carried by hangers 11 attached to reinforcing plates 12 at the top edge of the said blinds. the said hangers 11 being non-rotatably attached to the under side of discs 3. Weights 13 are contained in pockets formed at the lowermost ends of blinds 15 to improve frictional contact between the underside of the discs 3 and the draw cords 2 on which the discs rest.

Adjacent discs 3 are linked by a chain member 4 attached to spacer 10 which locates on upwardly directed pegs 9 mounted on support discs 3 and which move along centre channel 8. Spacers 10 permit rotation of the said discs without concomitant rotation of the chains. The length of the chain between spacers determines the maximum distance apart of the blinds when drawn across a window. A master slider (shown at 25 in figure 3) extends across the rail into each channel 7 and is attached to a free end of a chain 4. One side of slider 25 is non-slidably located on one run of draw cord 2 for movement therewith and the opposite side rests on the other run of draw cord 2.

Movement of slider 25 in the direction right to left in figure 1. effected by pulling on the left hand cord in loop 20. causes the blinds to move across

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the window. Movement of the slider in direction left to right in figure 1, effected by pulling the right hand cord in loop 20, causes the slider first to move against the left hand disc 3 and then to move the said disc 3 along the rail against the adjacent disc and so on until the blinds have been withdrawn to the right hand end of the rail. Because the discs are of a small diameter the blinds can be maintained in the withdrawn condition without need for overlapping.

10 The initial pull on the right or left hand cords in loop 20 results in all discs 3 being rotated in a clockwise or anti-clockwise direction respectively until adjacent blinds contact each other thus preventing further rotation. continued pulling then
15 results in the slider and the supports being moved as previously described.

In the preferred embodiment of the invention illustrated in figures 3 to 7, chain 4 of figures 1 and 2 is replaced by disc linking members 14 consisting of a thin strip element 24, formed of brass, and containing a closed lengthwise slot 26 extending to end 27. End 28 of element 24 contains an unslotted portion to the underside of which is pivotally attached, through pin 19, a disc 3 for free rotation about a
25 vertical axis. The centre of disc 3 lies 13mm from the end of slot 26.

End 28 of element 24 contains cut out portions 29 forming a T section 30 the stem 31 of the T terminating 13mm from the centre of disc 3. Stem 31 is cranked and has a
30 width dimension smaller than slot 26 in element 14 thereby enabling the cross head of T section 30 to be inserted through slot 26 of an adjacent member and the members to link together and lie flat in substantially the same horizontal plane.

35 In this embodiment master slider 25, as shown in figure 6, is slidably located on a link member 24 by pin 40 and washer 41 whereby the slider is enabled

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to move along slot 26. The length of slot 26 in the member 14 carrying the master slider 25. is arranged such that the movement of the slider from one end of the slot to the other under the influence of a draw cord allows the blinds carried by the discs to be rotated through approximately 360° through frictional contact of the cords on the underside of the discs.

The linking member 14 may of course be formed of a material other than brass. e.g. of a plastics material. similarly the discs may be formed from materials such as neoprene and the track of an extruded plastics material such as PVC.

With the blinds in the position shown in figure 3, i.e. transverse of the rail, pulling the right hand end of loop 20 will cause discs 3 and associated blinds 5 to rotate in an anticlockwise direction until adjacent blinds contact each other and prevent further rotation. At the same time master slider 25 will slide along slot 26 in the linking member 14 until it reaches the end of the slot at which point it will contact the disc attached to the linking member. Further pulling on the cord will result in the disc being moved along the rail and the first member to slide beneath the adjacent member to which it is linked until the first disc contacts the next disc in line. This next disc will then be caused to move along the rail and its linking member will slide beneath the next adjacent member. The operation will then be continued until all of the discs and associated blinds have been moved to one end of the rail. A pull on the left hand cord in loop 20 will then cause the discs and blinds to rotate in a clockwise direction into a desired position.

When the blinds are to be drawn across a window from the last mentioned position, the left hand cord of loop 20 is pulled. Initially the discs and blinds

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are caused to rotate in a clockwise direction until adjacent blinds contact each other and prevent further rotation. At the same time the master slider 25 is pulled along the rail away from the adjacent 5 disc. When the locating means of the slider linking member reaches the end of the slot in its adjacent member it will pull that member and associated disc and blind across the window. The process will then be repeated until the discs and blinds have been drawn 10 as far as required. A pull on the right hand cord will then cause the blinds to rotate into any desired position, e.g. into a position transverse to the rail.

Since the linking members 14 are able to slide one beneath the other there is an absence of jamming 15 and the blinds can be moved smoothly backwards and forwards across a window.

The arrangement of the present invention is compact and simple to erect and operate.

The rail may be attached to a suitable surface by means of appropriately designed brackets (not shown) 20 that engage in grooves 31 formed in the upper face of rail 1.

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CLAIMS:

1. A vertical blind system comprising a rail (1); means (3) carrying a vertical blind (5) for movement along the rail (1) and for pivotal movement about a vertical axis; means to rotate said blind about said vertical axis. means (4,14) linking adjacent blinds whereby the maximum distance apart of said blinds is fixed and movement of one blind (5) along the rail (1) in one direction pulls an adjacent blind in the same direction; a draw cord (2) looped along the length of the rail (1); a master slider (25) attached to free end of a said linking means (4,14) and one run of a loop of said draw cords (2), whereby the slider (25) carrying means (3) and blinds (5) can be caused to move along the rail (1) by the action of said draw cord (2); characterised in that the means carrying each said blind comprises a small disc element (3) to which a blind (5) is non-rotatably attached, having a planar lower surface, said surface being in frictional contact with both runs of the draw cord (2), whereby initial movement of the draw cord (2) causes said disc elements (3) and associated blinds (5) to rotate about a vertical axis.
2. A vertical blind system according to claim 1 wherein the planar lower face of each said disc element (3) is serrated.
3. A vertical blind system according to claim 1 or claim 2 characterised in that the means (4,14) linking adjacent blinds comprises an elongate member (24) of rigid material having a closed slot (26) extending lengthwise to a first end portion (27) thereof, a non-slotted second end portion (28) and a locating means (30) formed at said second portion (28) and capable of slidably engaging within the slot (26) of an adjacent member (4). a said disc element (3) being positioned for rotational movement about a vertical

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axis. at said second end (28) between said locating means (30) and an end of said slot (26). whereby when the blinds (5) are drawn together the locating means (30) of one member (24) slides along the slot (26) of an adjacent member (24) until it is in engagement with the opposite end of the said slot (26) causing the one said member (24) to slide over the adjacent said member (24) and to allow the carrying disc elements (3) to close one against the other and when the blinds are drawn in the opposite direction, the said first member (24) slides to the opposite end of the slot (26) in the said second member (14) whereafter it causes the said member and associated disc element (3) and blind (5) to move in the same direction.

4. A device according to claim 3 wherein the master slider (25) is located at said second end (28) of a said linking member (24), the length of the slot (26) in said member being sufficient to allow rotational movement of the blinds (5) through approximately 360° during movement of the said master slider (25) from one end of the slot (26) to the other under the influence of the said draw cords (2).

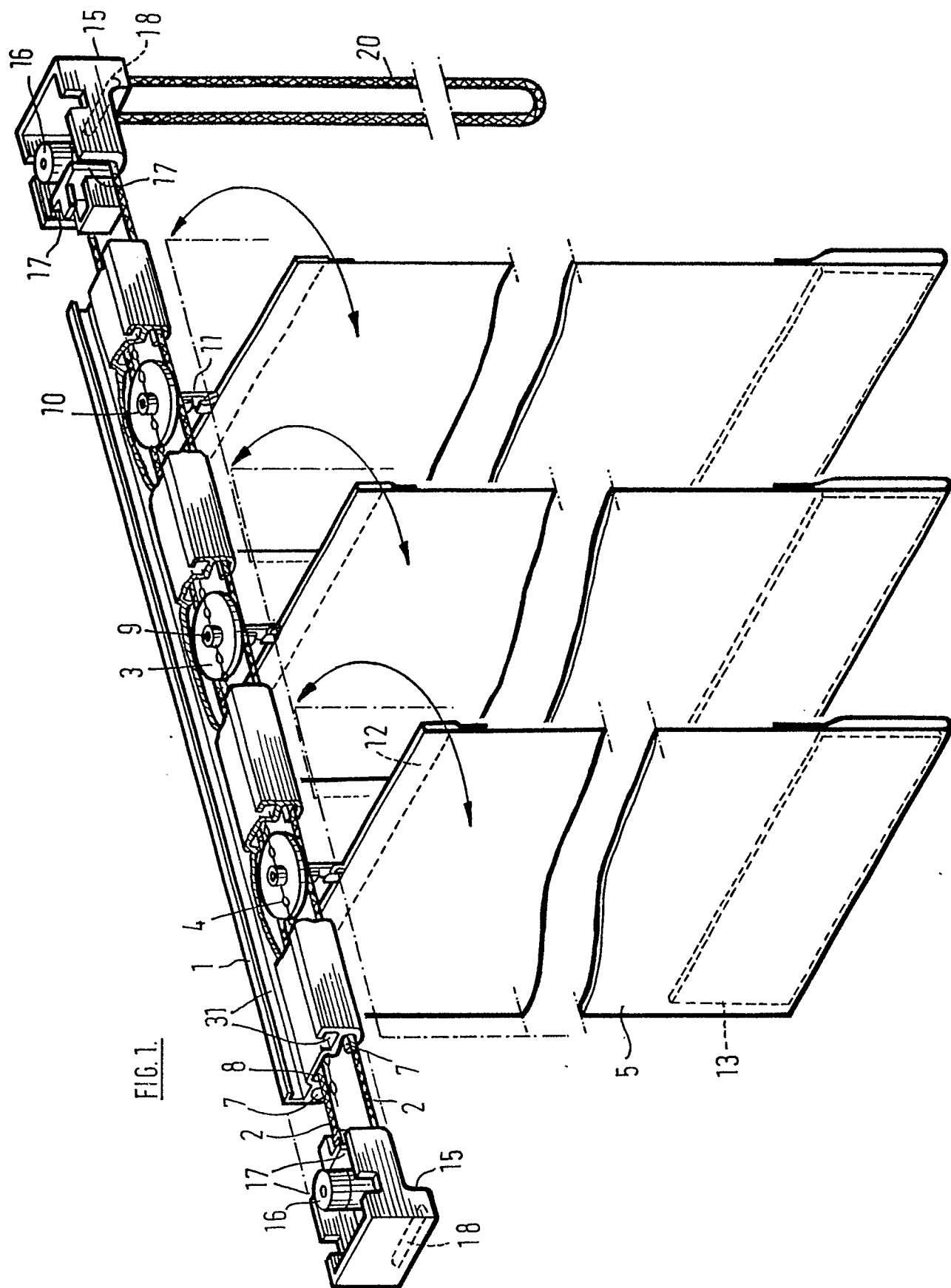


FIG. 1.

FIG. 2.

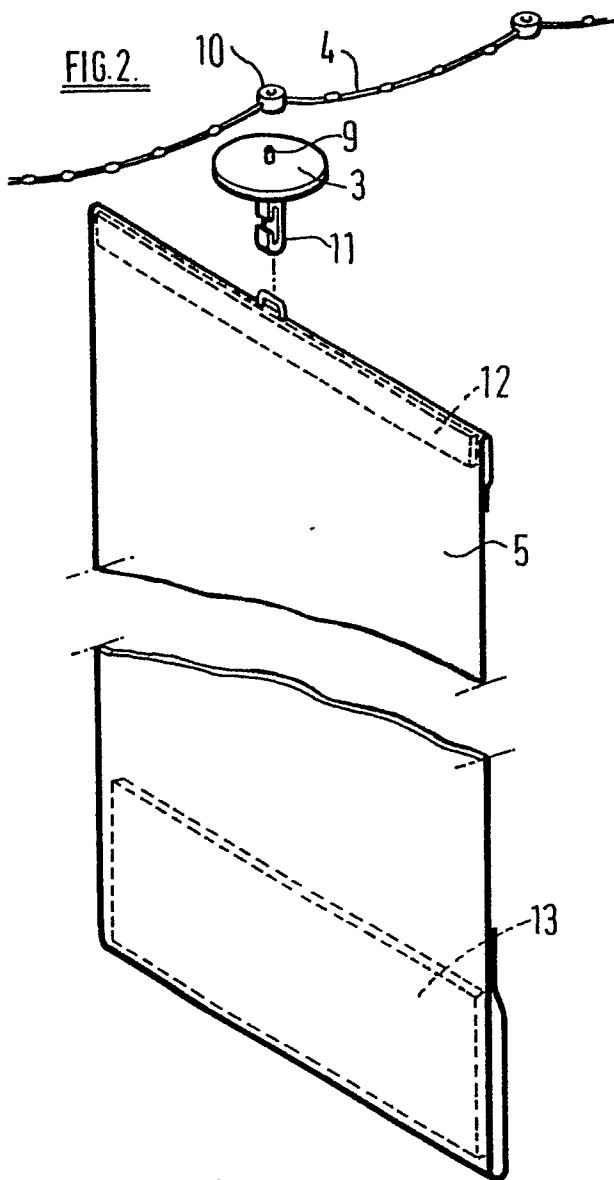


FIG. 4.

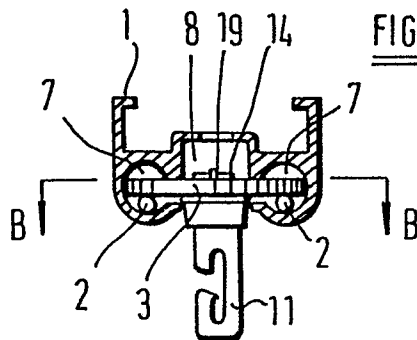


FIG. 5.

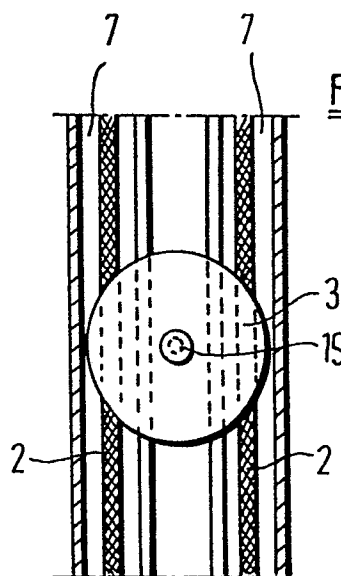


FIG. 6.

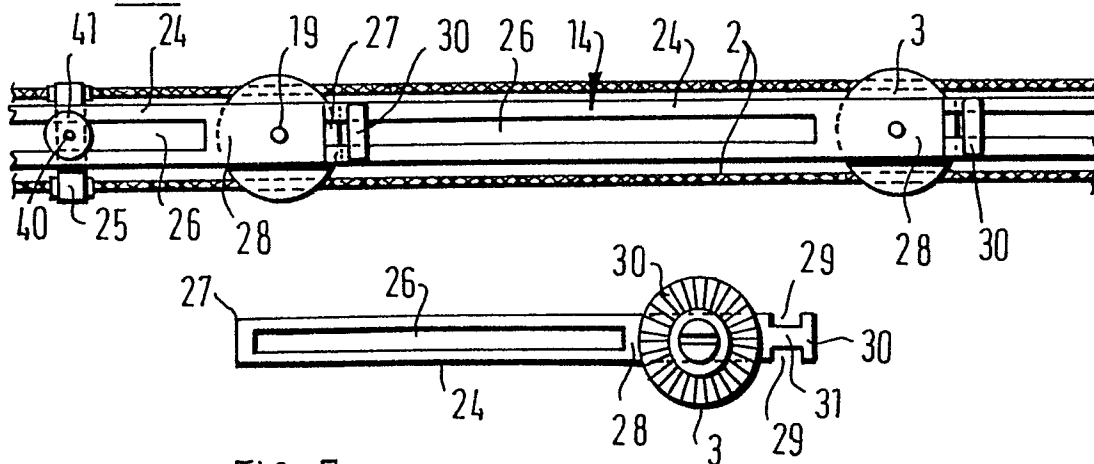


FIG. 7

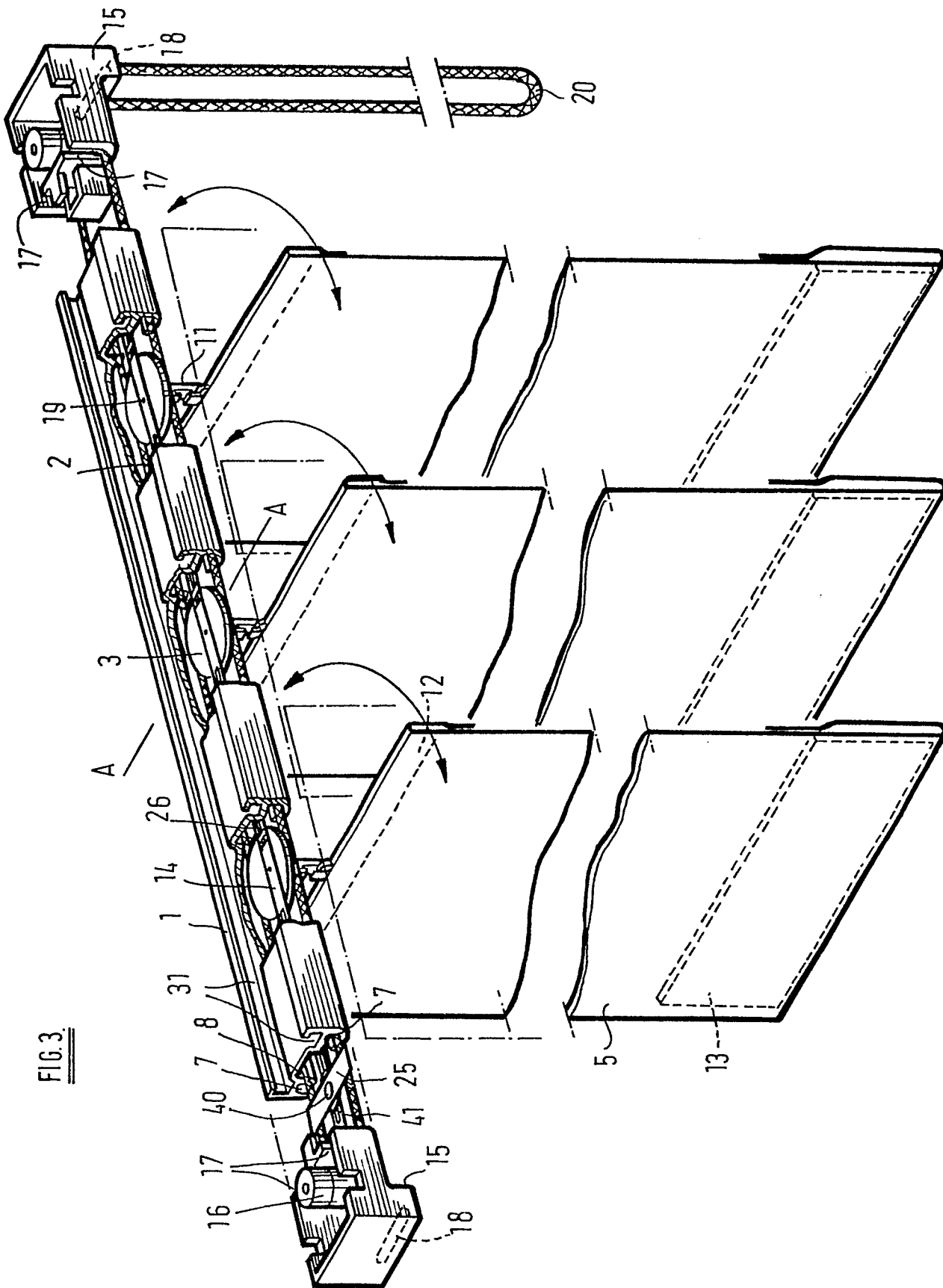


FIG. 3