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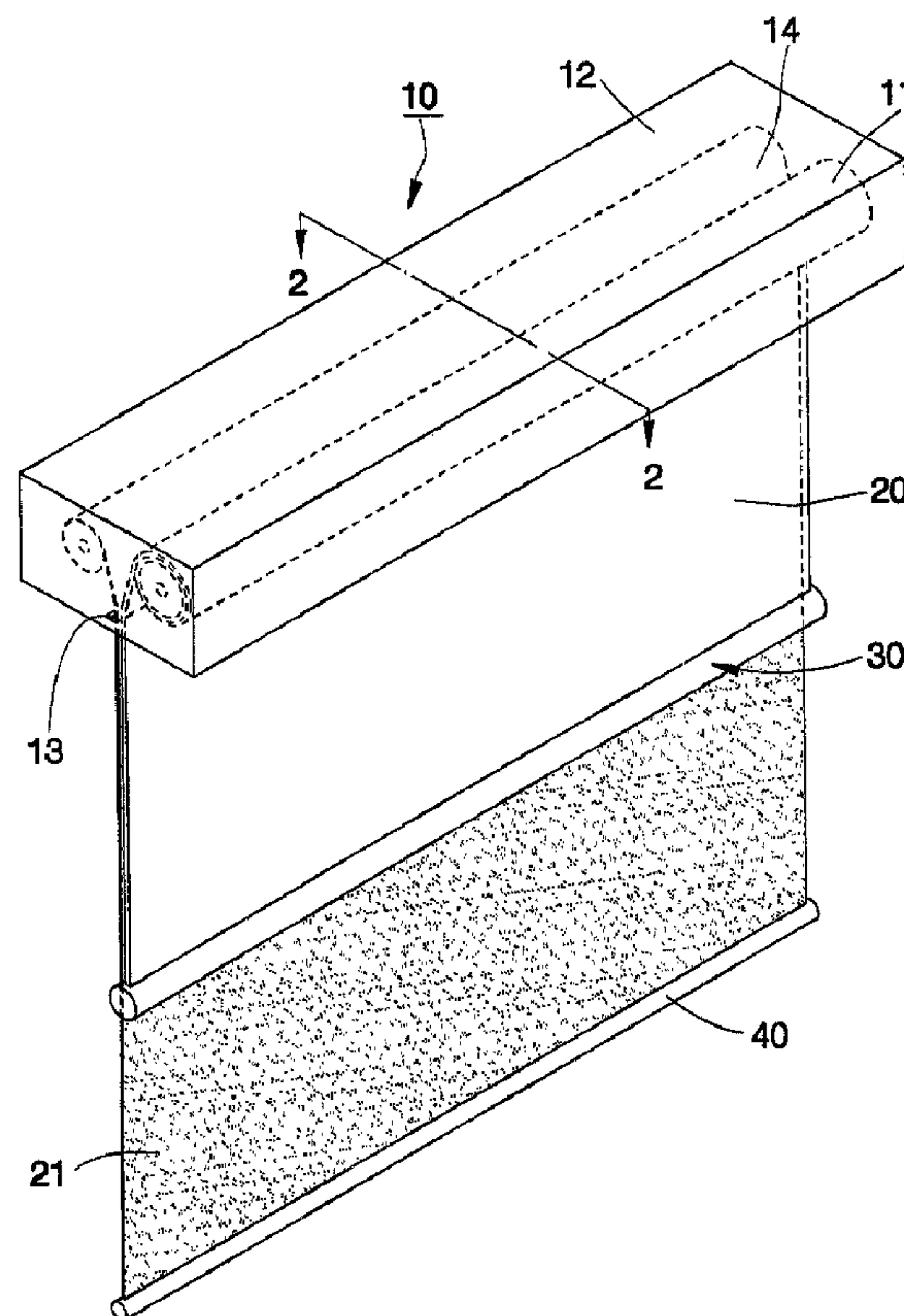
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(54) Title: DOUBLE-LAYER ROLLER BLIND



(57) Abrégé/Abstract:

A double-layer roller blind includes a first roller and a second roller horizontally arranged in parallel at the top side of a window, a first shade fastened with a top edge thereof to the first roller, a first bottom bar fastened to a bottom edge of the first shade, a second shade fastened with a top edge thereof to the second roller, and a second bottom bar fastened to a bottom edge of the second shade and suspended below the first bottom bar. The first bottom bar is provided with an insertion space through which the second shade is inserted such that the second shade is kept close to the first shade.

ABSTRACT OF THE DISCLOSURE

A double-layer roller blind includes a first roller and a second roller horizontally arranged in parallel at the top side of a window, a first shade fastened with a top edge thereof to the first roller, a first bottom bar fastened to a bottom edge of the first shade, a second shade fastened with a top edge thereof to the second roller, and a second bottom bar fastened to a bottom edge of the second shade and suspended below the first bottom bar. The first bottom bar is provided with an insertion space through which the second shade is inserted such that the second shade is kept close to the first shade.

DOUBLE-LAYER ROLLER BLIND

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a roller blind and more particularly, to a
5 double-layer roller blind having two shades that are smoothly close to each other.

2. Description of the Related Art

As shown in FIG. 6, a conventional double-layer roller blind **80** is shown
comprised of two rollers **81, 82**, two shades **83, 84**, and two bottom bars **85, 86**. The
rollers **81, 82** are transversely pivotally fastened to the top side of the window (not
10 shown), and can be respectively rotated by way of a respective lift cord or a motor
governed by a remote controller. The shades **83, 84** have the respective top edge
respectively fastened to the rollers **81, 82** such that the rollers **81, 82** can be rotated to
roll up or let off the shades **83, 84**. The shades **83, 84** are usually made of different
fabrics, i.e., the shade **83** which approaches the window has a high transmission rate of
15 light (for example, made of a gauze cloth), the shade **84** which is relatively closer to
the inside of the house has a low transmission rate of light. The bottom bars **85, 86** are
respectively fastened to the bottom edges of the shades **83, 84**, holding the shades **83,**
84 smoothly suspended below the rollers **81, 82**. The user of the double-layer roller
blind **80** can control the rollers **81, 82** to roll up and let off the shades **83, 84**
20 respectively, so as to further regulate the light.

The aforesaid conventional design of double-layer roller blind **80** is still not
satisfactory in function. Because of a big gap between the shades **83, 84**, the shades **83,**
84 tend to be forced apart by wind as the imaginary line indicated in FIG. 6, resulting
in unstable amount of incident light.

25 Therefore, it is desirable to provide a double-layer roller blind that eliminates

the aforesaid drawback.

SUMMARY OF THE INVENTION

It is the primary objective of the present invention to provide a double-layer roller blind having two shades, which keeps the front and rear shades smoothly close to
5 each other, giving a nice looking and high stability of light shading.

To achieve this objective of the present invention, the roller blind provided by the present invention comprises a first roller, a second roller, a first shade having a top edge fastened to the first roller, a second shade having a top edge fastened to the second roller, a first bottom bar fastened to a bottom edge of the first shade, and a
10 second bottom bar fastened to a bottom edge of the second shade and suspended below the first bottom bar. The first bottom bar is provided with an insertion space through which the second shade is inserted, thereby keeping the second shade close to the first shade.

In an embodiment, the first bottom bar has a narrow elongated slot cutting
15 through top and bottom sides thereof to form the insertion space.

In another embodiment, the first bottom bar further comprises at least two guide wheels in contact with two sides of the second shade.

In still another embodiment, the first bottom bar is constructed to include a bar body and two end caps that are respectively fastened to two distal ends of the bar
20 body. The end caps each have an L-shaped flange defining with a periphery of the bar body the insertion space.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a double-layer roller blind according to a first preferred embodiment of the present invention.

25 FIG. 2 is a sectional view taken along line 2-2 of FIG. 1.

FIG. 3 is a partial view in section of a double-layer roller blind according to a second preferred embodiment of the present invention, showing the structure of the first bottom bar.

FIG. 4 is a perspective view of a double-layer roller blind according to a
5 third preferred embodiment of the present invention.

FIG. 5 is a sectional view in an enlarged scale of a part of FIG. 4, showing the structure of the first bottom bar.

FIG. 6 is a schematic drawing of a double-layer roller blind according to the prior art.

10 DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 and 2, a double-layer roller blind 10 in accordance with the first preferred embodiment of the present invention is shown comprised of a first roller 11, a second roller 14, a first shade 20, a second shade 21, a first bottom bar 30, and a second bottom bar 40.

15 The first roller 11 is a cylindrical member transversely pivotally fastened to the top side of the window (not shown). According to this embodiment, the first roller 11 is fastened pivotally with the inside of an elongated box 12, which is fixedly provided at the top side of the window. The first roller 11 can be controlled to rotate on its own axis inside the elongated box 12. It is to be understood that the method of
20 controlling the first roller to rotate can be achieved by means of any of a variety of conventional techniques, for example, by means of the control of a lift cord, a spring winding mechanism, or a wired or wireless controller. The elongated box 12 has a narrow elongated slot 13 extended along the length in the bottom side on the middle. The first roller 11 is suspended above the narrow elongated slot 13 near one lateral side
25 of the box 12, i.e. the side relatively closer to the inside of the house.

The second roller **14** is a cylindrical member fastened pivotally with the inside of the elongated box **12**, and can be rotated on its own axis by the user. According to this embodiment, the second roller **14** is suspended above the narrow elongated slot **13** near the other lateral side of the box **12**, i.e. the side relatively closer to the window, and arranged in parallel to the first roller **11** at the same elevation. The two rollers **11**, **14** can be controlled by a controller (not shown) to rotate synchronously or independently.

The first shade **20** is made of a sheet material having a relatively lower transmission rate of light. The top edge of the first shade **20** is fixedly fastened to the periphery of the first roller **11**. The bottom edge of the first shade **20** is inserted through the narrow elongated slot **13** and suspended below the first roller **11**. Therefore, the first roller **11** can be rotated to roll up the first shade **20** or to let off the first shade **20**.

The second shade **21** is made of a sheet material having a relatively higher transmission rate of light (for example, gauze cloth). The top edge of the second shade **21** is fixedly fastened to the periphery of the second roller **14**. The bottom edge of the second shade **21** is inserted through the narrow elongated slot **13** and suspended below the second roller **14**. Therefore, the second roller **14** can be rotated to roll up the second shade **21** or to let off the second shade **21**.

The first bottom bar **30** is a round rod member having an insertion space, which is a narrow elongated slot **31** extended along the length and cut through the top and bottom sides in this embodiment. The narrow elongated slot **31** divides the first bottom bar **30** into a base portion **32** and a retaining portion **33**. The retaining portion **33** is formed in the rear side of the first bottom bar **30** approaching the window. The base portion **32** is formed in the front side of the first bottom bar **30** and facing the

inside of the house. The top side of the base portion 32 is fixedly fastened to the bottom edge of the first shade 20. The bottom edge of the second shade 21 is vertically downwardly inserted through the narrow elongated slot 31 of the first bottom bar 30, and suspended below the first bottom bar 30. By means of the effect of the retaining portion 33, the second shade 21 is kept in close proximity to the first shade 20.

The second bottom bar 40 is fixedly fastened to the bottom edge of the second shade 21 below the first bottom bar 30.

When in use, the user can rotate the second roller 14 to lower the second shade 21 to the desired elevation. If the light intensity of incident light is still strong after the second shade 21 has been completely extended out, the user can then rotate the first roller 11 to lower the first shade 20 to the desired elevation, achieving the desired light shading effect.

By means of the design of the base portion 32 and retaining portion 33 of the first bottom bar 30, the first shade 20 and the second shade 21 are maintained in close proximity to each other and will not be forced apart upon a strong wind. Because the first shade 20 and the second shade 21 are constantly maintained in close proximity to each other, the sense of beauty of the double-layer roller blind is maintained. It is to be understood that the first roller 11 and the second roller 14 may be arranged in parallel at different elevations or constructed to roll up the respective shades 20, 21 in reversed directions, keeping the shades 20, 21 suspended below the narrow elongated slot 13 of the elongated box 12.

Further, according to the aforesaid embodiment, the second bottom bar 40 is maintained below the elevation of the first bottom bar 30, i.e., the height of the second shade 21 is maintained below the first shade 20. This arrangement does not affect normal functioning of the double-layer roller blind 10 because lowering the first shade

20 is for the purpose of shading the light that passes through the second shade 21 and because the elevation difference between the first bottom bar 30 and the second bottom bar 40 is insignificant after the first shade 20 and the second shade 21 have been fully extended out. Further, the transmission rate of light between the two shades may be reversed, i.e., the first shade 20 can be made of a sheet material having a relatively higher transmission rate of light, and the second shade 21 can be made of a sheet material having a relatively lower transmission rate of light.

According to the second preferred embodiment of the present invention as shown in FIG. 3, the double-layer roller blind 50 is comprised of a first roller (not shown), a second roller (not shown), a first shade 51, which has the top edge fixedly fastened to the periphery of the first roller, a second shade 52, which has the top edge fixedly fastened to the periphery of the second roller, a first bottom bar 60 fixedly fastened to the bottom edge of the first shade 51, and a second bottom bar (not shown) fixedly fastened to the bottom edge of the second shade 52. The second shade 52 is vertically downwardly inserted through an insertion space, i.e. a narrow elongated slot 63, in the first bottom bar 60. Further, two guide wheel sets 61 are provided in the narrow elongated slot 63 inside the first bottom bar 60 near two distal ends. Each guide wheel set 61 is comprised of two guide wheels 62 arranged in parallel at the same elevation. The second shade 52 passes between the two guide wheels 62 of each guide wheel set 61 with two sides thereof in contact with the two guide wheels 62 respectively.

During vertical movement of the first shade 51 or second shade 52, the guide wheel sets 61 reduce friction force between the first bottom bar 60 and the second shade 52.

The first and second shades can be maintained in close proximity to each

other by another method. According to the third preferred embodiment of the present invention as shown in FIGS. 4 and 5, the first bottom bar of the double-layer roller blind 70 has a bar body 71 and two end caps 72 respectively capped at two distal ends of the bar body 71. Each end cap 72 comprises a plug portion 73, which is inserted into one end of the bar body 71 of the first bottom bar, and a substantially L-shaped flange 74, which extends from the plug portion 73. The L-shaped flanges 74 of the two end caps 72 define with the periphery of the bar body 71 an insertion space 75, which guides movement of the second shade 76 relative to the first bottom bar and keeps the second shade 76 in close proximity to the first shade 78. The L-shaped flanges 74 of the two end caps 72 each have a retaining portion 77, which is disposed in contact with one side of the second shade 76 opposite to the first shade 78.

Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

WHAT IS CLAIMED IS:

1. A roller blind comprising:
a first roller;
a second roller;
a first shade having a top edge fastened to said first roller, and a bottom edge;
a second shade having a top edge fastened to said second roller, and a bottom edge;
a first bottom bar fastened to the bottom edge of said first shade, said first bottom bar having an insertion space through which the second shade is inserted; and
a second bottom bar fastened to the bottom edge of said second shade and suspended below said first bottom bar,
wherein said first bottom bar comprises a narrow elongated slot cutting through top and bottom sides thereof to form said insertion space.

2. A roller blind comprising:
a first roller;
a second roller;
a first shade having a top edge fastened to said first roller, and a bottom edge;
a second shade having a top edge fastened to said second roller, and a bottom edge;
a first bottom bar fastened to the bottom edge of said first shade, said first bottom bar having an insertion space through which the second shade is inserted; and
a second bottom bar fastened to the bottom edge of said second shade and suspended below said first bottom bar,
wherein said first bottom bar comprises a base portion fastened to the bottom edge of said first shade, a narrow elongated slot cutting through top and bottom sides thereof to form said insertion space, and a retaining portion spaced from said base portion by said narrow elongated slot and disposed in contact with one side of said second shade opposite to said first shade; wherein said narrow elongated slot is formed in said first bottom bar in an offset position between said base portion and said retaining portion.

3. A roller blind comprising:

a first roller;
 a second roller;
 a first shade having a top edge fastened to said first roller, and a bottom edge;
 a second shade having a top edge fastened to said second roller, and a bottom edge;
 a first bottom bar fastened to the bottom edge of said first shade, said first bottom bar having an insertion space through which the second shade is inserted; and
 a second bottom bar fastened to the bottom edge of said second shade and suspended below said first bottom bar,
 wherein said first bottom bar comprises a narrow elongated insertion slot cutting through top and bottom sides thereof to form said insertion space, and two guide wheel sets located in said narrow elongated slot near two distal ends, said guide wheel sets each comprising at least two guide wheels disposed in contact with two sides of said second shade.

4. A roller blind comprising:
 a first roller;
 a second roller;
 a first shade having a top edge fastened to said first roller, and a bottom edge;
 a second shade having a top edge fastened to said second roller, and a bottom edge;
 a first bottom bar fastened to the bottom edge of said first shade, said first bottom bar having an insertion space through which the second shade is inserted; and
 a second bottom bar fastened to the bottom edge of said second shade and suspended below said first bottom bar,
 wherein said first bottom bar comprises a bar body and two end caps respectively fastened to two distal ends of said bar body, said end caps each having an L-shaped flange, the L-shaped flanges of said two end caps defining with a periphery of said bar body said insertion space.

5. The roller blind as claimed in any one of claims 1 to 4, wherein said first shade and said second shade are respectively made of materials having different light transmission rates.

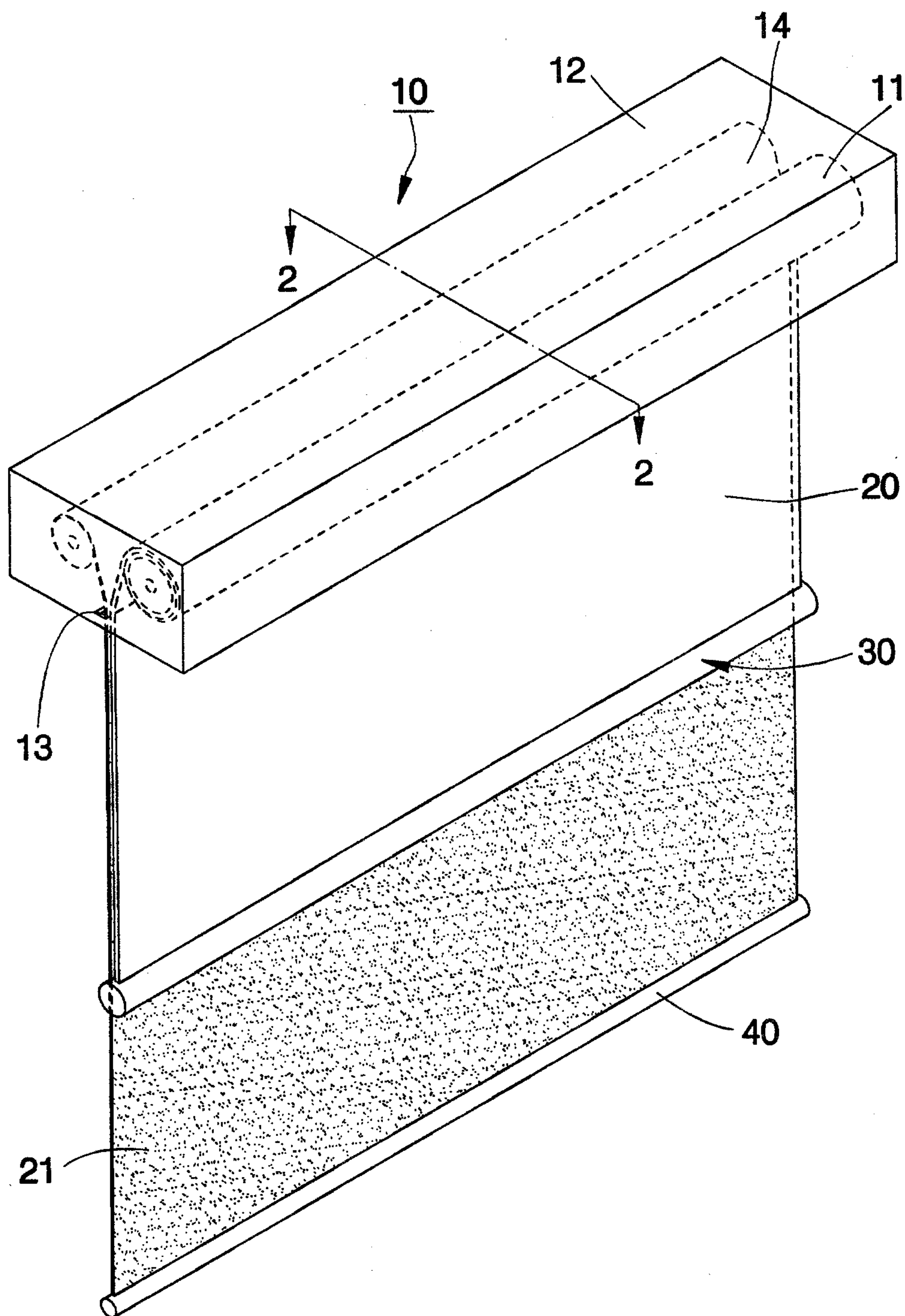


FIG. 1

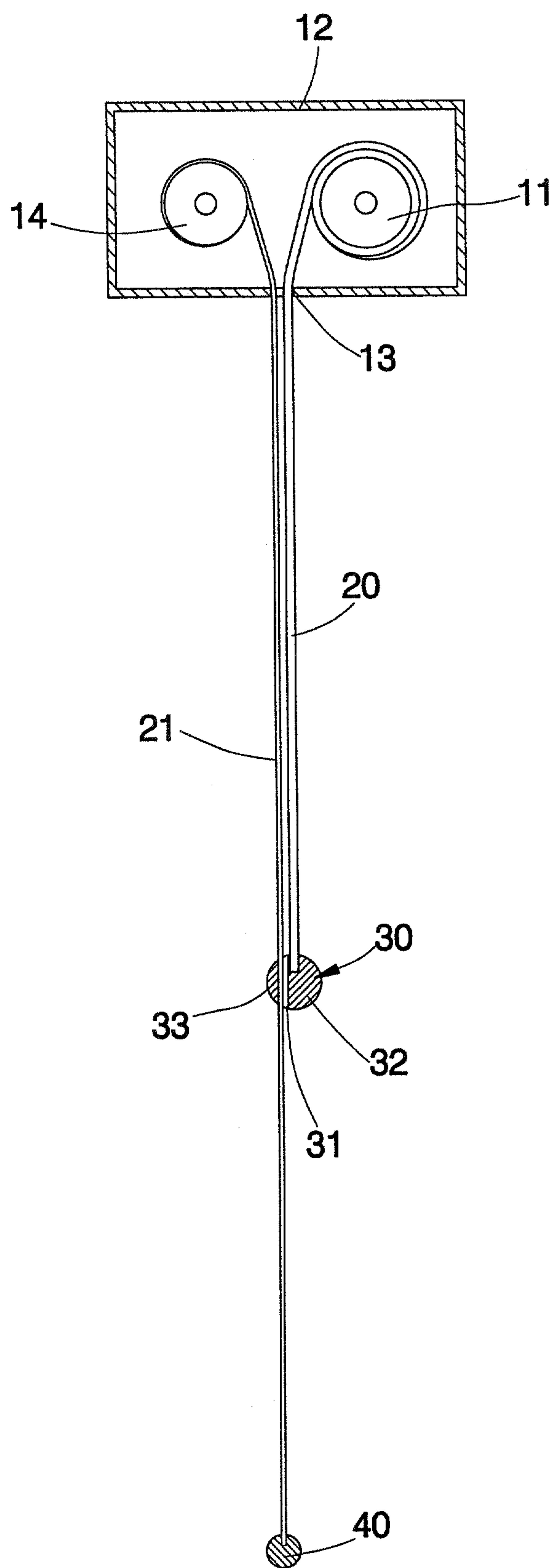


FIG. 2

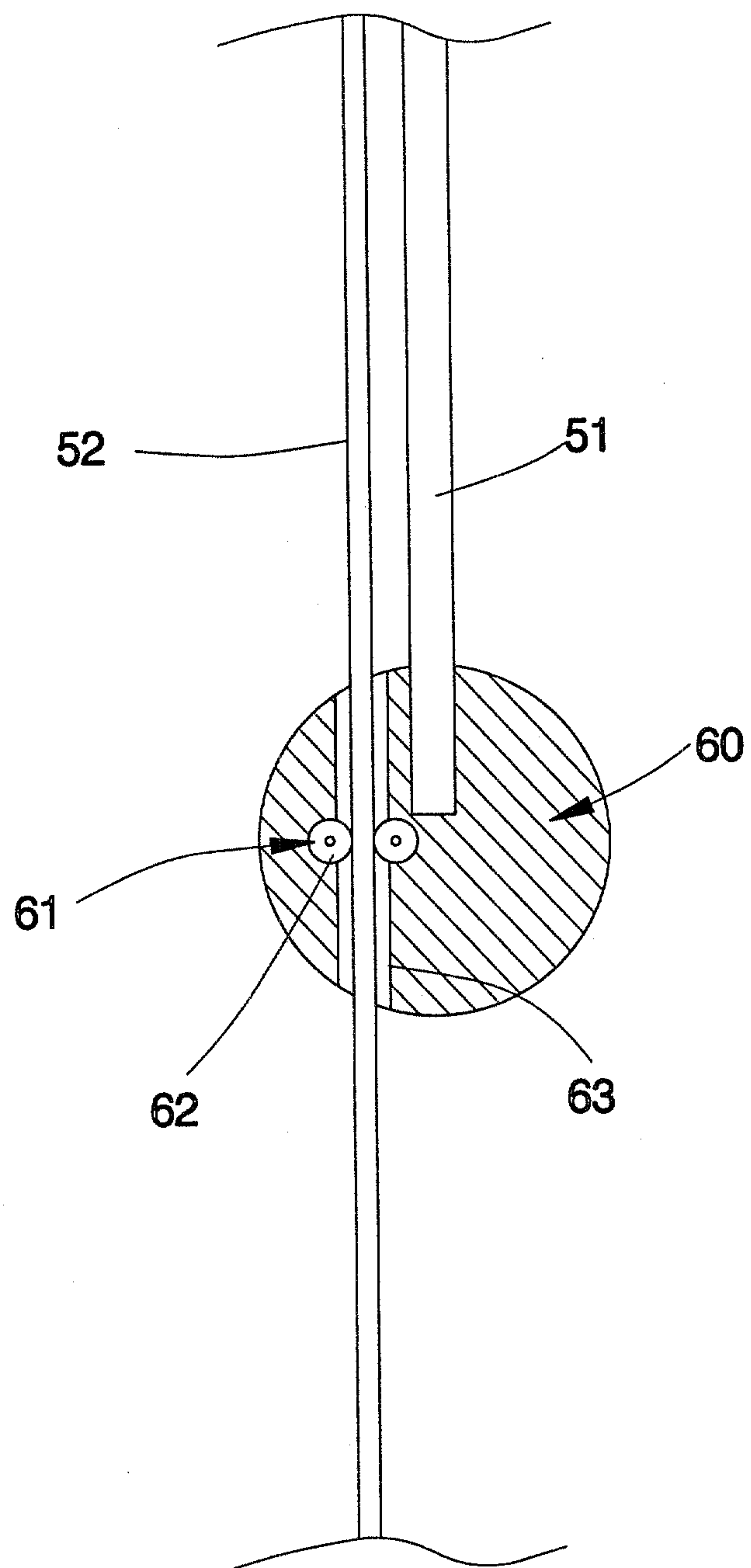


FIG. 3

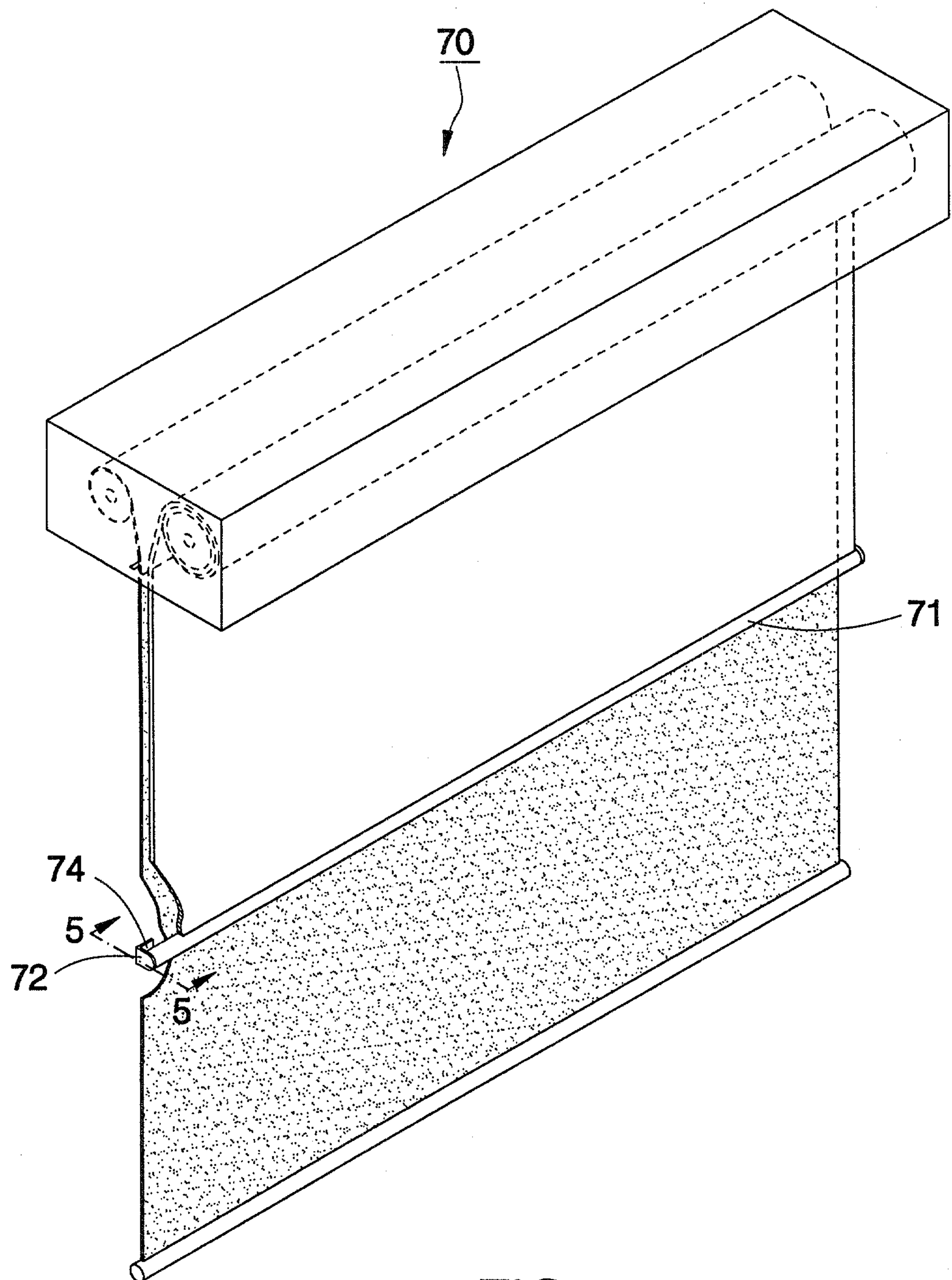


FIG. 4

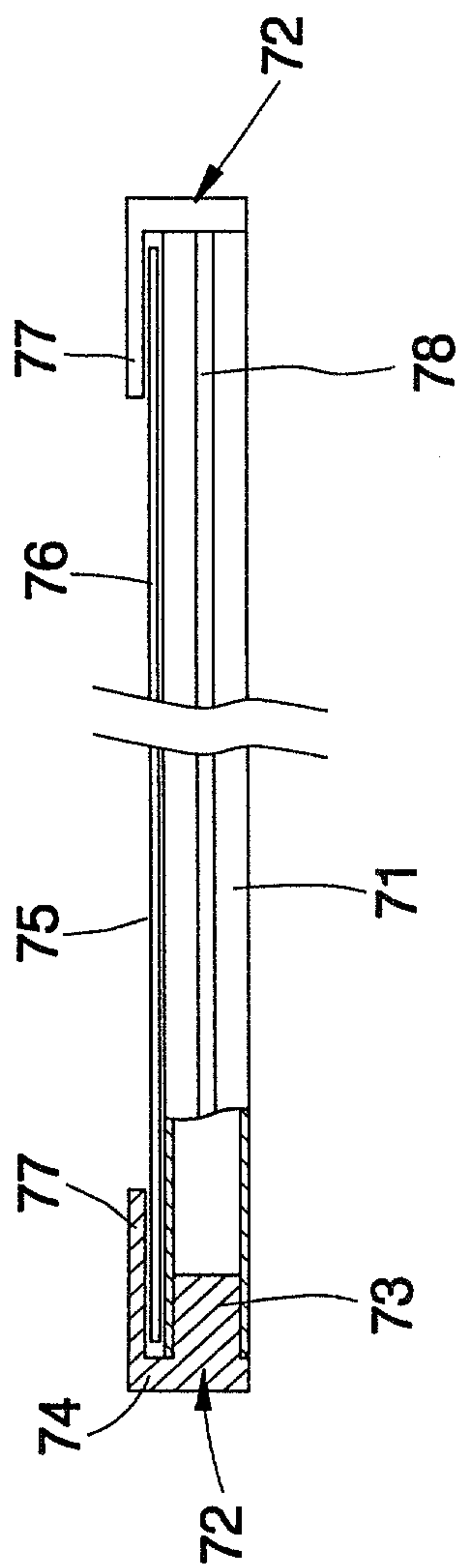


FIG. 5

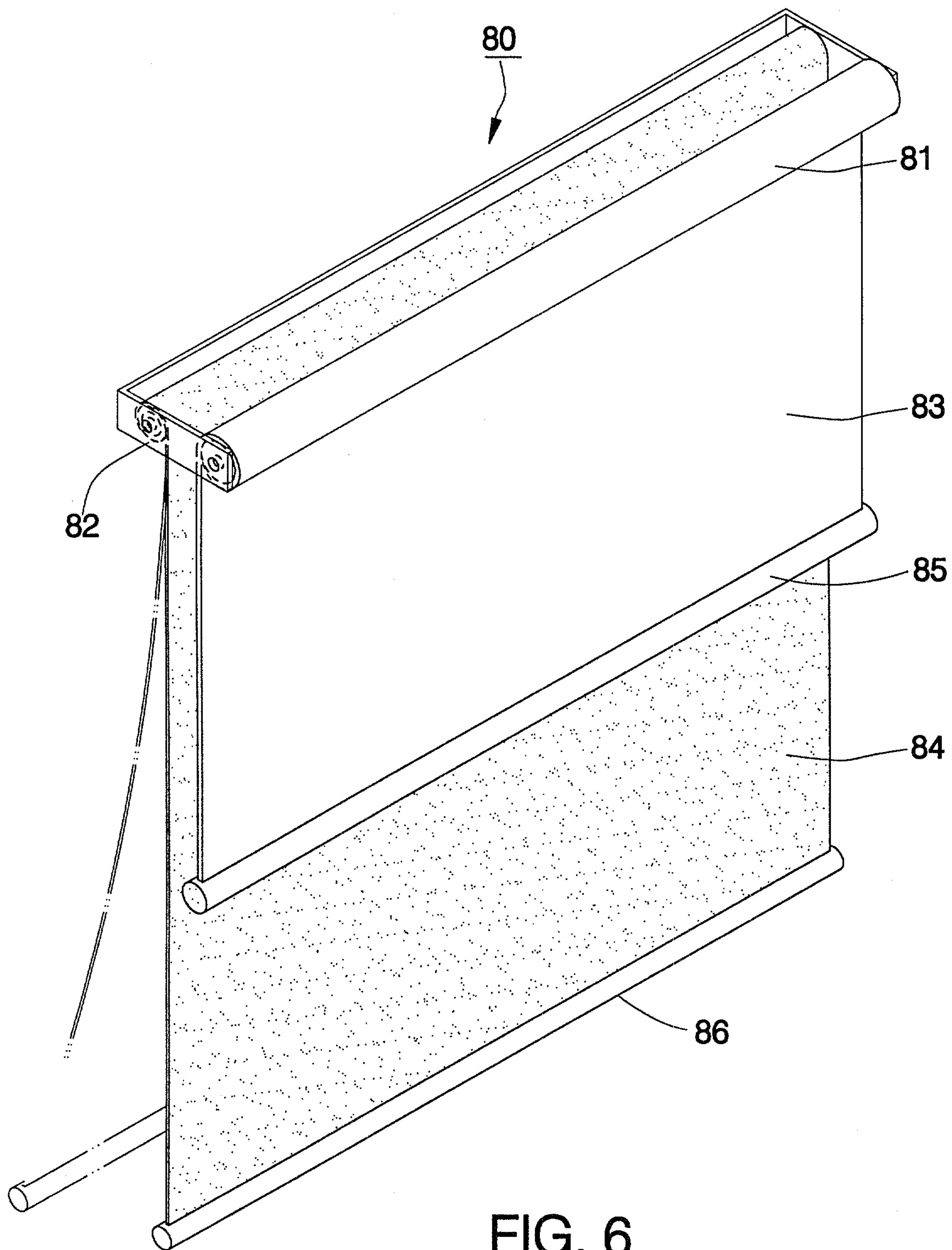


FIG. 6
PRIOR ART

