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

(11) EP 1 462 603 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.09.2004 Bulletin 2004/40

(51) Int Cl.[7]: **E06B 9/34**

(21) Application number: **03010286.7**

(22) Date of filing: **07.05.2003**

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

(30) Priority: **26.03.2003 CN 03238892**

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(54) Window covering

(57) A combination window covering is constructed to include an elongated barrel fastened rotatably with a top side of a window, a bottom rail below the barrel, slats arranged in parallel between the barrel and the bottom rail, front and back ladder tapes connected in parallel between the barrel and the bottom rail at front and back sides of the slats and joining the slats, and a light-admitting flexible sheet. The flexible sheet has first and second ends respectively fixedly fastened to the barrel at two sides, a front half extended from the first end and suspended at the front side of the slats, a back half extended from the second end and suspended at the back side of the slats, and a middle part connected between the front half and the back half and moveably passing over the bottom rail.

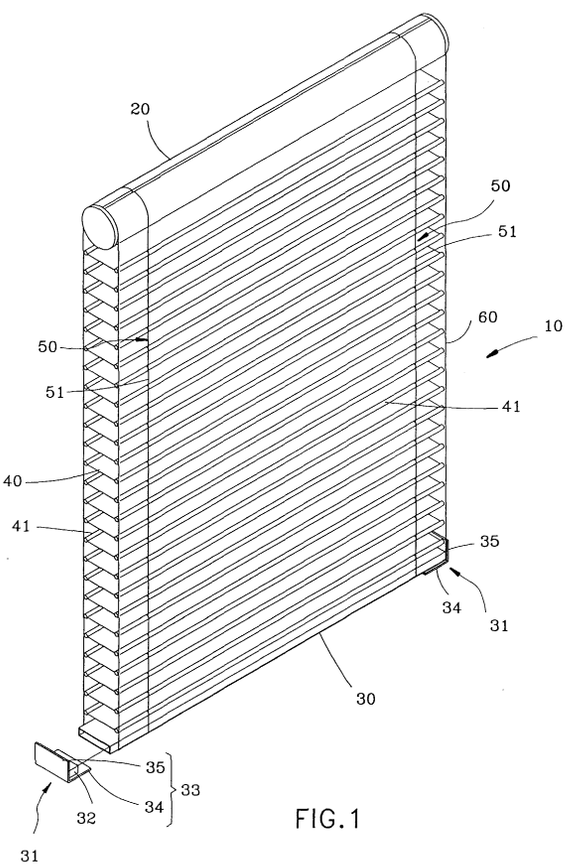


FIG.1

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to a window covering and, more particularly, to a combination window covering which comprises a blind and a pair of non-opaque flexible sheets at front and back sides of the blind.

2. Description of the Related Art

[0002] FIGS. 6 and 7 are perspective (in an extended condition) and side views of a combination window covering according to the prior art. This structure of combination window covering **90** comprises a barrel **91** fastened transversely pivotally with the top side of the window and rotatable by hand or a motor drive, a bottom rail **92** suspending below the barrel **91**, a plurality of flexible slats **93** arranged in parallel between the barrel **91** and the bottom rail **92**, two pairs of ladder tapes **94** bilaterally joining the flexible slats **93**, the ladder tapes **94** including two front ladder tapes **95** connected between the barrel **91** and the bottom rail **92** and joining the flexible slats **93** at the front side and two back ladder tapes **96** connected between the barrel **91** and the bottom rail **92** and joining the flexible slats **93** at the back side, and a pair of non-opaque flexible sheets (for example, meshed fabrics) **97A** and **97B** respectively provided at the front and back sides of the flexible slats **93** and connected between the barrel **91** and the bottom rail **92**. The non-opaque flexible sheets **97A** and **97B** are rectangular sheet members fitting the size of the window (the non-opaque flexible sheets **97A** and **97B** are not bonded to the flexible slats **93**; however, there are known combination blinds, for example, US patent No. 5,419,385, in which the flexible sheets are respectively bonded to the flexible slats).

[0003] By means of the aforesaid arrangement, the flexible sheets **97A** and **97B** vaguely cover the slats **93** at the front and back sides, showing a particular light shading effect quite different from conventional blinds. This design of combination window covering builds up an elegant and graceful style. The user can regulate the light passing through the combination window covering **90** by rotating the barrel **91** through an angle to move the front ladder tape **95** and the back ladder tapes **96** longitudinally in reversed directions. When continuously rotating the barrel **91**, the barrel **91** will roll up the flexible slats **93** and the flexible sheets **97A** and **97b** (see FIG. 8) to the top side of the window or to a particular elevation covering the upper part of the window.

[0004] The aforesaid combination window covering **90** is still not satisfactory in function. When the user rolling up the combination window covering **90** from its fully extended position (in the direction as shown in FIG. 8), the upper part of the back flexible sheet **97B** will be rolled up by the barrel **91** prior to the front flexible sheet **97A**. and, the back flexible sheet **97B** will be covered on the front flexible sheet **97A** over the periphery of the barrel **91**, i.e., the diameter of the back flexible sheet **97B** is greater than the front flexible sheet **87A** when rolled up. Because the flexible sheets **97A** and **97B** have the same length and are rolled up at a different start point, the back flexible sheet **97B** is smoothly stretched between the barrel **91** and the bottom rail **92** when the combination window covering **90** rolled up. At this time, the front flexible sheet **97A** has a curved lower part **98** suspending below the bottom rail **92** at the front side, destroying the sense of beauty of the received status of the combination window covering **90**.

[0005] It is therefore desirable to provide a combination window covering that eliminates the aforesaid drawback.

SUMMARY OF THE INVENTION

[0006] It is the primary object of the present invention to provide a combination window covering, which keeps the front and back flexible sheets in a well-balanced status, causing a sense of beauty.

[0007] To achieve this object of the present invention, the combination window covering comprises an elongated barrel fastened rotatably with a top side of a window for free rotation on an axis thereof; a bottom rail arranged in parallel to and spaced below the barrel; a plurality of slats arranged in parallel between the barrel and the bottom rail; front and back ladder tapes connected in parallel between the barrel and the bottom rail at front and back sides of the slats and joining the slats, and a light-admitting flexible sheet. The flexible sheet has first and second ends respectively fixedly fastened to the barrel at two sides, a front half extended from the first end and suspended at the front side of the slats, a back half extended from the second end and suspended at the back side of the slats, and a middle part connected between the front half and the back half and moveably passing over the bottom rail.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 is a perspective view, in an extended condition, of a combination window covering according to a preferred embodiment of the present invention.

FIG. 2 is a left side view of the combination window covering according to the preferred embodiment of the present invention.

FIG. 3 is a front view of a part of the combination window covering around one end of the bottom rail according to the preferred embodiment of the present invention.

FIG. 4 is a left side view of the preferred embodi-

ment of the present invention showing a status of the combination window covering where the combination window covering is going to be rolled up from the fully extended position.

FIG. 5 is a left side view in an enlarged scale of the preferred embodiment of the present invention, showing the combination window covering rolled up.

FIG. 6 is a perspective view, in an extended condition, of a combination window covering according to a prior art.

FIG. 7 is a side view of the combination window covering according to the prior art.

FIG. 8 is a schematic drawing showing the received status of the prior art combination window covering.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Referring to FIGS.1～3, a combination window covering **10** in accordance with a preferred embodiment of the present invention is shown comprised of a barrel **20**, a bottom rail **30**, a plurality of flexible slats **40**, two pairs of ladder tapes **50**, and a flexible sheet **60**.

[0010] The barrel **20** is a hollow cylindrical member having a length approximately equal to the transverse width of the window in which the combination window cover **10** is to be installed. According to the present invention, the barrel **20** is fastened rotatably with the top side of the window in transverse (horizontal) direction, and can be rotated on its own axis by the user (through a lift cord, or a wire-controlled and/or remote-controlled motor drive; the rotation control of the barrel is of the known art and not within the scope of the claims of the present invention, no further detailed description in this regard is necessary).

[0011] The bottom rail **30** is shaped like an elongated flat box arranged in parallel to and suspended below the barrel **20**. The length of the bottom rail **30** is approximately equal to the transverse width of the window. The width of the bottom rail **30** is approximately equal to the diameter of the barrel **20**. The bottom rail **30** is a heavy member made of metal (for example, extruded from aluminum), having two end caps **31** respectively disposed at the two distal open ends. The end caps **31** each comprise a plug **32**, which is plugged into one open end of the bottom rail **30**, and an angle plate **33** fixedly fastened to the plug **32** at an outer side. The angle plate **33** has a horizontal bearing wall **34** disposed in parallel to the bottom wall of the bottom rail **30**, and a vertical stop wall **35** protruding over the top side of the bottom rail **30** at a distance and extending in direction perpendicular to the bottom rail **30**.

[0012] The flexible slats **40** are narrow, elongated, rectangular members made of fabric. The length of the flexible slats **40** is approximately equal to the transverse width of the window. The width of the flexible slats **40** is slightly smaller than the diameter of the barrel **20**. Each slat **40** has two long sides hemmed and embedded with a respective rod member **41**. The rod members **41** of each slat **40** keep the length of the respective slat **40** in shape, allowing the respective slat **40** to be curved in transverse direction. The flexible slats **40** are arranged in parallel between the barrel **20** and the bottom rail **30** at different elevations.

[0013] The two pairs of ladder tapes **50** are symmetrically bilaterally fastened to the flexible slats **40**, including two front ladder tapes **51** connected between the barrel **20** and the bottom rail **30** and joining the flexible slats **40** at the front side and two back ladder tapes **52** connected between the barrel **20** and the bottom rail **30** and joining the flexible slats **40** at the back side (according to the present preferred embodiment, the front ladder tapes **51** and the back ladder tapes **52** are respectively tied to the rod members **41** of the flexible slats **40**, however any of a variety of conventional bonding methods may be used). By means of the ladder tapes **50**, the bottom rail **30** and the flexible slats **40** are suspended below the barrel **20**. As illustrated in FIG. 2, the flexible slats **40** are arranged in parallel at different elevations and equally spaced from one another. The pitch **P** between each two adjacent flexible slats **40** (i.e., the length of each front ladder tape **51** or back ladder tape **52** between two adjacent flexible slats **40**) is slightly smaller than the width (the length of the short sides) W of the flexible slats **40**. Further, the lowest flexible slat **40a** is closely suspended on the top surface of the bottom rail **30**; the vertical stop walls **35** of the angle plates **33** of the end caps **31** are respectively stopped against the left and right ends of the lowest two flexible slats **40a** and **40b**, keeping the left and right ends of the lowest two flexible slats **40a** and **40b** in position respectively.

[0014] The flexible sheet **60** is a rectangular piece of thin layer of meshed fabric that admits light. The length of the flexible sheet **60** is about twice of the longitudinal length of the window. The width of the flexible sheet **60** is approximately equal to the transverse width of the window. About one half of the flexible sheet **60** measured in longitudinal direction (the area corresponding to the dimensions of the window) is covered over the flexible slats **40** at the front side. The middle part of the flexible sheet **60** extends over the bottom side of the bottom rail **30** and supported on the horizontal bearing walls **34** of the angle plates **33** of the end caps **31** (see FIG. 3). The other half of the flexible sheet **60** is covered over the flexible slats **40** at the back side. Further, the two distal ends (the top ends of the front and rear halves) of the flexible sheet **60** are respectively fixedly fastened to the periphery of the barrel **20** at two sides. The length of the flexible sheet **60** fits the ladder tapes **50** so that the bottom rail **30** is maintained pressed on the middle part of the flexible sheet **60**. In order to let the bottom rail **30** be pressed on the middle part of the flexible sheet **60**, the ladder tapes **50** is made slightly longer than the longitudinal length of the flexible sheet **60**. Thus, the bottom ends of the ladder tapes **50** are not fully extended out when the combination window covering **10** set in the

fully extended position (see FIG. 2), i.e., the front ladder tapes **51** and the back ladder tapes **52** are not stretched straight at the area between the lowest flexible slat **40a** and the second lowest flexible slat **40b**.

[0015] When the user rotating the barrel **20** forwards (clockwise rotation in FIG. 2) or backwards, the flexible sheet **60**, the ladder tapes **50** and the flexible slats **40** are rolled up around the periphery of the barrel **20**, or lowered from the barrel **20** and extended out. When the bottom rail **30** lowered to the lower limit position, the flexible slats **40** are equally spaced from one another at different elevations over the whole area of the window. When the user continuously rotate the barrel **20** forwards or backwards through an angle after the bottom rail **30** has been lowered to the lower limit position, the light shading status of the combination window covering **10** is relatively adjusted. The aforesaid function is similar to conventional designs. As indicated above, the flexible sheet **60** extends over the bottom side of the bottom rail **30** and, the bottom rail **30** is pressed on the middle part of the flexible sheet **60**, therefore the front and rear halves of the flexible sheet **60** are maintained in a stretched and fully expanded status at the front and back sides of the flexible slats **40**, causing a sense of beauty.

[0016] When the user rotating the barrel **20** forwards after the combination window covering **10** has been fully extended out (for example, when adjusting the tilting angle of the flexible slats or rolling up the combination window covering) as shown in FIG. 4, the top side of the front half of the flexible sheet **60** will be lowered to the bottom side of the barrel **20**, and the upper part of the back half of the flexible sheet **60** will be overlaid on the periphery of the barrel **20**. When continuously rotating the barrel **20** forwards as shown in FIG. 5, the front and back halves of the flexible sheet **60** and the flexible slats **40** are rolled up around the barrel **20** from the back side. Because the flexible sheet **60** is not fixedly fastened to the flexible slats **40** and the bottom rail **30**, the middle part of the flexible sheet **60** is movable relative to the bottom rail **30** to automatically adjust the area of the front half and the area of the back half of the flexible sheet **60**, keeping the face of the flexible sheet **60** in a smooth condition at the front and back sides of the flexible slats **40** without wrinkles.

[0017] Further, the horizontal bearing walls **34** of the angle plates **33** of the end caps **31** support the middle part of the flexible sheet **60** below the bottom rail **30** and the vertical stop walls **35** of the angle plates **33** of the end caps **31** are respectively stopped against the left and right ends of the lowest two flexible slats **40a** and **40b**, the combination window covering **10** is maintained smooth when adjusting. The design of the width **W** of the flexible slats **40** to be slightly greater than the pitch **P** of the flexible slats **40** assures the rod member **41** at the top side of one lower flexible slat (the back side of the respective flexible slat when in horizontal) to be slightly higher than the rod member **41** at the bottom side (the front side of the respective flexible slat when in horizontal) of the adjacent upper flexible slat as shown in FIG. 5, preventing abutting of one rod member **41** against another in horizontal direction and, enabling the flexible slats **40** to be smoothly rolled up around the periphery of the barrel **20**. Further, keeping one flexible slat **40** in close contact with the top surface of the bottom rail **30** causes a sense of beauty.

[0018] Although a particular embodiment of the invention has 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. For example, an insertion slot may be extended through the front and back sides of the bottom rail for the passing of the flexible sheet such that the middle part of the flexible sheet has not to pass around the bottom side of the bottom rail as shown in the above-mentioned preferred embodiment. Accordingly, the invention is not to be limited except as by the appended claims.

Claims

1. A combination window covering comprising:

an elongated barrel fastened rotatably with a top side of a window for free rotation on an axis thereof;
a bottom rail arranged in parallel to and spaced below said barrel;
a plurality of slats arranged in parallel between said barrel and said bottom rail;
at least two pairs of ladder tapes, each pairs of the ladder tapes including a front ladder tape and a back ladder tape respectively longitudinally connected between said barrel and said bottom rail at front and back sides of said slats and joining said slats; and
a light-admitting flexible sheet having first and second ends respectively fixedly fastened to said barrel at two sides, a front half extended from said first end and suspended at the front side of said slats, a back half extended from said second end and suspended at the back side of said flexible slats, and a middle part connected between said front half and said back half and moveably passing over said bottom rail.

2. The combination window covering as claimed in claim 1, wherein said bottom rail has the bottom side pressed on the middle part of said flexible sheet.

3. The combination window covering as claimed in claim 2, wherein said bottom rail is provided with two horizontal bearing walls respectively extended from two distal ends thereof and adapted to support

the middle part of said flexible sheet below said bottom rail.

4. The combination window covering as claimed in claim 3, wherein said bottom rail is an elongated flat box having two end caps respectively fastened to the two distal ends, said end caps each comprising a plug press-fitted into one distal end of said bottom rail and an angled plate fixedly fastened to said plug, said angled plate having a vertical stop wall stopped at one end of each of two lowest ones of said and a part forming one of said horizontal bearing walls.

5. The combination window covering as claimed in claim 1, wherein said bottom rails has two vertical stop walls respectively extended from two distal ends thereof and respectively stopped at opposite ends of two lowest ones of said slats.

6. The combination window covering as claimed in claim 1, wherein said bottom rail has an elongated insertion slot extended through front and back sides thereof for passing of the middle part of said flexible sheet.

7. The combination window covering as claimed in claim 1, wherein said slats each have two long sides, two rod members respectively embedded in the two long sides and respectively tied to said front and back ladder tapes; said flexible slats have a width relatively greater than the pitch between each two adjacent ones of said flexible slats.

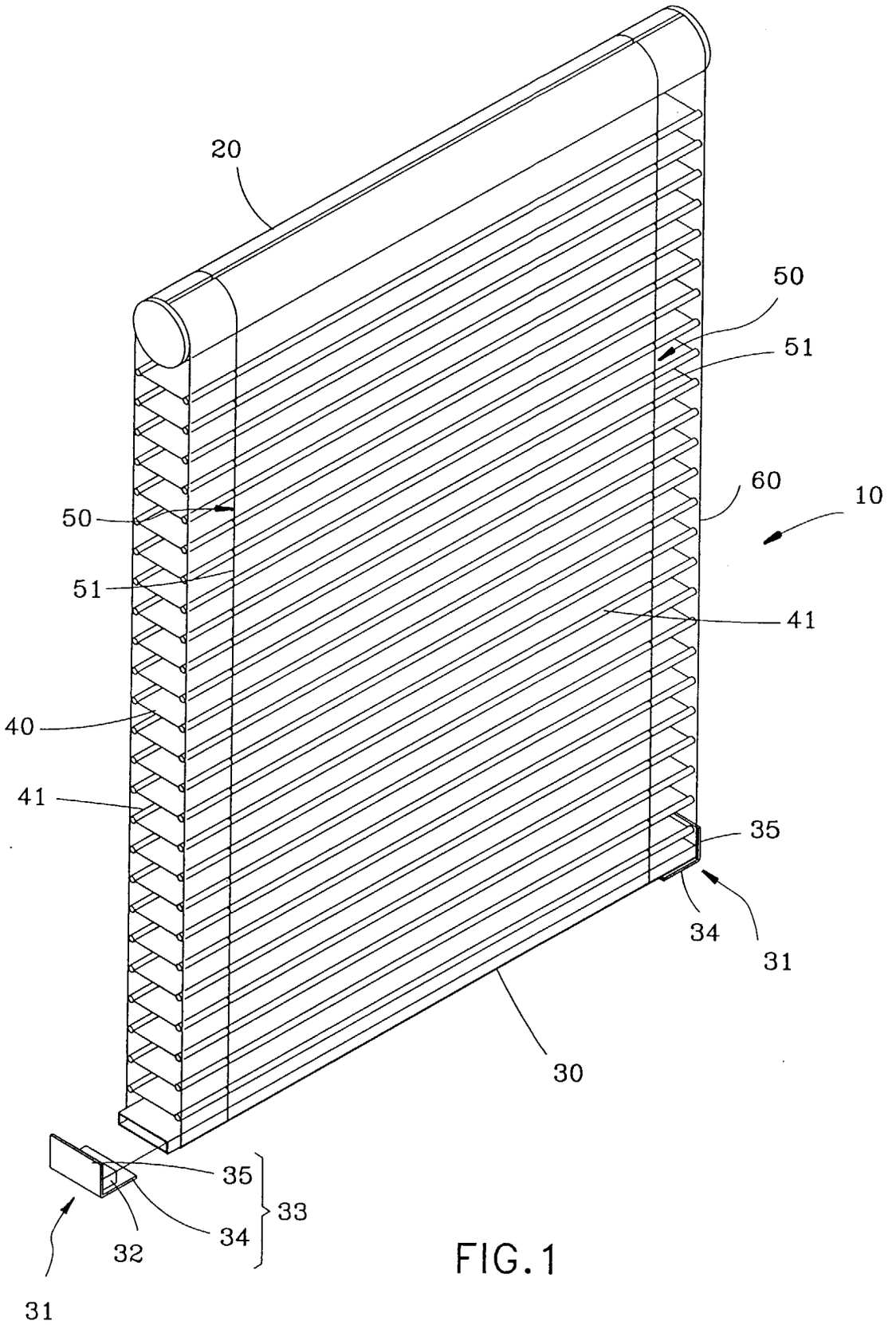


FIG.1

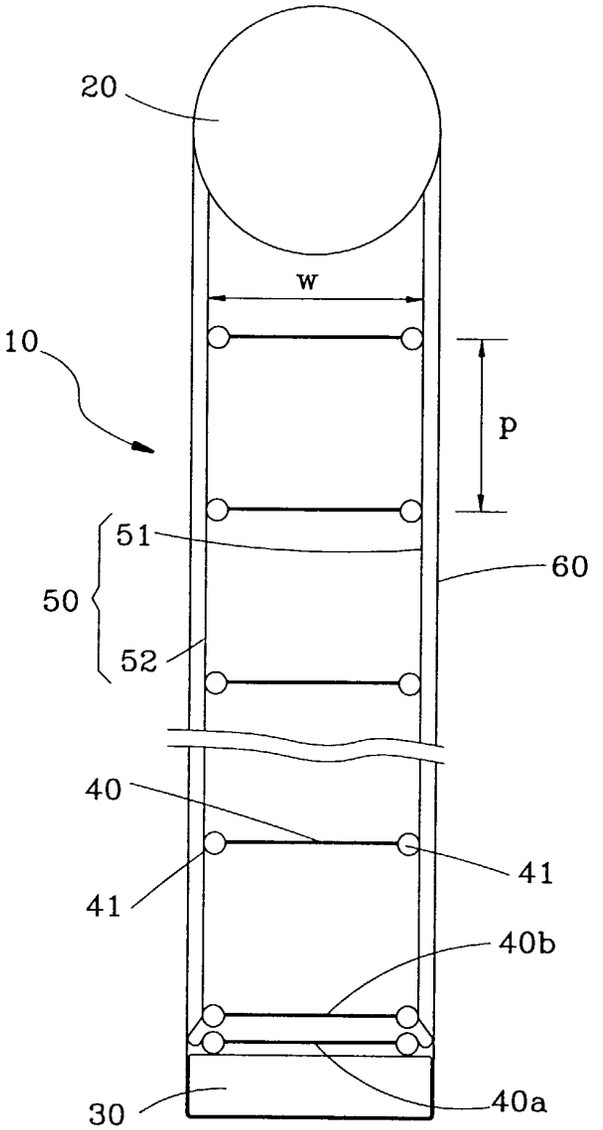

20
w
10
p
51
50
52
60
40
41
41
40b
30
40a

FIG.2

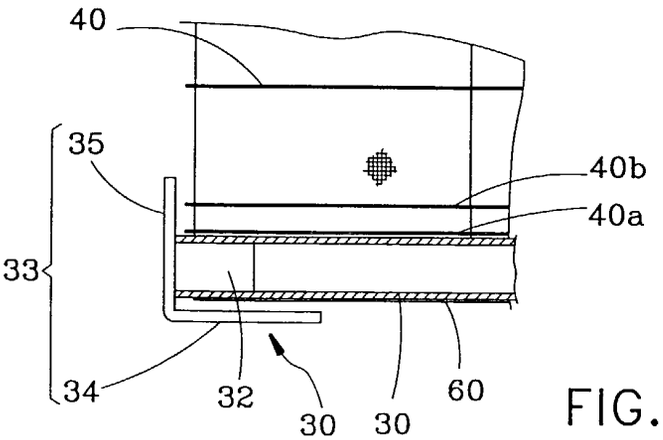

40
35
40b
40a
33
34
32
30
30
60

FIG.3

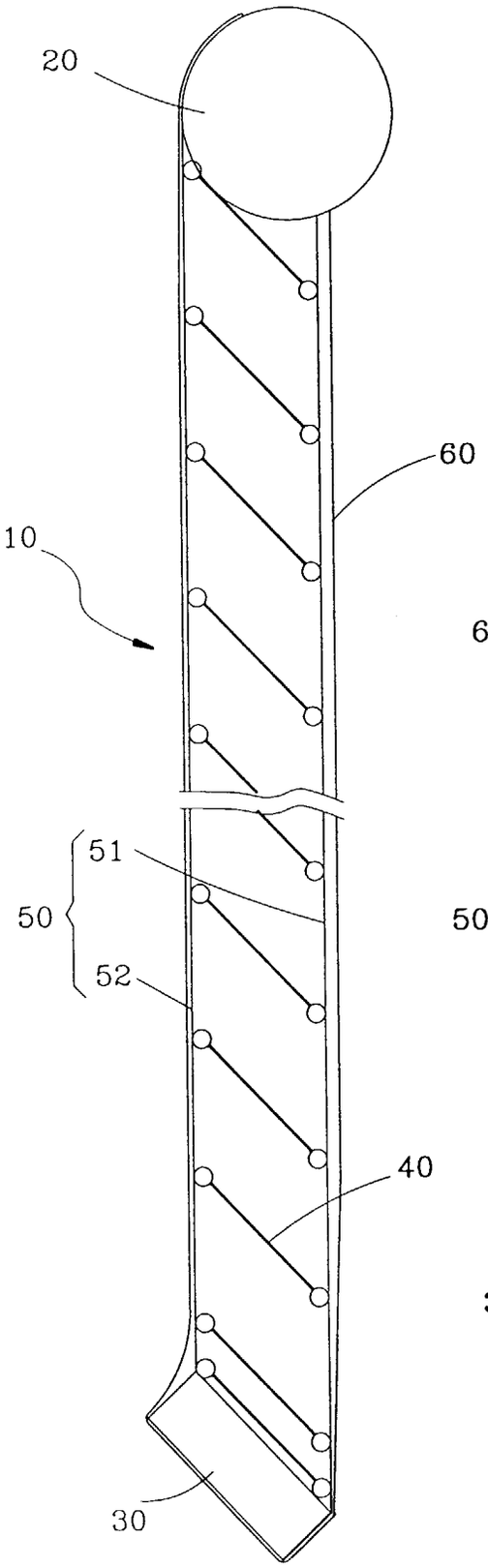


FIG.4

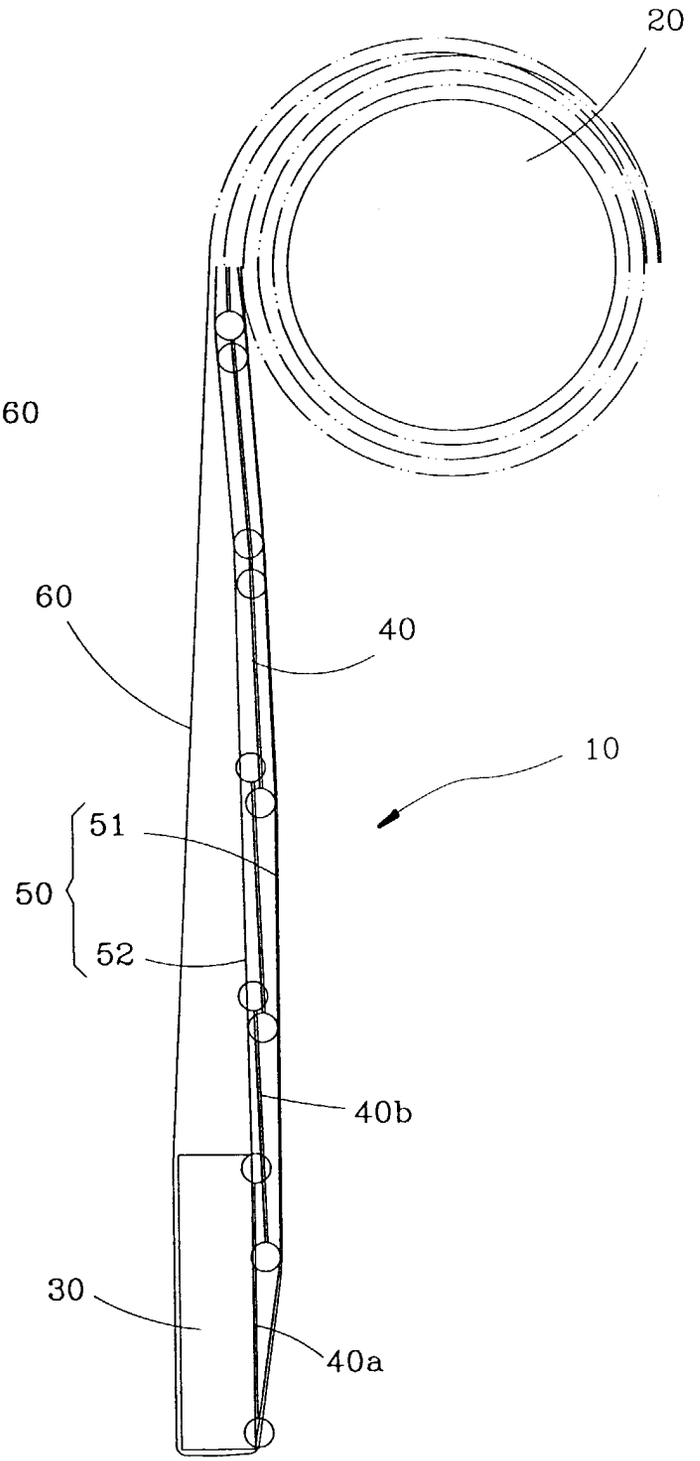


FIG.5

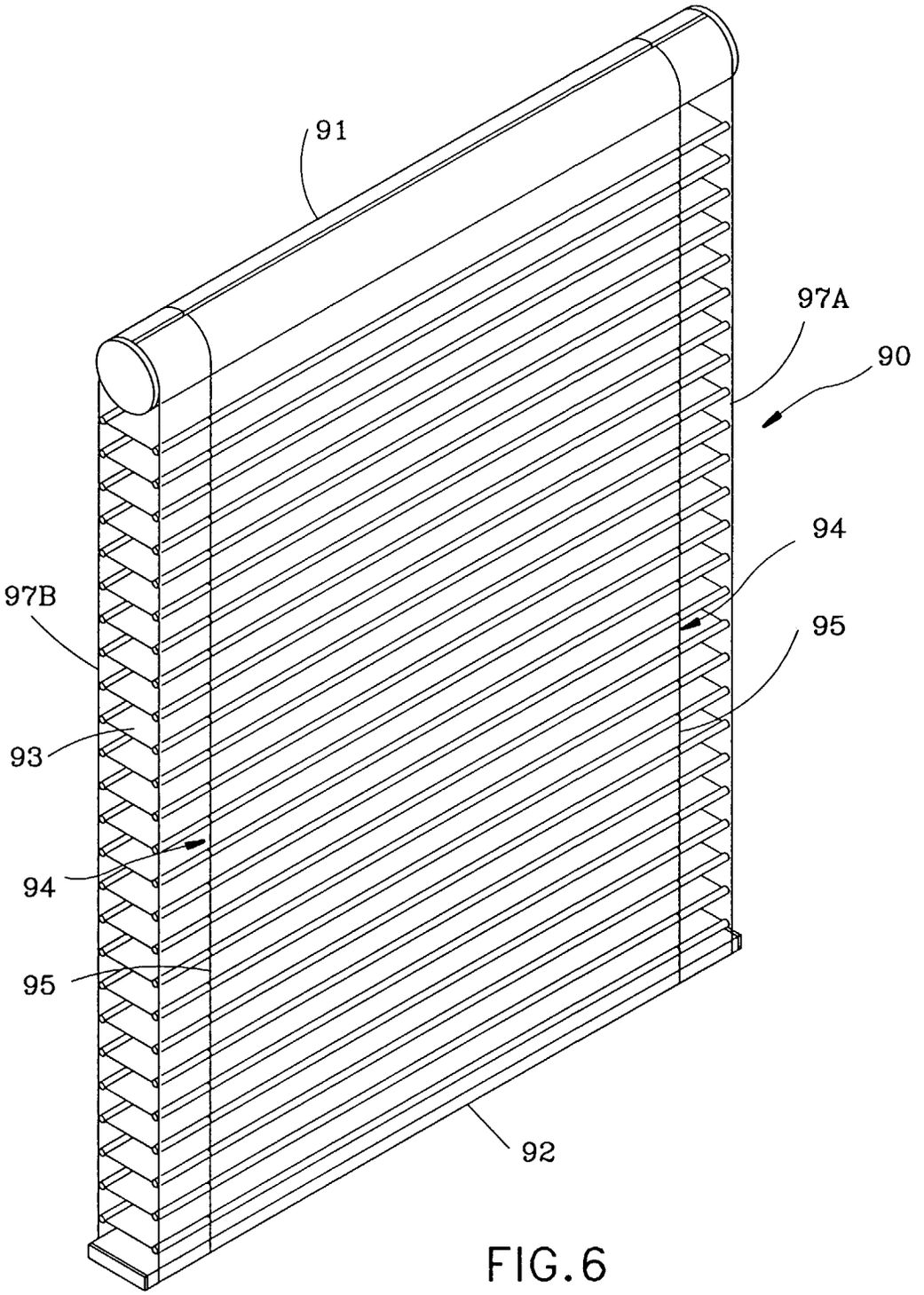


FIG.6

PRIOR ART

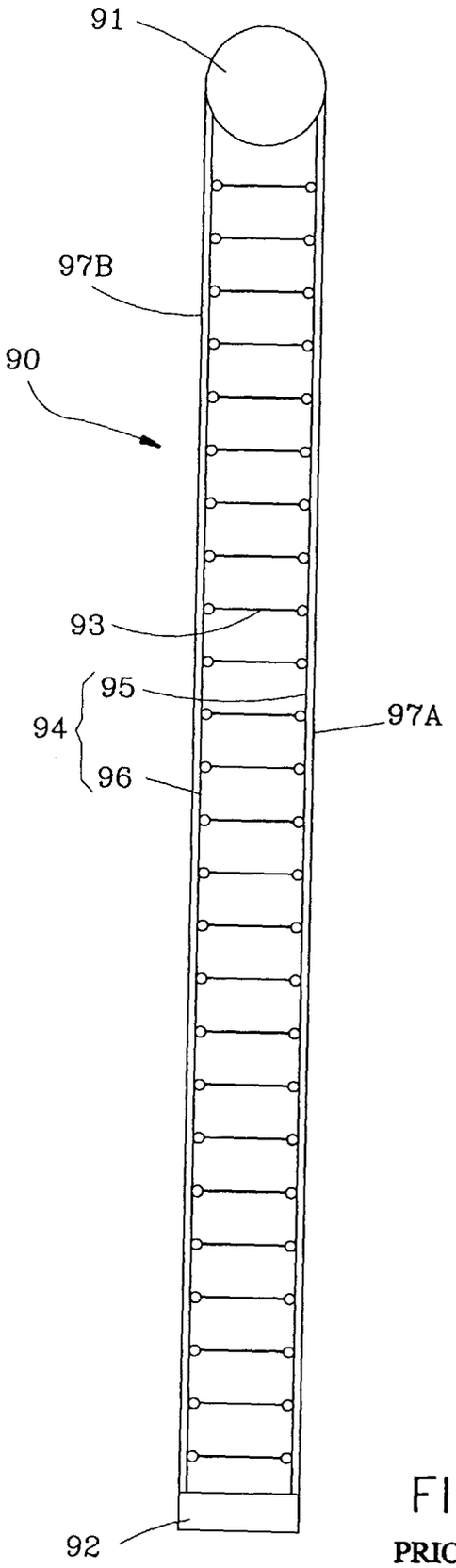


FIG.7

PRIOR ART

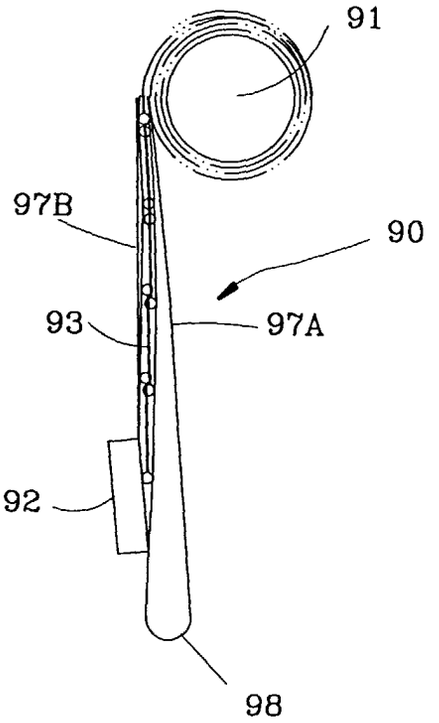


FIG.8

PRIOR ART

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 0286

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.7)
D,A	US 5 419 385 A (VOGEL DAVID ET AL) 30 May 1995 (1995-05-30) * column 7, line 1-20; figures 14,15 * ---	1-7	E06B9/34
A	US 6 189 592 B1 (DOMEL DOUGLAS R) 20 February 2001 (2001-02-20) * abstract; figure 1 * -----	1-7	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	21 July 2003	Kofoed, P

CATEGORY OF CITED DOCUMENTS

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21-07-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5419385 A	30-05-1995	CA 2128801 A1	30-01-1995
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82