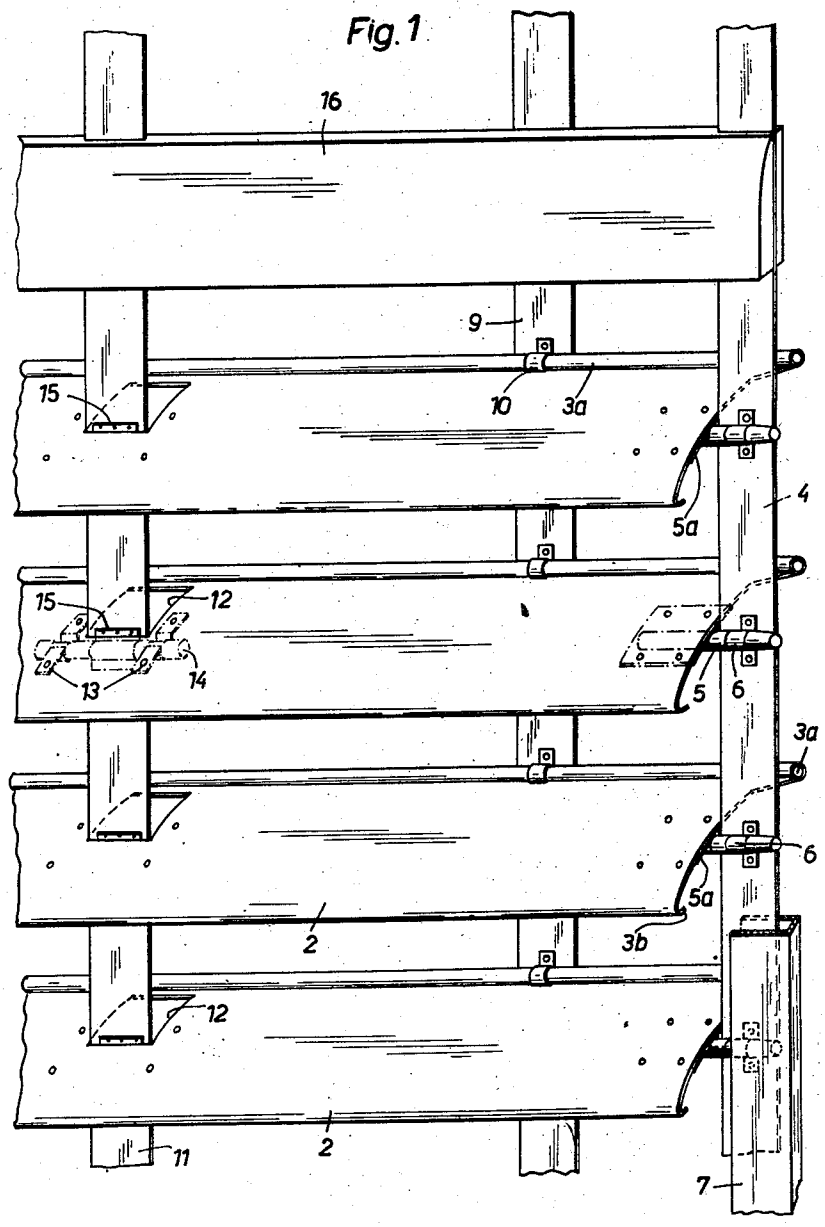
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VENETIAN BLIND

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Fig. 1



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Fig. 2

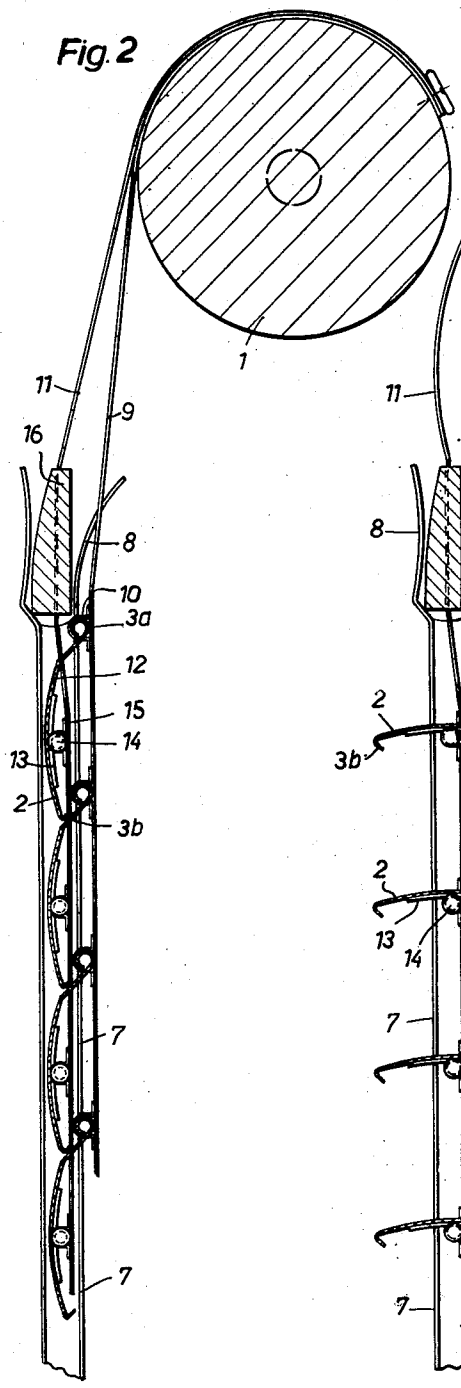
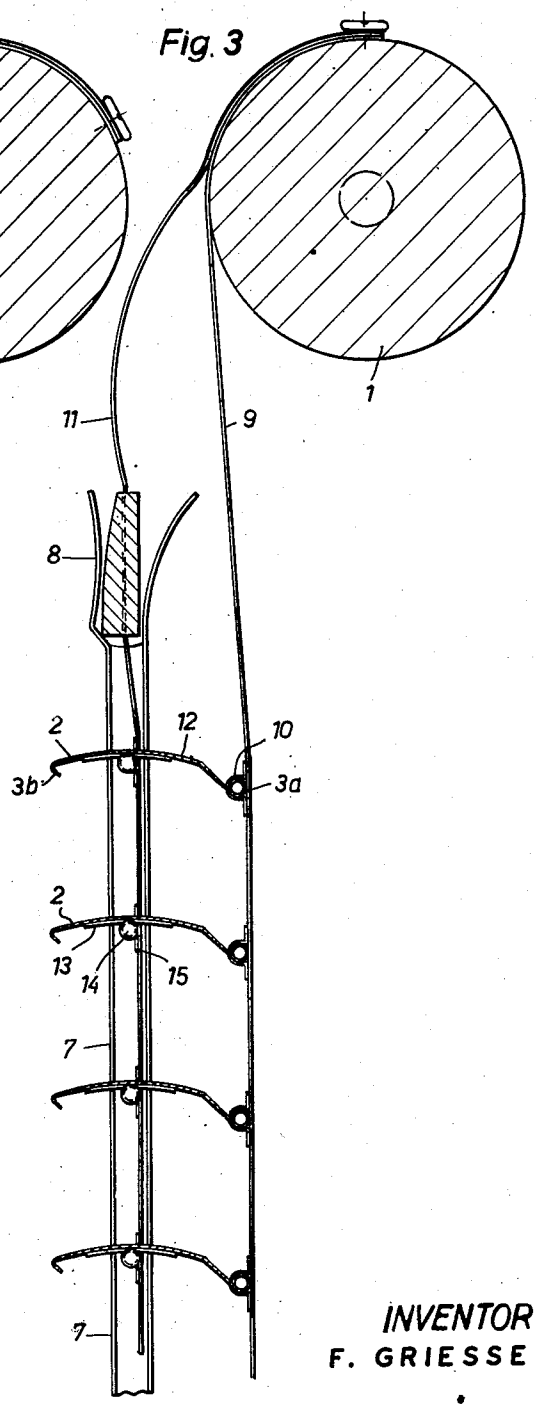


Fig. 3



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VENETIAN BLIND

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4 Claims. (Cl. 160—133)

The present invention relates to a Venetian blind of the type having a plurality of slats pivotally connected with their ends to guiding tapes suspended from a winding shaft and adapted to be wound on or unwound from said winding shaft, the slats being in addition thereto, articulated with their one longitudinal rim to at least one further tape secured to the winding shaft. Thereby the arrangement is such that when the Venetian blind is completely lowered a further rotation of the winding shaft in the direction of lowering the blind results in the slats articulated to said further tape being tilted into their open position about their connections at the guiding tapes.

Ordinarily two such further tapes will be provided one near each end of the slats.

In practice it has been found that particularly in the case of large blinds the slats suspended only at their ends tend to flex when the blind is lowered. The prime object of the present invention is to avoid this disadvantage.

For this purpose in accordance with the present invention a Venetian blind of the described type is characterized in that the slats are articulated with their longitudinal middle portion to at least a supporting tape extending through cut-outs in the slats and secured to the winding shaft so as to be windable on the latter together with the guiding tapes.

Preferably a transverse member arranged above the uppermost slat is anchored to the supporting tape and to the guiding tapes and may be wound onto the winding shaft together with the slats, this transverse member, when the blind is lowered, holding over the supporting tapes the middle portion of the slats at equal level with the ends of the slats held by the guiding tapes.

Other features and advantages of the invention will become apparent from the description now to follow of a preferred embodiment thereof given by way of example and in which reference will be made to the accompanying drawings, in which:

Fig. 1 is a perspective view of a portion of a Venetian blind with the slats tilted into open position,

Fig. 2 is a vertical longitudinal section showing a portion of the Venetian blind with the slats tilted into their closed position, and

Fig. 3 is a section similar to the one of Fig. 2 but with the slats in open position.

In the drawing reference numeral **1** designates the winding shaft of the Venetian blind. One end of this shaft is provided with a not represented winding drum from which is suspended in a known way per se a pull tape, or which carries a toothed rim engaging a manually actuatable gear.

The represented Venetian blind comprises a plurality of slats **2** made for example of sheet metal and having a slightly vaulted profile. The slats **2** are upwardly bordered at their inner rim to constitute an upwardly bent bead **3***a* while the outer longitudinal rim **3***b* of the slats is bent downwardly. The slats **2** have their front

ends pivotally connected each with a guiding tape **4** (Fig. 1) made of steel or the like. For this purpose a pin **5** is provided at each narrow end of the slats and connected thereto by means of a flange **5***a*. This flange **5***a* extends over the larger part of the breadth of the slat and serves simultaneously for stiffening and thereby reinforcing the latter. According to Fig. 1 the pin **5** is inserted into an eye **6** made of a piece of sheet metal having flanges secured by spot welding or by riveting to the guiding tape. The flange **5***a* may be a correspondingly bent sheet metal piece into which is inserted the pin **5**. Of course the flange and the pin could also be made of one piece by press-casting.

The two guiding tapes **4**, to which all slats **2** are pivotally mounted, extend laterally of the slats and are guided in lateral guiding rails **7**. The upper ends of the tapes **4** are secured to the winding shaft and are adapted to be wound on or unwound therefrom together with the slats **2**. A not represented end rail is secured to the lower ends of the tapes **4**.

The upper ends **8** of the rails **7** are somewhat widened as visible from Figures 2 and 3 and the reason for this widening shall be explained in detail hereafter.

Two further steel tapes **9** are also secured to the winding shaft **1**. To these tapes **9** the slats **2** are articulated with their inward longitudinal rims. For this purpose a recess is provided within the bead **3***a* of the slat **2** in the zone of the ends of the slats and this recess has approximately the width of an eye **10** which in a similar way as the eye **6** is welded or riveted to the steel tape **9**. The bead **3***a* of the slats **2** thereby constitutes a bearing pin rotatable in the eye **10**.

As is visible from Fig. 1 the tapes **4** and also the tapes **9** are throughgoing and do not for securing the eyes **6** necessitate slots which would weaken the tapes. Moreover the manufacturing of such tapes and the fixation of the eyes is very simple and cheap. It is also possible to make the tape from one piece with the associated eyes.

In the longitudinal middle line of the Venetian blind the slats **2** are suspended from a further steel tape **11**. For this purpose the slats are provided with rectangular cut-outs **12** through which this additional supporting tape **11** passes. The cut-outs **12** are arranged in such a way that their edge which in longitudinal direction is nearer to the slat rim **3***b* extends approximately through the longitudinal middle line of the slat. A pin **14** is secured by means of a pair of eyes **13** to the under side of each slat **2** so as to extend parallelly to and in the proximity of said edge of the cut-out. The pin **14** carries a further eye **15** having flanges secured for example by spot welding to the supporting tape **11**. It results from this arrangement that each slat **2** is articulated with its middle portion to the supporting tape **11** and the cut-outs **12** are chosen of such dimension that the tilting of the slats is not hindered.

A transverse member **16** is arranged above the uppermost slat **2** and this member **16** is anchored as well to the supporting tape **11** as also to the pair of guiding tapes **4**. When the Venetian blind is raised this transverse member **16** is wound on the winding shaft **1** to which the supporting tape **11** is secured in the same manner as are the slats **2**. The supporting tape **11** and the transverse member **16** guarantees that the middle portion and the ends of the slats are always at the same level when the blind is lowered and thus that the distance separating the slats **2** is the same over the whole length thereof. An undesired flexing of the slats under the action of their proper weight is thus efficaciously prevented. In the case of large Venetian blinds it is of course also possible to provide several such supporting tapes **11** equally distributed over the middle portion of the slats.

If the winding shaft **1** is rotated in the sense of lowering the Venetian blind (in a counterclockwise direction in Figs. 2 and 3) the tapes **4**, **9** and **11** are unwound from the winding shaft. Thereby the slats are in the closed position shown in Fig. 2. When the Venetian blind is completely lowered the transverse member **16** lies with its ends in the widened portion **8** of the guiding rails **7**. If in this position of the elements the winding shaft **1** is further rotated in the same direction the slats are tilted by the further unwinding tapes **9** about their articulation on the tapes **4** and **11** into their open position shown in Fig. 3. As the transverse member **16** anchored to the tapes **4** and **11** is supported in the widened portion **8** of the guiding rail **7** the tapes **4** and **11** which also are further unwound by the rotation of shaft **1** do not cause a further lowering of the slats **2**.

I claim:

1. A Venetian blind comprising a winding shaft, a pair of guiding tapes and at least one further tape suspended from said shaft and adapted to be wound on to and unwound from said shaft for raising and lowering the blind, a plurality of slats the ends of which are pivotally connected to said guiding tapes and one of the longitudinal edges of which is pivotally connected to said further tape, said slats having cut-outs therein, at least one supporting tape also suspended from the winding shaft between said guiding tapes and adapted to be wound thereon and unwound therefrom together with the guiding tapes, said supporting tape extending through the cut-outs in said slats and being articulated along their longitudinal middle axis to said supporting tape, a transverse member arranged above the uppermost slat and anchored to said supporting tape and to said guiding tapes, said transverse member being windable on the winding shaft together with the slats, a pair of guiding rails for the guiding tapes and abutting means in said guiding rails serving as abutments for the said transverse member in the lowered position of the blind.

2. A Venetian blind comprising a winding shaft, a pair of guiding tapes and at least one further tape suspended from said shaft and adapted to be wound onto and unwound from said shaft for raising and lowering the blind, a plurality of cambered slats the ends of which are pivotally connected to said guiding tapes and one of the longitudinal edges of which is pivotally connected to said further tape, said slats having rectangular cut-outs therein extending approximately from the longitudinal middle axis of a slat to the said one longitudinal edge thereof and having an edge extending parallel to and near the longitudinal middle axis of the slat, at least one single ply supporting tape also suspended from the winding

shaft between said guiding tapes and adapted to be wound thereon and unwound therefrom together with the guiding tapes, said supporting tape extending through the cut-outs in said slats, a bearing pin anchored to the under side of each slat in proximity of said cut-out edge, and an eye on said supporting tape and cooperating with said pin for articulating the slats along their longitudinal middle axis to said supporting tape.

3. A Venetian blind comprising a winding shaft, a pair of guiding tapes and at least one further tape suspended from said shaft and adapted to be wound onto and unwound from said shaft, for raising and lowering the blind, a plurality of chambered slats the ends of which are pivotally connected to said guiding tapes and one of the longitudinal edges of which is pivotally connected to said further tape, said slats having rectangular cut-outs therein extending approximately from the longitudinal middle axis of a slat to the said one longitudinal edge thereof and having an edge extending parallel to and near the longitudinal middle axis of the slat, at least one single ply supporting tape also suspended from the winding shaft between said guiding tapes and adapted to be wound thereon and unwound therefrom together with the guiding tapes, said supporting tape extending through the cut-outs in said slats, a bearing pin anchored to the under side of each slat in proximity of said cut-out edge, an eye on said supporting tape and cooperating with said pin for articulating the slats along their longitudinal middle axis to said supporting tape, a transverse member arranged above the uppermost slat and anchored to the supporting tape and to the guiding tapes, said transverse member being windable on the winding shaft together with the slats, a pair of guiding rails for the guiding tapes and abutting means in said guiding rails serving as abutments for the said transverse member in the lowered position of the blind.

4. A Venetian blind as claimed in claim 3 in which the said one longitudinal edge of said slats is upwardly bordered to provide a bead, said bead having a slot therein, an eye on said further tape extending through said slot said bead of the slat for articulating the slat by said one of its longitudinal edge to said further tape.

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