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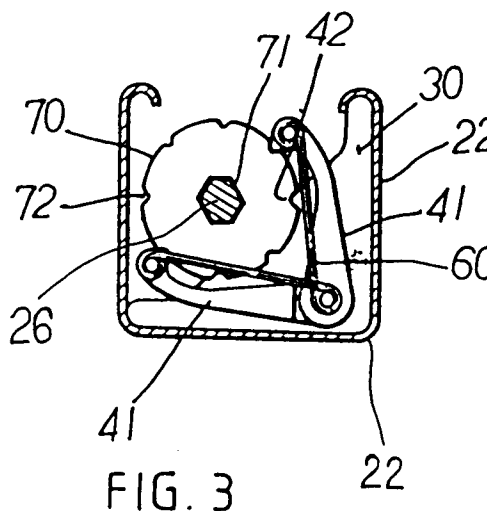
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I-20159 Milano (IT)(54) **Tilting mechanism for vertical or venetian blind.**

(57) A tilting device for a vertical or venetian blind, including two bases (30) fitted in an upper frame (22) of the blind, a pair of clamping claws (41) pivoted to the bases and restricted by a resilient member (60), and a stopper (70) fitted to a rotary shaft (26) of the blind, the stopper being formed with multiple flutes (72) and the clamping claw being formed with a projection (42) suitable to engage with the flutes for restricting the stopper and the rotary shaft from rotating; alternatively, a resilient member (90) can be fitted to a base fixed in the upper frame (22), the resilient member having a projection (91) suitable to engage with the flutes (12) of a stopper (10) to prevent the stopper and the rotary shaft (26) from rotating and thus fix the angle of the blind slats.

**FIG. 3****EP 0 548 442 A1**

The present invention relates to a device for controlling and effectively fixing the angle of slats of a vertical or venetian blind.

In conventional blinds (including vertical and venetian blinds, exemplified here by a venetian blind 20 as shown in Fig. 12), an adjusting device 23 and a rotary shaft 26 fitted with a series of ladder ropes 24 and rotary wheel 25 are mounted on an upper frame 22, for adjusting the angle of the blind slats 21. The adjusting device 23 is used to control the rotation of the rotary shaft 26 which further drives the rotary wheels 25 to incline the ladder rope 24. Consequently, the slats 21 are inclined along therewith. Such structure can achieve the object of adjustment of slat.

However, a shortcoming exists therein as follows.

The adjusting device 23 through a coil rod drives the gear arranged on the rotary shaft 26 so as to rotate the rotary shaft 26. Because a clearance exists between the coil rod and the gear, the rotary shaft 26 will sometimes idle. In addition, the diameter of the rotary wheel is larger than that of the rotary shaft 24 so that when the rotary shaft 26 rotates through a small angle, the periphery of the rotary wheel 25 will travel through a long arc to cause a large displacement of the ladder rope 24 and thus make the slats 21 rotate through a certain angle.

Therefore, when blown by air flow or suffering external force, the already adjusted slats might further rotate and the angle thereof will therefore change.

Therefore, a blind with a fixable rotary shaft is needed to eliminate the above shortcoming.

It is an object of this invention to provide an angle-fixing device for fixing the angle of the slats of a blind, wherein a pair of clamping claws restricted by a pair of resilient members are pivoted to two bases placed in the upper frame of the blind, and a stopper formed with even number of flutes arranged at equal interval is fitted on the rotary shaft whereby a projection of the clamping claw can engage with the flute of the stopper so as to restrict the stopper from moving. As a consequence, the rotary shaft is prevented from rotating and thus the angle of the slats can be fixed.

In the drawings:

- Fig. 1 is a perspective exploded view of a first embodiment of this invention;
- Fig. 2 shows the assembling relation between the first embodiment and the upper frame;
- Fig. 3 is a cross-sectional view of the assembly of this invention and the upper frame;
- Fig. 4 shows the engagement between the stopper and the projection of the clamping claw of this invention;

- Fig. 5 shows a second embodiment of this invention;
- Fig. 6 shows the assembling relation between the second embodiment and the upper frame;
- Fig. 7 shows the engagement between the stopper and the projection of the elastic member of this invention;
- Fig. 8 is a perspective view, showing the assembly of the second embodiment of this invention;
- Fig. 9 is a side view according to Fig. 8;
- Fig. 10 is a perspective exploded view of a third embodiment of this invention;
- Fig. 11 is a sectional view according to Fig. 10; and
- Fig. 12 is a perspective view of a conventional venetian blind.

Please refer to Figs. 1 and 2. The first embodiment of this invention includes two bases 30, a clamping device 40, a shaft rod 50, a stopper 70 and resilient members 60, wherein each base 30 is substantially triangular, suitable to be disposed in an upper frame of a blind with its two sides containing a right angle abutting against the bottom wall and front/rear wall of the upper frame. The base 30 is formed with a shaft hole 31 and a check flange 32 is disposed at one end of the shaft hole 31.

The clamping device includes two clamping claws 41 pivoted to the bases 30 by the shaft rods 50. Two projections 42 are formed respectively at upper edges of the clamping claws 41. On two sides of the projection 42 are disposed stopping rods 43.

The resilient members 60 are fitted to the stopping rods 43 to force the two clamping claws 41 to tend to move toward each other.

The stopper 70 has an axial through hole 71 corresponding to a rotary shaft 26 disposed in the upper frame 22. (Please refer to Fig. 3). The periphery of the stopper 70 is formed with several pairs of flutes 72 suitable to engage with the projections 42 of the clamping claws 40 for restricting the stopper 70 from rotating.

The shaft rods 50 are prevented from slipping out of the shaft holes 31 of the bases 30 by means of the check flanges 32 so that the bases 30, clamping claws 40 and resilient members 60 can be firmly associated together. The stopper 70 is fitted to the rotary shaft 26 whereby when the projection 42 is engaged with the flute 72 thereof by means of the elasticity of the resilient member 60, the rotary shaft 26 is fixed without improper movement.

As shown in Figs. 2 and 3, when an operator operates an adjusting device of the blind, since the torque exerted by the operator on the rotary shaft

26 is larger than the elastic force of the resilient member 60, the stopper 70 can push away the clamping claws 41 and rotate along with the adjusting device and rotary shaft 26. Therefore, the adjustment of angle of the slats will not be ill affected.

After the angle of the slats is properly adjusted, the projections 42 of the clamping claws 41 will enter the flutes 72 of the stopper 70 to be secured therein for preventing the stopper 70 from rotating.

As a result, when the blind is blown by air flow or suffers external force, the rotary shaft 26 will not rotate and thus the ladder rope is kept still and the angle of the slats remains unchanged.

Please now refer to Fig. 4, which shows a second embodiment of this invention, wherein the projection 42 is located at a middle portion of the clamping claw 41 and the resilient member 60 is fitted to the stopping rod 43. The resilient member 60 can be a V-shaped torque spring or an extensile spring.

Referring to Figs. 5 and 6, a third embodiment of this invention is shown therein. The third embodiment includes a base 80, a resilient member 90 and a stopper 10, wherein the base 80 is C-shaped, suitable to be placed into the upper frame 22 of the blind. A T-shaped insert groove 81 is defined in the C-shaped base 80.

The resilient member 90 can be a steel-made leaf spring having a middle projection 91 which has an arched top portion. The middle projection 91 is elastic and suitable to be recoverably pressed down.

The stopper 10 has a through hole 11 corresponding to the rotary shaft 26. The periphery of the stopper 10 is formed with multiple axial flutes 12 suitable to engage with the projection 91 of the resilient member 90.

The base 80 can be secured in the upper frame 22 as shown in Fig. 7 with the resilient member 90 fitted in the insert groove 81 thereof. The stopper 10 is fitted to the rotary shaft 26 whereby when the projection 91 of the resilient member 90 enters the flute 12 of the stopper 10, the stopper 10 is restricted from rotating or the stopper 10 can rotate and urge the projection 91 to elastically displace upward or downward.

The base 80 can be associated with the adjusting device 23 as shown in Figs. 8 and 9. Alternatively, the base 80 can be integrally formed on the adjusting device 23 and the stopper 10 can be provided with a laterally extending gear 13 which extends into the adjusting device 23, serving as a driving member thereof as shown in Figs. 10 and 11.

It should be noted that any modification of these embodiments should fall within the scope of this invention.

Claims

1. An angle-fixing device for vertical or venetian blind, said angle-fixing device being fitted in an upper frame (22) of the blind and associated with a rotary shaft (26) thereof, said angle-fixing device comprising two bases (30) fixed in the upper frame (22), a pair of clamping claws (41) pivoted to said bases by a shaft rod (50), a resilient member (60) connected to upper edges of said clamping claws (41) to make the same tend to move toward each other, a stopper (70) fitted to the rotary shaft (26) and formed with even number of flutes arranged at equal intervals, wherein the upper edges of said clamping claws are formed with projections (42) suitable to engage with said flutes of said stopper so that by means of the elastic force of said resilient member (60), the clamping claws (41) can restrict the stopper (70) from rotating and further prevent the rotary shaft (26) from improper rotating so as to fix an already adjusted angle of slats of the blind.
2. A device as claimed in claim 1, wherein on two sides of the upper edge of the clamping claw are disposed stopping rods (43) on which two ends of said resilient member (60) are hung and fixed.
3. A device as claimed in claim 1 or 2, wherein said projection (42) is located at a middle portion of said clamping claw.
4. A device as claimed in claim 3, wherein said resilient member (60) is a V-shaped torque spring or an extensile spring.
5. An angle-fixing device for vertical or venetian blind, comprising a base (80) fitted in an upper frame (22) of the blind, defining a T-shaped insert groove (81), a resilient member (90) having a middle projection (91) fitted in said insert groove, and a stopper (10) formed with several flutes (12), said stopper being fitted to a rotary shaft (26) of the blind, said projection of said resilient member being suitable to engage with said flutes (12) of said stopper to restrict said stopper from rotating and thus prevent the rotary shaft (26) from improper rotating for keeping an already adjusted angle of slats unchanged.
6. A device as claimed in claim 5, wherein said base is integrally associated with an adjusting device (23) of the blind.

7. A device as claimed in claim 6, wherein said stopper (10) is provided with a laterally extending gear (13) which extends into the adjusting device (23), serving as a driving member thereof.

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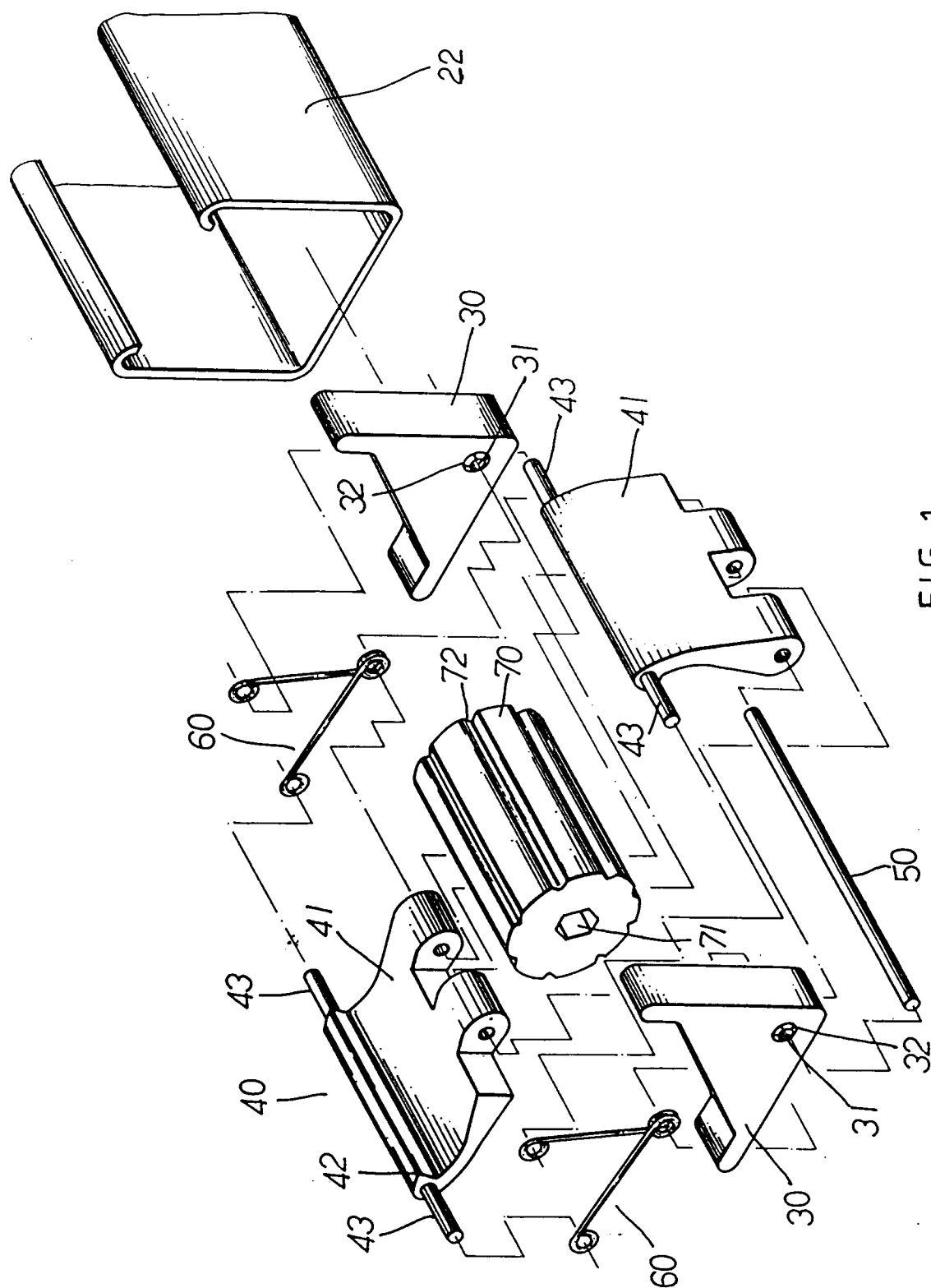
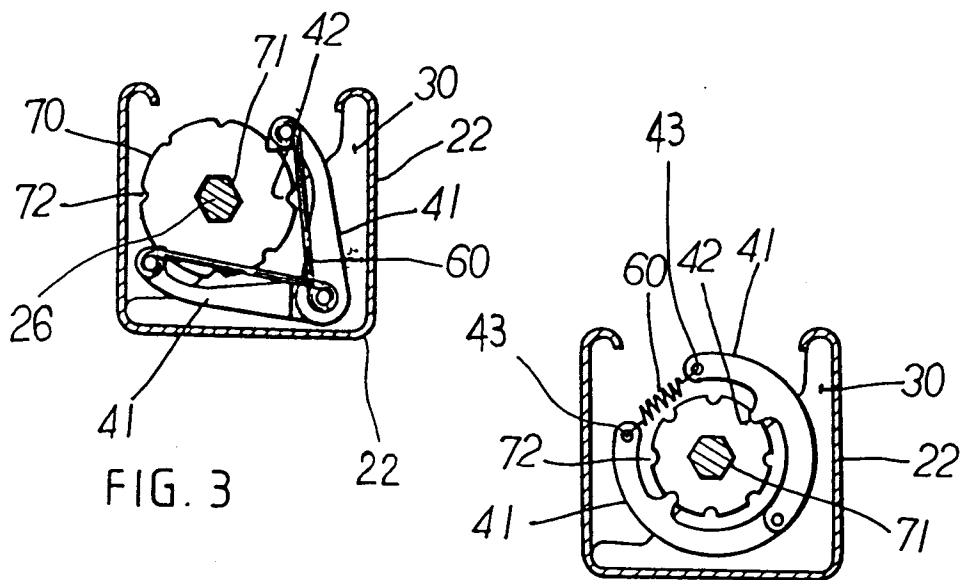
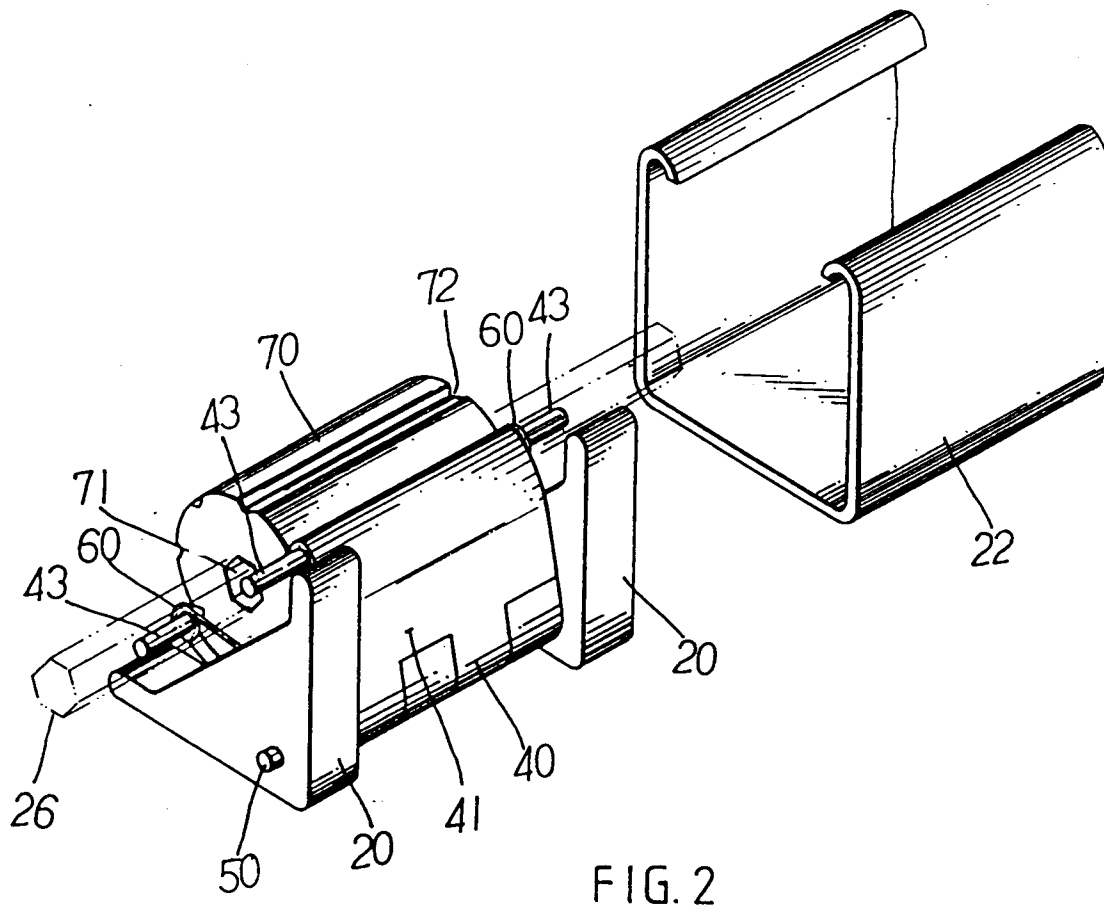


FIG. 1



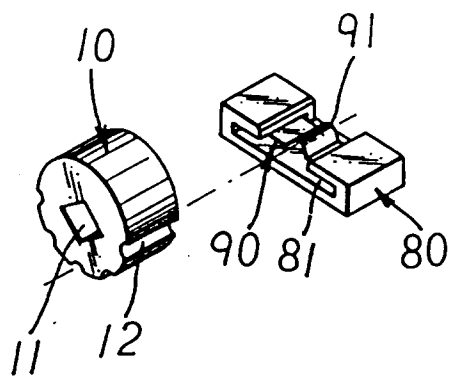


FIG. 5

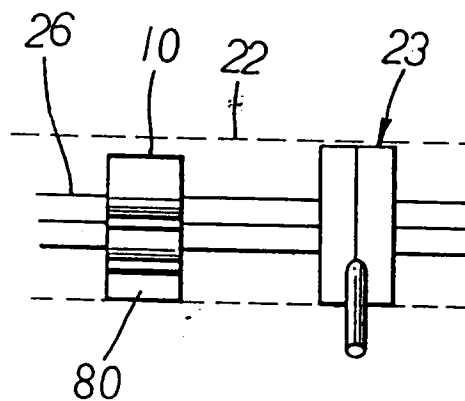


FIG. 6

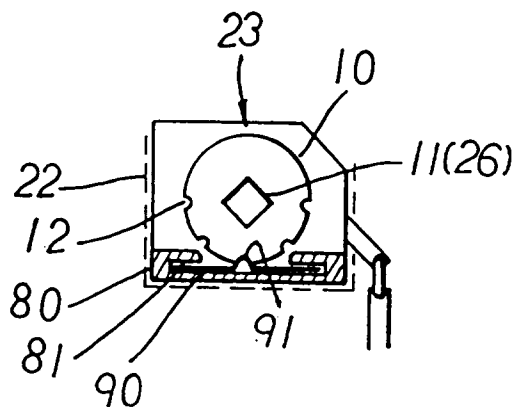


FIG. 7

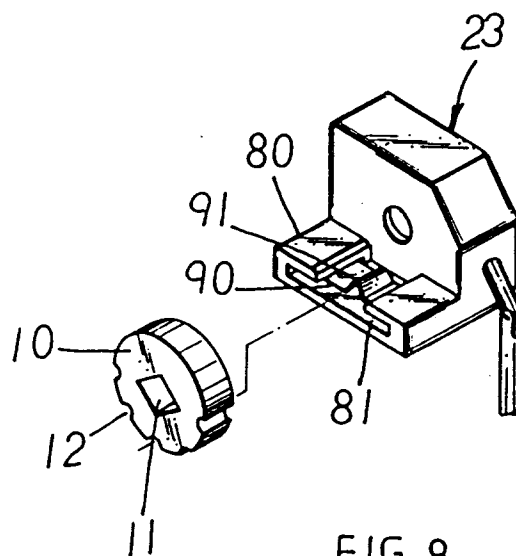


FIG. 8

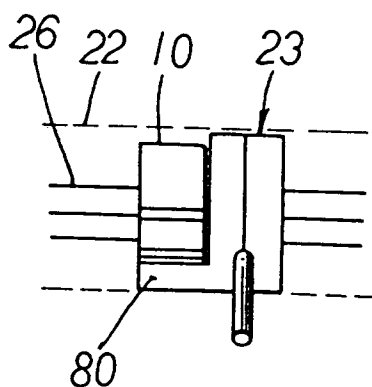
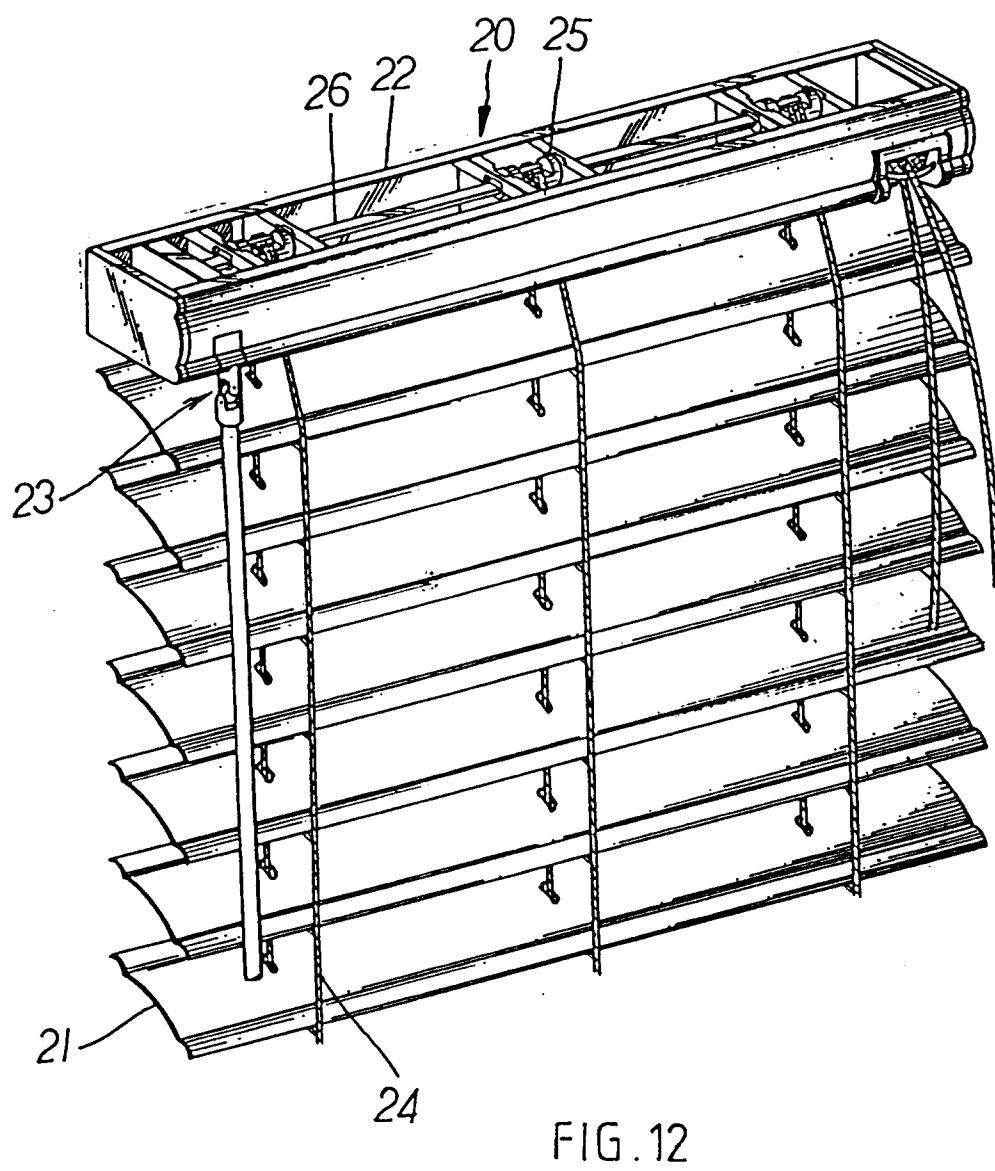
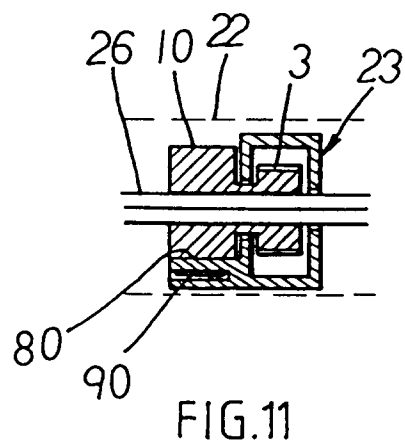
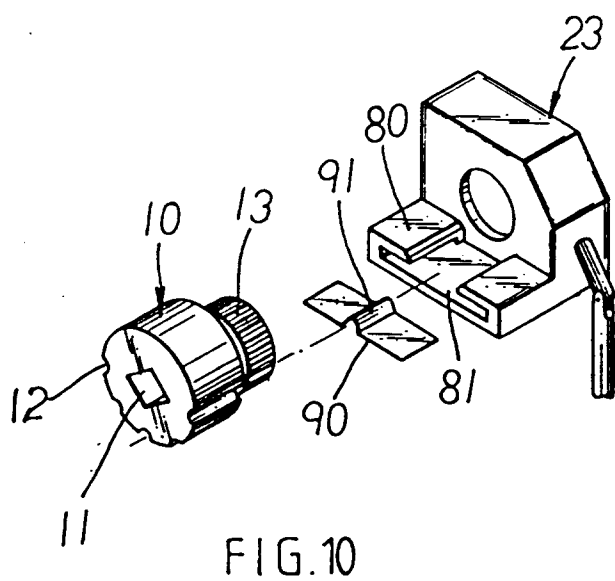


FIG. 9





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EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0468

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	WO-A-8 002 714 (HUNTER DOUGLAS INTERNATIONAL N.V.) * page 7, line 1 - line 19; figures 2,5 *	1	E 06 B 9/307
A	--- US-A-2 015 215 (CAMPBELL) * page 2, left column, line 27 - line 44; figures 1,4 *	1	
A	--- US-A-2 552 956 (GANTER) * column 2, line 44 - column 3, line 14; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 06 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29-06-1992	Examiner KUKIDIS S
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