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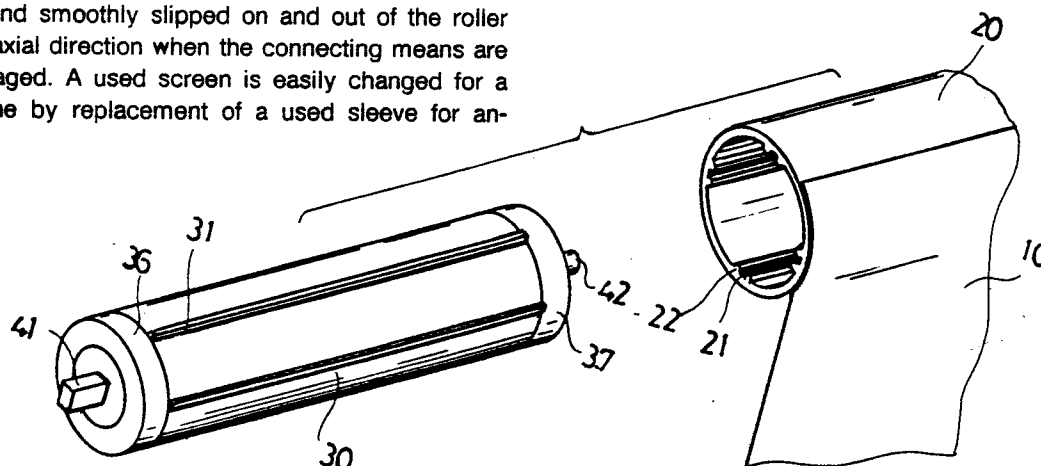
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⑤④ A roll blind provided with an exchangeable sleeve.

⑤⑦ A screen (10) has its upper end permanently fixed to a screen-winding sleeve (20), which is removably mounted on a roller (30) for rotation therewith. The roller is formed on the outer surface with at least an axial projection (31, 33, 34) or groove (32) as one connecting means for coupling engagement with an axial groove (21), slit (23, 24) or projection (22) as the other connecting means, so that the sleeve is rotatable with the roller as one body when the both connecting means are coupled with each other and smoothly slipped on and out of the roller in the axial direction when the connecting means are disengaged. A used screen is easily changed for a new one by replacement of a used sleeve for another.

FIG. 2



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A roll blind provided with an exchangeable sleeve

The present invention relates to a roll blind provided with an exchangeable sleeve to which the upper end of a screen is fixed. The sleeve is removably mounted on a roller rotatably supported by a pair of brackets.

In general, the roll blind has a screen wound on a roller which is rotatably supported by a pair of brackets. The screen has its upper end directly adhered on the surface of the roller by the use of an adhesive or fixed to a bar which is inserted from side to side into the groove or slit in the roller. The used screen is unable to be replaced by a new one, when it is adhered to the roller. The used screen can be substituted for a fresh one when the screen is not adhered to the roller but attached to the bar. However, it is impractical for users to dismount the bar from the roller, remove the used screen from the bar, attach a new screen to the bar and mount the bar in the roller, because it is not always easy to dismount the bar from the roller and attach the new screen to the bar without using such tools as used by roll blind makers.

But, the screen is desirably changeable according to user's preference. Therefore, there is a demand for a roll blind of which the screen can easily be exchanged without special tools.

The present invention as claimed is intended to comply with the demand and provide an roll blind in which a screen is easily changeable. The roll blind comprises a roller of which the opposite ends are rotatably supported by both brackets, a sleeve fitted on the roller for rotation therewith, and a screen of which the upper end is attached to the outer periphery of the sleeve. The roller is formed on the outer periphery thereof with a connecting element, such as an axial groove and an axial projection, for coupling engagement with the other connecting element, such as an axial groove, an axial slit and an axial projection, formed in the inner periphery of the sleeve. In the case of a non-split type sleeve, the inner diameter of the sleeve is slightly larger than the outer diameter of the roller, so that the former is smoothly fitted from side to side on the latter. The split type sleeve can have its inner diameter slightly larger than the outer diameter of the roller to resiliently fit on the roller. At any way, the sleeve is axially slipped on and out of the roller with ease. The both connecting elements can couple each other to rotate the sleeve and the roller as one body. An axial movement of the sleeve relative to the roller is prevented by the connecting elements coupled or an removable stopper provided on the side end of the roller. A variety of screens are previously fixed to the respective sleeves for supply to users.

The advantages offered by the invention are mainly that the screen in the roll blind can be changed without troublesome operations such as removing a used screen against an adhesive and dismounting a bar with a used screen from the roller, and that a variety of screens can be offered separately from the roller of a roll blind. All in all, one can freely change the screen according to his preference.

One way of carrying out the invention is described in detail below with reference to drawings which illustrate specific embodiments, in which:

FIG. 1 is a side view illustrating the side end of the roll blind according to the invention, one side bracket being omitted for the sake of clarity;

FIG. 2 is a pictorial view of the sleeve and the roller of FIG. 1, illustrating the sleeve slipped out of the roller;

FIG. 3 is a front elevational, partly sectional view of the roller equipped with a stopper ring;

FIG. 4 is a view similar to FIG. 1, illustrating another embodiment;

FIG. 5 is a view similar to FIG. 2, illustrating a further embodiment;

FIG. 6 is a pictorial view illustrating the roller provided with a removable end cap as a stopper;

FIG. 7 is a view similar to FIG. 3 of still another embodiment; and

FIG. 8 is a plan view of the embodiment of FIG. 7.

As seen in FIG. 1, a screen 10 is wound on a sleeve 20, which is fitted on a roller 30 rotatably supported by opposite brackets 40. The sleeve 20 is formed on its inner surface with thick portions 22 each being provided with an axial groove 21 as a connecting element. The roller 30 is formed on its outer surface with axial projections 31 as the other connecting element in mesh with the respective axial grooves 21 in the sleeve 20, thereby the roller 30 and the sleeve 20 rotating as one body. The sleeve 20 is made from a synthetic resin material such as vinyl chloride. The roller 30 of metal or synthetic resin has its outer diameter slightly smaller than the inner diameter of the sleeve 20, thereby the latter being smoothly slidable from side to side on the former.

As seen in FIG. 2, the sleeve 20 is formed on its inner periphery with a plurality of radially swelled portions 22 each extending axially from one end to the other end to have an axial groove 21 in the middle thereof. The screen 10 has its upper end adhered to the outer surface of the sleeve 20. A fixed shaft 41 projects from one of the both end caps 36 and 37 mounted on the opposite side ends of the roller 30, a rotary shaft 42 projec-

ting from the other. The rotary shaft 42 is rotatably supported by the bracket of FIG. 1, the fixed shaft being fixedly supported by the other non-illustrated bracket. The roller 30 is formed on its outer periphery with a plurality of the projections 31 disposed between the both end caps 36 and 37 for coupling engagement with the grooves in the inner periphery of the sleeve of FIG. 2. The axial length of the projection 31 is not always similar to but much less than the length of the roller. The sleeve 20 is smoothly slid from side to side on the roller 30, having the grooves 21 guided by the respective projections 31. The sleeve 20 is easily slipped on and off from the roller 30.

As seen in FIG. 3, it is desirable that a stopper ring 35 is removably mounted of the end cap 36 with a set screw to prevent the sleeve 20 from axially sliding on the roller 30 when the both connecting elements of the sleeve and the roller are loosely coupled with each other.

The groove in the sleeve and the projection on the roller are not limitative but exchangeable to each other. As seen in FIG. 4, the groove 32 can be formed in the outer periphery of the roller and the projection 22 can be provided on the inner periphery of the sleeve 20.

As seen in FIG. 5, the sleeve 20 is formed in its opposite end portions with a pair of slits 23, 23 while the roller 30 is provided on the both end caps 36, 37 with two pawls 33, 33 coupling engagement with the respective slits, at least one of the pawls being removable. The sleeve 20 is slipped on the roller 30 to one end cap 37 from the other end cap 36 in which the pawl 33 is removed. Thereafter, the sleeve 20 has been fixed to the roller 30 with the slits 23, 23 in mesh with the pawls 33, 33. The sleeve 20 is somewhat loosely fitted on the roller 30 but surely rotates together with the roller 30 by the virtue of the coupling engagement between the slit 23 and the pawl 33. The sleeve 20 is easily slipped on and off from the roller 30 when the pawl 33 is removed.

As seen in FIG. 6, the end cap 36 is integrally provided with a pawl 33 for coupling engagement with the associated slit 23 in the sleeve 20 when it is removably fixed to the roller 30 by the use of set screws. The end cap 36 is dismounted from and mounted on whenever the screen is changed.

As seen in FIGS. 7 and 8, the roller 30 has a leaf spring 34 embedded in a groove 38 with an axially enlarged bottom. The leaf spring 34 has its middle part projected radially outwardly from the surface of the roller 30. The sleeve 20 in the form of a split pipe has a split gap 24 resiliently nipping the middle part of the leaf spring 34, thereby rotating with the roller as one body. The sleeve 20 has its inner diameter equal to or slightly smaller than the outer diameter of the roller 30, therefore

the split gap 24 having its intermediate portion smaller than the opposite end portions nipping the leaf spring 34. Though the inner diameter of the sleeve 20 is slightly smaller than the outer diameter of the roller 30, the former is smoothly slipped on and off from the roller 30 from side to side. The reason for this is that the diameter of the sleeve 20 is resiliently expansible and that the leaf spring 34 is easy to sink in the roller 30 when it is pressed.

There are offered a variety of screens of which the upper end is directly adhered to the respective sleeves. One can freely select a new screen integral with a new sleeve from them according to his preference.

The changing operation of a used screen to a new one is easy: it starts from removing the roller from the brackets. Then, pawls and stopper rings are removed from the roller if provided. The used sleeve with the used screen is slid from side to side and slipped off from the roller. Thereafter, the new sleeve with the fresh screen is fitted on the roller and slid from side to side until the both connecting elements are coupled with each other. Then the pawls and the stopper rings are mounted on the roller if provided. Finally, the roller is reset in the brackets.

Claims

1. A roll blind with an exchangeable sleeve comprising a pair of brackets (40), a screen (10), a roller (30) rotatably supported by said brackets for winding up and off said screen, a sleeve (20) removably mounted on said roller for rotation therewith, characterized in that said screen (10) has the upper end thereof fixedly attached to the outer periphery of said sleeve (30) and that said sleeve (20) is provided with one connecting means (21, 22, 23, 24) for coupling engagement with the other connecting means (31, 32, 33, 34) formed on the outer periphery of said roller (30).

2. The roll blind of claim 1, wherein said roller (30) has at least a stopper ring (35) removably fixed to said roller for preventing the axial movement of said sleeve (20) on said roller.

3. The roll blind of claim 1, wherein said one connecting means comprises an axially extending groove (21) in mesh with an axially extending projection (31) as said other connecting means.

4. The roll blind of claim 1, wherein said one connecting means comprises an axially extending projection (22) in mesh with an axially extending groove (32) as said other connecting means.

5. The roll blind of claim 1, wherein said one connecting means comprises an axial slit (23, 24) in mesh with an axial projection (33, 34) as said other connecting means.

6. The roll blind of claim 5, wherein said axial projection comprises a pawl (33) removably fixed to said roller (30)

7. The roll blind of claim 5, wherein said axial projection comprises a leaf spring (34) embedded in said roller (30).

8. The roll blind of claim 5, wherein said axial slit is a split gap (24) of said sleeve (20) in the form of a split pipe.

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FIG. 1

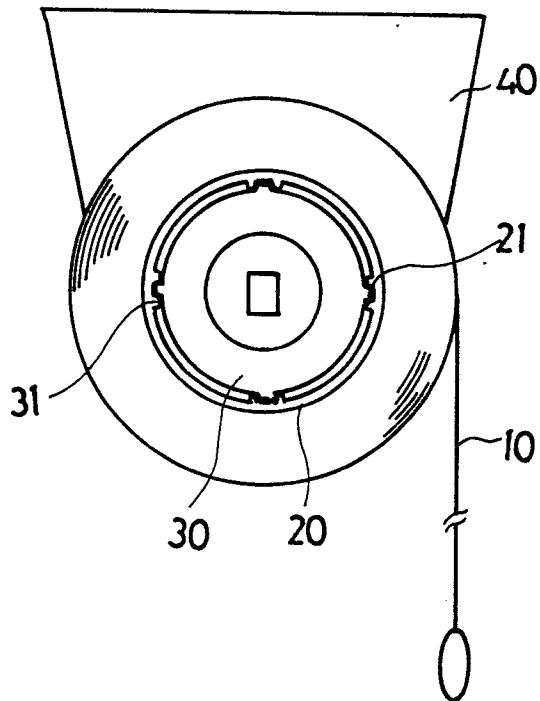


FIG. 3

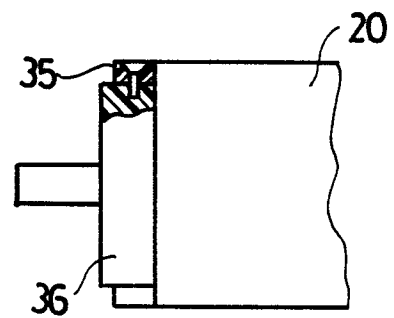
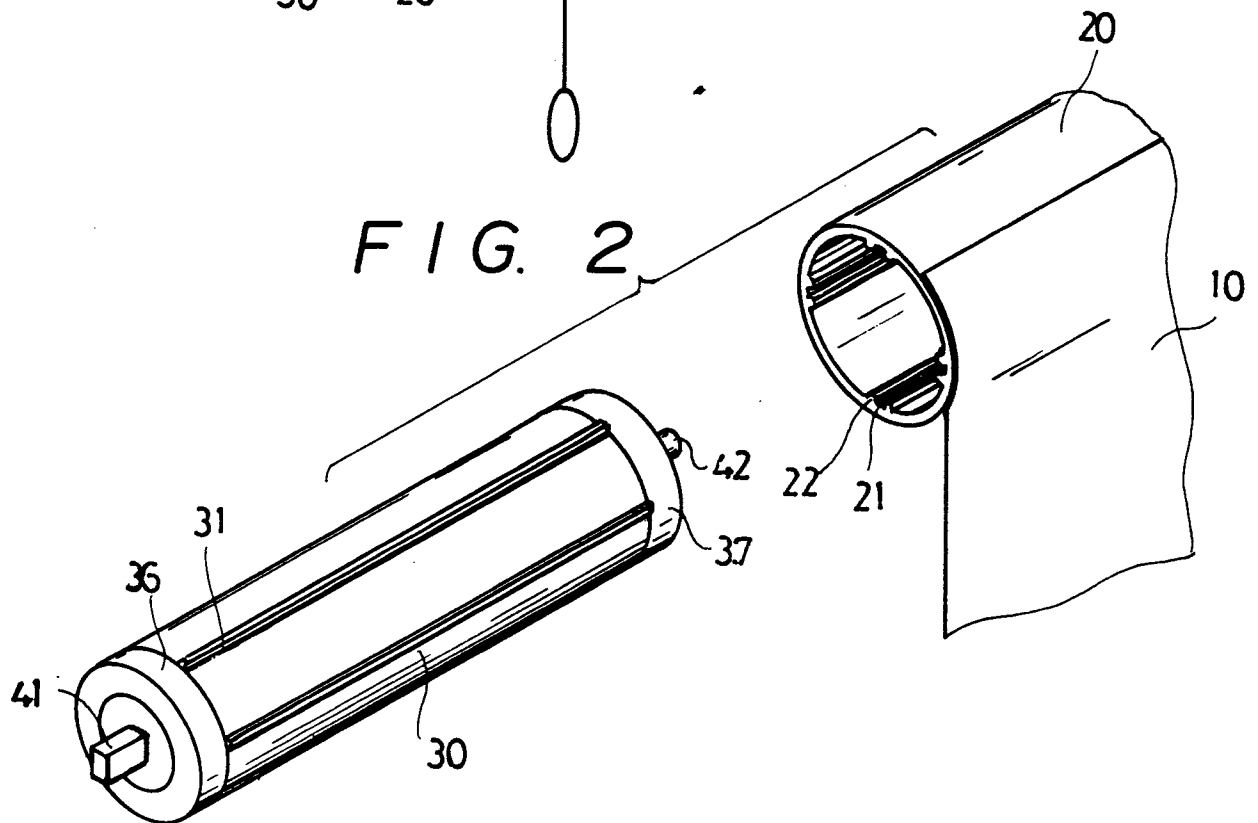


FIG. 2



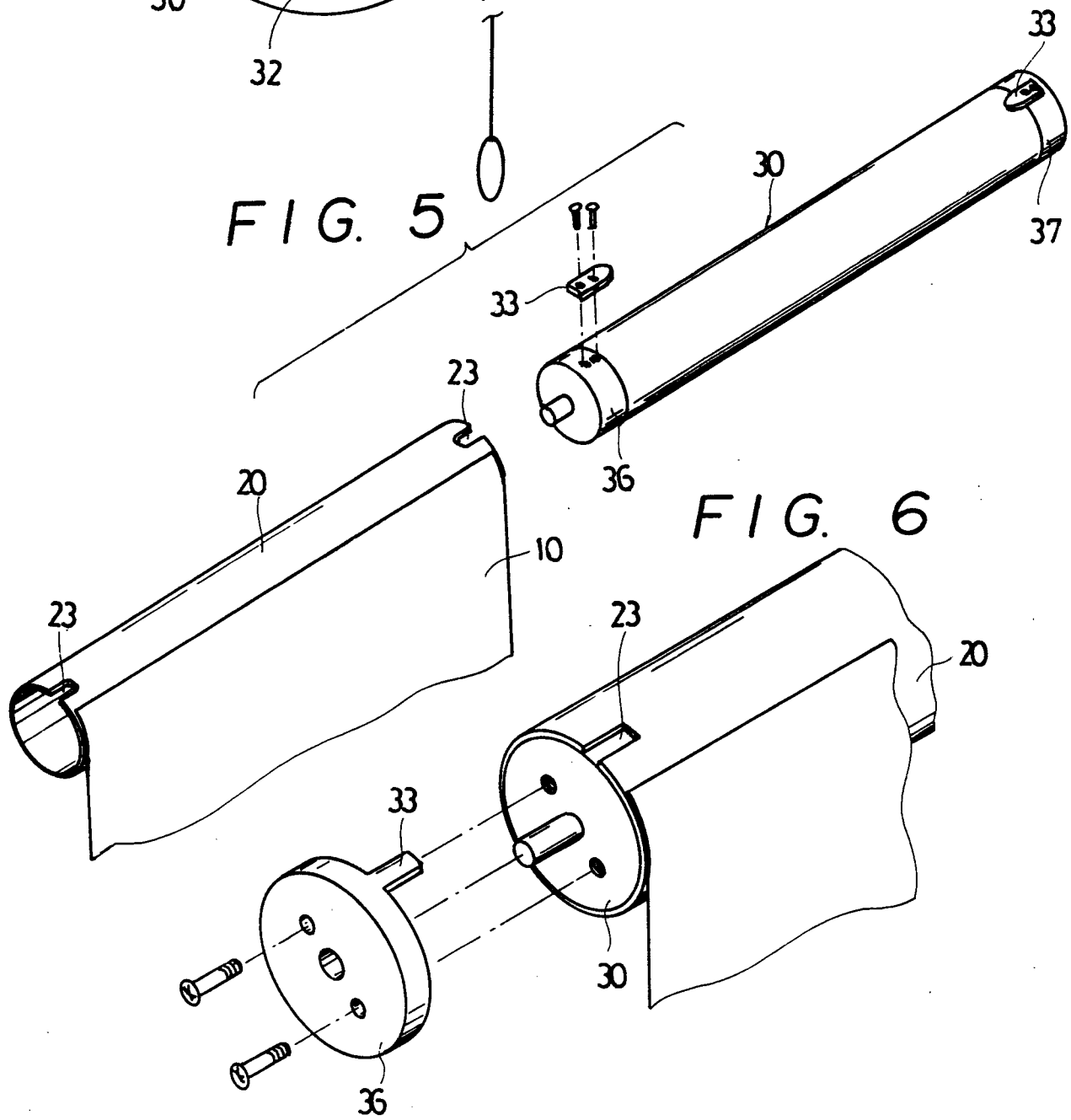
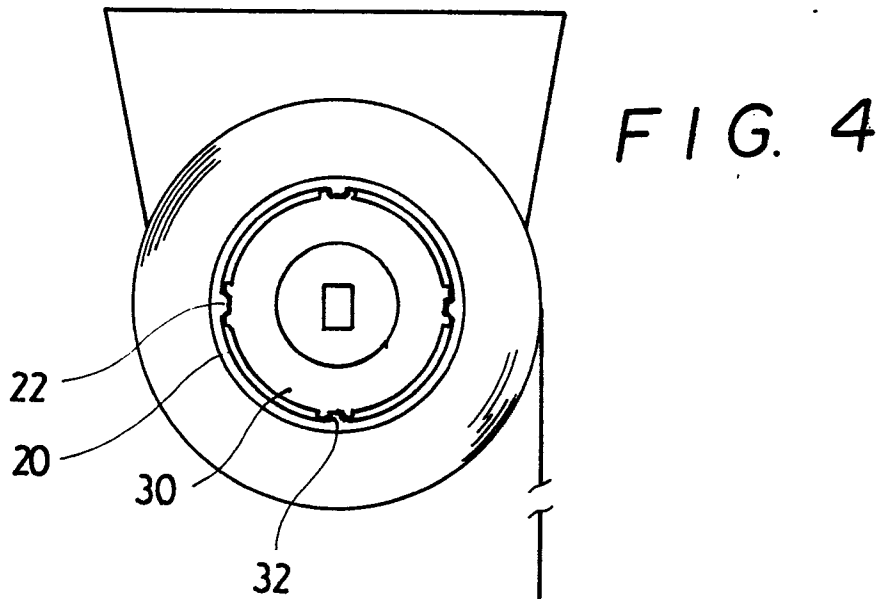


FIG. 7

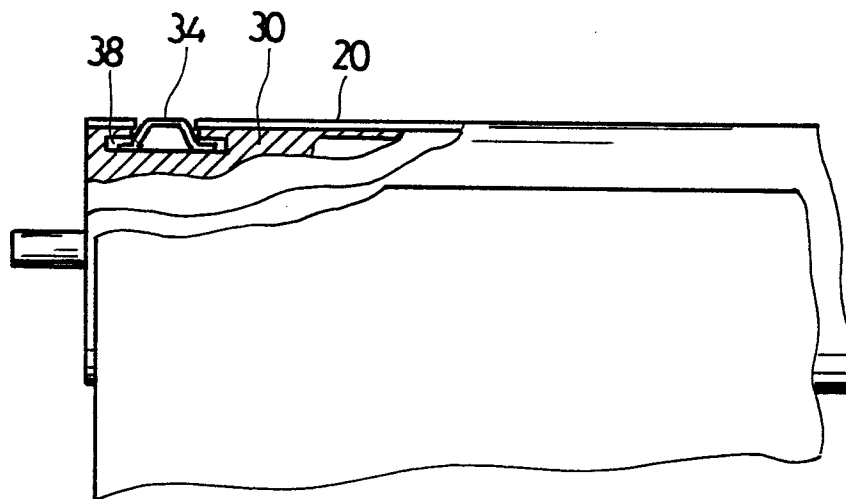
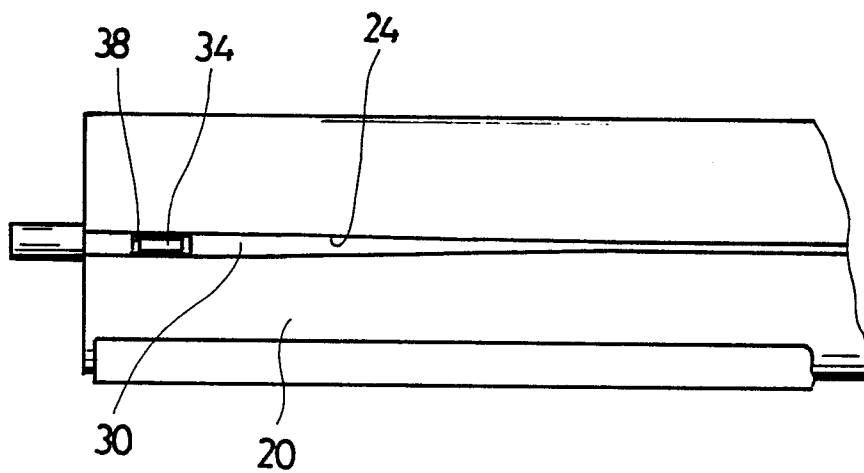


FIG. 8





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. 4)
X	US-A-1 949 356 (COLLINS) * Page 1; figures 1-3 *	1	E 06 B 9/171
A	DE-C- 738 118 (ROTZSCH) * Page 1, lines 40-54; page 2, lines 1-50; figures 1-5 *	2-5	
A	DE-A-1 659 568 (BRENNEMAN)		
A	US-A-3 521 694 (ANDERSON)		
A	US-A-3 308 874 (ANDERSON)		
A	DE-A-3 024 712 (SANDALL)		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			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 17-04-1986	Examiner VIJVERMAN W.C.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	