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(56) Documents Cited

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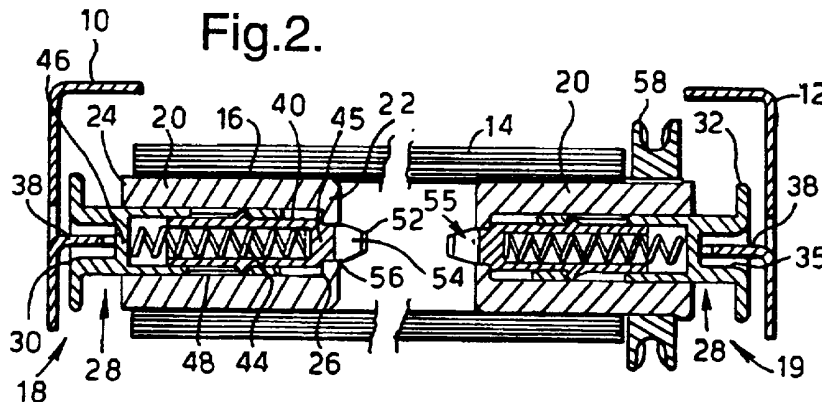
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(54) Abstract Title

END PLUG ASSEMBLY FOR USE IN A ROLLER

(57) An end plug assembly 18, 19 for a roller 16 of a blind or shade 1 comprises of a telescopic member 28 which is inserted into a cylindrical body 20 which in turn is engageable in an end of a roller 16. The telescopic member 28 comprises of two parts, having a first part 30, and a second telescopic part 40. The first part 30 is fixed mounted on a bracket 10 and acts together with the second part 40 as a bearing. A compression spring 44 urges the first part away from the second.



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Fig.1.

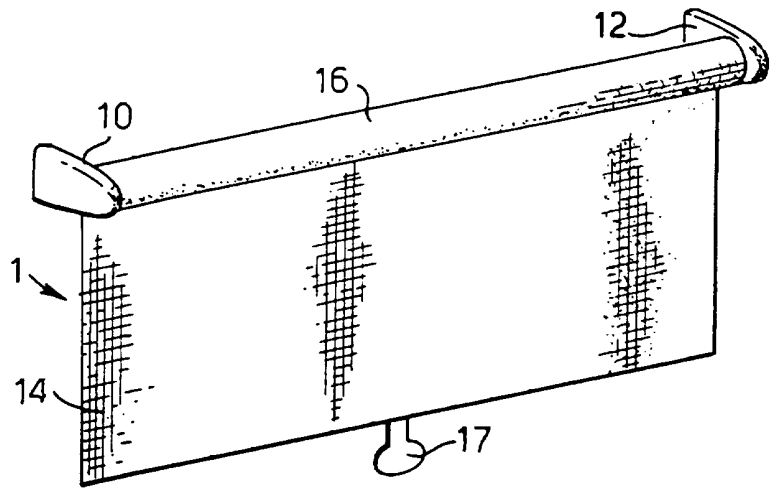


Fig.2.

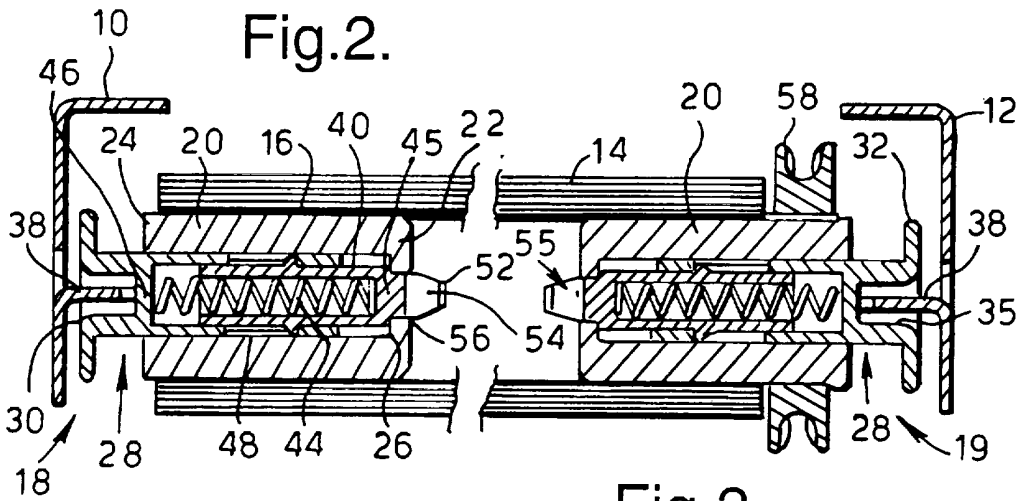


Fig.3.

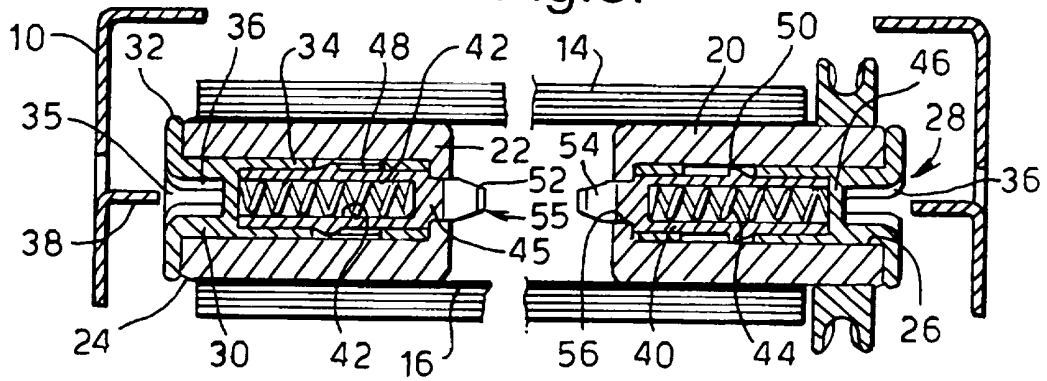


Fig.4.

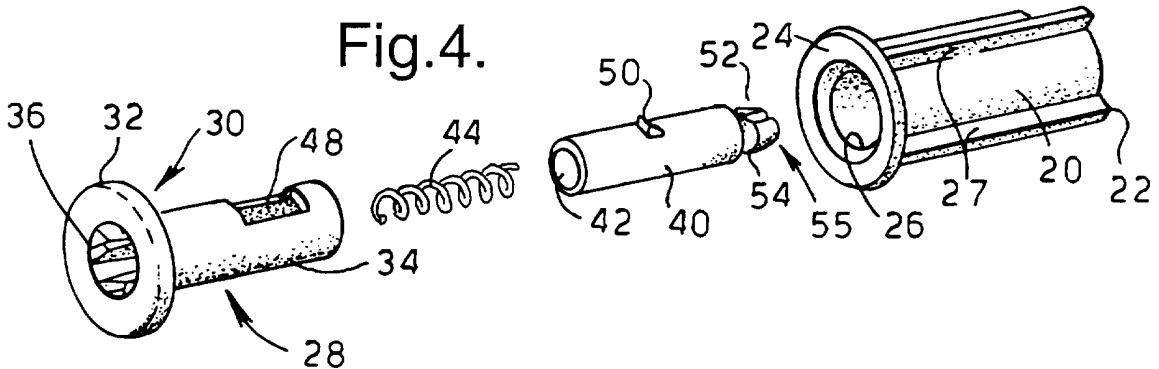


Fig.5.

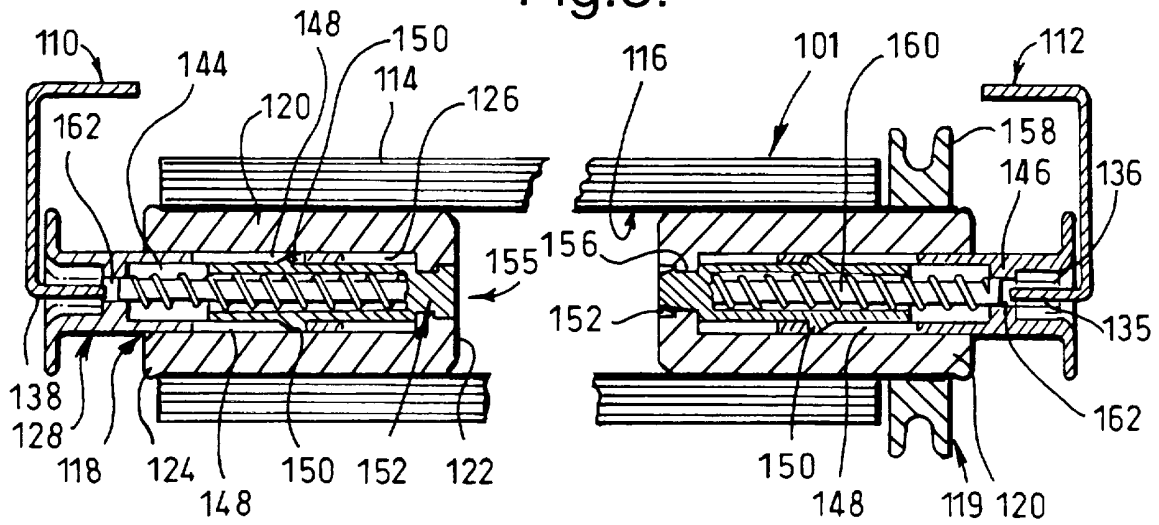


Fig.6.

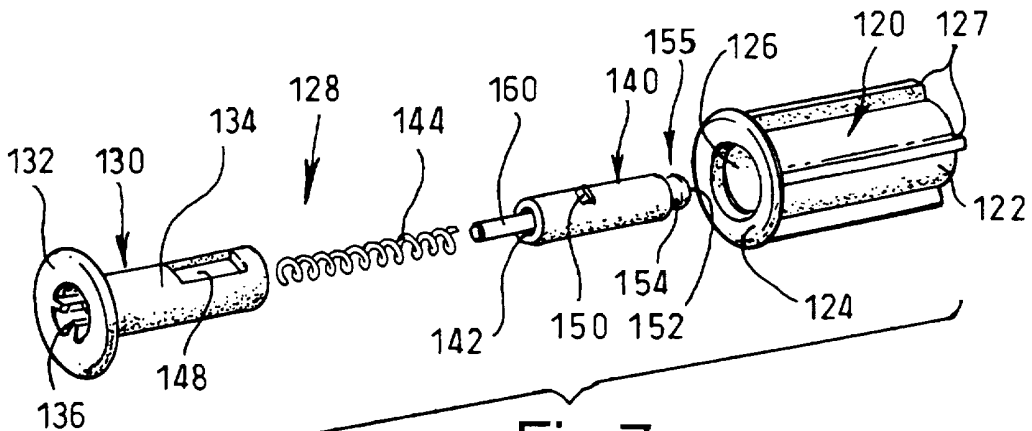
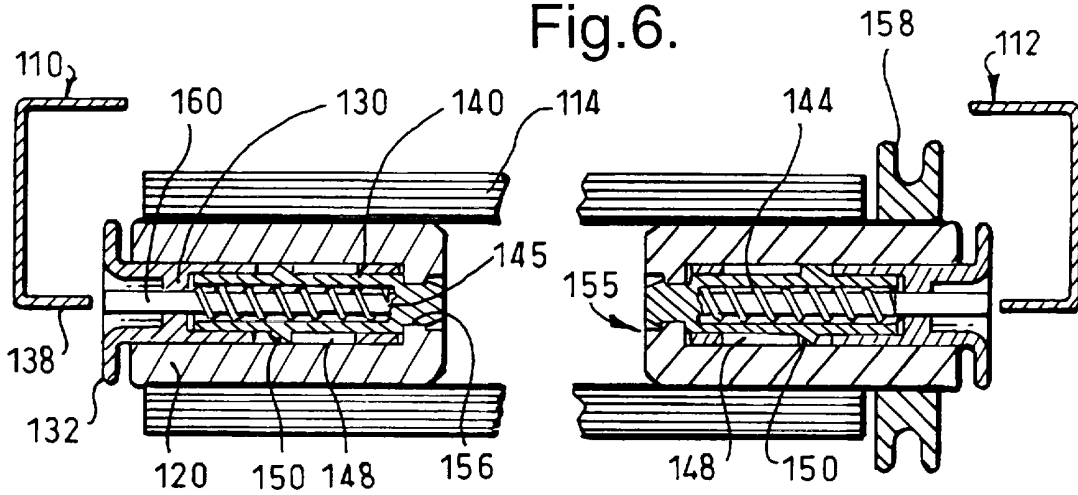


Fig.7.

END PLUG ASSEMBLY

This invention relates to an end plug assembly for an architectural covering, especially a covering of an architectural opening, such as a window blind or shade. This invention particularly relates to an end plug assembly for removably coupling a roller of the covering to a mounting bracket or the like.

US-A-1,732,430 and US-A-3,099,916 describe end plug assemblies which are inserted into the axial ends of generally cylindrical rollers of blinds and shades. Each end plug assembly has a generally cylindrical body with an axially extending, central cavity that is open at one of its axial ends. The cylindrical body is inserted in one end of the roller. One end of a telescopic member of each end plug assembly is inserted in the open end of the cavity for limited telescopic movement between inner and outer axial positions within the cavity and the roller. A spring, within the cavity, urges the telescopic member towards its outer axial position. The other end of the telescopic member is provided with a stub shaft which is rotatably mounted in a fixed mounting bracket.

However, in each of these end plug assemblies, the telescopic member rotates with the roller and therefore has to be rotatably journalled in the mounting bracket. For this reason, the roller assembly needs a different bracket on its idle end, as opposed to its driven end. In this regard, the mounting bracket for the driven end of the roller typically has either a flat pin or a non-circular opening to transmit torque at the driven end, while the bracket for the idle end typically has a circular opening or a cylindrical pin.

It is an object of this invention to overcome this problem. In particular, it is an object of the invention to provide a telescopic end plug which allows the use of identical mounting brackets on the idle end, as well as the driven end, of a roller. Moreover, it is an object of the invention to provide an alternative structure for an end plug which is less cumbersome, as well as less expensive, to assemble and use in a roller.

In the end plug assembly of this invention, the telescopic member that is inserted in an end of the axially extending, central cavity of the cylindrical

body, which is inserted, in turn, in an end of the roller, comprises: a first portion which includes means to mount the telescopic member in a fixed manner on a mounting bracket and a second portion which is telescopically engaged with the first portion; a spring is positioned between the first and second portions of the telescopic member to urge the first portion outwardly of the cavity; one of the first and second portions has an axially extending guide slot; the other of the first and second portions has a radially extending projection engaged in the slot to define inner and outer axial positions of the first portion; and the first and second portions are rotatable relative to the cylindrical body.

Thus, the first portion of the telescopic member of the end plug assembly of this invention is fixed to the mounting bracket and does not rotate, and the first and second portions of the telescopic member act together as a bearing, rotatably mounting the cylindrical body and the roller on the bracket. As a result, identical brackets can be used for the idle and driven ends of the roller.

Advantageously, the second portion of the telescopic member has a central detent to rotatably retain it in the cylindrical body. It is particularly advantageous that the central detent extends axially from the second portion of the telescopic member and engages a central aperture in the other end of the cylindrical body. However, a detent could be provided which projects inwardly from the cylindrical body and engages a central opening in the second portion of the telescopic member.

Advantageously, the first portion of the telescopic member also has a cylindrical part within the central cavity of the cylindrical body and forms a bearing surface for the cylindrical body. With such a construction, the second portion of the telescopic member is telescopically slidable within the cylindrical part of the first portion. With other constructions, however, the second portion could be telescopically slidable outside of the first portion.

A particularly advantageous embodiment of the invention is additionally provided with an axially extending core pin, which extends through a central opening of the first portion and which has its free end, in use, located in close

proximity to the mounting bracket. This prevents the end plug assembly from becoming unintentionally disengaged from the bracket.

Furthermore, the elongate guide slot is advantageously provided in the cylindrical part of the first portion of the telescopic member and the radially extending projection extends radially outwardly from the second portion.

Further aspects of the invention will be apparent from the detailed description below of particular embodiments and the drawings thereof, in which:

- Figure 1 is a general perspective view of a roller blind which can include an end plug assembly of this invention;
- Figure 2 is an enlarged cross-section through the roller of the roller blind of Figure 1, fitted with two end plug assemblies of the invention, retained on mounting brackets;
- Figure 3 is a view similar to Figure 2, but with the end plug assemblies shown released from the mounting brackets;
- Figure 4 is a perspective exploded view of one of the end plug assemblies of Figures 2 and 3;
- Figure 5 is a view, similar to Figure 2, of a further embodiment of the end plug assembly of the invention;
- Figure 6 is a view, similar to Figure 3, of the further embodiment of the end plug assembly; and
- Figure 7 is a view, similar to Figure 4, of the further embodiment of the end plug assembly.

Figure 1 shows a roller blind, generally 1, the ends of which are attached to a pair of conventional brackets 10, 12 for mounting the roller blind 1 on a wall, adjacent to a window. The roller blind 1 has a conventional shade 14 shown as rolled up on an elongate hollow tubular roller 16 (which cannot be seen in Figure 1 because a top portion of the shade 14 is wound about the roller 16). The top end of the shade 14 is attached to the roller 16 in a conventional manner. A conventional pull-tab 17 is provided on the bottom of the shade 14.

Figures 2 and 3 show the internal structure of the brackets 10, 12 used for mounting the roller blind 1. If desired, some form of cover arrangement

can be provided to produce a more aesthetically pleasing arrangement as shown in Figure 1.

The roller 16, as shown in Figures 2 and 3, has a hollow interior. Substantially identical end plug assemblies, generally 18 and 19, are provided in the left and right ends, respectively, of the roller.

The left end plug assembly 18 has a generally cylindrical body 20 with an inner or right axial end 22 within the left end of the hollow interior of the roller 16, an outer or left axial end 24 outside of the roller, and an axially extending, central cavity 26 that opens at the outer axial end 24. The right end plug assembly 19 also has the cylindrical body 20 with its inner or left axial end 22 within the right end of the hollow interior of the roller 16, its outer or right axial end 24 outside of the roller, and its axially extending, central cavity 26 that opens at its outer axial end 24. Suitable means such as ribs 27 (Figure 4) are provided on the outer surface of each cylindrical body 20, so that the cylindrical body can be force-fit through an end of the roller 16 into its hollow interior and so that the cylindrical body can then engage the end of the roller and rotate with it.

Mounted within the cavity 26 in the cylindrical body 20 of the left end plug assembly 18 is a telescopic member 28. A first portion 30 of the telescopic member 28 has an end flange 32, outside of the roller 16 and the cylindrical body 20, and a cylindrical extension 34, within the roller and the cavity 26 of the cylindrical body. The flange 32 has an axially-extending, cylindrical end opening 35 provided with inwardly projecting, circumferentially spaced, axial ribs 36 (Figure 4) which engage a tab or lug 38 on the left bracket 10 to prevent the first portion 30 of the telescopic member 28 from rotating.

Axially and telescopically slidable within the cylindrical extension 34 of the first portion 30 of the telescopic member 28 of the left end plug assembly 18 is a cylindrical second portion 40. The second portion 40 is within the roller 16 and the cylindrical body 20 and has an axially-extending, central cavity 42. Within the cavity 42 in the second portion 40 is a spring 44 which engages a blind right end 45 of the second portion 40 and a transverse left

wall 46 of the first portion 30. The spring 44 is preferably a compression spring, particularly a coil compression spring, that urges apart the blind end 45 of the second portion and the transverse wall 46 of the first portion 30, so as to bias the first portion outwardly of the cavity 26 in the cylindrical body 20, towards the outer axial end position of the first portion (shown in Figure 2).

An axially extending, elongate slot 48 in the cylindrical extension 34 of the telescopic member 28 of the left end plug assembly 18 is engaged by an outwardly extending, radial projection 50 on the second portion 40 of the telescopic member. The engagement of the slot 48 and projection 50 guides and restricts the axial movement of the first and second portions 30, 40 of the telescopic member 28 as described below.

The blind right end of the second portion 40 of the telescopic member 28 of the left end plug assembly 18 is provided with a frusto-conical axial projection 52, connected by a neck portion 54, thereby forming a central annular detent 55. The projection 52 is inserted through a central axial aperture 56 in the inner axial end 22 of the cylindrical body 20 to retain the second portion 40 in place in the cylindrical body. The neck 54 and central axial aperture 56 enable the cylindrical body 20 to rotate relative to the telescopic member 28. Thus, the roller 16 can also rotate relative the telescopic member 28. In this regard, the cylindrical extension 34 of the first portion 30 of the telescopic member 28 and the cylindrical second portion 40 of the telescopic member are adapted to act as a bearing journal for rotatably mounting the cylindrical body 20 and the roller 16.

The right end plug assembly 19 is substantially the same as the left end plug assembly 18, described above, but is shown as a mirror image in Figures 2 and 3. In this regard, the right end plug assembly 19 also has the generally cylindrical body 20 with an inner or left axial end 22, an outer or right axial end 24, and an axially extending, central cavity 26 that opens at the outer axial end 24. The only differences between the end plug assemblies 18, 19 are that the right end plug assembly 19 is provided with means to rotate the roller 16, that is, a bead chain pulley 58 on the cylindrical body 20A, as shown in Figures 2 and 3, and that the cylindrical body 20 of the right end

plug assembly 19 is not inserted as far into the cavity of the roller 16 as is the cylindrical body 20 of the left end plug assembly 18.

In order to remove the roller 16 from the brackets 10, 12, one or both of the first portions 30 of the end plug assemblies 18, 19 are pressed axially inwardly against the action of the spring 44, from the position shown in Figure 2 to the position shown in Figure 3. When this happens, the ribs 36 of the end opening 35 of the flange 32 of one or both of the first portions 30 of the end plug assemblies are disengaged from the tab 38 of one or both of the brackets 10, 12. This is because the first portion 30 of the telescopic member 28 of each end plug assembly telescopes over the second portion 40 of the telescopic member, against the bias of the spring 44, from an outer axial end position (in Figure 2) where its ribs 36 engage the tab 38 of the adjacent bracket 10, 12 to an inner axial end position (in Figure 3) where its ribs are disengaged from the tab of the adjacent bracket. The radial projection 50 on the second portion 140 engages the slots 48 in the cylindrical extension 34 of the first portion 30 to define and limit the outer and inner axial end positions of the first portion with respect to the second portion as shown in Figures 2 and 3, respectively.

While the two end plug assemblies 18, 19 have been shown as substantially identical, other forms of end plug assemblies can be provided as a substitute in either end of the roller 16, provided they permit the roller to rotate.

With the end plug assemblies 18, 19 of this invention, it has become possible to use the same mounting bracket 10, 12 with a simple flat tab or lug 38, while allowing the cylindrical body 20 of each end plug assembly to rotate freely with respect to its telescopic member 20. This simplifies the keeping of an inventory of parts.

Figures 5-7 show a further embodiment of an end plug assembly 118, 119 of the invention. Similar or identical elements are referred to by the same names and by reference numerals which differ by "100" from those used for the end plug assembly 18 of Figures 2-4.

As shown in Figures 5 and 6, the end plug assemblies 118, 119 are adapted to be held by brackets 110, 112, and a shade 114 is rolled up in layers on a roller 116. The roller 116 can be rotated by means of a drive pulley 158 or alternatively by a conventional spring motor (not shown) and has a substantially hollow interior. End plug assemblies 118, 119 are provided on the left and right ends of the roller 116 for cooperating with the brackets 110, 112, respectively.

Figures 5 -7 show that the left end plug assembly 118 includes a generally cylindrical body 120 with an inner axial end 122 and an outer axial end 124. An axially extending, central cavity 126 in the cylindrical body 120 is open at the outer axial end 124. A telescopic member 128 is inserted in the cavity 126 of the cylindrical body 120. The telescopic member 128 has a first portion 130 which engages the left bracket 110 and a cylindrical second portion 140 which engages the cylindrical body 120. The first portion 130 of the telescopic member has an end flange 132, outside of the roller 116 and the cylindrical body 120, and a cylindrical extension 134 within the roller and the cylindrical body. The flange 132 has an axially-extending, cylindrical end opening 135 provided with inwardly projecting, circumferentially spaced, axial ribs 136 which engage the tab 138 on the left bracket 110 to prevent the first portion 130 of the telescopic member 128 from rotating. The extension 134 of the first portion 130 has the second portion 140 axially and telescopically slidable within it.

The first portion 130 of the telescopic member 128 of the left end plug assembly 118 is capable of limited telescopic movement relative to the second portion 140 of the telescopic member, between an outer axial end position (in Figure 5) for engaging the tab 138 of the bracket 110 and an inner axial end position (in Figure 6) for disengaging from the tab 138 of the bracket 110. Within an axially extending, central cavity 142 in the second portion 140 is a spring 144 which engages a blind right end 145 of the second portion 140 and a transverse left wall 146 of the first portion 130. The compression spring 144 biases the first portion 130 of the telescopic member 128 outwardly of the cavity 126 in the cylindrical body 120, towards the outer end axial

position of the first portion. At least one, but preferably a pair of, radially outwardly extending, radial projections 150 on the second portion 140 engage corresponding, axially extending, elongate slots 148 in the cylindrical extension 134 of the first portion 130 to define and limit the outer and inner axial end positions of the first portion with respect to the second portion as shown in Figures 5 and 6, respectively.

Figures 5 -7 also show that the cylindrical extension 134 of the first portion 130 and the cylindrical second portion 140 of the telescopic member 128 of the left end plug assembly 118 act as a bearing journal for rotatably mounting the cylindrical body 120. In this regard, the second portion 140 of the telescopic member 128 is rotatably retained in the cylindrical body 120 by a central annular detent 155, axially extending from the second portion and engaged in a central axial aperture 156 in the inner axial end 122 of the cylindrical body 120.

As further shown in Figures 5-7, the cavity 142 in the second portion 140 of the telescopic member 128 of the left end plug assembly 118 also has an axially extending, core pin 160 which extends through the center of the coil of the compression spring 144. The first portion 130 of the telescopic member 128 has an axially extending, central cavity 162 which is in communication with the end opening 135 in the flange 132. The core pin 160 extends axially to a greater or lesser extent into the cavity 162 and the end opening 135 of the first portion, depending on whether the first and second portions 130, 140 of the telescopic member 128 are in their inner axial end position (Figure 6) or their outer axial end position (Figure 5), relative to each other. Thus, the core pin 160 is adapted, when the left end plug assembly 118 is mounted on the bracket 110, to extend with its free end in close proximity to the tab 138 of the bracket 110. This prevents the left end plug assembly 118 from becoming accidentally disengaged from the bracket 110, other than by deliberately pushing the flange 132 of the telescopic member 128 axially to the right, towards the right end plug assembly 119. In this regard, the core pin 160 effectively restrains any axial movement of the roller

116 and its end plug assemblies 118, 119, which could otherwise cause the end plug assemblies to become disengaged from the brackets 110, 112.

As still further shown in Figures 5-7, the right end plug assembly 119 is substantially the same as the left end plug assembly 118, described above, but is shown as a mirror image in Figures 5 and 6.

This invention is, of course, not limited to the above-described embodiments which may be modified without departing from the scope of the invention or sacrificing all of its advantages. In this regard, the terms in the foregoing description and the following claims, such as "left", "right", "bottom", "top", "axial", "radial", "inner", "outer" and "end", have been used only as relative terms to describe the relationships of the various elements of the end plug assemblies of the invention for architectural coverings. In this regard, the projection or pair of projections 50, 150 could extend inwardly of the cylindrical extension 34, 134 of the first portion 30, 130 of the telescopic member 28, 128 into elongate guide slots 48, 148 in the second portion 40, 140 of the telescopic member. Similarly, the cylindrical extension of the first portion of the telescopic member could be of a smaller diameter than the second portion of the telescopic member so as to fit within an enlarged cavity 42, 142 of the second portion of the telescopic member, and the compression spring 44, 144 could be of a suitable coil diameter to surround the cylindrical extension of the first portion. Likewise, the central annular detent 55, 155 could project inwardly from the inner axial end 22, 122 of the cylindrical body 20, 120, so as to engage the central axial aperture 56, 156 in the second portion 40, 140 of the telescopic member 28, 128. Moreover, the coil compression spring 44, 144 could be replaced by equivalent springs for biasing the first portion of the telescopic member axially away from its second portion.

CLAIMS

1. An end plug assembly for coupling a roller of an architectural covering to a mounting bracket, said end plug assembly comprising:
- a cylindrical body engageable with an end of said roller, said body having inner and outer axial ends and an axially extending, first central cavity, open at said outer axial end;
 - a telescopic member adapted for limited telescopic movement in said first central cavity between an outer axial end position where said telescopic member engages said bracket (1-12) and an inner axial end position where said telescopic member is disengaged from said bracket; and
 - a spring within said first central cavity to urge said telescopic member towards said outer axial end position;
 - wherein said telescopic member comprises a first portion including means to mount said first portion in a rotatably fixed manner on said mounting bracket and a second portion telescopically engaged on said first portion and positioned within said first central cavity; said spring being positioned between said first and second portions, to urge said first portion outwardly of said first central cavity; and
 - wherein one of said first and second portions has an axially extending guide slot and the other of said first and second portions has a radially extending projection engaged in said slot, to define said inner and outer axial end positions of said first portion; and
 - wherein said first and second portions act as a bearing journal for rotatably mounting said cylindrical body,

2. The end plug assembly of claim 1 wherein said cylindrical body is rotatably retained on said second portion of said telescopic member by a central detent that is on one of said cylindrical body and said second portion and is in a central axial aperture in the other of said cylindrical body and said second portion.
3. The end plug assembly of claim 1 or 2 wherein said first portion of said telescopic member has a cylindrical extension extending into said first central cavity and forming a bearing surface for said cylindrical body.
4. The end plug assembly of claim 3 wherein said second portion of said telescopic member is telescopically slidable within said cylindrical extension of said first portion of said telescopic member.
5. The end plug assembly of claim 4 wherein said slot is formed in said cylindrical extension of said first portion of said telescopic member and said projection extends radially outwardly from said second portion of said telescopic member.
6. The end plug assembly of claim 2 wherein said detent extends axially from said second portion of said telescopic member and engages said aperture in said inner axial end of said cylindrical body.
7. The end plug assembly of claim 3 wherein said second portion has an axially-extending, second central cavity accommodating said spring.

8. The end plug assembly of claim 1, 2 or 3, wherein said second portion has an axially extending core pin and the first portion has a central opening and wherein the core pin extends through the central opening to enable a free end of the core pin to be located in close proximity of a tab of a mounting bracket, when in use.
9. The end plug assembly of any one of claims 1-8 wherein said spring is a compression spring, particularly a coil compression spring.
10. An architectural covering, especially a covering for an architectural opening, such as a window blind or shade roller blind, comprising an end plug assembly of any one of claims 1-9.
11. An end plug assembly constructed and arranged substantially as hereinbefore described with reference to and as illustrated by the accompanying drawings.
12. An architectural covering constructed and arranged substantially as hereinbefore described with reference to and as illustrated by the accompanying drawings.



Application No: GB 9917030.0
Claims searched: 1-12

Examiner: Matthew Parker
Date of search: 27 October 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.Q): EIJ JEX
Int Cl (Ed.6): E06B 9/40 9/42 9/44 9/50
Other: Online: WPI, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2313143 LOUVER-LITE LTD	
A	GB 2051936 SANDALL	
A	GB 0588698 THE EQUIPMENT AND ENGINEERING COMPANY LTD	
A	EP 0672814 FORJAS DEL VINALOPO	
A	US 4399857 TOSO KABUSHIKI KAISHA	
A	US 4729418 GENERAL CLUTCH CORP	
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A	US 3099916 EASTERN PRODUCTS BALTIMORE	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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