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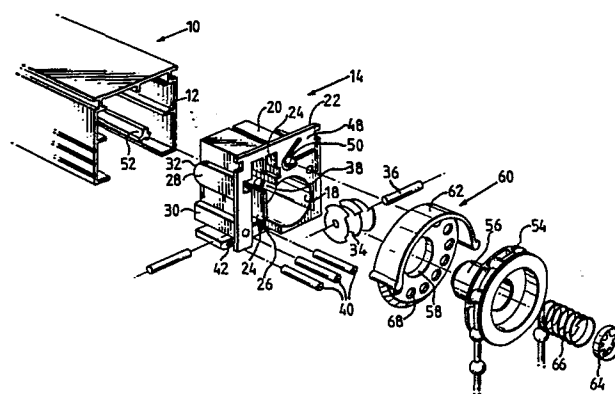
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54 **A vertical blind headrail end cap and assembly including such an end cap.**

57 A vertical blind headrail end cap and assembly therefor in which a body portion of the end cap is inserted into the end of the headrail and has a bore therethrough for the passage of an operating shaft. A recess is formed in the body portion to accommodate the operating hub either of a drive pulley for the operating shaft or of a gear forming part of a wand tilter. The outside face of the body portion can locate a housing for the drive pulley or the housing of the wand tilter depending on which is preferred to be used in a particular instance.



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TITLE: A VERTICAL BLIND HEADRAIL END CAP AND ASSEMBLYINCLUDING SUCH AN END CAP

The present invention relates to a vertical blind headrail end cap and to an assembly including such an end cap.

A vertical blind headrail can have a variety of
5 different forms of end cap and drive mechanisms for rotating the operating shaft of the headrail. The operating shafts themselves may take the form of a simple tilt rod in which case the travellers of the vertical blind are normally moved by pull cords. In an alternative arrangement the
10 operating shaft is provided with a helical thread on it and this is used to translate the travellers to the desired position and thereafter to tilt them to the desired angle.

The drive mechanism for the operating shaft can also take many different forms. For example, it can be in the
15 form of a pulley which is mounted on the shaft and is operated, for example, by a ball chain or a cord or it can be in the form of a wand tilter, that is one involving two bevel gears and an operating wand or rod.

These arrangements require various different types of
20 end cap which requires an elaborate system of stocking of the various parts necessary to fulfill all users requirements.

It is now proposed, according to the present invention, to provide a vertical blind headrail end cap said
25 end cap comprising, a body portion insertable into the end of the headrail, means to determine the amount by which the body portion can be inserted into the headrail, a bore through the body for the passage of an operating shaft, a recess formed in the body to accommodate the hub of an
30 operating shaft drive means selected from a plurality of

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shaft drive means, each provided with a hub and means associated with the outer face of the body portion for locating alternatively the housing of any one of said plurality of shaft drive means.

5 With such an end cap one can utilize alternatively different types of drive means very readily using the same end cap.

To enable the end cap to be used with separately operable pull cords, the body portion may be provided with
10 accommodation holes for at least two cord guide pins, said holes being spaced apart from one another and arranged with their centre axes parallel to the axis of the operating shaft.

The end cap may further comprise, in the body portion,
15 at least one accommodation space for a pull cord guide pulley, and at least one bearing space for rotatably accommodating a shaft for said pulley, said accommodation holes and said at least one bearing space being dimensioned to receive identical elements which can each form either a
20 guide pin or a pulley shaft, as appropriate. One can utilize the same elements, usually in the form of simple cylindrical pins, as the guide pins or the pulley shafts which reduces the number of parts which have originally to be stocked.

According to a second aspect of the present invention
25 there is provided a vertical blind headrail assembly a channel section headrail, at least one end cap mounted in an end of the headrail, said end cap including a body portion inserted into said end of the headrail, means to determine the amount by which the body portion can be inserted into
30 the headrail, a bore through the body for the passage of an operating shaft, a recess formed in the body, an operating shaft drive means capable of rotating said shaft, said drive means having a hub inserted in said recess of the end cap and operatively engaged with said shaft, and a housing
35 associated with said drive means engaged against the outer face of the body portion of the end cap.

With such an assembly the shaft drive means may be in the form of a pulley and the housing may closely surround a part of the pulley circumference, the housing being provided with a number of cavities or projections and the housing
5 located on said cap body being formed with at least projection or cavity cooperating with one of said cavities or projections on the housing to allow selective positioning of the housing with respect to the end cap body portion. With such an arrangement the projection may be
10 mounted on the end of a tongue on said body portion, enabling said projections to spring back and allow repositioning of the cover during or after installation of the assembly.

In an alternative construction, the operating shaft
15 drive means may be in the form of a first gear and the housing rotatably accommodates a second gear for driving engagement with said first gear, the second gear being operable from the outside.

In this arrangement the housing may comprise a bearing
20 for the end of the operating shaft and the second gear may form part of a wand operating construction. Advantageously the housing is fixed to the end cap by screws, and the locating means on the body portion of the end cap are screw holes.

25 The invention also contemplates a vertical blind headrail cap assembly system comprising:-

a) at least one end cap mountable in an end of the headrail, said end cap including a body portion insertable into said end of the headrail, means to determine the amount
30 by which the body portion can be inserted into the headrail, a bore through the body for the passage of an operating shaft, a recess formed in the body;

b) a pulley provided with a hub for engaging an operating shaft of the blind and being mountable in said
35 recess;

c) a first gear provided with a hub for engaging an

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operating shaft of the blind, said first gear being interchangeable with said pulley and insertable in said recess;

d) a first housing for said pulley;

e) a second housing rotatably accommodating a
5 second gear oppositely engaging said first gear when said housing is coupled to the end cap by locating means in the body portion of the end cap, said first and second housings being interchangeable with one another, provided the pulley and the first gear are also interchanged;

10 f) at least one accommodation space and bearing space in said body portion;

g) at least one cord guide pulley mounted in said accommodation space and a bearing for said guide pulley or pulleys in said bearing space; and

15 h) at least two cord guide pins mountable in accommodation holes in the body portion of the end cap.

With such a construction, which essentially forms a kit of parts, a user may have available several different arrangements to suit the particular requirements of the
20 window to be covered by the vertical blind itself.

In order that the invention may more readily be understood, the following description is given, merely by way of example, reference being made to the accompanying drawings, in which:-

25 Figure 1 is an exploded perspective view of one embodiment of headrail end cap assembly according to the invention illustrating the end cap at one end;

Figure 2 is an exploded perspective view of the end cap at the other end;

30 Figure 3 is a view similar to Figure 1 of a second type of operating mechanism of the assembly; and

Figure 4 is a perspective view from the other side of the operating mechanism shown in Figure 3.

Referring first to the construction illustrated in
35 Figures 1 and 2, there is illustrated a headrail 10 provided with conventional internal longitudinal ribs 12. Inserted

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into this headrail is an end cap 14 (Figure 1), and at the other end an end cap 15 (Figure 2). These end caps are substantially identical but are mirror images of one another.

5 Each end cap is provided with a longitudinal bore 16 opening into a recess 18 in the body portion 20 of the end cap. Formed at the outer end of each end cap is an end flange 22, which has a substantially flat outer face and is arranged to engage against the end of the headrail 10 to
10 limit the movement of the end cap into the end of the headrail.

Accommodation spaces 24 are formed in the outer face of the end cap and extend right through the end cap and are separated from one another by a partition 26.

15 Formed on the outer surface of the body portion 20 on one side is an upper bulge 28 and a lower bulge 30. The upper bulge is closed at the end 32.

One or two pulleys 34 can be inserted into the accommodation spaces 24 and a bearing shaft 36 can pass
20 through the pulley or pulleys and also through the gap 38 formed in the partition 26, with the ends being accommodated within the upper bulge 32 and a groove 33. Since the upper bulge 28 is closed at the end 32, this limits the inward movement of the pin 36 and hence of the
25 pulley or pulleys 34.

Three guide pins 40 which are of identical construction to the bearing shaft 36, are inserted into accommodation holes 42 so that pull cords for the travellers of the vertical venetian blind can pass between the pins 40,
30 and be separated from one another, before passing over the pulleys 34.

The end gap is also provided with screwholes 44, 46 the latter extending within the lower bulge 30.

Also formed on the outer face of the end cap is a
35 resilient tongue 48 having an outwardly extending projection 50 which can flex inwardly to a position in which its

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extremity is flush with the outer face of the flange.

The assembly is provided with a conventional operating drive shaft 52 which may either be a longitudinally grooved shaft, as shown, or can be a shaft provided with
5 helical grooves which are used to move and operate the travellers. The drive shaft 52 passes through the longitudinal bore 16 which is concentric with the recess 18. In Figure 1 there is illustrated a drive pulley 54 provided with the usual means to engage a ball chain and having a hub
10 56 which passes through a central opening 58 in a cover indicated by the general reference numeral 60, the hub being accommodated within the recess 18. The cover is provided with an arcuate cover portion 62 to cover the bead chain carried on the pulley 54. The pulley 54 and cover 60
15 are retained in place on the operating shaft 52 by a slip nut 64 and spring 66, thus urging the cover against the outer face of the flange 22. It will be noted that the cover 60 is provided with a plurality of circumferentially spaced cavities 68, illustrated in the form of holes which
20 pass right through the cover. These are positioned to engage selectively on the projection 50, thereby to position the cover portion 62 in one of several different rotational positions.

It will be seen from Figure 2 that a similar slip nut
25 65 is provided for mounting on the other end of the operating shaft 52 to hold the whole assembly intact.

Figure 3 illustrates another form of operating shaft6 drive mechanism. Since the headrail and end caps are identical, like parts have been indicated by like reference
30 numerals. In place of the drive pulley 54 there is provided a wand operating gearbox indicated by the general reference numeral 70. This includes a housing 72 having countersunk holes 74 therein to accommodate screws 76 which can be threadedly engaged in the screwholes 44, 46 to hold the
35 housing in place.

Formed essentially within the housing is a

longitudinally extending bearing sleeve 78 having a through bore 80 to act as a bearing. The bore 80 is provided with a countersink at 82 to accommodate a slip nut 64 to hold the shaft 52 in position.

5 The gearbox includes a first bevel gear 84 having a hub 86 splined at 88 to engage in the grooves in the drive shaft 52.

10 The first bevel gear is in meshing engagement with a second bevel gear 86 having a hub 88 mounted for rotation in a bearing portion 90 formed in the housing, the hub having a ball connection 92 for connection to a wand operator. Rotation of the wand operator will cause rotation of the two bevel gears and thus of the operating drive shaft 52.

15 This construction also includes a slip nut 65 against a washer 94 and a spring 96 to hold the drive shaft 52 in place.

20 It will be thus seen that the construction of end cap of the present invention allows one to use, at will, either a pulley drive arrangement as shown in Figures 1 and 2 or a wand operated gearbox arrangement is illustrated in Figures 3 and 4. The arrangement is such that either of these drives could be mounted at either end of the headrail using perfectly standard end caps. Thus, with the construction of the present invention, using only fourteen parts, one can
25 have, right or lefthand end control for horizontal or sloping installations, a combined chain control for right or lefthand horizontal installations or a cord and wand control for right or lefthand horizontal installations. It will be understood therefore, that the
30 construction of the present invention enables, with the minimum of parts, the maximum of versatility.

C L A I M S

1. A vertical blind headrail end cap, said end cap comprising, a body portion insertable into the end of the headrail, means to determine the amount by which the body portion can be inserted into the headrail, a bore through
5 the body for the passage of an operating shaft, a recess formed in the body to accommodate the hub of an operating shaft drive means selected from a plurality of shaft drive means, each provided with a hub and means associated with the outer face of the body portion for locating
10 alternatively the housing of any one of said plurality of shaft drive means.

2. An end cap according to claim 1, wherein the body portion is provided with accommodation holes for at least two cord guide pins, said holes being spaced apart from one
15 another and arranged with their centre axes parallel to the axis of the operating shaft.

3. An end cap according to claim 2, and further comprising, in the body portion, at least one accommodation space for a pull cord guide pulley, and at least one bearing
20 space for rotatably accommodating a shaft for said pulley, said accommodation holes and said at least one bearing space being dimensioned to receive identical elements which can each form either a guide pin or a pulley shaft, as appropriate.

25 4. A vertical blind headrail assembly, comprising a channel section headrail, at least one end cap mounted in an end of the headrail, said end cap including a body portion inserted into said end of the headrail, means to determine the amount by which the body portion can be inserted into
30 the headrail, a bore through the body for the passage of an

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operating shaft, a recess formed in the body, an operating shaft drive means capable of rotating said shaft, said drive means having a hub inserted in said recess of the end cap and operatively engaged with said shaft, and a housing
5 associated with said drive means engaged against the outer face of the body portion of the end cap.

5. A vertical blind headrail assembly according to claim 4, wherein the shaft drive means is a pulley and the housing closely surrounds a part of the pulley
10 circumference, said housing being provided with a number of cavities or projections and the housing locating means on the end cap body portion being formed by at least one projection or cavity cooperating with one of said cavities or projections on the housing to allow selective positioning
15 of the housing with respect to the end cap body portion.

6. A vertical blind headrail assembly according to claim 5, wherein the projection is mounted on the end of a tongue on said body portion, enabling said projection to spring back and thereby allow repositioning of the cover
20 during or after installation of the assembly.

7. A vertical blind headrail assembly according to any one of claims 4 to 6, wherein the operating shaft drive means is a first gear, and the housing rotatably accommodates a second gear for driving engagement with said
25 first gear, said second gear being operable from the outside.

8. A vertical blind headrail assembly according to claim 7, wherein the housing comprises a bearing for the end of the operating shaft.

30 9. A vertical blind headrail assembly according to claim 7 or 8, wherein the second gear is part of a wand

operating construction.

10. A vertical blind headrail assembly according to any one of claims 5 to 9, and wherein said housing is fixed to the end cap by screws, the locating means at the body
5 portion of the end cap being screw holes.

11. A vertical blind headrail assembly comprising:-

a) at least one end cap mountable in an end of the headrail, said end cap including a body portion insertable into said end of the headrail, means to determine
10 the amount by which the body portion can be inserted into the headrail, a bore through the body for the passage of an operating shaft, a recess formed in the body;

b) a pulley provided with a hub for engaging an operating shaft of the blind and being mountable in said
15 recess;

c) a first gear provided with a hub for engaging an operating shaft of the blind, said first gear being interchangeable with said pulley and insertable in said recess;

d) a first housing for said pulley;

20 e) a second housing rotatably accommodating a second gear oppositely engaging said first gear when said housing is coupled to the end cap by locating means in the body portion of the end cap, said first and second housings being interchangeable with one another, provided the pulley
25 and the first gear are also interchanged;

f) at least one accommodation space and bearing space in said body portion;

g) at least one cord guide pulley mounted in said accommodation space and a bearing for said guide pulley or
30 pulleys in said bearing space; and

h) at least two cord guide pins mountable in accommodation holes in the body portion of the end cap.

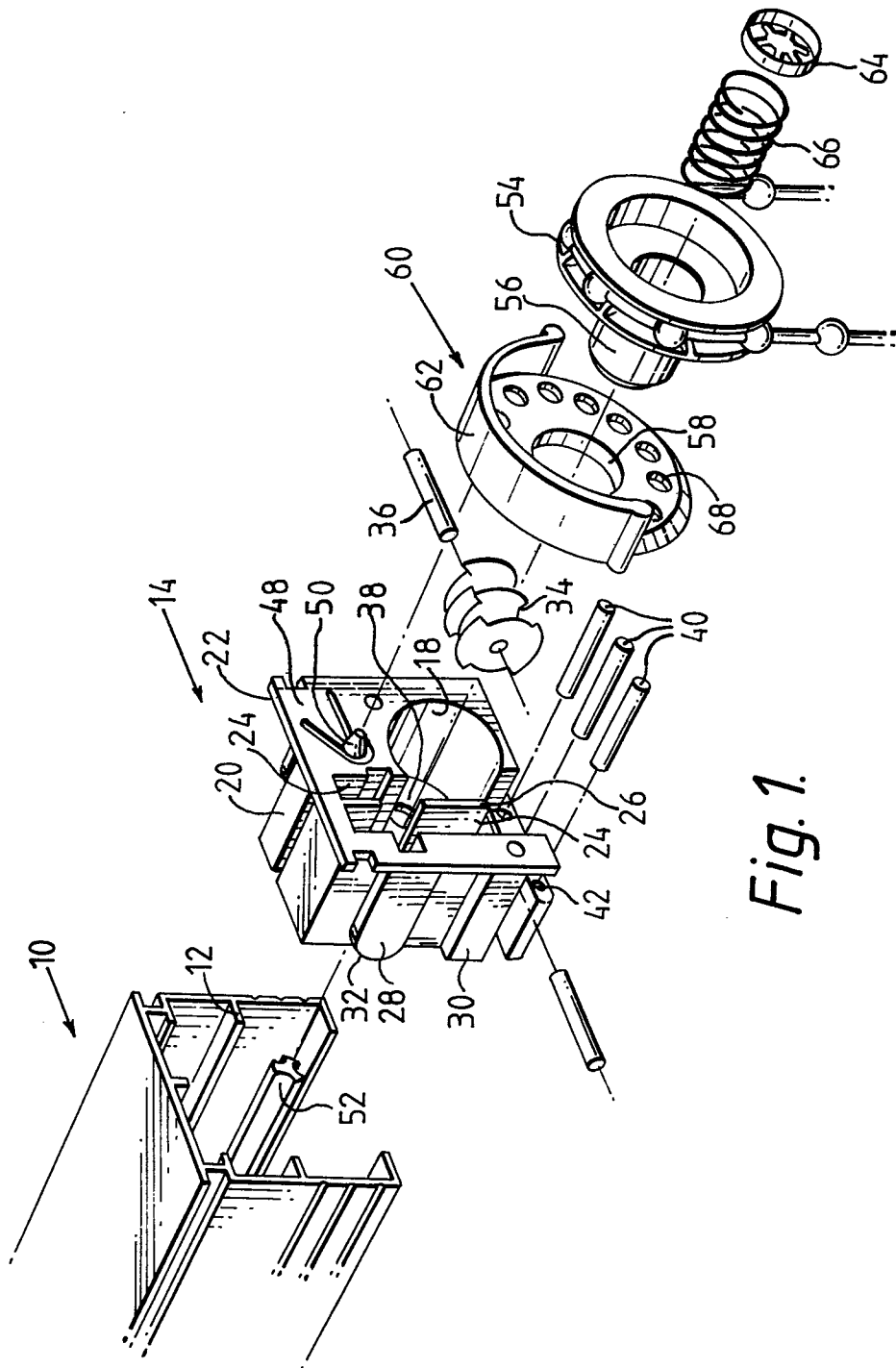


Fig. 1.

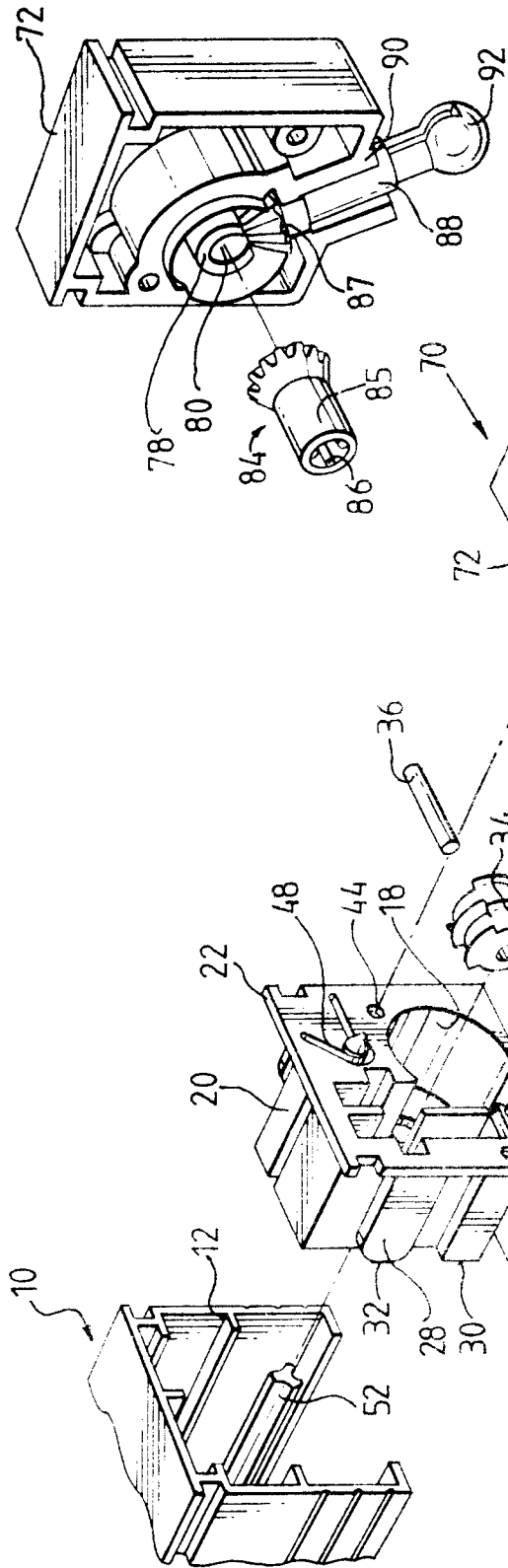


Fig. 4.

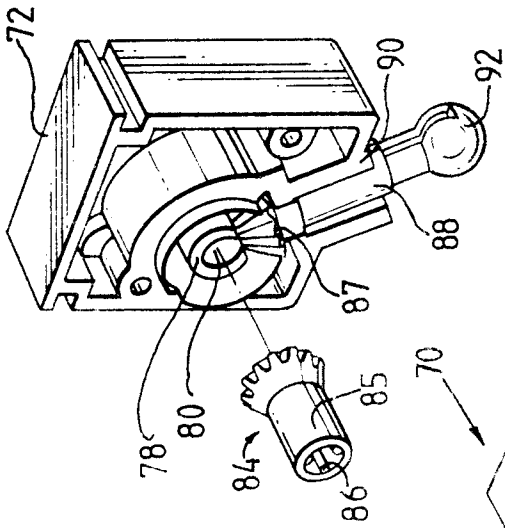


Fig. 3.

Fig. 2.

