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EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.12.1997 Bulletin 1997/49

(51) Int. Cl.⁶: E04F 10/06

(21) Application number: 97108205.2

(22) Date of filing: 21.05.1997

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE

(30) Priority: 28.05.1996 IT CO960013 U

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(54) Fully foldaway awning

(57) A headrail (2) with articulated arms (4) for an awning (1), comprising:

- side plates (31) adjustable upon installation in any desired inclination;
- at least a support (29) with a hole where the winding drum (3) of awning (1) passes for its direct connection to a motor unit with help manoeuvre or to a hand activation group;
- an internal shell (12) for the protection of the wound awning;

- a front transversal terminal (6) wherein a longitudinal recess is provided (13) for a winding roller (7) of awning (5);
- winding means for the same valance, of either a manual (15) or an automatic (21-28) type, dependent on those for winding awning (1), and
- valance winding elastic guide pliers (8).

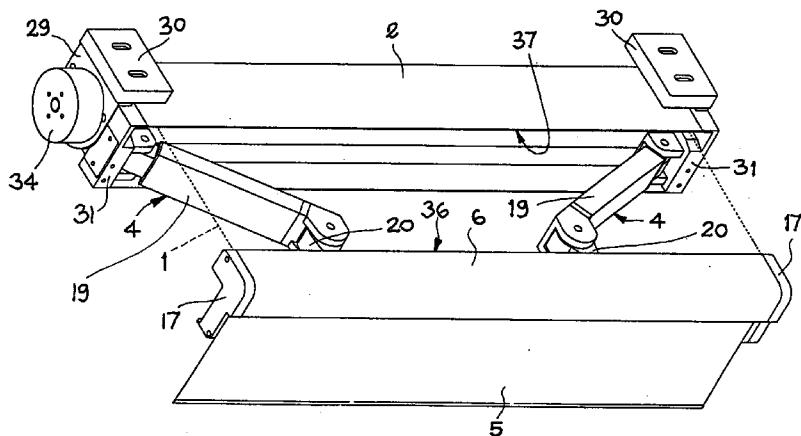


FIG. 1

Description

The present invention relates to a fully foldaway awning. More particularly, the present invention relates to a fully foldaway awning comprising:

- a headrail with articulated arms and a drum for the complete winding of the awning, with full folding of the same within a protection shell;
- supporting side plates adjustable after the installation in any wished inclination;
- at least a terminal support provided with a hole through which the extension of said winding drum protrudes for its direct connection to a rotation activation group, motor-driven with help manoeuvre, or manual;
- a casing coupled to said support for the independent positioning of the activating means, independently on the more or less inclined orientation of said plates;
- a transversal front terminal which engages into the free edge of the awning and which comprises a space within which a full foldaway winding roller is located, of a valance which is kept in guide and alignment by means of semicircular elastic pliers; and
- a device for winding the valance on its roller, constituted by a knob hand activated or activated by a pulley system with rope gears coupled to articulated arms of the awning and automatically dependent on the movement of the latter.

Many types of awnings are known with different supporting, winding and extension means, hand- or motor driven.

The main drawback of all the types known of awning is that the valance, i.e. the strip of fabric which is the finishing terminal along the most external edge of the awning is not windable, remains always outside the headrail and is continuously subject to atmospheric agents. In such conditions, it is obvious that not much after the installation and the start of the use, evident differences appear between the awnings, which can be wound and protected in the inside of the headrails, and the corresponding valances, always exposed, which differences are due to colour decay, smog, powder, wear due to beating, and so on.

Such phenomena become obviously more and more marked as seasons pass and change.

To try to eliminate the above drawbacks, some producers supply awnings without valance. However, such solution is little agreeable and unsatisfactory for users.

Other drawbacks of the awnings of the known art are also to be found in hand or motor control systems, for the unwinding and the rewinding. In fact, many solutions are rather complicated and expensive and show special problems in the combinations with awnings oriented with marked inclinations.

Further drawbacks are caused by the internal con-

figuration of headrails, where the sequence of windings and extensions of the awnings cause the latter to wear rather quickly especially in correspondence of the possible longitudinal sewings, and anyhow along the surface corresponding to the last winding turn on the drum.

Object of this invention is to eliminate said drawbacks.

According to the present invention, these and other objects - which will be more apparent thanks to the following description - are obtained according to the features of the characterising part of claim 1.

The fully foldaway awning of the present invention allows to achieve the following results:

The awning if fully foldable in the headrail and the valance is fully windable in the front transversal terminal; once the winding of the awning has ended, the transversal terminal wherein the windable valance is comprised, touches and closes the headrail containing the awning; the winding of the valance in the transversal terminal is realisable by hand by means of at least a side knob, or it is realisable automatically by means of gears coupled to the conventional extension and/or closing movements of articulated arms which control the opening or the winding of the awning, independently on such control being hand or motor-driven, with help manoeuvres by winches; the headrail comprises supporting end plates adjustable according to the inclination which one wants to impart to the extended awning; a holed support may be coupled to at least one of said plates, through which an end passes of the awning winding drum, for its direct connection with a rotation activation group, motor controlled with help manoeuvres, or hand controlled, which results to be correctly oriented vertically, independently on the inclined setting of the awning; inside the headrail a peripheral smooth, anti-abrasion shell is applicable, while along the transversal terminal elastic, half-annular pliers are located, co-axially coupled around the winding roller, having the function of regulating and guiding the valance during the winding/unwinding stages.

The advantages achieved by means of the present invention lay essentially in that, in closing conditions, both the awning, the related articulated arms and the valance are fully covered and protected from any external agent: the valance winding system may be independent and manual or automatic coupled with the opening and closing movement of the articulated arms of the awning, independently on the hand- or motor control of the awning; the protection systems of said parts, of movement and orientation are constituted of simple means, rational as concerns the structure and of easy and economic realisation. The fully foldaway awning of the present invention will be described with more details hereunder, with reference to the attached drawings which represent an embodiment expounded by way of non limiting example, wherein:

Figure 1 shows an overall perspective view of a fully assembled awning,

Figure 2 shows a schematic view of a cross-section comprising the headrail and the front transversal terminal coupled to one another in closing position,

Figures 3 and 4 show the schematic views of cross-sections of the front terminal only with a fully wound and fully unwound valance, respectively;

Figure 5 shows a side schematic view of the headrail ready to be applied to a wall, with side plates adjustable according to the inclined orientation of the installed awning,

Figure 6 shows an exploded schematic perspective view of a terminal of the headrail for ceiling applications, with the plate adjustable for the inclined orientation of the installed awning;

Figure 7 shows the perspective schematic view of the ends of a front transversal terminal with winding roll for the valance and the related means for the drive and control of hand winding/unwinding, and Figures 8 and 9 show perspective schematic sequential views of the system of automatic winding/unwinding of the awning.

With reference to the figures, the fully foldaway awning of the present invention comprises an awning (1), a headrail (2) provided with a winding drum (3) and articulated arms (4) and a valance (5). Valance (5) is comprised in a front transversal terminal (6) equipped with a winding roller (7) for the awning and drive elastic pliers (8). Terminal (6) engages with the front edge of awning (1) through a roping/raceway coupling (9). With like roping/raceway couplings (10) (11), awning (1) engages the back edge to its winding drum (3) and valance (5) engages the upper edge to its winding roller (7).

The inside of headrail (2) is covered by a continuous protecting shell (12) from plastic material or metal, such as, by way of non limiting example, PVC, chrome-plated steel and the like, which causes the inside winding housing of the awning to be smooth and uniform, preventing in this way the awning from getting dirty or wearing following the manoeuvres. The front terminal (6) comprises a longitudinal recess (13) closed at the top and open at the bottom, wherein the winding roller (7) of the valance is enclosed.

In said front terminal (6) semiannular elastic pliers (8) are located which, fixed along a groove (14), extend with their arms around the winding roller (7), forming an open circle whose internal diameter corresponds, at rest, to the diameter of roller (7) plus a fabric turn of the valance (5).

When awning (5) winds on roller (7), the arms of pliers (8) open elastically due to the increased size of the wound fabric, and the internal walls of said arms exert on the fabric a pressure sufficient to obtain a correct winding adhering around said roller (7).

The pressure exercised by the arms of pliers (8) is especially useful during the contrary operation, i.e. when the valance (5) is unwound and goes down towards the outside. In fact, such pressure prevents the

fabric from unwinding inside recess (13) and facilitates the regular and progressive unfolding of the fabric, without any hindrance.

In case of valances (5) having longitudinal sewings (46), the elastic pliers (8) are positioned in correspondence of said sewings, except for those of side edges. If valances have no intermediate sewings, pliers (8) are positioned at a uniform distance along the extension, edges being always excluded.

Winding and unwinding of valance (5) may be realised by a manual system comprising, at least on one of the ends of the transversal terminal (6) a knob (15) provided with a hub (16) which fits into an end of the winding roller (7). The rotation of roller (7) may also be automatic, according to the opening and winding movements of the awning (1). The automatic rotation of roller (7) takes place as follows: when awning (1) is closed and the opening movement starts, the profiles (19) and (20) of the two articulated arms (4), to which said awning is engaged along the external edge, shift from their parallel closing position and start articulating unthreading awning (1) from headrail (2).

To each lower profile (20) of the articulated arms (4) a supplementary lever (21) is engaged. At the end of said supplementary lever (21), a sliding block is hinged with or without wheels or rolls (22 DX and 22 SX) which can slide along grooves (23) obtained on the front transversal terminal (6). The end supports (35) of the same lower profiles (20) are tied to the same terminal (6).

During the opening, the sliding blocks (22 DX and 22 SX) slide along grooves (6), exercising a traction on ropes (24 DX, 24 SX) fixed to the same.

With specific reference to Figures 8 and 9, one of the ropes (24 DX) making part of the sliding block (22 DX) slides around a support with a central pulley (25), enters the throughholes of said sliding block (22 DX) and of stop (26 DX) of the transversal terminal (6), slides on a pulley of a support (27 DX) and fixes to the upper part of a pulley (28 DX) engaged at the right end 40 of roller (7) for the winding of valance (5).

On the other side, the other rope (24 SX) making part of the rolling block (22 SX) enters the through-hole of stop (26 SX) of the transversal terminal (6), slides on a pulley of support (27 SX) and fixes to the lower part 45 pulley (28 SX) engaged in the left end of the same winding roller (7).

During the opening of the awning, lever (21 DX) creates a traction on rope (24 DX) wound on pulley (28 DX); this one causes roller (7) to rotate and the valance 50 unwinds. At the same time, to the left side rope (24 SX) winds on pulley (28 SX) so that, when awning (5) is enclosed, lever (21 SX) exercises a traction on its rope (24 SX), which causes pulley (28 SX) to rotate in the contrary direction with regard to the preceding one, with 55 ensuing winding of the valance. In the same way, to the left side rope (24 SX) re-winds on pulley (28 SX) and the system is already ready for a subsequent opening of the valance at the same time as the opening of the awning.

It should be noted that the system of wind-

ing/unwinding of the valance takes place at the same time as the corresponding operation exercised on the awning, independently on the hand- or motor system adopted for the same awning.

Figures 5 and 6 show the side supports (29) which, associated to counter-plates (30) may be adapted for both horizontal wall-applications and vertical ceiling-applications. In any case, plates (3) tied to the end of headrail (2) are coupled to and engaged with supports (29). The coupling between supports (29) and plates (31) allows the installation of the awning with any inclined orientation.

At least one of plates (31) comprises a central through-hole (32), alignable to a corresponding hole (33) of at least one of said supports (29) through which an end of said winding drum (3) of awning (1) inserts, to facilitate its connection with any hand- or motor movement means, with conventional help manoeuvre, comprised in a casing (34) alignable always by means of vertical manoeuvres, independently on the more or less inclined orientation of plates (3), and therefore of awning (1).

In conditions of full closing or total winding of awning (1) in headrail (2) and of valance (5) in the front transversal terminal (6) the upper-back part (36) of the latter engages with and superpose on the upper-front end (37) of said headrail (2), forming a full, single and sequential protection covering of the whole.

In an application suggested by way of non limiting example, the inclined coupling between plates (31) and supports (29) is realised by means of side sectors (38) that engage their toothed ends (39) in as many complementary housings (40) obtained along the peripheral edges of supports (29).

Sectors (38) are kept engaged with housings (40) by means of back friction couplings between the ray-like surfaces (42) of as many buffers, locked by pressure screws (43). After the setting of the maximum desired inclined position, and before fully locking screws (43) by means of screw regulators (44), it is possible to carry out an exact micrometric positioning by causing said ray-like surfaces (41, 42) to slide relatively to one another.

Having established the desired position, said surfaces engage with one another, tightly locking screws (43), and screw-regulators (44) are locked by means of dowels (45).

Even though the present invention has been described hereabove with reference to a possible embodiment of the same, various changes and modifications may be made by those skilled in the art, in view of the above description.

Therefore, the present invention intends to comprise all of the changes and modifications falling within the spirit and the protection scope of the appended claims.

Claims

1. A fully foldaway awning comprising an awning provided with a valance (5) and whose back edge is coupled to a winding drum (3) contained in a headrail (2) and whose front edge is coupled to a front transversal terminal (6) interconnected with said headrail through articulated arms (4), and comprising means for the manoeuvre/unwinding from said drum (3), characterised in that said front terminal (6) comprises a transversal recess (13) housing a roller (7) in which the upper edge of valance (5) engages, elastic pliers (8) driving the winding/unwinding of said valance being located in coaxial alignment with the roller; said roller (7) comprising supporting means (18) located in the side covering (17) of said terminal (6), and comprising a knob (15) for hand rotation or automatic rotation means with transfer systems of translation motions deriving from the articulated arms (14) into rotary motions of roller (7).
2. The awning according to claim 1, wherein headrail (2) is provided with a continuous protection shell (12) substantially enveloping the same awning, and with an upper-front part (37) which, when closed, engages with, superposes on, and adjointingly aligns with a complementary upper-back part (36) of said transversal terminal (6) of protective containment of said wound valance (5); besides, it is also provided with side end plates (31) which engage with side supports (29), according to any desired inclination; at least one of said side supports (29) comprising a central passage (33) through which passes a corresponding end of the winding drum (3) for its connection with the rotation movement means, either manual or motor-driven.
3. The awning according to claim 1 or 2, characterised in that the front transversal terminal (6) comprises: a longitudinal recess (13), with co-axial roller (7), constituting the containment housing of valance (5) in closing conditions; at least an elastic semiannular guide pliers (8) with elastically openable arms, which are co-axially aligned with roller (7) and located at prefixed intervals, preferably in correspondence of possible intermediate sewings (46) and an upper-back extension of headrail (2); said terminal being also provided with side end coverings (17) supporting said winding roller (7).
4. The awning according to any of the preceding claims, characterised in that the winding roller (7) of valance (5) is provided with at least a side end knob (15), for the rotation hand control in both directions.
5. The awning according to any of the claims 1 to 3, characterised in that the winding roller (7) of valance (5) receives the rotary motion in both direc-

tions through ropes (24) engaged, in opposition, with two pulleys (28) located at the ends of said roller (7); said ropes (24) being connected, through gears and guides (25, 26, 27), to sliding blocks (22) with or without wheels and rolls which slide in grooves (23) obtained on the transversal terminal (6) and which are caused to move by supplementary levers (21) coupled and dragged by the articulated arms (4) for the opening/closing of awning (1); the automatic rotary motion of the winding roller (7) of valance (5) depending on the opening/closing movement of the articulated arms (4) for unwinding/winding awning (1).

6. The awning according to any of the preceding claims, characterised in that headrail (2) of containment of the winding roller (3) of awning (1) comprises end plates (31) which couple to the side supports according to any desired inclined position.
7. The awning according to any of the preceding claims, characterised in that the rotation control means of the winding drum (3) of awning (1) are either manual or motor-driven, with a pulley help manoeuvre; said means being comprised in a casing (34) vertically orientable independently on the inclination imparted to the awning.
8. The awning according to any of the preceding claims, characterised in that supports (29) and plates (31) are arranged relatively to one another according to different inclinations by means of side couplings comprising peripheral housings (40), along the peripheral edges of said supports, and side sectors (38) with toothed ends (39), complementary to said housings (40); said coupling comprising friction locking means (41, 42, 43) and micrometric regulation means (44).

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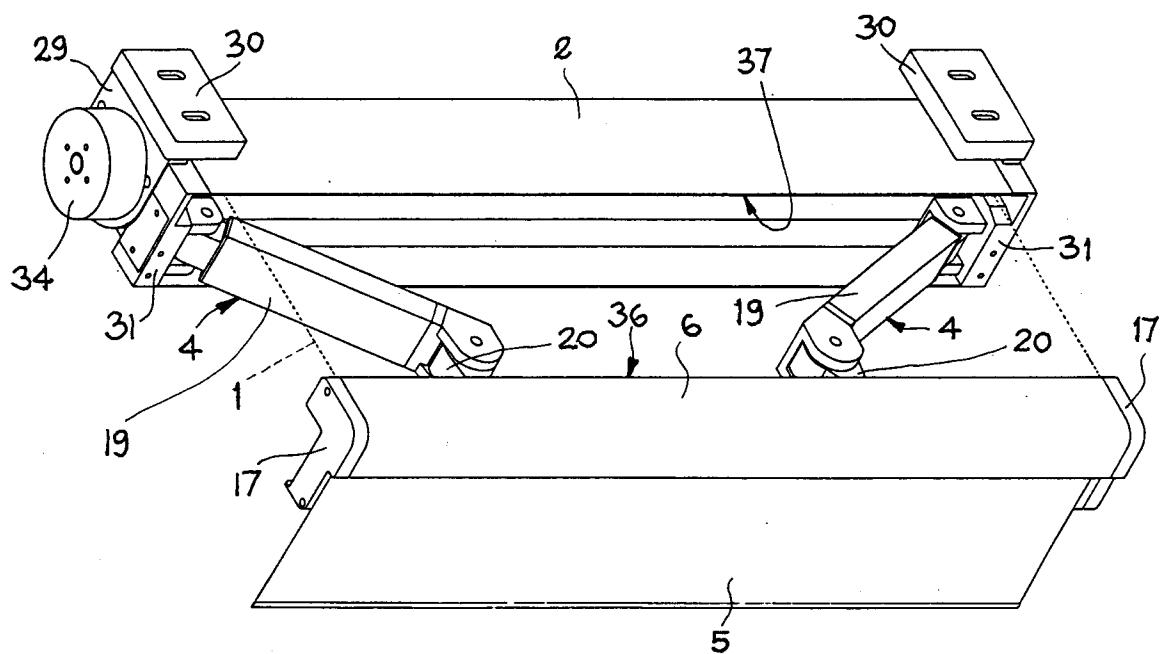


FIG.1

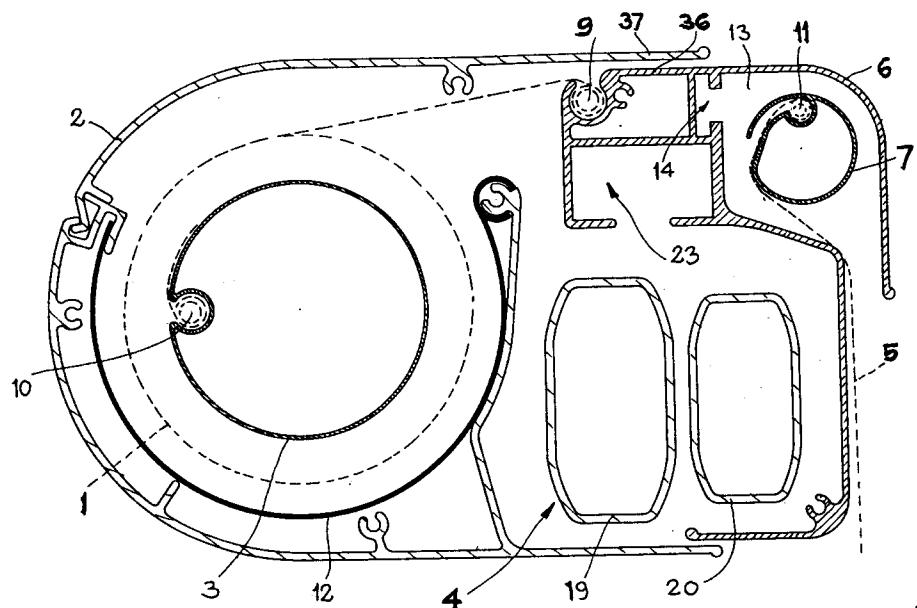


FIG.2

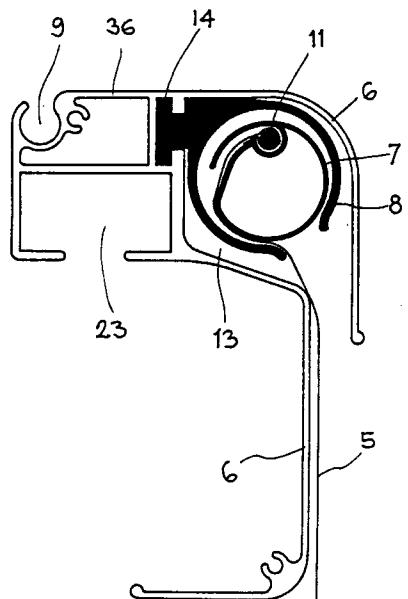


FIG. 4

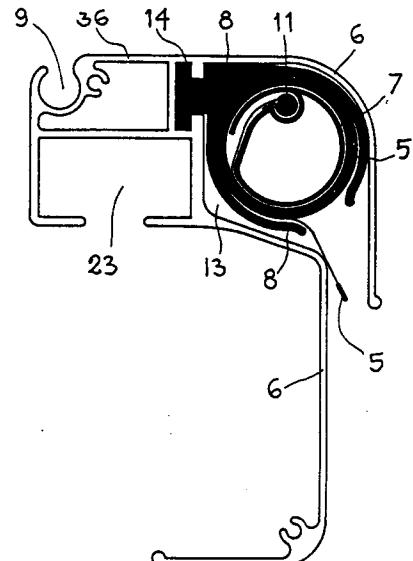
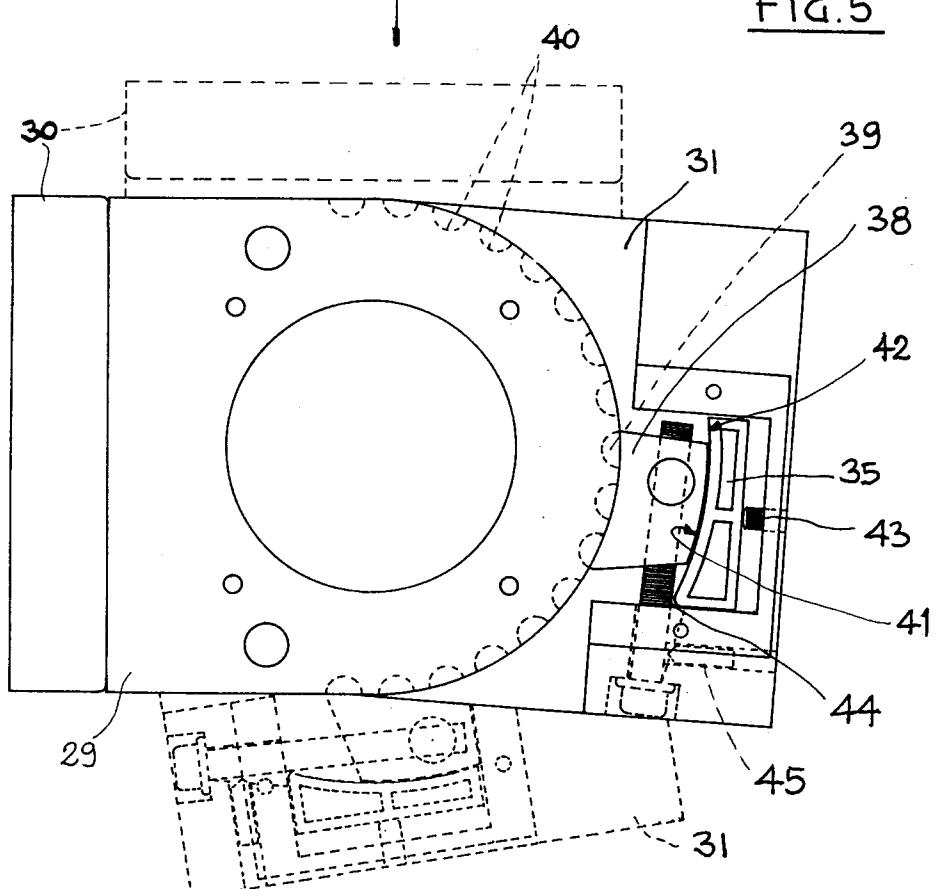


FIG. 3



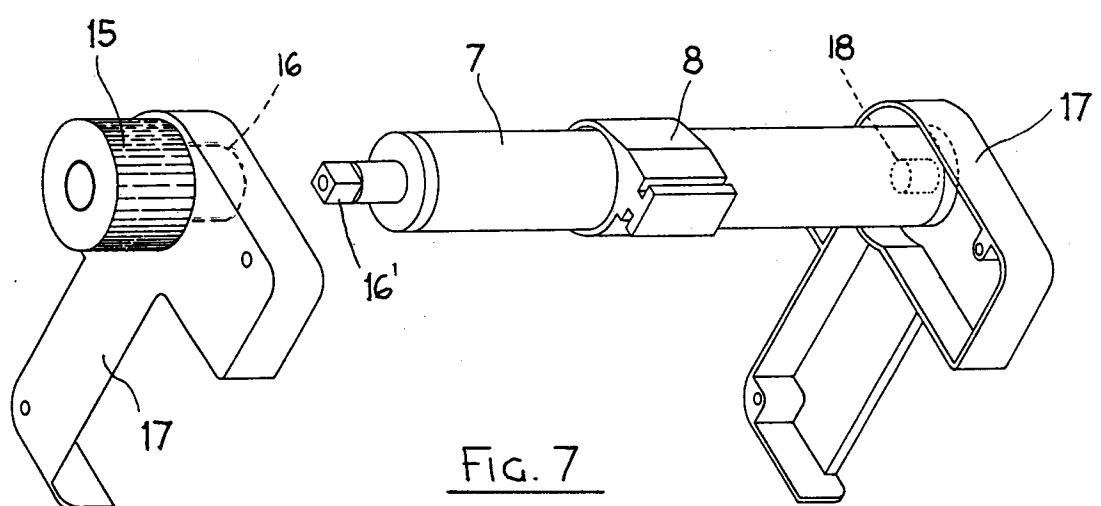
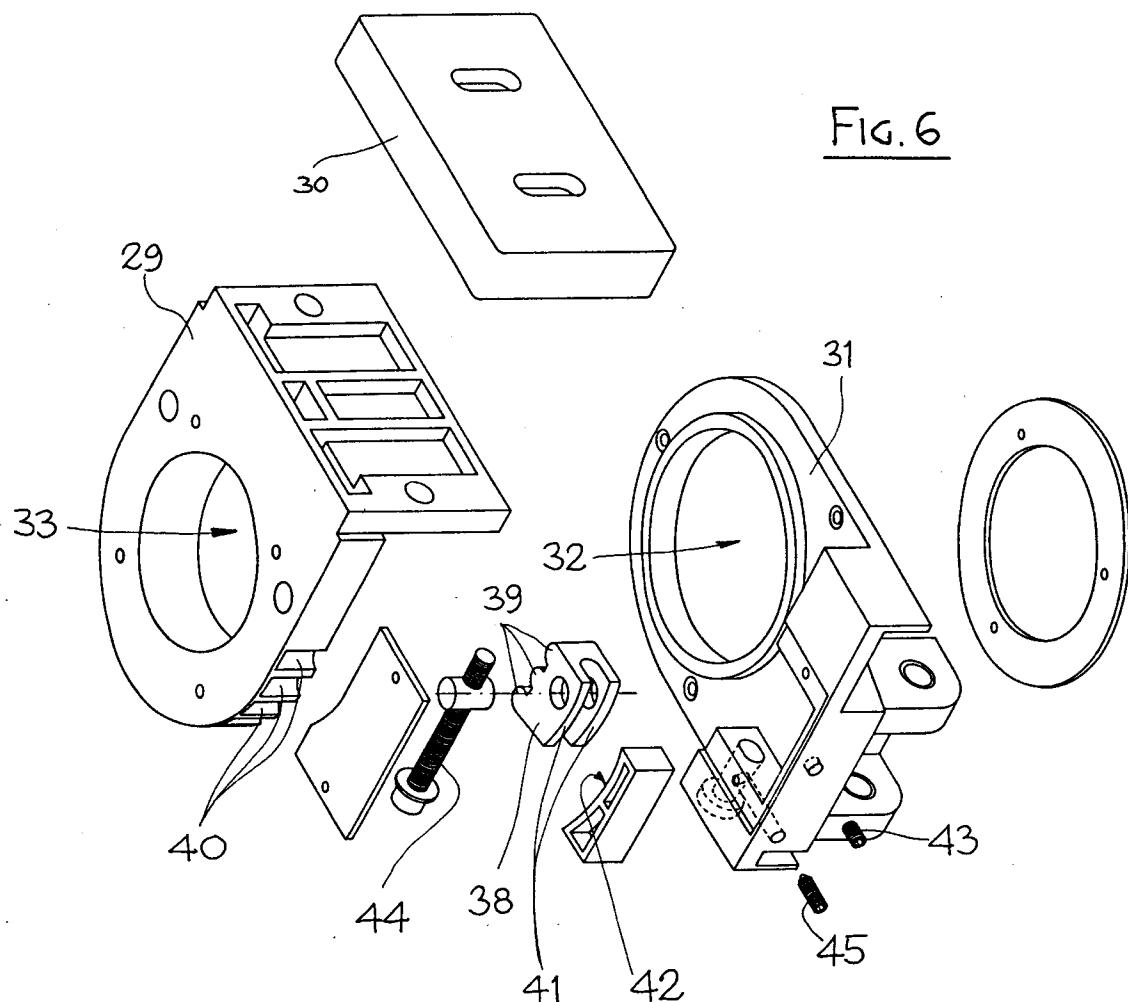
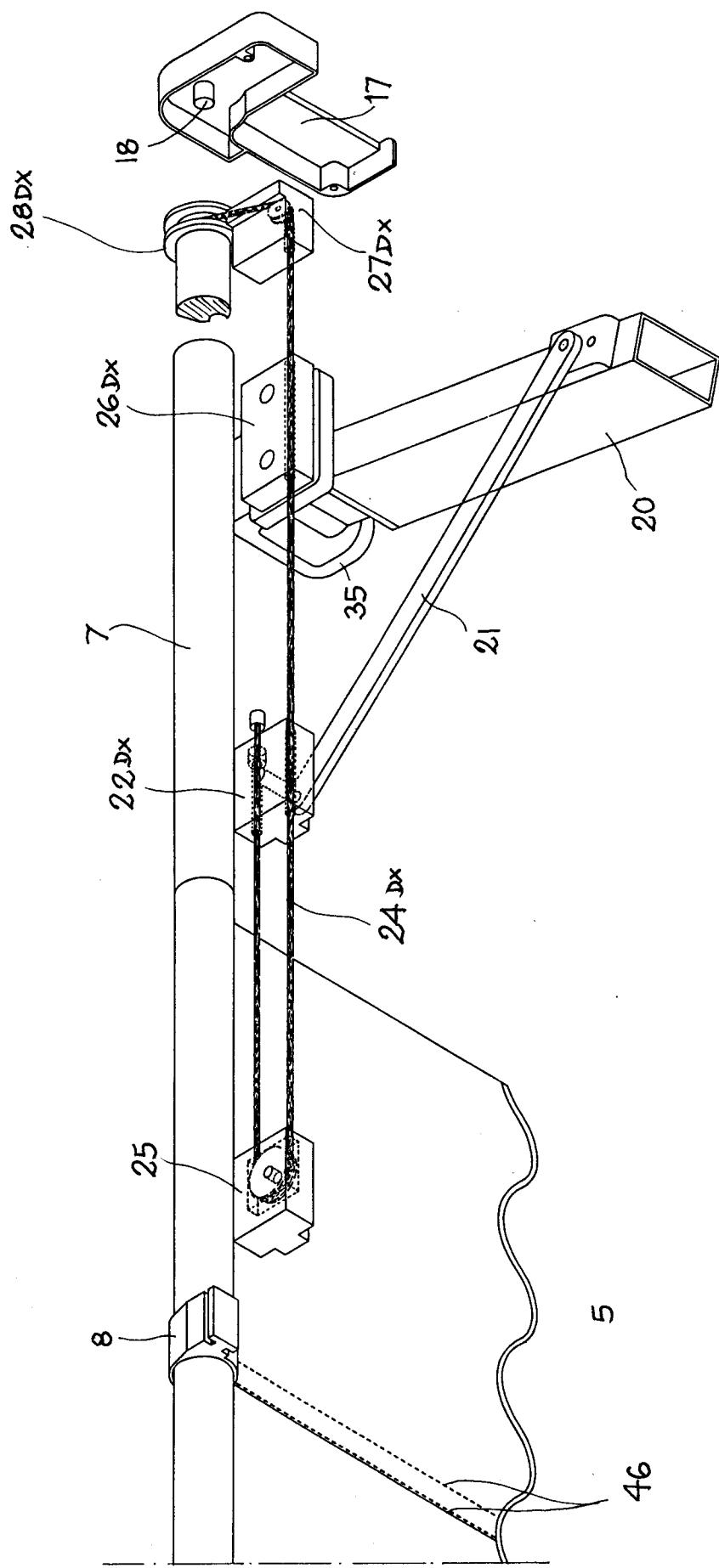


FIG. 8



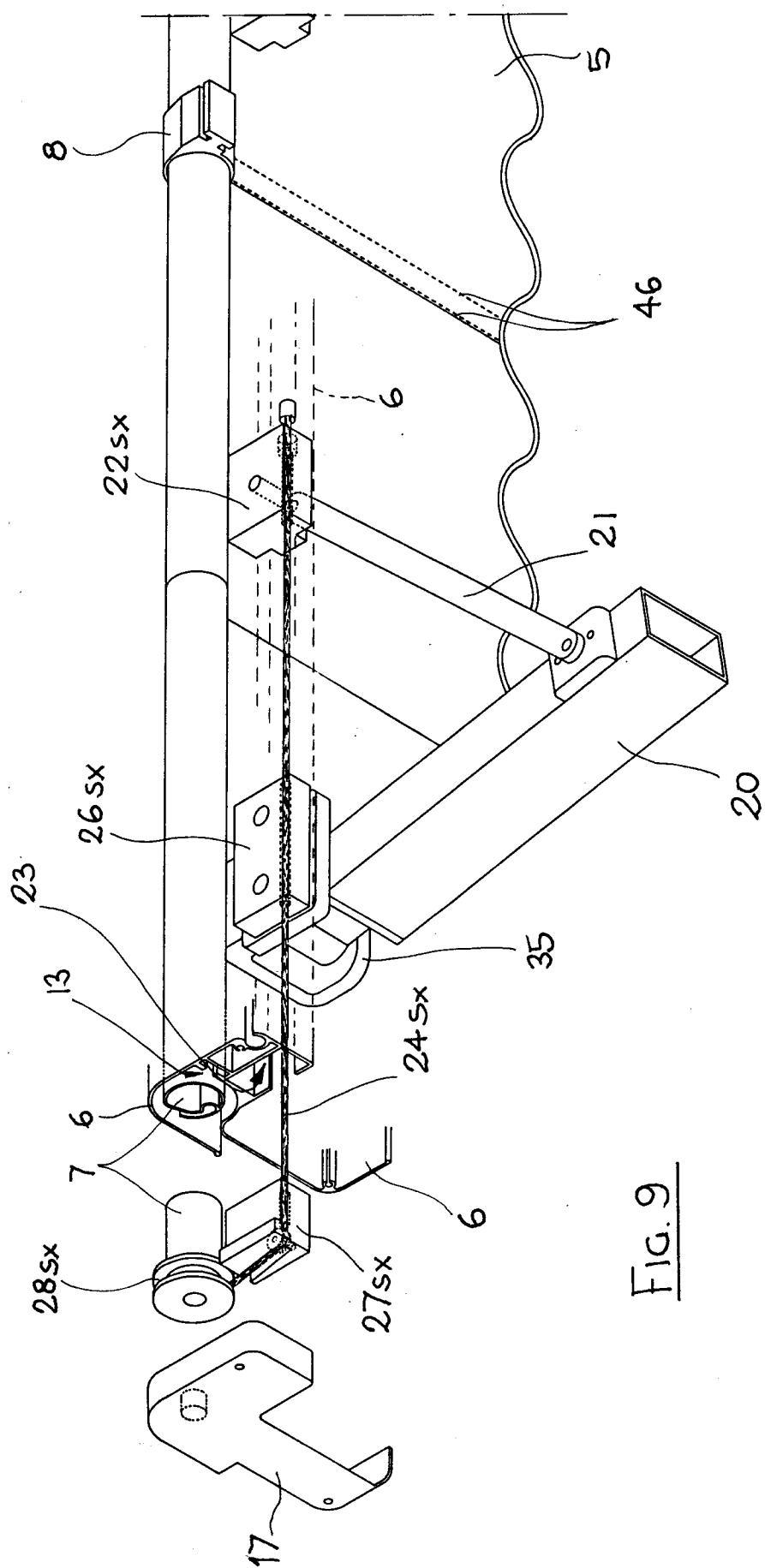


FIG. 9