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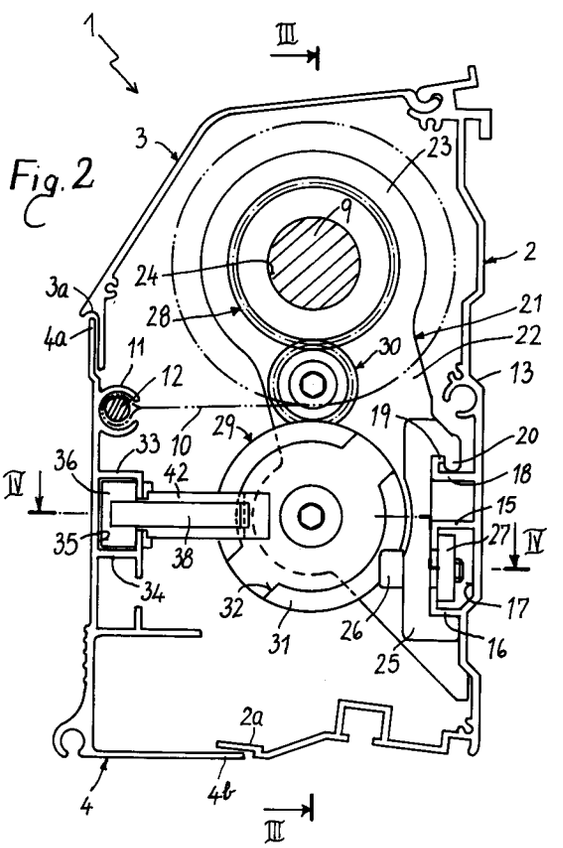
(54) Awning locking mechanism.

(57) Mechanism for locking an awning comprising a casing (1) composed of a rear profiled element (2) and of a front profiled element (4) which is connected to the rear profiled element by means of a pair of articulated arms which, in folded position, are accommodated in the casing, and a shaft (9) for rolling up the sheet (10) which constitutes the awning; the shaft is supported so as to be able to rotate by a pair of brackets (21) which are rigidly associated with the rear profiled element; the mechanism is characterized in that two respective gears (28) are keyed on the opposite ends of the shaft, and transmit their motion to respective second gears (29) which have an axial collar (31) in which at least one recess (32) is defined and to which the hook-like end of an oscillating lever (42) engages in the awning closure position; the lever is actuated in engagement position by spring means (38) and can be disengaged in order to allow the spacing of the front profiled element from the rear profiled element when the hook-like end of the lever is aligned at the recess by means of the rotation of the shaft.

Fig. 2



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The present invention relates to an awning locking mechanism.

It is already known to roll an awning on a roller accommodated in a casing formed by profiled elements, wherein the front profiled element, to which the awning is fixed, can be spaced when the awning is unrolled.

The casing furthermore accommodates a pair of bolts whose opposite ends are hook-shaped. In order to lock the awning rolled on the roller, a wedge-shaped protrusion which is rigidly associated inside the front profiled element is engaged by the lower end of the bolt and retained by the action of a spring.

In order to release the bolt, the roller is rotated from the outside until the upper end of the bolt engages a raised portion which protrudes from the front end of said roller; then, by rotating the roller again, this time in the opposite direction, the bolt is raised and the front profiled element is free. However, if this solution is adopted, there is the problem that the awning, inside the casing, remains loose for a certain portion, and this causes a sudden opening of the front profiled element, which descends rapidly due to its own weight until the loose portion of the awning is stretched again.

The aim of the present invention is therefore to provide a locking mechanism which is suitable for facilitating the use of the awning, in particular making the opening of the casing which contains it more uniform.

Within the scope of this aim, a further object of the invention is to provide a mechanism which has a simple construction and is safely reliable in operation.

This aim and this object, and other objects which will become apparent hereinafter, are achieved by the present awning locking mechanism as defined in the appended claims.

The details of the invention will become apparent from the detailed description of a preferred embodiment of the locking mechanism, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is an exploded view of the casing with the awning unrolled;

figure 2 is a transverse sectional elevation view of a casing which contains the awning and the locking mechanism according to the invention;

figure 3 is a sectional view of one of the ends of said casing, taken along the plane III-III of figure 2;

figure 4 is a sectional view of the casing, taken along the plane IV-IV of figure 2, with a detail of the locking mechanism.

With reference to the above figures, the awning has a casing, generally designated by the reference numeral 1, which is preset for being fixed to the outside of a camper or caravan.

The casing 1 is formed by a rear profiled element 2, with which a hood 3 is associated in a snap-together manner, and by a front profiled element 4 which has an L-shaped cross-section and closes said casing perfectly; the upper and lower edges of said front profiled element are complementary to those of the hood 3 and of the rear profiled element 2 respectively.

The front profiled element 4 is coupled to the rear profiled element 2 by means of a pair of arms 5 and 5a whose construction is known and accordingly is not described in detail; said arms are accommodated inside the casing 1 in their folded position and said arms extend at an angle downwardly in their open position as in known awnings.

The casing 1 is furthermore closed at its opposite ends by two covers 6 and 6a, one of which has a housing 6b for a reduction mechanism 7.

Said mechanism 7 has a helical gearwheel which meshes with a worm screw which is actuated by means of an external crank 8 which can be coupled to the shaft of the worm screw.

A shaft 9 is connected in rotation to the helical gearwheel and extends below the hood 3 in the upper part of the casing above the arms 5 and 5a; the sheet which constitutes the awning 10 is wrapped on said shaft. The front edge of the awning 10 is tubular and is fixed in an open groove 11, defined on the inner surface of the profiled element 4, by means of a rod 12 which is inserted in the tubular edge of the awning 10, inside the groove 11.

The rear profiled element 2 has a series of longitudinal folds 13 which help to stiffen it. Two longitudinal wings 15 and 16 protrude from the inner surface and their edges are folded toward one another so as to define a channel 17, whereas a third wing 18 extends above the two wings 15 and 16 and has an edge 19 which is folded upward. Teeth 20 engage the edge 19 and belong to two respective brackets 21 for supporting the shaft 9 so that it can rotate; said brackets are provided at each of the ends of the casing 1.

The brackets 21 are formed by a plate 22 which is orthogonal to the profiled element 2, and comprise a circular upper region 23 which is centrally provided with a circular opening 24.

A tab 25 protrudes axially inward from the lower part of the plate 23, is provided with the tooth 20 in an upward position and is shaped so as to cover the wings 15, 16 and 18. The brackets 21 are fixed to the profiled element 2 by means of a screw 26 and a nut 27 which is accommodated in the channel 17.

The openings 24 of the two brackets 21 are rotatably crossed by the ends of the shaft 9 on which two respective gears 28 are keyed. Each

gear 28 transmits its motion to a respective gear 29 by means of an idler gear 30.

The gears 28 and 29 are supported so as to be able to rotate by pivots which protrude in a cantilever manner from the brackets 21.

The gear 29 is provided with an axial collar 31 which has a chamfer 31a along its outer edge. The continuity of the collar 31 is interrupted by a pair of diametrically opposite recesses 32.

The front profiled element 4 has a pair of longitudinal wings 33 and 34 which protrude toward the inside of the casing 1; the edges of said wings are folded toward one another so as to define a longitudinal seat 35.

A pair of blocks 36 is inserted at the opposite ends of the seat 35, and a cavity 37 is defined in said blocks and is open toward the inside of the casing 1.

Each block 36 has, on one side, a lamina 38 which protrudes through the wings 33 and 34 and is curved so as to form a leaf spring 38.

A plate 40 is rigidly associated with the block on the side opposite to the lamina 38 by means of a bridge 39 and is spaced from the block by a slot 40a in which the opposite edges of the wings 33 and 34 are inserted.

The plate 40 and the block 36 are crossed by a hole in which a screw 41 is engaged; said screw allows, with the aid of a nut 41a embedded in a recess of the block, to fix said block in a preset position along the seat 35.

A lever 42 is inserted in the seat 35 together with the block 36 and engages the cavity 37 with an enlarged end 43; the spring 38 acts on said lever.

The other end of the lever 42, which protrudes toward the inside of the casing 1, is shaped like a hook 44 which has a chamfer 44a. The block 36 and therefore the lever 42 are fixed along the seat 35 and in a position in which the chamfer 44a is arrangeable on the same plane as the chamfer 31a which externally surrounds the collar 31.

The operation of the described locking mechanism is as follows.

When the front profiled element 4 is in the position which closes the casing 1, the hook-like end 44 of the lever 42 is effectively hooked to the collar 31 of the gear 29, as shown by figure 4. In this position, the upper edge 4a of the front profiled element 4 engages a front groove 3a of the hood 3, whereas the lower edge 4b abuts with an undercut 2a which is defined frontally in the rear profiled element 2.

When one wishes to open the casing 1 in order to unroll the awning 10, rotation is performed by means of the crank 8 of the shaft 9. In this manner, the motion is transmitted from the gear 28 to the gear 29 until one of the recesses 32 is at the hook 44 of the lever 42.

This first rotation of the shaft 9 also unrolls a small portion of the awning 10 inside the casing, and when one of the recesses 32 aligns with the hook 44, such hook, by virtue of the force of gravity on the front profiled element 4, disengages from the collar 31 of the gear 29, allowing the profiled element 4 to space from the profiled element 2 and descend as the unrolling of the awning 10 continues.

When one wishes to roll up the awning, the shaft 9, by means of the crank 8, is rotated in the direction opposite to the unrolling direction until the front profiled element 4 is ready to engage, with its edges 4a and 4b, the groove 3a of the hood 3 and the undercut 2a of the profiled element 2.

However, before reaching the final position, the hooks 44 of the levers 42 abut with the gears 29 and, by virtue of the engagement between the chamfers 44a and 31a, engage behind the collars 31, ensuring a firm retention of the profiled element 4 in the casing closure position.

In order to ensure the alignment of the chamfers 31a and 44a and at the same time protect the spring 38 against excessive flexing, such as for example in the case of longitudinal movements of the front profiled element 4 with respect to the rear profiled element 2, a pair of teeth 45 protrudes from the enlarged portion 43 of the lever 42; said teeth, by abutting on the bottom of the cavity 37, keep the lever 42 perpendicular to the profiled element 4. Furthermore, if the lever 42 is stressed so as to incline more than appropriate, the teeth 45, by making contact with the opposite edges of the wings 34, limit the oscillation of the levers 42 within a yielding limit of the tabs 38.

The invention has the substantial advantage of allowing the release of the awning immediately after the roller has started to rotate. In this manner, the awning can be lowered without appreciable jolts and thus without compromising its integrity. It is significant that the release of the awning is obtained in the unrolling direction, so that there are no stresses on the structure, contrary to what occurs in known devices, in which release occurs by winding the awning further and thus with a considerable stress.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Locking mechanism for an awning which comprises a casing (1) having a rear profiled element (2) and a front profiled element (4) which is connected to the rear profiled element by means of a pair of articulated arms (5, 5a) which, in folded position, are accommodated in said casing, and a shaft (9) rotatably supported by said rear profiled element (2) for rolling up the sheet (10) which constitutes said awning, characterized in that said locking mechanism comprises an element (29) which receives motion from said shaft and which has an axial collar (31) in which at least one recess (32) is defined, a spring-biased oscillating lever (42) which is connected to said front profiled element and which comprises a hook-like end (44) for lockably engaging with said collar (31) and for disengaging therewith at said recess (32).

2. Mechanism according to claim 1, characterized in that said lever (42) is biased by a leaf spring (38) which is defined by an arc-like lamina of a block (36) in which a cavity (37) is defined, said cavity being articulately engaged by an end (43) of said lever (42), said block (36) being inserted in a longitudinal seat (35) along which it can slide and be fixed, said seat being formed by wings (33, 34) which protrude from the front profiled element (4) toward the inside of the casing.

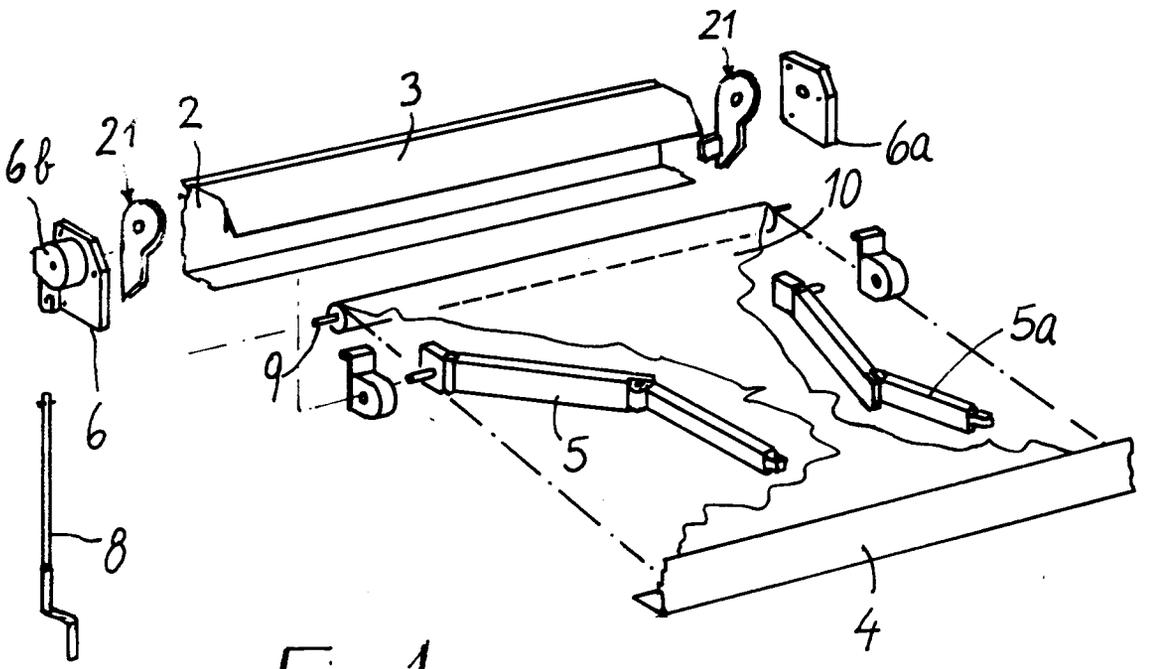
3. Mechanism according to claim 1, characterized in that said axial collar (31) has a peripheral chamfer (31a) and a pair of diametrically opposite recesses (32).

4. Mechanism according to claim 3, characterized in that the end (43) of said lever (42) which is articulated in said block (36) has at least one tooth (45) which constitutes a stroke limit for the oscillations of the lever.

5. Mechanism according to claim 1, characterized in that said hook-like end (44) of said lever (42) has a chamfer (44a) which is arrangeable in the same plane as the chamfer (31a) of said collar.

6. Mechanism according to claim 1, characterized in that a first gear (28) is keyed to said shaft (9) and said rotating element comprises a second gear (29) which receives motion from said first gear (28) by an interposed idle gear (30).

7. Mechanism according to the preceding claims, characterized in that a pair of brackets (21) are connected at opposite ends of said rear profiled element which rotatably support a respective end of said shaft (9), a respective second gear (29), and a respective idle gear (30), said front profiled element (4) having connected thereto a pair of levers (42) one each for engaging a collar (31) of a respective second gear (29).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6b
6a
10
5a
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Fig. 1

Fig. 4

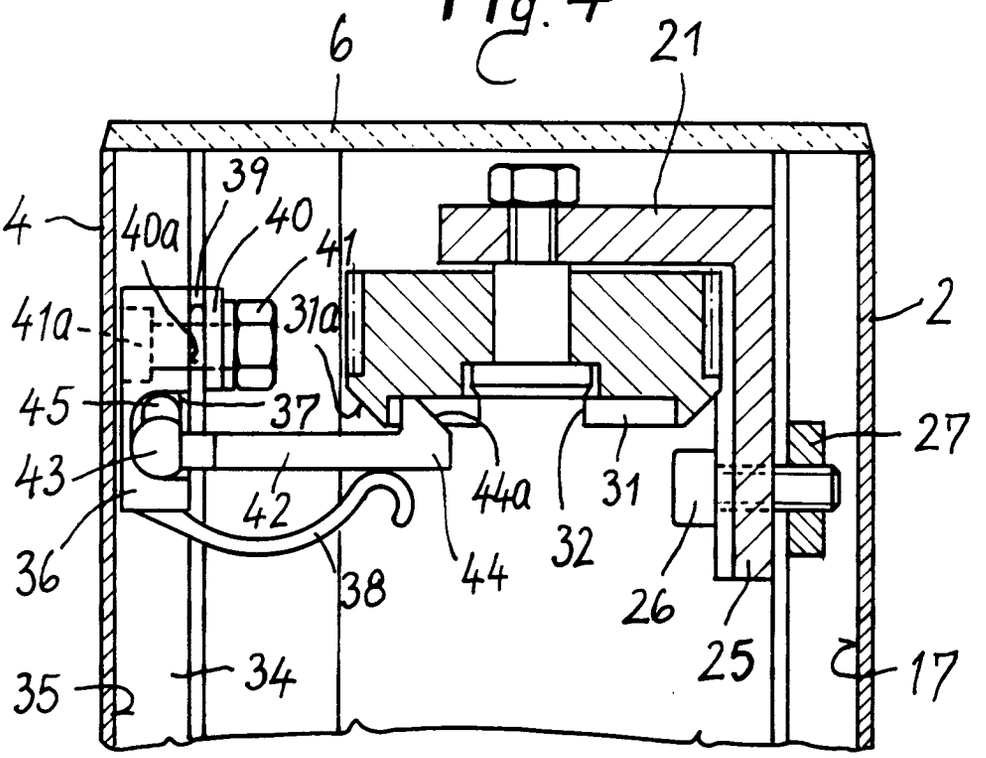
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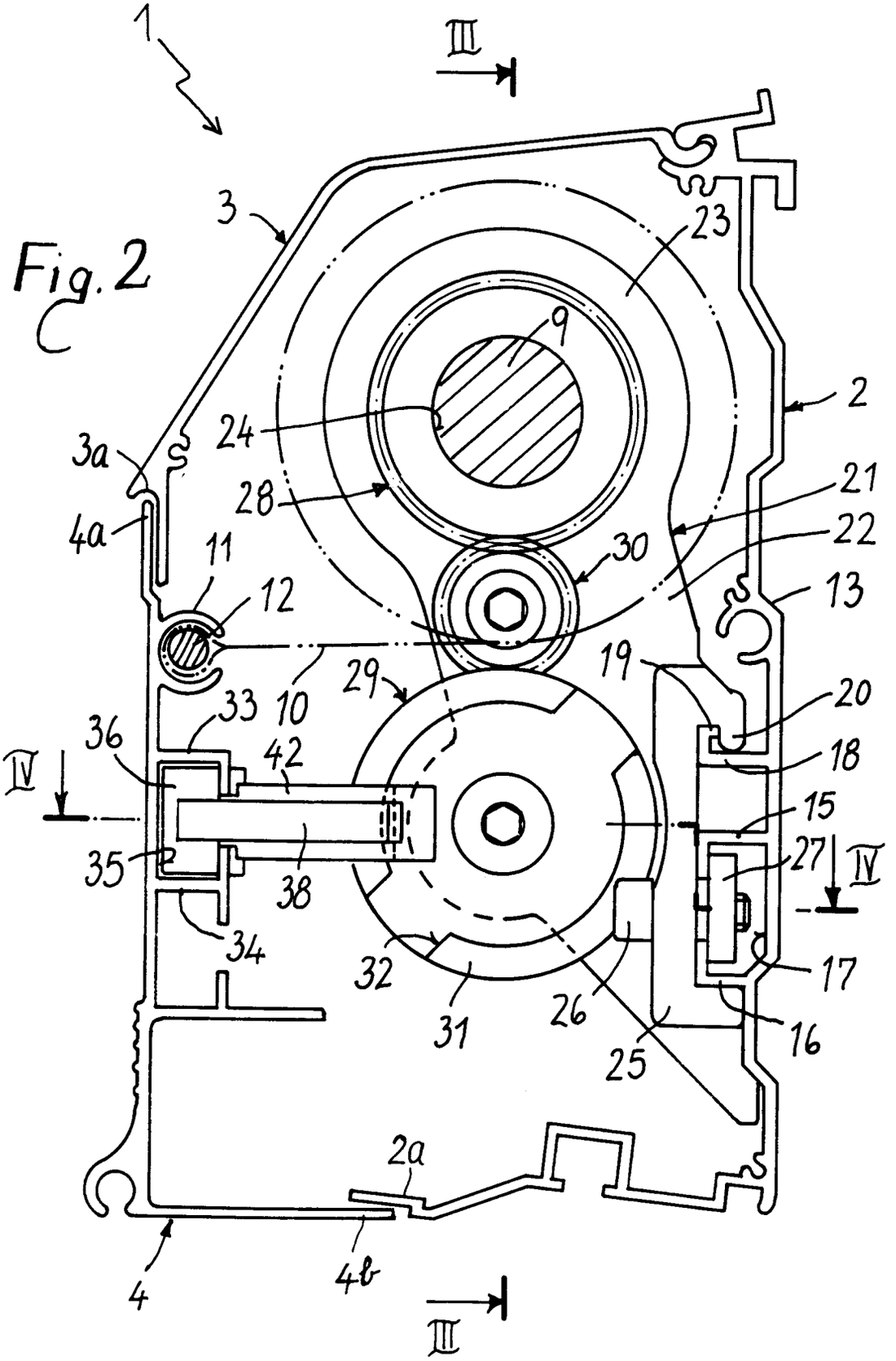
Fig. 2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III
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3a
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4a
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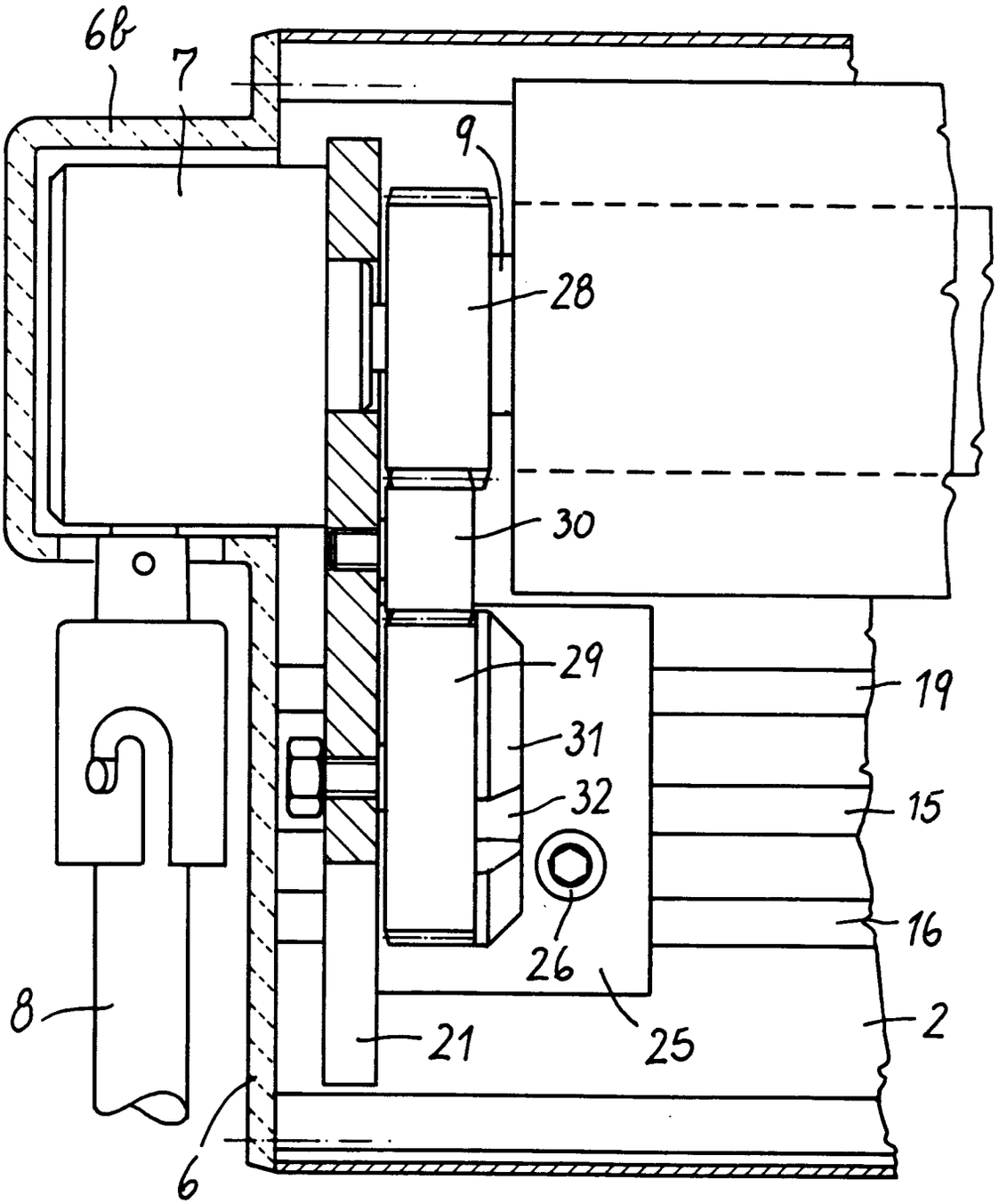

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 6485

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)
Y	US-A-4 997 021 (BRUTSAERT) * column 2, line 61 - column 4, line 34; figures * ---	1-5	E04F10/06 E06B9/17
A		6,7	
Y	CH-A-148 425 (KASTNER) * page 3, left column, last paragraph - right column, last paragraph; figures * ---	1-5	
A	EP-A-0 230 476 (POZZI) * column 1, line 46 - column 3, line 6; figures * ---	1-5	
P,A	FR-A-2 656 372 (BRUTSAERT) * page 2, line 19 - page 4, line 19; figures * -----	1-5	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E04F
E06B
E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 AUGUST 1992	KUKIDIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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