(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 297 198**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87830251.2**

(51) Int. Cl.[4]: **E06B 9/209**

(22) Date of filing: **02.07.87**

(43) Date of publication of application:
04.01.89 Bulletin 89/01

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

(71) Applicant: **I.M.B.A.C. S.p.a.**
Via Mazzini, 3
I-20061 Carugate (Milano)(IT)

(72) Inventor: **Cattaneo, Rino**
Via Parada 24
I-20057 Vedano Al Lambro (Milano)(IT)

(74) Representative: **Lecce, Giovanni**
UFFICIO BREVETTI CALCIATI S.r.l. via G. Negri,10
I-20123 Milano(IT)

(54) Safety device for geared winch for the movement of roller blinds.

(57) Safety device of a geared winch for the movement of blinds comprising a hollow base (1), in which the movement means of the drum of the blind are inserted, said base (1) having the inside surface of the chamber (8) provided with gear teeth (11); an eccentrically shaped hub (6), in which the axis of the drum (2) is inserted, driven by said movement means; a gear (12) keyed on said hub (6) and provided with teeths (13) on the outside surface, which only in part engage with those (11) obtained in the inside surface of the chamber (8); ans stop mens for end of travel (14 and 15), fixed respectively on the base (1) and on the gear (12) keyed on the eccentric hub (6).-

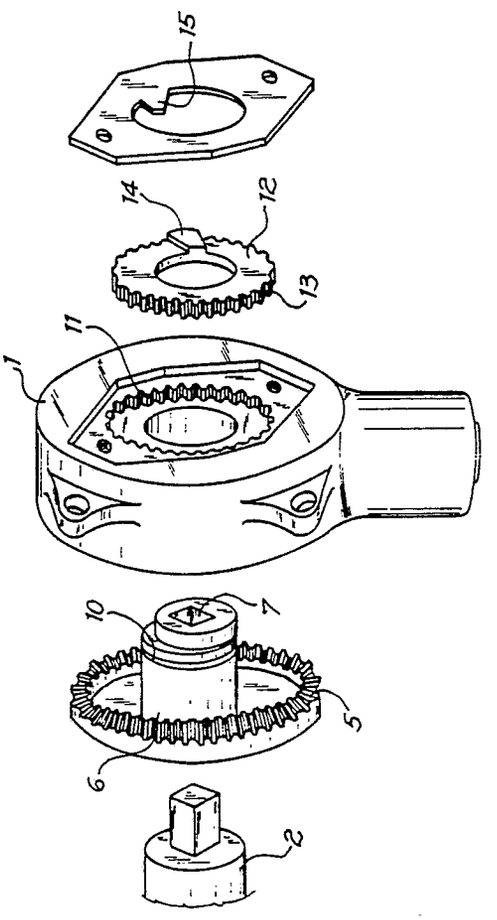


Fig.3

EP 0 297 198 A1

SAFETY DEVICE FOR GEARED WINCH FOR THE MOVEMENT OF ROLLER BLINDS

The present invention refers to a safety device for geared winch for the movement of roller blinds.

More in particular, the present invention refers to a safety device for geared winch for the movement of roller blinds in wood. plastic or aluminium, sunshades, tents, awnings etc., wound on a drum.

As noted, for the movement of blinds. curtains, awnings etc. geared winches are used to drive a drum on which the blind is wound in upstroke and unwound in downstroke.

These winches generally comprise a gear provided with a hollow pin, in which the axis of the drum and a means to move this gear are inserted and fixed; said means may be a worm screw, helical wheel, bevel pinion etc.

The main disadvantage of the winches is that they do not have a stop device for upstroke and downstroke. The lack of winch stop at end of travel makes it necessary, as noted, to rewind the sheet of the blind in opposite direction to the correct one in downstroke, and the exit of the sheet from the guide, in upstroke.

To solve these problems different stop devices have been proposed, to be coupled to the winch. These devices serve to avoid possible incorrect manoeuvres at the end of standard unwinding or winding of the blind, preventing further incorrect movement.

The noted devices are applied externally to the winch or placed at the end of the winding drum opposite the one on which the winch is fixed.

The noted stop devices, even if satisfactory from a functional point of view, are rather bulky, are more expensive to instal and are subject to frequent breakage or faults, making continuous assistance necessary.

To solve all these problems, the present invention provides a safety device which, besides being easy to construct, is inserted in the base of the winch, forming an assembly with the latter.

According to the present invention, the safety device for geared winch comprises:

a. a hollow base with ring section equipped with toothing along the circumference of the hollow and containing the moving means of the wnch and a hollow hub in which the axis of the drum on which the blind is wound and unwound is inserted; this hub is eccentrically shaped;

b. A gear composed of a hollow cylinder with ring section inserted in the eccentric hub, equipped with teeth on the outside surface facing the teeth of the base and having a thickness (measured at the base of the teeth) equal to the smallest distance between said hub and said teeth, so that only some teeth of said gear are inserted in the cor responding teeth of the base; and

c. stop means for end of travel comprising a tooth fixed on the surface of the gear and a corresponding countertooth or plate fixed to the base, projecting from the latter towards the gear in position corresponding to the tooth and having a height lower than the lowest distance between the hub and teeth; the distance between said tooth and countertooth being function of the number of revs required to lower or raise the blind.

The eccentric hub may consist of a hollow cylinder keyed on the hub of the winch and having variable thickness to make it eccentric.

The countertooth or plate may be obtained on the inside surface of a ring, fixed, by means of screws or other equivalent means, to the base.

The ring may be circular, triangular or polygonal for its most effective fixing and maintenance in position.

During operation of the winch, the eccentrically shaped hub moves the gear whose teeth engage in those of the base. The difference between the number of teeth of the gear and the number of teeth and eccentricity of the hub permit that, at each complete rev of the hub, only a partial rotation of the gear corresponds. A considerable number of revs of the hub and therefore of the drum of the blind are therefore necessary before the gear has made a complete rev.

Making a suitable adjustment of the distance between the tooth of the gear and the countertooth or stop plate of the base it may therefore be ensured that tooth and countertooth are in contact with each other at end of upstroke or downstroke of the blind. As the countertooth is fixed to the base, the movement of the gear and therefore of the hub and drum is locked as soon as the tooth goes into contrast with the fixed countertooth, thus preventing further unwinding and/or winding of the blind due to a possible incorrect manoeuvre of the operator.

The constructive and functional characteristics of the safety device for geared winches of the present invention can be more easily understood from the following detailed description, in which reference is made to the attached drawings which show a preferred, illustrative but not limitative construction of the present invention, in which:

fig. 1 shows a front schematic view of a geared winch equipped with the safety device object of the present invention;

fig. 2 shows the schematic view of the cross-section with a plane passing through line A - A′ of the winch in fig. 1; and

fig. 3 shows the perspective schematic view of the winch in figures 1 and 2 in exploded form.

With reference to the drawings, the geared winch, in which the safety device of the present invention is inserted, comprises a base (1) in which the movement means of the hub (2) are inserted. Said means comprise a bevel pinion (3), driven by a manoeuvring pin (4), and a bevel ring gear (5), which engages with the abovementioned bevel pinion (3), according to the noted technique.

The gear (5) is integral to a hollow hub (6), in whose hollow, having a polygonal section, the axis of the drum (2) of the blind is inserted. The base (1) is hollow, with ring section, and the hollow hub (6) is inserted in its hollow (8). A seeger ring (9), inserted in a perimetral hollow (10) of the hub (6), keeps the hub fixed to the base (1) with the relevant gears inserted. According to the present invention, the free end (6′) of the hub (6) is eccentrically shaped. Moreover, the inner wall of the hollow (8) of the base is provided with gear teeth (11) in the zone corresponding to the eccentric part (6′) of the hub. In the hub (6′) a gear (12) is keyed, composed of a hollow cylinder with ring section, provided with teeth (13). The thickness of the gear (12), measured at the base of the teeth (13), is equal to the smallest distance between the surface of the hub (6′) and the gear teeth (11) of the base so that only some of the teeth (13) engage with those (11) of the chamber (8). From the surface of the gear (12) projects a stop tooth (14), integral to the outside surface of said gear.

A countertooth (15) is fixed on the base (1) and its length is shorter than the distance between the surface of the hub (6) and the gear teeth (11), so as not to interfere with the free movement of the gear (12), before they come into contact. Alternatively, the countertooth (15) may be integral to a circular or polygonal flange fixed to the base (1). Eccentricity of the hub (6) may be obtained keying on it a hollow cylinder with variable thickness to give it eccentricity.

The safety device of the present invention operates as follows: the bevel pinion (3), driven by the manoeuvring pin (4), starts the gear (5) and then the hollow hub (6) integral to same rotating.

The hollow hub (6) moves the gear (12) keyed on it and some teeth (13) of the gear (12) engage with the respective teeth (11) of the base. As the number of teeth (13) of the gear (12) is lower than that of the teeth (11) of the base and the hollow hub (6′) is eccentric, to each complete rev (360°) of the gear (5) only a small rotation of the gear (12) corresponds. The angular distance between the stop tooth (14) and countertooth (15) is regulated in such a way that this distance is covered by the gear (12) making a number of revs of the gear (5) neces sary for complete unwinding and/or winding of the blind on the drum (2).

From the above the constructive and operating simplicity of the safety device of the present invention is evident. In its practical construction, various changes, modifications and variations may be made to the present invention.

Claims

1. Safety device of a geared winch for the movement of blinds, comprising:

a. a hollow base with ring section provided with teeth along the circumference of the hollow and containing movement means of the winch and a hollow hub in which the axis of the drum on which the blind is wound or unwound; said hub being eccentrically shaped;

b. a gear composed of a hollow cylinder with ring section inserted in the eccentric hub, equipped with teeth on the external surface facing the teeth of the base and having a thickness (measured at the base of the teeth) equal to the smallest distance between said hub and said teeth, so that only some teeth of said gear are inserted in the corresponding teeth of the base; and

c. stop means for end of travel, comprising a tooth fixed on the surface of the gear and a corresponding countertooth or plate fixed to the base, projecting from the latter towards the gear, in corresponding position to the tooth and having a height lower than the smallest distance between the hub and the teeth; the distance between said tooth and countertooth being function of the number of revs required to lower or raise the blind.

2. Safety device according to claim 1, in which the eccentric hollow hub consists of a hollow cylinder keyed on the hub of the winch and having variable thickness to give eccentricity.

3. Safety device according to claim 1 or 2, in which the countertooth is obtained on the inside surface of a ring fixed to the base.

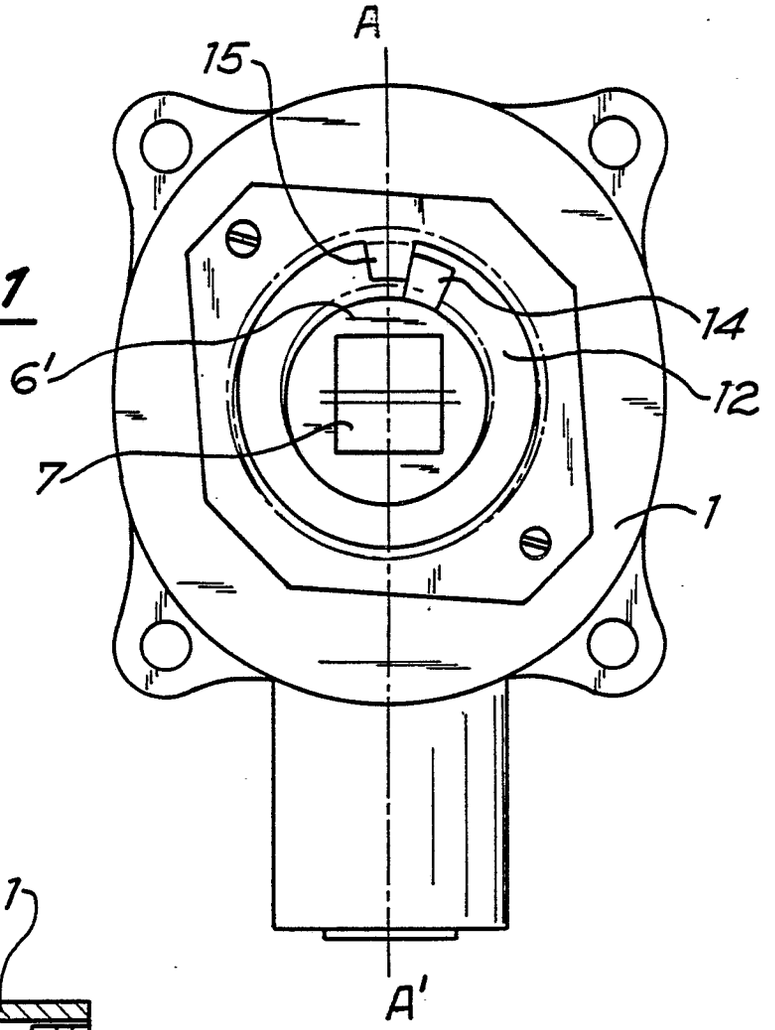
4. Safety device according to claim 3, in which the ring is circular.

5. Safety device according to claim 3, in which the ring is triangular or polygonal.

6. Safety device according to any one of the previous claims, in which the hub is provided with a perimetral hollow in which a seeger ring is inserted to fix the hub to the base.

7. Safety device according to any of the previous claims, in which the angular distance between the stop tooth and the countertooth corresponds to that covered by the gear during the complete downstroke or upstroke of the blind.

Fig. 1



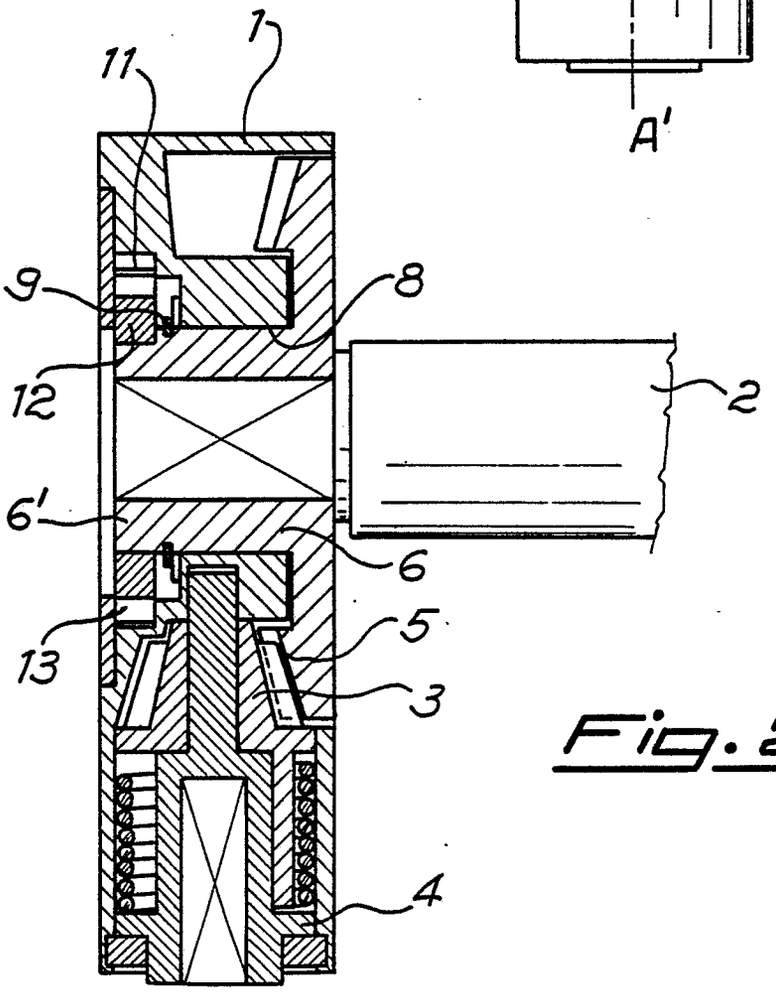
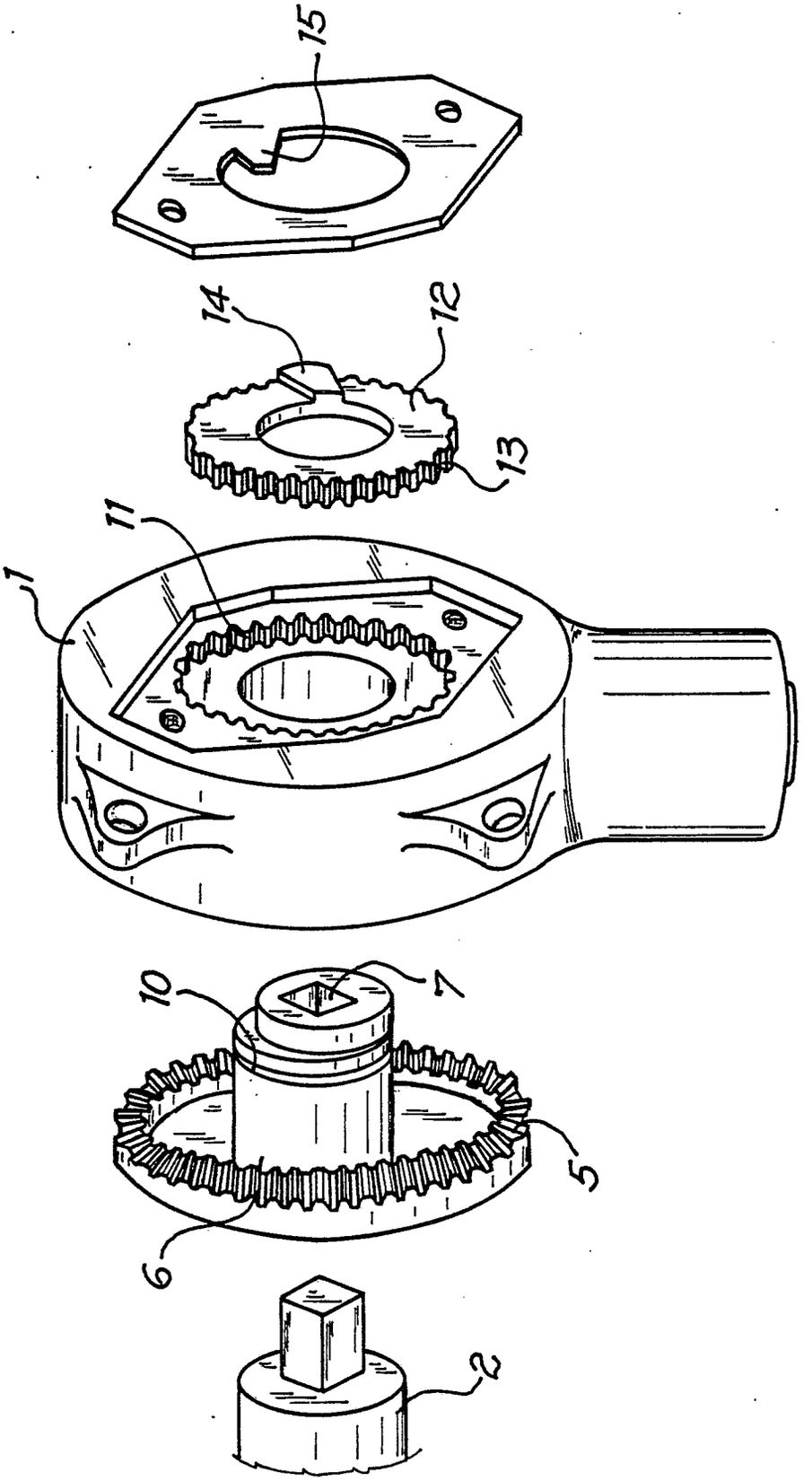


Fig. 2

Fig.3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 87 83 0251

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)
A	DE-A-2 362 112 (WIEGELMANN) * Page 2, paragraphs 3,4; pages 3,4; figures 1-3 *	1	E 06 B 9/209
A	FR-A-1 479 577 (MEWALUX)		
A	FR-A-2 141 534 (RIOU)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26-02-1988	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

EPO FORM 1503 03.82 (P0401)