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

(11) Publication number: **0 096 664**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **13.09.89**

(51) Int. Cl.[4]: **E 06 B 9/204,** E 06 B 9/206

(21) Application number: **83830115.8**

(22) Date of filing: **08.06.83**

(54) **A roller shutter winding lifting friction device.**

(30) Priority: **09.06.82 IT 8340682**

(43) Date of publication of application:
21.12.83 Bulletin 83/51

(45) Publication of the grant of the patent:
13.09.89 Bulletin 89/37

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

(56) References cited:
DE-A-2 013 055
DE-A-2 620 808
FR-A- 794 770
FR-A-1 386 359

(73) Proprietor: **Piemonte, Elvana**
Via Parini 10
I-34074 Monfalcone (Gorizia) (IT)

(72) Inventor: **Piemonte, Elvana**
Via Parini 10
I-34074 Monfalcone (Gorizia) (IT)

(74) Representative: **D'Agostini, Giovanni, Dr.**
D'AGOSTINI ORGANIZZAZIONE n. 17 via G.Giusti
I-33100 Udine (IT)

Courier Press, Leamington Spa, England.

EP 0 096 664 B1

Description

The invention relates to a roller shutter lifting-winding friction device.

Roller shutter winding-lifing devices manually operated by belt or by rotating bar well known in prior art. Said devices ar generally used for lifting and winding roller shutters or blinds. Belt operated devices are very bulky as they utilize a winding belt device generally separated from the winding drum coaxially placed with respect to the roller shutter winding bar; furthermore, the utilization of a independent winding belt device requires a separate installation with an expensive hole on the wall; not to mention that the belt breaks frequently, involving a considerable amount of work for its replacement.

On the other hand, rotating bar operated devices are extremely expensive for their complexity and the rotating bar is also very bulky; furthermore, the lifting and lowering speed is inevitably very slow, due to the transmission means.

Relevent background art can be represented by FR—A—794770 and FR—A—1386359.

The invention as claimed is intended to provide a remedy. According to the invention a roller shutter winding device comprises a bar connection and a clockwise or counter-clockwise rotatable toothed driving pulley placed coaxially with respect to said bar connection for winding or unwinding a rollershutter or curtain by means of an endless chain, wherein said driving pulley is mounted coaxially on a gear pinion by means of a screw thread and is connectable with said bar connection by means of a free rotating ratchet gear device having friction surfaces and provided between the pulley and a flange shaped abutment of the gear pinion whereby upon rotating said driving pulley in one direction the free ratchet wheel of said free rotating ratched gear device is frictionally clutched between said pulley and the flange shaped abutment of said gear pinion, thus causing a fixed joint connection between said driving pulley and the gear pinion to said roller shutter connection, whereas upon rotating said driving pulley in the opposite direction, said free ratchet wheel will be unclutched allowing a controlled rotation in the same direction of said roller shutter connection.

The advantages offered by the invention are mainly that belts are not utilized, avoiding the frequent breakages and replacments, and also avoiding separate bulky winding belt devices and expensive holes for their installation on the wall.

Further advantages can be noticed if the invention is compared with rotating bar winding-lifting devices, because the relative bulky rotating bar is not utilized and a very compact winding device coaxial with respect to said roller shutter winding bar is ised, with reduced overall dimension equal to a standard belt pulley.

The device according to the invention is very cheap and extremely reliable and can be utilized for lifting also very big and heavy roller shutters due to its gear reduction means which operate only in the lifting action, being automatically disengaged when the toothed driving pulley is rotated in the opposite direction, allowing the desired and controlled lowering of sid roller shutter.

One way of carrying out the invention is described in detail below with reference to the annexed drawings which illustrate only one specific embodiment, in which:-

Figure 1 is a perspective view of the device according to the invention, in the specific case for lifting-winding a roller shutter, placed on a wall; Figure 2 is a view of a gear transmission and reduction means of the device according to the sectional view on the plane A—A of Figure 4; Figure 3 is a view on the transversal plane normal to the rotation axis of the support plate of the roller shutter winding bar, supporting three free rotatable planetary gears of the axial gear reduction means "A"; Figure 4 is an axial sectional view of the whole shutter winding direction, tightening the plates and ratchet wheels of said multi-plate friction clutch by said screw connection; Figure 5 is a transversal plane view from the left inner side of the mounting plate "C", which fixes on the wall and supports the whole device and, by means of this one, supports the roller shutter winding-lifting bar, as shown in Figure 1; Figure 6 is a vertical plane sectional view of the mounting plate "C" shown in Figures 4 and 5, and in the specific case according to section C-C of Figure 5, with the free gear open springs (in continous line and short dash line in the connecting position); Figure 7 is a right side view of the device shown in Figure 4 without the mounting plate "C" and showing, in partial section on the intermediate plane of the driving toothed pulley and internally coaxially to this one, the free ratchet wheel multi-plate friction clutch assembly; Figure 8 is an axially sectional view of the complete device as shown in Figure 4, wherein said multi-plate friction clutch is disengaged from said free ratchet wheel by means of reversed rotation of said toothed driving pulley for the controlled lowering of said roller shutter.

The figures show the roller shutter lifting-winding device comprising in its basic design: a driven rotating plate with freely rotatable planetary gears assembly "A"; a driving toothed pulley with free ratchet wheet multi-plate friction clutch assembly 'B"; a mounting plate "C" for mounting the complete device on the wall; a fixed rim gear wheel "D" for gearing said planetary gears 1 of the driven rotating plate assembly "A" for supporting a winding bar for said roller shutter 2.

In detail, the driven rotating plate "A" consists of a metallic plate disc 3 with reinforcing ribs 4 further comprising an axial welded connecting pipe with squared interior section 5 for fixed connection with the end of a winding bar (not shown) for winding the roller shutter 2; furthermore, on the opposite side, said metallic plate disc 3 supports symmetrically welded, radially place at 120° one from the other, at the same

distance from the centre, three sleeves 6 which support coaxially three free rotatable planetary gears 1, and further, coaxially inside the pipe connection 5, said disc 3 has a axial central hole 7 for fixing the whole device by means of a central tightening pin 8, as shown in Figure 4. Said driven rotating plate assembly "A" is coaxiall insertable within said rim gear "D" as shown in Figure 4, to realized a planetary transmission as shown in Figure 2. The rim gear wheel "D" is preferably made in plastic material and presents an internal toothed rim 9 for gearing with said planetary gears 1, being said rim gear "D" provided with suitable axial hole 10 to allow the crossing of an axial central pinion 14 of said driving toothed pulley assembly "B".

The driving toothed pulley with free ratchet wheel multiplate friction clutch assembly "B" comprises a plastic driving pulley 11 with periferical teeth 12 for engaging an endless multisphere chain 13, which allows the clockwise or counter-clockwise rotation of said pulley. The pulley 11 is thus free to rotate clockwise or counter-clockwise, manually driven by the chain 13, being said pulley 11 provided with an axial thread to receive an axially sliding central pinion 14 for centrally gearing with said three planetary gears 1, as shown in Figures 2, 4 and 8.

The pinion 14, generally made in plastic material, makes one body with a first abutment comprising a two, three or four-start thread 15 cooperating with a similar thread of the axial hole of the driving pulley 11, in such a way that pulling the chain 13 on the side 13' of Figure 1 the driving pulley 11 rotates clockwise, a rotating counter-clockwise it screws on the thread 15 of the support pinion 14 tightening against a suitably provided flange shaped abutment 14' by means of the ratchet ring 19. On the outside the driving pulley 11 has a cylindrical seat 16 forming an annular groove and supports, annularly connected rotation pins 17, three ratchet gear toothed springs 18 cooperating with the ring 19, free to rotate on the support pinion 14 and supplied with a free wheel peripheric toothing controlled by the ratchet gear springs 18 for allowing the free rotation of the free rotatable ring 19 clockwise but not counter-clockwise.

Two free rotatable clutch ledges 20, 21 are provided on the right and left side of the free rotatable ring 19, so that, with the counter-clockwise rotation of the driving pulley 11, pulling the multisphere chain 13 agaist the roller shutter 2 said chain winds on the thread 15 of the support pinion 14 lightening against the inside abutment 21 of the flange 14' and locking the free rotatable ring 19, thus allowing the connection 5 to rotate in reduction ratio by means of the reduction gear transmission system: support pinion 14, free rotatable planetary gears 1 and toothed rim 9; the roller shutter 2 will thus be easily lifted due to the gearing down of the turn numbers between the driving pulley 11 and the roller shutter connection 5 by means of said reduction gear transmission system 14, 1, 9 thus making the metallic plate disc 3 and its connection 5 rotate, as the mounting plate "C" is seamed fixed on toothed rim "D" by means of three suitably arranged fastening connection 22, 23, 24, and the mounting plate "C" is fixed on the wall by means of tightening screws utilizing the holes 25, and the complete device is assembled by the central axial pin 8, axially fixed to the mounting plate "C" and tightened with the elastic ring 26 at the other end.

For this purpose the driving pulley 11 is free to move axially against the surface of said toothed rim "D", a slack 27 being provided with respect to the support pinion 14, 14'; therefore, rotating clockwise the driving pulley 11, that is pulling the chain portion 13" of the driving chain 13, this one will unscrew from the thread 15 with the support pinion 14 moving axially to the left and unclutching the friction annular plates 20, 21 and the free rotatable ring 19, thus allowing the rotation of said free rotatable ring 19 that will no longer lock the support pinion 14, which will thus be free to rotate and will slide in rotation by means of the weight of the roller shutter 2, allowing the controlled clockwise rotation of the roller shutter support rotating disc "A", allowing the speedy lowering of the roller shutter 2 in the desired quantity, because, if the driving pulley 11 rotation is stopped by stopping the pulling of the chain portion 13" of the chain 13, the same unwinding force impressed by the weight of the roller shutter 2 to a driven plate "A" makes the pinion 14 rotate clockwise, while the driving pulley 11 stops causing the screwing of the pulley 11 on the thread 15 with the pinion 14 thus moving the driving pulley 11 to the right, clutching the friction annular plates 20, 21 against the free rotatable ring 19 and consequently the roller shutter cannot lower anymore because the free rotatable ring 19 cannot rotate clockwise as its toothing meshes with the ratchet ear toothed springs 18 that allow only its counter-clockwise rotation. Therefore, also the pinion 14 is locked. When the chain 14" is pulled again, the driving pulley 11 is moved to the left, making a friction on the surface 27 against the toothed rim "D" which will cause a rotation friction also of the driving pulley 11, but said friction can be easily overcome by the manual pulling force of the chain portion 14", and consequently, as the driving pulley 11 rotates clockwise releasing the pinion 14, the roller shutter 2 will lower once more, and so on, because the thread 15 has a very lower friction force if compared with the rotation force of the device, in such a way that:

1. the friction is clutched:

a) either by the counter-clockwise rotation of the driving pulley 11 (lifting of the roller shutter);

b) or by stopping the rotation of said driving pulley 11 (tension of the roller shutter weight which makes the pinion 14 rotate clockwise).

2. The friction is unclutched only rotating clockwise the driving pulley 11 thus allowing a controlled counter clockwise rotation of the pinion 14, utilizing the weight of the roller shutter 2 with automatic locking when the clockwise rotation of the driving pulley 11 is stopped.

Naturally the rotations will be reverse if the device is installed at the other side of the rollershutter.

The driving pulley 11 is restricted in its axial movement as regards the pinion 14 due to the inside ledge which prevents its slipping off by means of an elastic ring 28.

Claims

A roller shutter (2) winding device which operates by means of a bar connection (5) and a clockwise or counter-clockwise rotatable toothed driving pulley (11) placed coaxially with respect to said bar connection (5) for winding or unwinding a roller shutter or curtain (2) by means of an endless chain (13), wherein said driving pulley (11) is mounted coaxially on a gear pinion (14) by means of a screw thread (15) and is connectible with said bar connection (5) by means of a free rotating ratchet gear device (18, 19) having friction surfaces (20, 21) and provided between the pulley (11) and a flange shaped abutment (14') of the gear pinion (14), whereby upon rotating said driving pulley (11) in one direction the free ratchet wheel (19) of said free rotating ratchet gear device is frictionally clutched between said pulley (11) and the flange shaped abutment (14') of said gear pinion (14), thus causing a fixed joint connection between said driving pulley (11) and the gear pinion (14) to said roller shutter connection (5), whereas upon rotating said driving pulley (11) in the opposite direction, said free ratchet wheel (19) will be unclutched allowing a controlled rotation in the same direction of said roller shutter connection (1).

2. A roller shutter winding device as claimed in claim 1, wherein the transmission of the rotation, by means of said friction clutch means for allowing the rotation of said roller shutter connection (5), is carried out a coaxial gear reduction means comprising a coaxial driving gear pinion (14) connected to said friction clutch means, being said pinion geared with free rotatable planetary gears (1) on a support plate disc (3) connected axially fixed to said roller shutter connection (5) and wherein said planetary gears (1) are externally and circularly geared by a fixed toothed rim (D) connected to a fixed mounting plate (C) which supports the entire device (2, 2') at one end of the roller shutter (2, 2') by means of said winding bar connection (5).

3. A roller shutter winding device as claimed in claims 1 and 2, characterised in that it comprises: a rotatable roller shutter support plate assembly (A) comprising a rotating plate disc (3) supplied with a roller shutter or curtain (2, 2') winding and unwinding bar connection, supporting three radially spaced face rotatable planetary gears (1); a toothed rim (D) provided with inside circular rim gearing tooth (9) for gearing externally with said planetary gears (1) of said roller shutter support plate assembly (A); a driving friction clutch pulley assembly (B) coaxial to the preceding aseemblies and placed externally to said toothed rim (D) and comprising a driving pulley (11) connected to an automatic free multiphase clutch ratched wheel (18, 19, 20, 21, 14') for driving, through an axial displacment screw coupling (15), an axial pinion (14) for driving the planetary gears (1) respectively clutching said friction clutching means only in one direction, and unclutching said friction clutching means in the opposite direction, making the driving pulley (11) free rotatable as regards the pinion (14); a mounting plate (C) supplied with holes for its connection on the wall (25) and fixed supporting means (22, 23, 24) for fixedly supporting said fixed toothed rim (D).

4. A roller shutter winding device as claimed in the preceding claims, wherein said screw coupling (15) for driving said automatic free multiplate friction clutch ratchet wheel means (20, 21, 14', 18, 19) has two or more starts.

5. A roller shutter winding device as claimed in the preceding claims, wherein said plate unit (roller shutter support assembly) (A), said fixed toothed rim (D), said driving friction clutch pulley assembly (B) and said mounting plate (C), are axially assembled in a single device by means of an axial central pin (8), coaxial to said roller shutter bar connection (5) and in which the screw coupling between the driving pulley (11) and the pinion (14) allows a free axial movement between said driving pulley (11) and the flange shaped abutment (14') of the pinion (14) of the gear transmission and this in order to cause, with rotation in one or in the opposite direction, respectively the clutching between them of a free ratched wheel (19) locking it in one rotating body, or vice versa its unclutching making them free rotating and releasing the driving pulley (11) with respect to the pinion (14).

6. A roller shutter winding device as claimed in the preceding claims, wherein said driving pulley (11) is driven by an endless chain (13), being one chain portion (14") deviated by a fixed lower guide (28) which approaches the two chain portions (13', 13"), wherein the first one is for winding lifting the roller shutter (2, 2') and the second one is for unwinding lowering the same roller shutter (2, 2') respectively.

Patentansprüche

1. Reibungseinrichtung zum Aufwickeln und Heben von Rolladen (2), die durch eine Stabsverbungung (5) und eine gezahnte Betätigungsrolle funktioniert, die in beiden Richtungen gedreht werden kann (11) und, die im Verhältnis zur Stabsverbindung (5) coaxial liegt, damit ein Rolladen oder ein Vorhand (2) aufgehoben oder heruntergelassen wird dank einer unendlichen Kette (13), in der die Betätigungsrolle (11) coaxial auf einen Verzahnungsgiebel (14) montiert ist, dank einem Schraubengewinde (15), und, die durch eine rotierungsfreie Ratschverzahnungseinrichtung (18, 19) mit Reibungsflächen (20, 21), die zwischen der Rolle (11) und einem Teil (14') des flanschförmigen Verzahnungsgiebels (14) liegt, mit der Stabsverbindung verbunden werden

kann. Mit def Drehung der Betätigungsrolle (11) in eine Richtung, wird das freie Ratschrad (19) der Ratschverzahnungseinrichtung durch Reibung zwischen der Rolle (11) und dem flanschförmigen Teil (14') des Verzahnungsgiebels (14) gegriffen, was zu einer festen Verbindung zwischen der Betätigungsrolle (11), dem Verzahnungsgiebel (14) und der Montage der Rolladen (5) führt. Andererseits, mit der Drehung der Betätigungsrolle (11) in die entgegengesetzte Richtung, wird das freie Ratschrad freigelassen, was eine Kontrollierte Drehung in dieselbe Richtung wie die der Montage von Rolladen (1) erlaubt.

2. Reibungseinrichtung zum Aufwickeln und Heben von Rolladen (2) nach dem Patentanspruch 1, in der der Antreib de Drehung, dank dem Reibungsgreifensmittel, das die Drehung der Montage von Rolladen (5) erlaubt, durch ein coaxiales Verzahnungsabschächungsmittel realisiert wird, das aus einem coaxialen Betätigungsverzahnungsgiebel (14) besteht, der mit dem Reibungsgreifensmittel verbunden ist. Die Verzahnung des Giebels wird durch planetaren rotierungsfreien Verzahnungen (1) möglich gemacht, die sich auf einer Stützungsplatte (3) befindet, die axial und fest mit der Montage von Rolladen (5) verbunden ist und, in der die planetaren Verzahnungen (1) äusserlich und kreisförming durch eine feste gezahnte Krone (D) aktioniert werden, die mit einer festen Stützungsplatte (C) der ganzen Verzahnung (2, 2') an einem Ende des Rolladens (2, 2') durch die Stabsverbindung (5) verbunden ist.

3. Reibungseinrichtung zum Afwickeln und Heben von Rolladen (2) nach den Patentansprüchen 1 und 2, die durch die Tatsache charakterisiert ist, dass sie aus den folgenden Elementen besteht: aud einer rotierenden Stützungsplattenverbindung von Rolladen (A). die aus einer rotierenden Platte (3) und einer Verbindung von Stäben zum Aufwickeln und zum Heben eines Rolladens oder eines Vorhangs (2, 2') besteht, die drei rotierenden planetaren Verzahnun gen hält; aus einer gezahnten Krone (D) mit einer inneren und kreisförmigen Verzahnungszahn (9) für die äussere Betätigung der planetaren Verzahnungen (1) der Montage der Stützungsplatten von Rolladen (A); aus einer Montage von Betätigungsrollen von Greifen durch Reibung (B), die coaxial im Verhältnis zu den vorigen Verbindungen und ausser der gezahnten Krone (D) liegt, und die aus einer Betätigungsrolle (11) besteht, die mit einem freien und automatischen Ratschgreifensrad (18, 19, 20, 21, 14') für die Betätigung verbunden ist, durch eine Schraubenverbindung von axialer Bewegung (15) eines axialen Giebels (14), die dazu dient, die planetaren Verzahnungen (1) zu betätigen, indem das Reibungsgreifensmittel in eine einzige Richtung gegriffen wird, und das Greifensmittel in die entgegengesetzte Richtung freigelassen wird, was jede Drehung der Betätigungsrolle (11) im Verhältnis zum Giebel (14) möglich macht; aus einer Platte (C) mit Löchern für die Kupplung an die Mauer (25) und mit Stützungsmitteln (22, 23, 24) für die feste Haltung der festen gezahnten Krone (D).

4. Reibungseinrichtung zum Aufwickeln und Heben von Rolladen nach den vorigen Patentansprüchen, in der die Schraubenverbindung (15) für die Beschäftigung des freien und automatischen Greifensratschrad (20, 21, 14', 18, 19) mehrere Starten hat.

5. Reibungseinrichtung zum Aufwickeln und Heben von Rollanden (2) nach den vorigen Patentansprüche, in der die Platten (Stützungsverbindung von Rolläden) (A), die feste gezahnte Krone (D), die Montage von Betätigungsgreifensrollen durch Reibung (B), und die Verbindungsplatte (C) axial in einzige Einrichtung zusammengebracht werden, durch eine zentrale Achse (8), die coaxial im Verhältnis zur Stabsverbindung der Rolladen (5) liegt und, in der die Schraubensverbindung zwischen der Betätigungsrolle (11) und dem Giebel (14) eine freie axiale Bewegung zwischen der Betätigungsrolle (11) und dem flanschförmigen Teil (14') des Giebels (14) des Verzahnungsantriebs erlaubt, um mit der Drehung in die eine oder die andere Richtung zur Greifung zwischen ihnen eines freien Ratschrad (19), was es in einem rotierenden Körper schliesst, oder vice versa, seine Freilassung die Drehung freimacht und die Betätigungsrolle (11) im Verhältnis zum Giebel freilässt.

6. Reibungseinrichtung zum Aufwickeln und Heben von Rolladen (2) nach den vorigen Patentansprüche, in der die Betätigungsrolle (14) durch eine unendliche Kette (13) aktioniert wird. Ein Teil der Kette wird durch einen festen Leiter (28) abgeleitet, der zwei Teile definiert (13, 13'). Der erste Teil dient dazu, den Rolladen zu haben (2, 2') und der zweite, den Rolladen niederzulassen.

Revendications

1. Un dispositif à friction pour l'enroulement et le levage d'un volet (2) qui fonctionne grâce à un assemblage de barres (5) et une poulie de commande dentée tournant dans le sens des aiguilles d'une montre ou dans le sens contraire (11), placées axialement par rapport à l'assemblage de barres (5) afin d'enrouler ou de dérouler un volet à enroulement ou un rideau (2) grâce à une chaîne infinie (13), dans laquelle la poulie de commande (11) est montée coaxialement sur un pignon d'engrenage (14) grâce au filet d'une vis (15) et peut être raccordée avec l'asemblage de barres (5) par le moyen d'un dispositif d'engrenage à rochet libre de rotation (18, 19) ayant des surfaces de friction (20, 21) et placée entre la poulie (11) et un contrefort (14') du pignon d'engrenage (14) en forme de bride. Lors de la rotation de la poulie de commande (11) dans une direction, la roue à rochet libre (19) du dispositif d'engrenage à rochet est saisie par friction entre la poulie (11) et le contrefort en forme de bride (14') du pignon d'engrenage (14), causant ainsi une connexion fixe entre la poulie de commande (11), le pignon d'engrenage (14) et l'assemblage de volet à enroulement (5). Par contre, lors de la rotation de la poulie de commande (11) dans la direction opposée, la roue à rochet libre (19) sera libérée,

permettant une rotation contrôlée dans la même direction que l'assemblage de volet à enroulement (1).

2. Un dispositif à friction pour l'enroulement et le levage d'un volet selon la revendication 1, dans lequel la transmission de la rotation, grâce au moyen de saisie par friction pour permettre la rotation de l'assemblage de volet à enroulement (5) est effectuée par un moyen de réduction d'engrenage coaxial comprenant un pignon d'engrenage de commade coaxial (14) relié au moyen de saisie par friction, l'engrenage du pignon se faisant grâce à des engrenages planétaires à rotation libre (1) sur un disque de support (3) relié axialment et de manière fixe à l'assemblage de volet à enroulement (5) et dans lequel les engrenages planétaires (1) sont actionnés de façon externe et circulaire par une couronne dentée fixée (D), reliée à une plaque de montage fixée (C) supportant le dispositif tout entier (2, 3') à une bout du volet à enroulement (2, 2') grâce à l'assemblage de barres (5).

3. Un dispositif à friction pour l'enroulement et le levage d'une volet selon les revendications 1 et 2, caractérisé par le fait qu'il comprend; un assemblage de plaques de support rotatif de volet à enroulement (A) comprenant un disque rotatif (3) auguel s'ajoute un assemblage de barres de levage et d'abaissement d'un volet à enroulement ou un rideau (2, 2'), supportant trois engrenages planétaires rotatifs espacées radialement (1), une couronne dentée (D) avec une dent d'engrenage de couronne circulaire et interne (9) pour l'actionnement externe des engrenages planétaires (1) de l'assemblage de plaques de support de volet à enroulement (A); un assemblage de poulies de commande de saisie par friction (B), coaxial par rapport aux assemblages précédents et placé à l'extérieur de la couronne dentée (D) et comprenant une poulie de commande (11) reliée à une roue de saisie à rochet multiphases, libre et automatique (18, 19, 20, 21, 14') pour la commande, par un raccord de vis de déplacement axial (15) d'une pignon axial (14) servant à commander les engrenages planétaires (1), saisissant respectivement le moyen de saisie par friction dans une seule direction, et librérant ce-dernier dans la direction opposée, rendant possible toute rotation de la poulie de commande (11) par rapport au pignon (14), une plaque de montage (C) avec des trous pour son raccordement au mur (25) et des moyens de support fixes (22, 23, 24) pour le support fixe de la couronne dentée fixée (D).

4. Un dispositif à friction pour l'enroulement et le levage d'un volet selon le revendications précédentes, dans lequel le raccord de vis (15) pour la commande de la roue à rochet de saisie par friction multiplaques, libre et automatique (20, 21, 14', 18, 19) a deux ou plusieurs départs.

5. Un dispositif à friction pour l'enroulement et le levage d'un volet, selon les revendications précédentes, dans lequel l'unité de plaques (assemblage de support du volet à enroulement) (A), la couronne dentée fixée (D), l'assemblage de poulie de commande de saisie par friction (B) et la plaque de montage (C) sont rassemblés axialement dans un seul dispositif par un axe central (8); coaxial par rapport à l'assemblage de barres du volet a enroulement (5) et dans lequel le raccord de vis entre la poulie de commande (11) et le pignon (140 permet un mouvement axial libre entre la poulie de commande (11) et le contrefort en forme de bride (14') du pignon (14) de la transmission d'engrenage, et ceci pour causer, avec la rotation dans l'une ou l'autre direction, la saisie entre eux d'une roue à rochet libre (19) l'enfermant dans un corps rotatif, ou vice versa, sa libération rendant libre la rotation et libérant la poulie de commande (11) par rapport au pignon.

6. Un dispositif à friction pour l'enroulement et le levage d'une volet, selon les revendications précédentes, dans lequel la poulie de commande (14) est actionnée par une chaîne infinie (13), une portion de la chaîne étant déviée par un guide inférieur fixe (28) approchant les deux portions de la chaîne (13', 13''), dans lequel la première sert à lever le volet à enroulement (2, 2') et le seconde à l'abaisser.

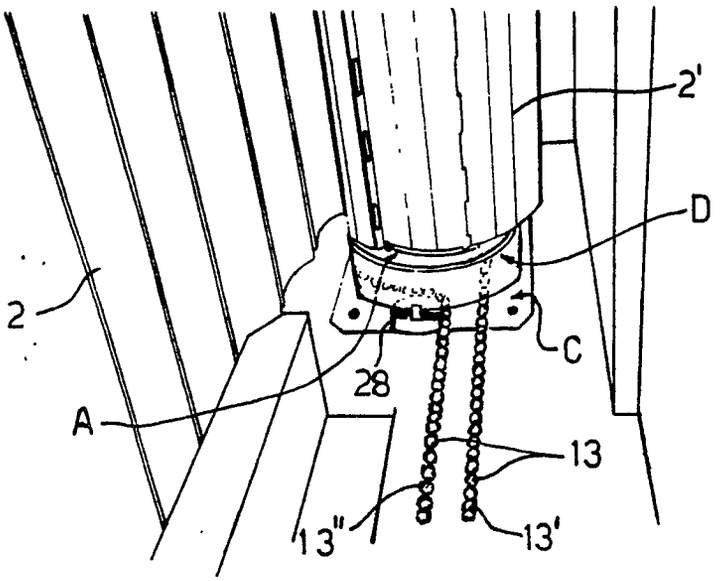

Fig.1

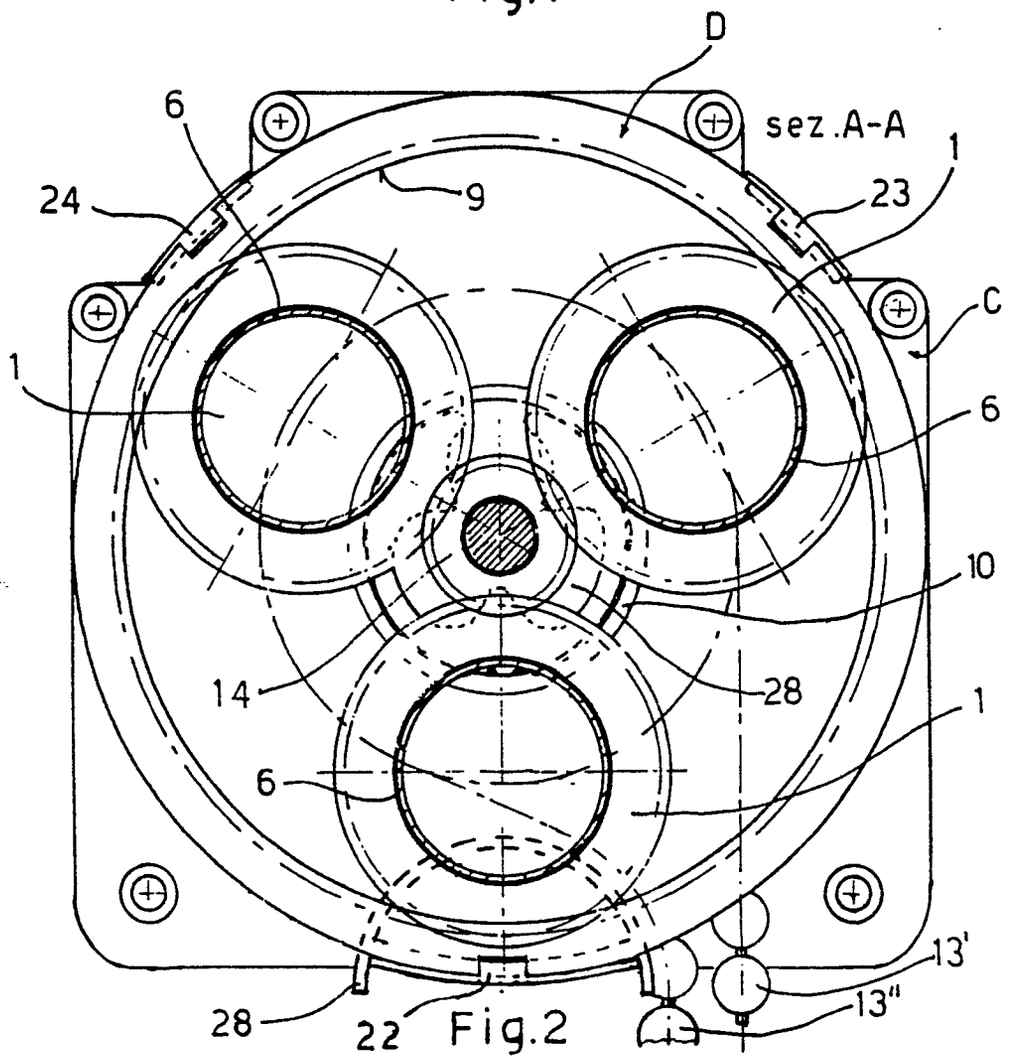

Fig.2

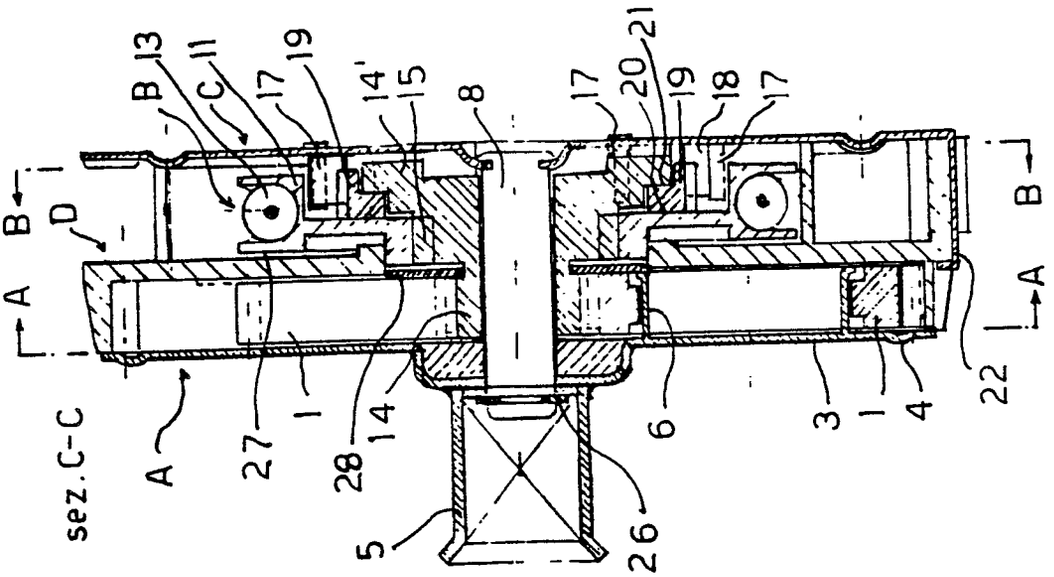
sez.C-C
A
B
C
D
1
2
3
4
5
6
7
8
11
13
14
14'
15
17
18
19
20
21
22
26
27
28

Fig.4

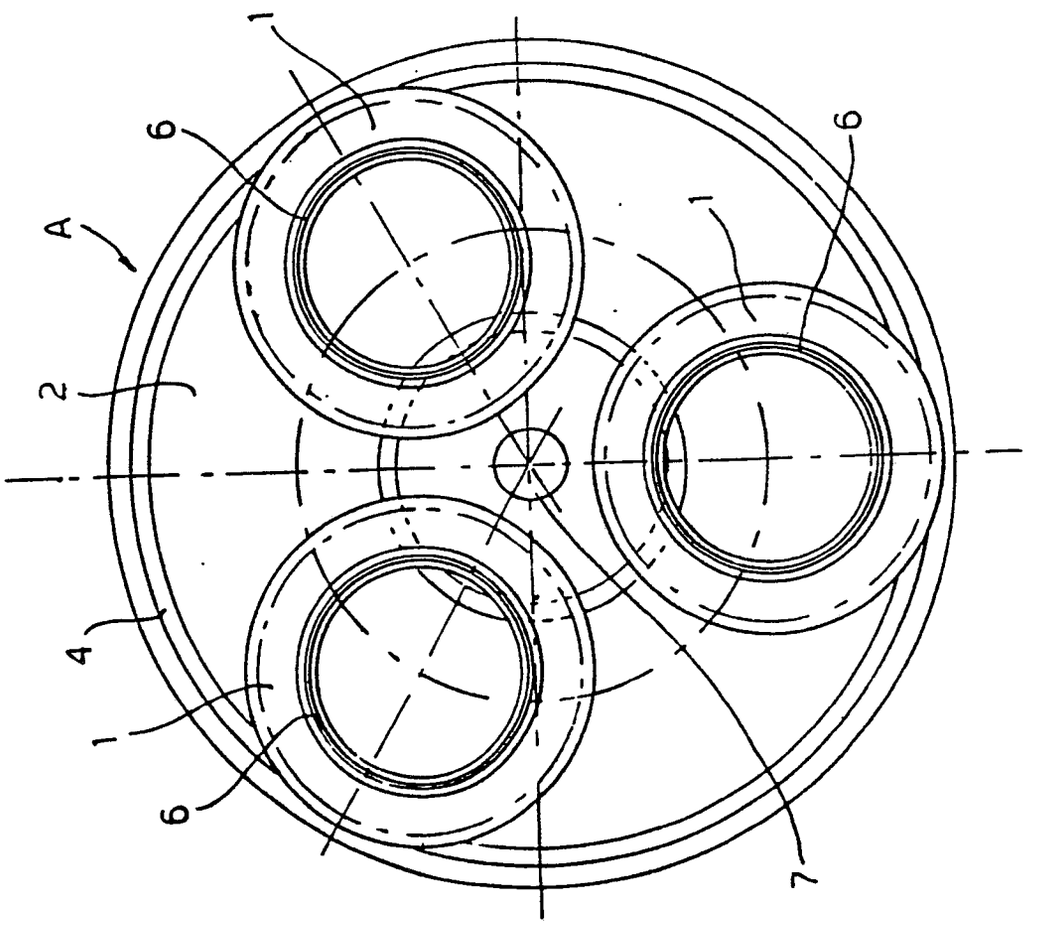
A
1
2
4
6
7

Fig.3

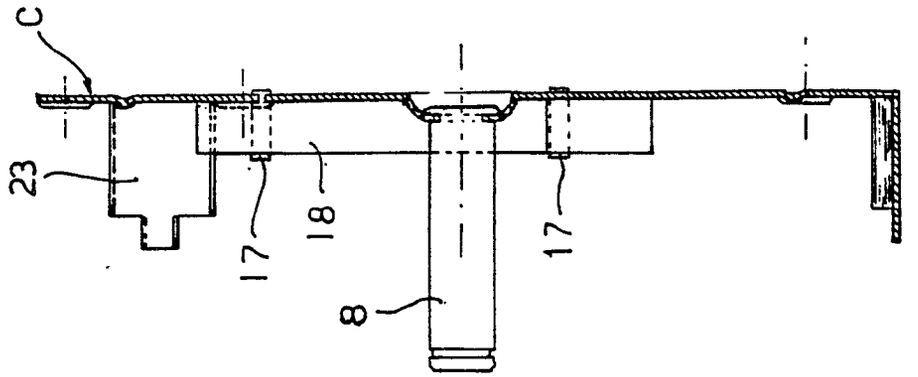

Fig.6

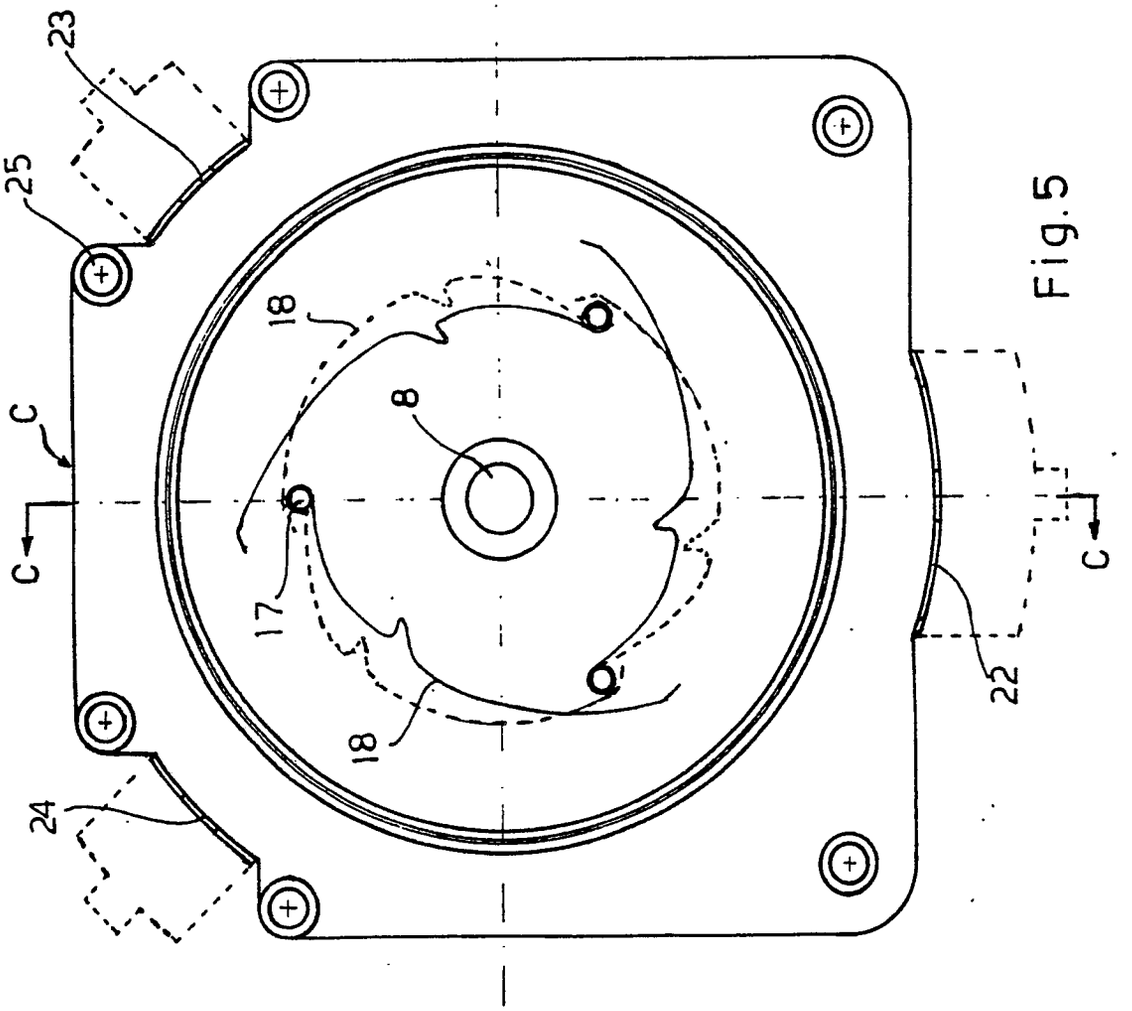

Fig.5

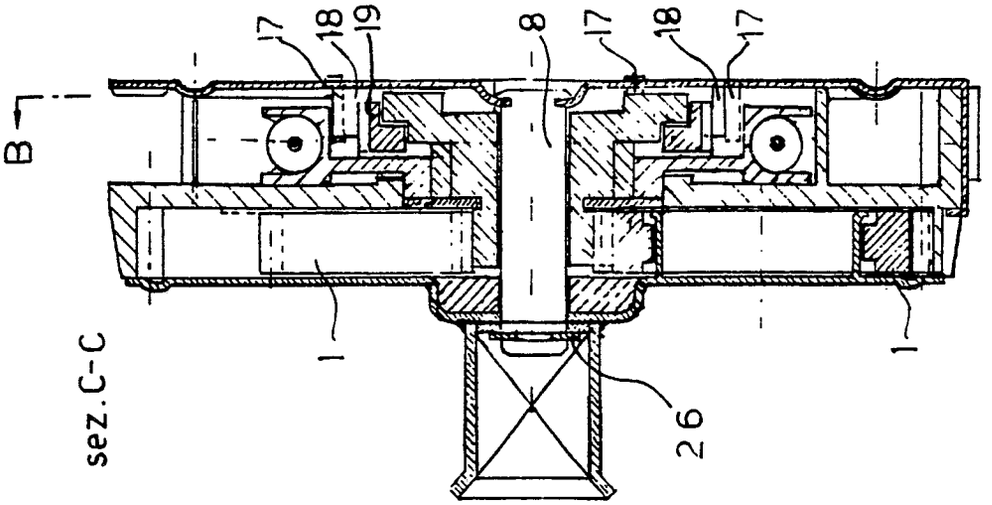
B
B
17
18
19
8
17
18
17
1
1
26
sez.C-C

Fig.8

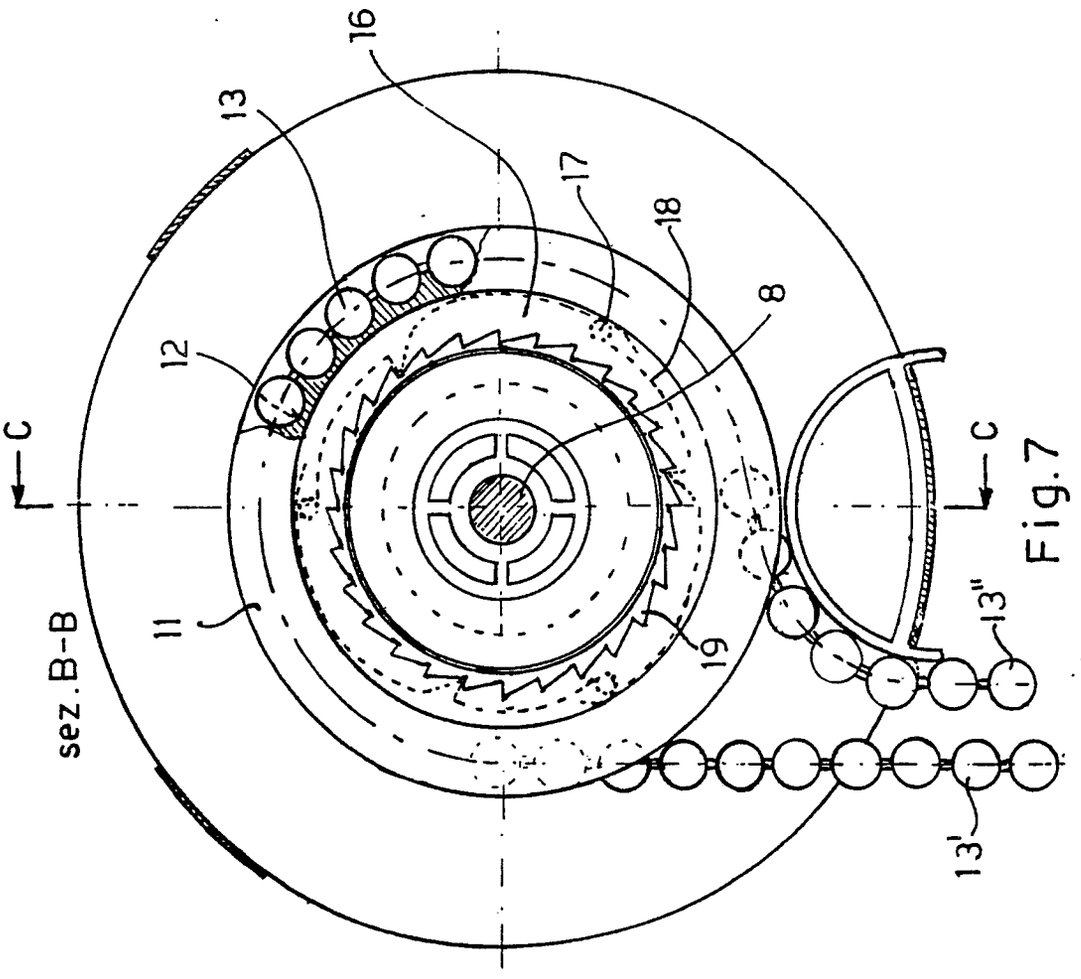
16
13
17
18
8
12
C
C
11
19
13"
13'
sez.B-B

Fig.7