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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Simplified manual drive system with reducer, for automobile vehicle window winder.**

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DE-A- 2 616 331
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(73) Proprietor: **DISPOSITIVOS DE ACCESORIOS DE PUERTAS, S.A.**
Poligono Industrial Gamonal-Villimar C/. Alcalde Martin Cobos, s/no.
E-09007 Burgos(ES)

(72) Inventor: **Romero Margarino, Antonio**
27. Gral.Dàvila St.
E-09006 Burgos(ES)

(74) Representative: **Lopez Medrano, Santiago**
Gran Via, 40 -5.
E-28013 Madrid (ES)

Rank Xerox (UK) Business Services
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Description

At present, vehicle manufacturers impose certain deminds on manually driven window winders; when the winding handle is in the forward horizontal position and is turned upwards, the window glass should rise.

In traditional devices with direct action on the cable drum, this implies the fact that the cable that makes up the kinematic chain enters the reel in opposite flexure to that which it takes at the track outlets. On the other hand, so that the winding torque is not very high, it is necessary for the radius of the cable reel or winding drum to be very small. Like this, both circumstances cause the life of the cable to be relatively short in relation to the life demands currently imposed.

Already known from DE -A- 2 616 331 is an operating or drive device for car and similar vehicle windows, with a cable winding drum which is of an excessive diameter, meaning that the winding torque of this said device is very high, thus causing the useful life of the cable to be relatively short in relation to the life demands currently imposed on mechanisms of this kind.

Thinking about the need and convenience, in cable-type window winders, of the cable not being submitted to alternating flexures, the system of the present application provides greater life than traditional systems and also, by having a reducer, it achieves a reduction in the operating torque.

One object of the present application is, therefore, the fact that the flexure of the cable to be always carried out in the same direction.

Great importance in the present application has the fact that the braking chamber is built into the casing and in the opposite position to that of conventional devices and systems.

The object of the present application will be achieved by the drive system for automobile vehicle window winder, as defined in claim 1.

In accordance with the system of the present application, a mechanism is provided made up of a casing, preferably obtained by injection of reinforced fibre glass thermoplastic resin, from which the following are obtained directly: a shaft on which the winding drum or reel has to turn; the cylindrical braking chamber of the system in which the brake spring and the end of the operating shaft are housed; the cable outlets, top and bottom, which between them form an angle.

The two angles between them form the most appropriate angle through which the cable conductor guides have to slide, in a tension regulation system for the cable which is adopted, which is oscillating and of fixed or automatic regulation.

A pinion, also obtained by injection, the same as the casing, has a cylindrical sector equipped with a rear opening, which in its iterior receives a finger of the operating shaft. This finger is a projection of a boss of the shaft itself, so that with suitable annular play, it allows the pinion to be moved simultaneously with a brake spring (4). The said finger has recesses into which the brake springs are hooked, by which the action of transmitting turning to the pinion is carried out directly between the edges of the shaft boss and those of the cylindrical sector of the pinion, without there being any intermediate pressure on the hooks and, therefore, without any deformation of these edges. With this, total constancy is achieved in the dead annular play between both and therefore free turning of the handle.

If the shaft is not operated, and an attempt is made to lower the window glass, by the cable acting on the winding drum or reel, the latter would cause the pinion to turn, and therefore by the cylindrical sector of the pinion coming to rest on the lug or hook of the brake spring, it would prevent it from turning by braking the system, braking which is much more effective than in the conventional direct system, due to the relation that exists between the reel and the pinion.

The brake spring is perfectly centred, on one side by an inner edge of the pinion itself which forms an inclined plane in relation to its own shaft and on the other side by a washer placed over the shaft and equipped with a projection or boss which becomes housed in the cylindrical sector of the pinion. This centering arrangement produces the optimum braking condition of the brake-spring.

The winding drum or reel assembly can be made up of one single part or of two, made separately, fitted together by one clipping over the other. The toothing of the winding drum is inclined-straight, the same as that of the pinion, in order to provide smoothness of movements.

The above-mentioned assembly is closed by a metallic cover, obtained, from a punched and cut steel sheet, which has one outlet collar or hole for the operation shaft and another for the shaft of the winding drum or reel.

The cover is fastened to the said casing by cramping the lugs around its edges into the corresponding notches around the casing.

The metallic cover has a perfectly flat surface and is equipped with drill holes so that by means of these it can be fastened directly to the vehicle door. The corresponding nuts can be welded or inserted into these drill holes. An additional welded support could also be arranged in its turn, if it should be necessary to separate it.

All these and other details can be seen more clearly on the sheets of drawings which are attached, in which the following are shown:

Figure 1 shows a general view of a conventional device with direct action on the cable drum.

Figure 2 shows the performance of the patent, in a general view.

Figure 3 is an inside view of the casing.

Figure 4 is a cross-section view of the mechanism of the patent.

Figure 5 is a general perspective of the assembly of the parts, in accordance with the patent.

In accordance with the drawings, we would firstly like to point out that in figure 1, a system of direct action on the cable drum is shown, in which a cable (23) is operated by a drum (25) and a winding handle (24), so that the cable acts on a part (31) which raises or lowers an incorporated window glass by means of a guide or track (26). It can be seen how the cable enters into the drum as a result of the (28) which is developed at the track outlet, which undoubtedly means an alternating flexure of the cable (23).

In the same way, the patent foresees a solution, which is represented in fig. 2, in which the cable (23) enters into the winding drum (2) in a way not opposed to the direction generated according to (28) at the track outlet (26).

In fig. 1, the handle (24) is shown, together with its turning direction (27) and the direction according to which the cable (23) enters the drum (25). Thanks to these movements, the casing (31) which is connected to the window glass moves with it along the track (26).

According to fig. 2, the patent has an entry direction (30) to the winding drum or reel (2), which is, on turning the handle (24) in direction (27) over the pinion (9), in the same direction as shown by component (28).

To carry out this innovation, the patent develops the casing shown in figs. 3 and 4, shown by position (A), on which the following are developed: the shaft (1) where the winding drum (2) has to turn; the cylindrical chamber (3) and the support (6). The casing (A) receives the winding drum (2) operated by cable at its periphery, and this drum (2) is connected to the pinion (9), which is assembled on a shaft (5) operated by the winding handle (24), not shown here.

Also in relation to fig. 5, we would like to point out the situation of the pinion (9) and the shaft (5) which appear in fig. 4. The pinion (9) has a rear section on the side toward the casing (A), or a cylindrical sector on which the opening (22) with walls or edges (21) can be seen. The hollow in the pinion (9) receives the shaft (5), which has a boss that is raised by the cog (10), equipped in its turn with notches (13).

The brake spring (4) is housed on the cylindrical sector of the pinion (9) and the finger (10) of the shaft (5) is received in the opening (22). The finger (10) has annular play which allows the pinion (9) to be moved and, in its turn, the brake spring (4) also to be moved.

If trying to operate the winding drum (2) by any other way than the winding handle, for example by forcing the window glass, the winding drum (2) would make the pinion (9) turn, and this, by resting its cylindrical sector on the hooks of the brake spring (4), would prevent it from turning, thus achieving braking.

The brake spring (4) is suitably centred on the sector of the pinion and on the finger (10) of the shaft (5), by means of its lateral support on the inside edge (11) of the pinion (9), which forms an inclined plane, and, at the other end, thanks to the washer (12), which is moved by its boss (20) housed in the sector of the pinion (9).

As was mentioned, the shaft boss (5) which has the finger (10) is equipped with side notches (13). The hooks of the brake spring (4) become housed in these notches (13), so that the action of transmitting turning of the shaft (5) to the pinion (9) is carried out directly between the edges of the shaft (5) boss and the edges (21) of the opening (22) of the cylindrical sector of the pinion (9). All this, without any intermediate pressure on the hooks and consequently without any deformation of the edges, in order to achieve a total constant in the dead annular play between both and free turning of the smallest winding handle.

The assembly is closed by the cover (14), which has the collars (15) and (16) for the shaft (5) and the winding drum shaft (1). It is also equipped with holes (18) for fastening, as well as lugs (17) which are received in the notches (19) in the casing (A).

Claims

1. Simplified manual drive system with reducer, for automobile vehicle window winder, with a pinion (9) connected to a brake spring (4) and to a winding drum or reel (2) onto which a cable (23) is wound, with the pinion (9) and the drum (2) being mounted in a casing (A), in that the cable (23) travels without being subject to alternate flexures with regard to the outlets of a guide track (26) for move ment of the window glass, which is essentially characterized by:

- a casing (A) which includes a seating shaft (1) for the winding drum (2), two outlets (7) and (8) for the cable, a braking chamber (3) with a recess (6) to receive the end of the drive shaft (5), and a front cover (14) for closure, with the said casing (A) being one single part made by injection of reinforced fibre glass thermoplastic resin.

- a pinion (9) with an adjoining area in the shape of a cylindrical sector (21) with an opening (22) in which is housed a projection or finger (10) of the operating or drive shaft (5), with the exterior of the said sectors (21) and of the finger (10) being clamped together by brake spring (4) which is centred and controlled by a portion (11) of the sector in an inclined plane, at the same side as the toothed or cog drive, and by a washer (12) on the other side of the finger (10), which is clamped onto the shaft (5) and is provided with a projection or protrusion (20) housed in a hollow in the cylindrical sector of the pinion.
- the finger (10) of the shaft (5) is of a smaller angle than that of the opening (22) in the pinion and is provided with four notches (13) at its corners, into which the hooks of the brake spring (4) are housed in a diagonally opposed position.
- the reduction between the pinion (9) and the winding drum (2) is determined in terms of the diameter of the cable winding drum in order to provide the preset movement per turn of the winding handle,

2. Simplified manual drive system with reducer, for automobile vehicle window winder, in accordance with claim 1, characterized in that the toothing of the winding drum or reel (2) and of the pinion (9) is of inclined-straight teeth,

3. Simplified manual drive system with reducer, for automobile vehicle window winder, in accordance with claim 1, characterized in that the cover (14) is provided with sypport projections (15) and (16) for the shafts (5) and (1), and its edges are provided with lugs (17) which are housed in the corresponding notches in the casing (A).

Patentansprüche

1. Einfach von Hand angetriebenes System mit Untersetzer für kabeltrommel von Wagenfenster, mit einer Rolle (9) in Verbindung mit einer Bremsfeder (4) und einer Kabeltrommel bzw. einer Rolle (2) auf der sich die Kabel (23) einwickelt, mit der Rolle (a) und der Kabeltrommel beide in einem Gehäuse (A) untergebracht, durch welche der Kabel (23) durchläuft, ohne wechselnder Biegebelastung bezüglich des Führungssteges (26) untersetzt zu werden, für die Bewegung des Fensterscheibes, hauptsächlich gekennzeichnet durch:

- ein Gehäuse (A) mit einer Wellenaufnahme (1) für die Kabeltrommel (2), zwei Ausgangsbüchsen (7) und (8) für die Führung des Kabels, einer Bremskammer (3) mit einer Aussparung (6), die zur Aufnahme des Endes der Antriebswelle (5) und einer Stirnabdeckung (14), daß dieses Gehäuse (A) ist als ein einziges Teil hergestellt aus verstärktem thermoplastischem Fiberglass-Spritzguß ,
- eine Rolle (9) mit einer Nebenfläche, gebildet wie ein Zylindersektor (21) mit einer Öffnung (22) in welcher einer Vorsprung oder Finger (10) des Antriebes oder der Antriebswelle (5) untergebracht ist, wobei die Aussenseite des erwähnten Sektors (21) und der Finger (10) durch Wirkung der Bremsfeder (4) zusammengeklappt sind, die durch ein Teil (11) des Sektors in einer Schrägebene, auf derselben Seite wie der Antriebsverzahnung, und durch eine Scheibe (12) auf der anderen Seite des Fingers (10) zentriert und gesteuert wird, welcher zu der Welle (5) geklappt ist und mit einer Vorsprung (20) ausgestattet ist, die in einer Aussparung des Zylindersektors der Rolle untergebracht ist,
- der Finger (10) der Welle (5) hat einen Kleineren Winkel als die Öffnung (22) der Rolle und verfügt über vier Nuten (13) in seinen Ecken, in denen sich die Bremsfeeder (4) schräg voneinander befinden,
- die Untersetzung zwischen der Rolle (9) und die Kabeltrommel (2) erfolgt nach dem Durchmesser der Kabelwelle, um die Voreinstellung zum Drehen der Kurbel zu ermöglichen.

2. Einfach von Hand angetriebenes System mit Untersetzer für Wagenscheibenhebewerk nach Anspruch 1, dadurch gekennzeichnet, daß die Verzahnung der Kabeltrommel oder Rolle (2) und die der Rolle (9) schräg ausgeführt ist.

3. Einfach von Hand angetriebenes System mit Untersetzer für Wagenscheibenhebewerk nach Anspruch 1, dadurch gekennzeichnet, daß die Abdeckeung (14) verfügt über Stützvorsprünge (15) und (16) für die Wellen (5) und (1), und daß ihre Enden mit Ansätze (17) ausgestattet ist, welche in die entsprechenden Nuten des Gehäuses (A) untergebracht sind.

Revendications

1. Système simplifié d'actionnement manuel muni d'un réducteur, pour vitre latérale d'automobile, avec un pignon (9) relié à un ressort de frein (4) allant à un tambour d'enroulement ou chariot (2) auquel un câble (23) est bobiné, le pignon (9) et le tambour étant montés dans une carcasse (A), dans laquelle le câble (23) se déplace sans être sujet à des flexions alternées pour ce qui concerne les sorties de la glissière de guidage (26) pour le déplacement de la vitre, se caractérisant essentiellement par:
   - une carcasse (A) qui comprend un axe d'appui (1) pour le tambour d'enroulement (2), deux sorties (7) et (8), pour le câble, une chambre de freinage (3) avec un creux (6) destiné à recevoir l'extrémité de l'axe de conduite (5), et un couvercle frontal (14) de fermeture, ladite carcasse (A) étant à un seul corps réalisé par injection ou résine thermoplastique en fibre de verre renforcée.
   - un pignon (9) à zone annexe servant de secteur cylindrique (21) avec une ouverture (22) dans laquelle vient se loger un saillant ou doigt (10) de l'axe d'actionnement ou de conduite (5), l'extérieur de cette section (21) on doigt (10) étant fixés l'un à l'autre par un ressort de frein (4) qui reste centré et contrôlé par une partie (11) de la section dans un plan incliné, en même temps que la partie dentée ou encliquetée, et par une rondelle (12) de l'autre côté du doigt (10), lui-même sujet à l'axe (5) et doté d'un saillant ou protubérance (20) venant se loger dans un creux de la section cylindrique du pignon.
   - Le doigt (10) de l'axe (5) est d'un angle plus faible que celui de l'ouverture (22) du pignon, et il est muni de quatre saillants (13) dans ses coins, dans lesquelles viennent se loger les empattements du ressort de frein (4) dans une position diagonale opposée.
   - La réduction entre le pignon (9) et le tambour d'enroulement (2) est déterminée en termes de diamètre du tambour d'enroulement du câble de manière à permettre le déplacemant prévu lora du tour de manivelle.

2. Système simplifié d'actionnement manuel muni d'un réducteur pour vitre latérale d'automobile, conformément à la revendication 1, se caractérisant par la partie dentée du tambour d'enroulement ou chariot (2) ainsi que du pignon (9) lequel est à encliquetage en plan incliné droit.

3. Système simplifié d'actionnement manuel muni d'un réducteur, pour vitre latérale d'automobile, conformément à la revendication 1, se caractérisant par le fait que le couvercle (14) se trouve doté de saillants (15) et (16) pour les axes (5) et (1), et que ses bords sont dotés d'empattements (17) qui viennent se loger dans les creux de la carcasse (A).

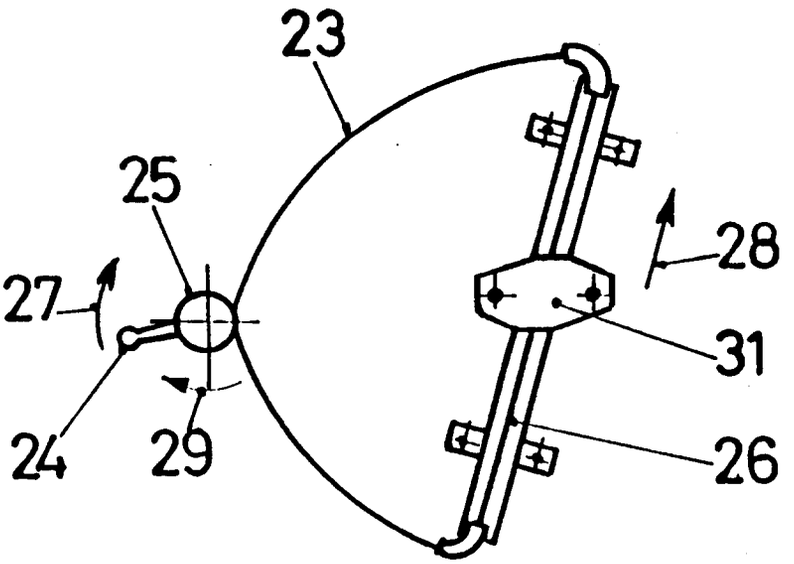

FIG. 1

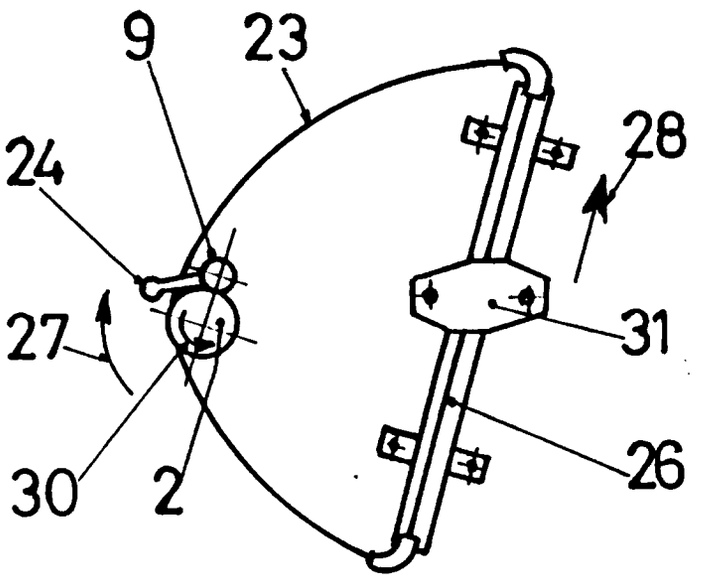

FIG. 2

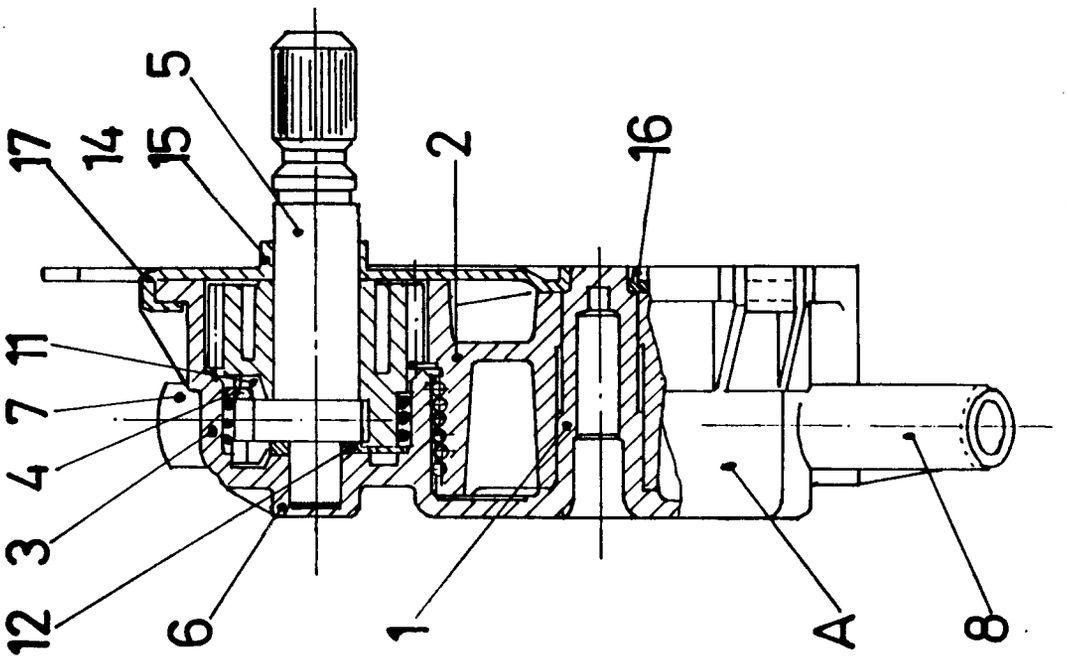

FIG.4

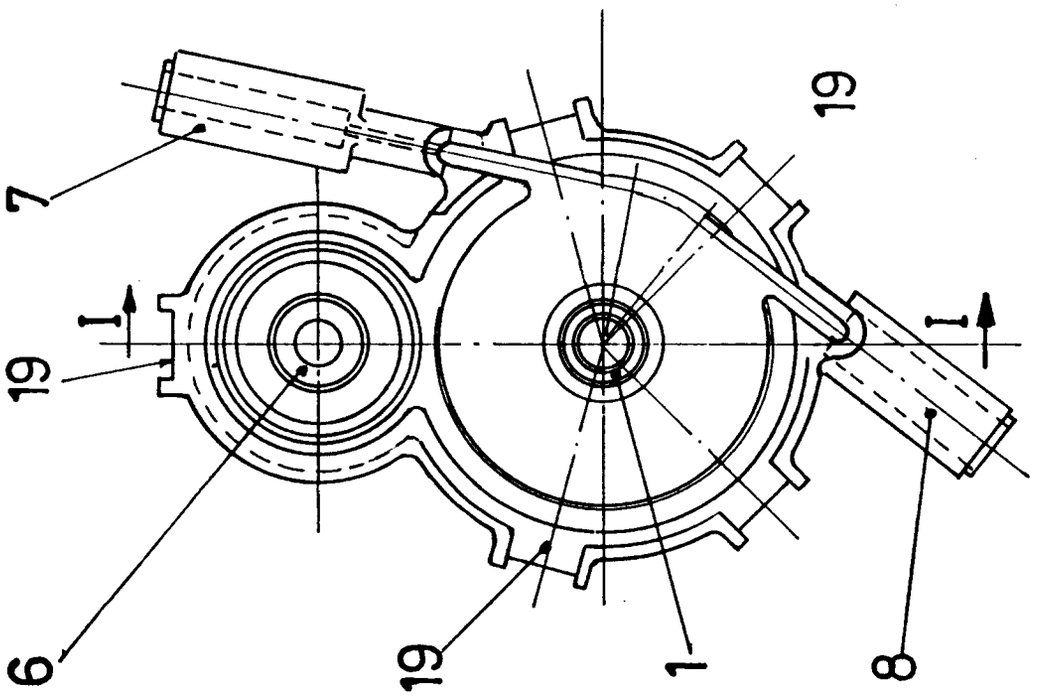

FIG.3

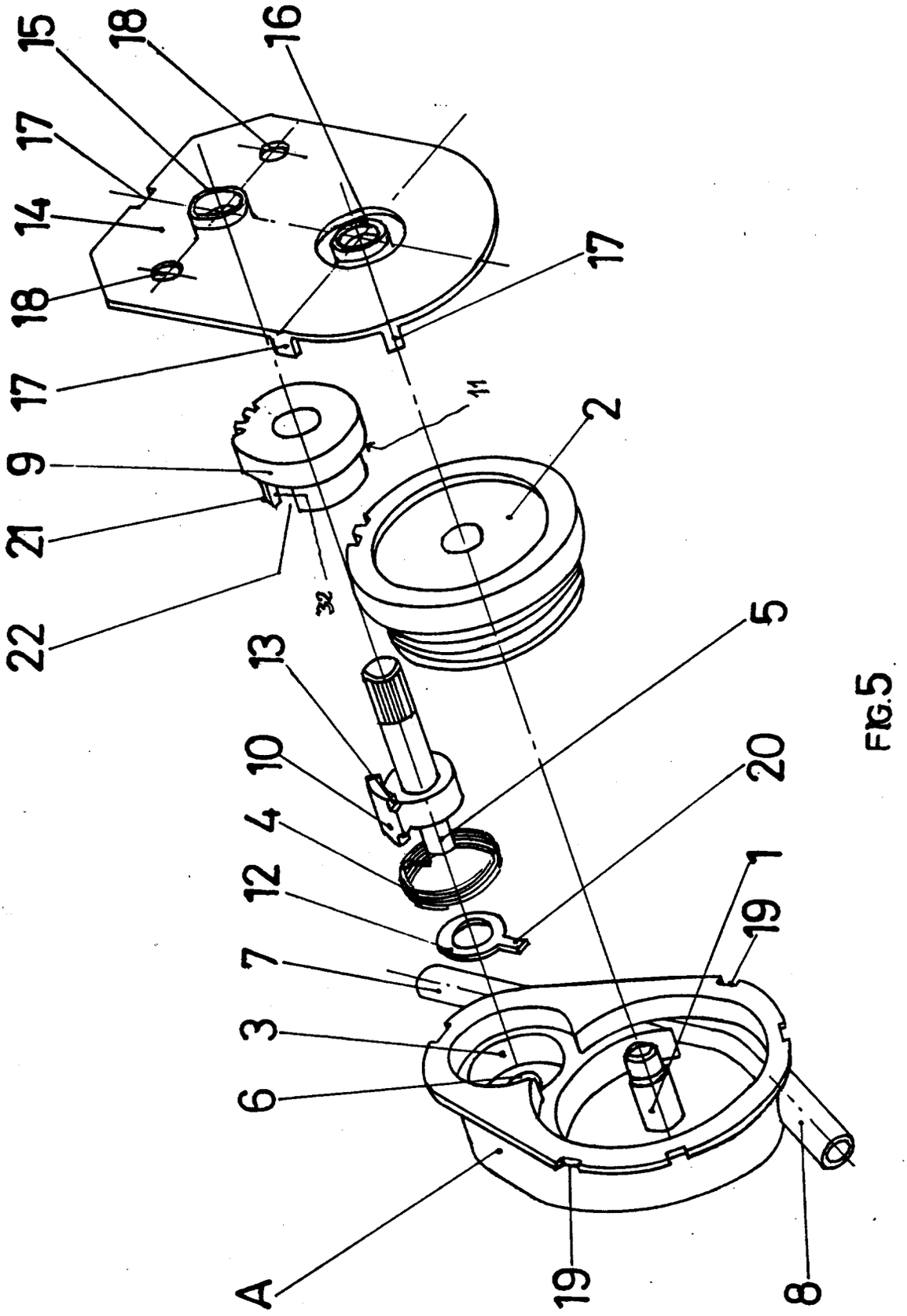

FIG.5