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

57 The patent deals with the fact that in cable (23) type window winders, this cable is not subject to alternating flexures. The braking chamber is placed in the opposite direction to conventional ones and inserted inside the casing of the device (A), which makes the assembly considerably reduced in width and does not show any bulging or swelling towards the inside of the vehicle.

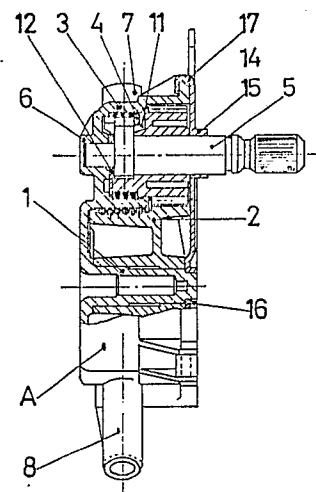


FIG.4

Description

At present, vehicle manufacturers impose certain demands 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.

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

One object of the patent is, therefore, the fact that the flexure of the cable is always carried out in the same direction.

Another object of the patent is the fact that the braking chamber is built into the casing and in the opposite position to that of conventional devices and systems.

In accordance with the patent, 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 interior 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", which is characterized the cable (23) does not suffer alternative flexures with regard to the outlets of the guide track (26) for movement of the window glass.

2.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", which, in accordance with the previous claim, is characterized because the casing (A) of the device incorporates the shaft (1) of the cable winding drum, the braking chamber (3), the support (6) of the inside end of the operating shaft and the cable outlets (7,8) in one single injected part made of thermoplastic resin and relatively narrow in width.

3.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claim 1, characterized because the pinion (9) operated by the winding handle shaft has an internal cylindrical sector next to the dentated area, the sector being equipped with an opening (22) which receives a finger (10) of a boss on the winding handle shaft and is moved by this finger, in that a brake spring (4) clamps to the sector and to the said finger, in that the said brake spring is controlled, on the side of the dentated sector of the pinion, by a portion on an inclined plane (11).

4.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claim 3, characterized because a washer (12) which fits round the winding handle shaft is placed on the other side of the boss, which is equipped with a projection (20) housed in a gap in the cylindrical sector of the pinion.

5.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claims 1 and 2, characterized because the reduction ratio between pinion and winding drum or reel 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.

6.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claim 3, characterized because the finger (10) of the boss has a smaller angle than that of the opening in the cylindrical sector and is equipped with four notches (13) in its head in

which the hooks of the brake spring are housed in a diagonally opposed position.

7.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claim 2, characterized because the cable winding drum assembly can be obtained in one or two parts and in that the toothing of the winding drum and of the pinion are of inclined-straight teeth.

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8.- "SIMPLIFIED MANUAL DRIVE SYSTEM WITH REDUCER, FOR AUTOMOBILE VEHICLE WINDOW WINDER", in accordance with claim 2, characterized because closure is carried out by a metallic plate (14) with support projections for the winding handle shaft and the winding drum shaft, in that its edges are equipped with lugs (17) which are housed in the corresponding notches in the casing.

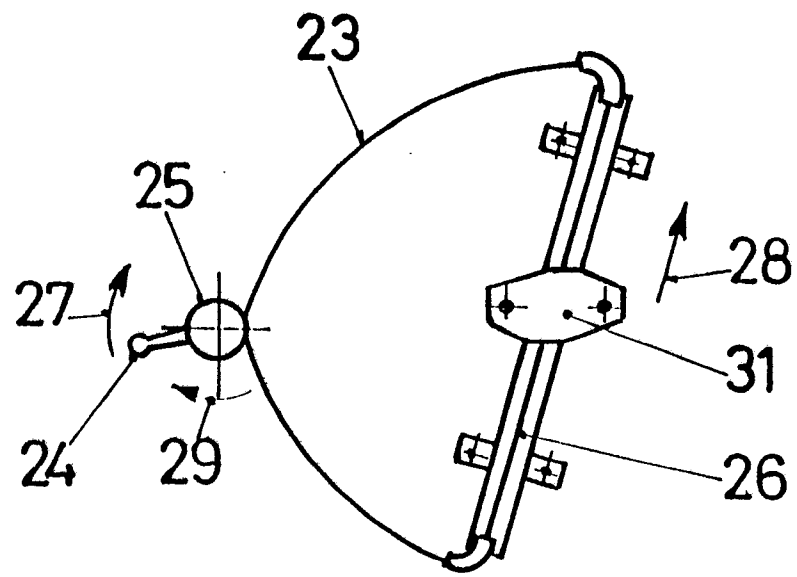


FIG. 1

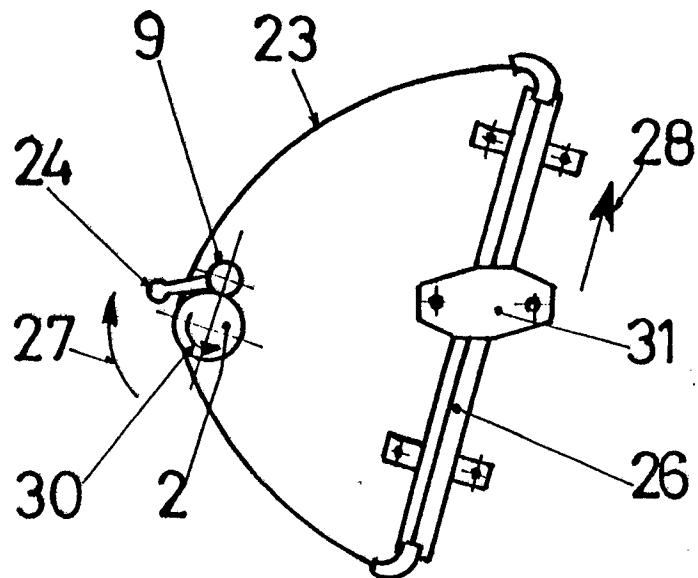


FIG. 2

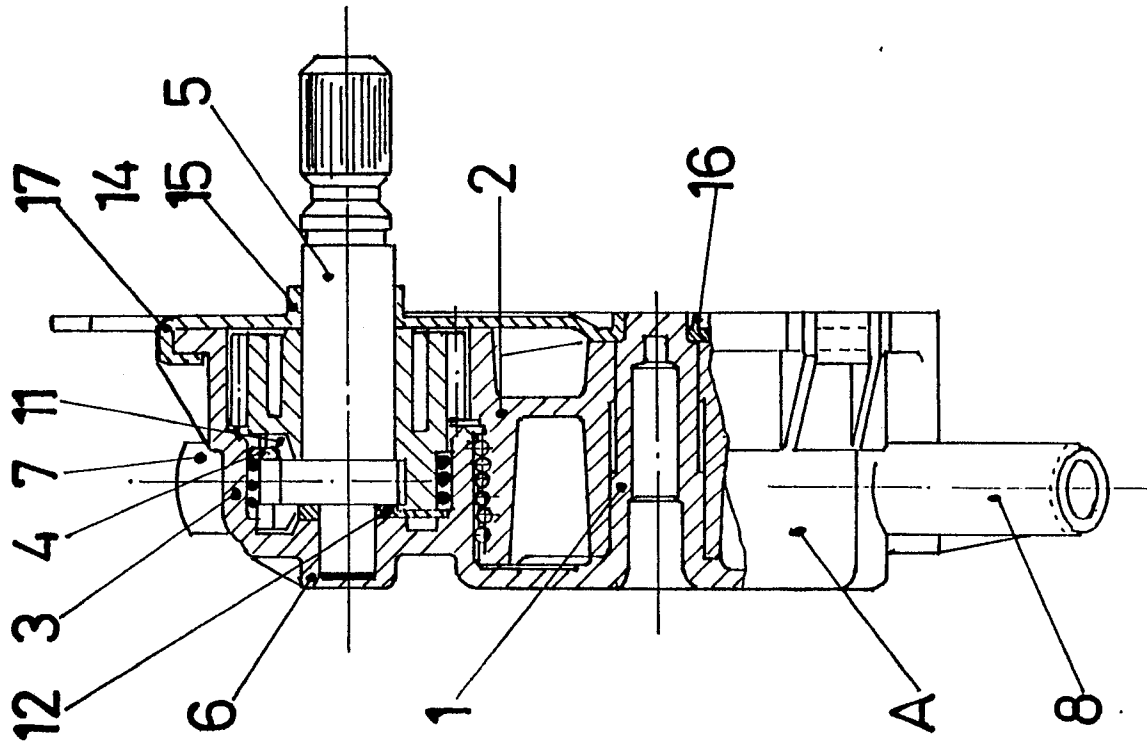


FIG. 4

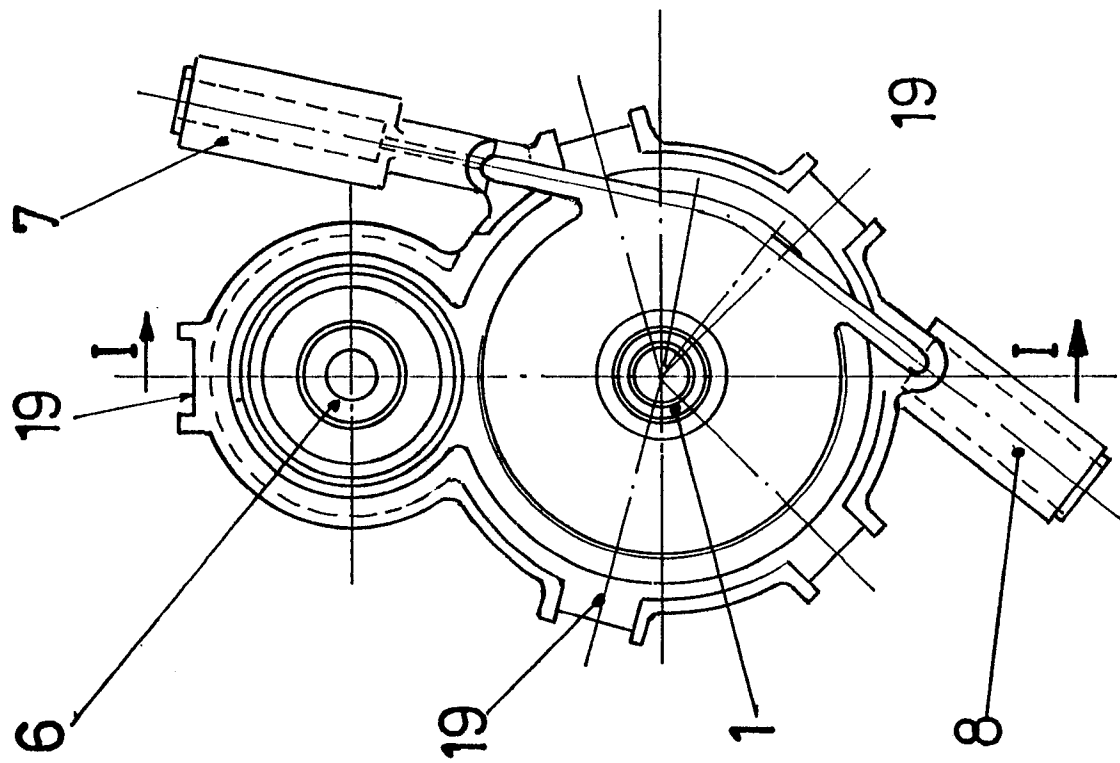


FIG. 3

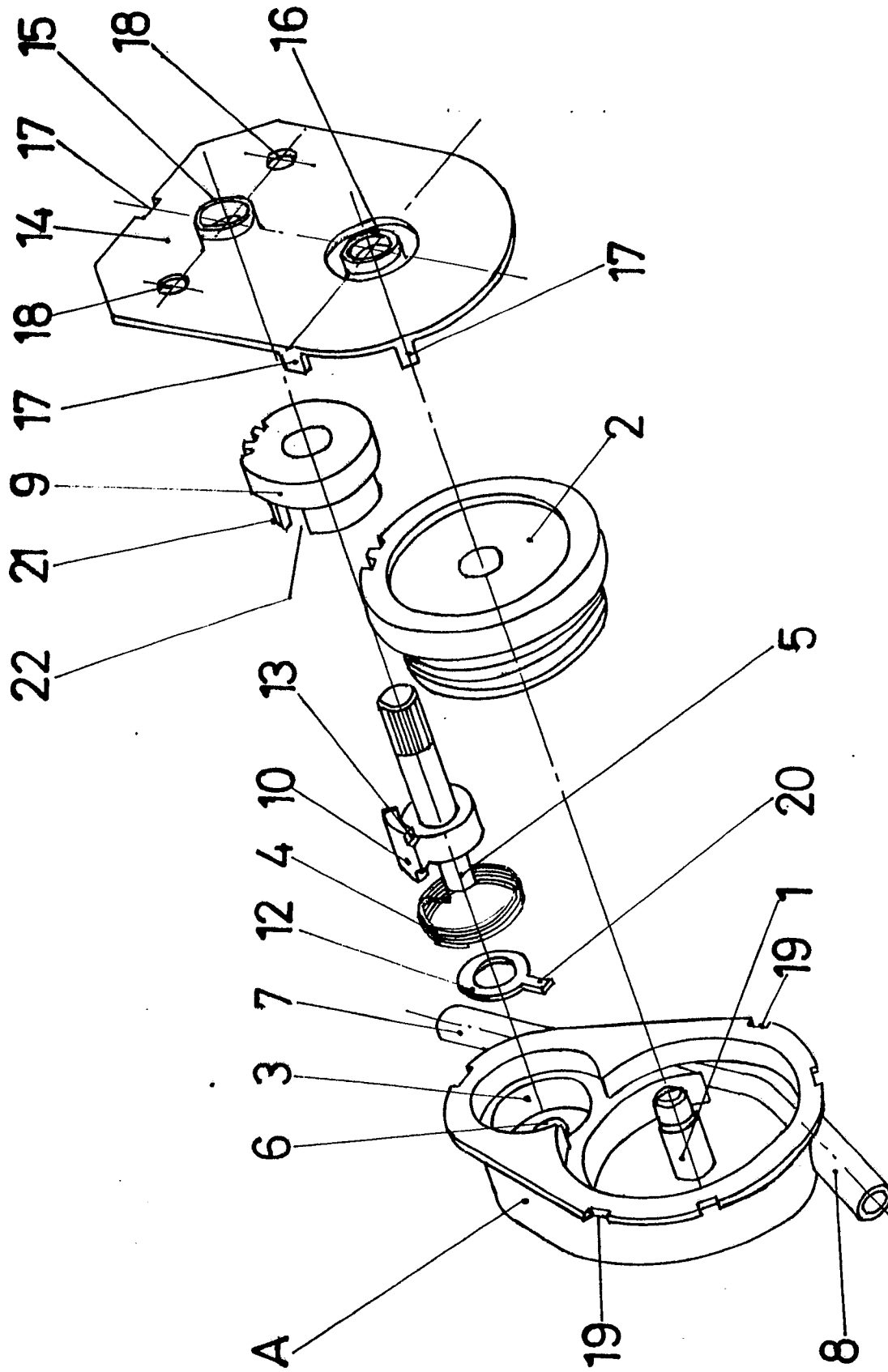


FIG.5



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)
X	DE-A-2 616 331 (KÜSTER & CO. GmbH) * Figure 1; page 8, lines 1-15 *	1	E 05 F 11/48
Y		2	
A		5,7	

Y	GB-A-1 197 879 (FIAT SOCIETA PER AZIONI) * Figures 2,5; page 2, lines 24-32 *	2	
A		3,8	

A	FR-A-2 385 869 (TERENZIO SESSA) * Figures 1,2,6; page 4, line 22 - page 6, line 20 *	1-3,5-7	

A	GB-A- 908 210 (GENERAL MOTORS CORP.) * Figures 1,3; page 1, line 59 - page 2, line 30 *	2,4,5	

A	DE-A-3 729 694 (INDUSTRIAS TECHNO-MATIC) * Figures 1,2; column 3, lines 46-58 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 05 F
Place of search THE HAGUE		Date of completion of the search 09-08-1989	Examiner KISING A.J.
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	