



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 894 932 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.02.1999 Bulletin 1999/05

(51) Int. Cl.⁶: **E05F 3/06**

(21) Application number: **98850090.6**

(22) Date of filing: **28.05.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Bengt, Göran Nilsson**
26191 Landskrona (SE)

(74) Representative:
Nordén, J. Ake et al
Oscar Grahn Patentbyrå AB
Box 19540
104 32 Stockholm (SE)

(30) Priority: **02.06.1997 SE 9702085**

(71) Applicant: **BESAM AKTIEBOLAG**
S-261 22 Landskrona (SE)

(54) **Arrangement for door closers and/or door openers**

(57) Arrangement for operating devices for mechanically operated doors with a driving mechanism and a manoeuvring mechanism including a rotatable device in the form of a cog wheel and a linear device furnished with cogs that interact with the cog wheel.

The novel aspect is that two linear devices furnished with cogs are arranged with a distance between one another with the cog wheel between them, whereby the size of the cog wheel is adapted to this distance so that it is only able to engage with one row of cogs at a time, and that the cog wheel is mounted in a housing (17) that is displaceable relative to the frame on which the rows of cogs are mounted to allow the displacement of the cog wheel to engage in an operating position with one row of cogs at a time.

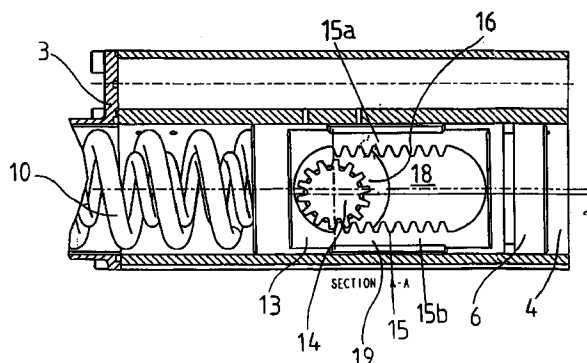


FIG. 4

EP 0 894 932 A2

Description

Technical field

[0001] The invention refers to an arrangement used with mechanically operated doors, preferably doors where the movement of a linearly operating motor such as a piston cylinder unit or similar affects a rotating component that is in turn coupled together with a mechanism that affects the door.

The prior art

[0002] It is known that door openers utilise, together with a pressure-affected cylinder, a displaceable component body that is furnished with cogs or teeth, plus a cog wheel arranged with its axis of rotation across the direction of movement of this body, and that is in turn joined to a mechanism that affects the leaf of the door. Arrangements of this type are set up during their manufacture to rotate the cog or teeth wheel in a specific direction. This means that two different door opening units must be supplied, even if - when space permits - one can in emergencies use a left-handed door opener for a right-handed door and *vice versa* by turning the opener upside down.

The objective of the invention

[0003] The essential objective of the invention is to accomplish an arrangement that can be set up at the point of installation to operate together with a right-handed or a left-handed door according to need.

Summary of the invention

[0004] According to the invention, a pressure-affected piston or otherwise displaceable body furnished with double rows of cogs or teeth that run in opposite directions to one another, and a wheel furnished with cogs or teeth and supported on a bearing mechanism are constituted so that the axis of rotation of the wheel is displaceable between two positions located on either side of a plane running along the centre of the rows of cogs, whereby in one of these positions, the cog wheel engages and turns to bring about movement of the row of cogs in one direction, while in the opposite position, the cog wheel engages and turns to bring about movement of the row of cogs in the opposite direction. The displacement of the cog wheel is accomplished in that its axle is mounted off-centre in a bearing device that is in turn supported to rotate in a circular seat in the frame of the arrangement.

Brief description of the drawings

[0005] The invention now will be described in greater detail with reference to the attached drawings where:

Fig 1 shows a door opener/closer according to the invention from above,

fig 2 shows a door opener/closer as seen from the front

fig 3 shows one end of the driving mechanism at a larger scale, and

fig 4 shows the same as fig 3 but in longitudinal cross-section.

10 Description of a preferred embodiment

[0006] In the unit 1 for the opening and closing of a door shown in full in fig 1 and 2, the actual manoeuvring mechanism is designated 2. This includes a frame 3 with a cylinder 4, fig 4, in which one part, designated in full 6, is displaceable to turn an axle 7. A system of arms 8, 9 is connected to the axle 7, of which an outer arm 9 is intended to be attached to the leaf of the door whose movement is to be steered with the help of unit 1.

[0007] While the closing movement is accomplished with the help of a spring 10 that can be partly seen in fig 4 and that affects part 6, the opening movement is accomplished by hydraulic means in that a motor 11, with the help of a pump 12, generates a pressure in cylinder 4. This pressure, acting against the closing spring 10, displaces the piston arrangement in part 6 in the opening direction. The piston section of part 6 is rigidly attached to a section 13 and it is via this section that the linear forwards and backwards movement of part 6 is transferred to the arm system 8, 9 with the help of a cog wheel 14, that together with axle 7 is seated in frame 3 as described below, by its cogs engaging with a row of cogs 15 on section 13 of part 6.

[0008] According to the invention, two opposite rows of cogs, 15a and 15b respectively, are arranged on the displaceable section 13 that is included in part 6. The axle 7 supporting the cog wheel 14, whose free end is intended to be connected to the arm system 8,9, is mounted off-centre with its interacting bearing parts 16 and these bearing parts have a cylindrical circumferential contact surface that rests in the cylindrical seat arranged in frame 3. This means that the bearing parts with the bearing, in which the cog wheel's 14 axle 7 is housed, together with the axle and cog wheel, can be caused to take up different turning positions relative to the frame. Since the cog wheel and its axle 7 are positioned off-centre relative to the bearing parts' common axis of rotation, a turning of the said bearing parts 16 means that the cog wheel's axis of rotation is displaced relative to the cogs, which in turn means that by turning to an first position, cog wheel 14 can be brought to engage with one row of cogs 15a, and by turning to a second position, be brought to engage with the other row of cogs 15b.

[0009] In the practical embodiment, part 6 with the piston section and section 13 are made in a single piece and the latter section is furnished with an elongated opening 18 extending in the axial direction, along the

opposite sides of which, cogs 15a and 15b are arranged.

[0010] The bearing parts have protruding flanges 16 that rest against the exterior of the frame 3 and that are furnished with slot-shaped cavities for locking screws 20. By loosening locking screws 20, the bearing parts are freed from the frame 3 and can be turned in one direction or the other and then be re-secured by means of the screws. The eccentricity in the bearings' position is then adjusted so that a displacement or, more correctly, a turning of the bearing parts between their outermost positions causes a displacement of the bearing and the cog wheel 14 from engaging with one of the side's row of cogs to the other side's.

[0011] This means that the installer can, by a simple turn of the hand, set up the door opening arrangement for a right hand or a left hand door when the door is being assembled at its place of installation.

[0012] It is obvious that this arrangement can also be used with arrangements whose only function is to close doors where the force used for opening is accumulated in a spring or similar device to be used as the driving force for a closing movement that is suitably steered in a *per se* known way with a hydraulic system of control.

[0013] Even if the described off-centre arrangement is the best and simplest solution, a similar effect can be obtained by, for example, arranging guides for the bearing parts so that they can together by means of screws or similar be displaced across towards the position for both rows of cogs.

[0014] The arrangement can naturally be used for other types of influential mechanisms than hydraulic ones, for example linear motors and similar.

Claims

1. Arrangement for operating devices for mechanically operated doors including a driving mechanism, an first and a second part for transferring a force, and a manoeuvring mechanism arranged in a frame, whereby the driving mechanism is set up to give the part for the first transfer of force a linear movement that in turn gives the part for second transfer of force a turning movement, and whereby the part for the first transfer of force has at least one section arranged with, for instance a gear or a row of cogs in a linear direction of movement, while the second part for transferring the force, along at least part of its circumference, is furnished with cogs that mesh with those cogs on the linear section and that are essentially rigidly connected with the manoeuvring mechanism **characterised** in,

that the first linear displaceable force-transferring part (6,13) is equipped with two linear sections furnished with cogs (15a,15b) that are located in positions that are opposite and parallel at a distance from each other,

that the turnable or rotatable part that is furnished with cogs (14) can be turned about an axis that is essentially parallel with the plane of the two linear sections furnished with cogs (15a,15b) and extending between these and displaceably mounted in bearings across the said plane,

that the turnable part that is furnished with cogs (14) situated between the linear sections furnished with cogs has a radius of extension that allows engagement with only one of the these linear sections at a time, and

that the displaceable mounting in bearings allows the displacement of the turnable part furnished with cogs (14) towards or respectively away from the linear sections furnished with cogs (15a,15b) on their respective sides to engage or disengage with one of the sections furnished with cogs at a time.

2. Arrangement according to claim 1 **characterised** in that the turnable part furnished with cogs (14) is mounted in bearings (16) that have circular supporting surfaces set up to interact with the turnable seat arranged in the frame, that the axis of rotation of the part furnished with cogs (14) is arranged off-centre in relation to the bearing part's axis of rotation, and that the off-centre arrangement between the turnable or rotatable part's (14) axis of rotation and the bearing parts' 16 axis of rotation is adjusted so that turning of the bearing parts allows the turnable or rotatable part's (14) displacement towards and away from the sections furnished with cogs.
3. Arrangement according to claim 1 or 2 **characterised** in that the locking mechanism (19) that works with the bearing parts (16) is arranged to keep the bearing parts (16) in a specified turning position or, after freeing them, allow their turning to another turning position.
4. Arrangement according to claim 1 or 2 **characterised** in that the turnable body furnished with cogs (14) has a diameter that is chosen so that in the first displacement position it engages one of the side's linear sections furnished with cogs (15a) and in the second displacement position, it engages the other side's linear section furnished with cogs (15b), and that the off-centre position of the housing (17) is set up so that by the turning of the bearing parts (16), displacement of the mounting in bearings (17) and thus of the turnable body (14) from one turning position to the other is achieved.
5. Arrangement according to claim 1, 2 or 3 **characterised** in that the driving mechanism includes a

spring.

6. Arrangement according to claim 1, 2 or 3 **characterised** in that the driving mechanism includes a pressure-affected piston cylinder arrangement. 5
7. Arrangement according to claim 1, 2 or 3 **characterised** in that the driving mechanism includes a spring for displacement of the first force transfer part in one direction and a pressure-affected piston cylinder arrangement for displacement in the other direction. 10

15

20

25

30

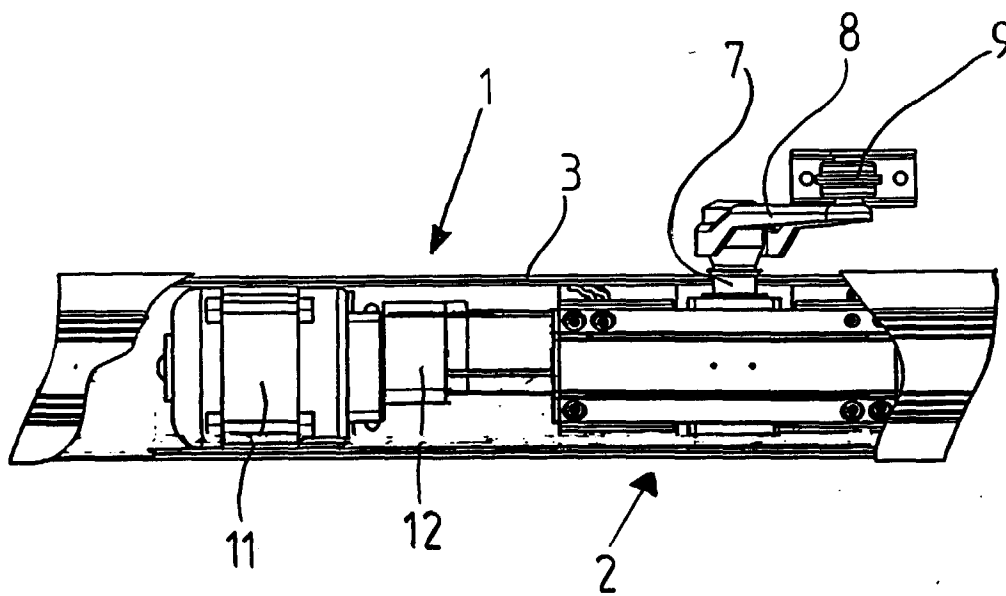
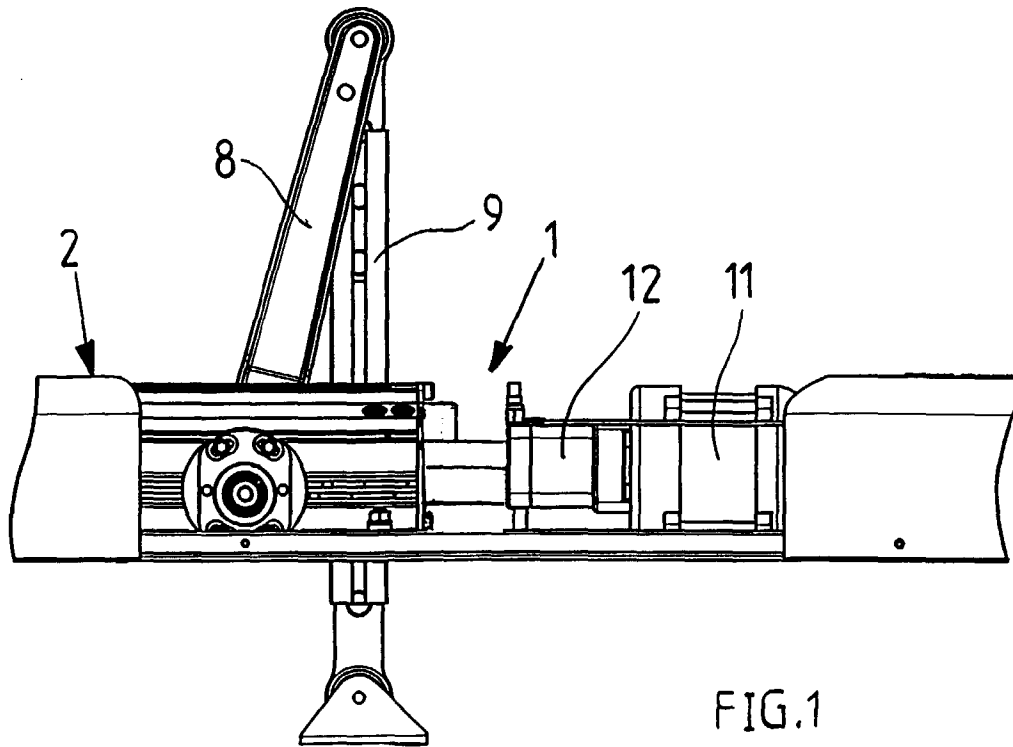
35

40

45

50

55



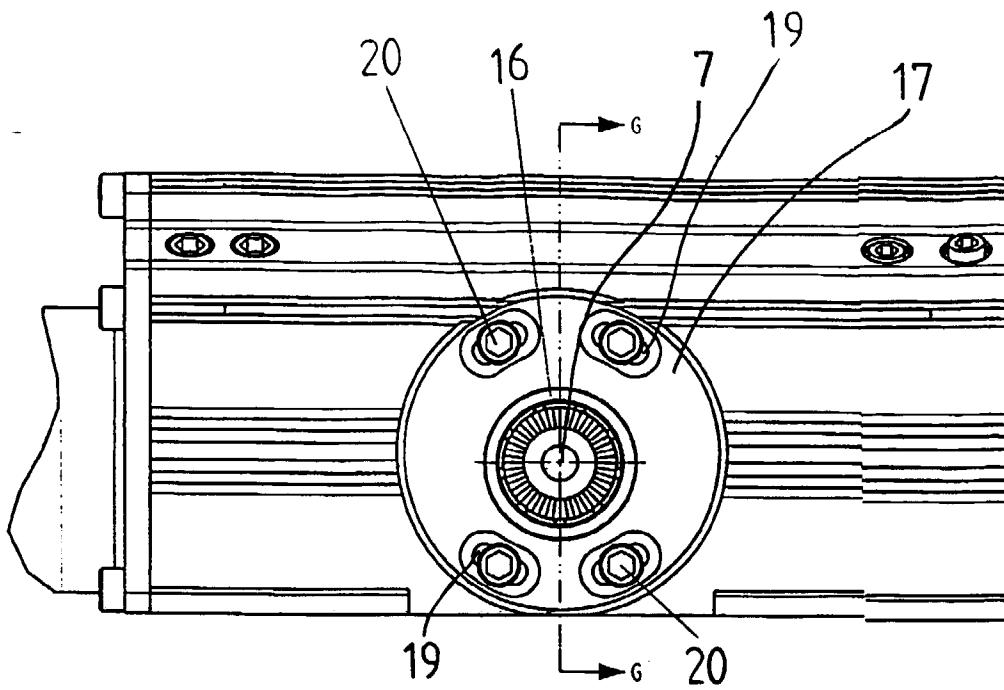


FIG. 3

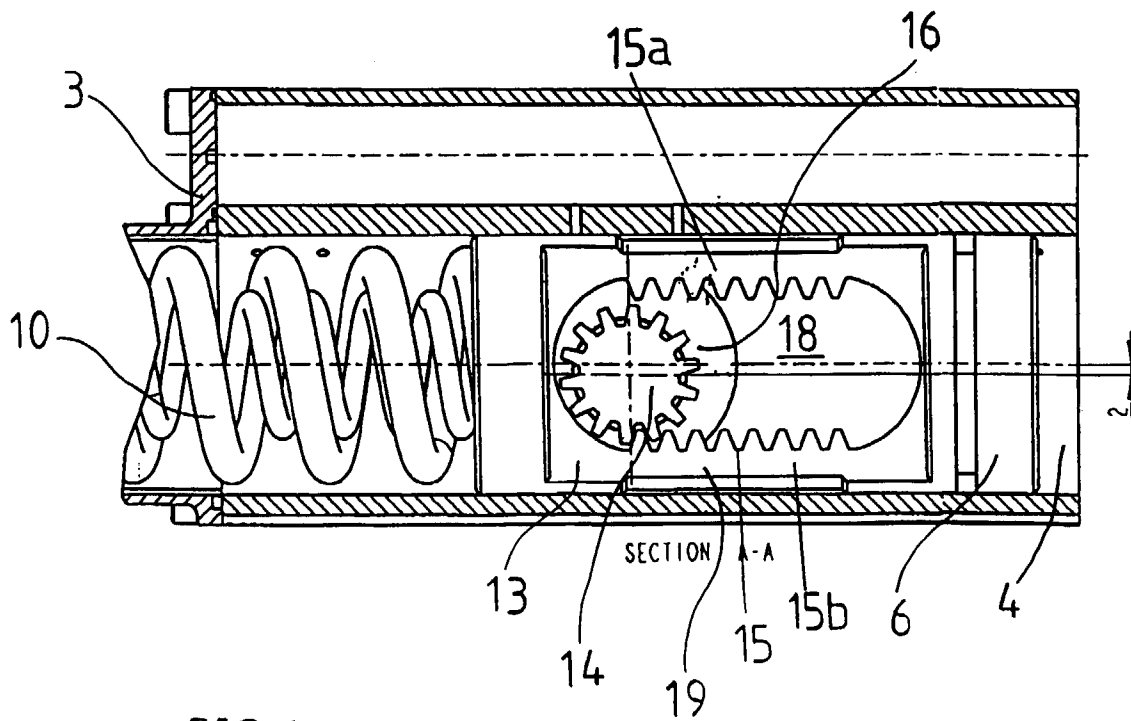


FIG. 4