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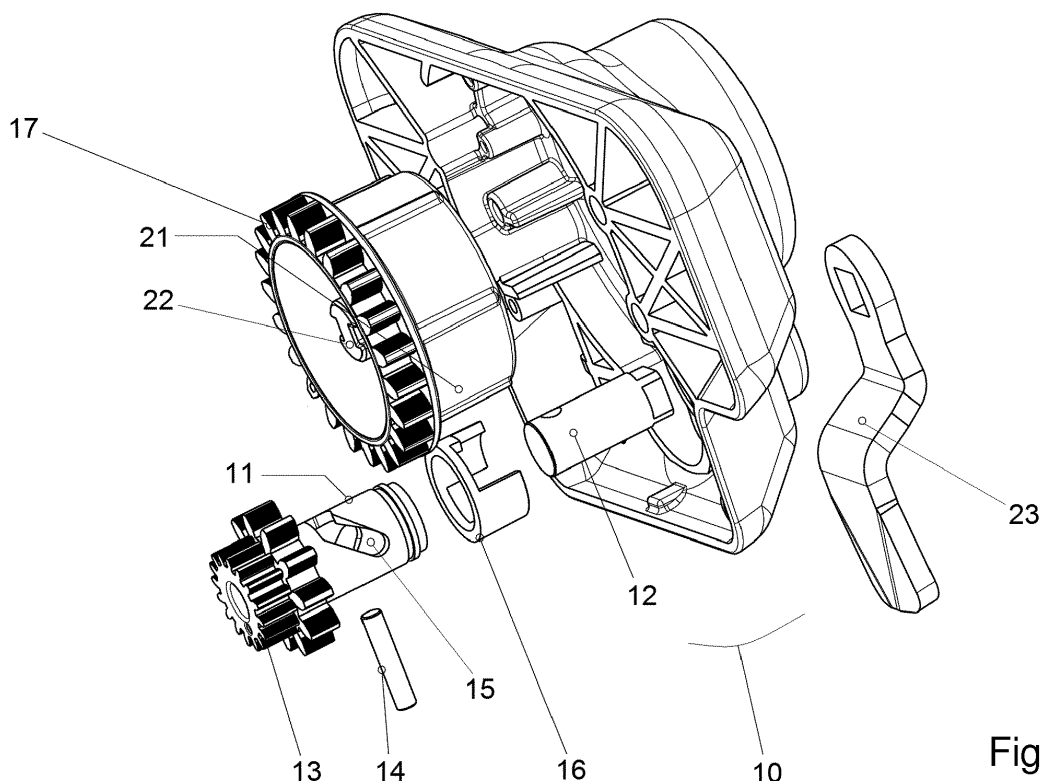
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(54) **ROTATABLE CLOSING DEVICE FOR DOORS AND HATCHES PROVIDED WITH OFFSET HANDLE AND LATCH**

(57) A rotatable closing device for doors and hatches which allows the user to close the door or hatch to which the device is applied by means of a simple rotation of the handle with much less force due to the use of a coupling by means of cogged wheels between handle and closing

latch. The device the present invention also allows simplifying the management and assembly because the locks and handle forming the device are compatible with the installation on doors of various thickness.

**Fig. 1****EP 3 473 790 A1**

Description

FIELD OF THE INVENTION

[0001] The object of the present invention relates to the field of closing systems and safety locks for doors and hatches, with particular reference to the doors and hatches of motor vehicles such as vans, caravans and the like.

BACKGROUND ART

[0002] In the field of closing systems and safety locks for doors and hatches, devices are available on the market which generally comprise a lock body, applied integrally to the door or hatch being examined, which houses a shaft adapted to guide a closing latch integral with one of the ends of said shaft. A rotatable actuation knob is associated with said shaft and is adapted to actuate it by translating it in axial direction and rotating it so as to close the rotatable lock of the so-called "screw lock" locking type of which it is part. Said rotatable knob furthermore is also generally provided with a cylinder lock which makes the locking thereof possible.

[0003] A lock of this type is described in German utility model application number DE202007013514U1 in which a mechanism similar to the one described is claimed, in which there is a knob that moves, in the travel thereof in axial direction, between two end positions: the first position, a stop position, in which it adheres to the lock body; the second position, an actuation position, in which it is protruding with respect to the flange of the lock body. This allows the lock to be operated by means of two separate movements of the knob, a translational one and a rotary one, so as to allow the locking by means of axial movement of the knob itself from the actuation position to the stop position, once the key is in closed position.

[0004] The lock pursuant to German utility model application number DE202007013514U1 moreover is also complex to make, requiring a series of mechanical details adapted to allow the dual rotary-translational movement of the knob described above. The manufacturing complexity is accompanied by an increased manufacturing cost, longer production times.

[0005] Moreover, the lock pursuant to German utility model application number DE202007013514U1 and others of the prior art have the handle in line with the latch and this may be a limit and a restraint in the connection of the lock itself with the door or hatch for which it is intended.

SUMMARY OF THE INVENTION

[0006] It is an object of the present application to introduce a rotatable closing device for doors and hatches, with particular reference to the doors and hatches of motor vehicles such as vans, caravans, motorcaravans and the like, which is simpler, more affordable and requires

less time to make with respect to the devices of the prior art, and with an increased level of flexibility of use and implementation.

[0007] The lock of the present invention falls within the scope of locks provided with rotatable lock having a lock of the so-called "screw lock" type, and is characterized in that it has a handle adapted to carry out a simple rotation without requiring translational movements to lock the lock, and it has the handle itself, and the shaft connected thereto, offset with respect to the shaft which guides the closing latch.

[0008] This allows an increased level of flexibility in using the lock coupled with a door or hatch, to be achieved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Further objects, features and advantages of the present invention will become more apparent from the following detailed description, provided by way of non-limiting example and illustrated in the accompanying drawings, in which:

Fig. 1 shows a partial exploded view of a preferred embodiment of the rotatable closing device according to the present invention;

Fig. 2 shows a perspective view of the handle lock of a preferred embodiment of the rotatable closing device according to the present invention;

Fig. 3 shows a partial longitudinal sectional view of a preferred embodiment of the rotatable closing device according to the present invention; and

Fig. 4 shows a partial cross section plan view of a preferred embodiment of the rotatable closing device according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] In reference to the accompanying drawings, a preferred embodiment of the rotatable closing device of the present invention comprises a lock 10 and a handle lock 20.

[0011] Lock 10 is provided with fastening means adapted to promote the fastening thereof to a door or a hatch, said lock 10 being adapted to be arranged assembled associated with a door or hatch, preferably on the inner side, and comprising a rotatable sleeve 11, preferably of the "screw lock" type, associated with a shaft 12, in turn associated with a first end of a latch, and at a second end with a first cogged wheel 13; the rotatable sleeve 11 is adapted to guide shaft 12 therein, in rotatable and axially translatable manner, by means of a pin 14 adapted to be engaged both with said shaft 12 and with a guide 15 on said rotatable sleeve 11; finally, said rotatable sleeve 11 further comprises an adjustment bushing 16 adapted to cooperate with said pin 14 and with said guide 15 so as to allow said rotatable sleeve 11 to rotate relatively to said shaft 12 while the shaft 12 itself translates

axially. A second cogged wheel 17 accommodated in a compartment of lock 10 is adapted to be engaged with the first cogged wheel 13 and is provided with engagement means with shaft 18 which is integral with handle 19 of the handle lock 20.

[0012] Preferably, the second cogged wheel 17 comprises a cup shape with a cylindrical-shaped middle wall 21 comprising therein a pin 22 adapted to be engaged with a corresponding housing inside shaft 18 which is integral with handle 19 of the handle lock 20 so as to prevent the mutual rotation and allow the mutual axial translation. The rotary motion of handle 19 actuated by the user is thus transmitted to pin 22 through shaft 18, thus putting the cogged wheel 17 into rotation, which in turn transmits it to the cogged wheel 13 and therefore to the rotatable sleeve 11, which acts on the latch that is first put into rotation and then into axial translation so as to progressively compress the door on the frame thereof, thus ensuring the proper flattening of any seals arranged on the edge of the door or frame of the door, thus locking the door itself.

[0013] The fact that handle 19 is connected to shaft 12 which guides the latch by means of a pair of cogged wheels 13, 17 allows the transmission ratio of said pair of cogged wheels 13, 17 to be acted on so as to conveniently select the actuation force that the user should apply to the handle itself to close the lock. Moreover, the presence of the cogged wheels 13, 17 also allows the distance between the axes of the two cogged wheels 13, 17 to be worked on to position the handle with respect to the axis of the latch according to needs. Finally, the particular shape of the cogged wheel 17, comprising pin 22 adapted to be engaged with a corresponding housing inside shaft 18 which is integral with handle 19, allows the coupling between lock 10 and the handle lock 20 of the closing device according to the present invention to be kept over a given range of distances between lock 10 and the handle lock 20, thus allowing the closing device described to be adapted to doors of various thicknesses.

[0014] The handle lock 20 is further provided with a seat 24 adapted to be fixed to a door or a hatch and to accommodate handle 19 when the closing mechanism is actuated and the door or hatch is closed. To this end, handle 19 preferably is provided with a shaft which has a first telescopic part consisting of two cylinders adapted to slide one inside the other with a compression spring that holds handle 19 in position normally protruding with respect to seat 24. A suitable coupling and release mechanism applied to the aforesaid first telescopic part of the shaft of handle 19 allows handle 19 accommodated in seat 24 to be held and released when the door is closed.

[0015] The rotatable handle 19 of the device according to the present invention finally may comprise a cylinder lock adapted to lock the handle in closed position.

[0016] The rotatable closing device according to the present invention allows the user to close the door or hatch to which it is applied by means of a simple rotation of the handle without requiring translational movements,

furthermore the coupling by means of cogged wheels described also allows the force required to actuate the handle to be conveniently modulated during the design step. The device of the present invention finally allows simplifying the management and assembly of locks and handle since said locks are compatible with the installation on doors of various thickness. This results in an increased simplicity of use, less production costs and times.

[0017] The preceding description of the preferred embodiments of the invention refers to the accompanying drawings. The same reference numerals in the various drawings identify the same or similar elements. The above detailed description does not restrict the scope of the invention claimed because the scope of protection related to the present invention is defined by the appended claims.

Claims

1. A closing device for doors and hatches, comprising:

a handle lock (20) adapted to be integrally fixed to a door or a hatch, said handle lock (20) comprising a rotatable handle (19) connected to a shaft (18);

a lock (10) adapted to be integrally fixed to a door or a hatch, said lock (10) comprising a shaft (12) associated with a closing latch (25); a rotatable sleeve (11) adapted to guide, when put into rotation about its own axis, the shaft (12) in a rotatable and axially translatable manner; connection means adapted to transmit the motion of said shaft (18) to said rotatable sleeve (11), **characterized in that** said connection means comprise a first cogged wheel (13) connected with said rotatable sleeve (11) and a second cogged wheel (17) connected to said shaft (18).

2. A device according to claim 1, **characterized in that** the rotatable sleeve (11) comprises a pin (14) adapted to be engaged both with said shaft (12) and with a guide (15) on said rotatable sleeve (11) and an adjustment bushing (16) adapted to cooperate with said pin (14) and with said guide (15) so as to allow said rotatable sleeve (11) to rotate relatively to said shaft (12) while the shaft (12) translates axially.

3. A device according to one or more of claims 1 to 2, **characterized in that** the second cogged wheel (17) comprises a cup shape with a cylindrical-shaped middle wall (21) comprising therein a pin (22) adapted to be engaged with a corresponding housing inside the shaft (18) which is integral with the handle (19).

4. A device according to one or more of claims 1 to 3,

characterized in that the handle lock (20) is further provided with a seat (24) adapted to be fixed to a door or a hatch and to accommodate the handle (19) when said handle (19) is in the closed position.

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5. A device according to claim 4, **characterized in that** the handle (19) is provided with a shaft which has a first telescopic part consisting of two cylinders adapted to slide one inside the other with a compression spring adapted to hold the handle (19) in position normally protruding with respect to the seat (24).
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6. A device according to claim 5, **characterized in that** the handle (19) comprises a coupling and release mechanism applied to said first telescopic part of the shaft of the handle (19), said coupling and release mechanism being adapted to hold and release the handle (19) inside the seat (24) when the door is closed.
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7. A device according to one or more of claims 1 to 6, **characterized in that** the handle (19) comprises a cylinder lock adapted to lock the handle (19) in closed position.
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8. A door comprising at least one closing device according to claims 1 to 7.

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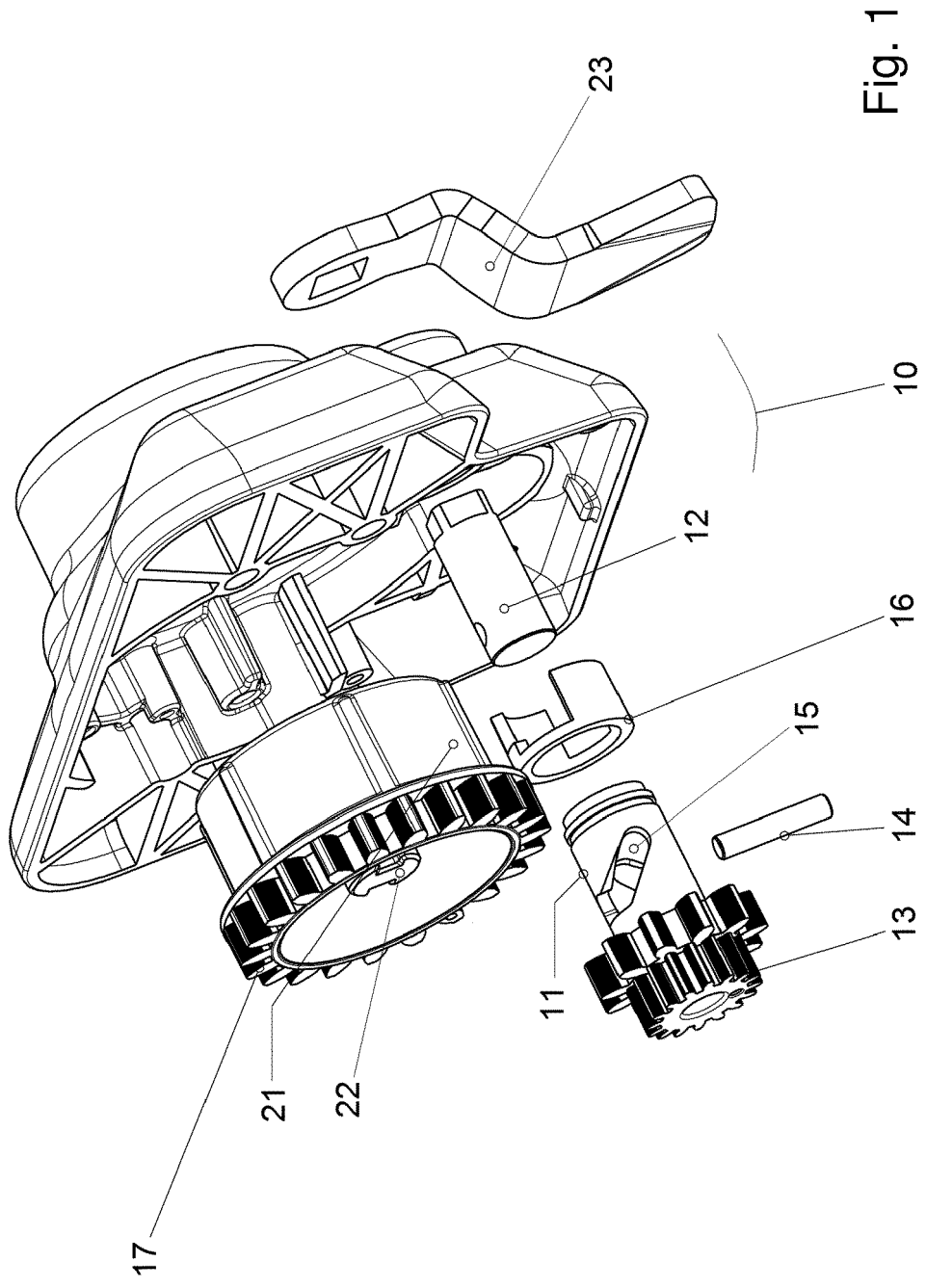


Fig. 1

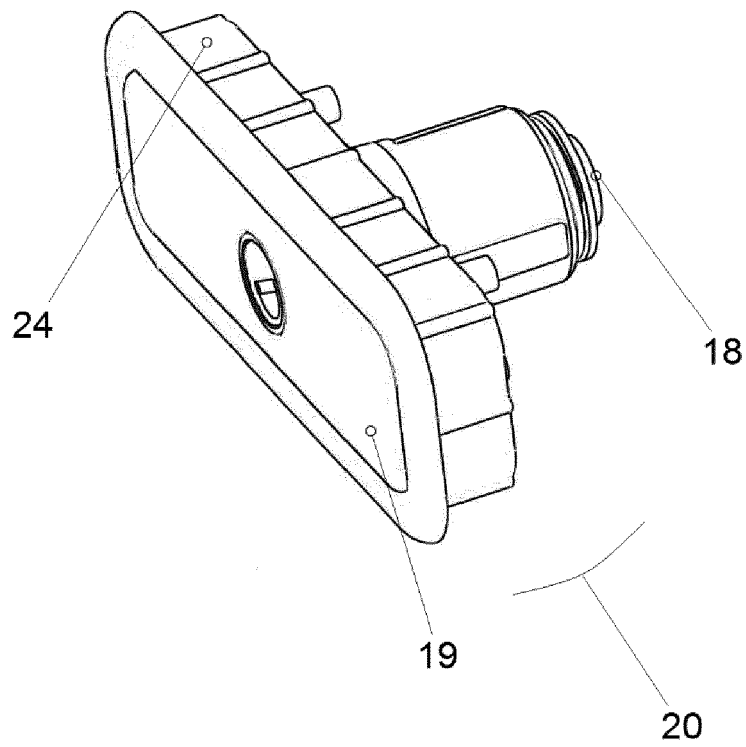


Fig. 2

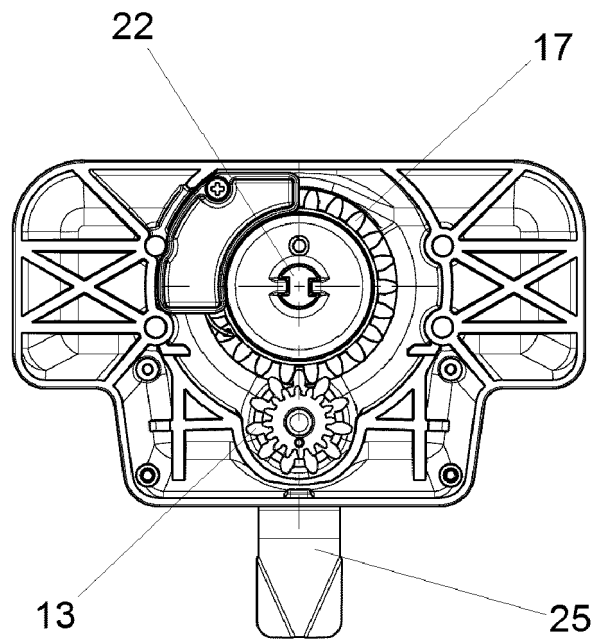


Fig. 3

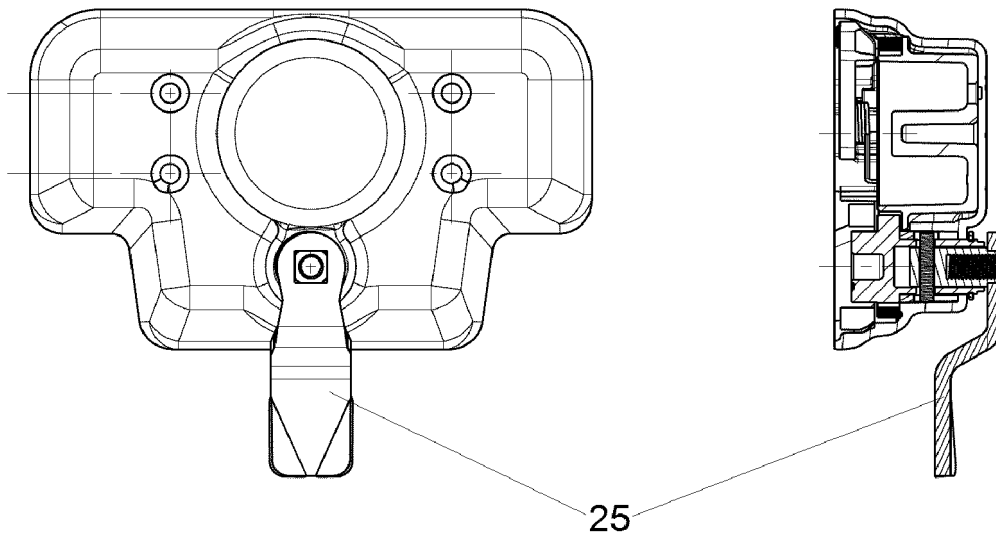


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 17 19 6938

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 February 2018	Examiner Viethen, Lorenz
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 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 19 6938

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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