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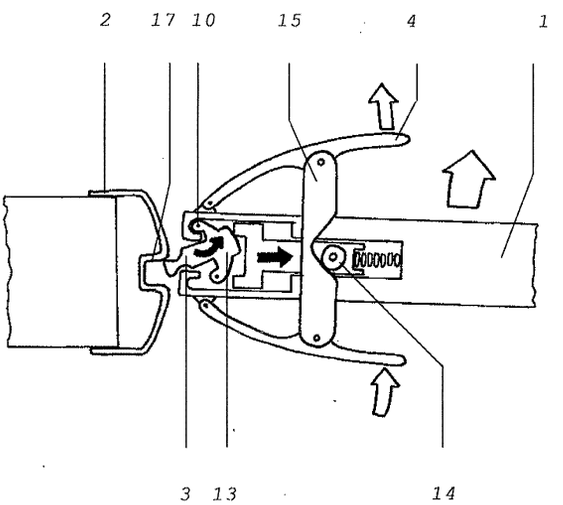
(54) Lock

(57) The invention relates to a lock intended for arranging in a panel (1), for instance a door, window or hatch, hung hingedly around a pivot axis relative to a frame (2) and movable between a closed position, in which it closes the passage defined by the frame (2), and an open position, which lock is provided with

locking means with a bolt (3) which is spring-loaded (6) to an active closing position and which co-acts for closure with a recess (17) present in the frame;
an operating member which operates the locking means; and
a transmission present between the operating member and the bolt (3) in order to retract the bolt (3) counter to the spring load (6) or release it when the operating profile is operated;
and has the caracteristics that
the bolt (3) is translatable in a direction along the main plane of the panel (1) and is rotatable around an axis lying substantially in this main plane and extending at least roughly in the direction of said pivot axis of the panel (1).

figure 3



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Description

[0001] The invention relates to a lock intended for arranging in a panel, for instance a door, window or hatch, hung hingedly around a pivot axis relative to a frame and movable between a closed position, in which it closes the passage defined by the frame, and an open position, which lock is provided with

locking means with a bolt which is spring-loaded to an active closing position and which co-acts for closure with a recess present in the frame;

an operating member which operates the locking means; and

a transmission present between the operating member and the bolt in order to retract the bolt counter to the spring load when the operating profile is operated.

[0002] Such a lock is generally known and common.

[0003] A normal door has one direction of rotation, i. e. the direction of rotation is fixed, or the door closes by striking against the door rebate. The bolt of the door lock is adapted to the direction of rotation. One side of the bolt is chamfered, whereby the chamfered side makes it possible that the guiding along the rebate or the frame causes the bolt to move inward counter to light spring pressure and to shoot into a recess in the frame when the door strikes against the rebate. The shape of the bolt causes the bolt to shoot into the recess and thereby shuts the door close-fittingly between bolt and door rebate.

[0004] The drawback of this construction is that the bolt is only suitable for a door with one direction of rotation. Or, it deprives the door of the flexibility to be used in a different situation where another direction of rotation is required.

[0005] The object of the invention is to provide a lock which does not have the described drawback. In accordance with the insight of the present invention the bolt must in this respect have more than one degree of freedom of movement. The lock of the invention therefore has the feature that the bolt is translatable in a direction along the main plane of the panel and is rotatable around an axis lying substantially in this main plane and extending at least roughly in the direction of said pivot axis of the panel.

[0006] Characteristic of any panel which closes in a frame is that the form of the frame guides the bolt inward when the door is closed. If the bolt is to shut the door close-fittingly between door rebate and bolt, the bolt will in normal conditions then have to shoot into the recess by means of a linear movement. There will in any case not be the space for an inward rotating movement unless the door is to be allowed to rattle. A linearly moving bolt is desired in order to close the door rattle-free in the rebate in the correct manner.

[0007] For the purpose of opening, this solution likewise suffices if the bolt is pulled positively out of the recess by the operating mechanism, for instance a door handle. The lock according to the invention is embodied such that the bolt is preferably not driven directly. Its function is limited to optionally locking the bolt in closing position. In the present case the bolt is driven during opening and closing by the initiated movement, comparable to the usual closure for a kitchen cabinet. In this closure the bolt rotates during opening and closing of the door. Due to the absence of the linear closing movement of the bolt there could occur play, which adverse effect is resolved in the case of small door panels by removing all play between door and rebate by means of a spring. This does not cause problems in the case of small door panels. In the case of large door panels however, such a solution would result in heavy springs, which will have a very adverse effect on the ease with which the door can be closed and opened.

[0008] Assuming a solution wherein the initiated movement operates the bolt during both opening and closing, a linear movement is desirable during closing which renders unnecessary the use of heavy springs behind a wedge-shaped bolt.

[0009] By dispensing with the formation of a wedge in the opening direction there will occur, if a linear movement is retained, no resolved force which drives the bolt into the panel. This is provided according to the invention by the second degree of freedom of movement.

[0010] The lock according to the invention is embodied such that when the closing panel is opened the lock only releases the bolt and that by pulling and pressing on the door in the desired direction of movement forces are initiated on the bolt which cause the bolt to pivot around its pivot axis. The lock allows the bolt to move linearly inward during closing, also if the operating means is not used. The door can thus drop freely into the lock.

[0011] In a particular embodiment the lock has the feature that the bolt is a separate component which under the influence of a pressure spring, optionally via a locking block, co-acts by means of a first rotation part with a second rotation part coupled to the door.

[0012] In a preferred embodiment the lock has the feature that the lock is rotatable around two different rotation zones.

[0013] This latter embodiment can have the feature that the two rotation zones are located at least almost symmetrically relative to the bolt of the panel.

[0014] A preferred embodiment has the feature that the transmission means co-act with the bolt in the manner of a cam with cam follower.

[0015] A possible product embodiment is a door, which will be described with reference to figures 1, 2, 3 and 4.

[0016] Figure 1 shows the door 1 which is hung hingedly in frame 2. The door is provided with a bolt 3 which in the closed position locks the door in the frame. In order to open the door the bolt is operated by the operating profile 4.

[0017] In figure 2 is shown a detail of door 1 with bolt 3 in closed position in co-action with frame 2. The bolt

is enclosed movably in a recess 5 of the door. Under the influence of spring 6 and the pressure block 7 between spring and bolt, the latter supports with both its rotation positions 8 and 9 in the hinge channels 10 and 11 of the door recess. Owing to the recess 12 in the pressure block, which encloses the ridge 13 on the rear of the bolt, the pressure block prevents the bolt being able to pivot on either of its two pivot points. The pressure block is in turn enclosed slidably in the recess of the door, whereby any inward directed force on the bolt which is greater than the spring force will slide the bolt and the pressure block inward.

[0018] The position of the pressure block in the recess of the door is determined by the roller 14 on the pressure block which co-acts with the curve path 16 of the strip 15 which is pivotally connected to profile members 4.

[0019] The operation in the different circumstances of opening and closing is shown in figures 3 and 4.

[0020] Figure 3 shows door 1 in only just closed position. By moving the profile members 4 in the desired opening movement of the door, a force is initiated on bolt 3 by the slot 17 in frame 2, which force will cause the bolt to pivot on its pivot point 10. The bolt is released by the pressure block because the same movement of the profile members, the curve path of strip 15, has pulled the roller 14 of the pressure block into the recess of the door, whereby the ridge 13 of the bolt has come free of the pressure block, so that the bolt is free to pivot. Owing to the symmetrical structure of the lock in the door, opening of the door in both directions is possible.

[0021] In figure 4 the door 1 is shown in almost closed position. The closing movement of the door is initiated by exerting a force on one of the operating members 4, or on the door itself, wherein the operating members, strip 15 and pressure block 7 remain in neutral position. During closing of the door the inclining side of frame 2 will slide the bolt 3 and the pressure block linearly inward out of the hinge channels 10 and 11 and counter to the spring pressure of spring 6 until the door is closed so far that the spring shoots the bolt into the slot 17 of the frame.

Claims

1. Lock intended for arranging in a panel, for instance a door, window or hatch, hung hingedly around a pivot axis relative to a frame and movable between a closed position, in which it closes the passage defined by the frame, and an open position, which lock is provided with

   locking means with a bolt which is spring-loaded to an active closing position and which co-acts for closure with a recess present in the frame;

   an operating member which operates the locking means; and

   a transmission present between the operating member and the bolt in order to retract the bolt counter to the spring load or release it when the operating profile is operated;

   characterized in that

   the bolt is translatable in a direction along the main plane of the panel and is rotatable around an axis lying substantially in this main plane and extending at least roughly in the direction of said pivot axis of the panel.

2. Lock as claimed in claim 1,
   characterized in that
   the bolt is a separate component which under the influence of a pressure spring, optionally via a locking block, co-acts by means of a first rotation part with a second rotation part coupled to the door.

3. Lock as claimed in claim 1,
   characterized in that
   the bolt is rotatable around two different rotation zones.

4. Lock as claimed in claim 3,
   characterized in that
   the two rotation zones are located at least almost symmetrically relative to the bolt of the panel.

5. Lock as claimed in claim 2,
   characterized in that
   the transmission means co-act with the bolt in the manner of a cam with cam follower.

figure 1

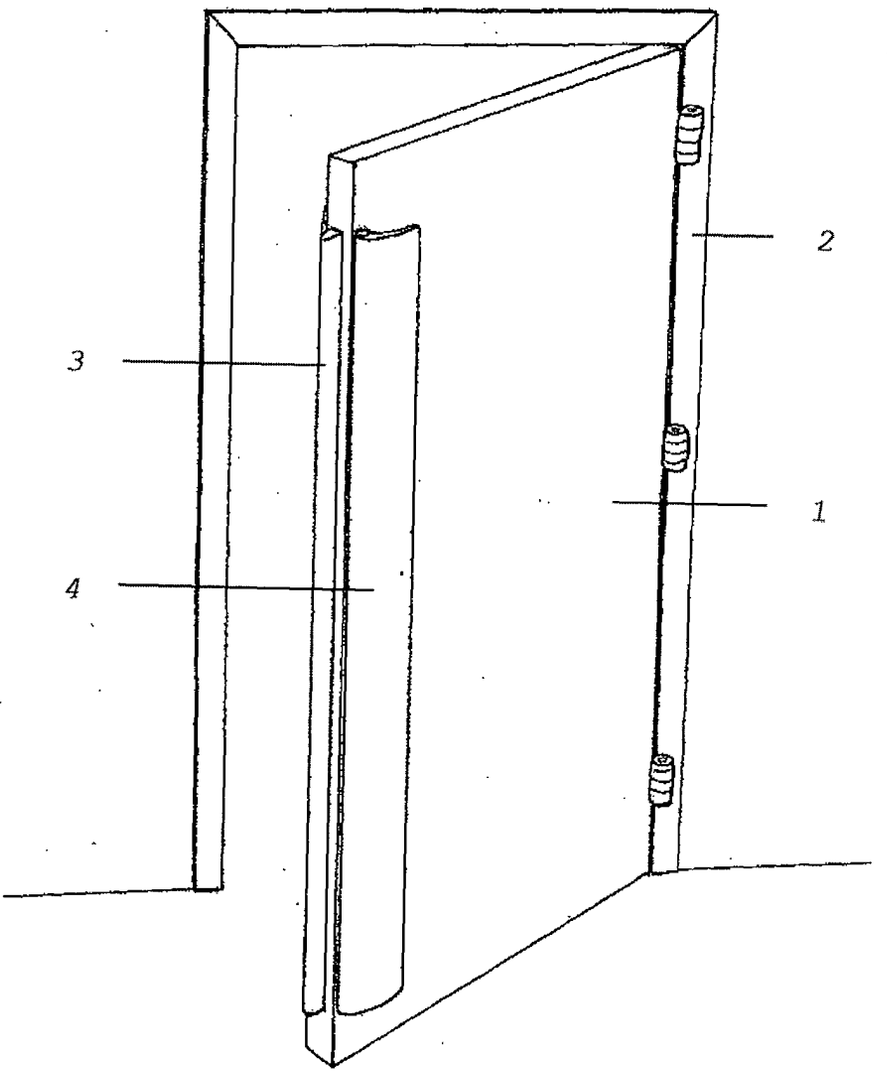


figure 2

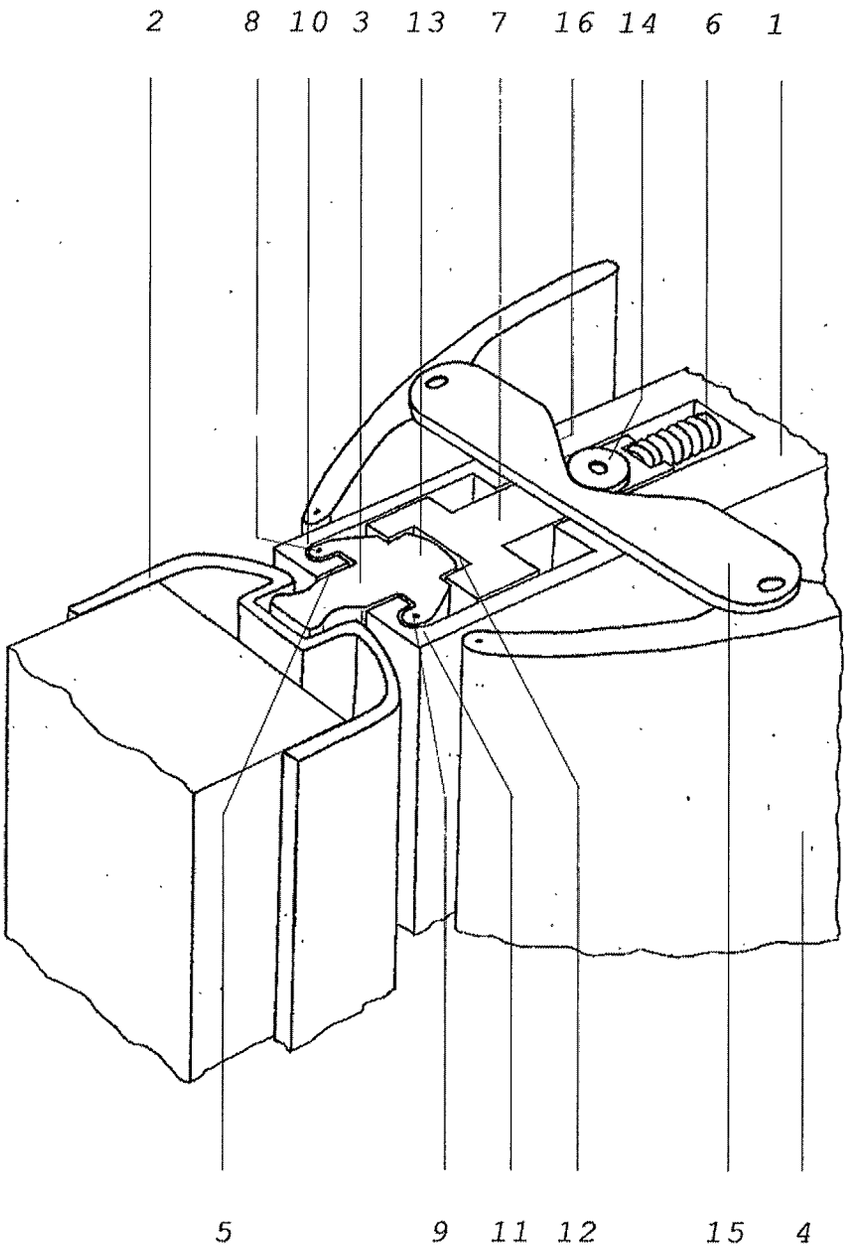


figure 3

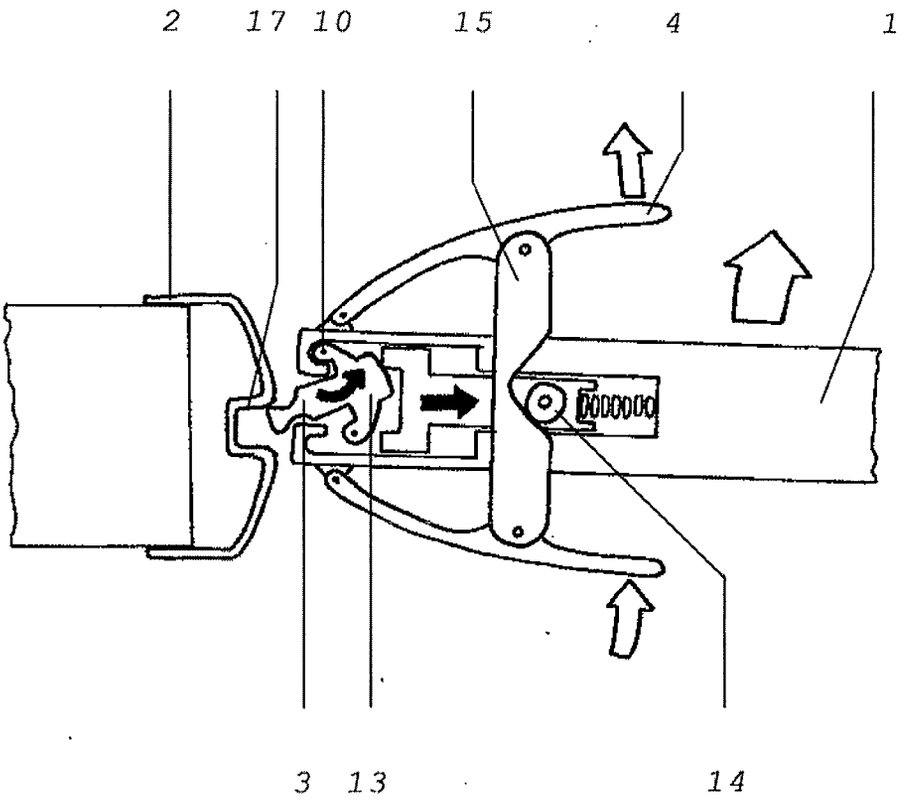
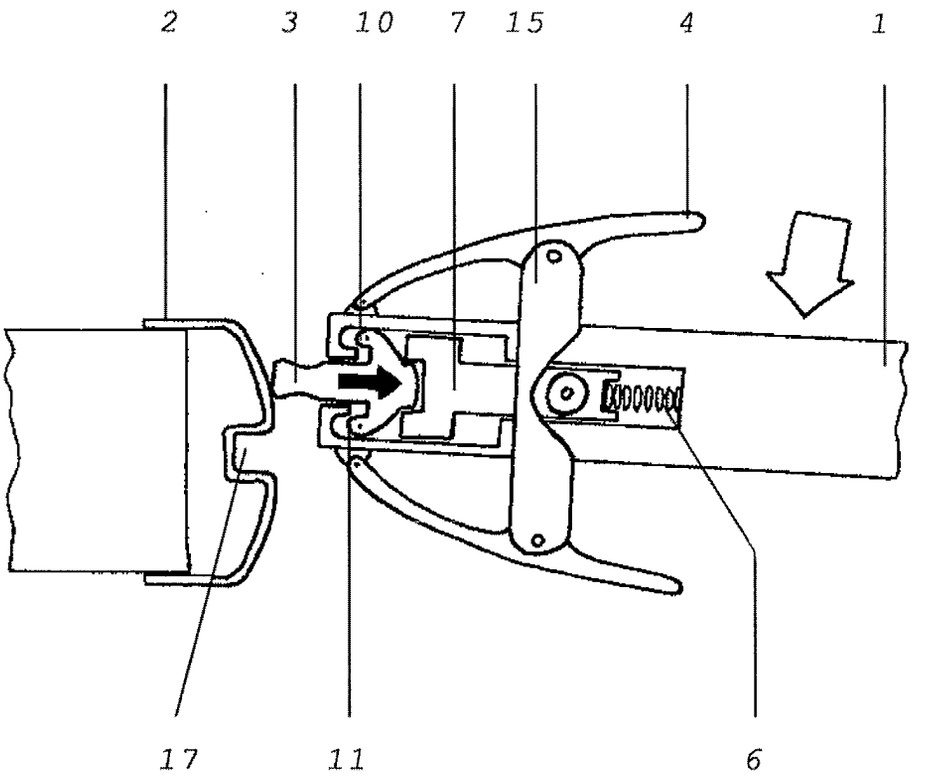


figure 4



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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 9927

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.7)
X	US 126 907 A (SKINNER) * the whole document *	1	E05C5/00 E05B7/00 E05C19/00
X	US 202 474 A (RUGGLES) * the whole document *	1	E05B15/10
X	US 3 951 442 A (SCHLAGE) 20 April 1976 (1976-04-20) * the whole document *	1,3	
X	DE 11 93 830 B (FA. KARL FLIETHER) 26 May 1965 (1965-05-26) * the whole document *	1	
X	EP 0 799 956 A (SIMONS & VOSS IDENTIFIKATIONSS) 8 October 1997 (1997-10-08) * the whole document *	1	
X	DE 74 39 056 U (GERBER) 15 July 1976 (1976-07-15) * the whole document *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) E05C E05B
Y	DE 15 53 495 A (TREFZER) 4 February 1971 (1971-02-04) * the whole document *	1	
Y	DE 15 53 490 A (TREFZER) 23 July 1970 (1970-07-23) * the whole document *	1	
A	FR 1 604 363 A (LICENTIA PATENT-VERWALTUNGS G.M.B.H.) 8 November 1971 (1971-11-08) * the whole document *	1,3	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 May 2003	Westin, K

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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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07-05-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 126907 A		NONE	
US 202474 A		NONE	
US 3951442 A	20-04-1976	NONE	
DE 1193830 B	26-05-1965	NONE	
EP 0799956 A	08-10-1997	DE 19613638 A1 EP 0799956 A2	09-10-1997 08-10-1997
DE 7439056 U	15-07-1976	DE 7439056 U1	15-07-1976
DE 1553495 A	04-02-1971	DE 1553495 A1	04-02-1971
DE 1553490 A	23-07-1970	DE 1553490 A1	23-07-1970
FR 1604363 A	08-11-1971	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82