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(54) Window or sliding door lock

(57) A window or sliding door lock includes a handle connected to a spindle, which is engaged with an eccentric polygonal hole of a driving member in a driving assembly. The driving member has male teeth defined along its outer edge, thereof. Two rack pieces are movably connected to the driving assembly and each rack piece has female teeth. The female teeth of one of the two rack pieces are engaged with the male teeth of the driving member. The two rack pieces each have a toothed surface and the two respective toothed surfaces face each other. Two pinion gears are held between the two rack pieces and are engaged with the two respective toothed surfaces, so that the two rack pieces move in opposite directions with the rotation of the driving member. Two locking plates are respectively connected to the two rack pieces and are moved between lock position and open position.

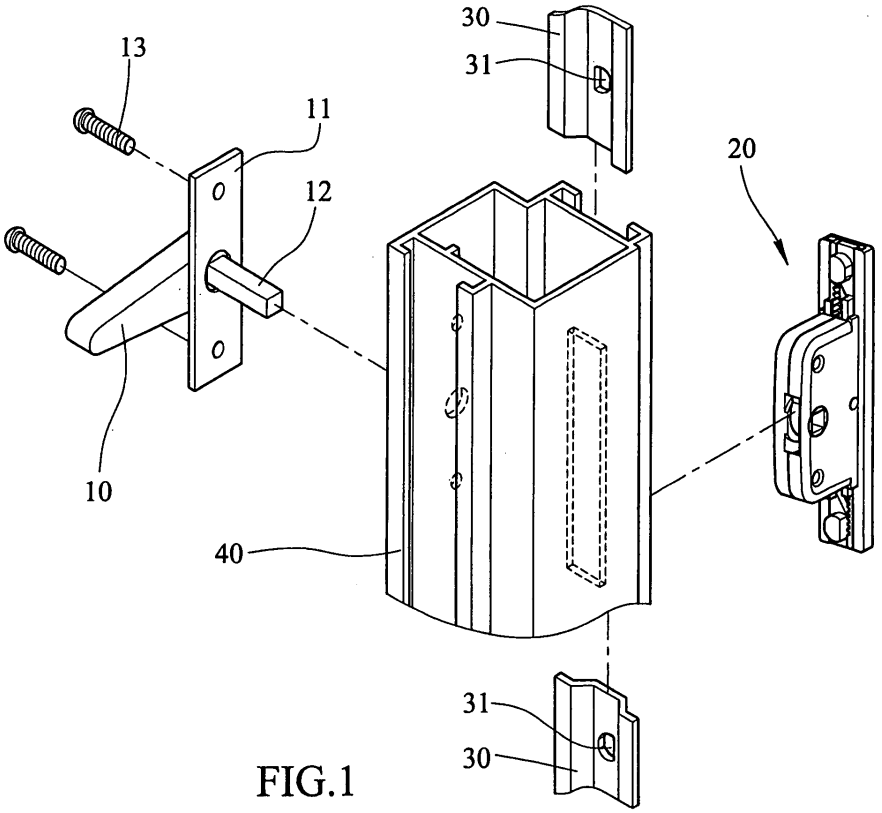

FIG.1

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Description

FIELD OF INVENTION

[0001] The present invention relates to a lock especially for a window or sliding door lock that drives two locking plates in opposite directions to lock windows or sliding doors.

BACKGROUND OF THE INVENTION

[0002] A conventional lock for windows or sliding doors shown (Figs. 6 and 7) generally includes a handle 50 with a spindle 51 that extends through a rosette, a driving assembly 60 with a driving member 70 received therein, and a locking rail 80 which is driven by the driving member 70 to move up and down between the lock position and the open position. The driving assembly 60 includes two lugs on two ends, thereof, and each lug is connected to the locking rail 80 by rivets, which extend through two slots 83 in the locking rail 80. The driving assembly 60 is composed of two parts 61 and 62, so as to form a space in which the driving member 70 is received. The spindle 51 extends and engages with a polygonal hole 71 in the driving member 70 and a plurality of teeth 72 are defined on the outside of the driving member 70. A rack plate 81 is fixed to the locking rail 80 and the teeth 82 of the rack plate 81 are engaged with the teeth 72 of the driving member 70, such that when the handle 50 is pivoted, the driving member 70 is rotated by the spindle 51 to drive the rack plate 81, so that the locking rail 80 is moved a distance the same as the slots 83 between the lock position and the open position.

[0003] However, the rack plate 81 and the locking rail 80 are connected at two points, so that the rack plate 81 shakes when driven by the driving member 70. The unstable engagement between the locking rail 80 and the rack plate 81 might cause movement of the locking rail 80. Furthermore, the locking rail 80 is an elongated plate, which is not convenient for packing and transportation.

[0004] The present invention intends to provide a window or sliding door lock, wherein two rack pieces are moved simultaneously in opposite directions, so as to move two locking plates between lock position and open position.

SUMMARY OF THE INVENTION

[0005] The present invention relates to a window or sliding door lock that comprises a handle with a spindle extending through a rosette, which is connected to a driving assembly. A driving member is received in a rotating action in the driving assembly. The spindle extends through an eccentric polygonal hole in the driving member that rotates as the handle and spindle are turned. The driving member has male teeth defined along its side, while two rack pieces are movably connected to the driving assembly and each rack piece has a set of female teeth, which are complementary to the male teeth on the driving member. The complementary teeth of one of the two rack pieces are engaged with the male teeth of the driving member. The two rack pieces each have a toothed surface on a different side of the racks and these two respective toothed surfaces face each other in the assembly. Two pinion gears are located between the two rack pieces and are engaged in rotation with the two respective toothed surfaces. The two rack pieces move in opposite directions when the driving member rotates and drives the female teeth of one of the two rack pieces. Two locking plates are located on two ends of the driving assembly and are connected respectively to the two rack pieces.

[0006] The primary objective of the present invention is to provide a lock of windows or sliding doors, in which the lock includes two locking plates that are driven by two rack pieces in opposite directions.

[0007] The present invention will become more obvious from the following description when taken into account the accompanying drawings, which show (for illustration purposes only) a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Fig. 1 is an exploded view to show the lock of the present invention including a handle and a driving assembly and a window frame;

Fig. 2 is an exploded view to show the parts of the lock of the present invention;

Fig. 3 shows that the two locking plates are in lock position;

Fig. 4 shows that the two locking plates are in open position;

Fig. 5 shows that the driving assembly is connected to the window frame by an inclined, pointed set screw extending through the driving assembly;

Fig. 6 is an exploded view to show a conventional window lock, and

Fig. 7 is a cross sectional view to show the movement of the locking rail of the conventional window lock.

DETAILED DESCRIPTION OF THE PREFERRED MBODIMENT

[0009] Referring to Figs. 1 to 3, the lock of the present invention comprises a handle 10 connected to a spindle 12, which extends through a rosette 11. A driving assembly 20 is attached to a door or a window frame 40. The driving assembly 20 is composed of two main-housing parts 21 a and 21 b. The protruding section of main-housing 21 a and smaller protrusion 24 create a U-shaped recessed space 25, located on one side of the inner surface of main-housing part 21a and part 21b. The main-housing part 21a includes two holes and the other main-

housing part 21b has two connection tubes 22, each of which has a threaded hole (not shown). The two main-housing parts 21a and 21b are connected to each other by means of screws 13 that extend through the two holes on each side of main-housing part 21a and are connected and fastened to the connection tubes 22 on the other main-housing part 21b. A driving member 26 is engaged in rotation within a groove in the middle protrusion 23 on the main-housing part 21a in the driving assembly 20, while the spindle 12 extends through the hole 211 defined through the middle protrusion 23 and through the eccentric polygonal hole 261 in the driving member 26 (the driving member 26 has male teeth 262 defined along its outer edge).

[0010] The two rack pieces 27 each include a U-shaped section on the rack, which has female teeth 271 defined therein. These U-shaped sections movably engage within the U-shaped spaces 25 in the main housing 21a /21 b. The female teeth 271 of one of the two rack pieces 27 engage with the male teeth 262 of the driving member 26. The two rack pieces 27 also each have a toothed surface 272 on the side and the two respective toothed surfaces 272 face each other. Two pinion gears 28 are located between the two rack pieces 27 and are engaged in rotation with the two respective toothed surfaces 272. Therefore, the two rack pieces 27 move in opposite directions when the driving member 26 drives the female teeth 271 of one of the two rack pieces 27.

[0011] Two locking plates 30 are located on two ends of the driving assembly 20 and are respectively connected to the two rack pieces 27. Each of the two rack pieces 27 has a stud 273 on one of the two ends, thereof, and the two locking plates 30 each have a hole 31 with which one of the two studs 273 is engaged.

[0012] As shown in Fig. 3, when the handle 10 is in its lock position, the two rack pieces 27 are moved away from each other in two opposite directions so that the window or the door is locked. As shown in Fig. 4, when the handle 10 is pivoted, the locking plates 30 are moved toward each other and the window or the door is in open position.

[0013] As shown in Fig. 5, the driving assembly 20 includes an inclined hole 212 and a set screw 29. The set screw 29 is engaged by means of a threaded passage within the inclined hole 212, so that the driving assembly 20 is fastened to the window frame 40. The main purpose of the set screw 29 is to ensure that the driving assembly 20 is fixed on the profile, or window frame 40.

[0014] The two locking plates 30 are driven by the two rack pieces 27 so that each of the locking plates 30 moves stably. The two rack pieces 27 are moved by the two gears 28, which are engaged within the toothed surfaces 272, so that the two rack pieces 27 do not shake while moving.

[0015] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

Claims

1. A window or sliding door lock comprising:

   a handle connected to a spindle which extends through a rosette;
   a driving assembly having a driving member received in a rotating action, therein, where a spindle extends through an eccentric polygonal hole in the driving member and main housing; a driving member having male teeth defined along its outer edge; two rack pieces movable and partially encased in the main housing of the driving assembly and each rack piece has female teeth along one section; female teeth of one of the two rack pieces engaged with the male teeth of the driving member; the two rack pieces each having toothed surfaces that face each other; two pinion gears located between the two rack pieces and engaged in rotation with the two respective toothed surfaces; the two rack pieces moving in opposite directions when the driving member drives the female teeth of one of the two rack pieces; and
   two locking plates located at two ends of the driving assembly and are respectively connected to the two rack pieces.

2. As per the lock claimed in claim 1, each of the two rack pieces has a stud on one of the two ends and two locking plates each has a hole, wherein each one of the two studs is engaged.

3. As per the lock claimed in claim 1, the driving assembly main housing includes a U-shaped recessed space defined by its main housing protrusion and smaller protrusion, the two rack pieces each include a U-shaped section, which has the female teeth defined. The U-shaped portions of the two rack pieces are movably engaged with the U-shaped space.

4. As per the lock claimed in claim 1, wherein the driving assembly includes an inclined hole and a pointed and threaded set screw, engaged within the threaded passage, so that the driving assembly is adapted to be connected and fixed to the window frame.

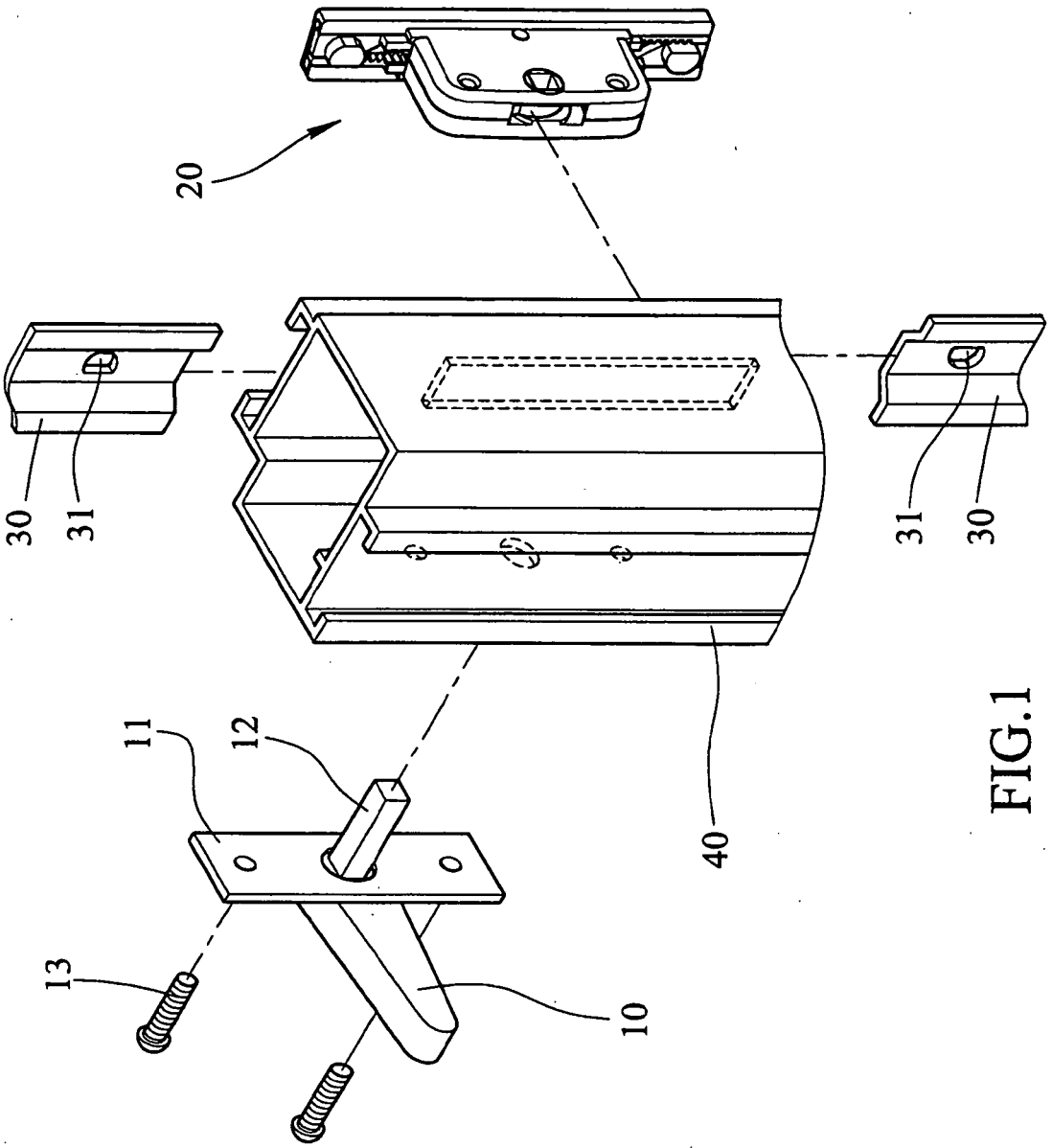
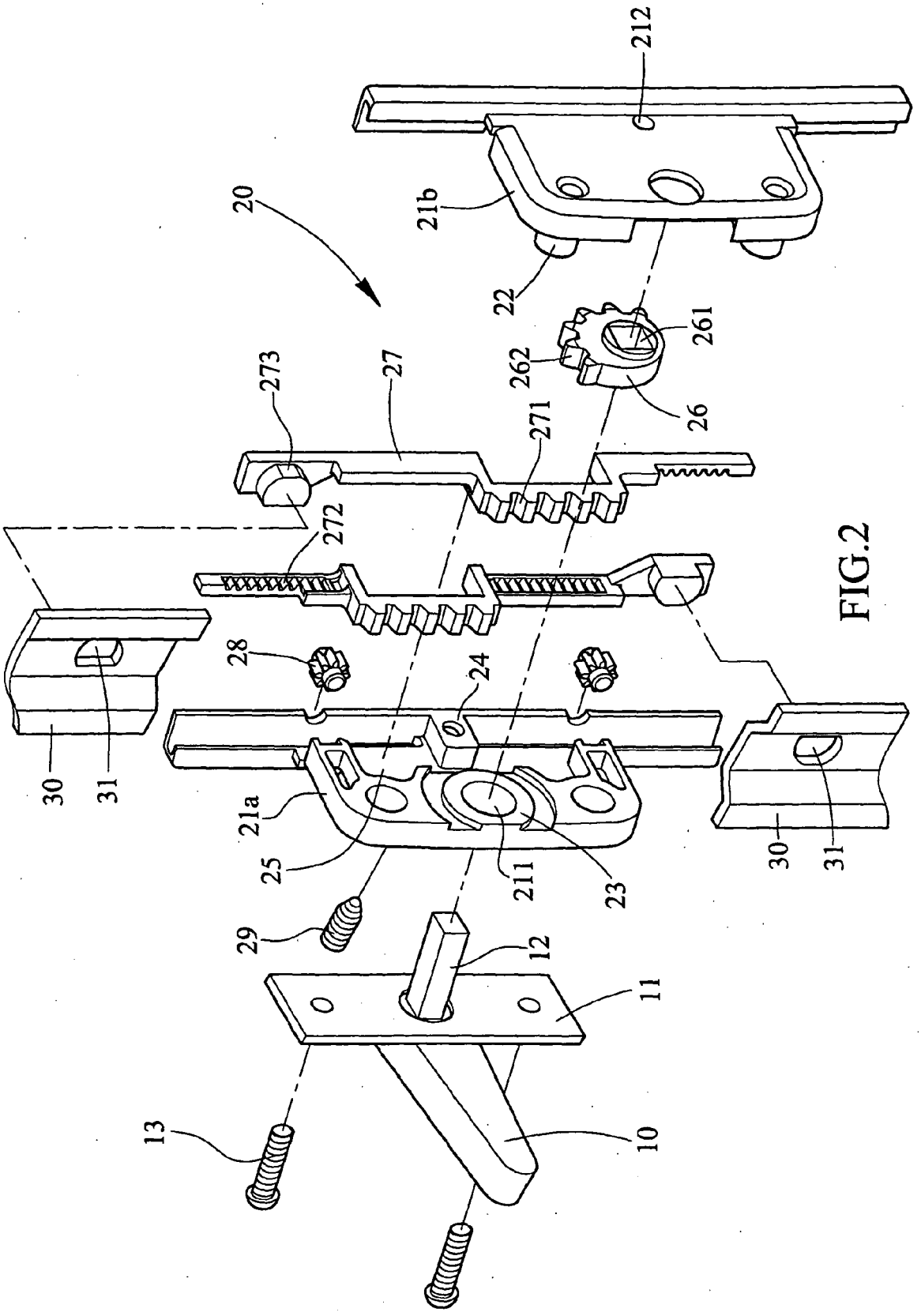


FIG.1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21b
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21a
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FIG.2

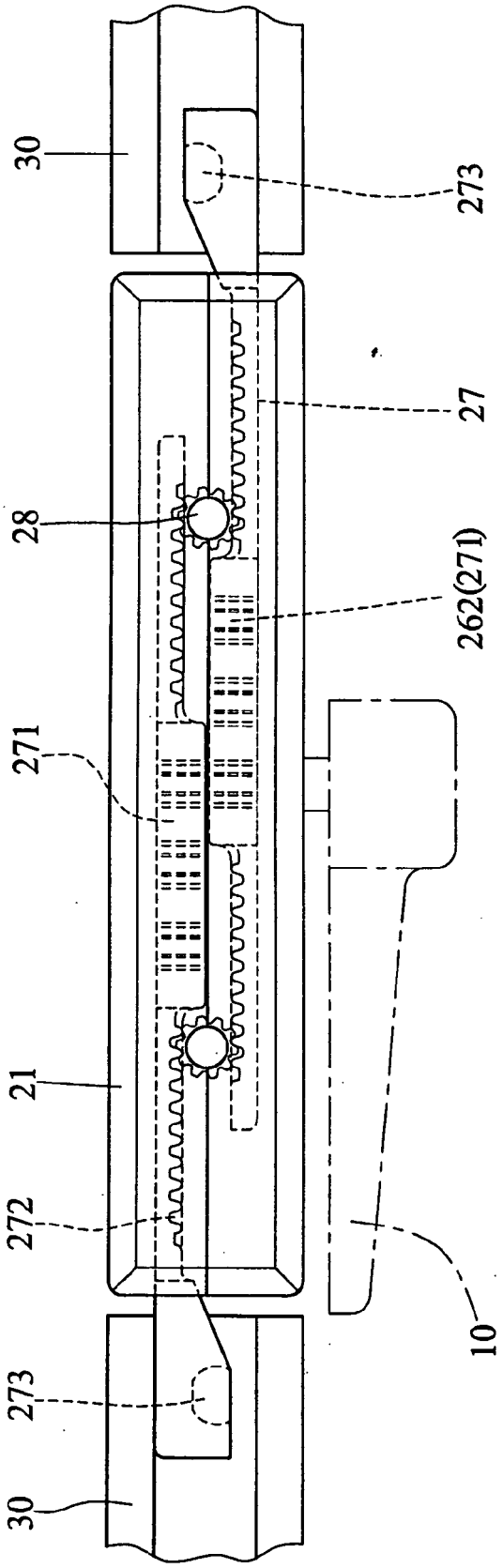

FIG.3

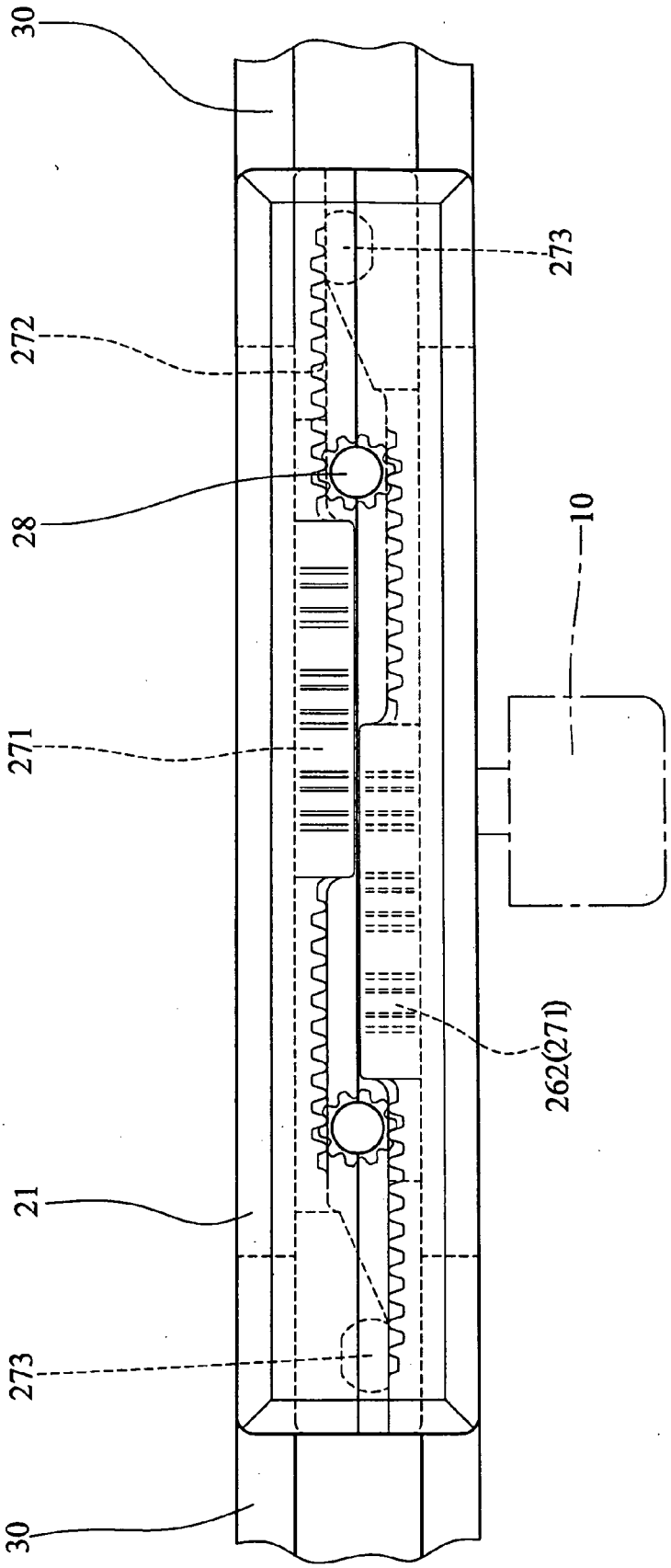

FIG.4

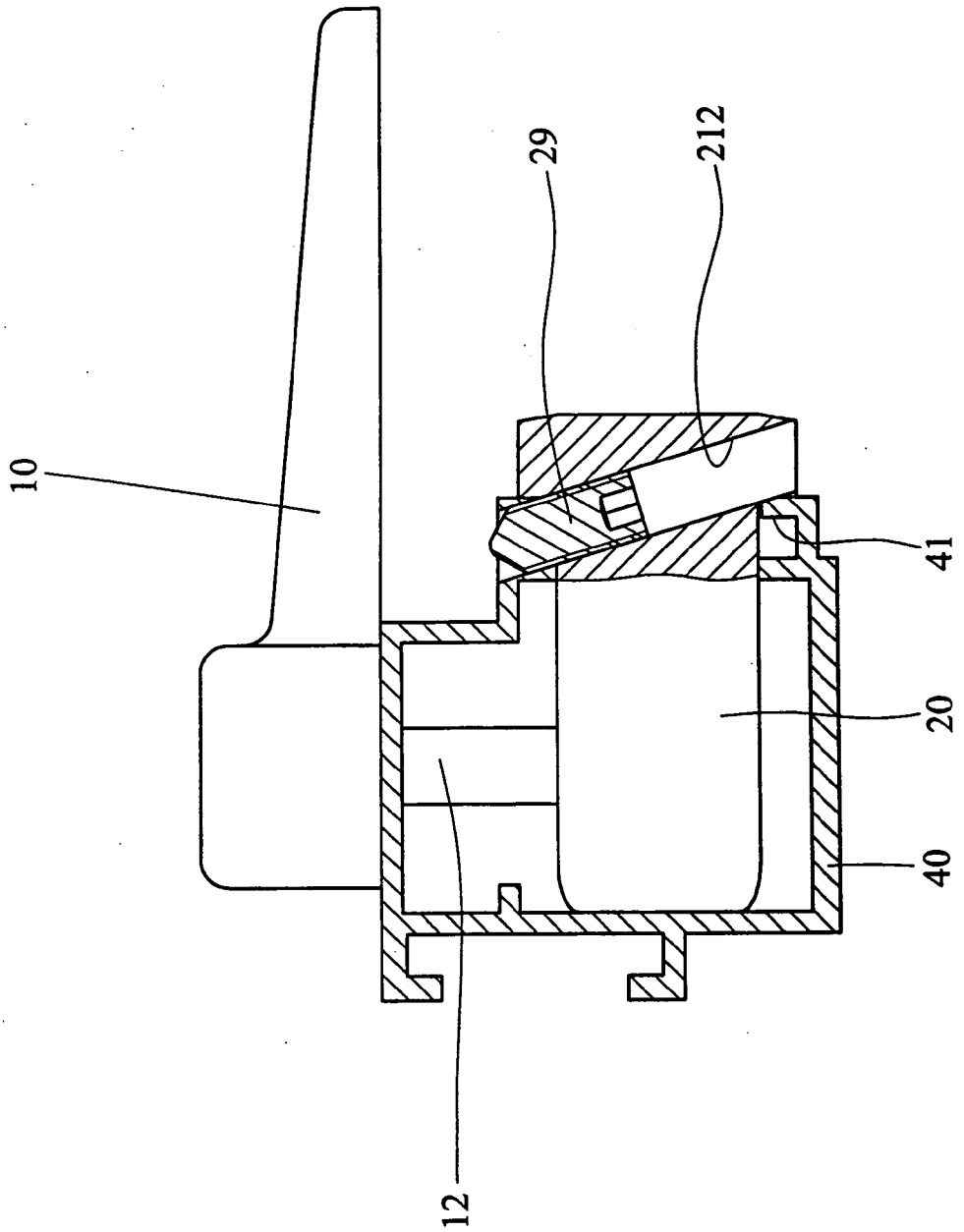

FIG.5

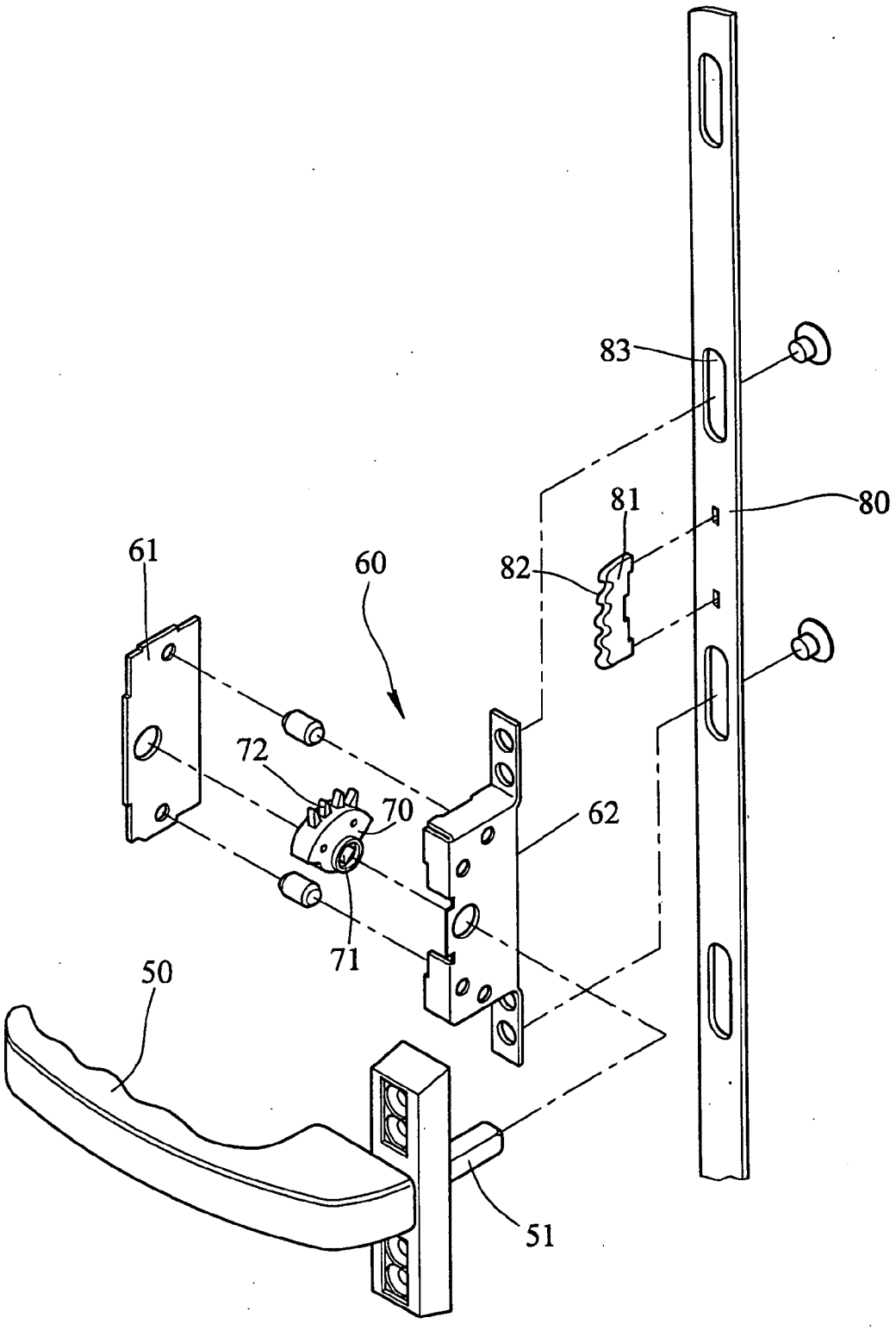

FIG.6
PRIOR ART

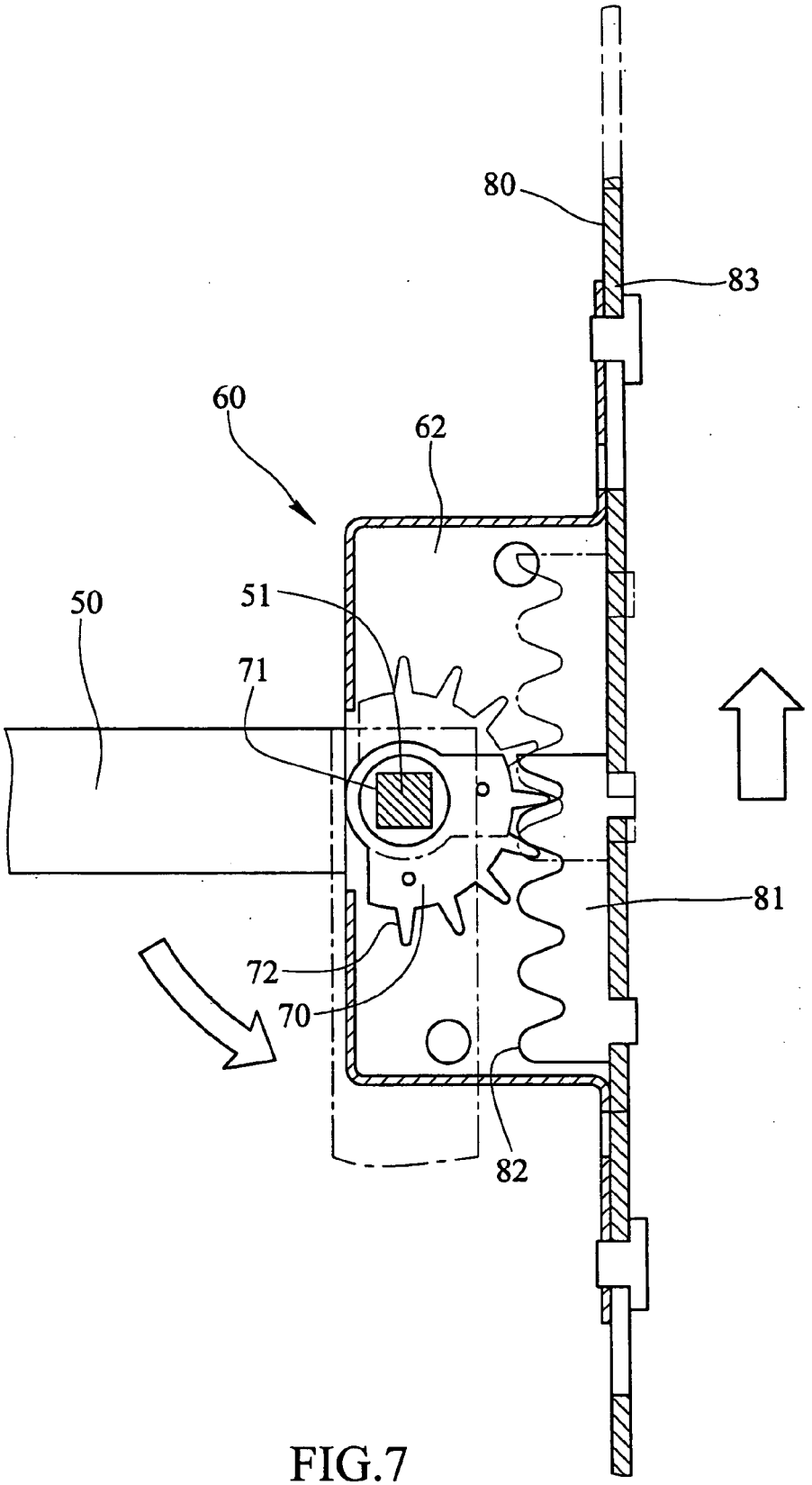

FIG.7
PRIOR ART

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 1253

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	GB 2 340 872 A (* WINKHAUS) 1 March 2000 (2000-03-01) * the whole document *	1-3	
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A	GB 2 289 709 A (KING) 29 November 1995 (1995-11-29) * figure 4 *	2	
A	GB 2 211 882 A (* HASP INTERNATIONAL LIMITED) 12 July 1989 (1989-07-12) * page 7, line 26 - line 28 *	4	TECHNICAL FIELDS SEARCHED (IPC) E05C E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 November 2005	Van Beurden, J

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 01 1253

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