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(54) LATCHING MECHANISM

(71) We, NCR CORPORATION, of Dayton in the State of Ohio, and Baltimore in the State of Maryland, United States of America, a Corporation organized and existing under the laws of the State of Maryland, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which is it to be performed, to be particularly described in and by the following statement:—

This invention relates to a latching mechanism for latching a drawer in a closed position.

In electronic cash registers or data terminal devices which are employed in merchandising checkout operations, the release of the cash drawer from a closed position to allow for the disbursement of change is conditioned on the operation of certain control keys on the keyboard of the terminal device. Before the checkout operation can continue, the terminal device must be notified that the cash drawer has been returned to its closed position. One example of a latching mechanism which generates a signal upon the latching of the cash drawer in a closed position is disclosed in the U.K. Patent Specification No. 1,467,788. While this type of latching mechanism operates satisfactorily, it has been found that the latching member requires precise adjustments with respect to the drawer catch to function properly, which adjustments are hard to hold due to the camming movement of the latching member by the drawer catch prior to the latching of the drawer catch. This condition has resulted in a high failure rate of the operation of the latch mechanism. The present invention alleviates the above disadvantage by providing a latching mechanism which is moved into a positive latching engagement with the drawer catch member upon the engagement of the latching mechanism by the latter, which mechanism is moreover of simple construction, low in cost and requires no adjustment for its satisfactory operation.

Thus according to the invention there is provided in a cash register, data terminal device, or similar enclosure structure including a slidably mounted drawer having a catch member secured to the rear thereof, a latching mechanism, including a latching member movable between a first, non-latching, position, and a second, latching, position and arranged in the path of said catch member to move from its non-latching to its latching position upon engagement thereof by said catch member during movement of said drawer to a closed position; a blocking member movable between a first, non-blocking, position and a second, blocking, position and arranged to move, in response to movement of said latching member from its non-latching to its latching position, from its non-blocking to its blocking position in which it holds said latching member in its latching position; and signal generating means arranged to produce, in response to movement of said blocking member, a signal indicative of the position of said drawer.

Preferably, the latching member includes a cam portion engageable by said catch member and is movable from its non-latching to its latching position by camming action.

In order that the invention be better understood, an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a side view of a latching mechanism in accordance with the present invention showing the mechanism in a latched position.

Figure 2 is similar to Fig. 1 showing the latching mechanism in an unlatched position.

Figure 3 is a view taken on line 3—3 of Fig. 1 showing a front view of the latching mechanism.

Referring to Figs. 1 and 2, there is shown a side view of a latching mechanism in accordance with the present invention which includes a support bracket 20 having a flange portion 22 secured to a support member 24, which support member may be a portion of a terminal device, by any suitable fastening means, such as screws 26. As shown more clearly in Fig. 3, the bracket 20 has an L-shaped upper portion 28 to which is mounted, by means of screws 31,

a solenoid 30 whose armature 32 extends downwardly into a cut-out portion 34 (Figs. 1 and 2) located in the bracket 20. While the present embodiment incorporates the use of a separate bracket 20 as a support member, it is obvious that a portion of the terminal device housing itself may be utilized for the same purpose.

Secured to the lower end of the armature 32 is one end of a stud 36 (Fig. 3), the other end of which is rotatably connected to an elongated blocking member 38 located adjacent the bracket 20 and having mounted thereon a hub member 40 which is rotatably mounted on a stud 42 secured to the bracket 20. It will be seen from this construction that operation of the solenoid 30 results in the armature 32 rotating the blocking member 38 between a first, blocking position shown in Fig. 1 and a second, non-blocking position shown in Fig. 2.

Positioned adjacent the front end of the blocking member 38 (left end as viewed in Figs. 1 and 2) is latch member 44 having a hook portion 46 comprising the front edge of the latch member 44 and including a lower receding cam portion 48 positioned below the hook portion 46. A hub member 50 secured to the latch member 44 is rotatably mounted on a stud 52 secured to the bracket 20. Positioned on the stud 52 is a torsion spring 54 having one end engaging the front edge of the bracket 20 while its other end engages the rear edge of the latching member 44 to thereby normally bias the latching member 44 in a non-latching position, which movement is limited by a stud 56 mounted on the bracket 20 and which is positioned in the path of the clockwise movement of the hook portion 46 of the latch member 44. The latching member 44 also includes an upstanding stop edge 58, which, as will be described more fully hereinafter, coacts with the front or left edge 60 of the blocking member 38 allowing the blocking member to hold the latch member 44 in a latching position.

As best understood from Figs. 1 and 2, the bracket 20 is positioned in the path of movement of the cash drawer 62 of the data terminal device. Secured to the rear edge 64 of the cash drawer 62 is a rearwardly extending spring member 66 and an L-shaped catch member 68, the latter secured to the rear edge 64 by means of screws 70. The catch member 68 is orientated on the cash drawer so as to engage the cam portion 48 of the latch member 44 upon the movement of the cash drawer 62 towards a closed position.

As shown in Fig. 1, secured to a front portion 71 of the bracket 20 by means of any suitable fastening means, such as screws 72, is a switch member 74 having a rearwardly extending snap action switch actuator member 76 whose free end engages the top edge of the blocking member 38. The actuator member 76 is mounted on the switch member 74 such that rotation of the actuator member 76 in a counter-clockwise direction will activate the switch member 74 while movement thereof in a clockwise direction will deactivate the switch member 74. In the present embodiment, the switch member 74 is activated during the time the cash drawer is not in a latched position and is deactivated upon the latching of the cash drawer in a closed position. It is obvious that the signals generated by the opening and closing of the switch member 74 can be utilized in any manner to indicate the position of the catch drawer within the terminal device.

In operation, the latch member 44 is normally in a latched position as shown in Fig. 1. In this position, the hook portion 46 of the latch member 44 engages the catch member 68 and thereby holds the cash drawer 62 in a closed position. The latch member 44 is maintained in this latched position by the blocking member 38 whose left edge portion 60 is positioned behind the stop edge 58 of the latch member 44, with the latch member 44 being urged in a clockwise direction against the stop edge 58 by the action of the torsion spring 54.

During a sales transaction in which the cash drawer 62 is required to be opened, the solenoid 30 is energized as a result of a functional operation performed by the terminal device. Energizing of the solenoid 30 results in the moving of the armature 32 in an upward direction, thereby rotating the blocking member 38 to a non-blocking position to release the latch member 44 to the action of the torsion spring 54. The torsion spring 54 will rotate the latch member 44 to a non-latching position shown in Fig. 2 where the latch member engages the stud 56. In this position, the catch member 68 is released allowing the cash drawer 62 to be moved to an open position by the action of the spring 66. The rotation of the blocking member 38 to its non-blocking position also results in a counter-clockwise rocking of the actuator member 76, thus closing of the switch member 74 and thereby providing a signal indicating the unlatching of the cash drawer 62. The solenoid 30 is then de-energized resulting in the moving of the armature 32 in a downward direction due to the weight of the armature 32 and the blocking member 38, thereby positioning the left edge portion 60 of the blocking member 38 against the top edge of the latch member 44, as shown in dotted lines in Fig. 2. While the movement of the blocking member 38 to its blocking position has been described as occurring due to the weight of the armature 32 and the blocking member 38, it is obvious that the same movement

can be accomplished by connecting a return spring member between the blocking member 38 and the bracket 20 in a manner so as to normally urge the blocking member to its blocking position.

At the completion of the change dispensing or other type of terminal operation requiring the cash drawer 62 to be opened, the cash drawer is manually moved inwardly (to the right in Fig. 2) towards a closed position by the operator. As the drawer 62 approaches the latching mechanism, the spring 66 will engage a flange portion 78 of the support member 24. The drawer catch 68 will then engage the cam portion 48 of the latch member 44 rotating the latch member in its latching position against the action of the torsion spring 54, in which the hook portion 46 of the latch member 44 is behind the catch member 68 (Fig. 1) and the left edge 60 of the blocking member 38 is allowed to drop down behind the stop edge 58 of the latch member 44.

Upon release of the cash drawer 62 by the operator after the catch 68 thereof has so rotated the latching member 44, the torsion spring 54 will return the latch member 44 clockwise to the position shown in Fig. 1 where the latch member 44 is held by the blocking member 38. The spring 66 will also urge the cash drawer 62 outwardly until the catch 68 engages the hook portion 46 as shown in Fig. 1, thereby latching the cash drawer 62 in its closed position. The spring 66 will thus bias the drawer 62 to be held in the latched position. The movement of the blocking member 38 to its blocking position upon the rotation of the latch member 44 by the catch member 68 allows the switch actuator arm 76 to rotate clockwise, thus deactivating the switch 74 and thereby signalling the data terminal device that the cash drawer 62 is in a latched position.

It will be seen from this construction that once the latch member 44 has been rotated in a counter-clockwise direction sufficiently to allow the blocking arm 38 to move into a blocking position with the stop edge 58 of the latch member 44, the hook portion 46 of the latch member 44 has been moved to a latching position with respect to the drawer catch 68. Since this latching movement is solely the result of the location of the hook portion 46, the cam portion 48 and the stop edge 58 of the latch member, it is obvious that no adjustments are required in order that the latching mechanism function for its intended purpose. It is further obvious that since the latching mechanism comprises essentially the latch member 44 and the blocking member 38 together with the torsion spring 54, the cost of such a mechanism is relatively low with very little wear occurring and thereby insuring a long operating life of the latching mechanism.

WHAT WE CLAIM IS:—

1. In a cash register, data terminal device, or similar enclosure structure including a slidably mounted drawer having a catch member secured to the rear thereof, a latching mechanism, including a latching member movable between a first, non-latching, position and a second, latching, position and arranged in the path of said catch member to move from its non-latching to its latching position upon engagement thereof by said catch member during movement of said drawer to a closed position; a blocking member movable between a first, non-blocking, position and a second, blocking, position and arranged to move, in response to movement of said latching member from its non-latching to its latching position, from its non-blocking to its blocking position in which it holds said latching member in its latching position; and signal generating means arranged to produce, in response to movement of said blocking member, a signal indicative of the position of said drawer.

2. A mechanism according to Claim 1, wherein said latching member includes a cam portion engageable by said catch member and is movable from its non-latching to its latching position by camming action.

3. A mechanism according to Claim 1 or 2, wherein said latching member is pivotally mounted for rotation by said catch member.

4. A mechanism according to Claim 3, wherein said lasting member includes a hook portion moved to a latching position with said catch member upon rotation of said latching member.

5. A mechanism according to any one of Claims 1 to 4, further including selectively operable actuating means for moving said blocking member from its blocking position to its non-blocking position, and biasing means for normally urging said latching member to its non-latching position, whereby said latching member is moved to its non-latching position upon the movement of said blocking member to its non-blocking position.

6. A mechanism according to Claim 5, wherein said biasing means is a spring.

7. A mechanism according to any one of Claims 1 to 6, wherein said blocking member is moved to its blocking position by the action of gravity.

8. A mechanism according to any one of Claims 1 to 6, wherein said blocking member is moved to its blocking position by the action of a return spring.

9. A mechanism according to any one of the preceding Claims, wherein said signal generating means includes a switch activated

by an actuating member operable in response to movement of said blocking member.

10. A latching mechanism substantially as hereinbefore described with reference to Figs. 1 to 3 of the accompanying drawings.

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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

FIG. 1

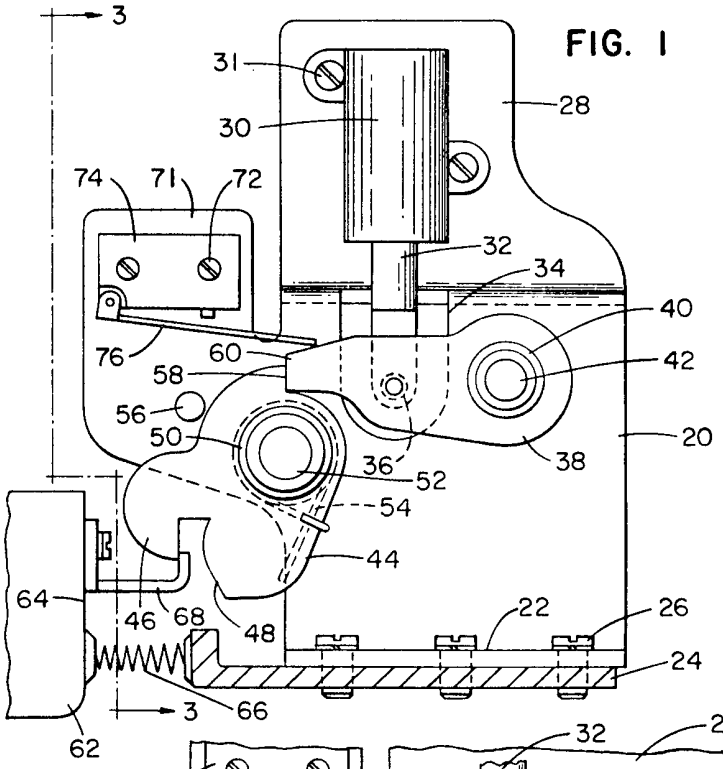

FIG. 2

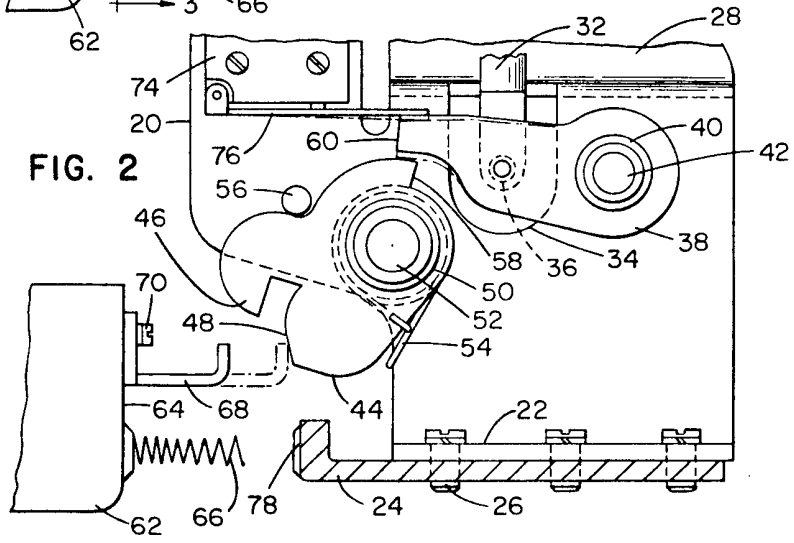

FIG. 3