

[54] **DRAWER POSITION SENSING LATCH OPERATED SWITCH ASSEMBLY**

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[51] **Int. Cl.**..... **H01h 3/16**

[58] **Field of Search**..... **200/61.61-61.83, 318-328; 235/10, 22; 340/274**

[56] **References Cited**

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[57] **ABSTRACT**

A drawer position sensing latch mechanism for generating an electrical pulse upon the latching of a cash drawer of a data terminal device. The mechanism includes a rotatable latch member and a switch actuating member slidably mounted on the latch member for conditioning the latching of the drawer upon movement of the drawer towards a closed position, means for urging the drawer to an open position which movement latches the drawer and closes a switch which generates an electrical pulse and includes a solenoid for rotating both the latch member and the switch actuating member to release the drawer for movement to an open position by the urging means.

12 Claims, 3 Drawing Figures

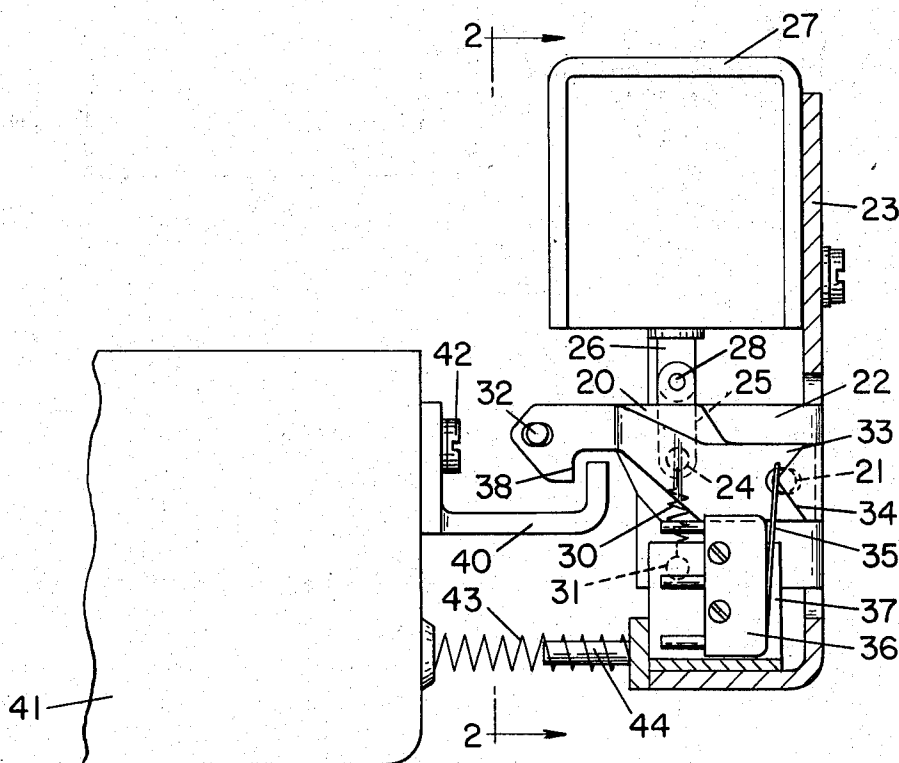


FIG. 1

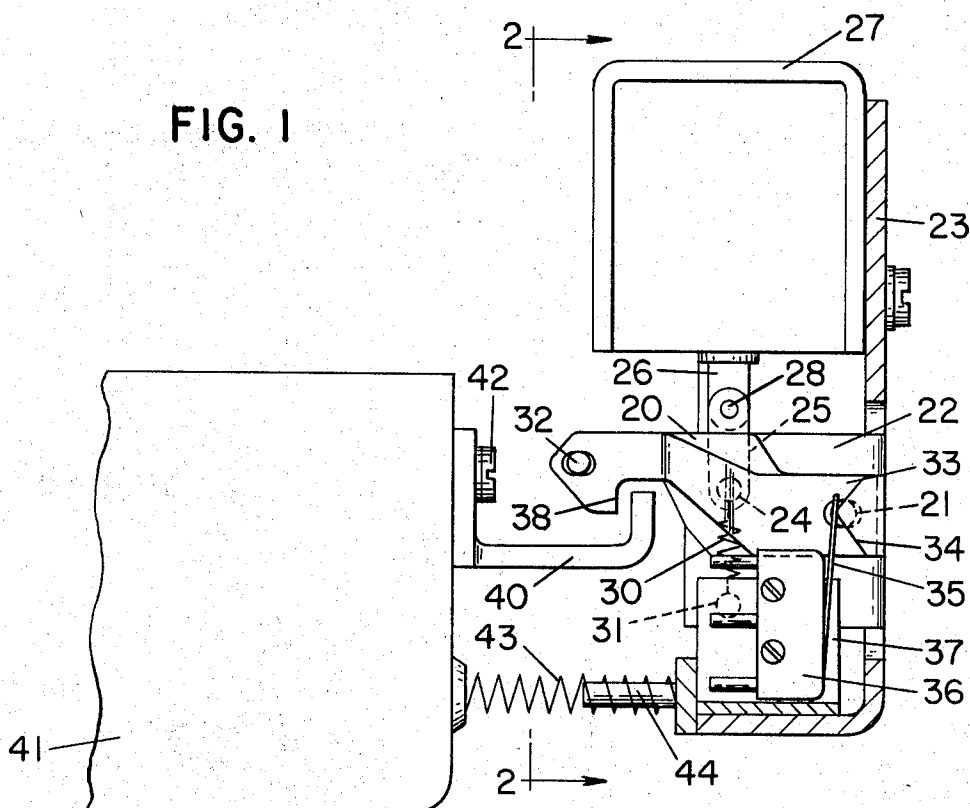


FIG. 2

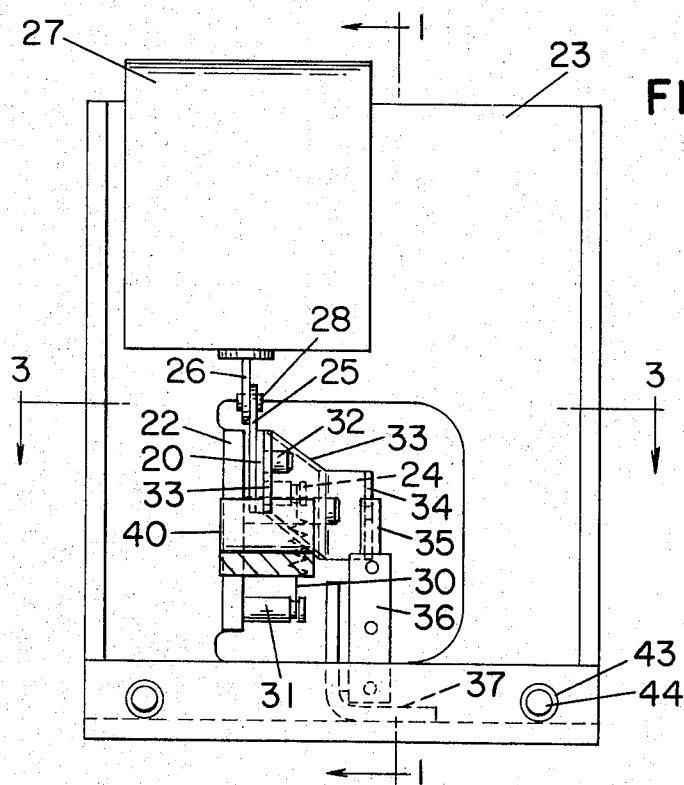
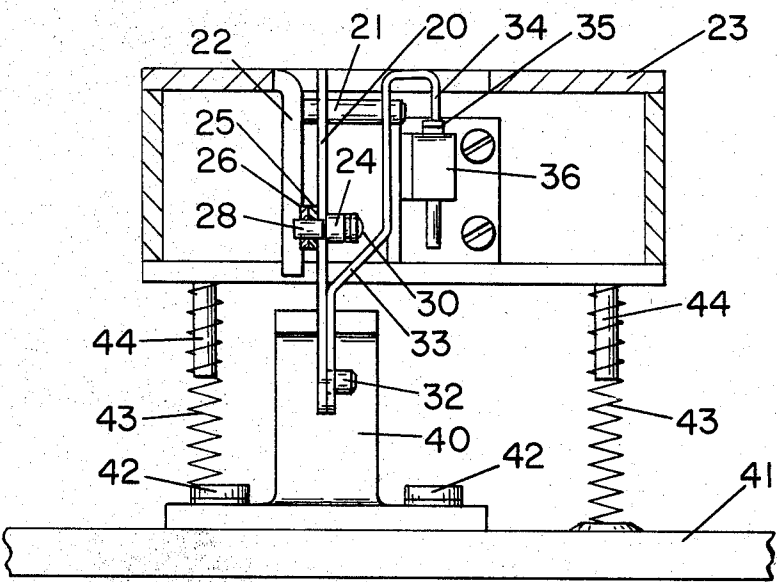


FIG. 3



DRAWER POSITION SENSING LATCH OPERATED SWITCH ASSEMBLY

BACKGROUND OF THE INVENTION

In modern data terminal or electronic cash register devices which are used in a checkout operation, the opening of the cash drawer prior to the disbursement of change is controlled by the operation of certain control keys on the keyboard of the terminal device. After a change operation, the cash drawer is required to be closed before the operation of the terminal device can continue. In meeting this requirement, prior cash drawer constructions have used a switch which is actuated as the drawer is moved into a latched position. It has been found, however, that the drawer may not be latched securely at the time of the switch operation and can subsequently be opened with the terminal indicating that the cash drawer is in a latched position. It is therefore a principal object of this invention to provide a latch mechanism which operates a switch only after the cash drawer is in a latched position. It is another object of this invention to provide a latch mechanism which can be released from the keyboard of the terminal device. It is a further object of this invention to provide a latching mechanism which is simple in operation and construction and therefore low in cost.

SUMMARY OF THE INVENTION

In accordance with the teachings of the present invention, there is provided a latch member pivotally mounted adjacent the cash drawer, a switch actuating arm slidably mounted on the latch member, the actuating arm engaging the arm of an associated switch in a non-actuated position, both the latch member and actuating arm having a latching portion for engaging the drawer upon movement of the drawer to a closed position and subsequently latching the drawer upon movement of the drawer to an open position, resilient means engaging the cash drawer and urging the drawer towards an open position, resulting in the drawer being latched by the latch member, and moving the actuating arm to trip the switch, and a solenoid engaging the latch member to rotate the latch member and the actuating arm to a position releasing the drawer to the action of the resilient means.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the latch mechanism taken on line 1—1 of FIG. 2 showing the drawer in a position prior to its movement to a latched position.

FIG. 2 is a front sectional view of the latch mechanism taken on line 2—2 of FIG. 1.

FIG. 3 is a top sectional view of the latch mechanism taken on lines 3—3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, there is shown a side view of the latch mechanism of the present embodiment and which includes the rear portion of the cash drawer. Included in the latch mechanism is an elongated latch member 20 rotatably mounted on a stud 21 secured to a bent-over portion 22 of a bracket 23. Secured to the latch member 20 is a stud 24 which extends through both sides of the latch member 20 (FIG. 3). Rotatably secured to one end of the stud 24 is a link member 25

which in turn is rotatably secured to the armature 26 of a solenoid 27 by means of a stud 28. The solenoid 27 is mounted to the bracket 23.

Secured to the other end of the stud 24 is one end of a return spring 30, the other end of which is secured to a stud 31 mounted on the bent-over portion 22 of bracket 23. With this construction, the latch member 20 is capable of rotating in a clockwise direction as viewed in FIG. 1, about the stud 21 either by operation of the solenoid 27 or being moved by means, to be described hereinafter, attached to the end of the drawer. In either case, the clockwise movement of the latch member 20 is against the action of the spring 30 which allows the spring to return the latch member to its home position upon release of the latch member.

Slidably mounted on a stud 32 secured to the latch member 20 and the stud 21 is a switch actuating member 33, the rear end of which is U-shaped to form an actuating portion 34. This actuating portion 34 is engaged by the switch arm 35 of a snap action switch 36 secured to a bracket 37 mounted on bracket 23. The switch arm 35 when in a switch-open position normally positions the switch actuating member 33 in a rearward position with respect to the latch member 20. In the present embodiment, the switch arm 35 is biased in a rearward direction thereby sliding the switch actuating member 33 in a rearward direction. While other arrangements can be used, the only requirement of the construction is that the switch actuating member 33 be positioned with respect to the latch member 20 to allow for a movement in forward direction, which movement will move the switch arm 35 in a switch closing direction.

Both the latch member 20 and the spring actuating member 33 have a recessed portion 38 which functions to latch an L-shaped tab member 40 secured to the rear of the cash drawer 41 by means of screws 42. Also secured to the rear of the cash drawer are a pair of spring members 43, the other end of which are positioned over an associated stud 44 secured to the bracket 23.

In operation, the switch actuating member 33 is positioned in a rear position by the switch arm 35 when in a switch-open position. As the drawer 41 is moved toward a closed position, the L-shaped end of the tab member 40 will engage and cam both the latch member 20 and the switch actuating member 33 clockwise against the action of the spring 30. Further movement of the tab member 40 will allow the spring 30 to return the latch member 20 and the actuating member 33 to their home positions which positions the tab member 40 in the recessed portions 38 of the latch member 20 and switch actuating member 33. This movement of the drawer will compress the springs 43. Once the inward movement of the drawer stops, the springs 43 will move the drawer and the tab member 40 forward toward an open position. During this forward movement, the tab member 40 will engage the recessed portion 38 of the switch actuating member 33 moving the actuating member 33 a distance sufficient to rotate the switch arm 35 counterclockwise thereby closing the switch 36. This movement of the tab member will continue until it engages the recessed portion 38 of the latch member 20, thereby latching the drawer in a closed position.

Closing of the switch 36 will generate a signal to the terminal device that the cash drawer is latched and closed. To release the cash drawer to the action of the

spring 43, thereby opening the drawer, the solenoid 27 is momentarily energized during operation of the terminal device or through depression of an appropriate key on the terminal device resulting in the armature 26 moving in an upward direction. This movement will rock both the latch member 20 and the switch actuating member 33 clockwise, thereby releasing the tab member 40 allowing the drawer to move to an open position under the action of the springs 43. The solenoid will then be deenergized allowing the spring 30 to return the latch member 20 and the switch actuating member 33 to their home position.

It will be seen from this construction that the switch 36 is actuated only after the drawer is positioned so that it cannot fail to be latched in a closed position. The drawer is held in a latched position by the action of the spring 30 on the latch member 20 and the switch actuating member 33 thus requiring no electrical power to hold the cash drawer in a closed position. While the switch 36 is shown mounted perpendicular to the line of movement of the drawer, it is obvious that its position can be altered to accommodate the structural environment in which it is used. Numerous variations or modifications of the disclosed latching mechanism will be evident to those skilled in the art. Therefore, it is intended that the foregoing description of the invention and the illustrative embodiment be considered in the broadest aspects and not in a limiting sense.

What is claimed is:

1. In combination with an enclosure structure including a slidably mounted drawer having an engaging member secured thereto, a latch apparatus for generating a signal upon latching of the drawer in a closed position within the enclosure structure comprising:

a. latching means movably secured to said enclosure structure and positioned in the plane of movement of the drawer engaging member, said latching means being moved to an operating position, by the engaging member upon movement of the drawer in a drawer closing direction, conditioning the engaging member to be latched by said latching means when the engaging member is moved in a drawer open direction;

b. signal generating means mounted on said enclosure structure for generating a signal when operated, said signal generating means includes an actuating member for operating said signal generating means when actuated;

c. actuating means operably associated with said latching means and engageable with said actuating member, said actuating means includes a latching portion for engaging the engaging member upon movement of the drawer in a drawer closing direction, said actuating means actuating said actuating member when moved by said engaging member in a drawer open direction;

d. and means engaging the drawer for normally urging the drawer in a drawer open direction, said urging means moving the drawer in a drawer open direction upon engaging of said engaging member by said actuating means whereby the engaging member is latched by said latching means and the signal generating means is operated by said actuating member.

2. The latch apparatus of claim 1 in which said latching means comprises a first latch member pivotally mounted to said enclosure structure, said latch member

having a recessed portion, one end of which constitutes a blocking portion, and spring means for positioning the first latch member in the path of movement of the engaging member whereby movement of the drawer in a drawer close direction will position the engaging member within the recessed portion of said first latch member.

3. The latch apparatus of claim 2 in which the actuating means comprises a second latch member slidably mounted on said first latch member, said second latch member includes a recessed portion for engaging the engaging member upon movement of the engaging member in a drawer open direction, and said urging means comprises a spring member for normally urging the drawer in a drawer open direction whereby the engaging member will move into engagement with the blocking portion of said first latch member and move said second latch member in a drawer open direction thereby actuating said actuating member.

4. The latch apparatus of claim 3 in which said signal generating means comprises a switch member and said actuating member comprises a switch arm normally biased in a drawer close direction.

5. The latch apparatus of claim 4 which includes selectively operable actuating means for rocking, when operated, said first latch member in a direction disengaging said engaging member from a latched position whereby said spring member will move the drawer in a drawer open direction.

6. In a data terminal device having a drawer slidably mounted for movement between an open and closed position, a mechanism for generating a signal indicating the closed position of the drawer comprising:

a. engaging means secured to the rear of the drawer;

b. a first movable latch member mounted in the path of movement of said engaging means, said latch member being moved by said engaging means, upon movement of the drawer in a drawer closing direction, to a first position conditioning the latch member for latching the engaging means;

c. a second movable latch member being moved by said engaging means to a first position conditioning said second latch member to latch the engaging means;

d. switching means for generating a signal when actuated;

e. switch actuating means engaging said switching means and said second latch member for actuating said switching means when operated, said switch actuating means being operated upon movement of said second latch member in a drawer open direction;

f. and urging means engaging said drawer member for normally urging said drawer member and said engaging means in a drawer open direction whereby upon movement of said first and second latch members to said first position, said urging means will move said engaging means to a latch position with said first latch member, said engaging means moving said second latch member to operate said switch actuating means.

7. In a housing which slidably supports a drawer between an open and closed position wherein the drawer has an engaging portion, a switch actuating latch mechanism for latching the drawer in the closed position comprising:

- a. a first latching member movably secured to the housing adjacent the engaging portion of the drawer, said first latching member being engaged and moved to a first position by the engaging portion of the drawer upon movement of the drawer in a drawer close direction, said first position conditioning the first latching member for latching the engaging portion upon movement of the drawer in a drawer open direction;
 - b. a second latching member movably mounted on said first latching member, said second latching member being moved to the first position by the first latching member upon movement of the drawer in a drawer close direction, said first position conditioning the second latching member for movement by the engaging portion in a drawer open direction upon movement of the drawer in a drawer open direction;
 - c. switch means for generating a signal when operated;
 - d. a switch operating member engaging said switch means for operating said switch means when moved in a drawer open direction, said switch operating member engaging said second latching member;
 - e. and resilient means engaging the drawer for normally urging the drawer in a drawer open direction, whereby upon the movement of said first and second latching member to said first position, said resilient means will move the drawer in a drawer open direction allowing said engaging portion to move into a latched position with said first latching member and said switch operating member through said second latching member to operate said switch means.
8. A method for generating a signal indicating the latched position of a register drawer comprising the steps of:
- a. moving the drawer in a first direction into engagement with a latch mechanism conditioning the latching mechanism for operation;
 - b. moving the drawer in the opposite direction to a latching engagement with the latching mechanism;
 - c. and actuating a switch during the opposite direction movement of the drawer to generate a signal indicating the latched position of the drawer.
9. In combination with a housing including a slidably mounted drawer having an L-shaped anchor member secured to the rear thereof, a switch actuating latch apparatus for generating a signal upon the position of the drawer in a closed position comprising:
- a. a latch member pivotally mounted to the housing, said latch member having a first latching portion;
 - b. a first resilient member engaging said latch member for normally urging said latch member to a position in the path of movement of the L-shaped anchor member, whereby said latch member will be moved, by said anchor member upon movement of the drawer in a drawer closing direction, to a first position conditioning said anchor member to be latched by said latch member upon movement of the drawer in a drawer open direction;
 - c. a switch actuating member slidably mounted on said latch member and having a second latching portion for latching the anchor member upon

- movement of the latch member to said first position;
 - d. a switch member positioned adjacent said switch actuating member, said switch member generating a signal when operated;
 - e. a movable switch actuating arm engaging said switch member for operating said switch member when moved in a drawer open direction, said actuating arm being normally biased in a drawer close direction and engaging said switch actuating member for biasing said actuating member in a drawer close direction to latch the anchor member when in said first position;
 - f. and a second resilient member engaging the drawer for urging the drawer in a drawer open direction whereby upon movement of the latch member and the switch actuating member to said first position, said second resilient member will move the drawer in a drawer open direction thereby latching said anchor member and operating said switch member.
10. The latch apparatus of claim 9 which includes a selectively operable actuating means engaging said latch member for pivoting said latch member, when operated, in a direction to release the anchor member from said latch member whereby said second resilient member will move the drawer to an open position.
11. A latch apparatus for actuating a switch upon latching a drawer in a closed position within an enclosure, the drawer having an anchor member on its rear portion comprising:
- a. a first latch member pivotally mounted on the enclosure;
 - b. a first spring member engaging said latch member for normally positioning the latch member in the path of movement of the anchor member whereby upon movement of the drawer in a closed direction, the anchor member will engage and pivot the latch member to a first position conditioning the latch member to latch the anchor member upon movement of the drawer in an open direction;
 - c. a second latch member slidably mounted on said first latch member for latching the anchor member when moved to said first position by said first latch member, said second latch member having an actuating portion;
 - d. a switch member positioned adjacent the second latch member;
 - e. a switch operating member engaging said switch member for operating said switch member when moved in a drawer open direction, said operating member being normally biased in a drawer closing direction and engaging the actuating portion of said second latch member thereby slidably moving the second latch member in a drawer closing direction to latch the anchor member when in said first position;
 - f. and a second spring member engaging the enclosure and the drawer for normally urging the drawer in an open direction whereby upon movement of said first and second latch member to said first position, said second spring member will move the drawer in a drawer open direction thereby latching the anchor member and operating said switch member.
12. The latch apparatus of claim 11 which includes a link member engaging said first latch member and a solenoid operated drive member engaging said link member for moving said link member and said first latch member, upon operation of the solenoid, in a direction releasing the anchor member from a latched position whereby said second spring member will move the drawer to an open position.