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(71) Applicant: **Cash Bases Limited**
New Haven, East Sussex BN9 0LA (GB)

(72) Inventors:
- **Ross, John**
  Seaford, East Sussex BN25 2QD (GB)
- **Marshall, Richard**
  Peacehaven, East Sussex BN10 8JB (GB)

(74) Representative: **Leckey, David Herbert**
Frank B. Dehn & Co.,
European Patent Attorneys,
179 Queen Victoria Street
London EC4V 4EL (GB)

(54) Cash drawers

(57) A cash drawer comprising a tray (4), a drawer (6) mounted for movement within the tray (4) and drawer release mechanism (10). The release mechanism (10) comprises a catch member (12) mounted on a catch support (16). The catch member (12) can move from a first position in which it retains the drawer (6) closed to a second position in which it will release the drawer (6). A catch retainer (20) retains the catch member (12) in its first position. The catch member (12) is arranged at an angle to the base of the cash drawer tray (4) and is mounted to a support arranged at an angle to the base of the cash drawer tray (4).

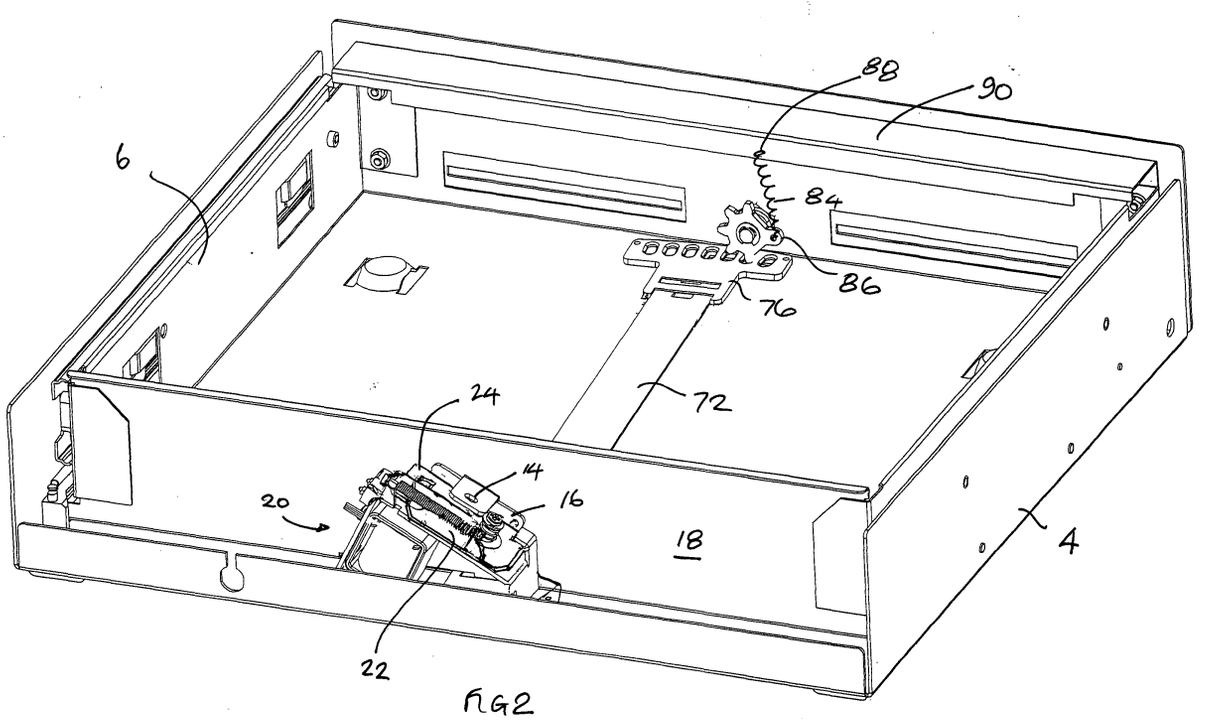

FIG2

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Description

[0001] The present invention relates to cash drawers and more particularly to release mechanisms for cash drawers.

[0002] A known form of cash drawer release mechanism comprises a solenoid which is operated in response to a drawer opening signal received from a cash register or the like to release a catch which holds the drawer closed. The drawer may then open under the force of an opening spring.

[0003] It has been found that certain such mechanisms may be susceptible to accidental opening when the cash drawer is struck. The present invention seeks, from a first aspect to alleviate this problem.

[0004] From a first aspect, therefore, the present invention provides a cash drawer comprising:

a tray;
a drawer mounted for movement within the tray; and
a drawer release mechanism: said release mechanism comprising:

a catch member, said catch member being mounted on a catch support for movement from a first position in which it retains the drawer closed and a second position in which it releases the drawer;
a catch retainer which retains the catch member in its first position; and
means for disengaging said catch member from said catch retainer to open the drawer;

wherein said catch member is arranged at an angle to the base of the cash drawer tray or is mounted to a support arranged at an angle to the base of the cash drawer tray.

[0005] It has been found that by angling the catch member in this manner, forces which may be transmitted to the catch member so as to cause it to disengage from the catch retainer are reduced or removed, thereby improving the security of the cash drawer.

[0006] Preferably the catch member is arranged at an angle of up to 45°, and more preferably about 30°, to the base of the cash drawer tray.

[0007] Preferably the catch member is pivotally mounted on its support for movement between its first and second positions.

[0008] Preferably the catch member and catch support are respective plates, the catch member being mounted on a face of the catch support.

[0009] Preferably the catch support is provided with mounting brackets for mounting it at the appropriate angle to the base of the cash tray.

[0010] Preferably the catch retainer comprises a tongue of material released from the catch support plate whereby an edge of the catch engages behind the tongue to retain the catch in its closed position.

[0011] Preferably the catch disengaging means comprises a solenoid which upon actuation in response to a suitable electric signal, pushes directly or indirectly on the catch member to push it out of engagement with the catch retainer.

[0012] In the preferred embodiment, the solenoid is mounted under and preferably projects through the catch support so as to engage the underside of the catch member whereby upon operation of the solenoid the catch member is pushed upwardly out of engagement with the catch retainer.

[0013] Preferably, to accommodate this vertical movement, the mounting of the catch member on its support comprises a slidable fixing. Most preferably, therefore, the catch member is mounted pivotally around a shaft along which it can also translate. Preferably the catch member is biased along the shaft towards its position of engagement by spring means.

[0014] As mentioned above, the catch disengagement means preferably comprises a solenoid which is operable in response to an appropriate electrical signal. Preferably, however, means are provided to open the cash drawer manually as well. In the preferred embodiment, therefore, a manual release member extends for engagement with the solenoid to push the catch member in the appropriate direction.

[0015] Preferably the manual release member engages the lower end of the movable solenoid part such that it pushes upwardly on the member to release the mechanism. This has the advantage that gravity will assist in returning the solenoid to its start position.

[0016] This is a novel arrangement in its own right, so from a further aspect, the invention provides a cash drawer mechanism comprising a drawer opening solenoid having a moveable part which is operable to open the cash drawer in response to an opening signal, said cash drawer mechanism further comprising a manual release mechanism, said manual release mechanism operating upon a lower end of the moveable solenoid part so as to move the solenoid member in an opening direction.

[0017] Preferably the manual release mechanism comprises an elongate member mounted to the cash drawer for manipulation by a user. Most preferably, the manual release member comprises an elongate strip having one end which cooperates with the solenoid.

[0018] Preferably, the manual release member is mounted adjacent the base of the cash drawer and preferably it extends through the rear of the cash drawer for engagement with the solenoid.

[0019] Preferably the manual release member is pivotable to effect the opening movement. Accordingly, the release member is preferably pivotally mounted in the cash drawer.

[0020] Preferably, the manual release member is rotated by a rack and pinion mechanism. Preferably, therefore, one end of the release member is provided with a rack into which engages a pinion coupled to a

rotary release mechanism accessible by a user, for example a key unit. This mechanism has the advantage that it does not impose out of plane forces on the release member and is advantageous in its own right, so from a further aspect, therefore, the invention provides a manual release mechanism for a cash drawer comprising a pivotally mounted release member extending from the front of the cash drawer to a drawer release mechanism at the rear of the drawer, and a rack and pinion mechanism for pivoting the release member in response to a drawer opening action by a user.

[0021] Preferably the mechanism is biased towards a closed position by a biasing spring. Preferably the biasing spring acts on the pinion mechanism, and most preferably extends between the pinion mechanism and a front wall of the drawer.

[0022] A preferred embodiment of the invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 shows a cash drawer embodying the present invention in an open condition;
Figure 2 shows a the cash drawer of Figure 1 in a locked position;
Figure 3 shows, in detail, the drawer release mechanism shown in Figures 1 and 2;
Figure 4 shows the manual release mechanism of the drawer mechanism of Figure 1 in a drawer locked position; and
Figure 5 shows the manual release mechanism of Figure 4 in a drawer open position.

[0023] With reference to Figures 1 and 2, a cash drawer unit 2 comprises a tray 4 and a drawer 6. The drawer 6 is slidable within the tray 4 along guides 8 provided on the sides of the tray. The tray is biased to the open condition shown in Figure 1 by spring means not shown.

[0024] The drawer 6 is held in a closed position within the tray 4 by a mechanism 10. The mechanism 10 comprises a catch pin 12 mounted in arcuate slots 14 in a pin retaining bracket 16 mounted to the rear face 18 of the drawer 6. The other part of the mechanism is a drawer release mechanism 20 which receives the pin 12 when the drawer is in the closed condition and which can release it to allow the drawer to open under its spring loading. The arcuate slots 14 allow the pin 12 some degree of movement, to accommodate misalignment of the pin 12 with the release mechanism 20.

[0025] The detail of the release mechanism is shown in Figure 3.

[0026] The mechanism comprises a catch 22 which is pivotally mounted to a catch support plate 24 about a spindle 26 mounted to the catch support plate 24. The catch support plate 24 has respective legs 28, 30 which have mounting feet 32, 34 at their lower ends. The feet 32, 34 have holes 36, 38 for receiving suitable fasteners for fastening the catch support plate 24 to the base of the tray 4 such that it, and thus the catch 22, does not lie parallel to the base of the tray 4. In this particular embodiment it is arranged at an angle of about 30°.

[0027] One leg 28 mounts a drawer status microswitch 40 which is closed when the catch plate 22 is in its closed position indicating that the drawer is closed. The other leg 30 mounts a power disconnect microswitch 42 whose operation will be discussed further below.

[0028] The catch 22 is biased to its open position by a spring 44 which engages a mounting post 46 provided on the catch support plate 24 and a lug 48 provided on the catch 22.

[0029] The catch 22 is provided with a hook portion 50 which overlies a slot 52 provided in the catch support plate 24. The catch support plate 24 has a raised tongue 54 behind which the catch 22 engages.

[0030] The catch 22 is mounted for both pivotal and axial movement with respect to the spindle 26. In its normal operative condition it is biased downwardly into contact with the catch support plate 24 by a spring 56 and washer 58.

[0031] A solenoid unit 60 is mounted to one leg 28 of the catch support plate 24 and has a moveable member 62 (Figure 4) whose upper end extends through an aperture 64 in the catch support plate 24 for engagement with the underside of the catch 22.

[0032] In the drawer position shown in Figure 2, the drawer mounted pin 12 engages with the hook 50 so as to retain the drawer closed. In this condition the pin 12 extends both through the hook 50 and the underlying slot 52 of the catch support plate 24.

When a suitable signal is sent to the solenoid from the cash station, the moveable member 62 moves upwardly to impact on the underside of the catch 22. This pushes the catch 22 upwardly against the force of the spring 56 and out of engagement with the catch retaining tongue 54, so causing the catch 22 to rotate in a clockwise direction in the sense of Figure 3 such that the hook 50 releases the drawer pin 12 to allow the drawer 6 to open. The catch 22 is stopped by a lug 66 provided on the catch support plate 24.

[0033] When the drawer is closed once more, the drawer pin 12 can engage with the edge of the catch 22 so as to pivot it anti-clockwise against the force of the spring 44. Due to the sprung mounting of the catch 22 which allows axial movement of the catch 22 relative to the mounting pin 26, and the inclined face of the catch retaining member 54, the catch 22 will be able to ride up over the catch retaining member 54 until it clears that member 54 and is then forced back down behind it by the spring 56. In that position the hook 50 will have closed once more around the pin 12 to retain the drawer closed, as shown in Figures 2 and 3.

[0034] The drawer described above also has a manual release mechanism 70. This mechanism 70 comprises an elongate release member 72 which is mounted along the base 74 of the drawer 6. It extends out through the rear face 18 of the drawer 6.

[0035] The rear end of the member 72 is provided with an opening fitting 76 for engagement with the movable solenoid member 62 as will be described further below. The forward end of the member 72 is provided with a rack member 78. Both these members may be an integral part of the opening member 72 or separately fabricated or moulded parts suitably affixed thereto.

[0036] The rack member 78 engages with pinion teeth 80 provided on a lock barrel 82 which can be engaged by a key to open the drawer.

[0037] The release member 72 is pivotally mounted about a pivot (not shown) provided on the base 64 of the drawer 6. The release member 72 is biased towards a central, drawer closed, position (intermediate the positions shown in Figures 4 and 5) by a coil spring 84 which extends between a lug 86 on the lock barrel 82 and a mounting hole 88 provided in a flange 90 of the drawer front.

[0038] The opening fitting 76 comprises a cam surface 92 which, when the release member is pivoted towards its opening position, shown in Figure 5, by turning a key inserted into the lock barrel 82, engages the lower end of the moveable solenoid member 62 so as to push it upwardly to disengage the catch member 22 from the catch retaining member 54 thereby allowing the drawer 6 to open.

[0039] The lock barrel 72 may also be turned in an opposite direction from the central, drawer closed, position to a drawer locked position shown in Figure 4. In this position the lock locks the drawer and the opening fitting 76 engages power disconnect microswitch 42 which disables the electrical supply to the solenoid 60, thereby preventing electronic opening of the drawer 4. (In the Figure, the catch 22 is shown disengaged, but it will in fact be engaged in this position.)

Claims

1. A cash drawer comprising:

a tray;
a drawer mounted for movement within the tray; and
a drawer release mechanism: said release mechanism comprising:

a catch member, said catch member being mounted on a catch support for movement from a first position in which it retains the drawer closed and a second position in which it releases the drawer;
a catch retainer which retains the catch member in its first position; and
means for disengaging said catch member from said catch retainer to open the drawer;

wherein said catch member is arranged at an angle to the base of the cash drawer tray, or is mounted to a support arranged at an angle to the base of the cash drawer tray.

2. A cash drawer as claimed in claim 1 wherein the angle is up to 45°, and more preferably about 30°, to the base of the cash drawer tray.

3. A cash drawer as claimed in claim 1 or 2 wherein the catch member is pivotally mounted on its support for movement between its first and second positions.

4. A cash drawer as claimed in claim any preceding claim wherein the catch member is mounted on a face of a catch support plate.

5. A cash drawer as claimed in claim 4 wherein the catch retainer comprises a tongue of material extending from the catch support plate whereby an edge of the catch engages behind the tongue to retain the catch in its closed position.

6. A cash drawer as claimed in any preceding claim wherein the catch disengaging means comprises a solenoid which upon actuation in response to a suitable electric signal, pushes directly or indirectly on the catch member to push it out of engagement with the catch retainer.

7. A cash drawer as claimed in claim 6 wherein the solenoid is mounted under and preferably projects through the catch support so as to engage the underside of the catch member whereby upon operation of the solenoid the catch member is pushed upwardly out of engagement with the catch retainer.

8. A cash drawer as claimed in claim 7 wherein the catch member is mounted on the catch support by a slidable fixing.

9. A cash drawer as claimed in claim 8 wherein the catch member is mounted pivotally around a shaft along which it can also translate.

10. A cash drawer as claimed in claim 9 wherein the catch member is biased along the shaft towards its position of engagement by spring means.

11. A cash drawer as claimed in any preceding claim further comprising means for opening the drawer manually.

12. A cash drawer as claimed in claim 11 comprising a manual release member extends for engagement with a or the solenoid to push the catch member.

13. A cash drawer as claimed in claim 12 wherein the manual release member engages the lower end of the movable solenoid part such that it pushes upwardly on the member to release the mechanism.

14. A cash drawer mechanism comprising a drawer opening solenoid having a moveable part which is operable to open the cash drawer in response to an opening signal, said cash drawer mechanism further comprising a manual release mechanism, said manual release mechanism operating upon a lower end of the moveable solenoid part so as to move the solenoid member in an opening direction.

15. A cash drawer mechanism as claimed in claim 14 wherein the manual release mechanism comprises an elongate member mounted to the cash drawer for manipulation by a user.

16. A cash drawer mechanism as claimed in claim 15 wherein the manual release member comprises an elongate strip or rod having one end which cooperates with the solenoid.

17. A cash drawer mechanism as claimed in claim 16 wherein the manual release member is mounted adjacent the base of the cash drawer and preferably it extends through the rear of the cash drawer for engagement with the solenoid.

18. A cash drawer mechanism as claimed in claim 15, 16 or 17 wherein the manual release member is pivotally mounted to the cash drawer.

19. A cash drawer mechanism as claimed in any of claims 15 to 18 wherein the manual release member is rotated by a rack and pinion mechanism.

20. A cash drawer mechanism as claimed in claim 19 wherein one end of the release member is provided with a rack into which engages a pinion coupled to a rotary release mechanism accessible by a user.

21. A manual release mechanism for a cash drawer comprising a pivotally mounted release member extending from the front of the cash drawer to a drawer release mechanism at the rear of the drawer, and a rack and pinion mechanism for pivoting the release member in response to a drawer opening action by a user.

22. A mechanism as claimed in claim 20 or 21 wherein the mechanism is biased towards a closed position by a biasing spring.

23. A cash drawer mechanism as claimed in claim 22 wherein the biasing spring acts on the pinion mechanism, and most preferably extends between the pinion mechanism and a front wall of the drawer.

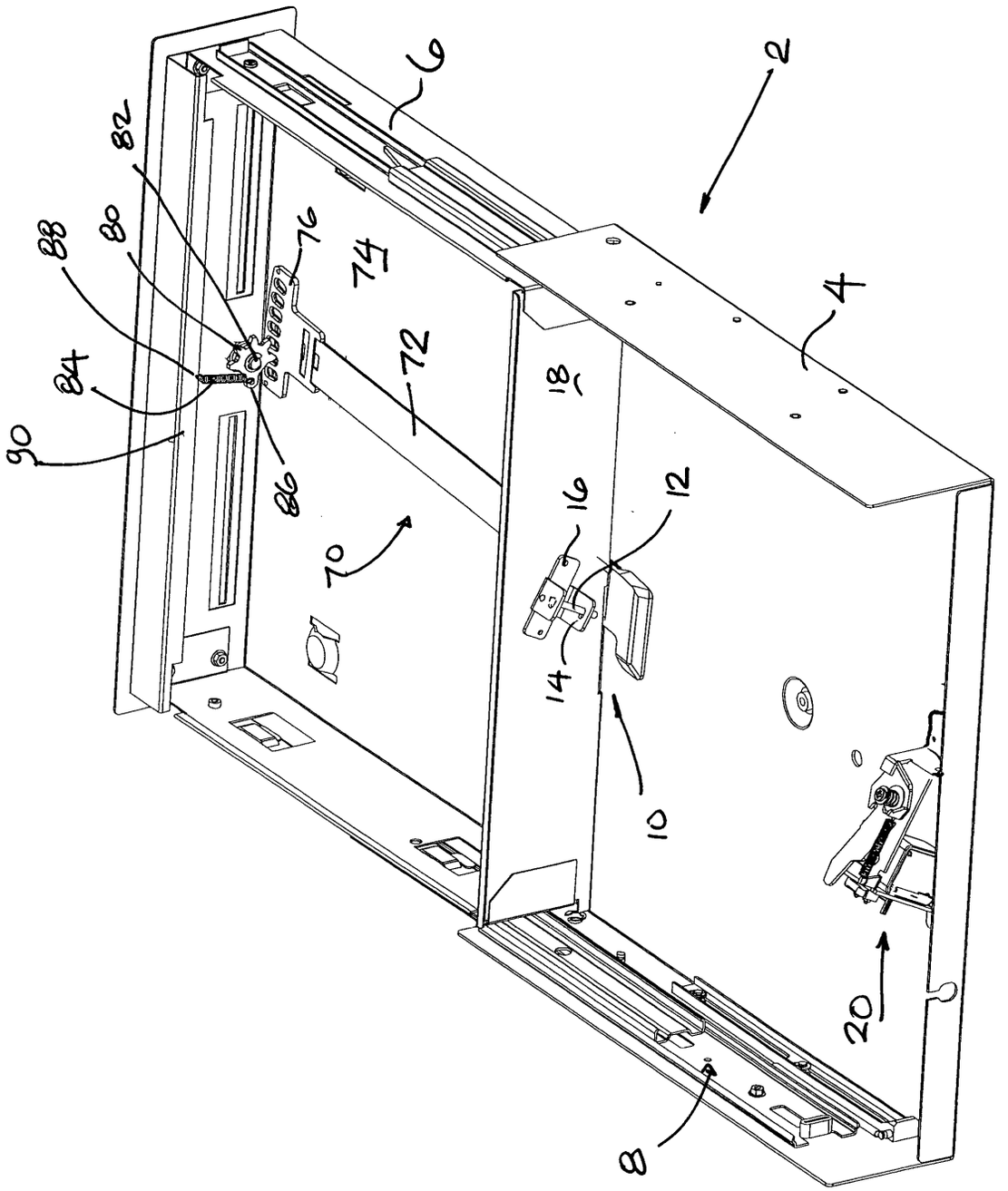

FIG 1

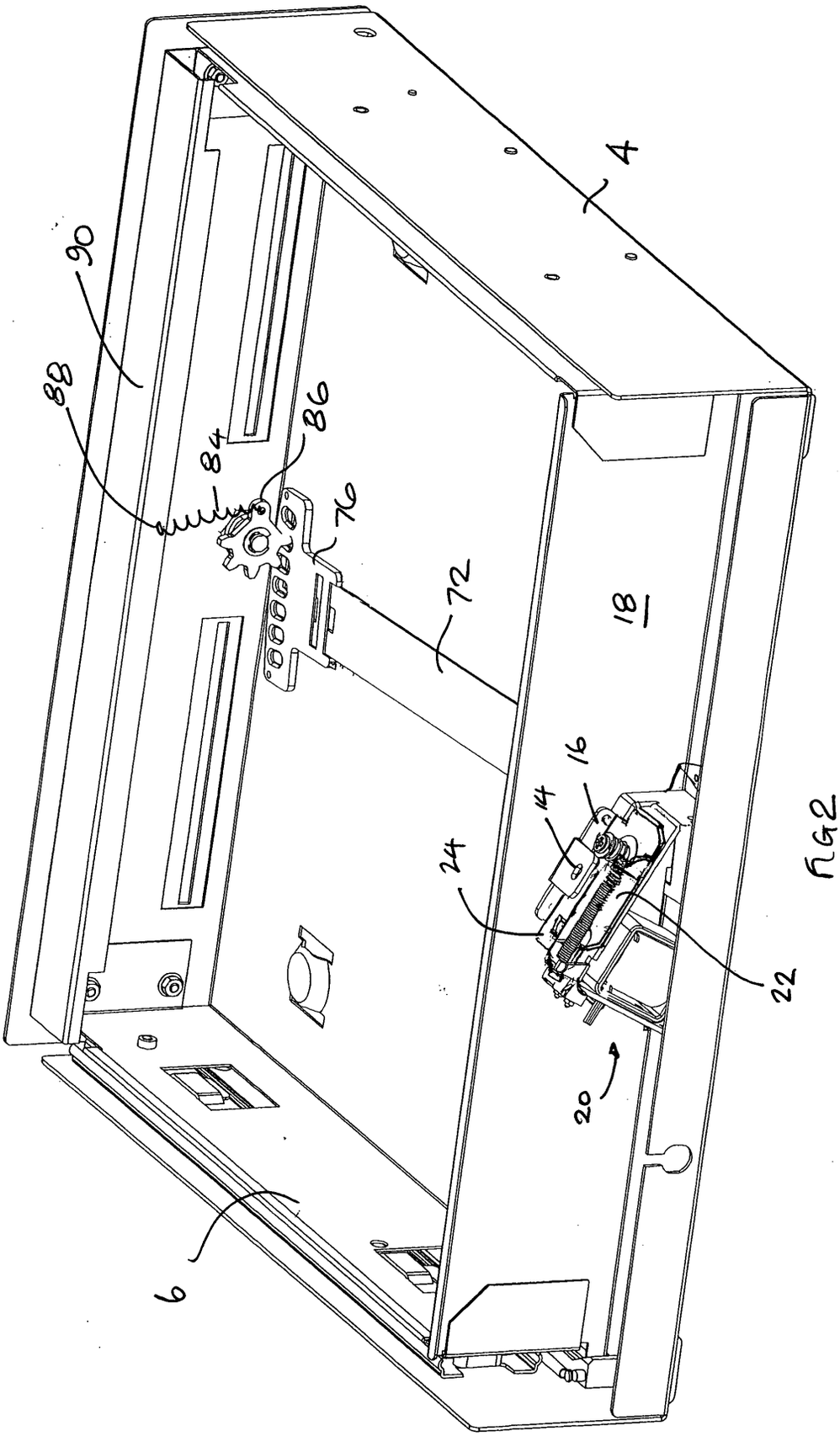

FIG2

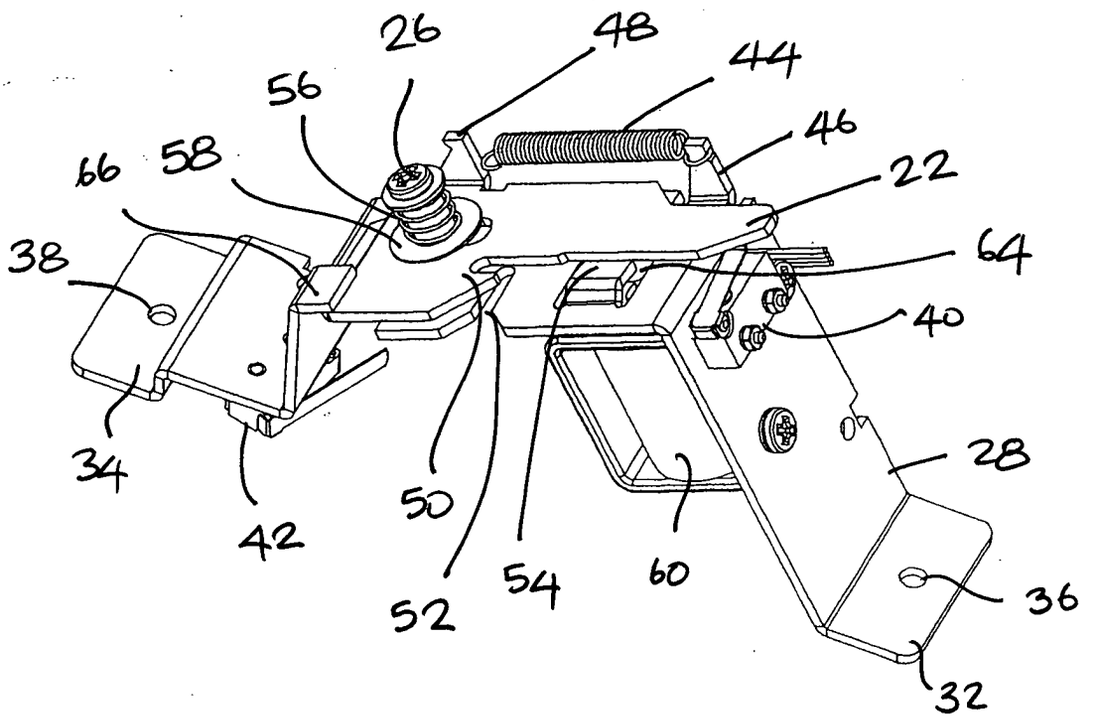

FIG3

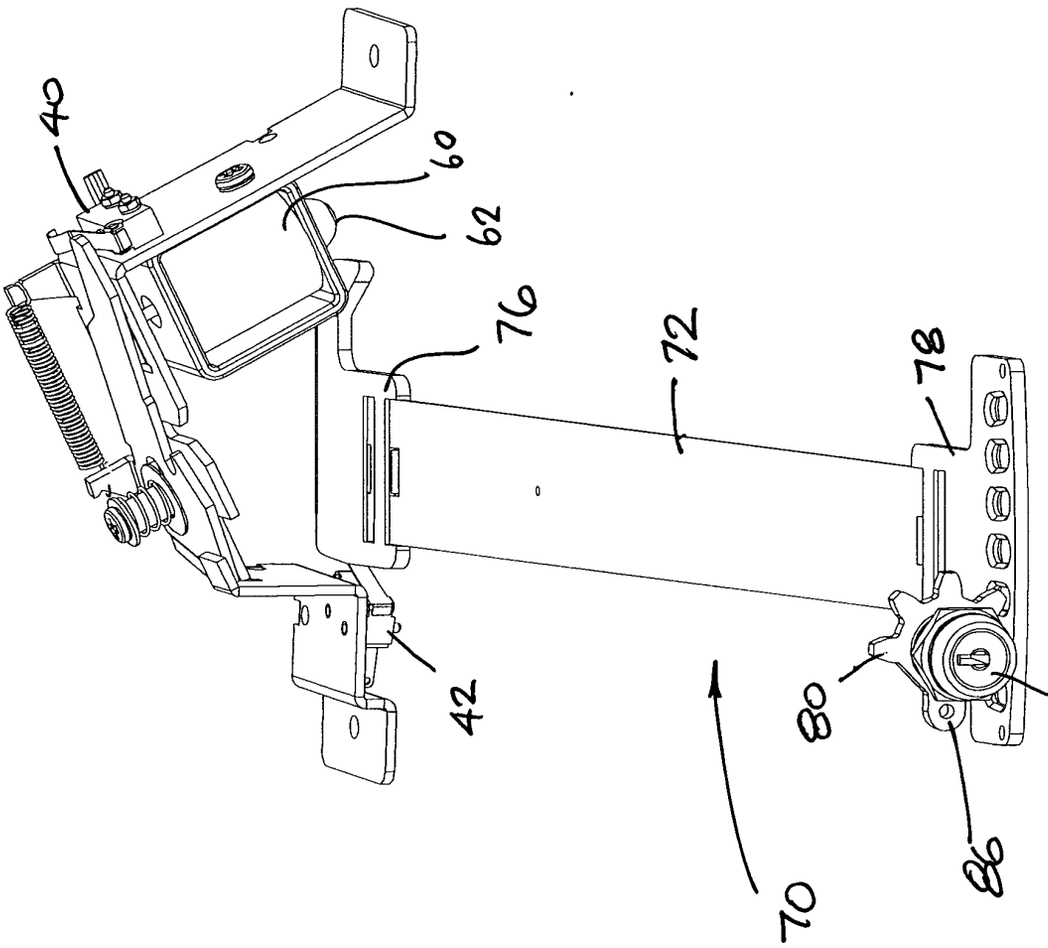

FIG 4

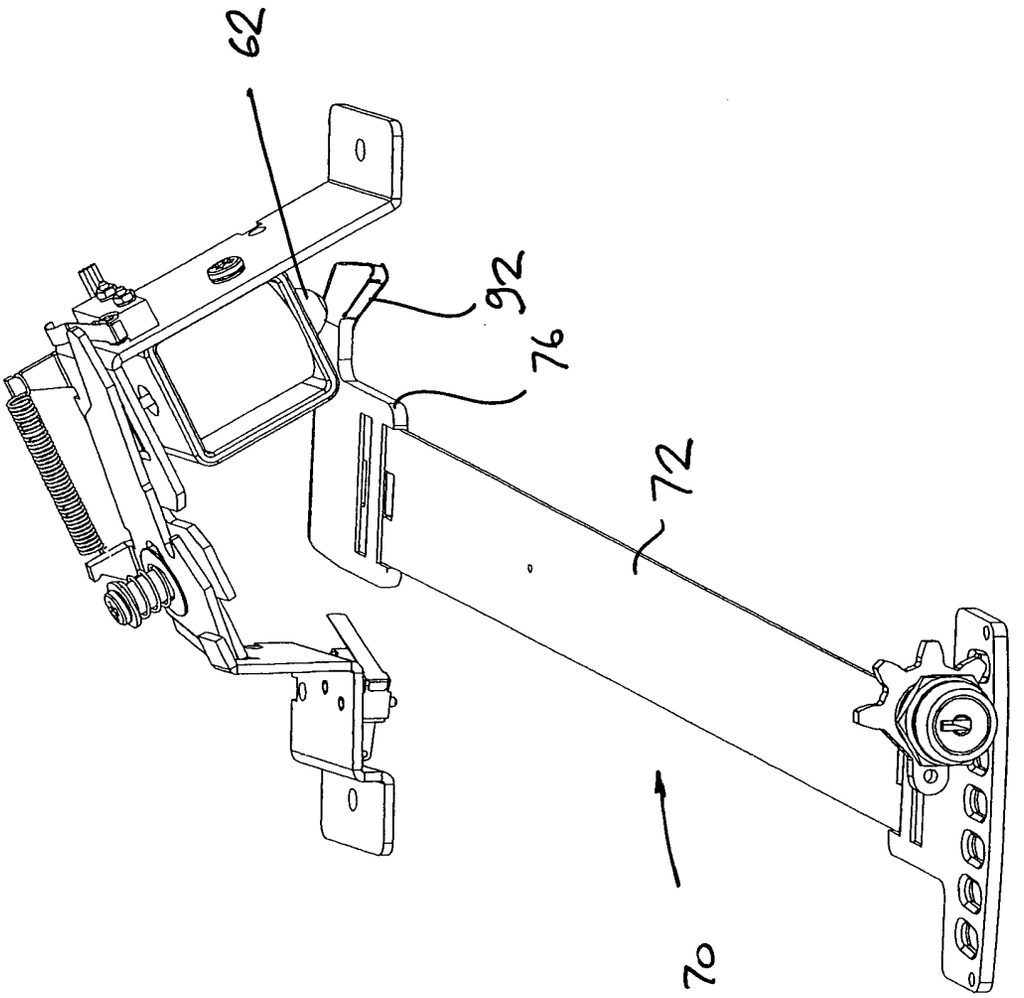

FIG 5