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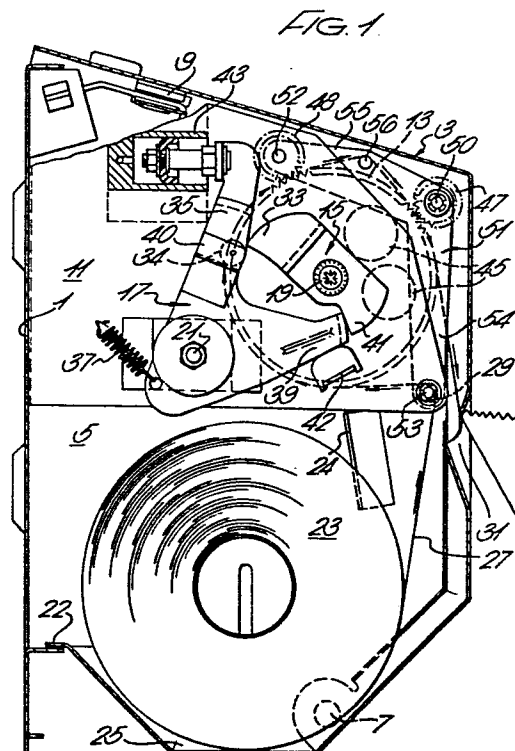
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54 **Paper towel dispenser.**

57 A dispenser for a web (27), for example a paper towel, comprises an eccentrically weighted roller (13) around which the web is trained. As a first portion of web is delivered from the roller the eccentrically placed weight (43, 45) is raised to a position of higher potential energy. Further delivery is then temporarily prevented by means of a locking device (15, 17).

When the locking device is released, the roller rotates under the influence of the weight, thereby automatically delivering a second portion of web.



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PAPER TOWEL DISPENSER

This invention relates to dispensers for continuous web materials and in particular to dispensers for paper towels from continuous paper rolls.

5 Many designs of paper towel dispensers have been proposed in which a locking device prevents uninterrupted delivery of paper from a roll, so that the user is encouraged to tear off a section of towel of a length no greater than a predetermined value. Several of these designs incorporate
10 a timing mechanism which causes the locking device to be released after a period of say, a few seconds. The dispenser is then ready for operation by the next user.

In dispensers of the type wherein sections of towel are drawn from the roll by the user pulling on the leading edge
15 of the web, it is desirable that, after one section has been severed from the roll, a length of paper sufficient to be grasped by the next user becomes accessible.

To this end, it has previously been proposed to provide automatic advance means for such dispensers whereby the
20 paper towel is advanced a short distance automatically upon release of the locking device. Paper towel dispensers incorporating this feature may be made independent of an external power supply if so constructed that withdrawal of a section of towel by the user also serves to prime the
25 automatic advance means.

Hitherto, this effect has been achieved by running the paper between a delivery roller and a pressure roller, and providing a spring to resist rotation of one of the rollers. In such a construction, withdrawal of a
30 section of paper serves to load the spring and, after the engagement and subsequent release of the locking device, the loaded spring is used to drive the delivery roller or the pressure roller and automatically advance a part of the next section of paper.

35 It is an object of the present invention to provide a simplified construction for a web dispenser incorporating a locking device and means for advancing the web after release of the locking device.

According to the present invention, there is provided a dispenser for dispensing predetermined lengths of web, such as paper towel, from a roll of web, said dispenser comprising an eccentrically weighted roller around which
5 the web is trained, a locking device capable of arresting the delivery movement of said web after delivery of a first portion from the roller, and means to disengage said locking device after a predetermined period of time, wherein the eccentrically weighted roller rotates to a position
10 of relatively high potential energy during delivery of said first portion and rotates under gravity to a position of lower potential energy after release of said locking device, thereby to deliver a second portion of said web.

Preferably, the locking device comprises a cam mounted
15 for rotation with said roller and a stop which is movable into engagement with said cam.

The stop may form part of one arm of a bell crank which is movable by the action of a part of said cam on a second arm of said bell crank into a position such that
20 said cam is engageable therewith.

A paper towel dispenser according to the present invention is now described, by way of example, with reference to the accompanying drawings, in which;

Fig 1 is a side view of the dispenser with the side
25 panel of the casing not shown, and

Fig 2 is a front view of the dispenser with the front panel of the casing and the paper roll not shown.

The dispenser comprises a casing formed from a back panel 1, a door panel 3, and two side panels 5. The side
30 panels 5 may be integral with the back panel 1 or fixed thereto by conventional means, e.g. by rivetting. The door panel 3 is pivotally connected to the side panels 5 by pivots 7, but is held in the closed position during use by a spring biased lock 9. The back panel 1 may be provided
35 with brackets or other means for mounting the dispenser on, say, a vertical wall. Also attached to the back panel is a chassis 11 which supports a dispensing mechanism.

The dispensing mechanism comprises an eccentrically weighted roller 13, a cam 15 and a bell crank 17. The roller and the cam are each fixedly mounted on a spindle 19 which in turn is rotatably mounted on the chassis 11. The
5 The bell crank 17 is pivotally attached about a pivot point 21 to the chassis. The function of the roller 13, the cam 15 and the bell crank 17 are now described by reference to the operating cycle of the dispenser.

The dispenser is loaded with a roll 23 of paper towel
10 by lowering the door panel 2 until flange 22 comes into abutment with door stop 24, and placing the roll 23 in a trough 25 formed by the lower portion of the door panel. The paper web 27 is fed over a bar 29, almost completely round the roller 13 and out through a slot 31 in the door
15 Panel 13. When the door panel is closed, a length of paper is left protruding through the slot 31. As the user pulls on this length of paper, the friction of the paper passing round the roller 13 causes the roller to rotate. Since the cam 15 is fixedly mounted with respect to the roller
20 13, the cam also rotates, and one end 33 of the cam 15 comes to bear against a cam follower roller 34 retained by a bracket 40 rivetted to one arm 35 of the bell crank 17. This causes the bell crank 17 to rock anticlockwise as seen in Figure 1 against the resistance of a spring 37. This
25 movement also causes the second arm 39 of the bell crank 17 to occupy a position (shown in Fig 1) such that it acts as a stop to the second end 41 of the cam 15 after only a small further rotation of the roller 13.

The tendency of the spring 37 to restore the bell crank
30 17 to its original position is delayed by the action of an air dashpot 43 which is mounted on the chassis 11. It is, of course, not essential to use an air dashpot for this purpose, and any other form of timing device may be used in its place. The abutment of the cam 15 against the arm
35 39 of the bell crank 17 therefore prevents rotation of the roller 13 for a period of, say, a few seconds. The user, finding that further delivery of the paper is arrested, severs his towel from the roll by pulling upwards against

the upper edge of the slot 31, which is serrated for this purpose.

When the spring 37 finally overcomes the resistance of the air dashpot 43, the arm 39 moves clockwise as shown in Figure 1, out of the path of the end 41 of the cam 15, thereby releasing the roller 13 for further movement. Clockwise movement of the bell crank 17 under the influence of the spring 37 is finally arrested by the stop 42. Eccentrically placed weights 43 and 45 located within the roller 13 now cause the latter to rotate under the effect of gravity through a further part of a revolution. By this means a short section of paper is fed through the slot 31, and the dispenser is again ready for operation by the next user.

In order to increase the frictional engagement of the paper with the roller 13, two pairs of pressure rollers 47, 48 are provided. The pressure rollers 47 are rotatably mounted on a spindle 50 carried between the elbows of two generally L-shaped arms 51, the ends 54 of which we attached to the chassis 11 by pivots 53. The rollers 48 are mounted on a second spindle 52 carried between the free ends 55 of the arms 51. Between the spindle 50 and the second spindle 52 is mounted a deflector bar 56. In use, the paper from the roller 23 is fed over the deflector bar 56 before being led out of the casing through the slot 31. When the user pulls on the free end of the paper therefore, the pressure rollers 47, 48 are brought to bear more forcefully against the roller 13, thus ensuring that the paper does not slip over the roller 13. The more strongly the user pulls, the more effectively the paper is clamped between the pressure rollers 47, 48 on the one hand, and the roller 13 on the other hand, so that the paper is released only when the roller 13 is free to rotate. The frictional engagement of the paper with the roller 13 is still further improved by providing the roller 13 and the pressure rollers 47, 48 with longitudinally ribbed surfaces.

If the user releases the paper before the roller 13 has been rotated to the position shown in Figure 1, it

might happen that the weights 43 and 45 have not yet passed top dead centre. Under these circumstances, the tendency of the weights would be to cause the roller 13 to rotate in the direction opposite to that which is required to dispense paper. Such undesirable rotation is prevented by means of a needle roller clutch shown generally at 61. Needle roller clutches have the great advantage of offering very little frictional resistance to rotation in the desired direction. It will be understood that if automatic advance of paper is to be effected solely by the influence of gravity on the eccentrically weighted roller 13, it is important that frictional resistance to movement of the paper is minimal.

In the event that the paper which protrudes through the slot 31 is severed without the automatic advance mechanism being fully primed, then priming may be achieved by the user turning an emergency feed handle 63 which is mounted on the spindle 19.

CLAIMS:

1. A dispenser for dispensing predetermined lengths of web (27) from a roll (23) of web, said dispenser comprising a roller (13) around which the web is trained, a locking device (15,17) capable of arresting the delivery movement of said web after delivery of a first portion from the roller, and means (43) to disengage said locking device after a predetermined period of time, characterised in that the roller (13) is eccentrically weighted and rotates to a position of relatively high potential energy during delivery of said first portion and rotates under gravity to a position of lower potential energy after release of said locking device, thereby to deliver a second portion of said web.

2. A dispenser according to claim 1 characterised in that the locking device comprises a cam (15) mounted for rotation with said roller and a stop (39) which is movable into engagement with said cam.

3. A dispenser according to claim 2 characterised in that the stop (39) forms at least a part of one arm of a bell crank (17) which is movable by the action of a part of said cam on a second arm (35) of said bell crank into a position such that said cam (15) is engageable therewith.

4. A dispenser according to claim 3 characterised in that a spring (37) is provided to bias said stop (39) away from engagement with said cam (15) and wherein the bias of said spring is resisted by means of a dashpot (43) for a short period of time after movement of said stop into engagement with said cam.

5. A dispenser according to any preceding claim characterised in that said weighted roller (13) is prevented by means of a needle roller clutch (61) from rotating in the direction opposite to that which is required to dispense said web.

6. A dispenser according to any preceding claim characterised in that said web (27) passes from said weighted roller (13) over a deflector bar (56) to which

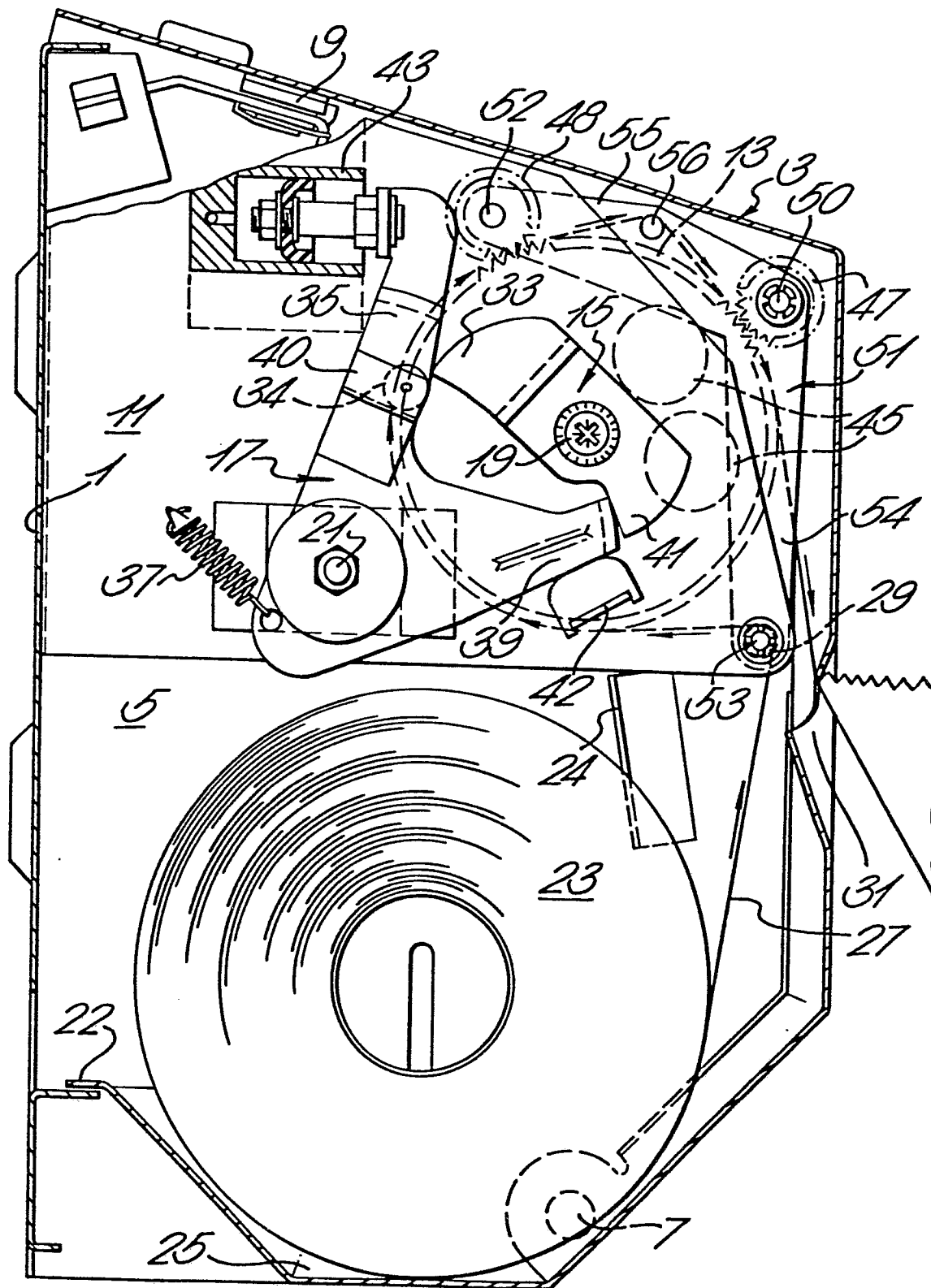
is linked a pressure roller (47), the arrangement being such that when tension is applied to the free end of the web (27), the pressure roller (47) is caused to bear more forcefully upon the web passing around the weighted roller (13).

7. A dispenser according to any preceding claim characterised in that the curved surface of the weighted roller(13) is provided with longitudinally extending ribs.

8. A dispenser according to any preceding claim wherein the web is a paper web.

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FIG. 1.



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