NEWSPAPER VENDING MACHINE WITH A FOLLOWER PRESSURE RELIEVING ASSEMBLY

Ronald William Searle, 6 Kim Place, Dallington, Christchurch, Canterbury, New Zealand
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The invention relates to machines (herein called newspaper vending machines) for vending and dispensing newspapers and other similar articles, such as magazines, comics, and the like. Accordingly, the term "newspaper" used herein is to be understood, wherever the context so admits, as including such other articles, as well as newspapers properly so called.

The general object of the invention is to provide a newspaper vending machine which is of relatively simple construction, and wherein newspapers from a supply with which the machine has previously been loaded can be dispensed one by one by a simple operation of the machine.

A further object of the invention is to provide a coin-freed newspaper vending machine which can be easily and rapidly loaded with a supply of newspapers, and in which the dispensing of the newspapers from the machine is controlled by a coin-freed locking mechanism.

Yet another object of the invention is to provide a newspaper vending machine in which the possibility of undesirable damage to the newspapers during the dispensing operation, and the possibility of dispensing more than one newspaper at a time, are minimised.

Other objects and advantages of the invention will be apparent from the following description.

The newspaper vending machine provided by the invention consists of a magazine into which newspapers may be loaded and arranged in a stack and which is provided with an aperture through which newspapers may be dispensed; elevating means whereby the stack is progressively raised as newspapers are dispensed therefrom so that the top of the stack is maintained under pressure at the same height within the magazine after each dispensing operation of the machine; dispensing means adapted and arranged to bear on and engage the uppermost newspaper of a stack of newspapers placed within the magazine; and operating means connected to the dispensing means and to the magazine, the arrangement being such that operation of the operating means lowers the stack of newspapers in the magazine so as to relieve the pressure applied through the elevating means, and at the same time actuates the dispensing means so that the dispensing means engage the uppermost newspaper of the stack and cause it to be dispensed through the aperture provided in the magazine.

The magazine may be constructed of sheet metal or other suitable material and may be of any size or shape appropriate to the type, size and number of newspapers to be held in the said magazine.

The newspapers may be placed on a sliding shelf, or tray, which may be influenced by a spring or counterweight, constituting the elevating means, so as to apply an upward pressure to the stack of newspapers, and thereby hold the top of the stack under pressure against a stop member provided within the upper part of the magazine. Guiding means may be provided in association with the aperture in the magazine, for the purpose of guiding the newspapers through the aperture during each dispensing operation.

The dispensing means, may be in the form of one or more fingers provided with points adapted to pierce and engage the uppermost newspaper of the stack. Alternatively, the fingers may have pads of rubber or other suitable material, which frictionally engage the surface of the uppermost newspaper and move it towards and through the dispensing slot in the course of each dispensing operation. The said fingers may be actuated by a hand lever which is connected to a shaft from which the fingers extend, the action being such that when the hand lever is moved in an direction the fingers engage with the uppermost newspaper in the magazine and move it through the dispensing aperture. On the return stroke of the hand lever, the fingers are returned to their original position, in which they are ready to engage the next newspaper, which in turn becomes the uppermost newspaper of the stack. The tray within the magazine may be mechanically linked with the hand lever, preferably by means of a ratchet and pawl, so that the tray and the stack of newspapers therein are lowered at the commencement of each dispensing operation, and thereby relieved of the pressure under which the stack is normally held against the stop member provided in the magazine.

The dispensing fingers may be pivotally mounted on the shaft, and arranged so that the pressure exerted by the fingers is sufficient to engage and move only the uppermost newspaper towards the aperture, but is insufficient to similarly move the underlying newspaper as well, at the same time.

The arrangement of the fingers acting with the rotary shaft is such that, on a forward and return movement of the hand lever, the fingers are moved forward and back, and this may be achieved by attachment of the fingers to the outer edges of collars, shafts, cams or the like. In order to sufficiently engage the surface of the newspaper the fingers may be lightly weighted or spring-loaded.

The connection between the hand lever and the shaft may be in the form of a slip clutch so as to prevent damage to the mechanism should excess force be applied to the hand lever, and the operation of the dispensing means may be controlled by an associated coin-freed locking mechanism mounted on or in the machine.

A newspaper vending machine constituting one embodiment of the invention will now be described in more detail by way of example of how the invention may be carried into effect, and with reference to the accompanying drawings, in which:

FIGURE 1 is a front elevation of the machine;
FIGURE 2 is a front elevation of the machine, with a front panel of the machine removed to show the interior of the machine;
FIGURE 3 is a side elevation of the upper part of the machine in vertical section and on a larger scale than FIGURES 1 and 2, showing the machine empty;
FIGURE 4 is a rear elevation of the machine, with a rear cover removed;
FIGURE 5 is a sectional side elevation of the machine at the conclusion of a dispensing operation, the section
being taken in the vertical plane indicated by the line V—V in FIGURE 4;

FIGURE 6 is a sectional plan of the machine in an empty condition, the section being taken in the horizontal plane indicated by the line VI—VI in FIGURE 5 above.

FIGURE 7 is a sectional side elevation similar to FIGURE 5, but showing the upper part only of the machine, at the commencement of a dispensing operation.

The machine shown in the drawings has a cabinet 1 which forms a magazine and which also houses dispensing means within its upper part, the cabinet consisting of a metal framework and covered with metal sheets. A front panel 2 of the cabinet is provided with a lock 3 and is removable so as to give access to the interior of the magazine, and is also provided with an elongated rectangular dispensing aperture 4. The newspapers are stacked on a substantially horizontal shelf 5 which is inclined slightly from the rear edge thereof. The shelf 5 is attached to a vertically movable support 5a which is guided for vertical movement in a slot 6 in the rear of the cabinet 1. The vertically movable support 5a is attached to a set of tension coil springs 7 at the back of the magazine by means of a chain 8 extending from the shelf 5 and passing over a tensioned sprocket 9 attached to a rotatable shaft 10 mounted at the upper rear part of the cabinet 1. By means of the springs 7, the shelf 5 and a stack of newspapers 11 resting thereon are raised to the maximum height allowed by a fixed stop member 12 provided on the inner face of the rear wall of the magazine.

The dispensing means include a dispensing shaft 13 which is mounted to extend transversely of the top of the magazine, and which extends through one side of the cabinet 1 and is provided at a point on the outside of the cabinet with a conventional slip clutch arrangement (not shown in the drawings) to which is secured a hand lever 14.

Three spaced link members 15 are fixed on the dispensing shaft 13 and have pivotally attached to their lower ends three metal fingers 16 which are pointed at their free ends and are arranged so that their points bear on the surface of the uppermost of the newspapers 11, and engage it when the hand lever 14 is moved in a dispensing operation.

An arm 17 which is provided at one end with a pawl 18, is connected at the other end to the dispensing shaft 13 by a short fixed crank 19. The pawl 18 is adapted to engage with a ratchet wheel 20 engaged on the shaft 13 of the uppermost of the articles stacked on the shelf 5. The arrangement is such that when the hand lever 14 is moved forward, the pawl 18 engages the ratchet wheel 20 and turns the shaft 10 so as to lower the magazine shelf 5, and relieve the upward pressure exerted by the springs 7 through the shelf 5 on the stack of newspapers 11 against the stop member 12.

The dispensing means has associated with it, and is normally locked by, a coin-free mechanism 21 (not shown in detail) which frees the said dispensing means when a coin of the correct denomination is inserted into it through a coin slot 22.

The magazine may be readily loaded by depressing the magazine shelf 5 and loading the newspapers thereon, after inserting 1 of the pages 2 to provide access to the interior of the magazine. The newspapers 11 are held against the stop member 12 until the hand lever 14 is freed by insertion of a coin in the slot 22 and moved from its position shown in FIGURE 5 to its position shown in FIGURE 7, when the shelf 5 is lowered slightly to relieve the pressure on the uppermost newspaper of the stack 11. By then returning the lever 14 to its position shown in FIGURE 5 the fingers 16 are caused to dig into the newspaper, pushing it out through the dispensing aperture 4, as shown in FIGURE 5, until it can be grasped and removed by the person operating the machine. During this latter movement of the lever 14, the shelf 5 again rises so that the stack of remaining newspapers is again held under pressure against the stop member 12.

To indicate when the magazine is empty, a roller 23 visible through a window 24 is provided at the upper front part of the cabinet 1. The roller normally rests in its position shown in FIGURE 7, but when the last newspaper has been dispensed a spring-loaded finger 25 is freed to rise, and bears on a radially projecting lug or plate 26 fixed to the roller 23, so that the roller is turned until a position shown in FIGURE 3, in which the word “EMPTY” or other appropriate indication appears in the window 24.

Minor adjustment of the angle of inclination of the upper surface of the shelf 5 may be effected by means of a screw 27, and connexions 28 provide for minor adjustment of the position of the points of the fingers 16. By means of the machine described above, a quantity of newspapers can be easily and rapidly dispensed by the purchasers without the need for supervision of the machine, the magazine being easily replenishable with newspapers when exhausted.

1. A vending machine comprising a housing for a stack of articles and having a discharge opening through which the articles may be dispensed from the top of the stack, a vertically movable support for the articles stacked in the housing, the said vertically movable support including an article supporting platform inclined toward the discharge end thereof, means for transmitting an upward force to the vertically movable support, a stop engageable with the top article in the stack for limiting the upward movement of the support by said force-transmitting means actuate Article discharging means engageable with the top article in the stack and moving the said article toward the discharge opening, pressure relieving means operatively connecting said article discharging means and said force-transmitting means so as to lower the platform slightly to disengage the top article in the stack from the stop before actuation of the article discharging means and thereby free the upper article in the stack for movement toward said discharge opening, and means for adjusting the angle of inclination of said supporting platform.

2. A vending machine comprising a housing for a stack of articles and having a discharge opening through which the articles may be dispensed from the top of the stack, a vertically movable support for the articles stacked in the housing, means for transmitting an upward force to the vertically movable support, a stop engageable with the top article in the stack for limiting the upward movement of the support by said force-transmitting means, actuate Article discharging means engageable with the top article in the stack and moving the said article toward the discharge opening, pressure relieving means operatively connecting said article discharging means and said force-transmitting means so as to lower the platform slightly to disengage the top article in the stack from the stop before actuation of the article discharging means and thereby free the upper article in the stack for movement toward said discharge opening, in which said force-transmitting means includes a drive transmission which operates in one direction to raise the vertically movable support and in which the pressure relieving means includes means for incrementally reversing the direction of said drive transmission.

3. A vending machine comprising a housing for a stack of articles and having a discharge opening through which the articles may be dispensed, a vertically movable support for the articles stacked in the housing, force-applying means for engaging said article discharging means and said vertically movable support and normally urging the support upwardly, a rotatable sprocket engageable with
and driven by said chain, a stop engageable with the top article in the stack for limiting the upward movement of the support, actuatble article discharging means engageable with the top article in the stack to move said article toward the discharge opening, a rotatable ratchet wheel operatively connected with the sprocket, and a pawl operatively connected with the actuatble article discharging means so as to rotate the ratchet an increment and lower the platform slightly to disengage the top article in the stack from the stop before actuation of the article discharging means and thereby free the upper article in the stack for movement toward said discharge opening.