

[54] NEWSPAPER VENDING MACHINE

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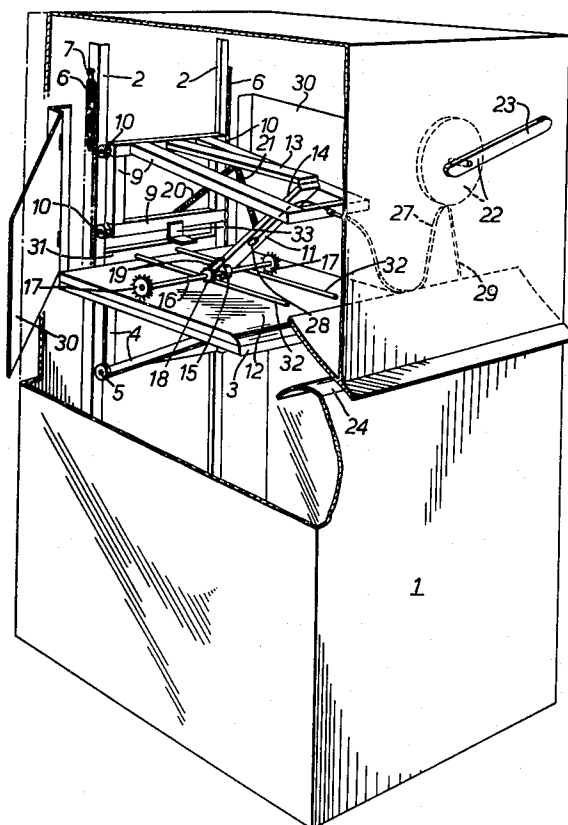
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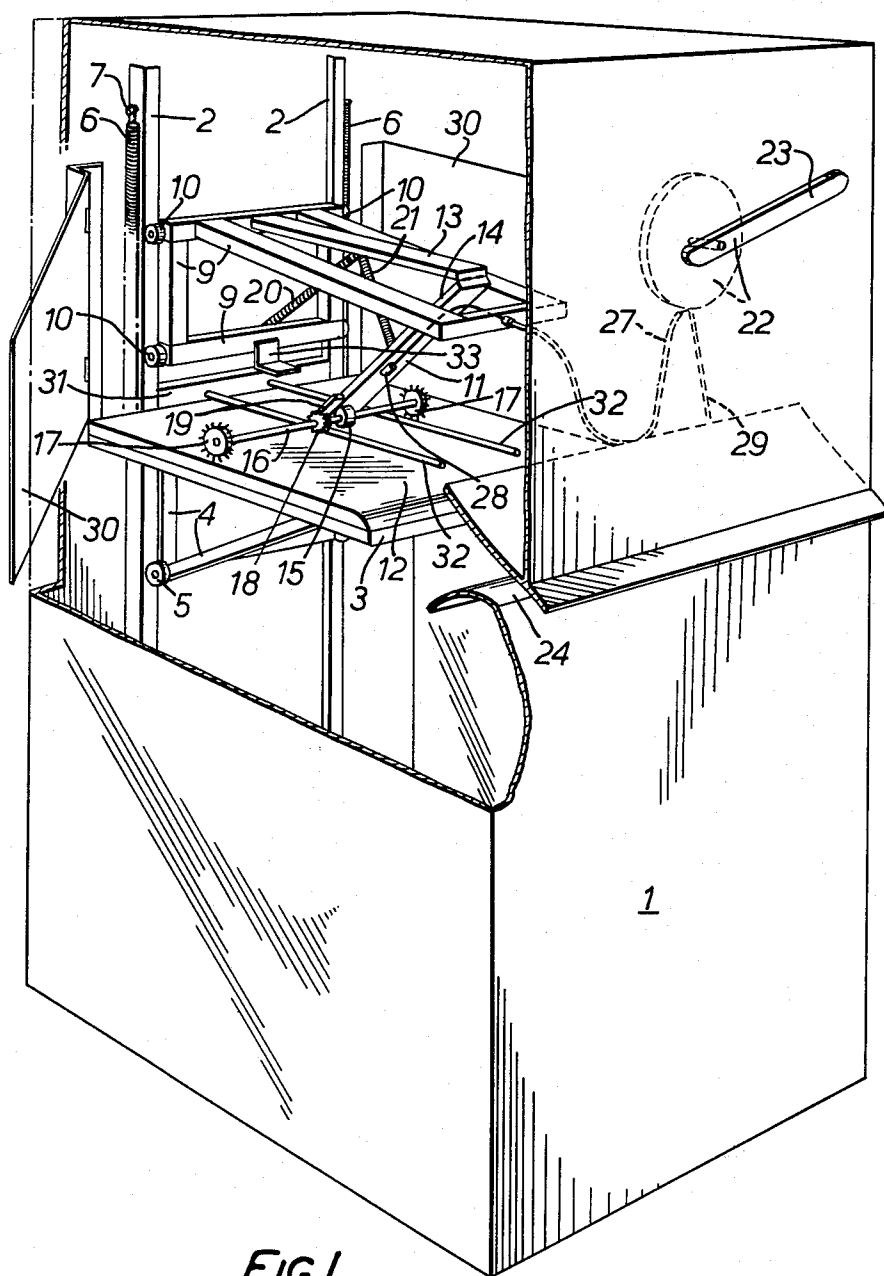
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ABSTRACT

A machine for dispensing newspapers and like articles, the machine comprising a platform for supporting a stack of newspapers, a carriage on which is mounted means for dispensing newspapers and the like one at a time from a stack thereof on said platform, a casing in which the platform, the carriage and the dispensing means are contained and mechanism operable from the exterior of the casing to cause the dispensing means to separate one newspaper from a stack thereof on the platform and to deliver the separated newspaper through a mouth-defining means in the casing to a location at which it is accessible to a user of the machine, wherein both the platform and the carriage are upwardly and downwardly displaceable in the casing along guide rail means mounted internally of the casing, the weight of the carriage, said dispensing means, the platform and newspapers stacked on the latter in the use of the machine being resiliently counterbalanced in such a way as to tend to maintain the top of such a stack at substantially a constant level despite progressive diminution of the stack height as a result of successive dispensing operations.

15 Claims, 2 Drawing Figures





NEWSPAPER VENDING MACHINE

This invention relates to machines for dispensing newspapers and like articles, such as magazines and pamphlets. However, such machines can be employed for dispensing any articles of the same general nature as newspapers from stacks of those articles.

Newspapers are awkward articles to handle mechanically unless they are folded and wrapped to form compact parcels. However, such folding and wrapping involves considerable extra expense, and it is therefore desirable to be able to provide a machine for dispensing newspapers one at a time from a stack thereof, each newspaper being folded once in the manner in which newspapers are usually despatched from the premises in which they are printed.

It is also desirable to provide a machine for dispensing newspapers which is entirely manually operated because such machines are usually positioned temporarily at street corners and other places where it is difficult or impossible to provide a power supply to operate a non-manual machine. However, these circumstances do not always exist and it is within the scope of the invention to provide a power-operated machine.

According to the invention, there is provided a machine for dispensing newspapers and like articles, the machine comprising a platform for supporting a stack of newspapers or the like, a carriage on which is mounted means for dispensing newspapers or the like one at a time from a stack thereof on said platform, a casing in which the platform, the carriage and the dispensing means are contained and mechanism operable from the exterior of the casing to cause the dispensing means to separate one newspaper, or the like from a stack thereof on the platform and to deliver the separated newspaper or the like through a mouth in the casing to a location at which it is accessible to a user of the machine, wherein both the platform and the carriage are upwardly and downwardly displaceable in the casing along at least one guide rail mounted internally of the casing, the weight of the carriage, said dispensing means, the platform and newspapers or the like stacked on the latter in the use of the machine being resiliently counterbalanced in such a way as to tend to maintain the top of such a stack at substantially a constant level despite progressive diminution of the stack height as a result of successive dispensing operations.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

FIG. 1 is a perspective view of a newspaper vending machine in accordance with the invention with parts of a casing thereof removed to disclose the interior of the casing, and

FIG. 2 is a front elevation of the machine of FIG. 1 with most of the front wall of the casing removed to disclose details of the interior of the casing.

The machine which is illustrated in the accompanying drawings is primarily intended for selling newspapers in the street and is designed so that a customer who wishes to purchase a newspaper has merely to place a coin or coins in a slot to free a mechanism which is then manually operated by the customer to deliver the required newspaper from an access mouth of the casing of the machine. The machine is a portable one that is intended to be delivered to, and removed,

from, selected sites of use by a delivery van or the like and preferably has weights (not shown) in its base so that it cannot easily be knocked over, blown over or mischievously moved. This is, of course, not essential and the machine may be constructed so that its base can be bolted or otherwise secured in a more or less permanent position. The machine may also be incorporated in the facade or hollow wall of a building or the like.

Referring to the drawings, the illustrated machine has a cuboid casing 1 from rigidly interconnected metal plates inside which casing 1 are two vertical guide rails 2 mounted on the inner surface of one side wall of the casing in parallel but horizontally spaced apart relationship. A substantially horizontal platform 3 is sustained from beneath by a framework 4 which carries rollers 5 that are movable upwardly and downwardly along the guide rails 2. Two tension springs 6 extend alongside the corresponding two guide rails 2 and have their upper ends connected to anchorages 7 mounted at the upper ends of those rails and their lower ends connected to further anchorages 8 that are fastened to the platform 3 very close to the upper rollers 5 of the framework 4 that sustains that platform 3 from beneath. The platform 3 is upwardly and downwardly movable along the guide rails 2 but downward movements thereof are resiliently opposed by the springs 6. This arrangement will be explained in greater detail below.

A carriage 9 is arranged above the platform 3 and is provided with upper and lower pairs of rollers 10 in respect of each rail 2. There are thus four pairs of the rollers 10 but it should be particularly noted that only one roller 10 of each pair of visible in the drawings. The two rollers 10 of each pair are located at opposite sides of guide flanges of the rails 2 in such a way that the whole carriage 9 can move upwardly and downwardly along the guide rails 2 independently of the underlying platform 3.

The carriage 9 is provided with means, generally indicated by the reference 11, for dispensing newspapers one at a time from a stack 12 thereof. The newspapers are stacked on the upper surface of the platform 3 in the condition in which they are conventionally despatched from the premises in which they are printed, that is to say, each newspaper is arranged with its pages closed and, if required, is folded once in a direction parallel to the upper and lower edges of its pages.

The dispensing means 11 comprises an upper arm 13 having one end pivotable relative to an upper member of the carriage 9 about a substantially horizontal axis and a lower arm 14 whose upper end is pivotable relative to the end of the upper arm 13 that is remote from the guide rails 2 about a further substantially horizontal axis that is parallel to the axis of the pivotal connection between the upper arm 13 and the carriage 9. The lower end of the lower arm 14 carries part of a universal joint 15, which may be in the form of a ball and socket joint, the other part of that universal joint 15 being fastened to a shaft 16 that projects from opposite sides of the universal joint in a substantially horizontal direction that is substantially parallel to the pivotal axes at the opposite ends of the upper arm 13 and to the axes about which the rollers 5 and 10 can rotate. Toothed wheels 17 are rigidly secured to the opposite ends of the shaft 16 and their toothed peripheries rest on top of the stack 12 of newspapers or on top of the

platform 3 when no newspapers are present in the machine. The wheels 17 may be formed from rubber, synthetic rubber or a synthetic plastics material or alternatively may be toothed metal wheels and are designed in such a way that their substantially radially projecting teeth will give a good grip upon a sheet of newspaper. The shaft 16 carries a ratchet wheel 18 close to the universal joint 15 and the lower arm 14 carries a co-operating pawl 19, the one-way mechanism that is afforded by the ratchet wheel 18 and pawl 19 being arranged so that the shaft 16 and its toothed wheels 17 can rotate to a significant extent only in an anticlockwise direction as seen in FIG. 2 of the drawings. A tension spring 20 interconnects the upper arm 13 and a lower member of the carriage 9 in such a way as to tend to turn the upper arm 13 downwardly about its pivotal connection with the carriage 9 in a clockwise direction as seen in FIG. 2 of the drawings and a further tension spring 21 interconnects the upper and lower arms 13 and 14 in such a way as to tend to turn the lower arm 14 upwardly in a clockwise direction as seen in FIG. 2 of the drawings about its pivotal connection with the upper arm 13.

A mechanism that is generally indicated by the reference 22 is carried by the side wall of the casing 1 that is opposite to the side wall whose internal surface carries the guide rails 2 and said mechanism comprises a handle 23 that is operable from the exterior of the casing 1 by a customer who wishes to purchase a newspaper to cause the dispensing means 11 to separate one newspaper from the stack 12 on the platform 3 and to deliver that newspaper through a mouth 24 in the side wall of the casing 1 which carries the mechanism 22 to a location at which the delivered newspaper is accessible to the customer.

The front wall of the casing 1 carries a coin-accepting mechanism 25 that may be of a construction which is basically known per se., said mechanism 25 having a slot into which the coin or coins required for the purchase of a newspaper may be inserted. There could, of course, be two or more slots of different sizes for circumstances where the purchase price of a single newspaper can or must be made up by employing a combination of coins of different values and different sizes. A chute 26 leads from the coin-accepting mechanism 25 to a section of the operating mechanism 22 in which the reception of at least one coin from the mechanism 25 enables manipulation of the handle 23 to operate the dispensing means 11. This section of the mechanism 22 is not illustrated in detail in the drawings and it will be realised that many coin-freed mechanisms are known that would be basically suitable for this purpose. The coin or coins that free the mechanism 22 fall into a lockable cash box (not shown) after one dispensing operation so that, upon the return of the handle 23 to its initial position, a further coin or coins must be inserted before a further newspaper can be delivered from the stack 12.

The core of a Bowden cable 27 extends from the operating mechanism 22 to an anchorage 28 on the lower arm 14 of the dispensing means 11, said anchorage 28 being positioned between the opposite ends of the lower arm 14 and preferably nearer to the universal joint 15 than to the pivotal connection between the arms 14 and 13. The sheath of the Bowden cable 27 extends between a stop close to the mechanism 22 and a second stop on an upper portion of the carriage 9 at the

end of the upper portion remote from the guide rails 2. A further spring-loaded Bowden cable 29 extends between the coin-accepting mechanism 25 and the platform 3 through which latter its core projects to carry a plate that is contacted by the lowermost newspaper of the stack 12 thereof when such a stack is in position. When the stack 12 is missing, the loading spring of the Bowden cable 29 causes the plate which has just been mentioned to rise above the surface of the platform 3 and the coin-accepting slot or slots of the mechanism 25 to be blocked. Preferably, but not essentially, an "empty" notice is then also moved into view in a small window (not shown) of the mechanism 25.

Flap-like doors 30 are formed in both the front and rear walls of the casing 1 of the machine and are provided with locks, not shown, by which they can be kept firmly closed to prevent unauthorised access to the interior of the casing. At least one of the doors 30 must, of course, be opened to obtain access to the interior of the casing 1 at more or less regular intervals to replenish the stack 12 of newspapers. The operative who opens one of the doors 30 for this purpose pushes the carriage 9 and the dispensing means 11 that is connected thereto upwardly along the rails 2 to a position in which the carriage 9 is retained against returning downwardly along the rails 2 by a simple spring-loaded latch or the like which is not illustrated in the drawings. A newspaper guide 31 is either also pushed upwardly along the rails 2 at this time or is temporarily removed from the machine. The newspaper guide 31 includes two rods 32 that lie on top of the stack 12 of newspapers when that stack is in position so as to prevent crumpling of the upper sheet of the uppermost newspaper of the stack 12 during a dispensing operation. Parts of the carriage 9 bear downwardly upon the newspaper guide 31 during the operation of the machine to maintain it in an effective position. If a very large stack 12 of newspapers is to be inserted into the machine, there may not be sufficient room between the top of the platform 3 and the bottom of the elevated carriage 9 and the dispensing means 11 that is mounted thereon and, under these circumstances, the platform 3 is pushed downwardly along the rails 2 by the operative, against the opposition of the springs 6, to a lowermost location in which, like the carriage 9, it is retained by a simple spring-loaded latch or the like that is not illustrated in the drawings. It is only then necessary to insert the fresh stack 12 of newspapers, to replace the newspaper guide 31 if it had been temporarily removed from the machine, to unlatch the platform 3, to unlatch the carriage 9 and to close and lock the opened door 30.

It is, of course, necessary that the top of the stack 12 of newspapers in the casing 1 of the machine should remain in register with the mouth 24 and it will be seen from the drawings that said mouth 24 is considerably widened in a vertical direction internally of the casing 1. The strength of the springs 6 is carefully chosen so that the weight of the platform 3, its sustaining framework 4, the carriage 9, the dispensing means 11, the newspaper guide 31 and the stack 12 of newspapers on the platform 3 is counterbalanced by those springs 6 to maintain the top of the stack 12 at substantially a constant level in the casing 1 which level is, of course, the same general level as that of the mouth 24. Obviously, each time a newspaper is removed from the top of the stack 12, the total weight of the elements that has just been mentioned is reduced and the height by which the

stack 12 projects above the platform 3 becomes smaller by the thickness of one newspaper. However, the diminution in total weight of the elements allows the stretched tension springs 6 to contract slightly so that the platform 3 is raised by a corresponding distance which substantially exactly compensates for the reduction in stack height and automatically maintains the substantially constant level of the top of the stack 12.

In the use of the machine which has been described when containing a stack 12 of newspapers, a customer inserts the required coin or coins in the slot or slots of the mechanism 25 with the result that at least one coin passes down the chute 26 to the section of the operating mechanism 22 that renders the hand 23 effective. The customer, in accordance with a prominent instruction notice on the casing 1, then pulls the handle 23 so that it turns in an anticlockwise direction as seen in FIG. 1 of the drawings. The core of the Bowden cable 27 is thus withdrawn into its sheath which causes the lower arm 14 to turn about its pivotal connection with the upper arm 13 in an anticlockwise direction as seen in FIG. 2 of the drawings and the upper arm 13, in turn, to pivot about its connection to the carriage 9 in the same direction as seen in FIG. 2. Both these movements take place against the opposition of the corresponding tension springs 21 and 20. It should, perhaps, be mentioned at this stage that the strength of the tension spring 21 is not very great and that its disposition in relation to the Bowden cable 27 is such that the toothed wheels 17 to remain in contact with the upper sheet of the uppermost newspaper of the stack 12 at times when the dispensing means 11 is not in operation. The carriage 9 is then disposed in the position shown in the drawings in which it is spaced above the top of the stack 12 of newspapers. The pivotal movements of the arms 13 and 14 that have just been mentioned cause the shaft 16 and the toothed wheels 17 to move from left to right as seen in FIG. 2 of the drawings from the initial position that is shown in full lines in that Figure to and beyond a displaced position which is shown in broken lines in the same Figure. Because of the provision of the one-way mechanism that comprises the ratchet wheel 18 and the pawl 19, the shaft 16 and wheels 17 cannot revolve in a clockwise direction as seen in FIG. 2 and movement thereof to the right as seen in that Figure is thus accomplished without rotation. The teeth of the wheels 17 grip the uppermost newspaper of the stack 12 thereof and move it to the right in the direction of an arrow X and into the receiving end of the mouth 24. In this position, part of the newspaper 24 will project from the casing 1 through the mouth 24 and will be readily accessible to the customer. The lever 23 is returned to its initial position either by the customer or by a spring and this involves extension of the core of the Bowden cable 27 from its sheath. However, in this case, the toothed wheels 17 move from right to left as seen in FIG. 2 of the drawings and are thus free to rotate with their shaft 16 so that there is no tendency for the fresh uppermost newspaper of the stack 12 to be pushed to the left as seen in FIG. 2 of the drawings and thus be crumpled. The tension springs 20 and 21 are of such strengths that the light pressure of the toothed wheels 17 on the top newspaper of the stack 12 is sufficient to move that newspaper 12 reliably in the direction X without increasing the frictional contact between that newspaper and the next underlying newspaper to such an extent that the next un-

derlying newspaper will also tend to be displaced in the direction X. It will be noted that the carriage 9 incorporates a bracket 33 having a lower limb which, as illustrated in the drawings, is clear of contact with the uppermost newspaper of the stack 12 when the dispensing means 11 is not in operation. When the handle 23 is turned to operate the dispensing means 11, the uppermost newspaper of the stack 12 is initially moved a short distance to the right as seen in FIG. 2 by the wheels 17. As the positions of the arms 13 and 14 that are shown in broken lines in the same Figure are approached, the differences in configuration and disposition of the dispensing means 11 allow the carriage 9 to move downwardly along the rails 2 until the lower limb of the bracket 33 comes to rest upon the top of the newspaper beneath the one actually being dispensed at a position between the rods 32 of the newspaper guide 31. The provision of the bracket 33 had been found to minimise still further any tendency for more than one newspaper to be delivered from the stack 12 as a result of a single dispensing operation. When the starting position of the dispensing means 11 is regained, the carriage 9 and its bracket 33 are moved upwardly along the rails 2 so that the bracket 33 no longer makes retaining contact with the uppermost newspaper of the stack 12. It will be noted that the fact that both the platform and the carriage 9 are independently movable upwardly and downwardly along the guide rails 2 has the additional advantage that the initial and final positions of the dispensing means 11 relative to the stack 12 of newspapers are substantially the same for all dispensing operations no matter whether the stack is of full height or is down to its last one or two newspapers. This ensures substantial uniformity of all of the dispensing operations. The loading spring of the Bowden cable 29 is quite weak so that the weight of even one newspaper, pressed down by the wheels 17 and the rods 32 of the newspaper guide 31, is sufficient to prevent premature cessation of the operation of the coin-accepting mechanism 25. The platform 3 is, of course, dimensioned to deal with newspapers of one particular size but, if it should be desired to sell shorter and/or narrower newspapers from the machine, this can be done merely by inserting appropriately shaped filler pieces in regions of the platform 3 that are not occupied by the material of the newspapers themselves. Although it has been stated above that the toothed wheels 17 remain in contact with the upper surface of the uppermost newspaper of the stack 12 throughout delivery of that newspaper in the direction X, the dispensing means 11 may be modified by placing the anchorage 28 closer to the shaft 16 than is illustrated in the accompanying drawings, the effect of this being that the core of the Bowden cable 27 will lift the wheels 17 upwardly off the uppermost newspaper of the stack 12, against the action of the tension spring 20, when the core of that Bowden cable 27 is withdrawn sufficiently far into its sheath. As soon as the handle 23 commences its return to its initial position under the action of a spring or being turned by a customer, the wheels 17 will be able to move downwardly back into contact with the fresh uppermost newspaper of the stack 12 and will then be able to roll to the left as seen in FIG. 2 of the drawings until substantially the starting position thereof that is shown in full lines in that Figure is regained. If desired, it may be ensured that the "floating" newspaper guide 31 will automatically be raised with the overlying "floating" car-

riage 9 and dispensing means 11 when the latter are pushed upwardly to facilitate replenishment of the stack 12 of newspapers. All that is necessary to ensure this is to connect the bottom of the carriage 9 to the newspaper guide 31, adjacent the lower rollers 10, by flexible but inextensible members such as light chains and to interconnect the free ends of the rods 32 (i.e., those ends which are furthest to the right as seen in FIG. 2 of the drawings) to the overlying part of the carriage 9 in a similar manner, preferably by further light chains. Such an arrangement does not inhibit movement of the newspaper guide 31 and its rods 32 during the use of the machine. In order that it should not be possible to obtain a newspaper from the machine without payment, it is desirable that the operating mechanism 22 should incorporate pawls and ratchet teeth arranged to prevent significant rocking of the lever 23. When such rocking is possible, the motion caused would be transmitted to the shaft 16 and wheels 17 to cause them to reciprocate through a short distance on top of the uppermost newspaper of the stack 12 and, bearing in mind the provision of the ratchet wheel 18 and pawl 19, repeated reciprocation of this kind would tend to feed the uppermost newspaper slowly but progressively in the direction X until it could be taken from the casing mouth 24 without payment. Preventing significant rockability of the lever 23, in combination with a judicious spacing of the teeth of the ratchet wheel 18, makes it substantially impossible to obtain a newspaper from the machine without payment in the manner which has just been discussed.

As previously mentioned, it is an object of the invention to provide a machine which does not need any source of power, such as electricity, to operate it so that the machine can be temporarily positioned at any convenient site which may well be one where electricity or other power is not readily obtainable. However, it is within the scope of the invention to provide a power-operated machine in which case the operating mechanism 22 would preferably be replaced by an electrically powered mechanism whose operation would be initiated automatically upon supplying the necessary coin or coins to the mechanism 25. A machine in accordance with the invention could be built into the facade or hollow wall of a building or the like in which case some modification of the shape of its casing 1 would probably be required for co-operation with that facade or hollow wall. Under these circumstances, the facade or wall could actually afford the casing of the machine. Moreover, a number of similar machines could be provided in a common casing to dispense, for example, different newspapers, magazines and the like originating from a single publisher or other commercial source. Under these circumstances, it would usually be desirable for the delivery mouths 24 corresponding to the different machines to be in the same wall of the common casing as the coin-accepting mechanisms 25 and it will be realised that the re-positioning of the mechanisms 25 to be on the same wall as is formed with the mouths 24 does not involve any basic alteration to the machine. Obviously, a number of machines incorporated in a single casing would not normally be portable and would therefore, in the vast majority of cases, be of the kind discussed above in which power-operation is employed rather than purely manual operation.

I claim:

1. A machine for dispensing newspapers and like articles, the machine comprising a platform for supporting a stack of newspapers, a carriage on which is mounted means for dispensing newspapers and the like one at a time from a stack thereof on said platform, a casing in which the platform, the carriage and the dispensing means are contained and mechanism operable from the exterior of the casing to cause the dispensing means to separate one newspaper from a stack thereof on the platform and to deliver the separated newspaper through a mouth-defining means in the casing to a location at which it is accessible to a user of the machine, wherein both the platform and the carriage are upwardly and downwardly displaceable in the casing along guide rail means mounted internally of the casing, the weight of the carriage, said dispensing means, the platform and newspapers stacked on the latter in the use of the machine being resiliently counterbalanced in such a way as to tend to maintain the top of such a stack at substantially a constant level despite progressive diminution of the stack height as a result of successive dispensing operations.

2. A machine according to claim 1, wherein the guide rail means comprises two guide rails that both extend substantially vertically in parallel but spaced apart relationship.

3. A machine according to claim 1, wherein both the platform and the carriage co-operate with said guide rail means by way of rollers that are rotatable about substantially horizontal axes.

4. A machine according to claim 3, wherein the rollers corresponding to both the platform and the carriage are arranged in upper and lower pairs, the rollers that correspond to the platform being carried by a framework that sustains said platform from beneath.

5. A machine according to claim 1, wherein the resilient counterbalancing of the weight of the carriage, the dispensing means, the platform and newspapers stacked on the latter is afforded by at least one tension spring corresponding to each guide rail of said guide rail means.

6. A machine according to claim 1, wherein the dispensing means comprises a first arm pivotally connected to the carriage, a second arm pivotally connected to the first arm and rotatable means carried by the second arm in such a position as to be able to engage the uppermost newspaper of a stack of newspapers on the platform.

7. A machine according to claim 6, wherein the rotatable means comprises a rotary shaft and toothed wheel means arranged to make contact with said uppermost newspaper of a stack, the rotary shaft being provided with a one-way mechanism arranged so that the toothed wheel means can revolve in substantially only one direction.

8. A machine according to claim 6, wherein the second arm of said dispensing means is connected by a flexible cable to said mechanism operable from the exterior of the casing.

9. A machine according to claim 8, wherein the flexible cable is a Bowden cable.

10. A machine according to claim 6, wherein the carriage incorporates a newspaper retaining bracket which is maintained in spaced relationship above a stack of newspapers on the platform by springs part of said dispensing means except during a dispensing operation at which time temporary changes in the configuration and

disposition of the dispensing means allow the carriage to move downwardly along the guide rail means and bring the bracket into retaining engagement with the newspaper of the stack beneath the one concurrently being dispensed.

11. A machine according to claim 1, wherein a newspaper guide is movable upwardly and downwardly along the guide rail means and comprises at least one rod arranged to bear against the upper surface of a stack of newspapers on the platform to tend to prevent crumpling of a newspaper engaged by the dispensing means during a dispensing operation.

12. A machine according to claim 1, wherein the mechanism operable from the exterior of the casing is

provided with a coin-accepting mechanism.

13. A machine according to claim 1, wherein the mechanism operable from the exterior of the casing is a manually operable mechanism having a handle that is turnable by a user of the machine.

14. A machine according to claim 1, wherein means connected to said platform is provided to prevent operation of the machine when there are no newspapers on the platform.

15. A machine according to claim 1, and taking the form of a portable machine whose casing is of substantially cuboid configuration.

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