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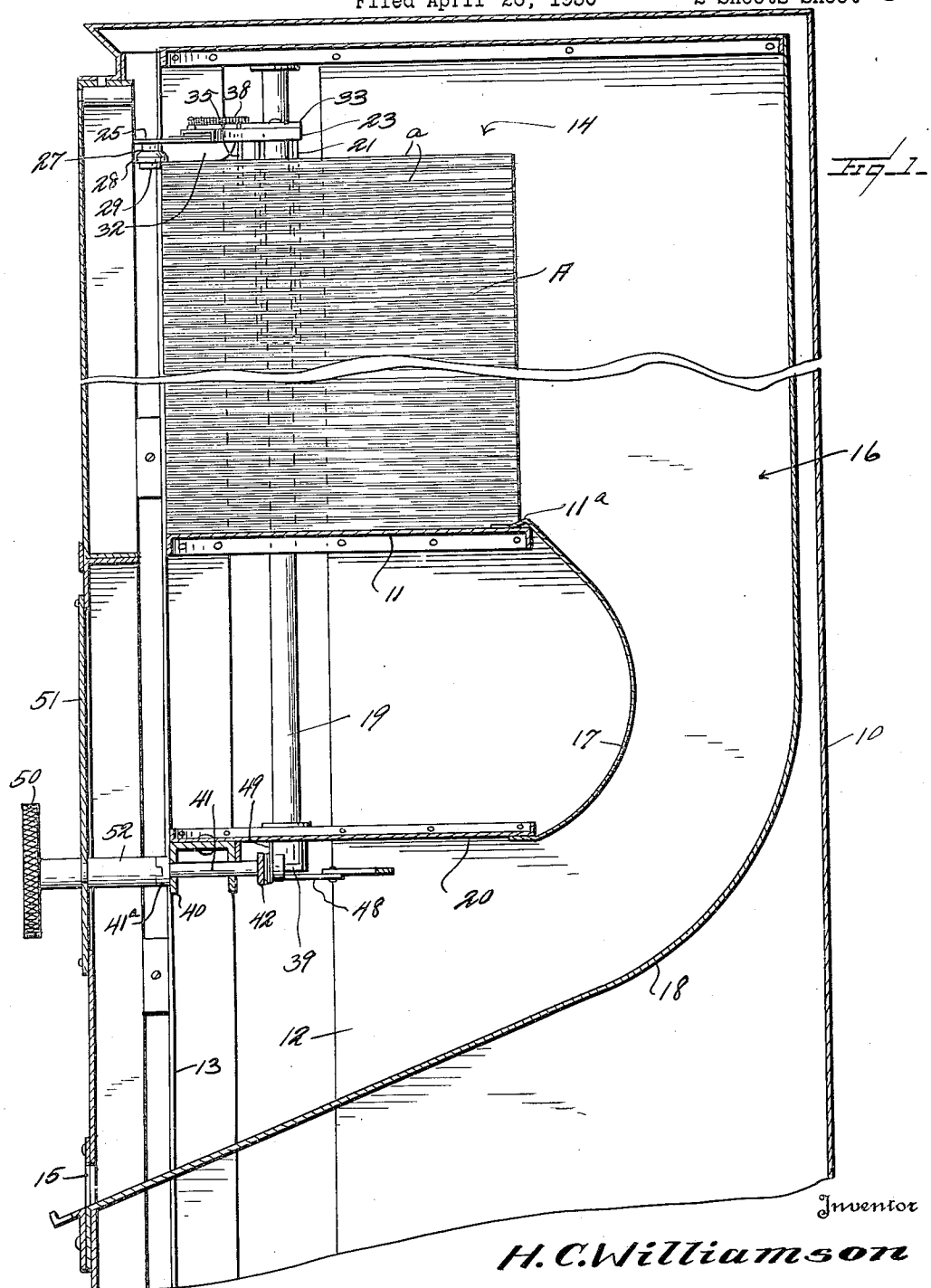
H. C. WILLIAMSON

1,946,183

VENDING MACHINE

Filed April 26, 1930

2 Sheets-Sheet 1



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Attorney

Feb. 6, 1934.

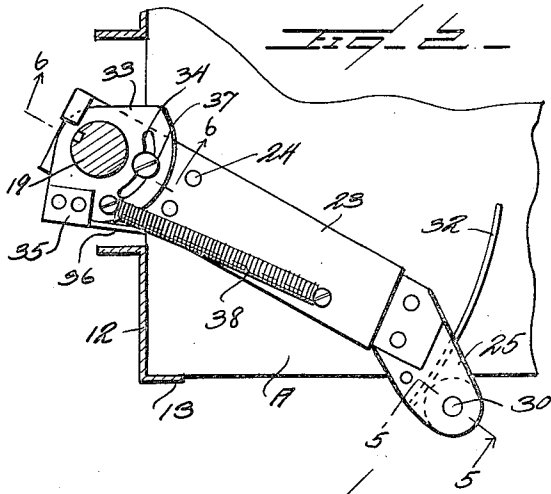
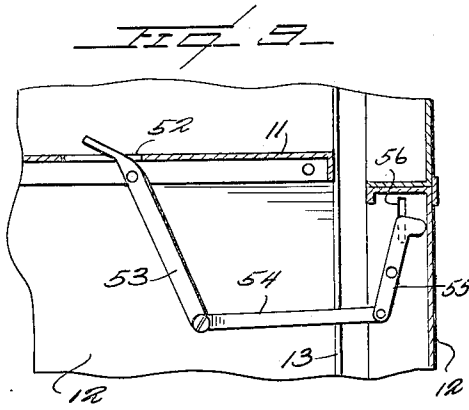
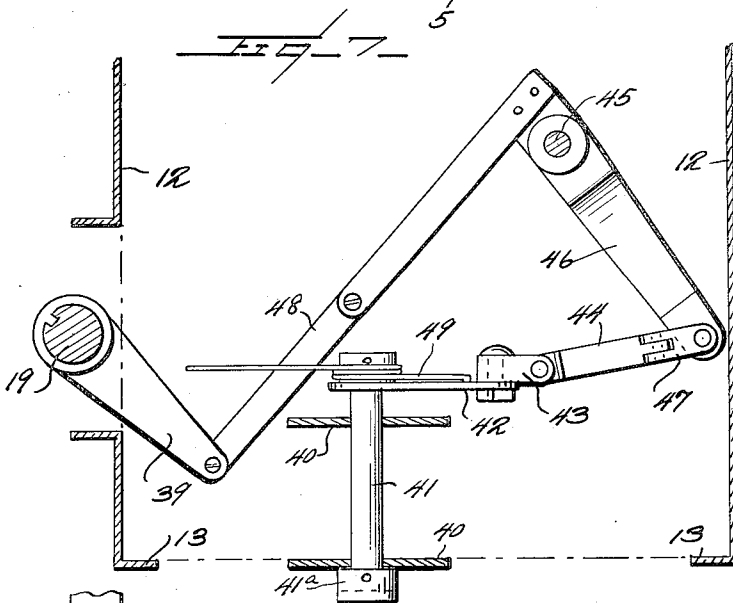
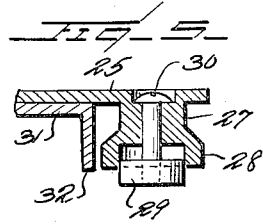
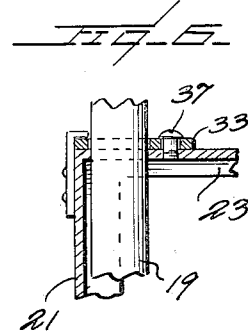
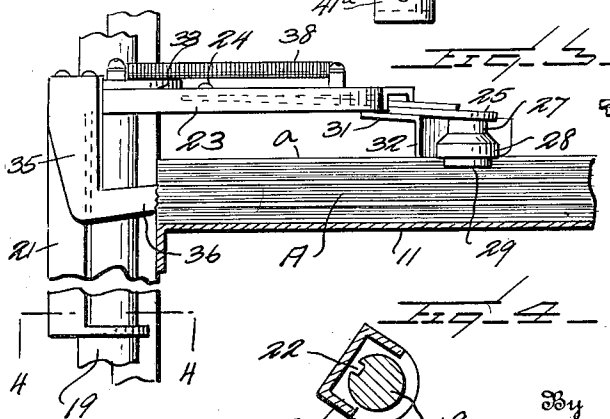
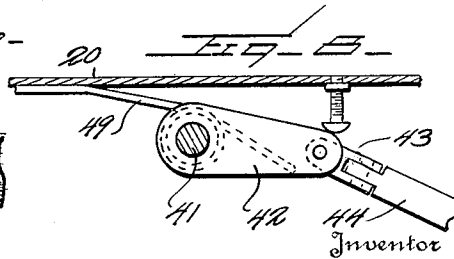
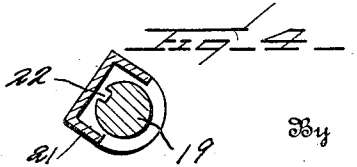
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VENDING MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,946,183

VENDING MACHINE

Henry C. Williamson, Marlin, Tex.

Application April 26, 1930. Serial No. 447,649

8 Claims. (Cl. 312—51)

This invention relates to vending machines and particularly to machines for vending stacked articles such as tablets, packages of paper, goods in flat packages or indeed any article which may be stacked one above another in a magazine to be vended one by one therefrom.

It has been suggested by the parent-teacher's association that a stock of school supplies be kept in each school to be sold to the pupils, thereby doing away with the pretended necessity of pupils going out of school to shops in the neighborhood for tablets, lesson paper and the like, a practice which may lead to the formation of ill-advised acquaintanceships, to the running up of small bills unknown to the parents and with playing slot machines to delays in the school work, and to chances of traffic accident.

The general object of the present invention is the provision of a vending machine designed to be kept in the school, the vending machine being adapted to vend school supplies upon the deposit of a proper coin or token.

A further object of the present invention is to provide a vending machine, particularly adapted for vending tablets, packages of paper and the like.

In the vending of such articles as tablets, stacked in a magazine, it has been found that if the article is vended from the lower end of the stack, the stack cannot contain at the most more than forty ordinary sized tablets of paper and operate properly for the reason that if, for instance, there are forty tablets in the magazine, the weight of thirty-nine of these tablets will have to be supported entirely by the lowermost tablet and that under these circumstances, not only does this superincumbent weight impede the operation of the machine to such an extent that small or weak children are unable to operate it successfully, but that such weight is exerted on the lowermost tablet that when the lowermost tablet is pushed out, it is very liable to be torn or otherwise injured. Of course, with each succeeding tablet which is vended, the machine becomes easier to operate and with less liability of damage to the article being vended, but at the best, such machines are limited in the number of articles which can be stacked in the magazine. It is, therefore, one of the particular objects of this present invention to provide a machine which will permit any number of tablets to be stacked within a magazine without any limitation except as regards the ordinary limitations of convenience and in actual practice, I provide a magazine which may support from sixty to one

hundred tablets in stacked formation within the magazine and vend always from the top of the stacked articles.

A further object is to provide a construction of this character which, without change, will vend tablets or other articles of different thicknesses, so that the machine does not have to be changed or adjusted for different thicknesses of tablets, or articles and furthermore which is so constructed that it will vend from the same magazine, tablets varying in thickness.

Another object is to provide a machine of this character which necessitates that the slot be just the size of the article being vended so as to prevent any more than one article passing out through the slot at one time, but in which the articles are shifted from the top of the stack rearward into a discharge chute, the front wall of which is formed by the stack of articles and by this discharge chute is conveyed downward to a discharge opening of ample size to permit the ready removal of the tablet and of such size as to permit tablets of different thicknesses to be discharged therefrom.

Another object is to provide means for preventing the articles underneath the articles being vended from being shifted by friction out of position.

Another object is to take advantage of the usually relatively heavy pasteboard backing of a tablet and the usually heavy paper smooth surfaced cover of the tablet to permit the tablet to be positively engaged by the ejecting means and permit the tablet to shift over lower tablets with the least possible friction.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through a service vending machine constructed in accordance with my invention;

Figure 2 is a fragmentary top plan view of the ejector arm and allied parts, the shaft being in section;

Figure 3 is a fragmentary edge elevation of the ejector arm and allied parts, the supporting plate being in section;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a fragmentary detailed section on the line 5—5 of Figure 2;

Figure 6 is a section on the line 6—6 of Figure 2;

Figure 7 is a fragmentary plan view of the

operating mechanism, the main shaft being in section;

Figure 8 is a section through the shaft 41 showing the arm 42 in plan;

5 Figure 9 is a fragmentary elevation showing the coin closing device.

Referring to these drawings, 10 designates the casing of a vending machine unit, it being understood that as many of these units may be used as desired or as there are articles to be vended. This unit has an area in cross section sufficient to contain therein the tablets A. Disposed at any suitable height from the base of the unit is a supporting plate 11 having its forward margin 15 downwardly flanged. This fits between lateral lining plates 12 having inturned flanges 13.

The tablets A normally abut against these flanges 13 and the magazine designated 14 and formed above the plate 11 may be of any suitable height. The front of the magazine is to be closed by a removable plate having an opening through which the tablets or other articles may be seen. This front plate may also contain advertising matter. Below the magazine the casing is also closed by a front plate which carries the coin controlled mechanism whereby the machine is operated and which plate is formed with a delivery slot 15.

The plate 11 as shown in Figure 1 does not extend back to the rear wall of the casing or cabinet but only sufficiently far back as to support a series of tablets stacked thereon so that back of the stacked tablets there is provided a space 16 constituting part of a chute, the lower portion of this chute being formed by two plates 17 and 18 which extend to and discharge through the discharge opening 15.

For the purpose of discharging the articles from the magazine 14, I provide preferably in one front corner of the magazine in a slot formed in the lining plate 12, a vertical shaft 19. This shaft extends up the full height of the magazine and also extends below the plate 11 any suitable distance. Disposed below the supporting plate 11 is a plate 20, the shaft 19 extending downward below this plate and this plate 20 supporting means for oscillating the shaft.

Mounted upon the shaft 19 is a sleeve 21 which may either wholly or partially embrace the shaft 19, this sleeve and shaft having a spline 22 whereby the sleeve will rotate with the shaft, but will freely move up and down upon the shaft. Carried by the upper end of this sleeve is an arm 23 channel-shaped in cross section, the flanges of the channel-shaped arm extending downward.

Disposed within this arm and attached by screws or like means 24 to the arm adjacent the shaft is a resilient member 25 which constitutes part of the arm. At its end, this resilient member is angularly bent as at 26 and the extremity of this resilient member carries upon it the downwardly extending tubular stud 27 enlarged at its lower end as at 28 to form a socket and disposed within this circular socket is a roller 29 mounted upon a stem 30 which extends loosely through the tubular stud. Thus this roller 29 has a slight play but is normally supported so that it projects slightly below the lower edge of the tubular stud 27. Attached to the resilient plate 25 closely adjacent the tubular stud is an angular plate 31 having a downwardly extending flange 32 which extends rearward and has its lower face rounded. This constitutes a finger or blade which bears

against the upper face of the uppermost tablet of the stack and supports the arm 23 with the roller 29 extending just below the pasteboard backing *a* of the tablet A, the tablets being so disposed within the magazine that this pasteboard back is on top in each case. By reason of the fact that only the edge of the blade 32 or finger bears against the top of the tablet, there is the least possible friction on the top of the tablet.

Loosely mounted upon the shaft immediately above the arm 23 is a plate 33 having therein an arcuate slot 34 and having attached to the front edge of the plate the inwardly projecting arm or finger 35, the extremity of which is laterally extended as at 36 and serrated. A screw or pin 37 projects through the slot 34 from the arm. Engaged at one end with this plate 37 and at the other end with a pin on the arm 23 is a spring 38.

Thus, it will be obvious that when the shaft 19 is oscillated to carry the arm toward the rear of the cabinet, the first movement of the arm will place the spring 38 under tension which will act to rotate the plate 33 and force the serrated edge 36 against a lower tablet or tablets and thus act to force the top tablet or lower tablets against the opposite side wall 12, thus holding these lower tablets against any possible movement with the arm 23. This will appear more fully when I describe the operation of the mechanism.

For the purpose of oscillating the shaft 19, I mount upon the shaft below the plate 20 the arm 39. Depending from the plate 20 are the two supporting flanges 40 within which is mounted a short section of a horizontal shaft 41 adapted to align with and be operated by the coin actuated mechanism. This shaft as illustrated is formed at its forward end face with a clutch recess 41^a. Mounted upon the shaft is a depending arm 42 and pivoted to this arm 42 for movement in a vertical plane is a connecting link 43, the outer end of which is bifurcated and pivotally engages a connecting rod 44. The link 43 has movement in a vertical plane on the arm 42 while the connecting rod 44 has pivotal movement in a horizontal plane on the end of the link 43. Thus a universal joint connection is formed between arm 42 and the rod 44. Mounted upon a vertically disposed stud 45 is an angularly bent arm 46, the extremity of which is connected to the rod 44 by a link 47 constructed in the same manner as the link 43 so that thus this arm 46 and the arm 42 are connected to each other by a linkage including universal joint connections 43 and 47.

The arm 46 constitutes a lever which extends beyond the stud 45 and the extremity of this lever is connected to the arm 39 by a link 48 which is, of course, pivoted to the extremities of the members 46 and 39. Surrounding the shaft 41 is a coiled spring 49 which acts to cause the return of the parts to their normal position and resist the rotation of the shaft 41 in one direction.

With this construction, it will be obvious that as the shaft 41 is rotated in a clockwise direction, the shaft 19 will also be rotated in a direction to carry the arm 23 rearward. Initially the roller 29 is disposed immediately in front of the forward edge of the uppermost tablet of the stack. When the shaft 19 is rotated in the direction stated, the arm 23 is carried rearward. The roller 29 engages the tablets and particularly that portion of the tablet which is reinforced by the backing *a* and as the shaft 19 is further rotated, this roller pushes the tablet rearward until the movement of the shaft 19 has been completed. This movement of the arm 23 shifts the tablet

back until its rear end approximates the rear wall of the magazine. Upon a release of the actuating mechanism, after the completion of this movement, the shaft 41 is, of course, rotated in a counter-clockwise direction, as for instance, by the action of the spring 49 through its linkage to the shaft 41 and the shaft 19 is also reversely rotated, carrying the arm 23 rearward until the blade 32 has escaped from the tablet. As soon as the blade 32 has escaped from the tablet, the tablet will tip downward in the space 16 rearward of the stacked articles and will slide downward through the chute 18 until its forward end is projected through the discharge opening 15.

It will be noted that with the tablets arranged as stated, the tablet is projected through the opening 15 with the face of the tablet upward. The discharge opening 15 is, of course, provided with a slight flange in front which prevents the complete discharge of the tablet, but permits the pupil to lift the tablet and pull it out. Of course, upon a return movement of the shaft 19, the arm 23 travels rearward over the upper face of the uppermost tablet with the roller 29 raised up within its socket so that a smooth surface is provided on the under face of the ejector as the arm 23 and allied parts may be called, until the arm has reached its initial position, whereupon the roller 29 drops downward of its own weight so as to project below the upper face of the tablet. It is also to be noted that as soon as the movement of the arm 23 is started toward the rear, the spring 38 will be placed under tension which will act to rotate the plate 33 or place a tension on this plate which will urge the serrated end 36 of the finger 35 against the edges of the tablets, forcing these tablets and particularly the next to the topmost tablet against the opposite wall, thus holding these tablets from movement when the topmost tablet is being forced rearward.

The coin controlled actuating mechanism forms no part of this invention and is not illustrated in the present drawings, a particular form of such mechanism being illustrated, however, described, and claimed in prior Patent No. 1,802,488 issued April 28, 1931.

Any suitable actuating mechanism may be used whereby the shaft 41 may be manually or automatically rotated upon the deposit of a coin.

I have simply illustrated for this purpose a handle 50 mounted upon the plate 51 which forms part of the front plate of the machine, this handle having a shaft 52 having a clutch face meshing with the clutch face 41^a. It will be understood that the only reason for having the shafts 41 and 52 formed as two sections is simply to permit the plate 51 to be taken off when occasion may require and that I do not wish to limit myself to this nor to any specific means for operating the shaft 41. Furthermore, it is obvious that I do not wish to be limited to the use of the shaft 41 as an actuating means for the shaft 19 as other means might be provided for actuating the shaft 19, but where these vending cabinets or cases are disposed one beside the other in gangs, it is obvious that the means in this case should be disposed on the front of the cabinet. Where, however, a single cabinet is used, the means for operating the shaft 19 might be disposed on the side of the cabinet. Neither do I wish to be limited to the details of construction illustrated as these may be varied in many ways without departing from the spirit of the invention as defined in the appended claims.

I have illustrated in Figure 9 the means whereby

the slot is closed after all of the articles have been vended. The slot for the introduction of the coin is designated 56. The plate 11 is slotted as at 52 and pivoted upon this plate is a lever 53, one end of which is disposed within this slot and the lower end of the lever is connected by a link 54 to a pivoted coin closing member 55. When the articles are stacked upon the plate 11, the weight of the article or articles forces the inner end of the lever 53 downward, thus shifting the member 55 out of its position in front of the slot.

As soon as the last article has been vended, the weight of these parts 53, 54 and 55 will cause the member 55 to swing to a slot obstructing position across the slot 51, thus preventing the introduction of a coin.

It will be seen that the advantages of this construction are many, the main advantage being that the magazine may contain any desired number of articles, the number being only limited by the height of the mechanism and that no matter how many articles there are contained in the magazine, there will be no more frictional resistance to the discharge of the first article, than there will be to the discharge of the last article. Furthermore, it will be noted that the same magazine and the same vending mechanism may be used for articles of different thicknesses as after the arm 23 has made its ejecting movement, it will automatically drop down upon the next article without regard to the thickness of the article vended. The construction is such that tablets varying between a maximum thickness and a minimum thickness may be readily vended. It is obvious also that the lining 12 may be readily adjusted to suit tablets of different widths, though ordinarily school tablets, while varying in thickness and in quality of paper, are made of certain standard widths and lengths. In placing the tablets in position within the magazine, the operator simply opens the front of the cabinet, then lifts the ejector arm 23 to the full height of the shaft 19, stacking the tablets within the magazine, bringing their front edges against the flanges 13 and then lower the arm on to the first tablet of the series with the roller projecting over the forward edge of the tablet. This is all that is necessary to do in filling the magazine. Then the front plate is closed and locked and the machine is ready for vending.

It will be seen that the supporting plate 11 is curved upward at its rear end and then downward as at 11^a. This I have found in actual practice to be necessary in order that a certain amount of resistance will be offered to the movement of the tablets toward the rear under the action of the ejector particularly as regards the last tablet of the series.

It will be noted as one of the advantages of the invention that the tablets are not vended directly through a slot in the front of the casing which has been the case in all vending machines known to me where the article is ejected or pushed out from the magazine. Where the article is vended directly by it being pushed out of such a slot, it is necessary that the slot should be of the same width or approximately the same width as the article being vended in order that the walls of the slot shall hold either the superincumbent articles or an article below from being pushed out at the same time. As a consequence, this slot must have a size very closely approximating the thickness of the article and thus each vending machine must be made with particular relation to the thickness of the article being vended. This is

not the case with my machine where as before stated, articles of widely differing thickness may be vended from the same machine.

- Another objection to the ejection of an article
 5 directly through a slot in the ejector is that with
 the opening so closely approximating the thick-
 ness of the article as it has to do, the article, if
 there is the least inequality in thickness, is very
 liable to be torn, scored, or otherwise marred.
 10 There is nothing in my machine which mars the
 article in any way.

The ejector does not have prongs or teeth which
 engage the upper face of the article to force it
 out through a slot which is necessary even in
 15 those machines which under some circumstances
 vend articles by pushing them from the top of
 the pile, but the article is simply shifted rearward
 against no impediment whatsoever and then al-
 lowed to drop of its own weight downward
 20 through a chute and be discharged. Furthermore
 in those machines known to me in which an ar-
 ticle is vended from the top of a pile or stack,
 there has been a slot in the front wall of the
 machine through which the article must be pushed
 25 by the ejector and obviously means must be pro-
 vided for raising the articles upward step by
 step as the ejector forces out the topmost article.
 This has necessitated a spring or weight for this
 purpose whereas in my machine no spring or
 30 weight is used, the articles resting one upon an-
 other and the ejector following down step by step
 as the articles are ejected without any shifting
 of the articles and without the necessity of any
 spring actuated means.

I claim:—

- 35 1. A vending machine including a magazine
 for stacked articles, a vertical oscillatable shaft
 extending upward through the magazine, an ejec-
 tor movable vertically upon said shaft but rotat-
 40 ing therewith and resting by its own weight upon
 the top of the stack in the magazine and follow-
 ing downwardly as the articles are discharged one
 by one from the stack, the ejector including an
 arm and a leaf spring forming part of and ex-
 45 tending beyond the arm and carrying at its ex-
 tremity a roller adapted to engage against the
 edge of the article, and a vertically disposed blade
 resting upon the top of the article.

- 50 2. A vending machine including a magazine for
 stacked articles, a vertical, oscillatable shaft ex-
 tending upward through the magazine, an ejector
 movable vertically upon said shaft but rotating
 therewith and resting by its own weight upon the
 55 top of the stack in the magazine and following
 downwardly as the articles are discharged one
 by one from the stack, the ejector including an
 arm and a leaf spring forming part of and ex-
 tending beyond the arm and carrying at its ex-
 60 tremity a roller adapted to engage against the
 edge of the article, and a vertically disposed blade
 resting upon the top of the article, the roller be-
 ing loosely mounted for slight vertical movement.

- 65 3. A vending machine including a casing, an ar-
 ticle support in the casing forming the bottom of
 a magazine on which the articles are stacked in
 superimposed relation, the rear wall of the casing
 being spaced from the rear of said support and
 forming a discharge chute, an ejector mounted
 70 within the casing resting upon the top of the stack
 and following downwardly by its own weight as
 the articles are discharged from the stack and
 having means for engaging only the topmost ar-
 ticle, manually operable means for shifting the
 75 ejector in a direction to shift said article toward
 the chute, and means acting automatically to bind

against the articles immediately below the top-
 most article to hold these articles from shifting
 movement when the topmost article is shifted by
 the ejector.

4. A vending machine including a magazine for
 stacked articles, a shaft extending upward
 through the magazine, an ejector resting upon
 the top of the stack of articles, and slidably
 80 mounted upon said shaft to descend by gravity as
 the articles are vended, the ejector rotating with
 the shaft, the ejector comprising an arm and an
 article engaging member resiliently carried at the
 end of the arm, and means for holding the subja-
 cent articles against dislodgment when the ejec-
 85 tor arm is operated comprising a plate surround-
 ing the shaft and resting upon the arm, a spring
 connecting the arm to the plate, and a member
 carried by said plate and depending therefrom
 and having a portion adapted to engage the edge
 90 of adjacent articles below the topmost article as
 the ejector arm is swung to eject the article.

5. A vending machine including a casing, an ar-
 ticle support in the casing forming the bottom of
 a magazine on which articles are stacked in su-
 perimposed relation, a shaft extending vertically
 100 through said magazine to one side of said plate,
 an ejector arm slidably mounted upon the shaft
 but rotating therewith, the extremity of the arm
 carrying a downwardly urged leaf spring, a cir-
 cular stud carried upon the end of the leaf spring,
 105 and having a socket in its lower end, a roller dis-
 posed in the socket, a vertically disposed blade
 mounted upon the extremity of the spring and
 extending toward the rear wall of the casing, the
 under edge of said blade being rounded to bear
 110 against the article, a vertical stem carrying the
 roller and extending upward through the arm
 and having a head at its upper end, the stem
 permitting a movement of the roller into or out
 of the socket, a plate loosely surrounding the shaft
 115 and resting upon the arm, and having a depend-
 ing element adapted as the plate is rotated to
 engage against the side edges of adjacent articles
 just below the topmost article, and a contractile
 spring engaging said arm on said plate and acting
 120 as the arm is shifted rearward to discharge an
 article to cause said element to bind against sub-
 jacent articles and hold the subjacent articles
 from movement, manually operable means for ro-
 tating said shaft in a direction to eject the ar-
 125 ticle, and spring means for returning the shaft
 to its initial position.

6. A vending machine including a casing, a sub-
 stantially horizontal support within the casing
 forming the bottom of a magazine in which ar-
 ticles are disposed in superposed relation, one wall
 of the casing being spaced from the rear end of
 said support and constituting a portion of a chute,
 and means operable from the exterior of the cas-
 130 ing engaging the topmost article of the series and
 movable in one direction to shift the article to-
 ward the wall of the casing, and beyond the sup-
 porting plate whereby the article will project over
 the edge of the plate, said means including a mem-
 135 ber bearing against the top of the article as the
 ejector is moved in a reverse direction and hold-
 ing the article from toppling over the edge of
 the support until the ejector has been returned
 substantially to its initial position.

7. A vending machine including a magazine for
 stacked articles and an ejector resting upon the
 top of the stack as the articles are discharged
 from the stack, the ejector carrying at its ex-
 tremity a roller engaging against the edge of the
 140 article to eject when the ejector is moved in one

direction, said roller bearing against the upper face of the next succeeding article when the first article has been discharged.

5 8. A vending machine including a magazine for stacked articles, a vertical oscillatable shaft extending upward through the magazine to one side of the articles, an ejector movable vertically upon said shaft but rotating therewith and resting by its own weight upon the top of the stack in the magazine and following downwardly as the articles are discharged one by one from the stack, the
10 ejector including an arm and a leaf spring form-

ing part of and extending beyond the arm, the leaf spring having an angularly extending portion at its end, a downwardly projecting hollow stud on said portion adapted to engage over the edge of the article to be vended, the stud being
80 formed with a socket and a roller supported within said socket for vertical movement with relation to the socket, the roller bearing against the upper surface of a lower article when the topmost article has been discharged and the ejector is
85 moving back to its initial position.

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