Dispensing Machine for Articles

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Filed Nov. 20, 1963, Ser. No. 324,919

3 Claims.

(Cl. 221—11)

This invention relates in general to a vending machine, and more particularly to an improvement of the vending machine disclosed in the Casey et al. Patent 3,016,165, which is assigned to the assignee of record, and still more particularly to a vending machine of the type illustrated in the aforesaid patent which has a materially increased capacity for articles to be dispensed before the machine needs refilling.

In the vending machine according to the present invention, four juxtaposed stacks of articles may be dispensed before the machine is considered empty. The center stacks of articles are dispensed from the machine in exactly the same manner as disclosed in the aforesaid patent, and upon substantial exhaustion of the articles in the center stacks, the adjacent outer stacks are caused to be fed to the center stacks, thereby permitting the outer stacks to be dispensed from the machine by the same mechanism employed in dispensing of the center stacks. Thus, the capacity of the machine disclosed in the aforesaid patent is substantially doubled, while no increase in size of the machine is necessary.

Accordingly, it is an object of this invention to provide a vending machine having an improved mechanism for dispensing articles.

Another object of this invention is in the provision of a vending machine capable of dispensing articles from four juxtaposed stacks of articles maintained in a magazine.

Still another object of this invention resides in the provision of a vending machine like that of the aforesaid patent which is improved to thereby essentially double the capacity of the machine without increasing the overall dimensions.

A further object of this invention is to provide a vending machine having four juxtaposed rows of articles with means for alternately dispensing the lowermost article from the center rows and means for causing the outer rows to feed to the center rows when the center rows have substantially exhausted their supply of articles.

Another object of this invention is in the provision of a vending machine having an unusually large capacity, thereby substantially reducing the maintenance required to keep the machine full of articles.

A still further object of this invention is to provide a vending machine that is inexpensive to manufacture and which has a large capacity to minimize refilling thereof. Other objects, features and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheafs of drawings, wherein like reference numerals refer to like parts, in which:

FIG. 1 is a perspective view of the vending machine according to the invention;

FIG. 2 is an enlarged front view of the vending machine showing internal operating components with the cover removed;

FIG. 3 is a transverse sectional view, taken substantially along line 3—3 of FIG. 2, illustrating the dispensing chute between the dispensing opening and the ejector dispensing position;

FIG. 4 is a perspective view of one of the outer chutes employed for retaining an outer stack of articles and for transferring the outer stack to an inner stack upon substantial exhaustion of the articles in an inner stack;

FIG. 5 is a frontal elevational view of the vending machine of the present invention with the cover removed and illustrating the magazine as completely filled and the position of the parts at this time; and

FIG. 6 is a frontal elevational view similar to FIG. 5 but illustrating the depletion of the supply of articles in the center stack and the swinging of the outer chutes inwardly to permit dispensing of the outer stacks at the inner stack positions.

Referring now to the drawings and particularly to FIG. 1, the article vending machine, according to the present invention, is generally designated by the numeral 10 and includes an enclosure or cabinet 11. The cabinet includes a rear section 12 and a front or cover section 13 which constitutes a rectangular box-shaped cabinet. The rear section includes a back panel 14, side panels 15 and 16, a bottom panel 17, and a top panel 18.

The rear section 12 is closed by the cover section 13, the latter of which includes a front panel 19 and a peripheral flange 20 that completely telescopes over the entire peripheral edge of the open side of the rear section 12. A key-operated lock 21 is provided to lock the cover section 13 in place on the rear section 12. It should be appreciated that the vending machine 10 may be mounted on a wall by means of screws or other fasteners arranged to secure the back panel 14 against a wall, or it may be supported on a stand, if so desired.

The front panel 19 of the cover section 13 is provided with a coin slot plate 22 for receiving a coin deposited by the operator. The coin is dropped into a coin chute 23 that delivers the coin to the mechanism releasing the ejector for dispensing an article from the magazine. A handle or lever 24 extends through an arcuate slot 25 in the cover 13 for operating the dispensing mechanism. A pair of spaced openings 26 and 27 are provided in the cover section 13 through which articles are dispensed upon operation of the machine. As particularly shown in FIG. 1, the openings are horizontally spaced and arranged at the lower corners of the front panel 19.

A magazine is provided within the cabinet 11 for holding four juxtaposed rows or stacks of articles 28, 29, 30 and 31. The center stacks 29 and 30 are separated by a vertically extending central partition 32, while the outer stacks 28 and 31 are held in chutes 33 and 34. A narrow flange 35 overlies the forward edge of the central partition 32 to hold the articles 36 in vertically aligned position.

Each of the chutes 33 and 34 includes opposed side walls 37 and 38, a rear wall 39 and a top wall 40 as seen particularly in FIG. 4. Additionally, the forward edges of the side walls 37 and 38 are bent over to define flanges 37a and 38a, respectively, to prevent movement of the chutes forwardly through the open front of the chutes. The lower ends of the chutes are open, and inclined supporting plates 41 and 42 are secured in the cabinet to prevent the articles from falling through the bottom of the chutes when the chutes are in their rest positions. These details are shown particularly in FIGS. 2 and 5. The supporting plates 41 and 42 are included downwardly toward the center stacks 29 and 30 to facilitate movement of the chutes upon substantial exhaustion of the supply of articles in the center stacks 29 and 30.

The chutes 33 and 34 are hinged to the top panel 18 of the cabinet by means of hinges 43 and 44, respectively, so that they will swing inwardly toward the central partition 32 upon depletion of the center stacks 29 and 30 as shown in FIG. 6. In this respect, the hinges 43 and 44 are connected to the top walls 40 of the chutes and to the underside of the top panel 18 of the cabinet, but the hinges are on opposite sides of the chutes.

The articles 36 are removed from the stacks 29 and 30 one at a time by means of an ejector 45. The ejector includes an elevated portion 46 of substantially the...
height of an article, and pockets 47 and 48 on opposite sides thereof. The elevated portion 46 serves as a pusher for pushing the lowestmost article of each stack laterally of the stack and into dispensing chambers 49 and 50. The operation of this ejector is exactly like that described in the aforesaid patent. A pin 51 is secured to the ejector and received by the lower bifurcated end of an actuating lever 53 which is pivoted to a shaft 55 on the support 54. The bumper lug 24 is mounted at the upper end of the lever 52, and oscillating movement of the lever causes shifting of the ejector 45 from its extreme right position as shown in FIG. 2 to its extreme left position. In the extreme right position as shown in FIG. 2, the machine will have just completed dispensing of an article from the stack 30, while movement of the ejector in the other direction will cause ejection of an article from the stack 29. The coin responsive mechanism is not herein described inasmuch as it does not pertain to the novelty of the present invention.

As seen particularly in FIG. 3, an article 36 upon being shifted to the dispensing area 50 tips downwardly by gravity to engage a chute guide 55 which coats with a reverse L-shaped plate 56 to define a chute 57 leading to the dispensing opening 27 in the front panel 19 of the cover 13. Similarly, when the pin 51 of the ejector enters into the dispensing area 49, an article will be delivered to a chute leading to the dispensing opening 26 in the front panel 19.

As may be seen most clearly in FIG. 6, when the height of the center stacks 29 and 30 falls below the supporting plates 41 and 42 and the lower ends of the chutes, the gravitational action of the chutes 33 and 34 will cause them to swing inwardly toward the central partition 32 to the positions as shown in FIG. 6 so that the outer stacks 28 and 31 will now feed to the center stacks 29 and 30 or to the receiving stations of the ejector 45. The plates 32 may then be dispensed from the machine. Thus, the movement of the outer stacks 28 and 31 is automatic upon substantial exhaustion of the supply of articles in the center stacks 29 and 30. Therefore, the capacity of the machine for dispensing articles is greatly increased and substantially doubled without increasing the dimensional size of the machine.

In order to guard against misalignment of the lower ends of the chutes 33 and 34 with the stacks 29 and 30, a locking plate 58 is hingedly mounted on the outer walls 38 of each chute, and normally maintained in an upright position against the inside surfaces of the opposed cabinet side walls 15 and 16 as particularly shown in FIGS. 2 and 5. A light spring (not shown) is mounted on the hinge of the plates 58 to urge a slight pressure in a direction to force the plates downwardly and away from the outer walls 38 of the chutes. When the plates 58 have dropped to the position shown in FIG. 6, it is not then possible that the lower ends of the chutes 33 and 34 will swing outwardly again toward the side walls of the cabinet. The length of the plates 58 is such as to bridge the distance between the outer cabinet side walls and the outer walls of the chutes.

While the chutes 33 and 34 are in their outer positions as shown in FIG. 5, it will be appreciated that a slight inward force is concentrated against the outer or adjacent edges of the articles in the center stacks 29 and 30. In order to prevent hanging of the articles and non-filling of the pockets 47 and 38 which would permit operation of the machine without dispensing of an article, a bumper bar 59 is secured to the upper end of the actuating lever 52 and provided with bumper lugs 60 and 61 that respectively bump brackets 62 and 63 of the chutes 33 and 34 upon reciprocation of the lever 52. When the bumper lug 60 bumps the bracket 62 attached to the chute 33, it gives the chute a slight push toward the cabinet wall 15 to provide positive clearance between the chute and the articles in the adjacent stack 29. The bumper lug 61 operates in the same manner relative to the bracket 63 which is attached to the chute 34. The bumper bar 59 and the brackets 62 and 63 are dimensioned so that the bumper lugs 60 and 61 will not engage the brackets 62 and 63 when the chutes 33 and 34 are in their unloading position as shown in FIG. 6. In this position, the lower end of the bumper bar 59 clears the upper edges of the brackets 62 and 63.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention, but it is understood that this application is to be limited only by the scope of the appended claims.

The invention is hereby claimed as follows:
1. A dispensing machine for articles comprising, a cabinet having front, back, side, top and bottom panels, a pair of horizontally spaced openings in said front panel through which articles are to be dispensed, a magazine in said cabinet having guideways for holding four juxtaposed vertical stacks of articles including two center stacks and two outer stacks, said magazine being defined by a central vertical partition separating said center stacks and outer chutes having inner and outer walls receiving said outer stacks, the inner walls of said outer chutes engaging with the guide brackets of the center stacks or the center stacks, fixed bottom walls supporting the lowestmost article of the outer stacks above the lowestmost article of the center stacks, means below said center stacks supporting the center stacks and for alternately ejecting the lowestmost article of one center stack through one opening and the lowestmost article of the other center stack through the other of said openings, and means pivotally mounting the outer chutes at the upper ends of the inner walls thereof to the top panel of the cabinet, whereby the outer chutes swing inwardly to feed the inner stacks of the center guideways upon depletion of the outer stacks in the center stacks below said fixed bottom walls.
2. A dispensing machine for articles comprising, a cabinet having front, back, side, top and bottom panels, a pair of horizontally spaced openings in said front panel through which articles are to be dispensed, a magazine in said cabinet having guideways for holding four juxtaposed vertical stacks of articles including two center stacks and two outer stacks, said magazine being defined by a central vertical partition separating said center stacks and outer chutes having inner and outer walls receiving said outer stacks, the inner walls of said outer chutes engaging with the guide brackets of the center stacks or the center stacks, fixed bottom walls supporting the lowestmost article of the outer stacks above the lowestmost article of the center stacks, means below said center stacks supporting the center stacks and for alternately ejecting the lowestmost article of one center stack through one opening and the lowestmost article of the other center stack through the other of said openings, and means pivotally mounting the outer chutes at the upper ends of the inner walls thereof to the top panel of the cabinet, whereby the outer chutes swing inwardly to feed the inner stacks of the center guideways upon depletion of the outer stacks in the center stacks below said fixed bottom walls, and means connected to said ejecting means for alternately urging said outer chutes outwardly prior to inward swinging movement of said chutes to prevent jamming of articles between said outer chutes and said central partition.
3. A dispensing machine for articles comprising, a cabinet having front, back, side, top and bottom panels, a pair of horizontally spaced openings in said front panel through which articles are to be dispensed, a magazine in said cabinet having guideways for holding four juxtaposed vertical stacks of articles including two center stacks and two outer stacks, said magazine being defined by a central vertical partition separating said center stacks and outer chutes having inner and outer walls receiving said outer stacks, the inner walls of said said outer chutes...
coacting with the partition to define the guideways for the center stacks, fixed bottom walls supporting the lowermost article of the outer stacks above the lowermost article of the center stacks, means below said center stacks supporting the center stacks and for alternately ejecting the lowermost article of one center stack through one opening and the lowermost article of the other center stack through the other of said openings, means pivotally mounting the outer chutes at the upper ends of the inner walls thereof to the top panel of the cabinet, whereby the outer chutes swing inwardly to feed the inner stacks of the center guideways upon depletion of articles in the center stacks below said fixed bottom walls, and means for positively latching the chutes in the inwardly swung position, said latching means including plates pivoted to the outer walls of said chutes that drop upon inward movement of said chutes to bridge the spacing between the chutes and the side panels of the cabinet.

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