ABSTRACT: An article dispensing apparatus for dispensing articles alternately from two tandem forward and rearward positioned stacks of articles in a single magazine including forward and rearward article funnels extending to a respective different primary release and support member together with a respective secondary release means adapted to engage the article next above the position of the lowermost article in the respective funnel, each secondary release means being disengaged to lower the next above article onto the respective primary support member in its funnel when the primary release member for the other funnel is moved to vend the lowermost article therefrom.
TANDEM VENDING MACHINE
CROSS REFERENCES TO RELATED PATENT APPLICATION

So far as is known, this invention is not related to any pending patent applications.

BACKGROUND OF THE INVENTION

Vending machines for vending articles from a magazine containing a stack of articles such as a corded stack of bottles are well known and for examples of such machines, reference may be made to the U.S. Pat. No. 3,579,342 issued to M. W. Newberry on Apr. 23, 1968 and the U.S. Pat. No. 3,377,088 to M. W. Newberry issued on Aug. 22, 1967, both patents being assigned to the Westinghouse Electric Corporation. In such machines, the lowest article in each column of a corded stack of articles is supported on a respective support and release rod, an alternate one of which is moved to a releasing position for each successive vending operation. Canned soft drinks are now very popular and because of their more compact overall dimensions it is possible to effectively double the capacity of a corded stack bottle vending machine by adapting such machine to the storage of cans in tandem forward and rearward positioned stacks of cans in each magazine in an arrangement to be controlled for vending alternately from each tandem stack during successive vending operations. The vending mechanism of this invention is a novel and uncomplicated adaptation of the previously known corded stack vending machines of the type described in the above-mentioned patents.

PRIOR ART

With the exception of the above-mentioned patents for which this invention is a modification and improvement, no prior patents are known to be pertinent.

SUMMARY OF THE INVENTION

According to the invention, the dispensing machine magazine is adapted to contain two tandem forward and rearward positioned stacks of articles preferably arranged in the so-called corded stack formation. For this purpose, respective forward and rearward funnels are provided in the lower portions of the magazine to funnel articles from each respective stack to a respective different primary support and release member or rod. An alternate one of each of the two primary support and release members is moved from a resting support position to a release position and back during each successive vending operation by any suitable operating mechanism such as either of the two operating described in the above-mentioned patents to thereby vend an article from a respective one of the tandem positioned funnels. In order to prevent the release of more than one article during each vending operation, this invention provides for a respective secondary release means or lever to be associated with each funnel adapted to engage the article next above the position of the lowest article that would be supported on the primary support means. Each of the secondary release means for a respective funnel is coupled to the primary support member associated with the other funnel in an arrangement whereby the movement of the primary support member for one funnel to a position for vending an article from that funnel is effective to move the secondary release means for the other funnel to a release position not engaging the article next above the position of support on the other primary support means and thus allowing such article to drop down to be supported on such other primary support to be vended therefrom during the next successive vending operation.

Further objects, features and the attendant advantages of the invention will be apparent with reference to the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a simplified top plan view of the magazine structure only of a vending machine incorporating the dispensing apparatus of the invention.

FIG. 2 is a section taken on the line II-II of FIG. 1 near the front of the vending magazine and showing both the primary and secondary support and release members in their normal position not allowing any articles to be vended; and

FIG. 3 is a view similar to FIG. 2 but showing the primary and secondary support members in the position assumed during a vending operation while a lowermost article is being vended from the forward magazine funnel.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 of the drawing is a simplified top plan view showing a vending machine magazine structure having sidewalks 10, 11, a front wall 12, and a rear wall 13. It should be understood that the vending machine may actually contain a plurality of such magazine structures in side-by-side relation. The spacing between the sidewalks 10 and 11 is such as to accommodate a plurality of articles such as cans 14 and 15 in two vertically positioned rows in side-by-side overlapping relation forming what is referred to as a corded stack. It will also be noted that the spacing between the front wall 12 and the rear wall 13 is such as to accommodate two corded stacks of cans in tandem forward and rearward positions with the forward stack including cans 14 and 15 in front of the rearward stack of cans including cans 16 and 17. Divider partitions 18 and 19 may be included in the magazine structure to keep the forward and rearward stacks of cans from intermixing and jamming. This invention is not related to the details of such guide structures and therefore they have been shown in a very simple form only, it being understood that various arrangements for guiding the movement of the cans in the corded stack formations may be provided by those skilled in the art.

Referring now to FIGS. 2 and 3 of the drawings, it will be seen that the lower end of the magazine in the forward part thereof, wherein the forward stack of cans containing cans 14 and 15 is located, is provided with a funnel structure including the funnel walls 20, 21 and 22. Thus, the forward stack of articles included in the cans 14 and 15 is funneled in a position including cans 23 of the forward stack resting on the support and release rod 24 in its normal position. Similarly, the lower portion of the magazine in the rearward part thereof is provided with funnel walls including the wall surfaces 25, 26 and 27 for funneled the articles in the rearward stack of articles such as the can 28 to a lowest position where it will be supported on the support and release rod 29 in its normal position. For purposes of clarity of the drawing, only cans 16, 17 and 28 of the rearward stack are shown, the remainder of the cans being omitted in both FIGS. 2 and 3. In FIG. 2, however, the can 28 is shown in the position next above the lowest position where such can would be supported on the primary support and release rod 29. FIG. 3 of the drawing shows can 28 in the lowest position after it has been released to that position to be supported on the primary support and release rod 29 in its normal position.

A secondary release member lever 30 is connected to the rearward funnel wall structure 31 by a pivot bracket 32 intermediate its length. In the normal non-vending position the primary support rod 24 and the secondary release member 30 are in the position shown by FIG. 2 of the drawing with the lower end of the release member 30 engaging the primary support rod 24. The upper end of the secondary release member 30 is shaped at 33 to engage an article such as the can 28 and hold it in a position next above the lowest position where the can 28 would be supported on the support and release rod 29 for the rearward funnel.

Similarly, a second secondary release member or lever 40 is secured to the lower end 41 of the forward funnel wall 21 by means of a pivot bracket 42 intermediate its length. The lower end of the secondary release member 40 engages the primary
support rod 29 in its normal position as shown in FIG. 2 and its upper end is shaped at 43 to engage the article 44 in the forward stack of articles next above the lowermost article 23. The primary support rod or member 24 is operably moved to the left and back of FIG. 2 of the drawing during one vending operation to release the lowermost can 23 for vending and the primary support rod 29 is operably moved to the right and back of FIG. 3 of the drawing to release the lowermost can 28 for vending. Any suitable operating mechanism (not shown) may be provided to alternately operate a selected one of the rods 24 and 29 during successive vending cycles. Two typical operating mechanisms have been described in the previously mentioned U.S. Pat. Nos. 3,379,342 and 3,337,008 to Newbery.

It is believed that the operation of the dispensing mechanism of the apparatus is now obvious but for the sake of completeness reference is made to FIG. 3 of the drawings to show how the primary and secondary release members 24 and 30 are moved during the vending operation. It should be understood that the next successive vending operation would cause a corresponding movement of the primary and secondary release members 29 and 40, respectively. Assuming that the vending machine is loaded as shown by FIG. 2 of the drawings with a lowermost article or can 23 in the forward stack and funnel resting on the support rod 24, the next vending operation would reciprocate the rod 24 to the position shown by FIG. 3 of the drawings and back to the position shown by FIG. 2. While the rod 24 is in the position shown by FIG. 3, the can 23 will drop to the vending chute (not shown). However, it will be noted that the can 50 in the position next above the lowermost article or can 23 being vended is at that time retained in the funnel structure by the supporting action of the upper end 43 of the secondary release member 40. It will also be noted that the movement of the rod 24 to the position shown by FIG. 3 has allowed the upper end 33 of the secondary release member 30 to move outward by a combination of gravity and camming function from under supporting relation to the can 28 in the position next above the lowermost position in the rear funnel for the rearward stack of articles including the cans 16, 17 and 28. Thus, the can 28 will drop down to the position shown by FIG. 3 where it is supported on the primary support member 29 for the rearward funnel. Near the end of the vending operation, the primary support rod 24 moves back to the position shown by FIG. 2 of the drawings and the upper end 33 of the secondary support member 30 moves into supporting relation with the can in the position next above the lowermost position in the rearward stack of cans or articles. When the next successive vending operation is initiated, the primary support rod member 29 will move to the right of the drawings thus allowing can 28 in the lowermost position for the rearward stack of articles to be vended, and at the same time allowing can 50 in the forward stack to drop from the position next above the lowermost position to the lowermost position where it will be supported on the primary support rod 24 in its normal position. Thus, articles in both funnel structures next above the positions of the lowermost articles are assured of being supported either on secondary or primary release means when the primary support members are in their normal positions of rest and the alternate movement of one primary support member to release for vending a lowermost article in one funnel is effective to operate the secondary release for the other funnel to release the next above article in the other funnel to be supported in the lowermost position on the other primary support member.

Various modifications will occur to those skilled in the art. I claim:

1. Article dispensing apparatus comprising, a magazine adapted to contain articles in two tandem positioned forward and rearward stacks of articles, first and second primary release and support members disposed beneath said stacks respectively and each mounted for movement between a normal position of rest in which it is adapted to support a lowermost article resting thereon and a releasing position in which it releases said article to be released, a first funnel structure in the forward part of said magazine to funnel the forward stack of articles to a position at which the lowermost article will be supported by said first support member, a second funnel structure in the rearward part of said magazine to funnel the rearward stack of articles to a position when the lowermost article will be supported by said second support member, first secondary release means associated with said first primary support member and adapted to engage the article next above the position for the lowermost article in said second funnel structure and movable out of engagement with said article next above as said first primary support member is moved to the release position to release the lowermost article supported in the first funnel structure, and second secondary release means associated with said second support member and adapted to engage in supporting relation the article next above the position for the lowermost article in said first funnel structure and movable out of engagement with said article next above as said second primary support member is moved to the release position to release the lowermost article supported in said second funnel structure whereby the alternate movement of one primary support member to release for vending a lowermost article in one funnel is effective to move downward to become the lowermost article supported by the associated primary support member.

2. The dispensing apparatus of claim 1 in which the first secondary release means associated with said first primary support member is a first lever having a remote end adapted to engage the article next above the position for the lowermost article in the second funnel structure, and the second secondary release means associated with said second support member is a second lever having a remote end normally adapted to engage the article next above the position for the lowermost article in the first funnel structure.

3. The invention of claim 2 in which said first and second pivotal levers are pivotally supported intermediate their lengths on the associated funnel structure with their respective lower ends engaging one respective primary support member and their respective upper ends adapted to engage the article next above the position for the lowermost article in the first funnel structure.

4. The invention of claim 3 in which the shape of the upper ends of each of said levers when engaging the respective article next above the position for the lowermost article is such as to provide a camming action by the weight of the articles in the stacks above for moving the respective secondary release lever out of engagement therewith when the associated primary support member is moved from the normal supporting rest position thus allowing the next above article to move downward to become the lowermost article supported by the associated primary support member.