United States Patent

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[54] **ARTICLE DISPENSER**
4 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **221/251,** 221/266
[51] **Int. Cl.** **B65g 59/06**
[50] **Field of Search** ..... 221/251-—266

[56] **References Cited**

UNITED STATES PATENTS

2,311,632	2/1943	Berger et al.	221/266X
3,379,343	4/1968	Kirkland	221/251

FOREIGN PATENTS

243,149	2/1912	Germany	221/251

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ABSTRACT: An article dispenser which will handle articles of uneven or nonuniform size and/or rough assembly is disclosed. A plate is mounted on the dispenser over the egress opening, the plate having a beveled edge which is engaged by the article as it is being dispensed. The article acts against the plate edge to raise the plate from the opening to allow the article free egress, the plate blocking any other articles. The ejector slide simultaneously lifts the stack of articles off of the one being ejected.

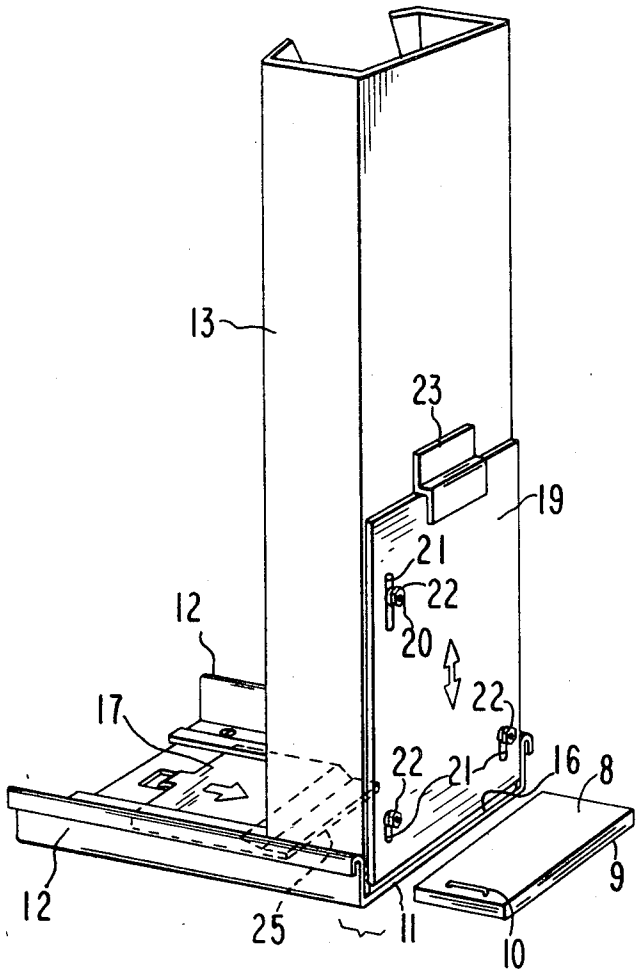
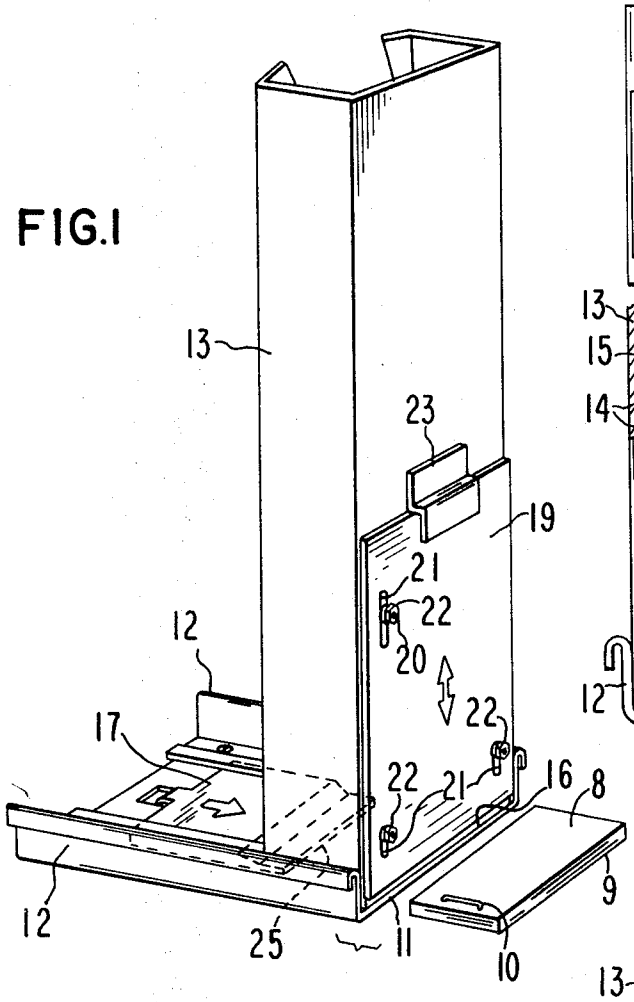


FIG. 1



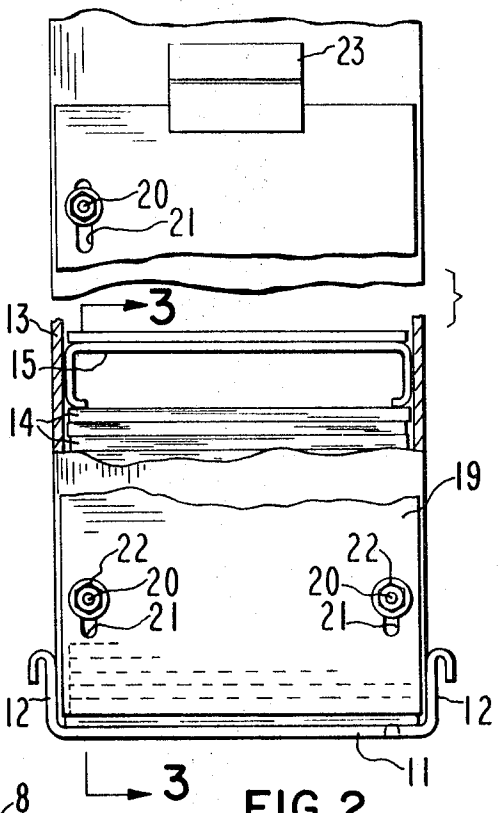


FIG. 2

FIG. 3

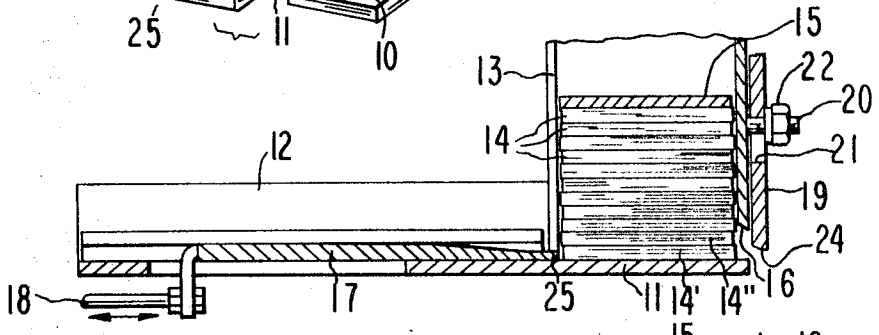


FIG. 4

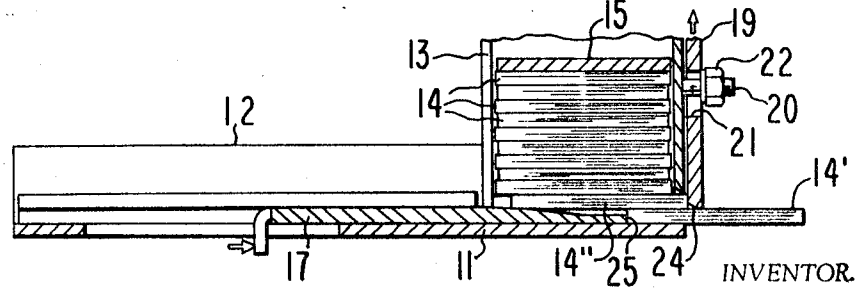
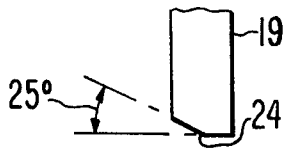


FIG. 5



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ARTICLE DISPENSER

SUMMARY OF INVENTION

The present invention relates to an improved article-dispensing machine and, more particularly, to a dispenser machine suitable for dispensing articles which are of nonuniform size and/or rough surfaced.

Generally, prior-art dispensing machines of the type to which the present invention relates, need only handle articles of neat assembly and fairly uniform sizes and shapes, for example cigarettes or candy bars. A need has arisen for a machine that will dispense articles, that, although designed to be similar in size and shape, are, in actuality, manufactured or packaged in such an imprecise manner that their shapes vary from lot to lot and individually within lots. One example of such an article is a package containing postage stamps. The postage stamps come in small flat sheets which are sandwiched between heavy paper or cardboard front and backing covers to protect the face of the stamp and the gummed back. These stamp sheets and pair of covers are assembled into a unitary booklet in an inexpensive manner, as by a single staple through one edge. Since the actual assembly of the stampbook or package is not at all critical, the stapling is not done with great care and the exact thickness of the cover material is not held to close tolerances. The staples may be tightly embedded and crimped over in certain ones of the packages and more loosely inserted in others. In any event, the thickness of the booklets varies from one to the other and from pair to pair; in addition, the staples have a tendency to snag on each other or on the covers of the other booklets. Therefore, the prior-art dispensing machines are unable to handle them properly.

More specifically, the fixed opening in the prior-art dispensing machine through which the stampbook is ejected, if dimensioned to pass the normal or standard-sized book, will not pass the book that is unusually thick or that has a staple which stands up a little higher than normal. If the opening is enlarged to take account of the largest thickness to be encountered in any one packet of any particular lot, then the opening is found to be large enough that it will pass two packets which are more tightly assembled than normal and which happen to appear together at the opening.

The present invention overcomes the aforementioned problems by providing a new and novel mechanism that operates to sense the packet size and to regulate the size of the egress opening to accommodate the extra-large packets as well as the normal and smaller than normal packets such that only one packet or stampbook is dispensed at a time. This is accomplished by means of a movable plate with one beveled edge extending over and above the egress opening. As the lowest stamp book in the stack is being urged out of the dispenser by the injection mechanism, the stampbook encounters the beveled edge of the plate and acts upon this edge to cause the plate to move so as to permit the stampbook to pass out under the plate. The next stampbook in the stack may also seek to move with the first stampbook out from the dispenser and this second book may also engage the lower beveled edge of the movable plate. However, a lifting force exerted on this second book within the dispenser by the ejection mechanism reduces the force that the second book may exert on the beveled edge of the plate. The plate resists movement by the second book and holds it within the dispenser while the first book completes its egress from the dispenser.

The features and advantages of this novel dispenser apparatus will become more apparent from a perusal of the following specifications taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of the improved dispensing machine;

FIG. 2 is a front view, partly cut away, of this dispenser machine;

FIG. 3 is a cross section view of the dispenser taken along section line 3–3 in FIG. 2 showing the machine at rest;

FIG. 4 is a view similar to that of FIG. 3 showing the machine during the period that an item is being dispensed therefrom, and;

FIG. 5 is a view showing the beveled edge of the movable plate.

The item dispenser utilized to illustrate the present invention carries postage stampbooks, although it should be understood that this invention applies equally well to dispensers of other articles. The dispenser comprises a main base **11** with side portions **12** extending along its length. An elongated, generally rectangular shaped casing or hopper **13** is mounted on the base **11**, the dimensions of the hopper being such as to accommodate the shape of the plurality of stampbooks **14** which are stacked within the hopper. The stampbooks are placed within the hopper from the top thereof and a metal plate **15** is utilized to weight down the books.

The front of the hopper **13** is provided with an opening **16** designed to permit the stampbook **14'** at the bottom of the stack to pass out from the hopper. Ejection of the stampbook is accomplished by sliding movement of the ejector slide or member **17** to the right as viewed in FIGS. **3** and **4** in response to movement of a drive member **18**. Cyclic movement of the drive member may be produced by any well-known means such as a coin-activated mechanism.

The opening **16** is substantially larger in the vertical direction than the normal thickness of a stampbook, since certain ones of the stampbooks, due to the imprecise nature of their manufacture, may be extra thick. Provision of an opening size necessary to pass such thick booklets results in an opening which will also simultaneously pass two books which are each of normal or less than normal thickness, the total thickness of the stacked pair being less than the height of the opening. Since the stampbooks will come without too much care being given to careful stapling, and since the staples may or may not stack on each other in random chance manner, the total thickness of any one book or any pair of books at the bottom of the hopper will vary considerably from batch to batch of stamp books and within batches.

A weighty plate **19** is movably mounted on the face of the hopper **13**, the plate being held in place by screws **20** extending through elongated openings **21** in the plate. The nuts **22** are backed off slightly to permit the plate freedom of vertical movement, the extent of such movement being set by the upper edge of the two lower plates **21** and by the stop **23** secured to the face of the hopper. The lower edge **24** of the plate **19** is beveled in the transverse direction as viewed in FIGS. **3**, **4** and **5**. In its lowermost position, (See FIGS. **2** and **3**) the plate **19** hangs down over the opening **16**, thus forming a slightly smaller egress opening. In operation, when the ejection slide or member **17** is moved to the right to eject a stamp book, its front edge **25** engages the side edge of the lowermost book **14'** in the stack and urges it to the right through the opening **16**. The plate **19** is so positioned that, regardless of the thickness of the booklet **14'**, the booklet will contact the back of the beveled lower edge **24** of the plate **19**. With continued movement of ejection slide **17**, the pressure exerted on the beveled edge **24** by the emerging booklets will cause the plate **19** to be raised upwardly until such time as the entire book **14'** can slip under the plate, the book **14'** then continuing to slide under the edge until the book clears the base **11** and falls free of the dispenser.

During the egress movement of the lowest booklet **14'** the next highest booklet **14''** may also be urged in the egress direction by its frictional contact with the lower book **14'** or by a snagging of the staples. The front side of this second booklet **14''** may also engage the back of the beveled lower edge of the plate **19**, and tend to raise the plate **19**, as did the lower booklet, but the plate will not rise for reasons explained below.

The front edge **25** of ejector slide **17** is made thinner than the thickness of any stamp booklet so that this edge **25** will not contact more than the lower booklet **14'**. The top surface of the slide **17** tapers gradually to a greater thickness toward the

rear of the slide **17**, the slope of this slide **17** serving to lift the second booklet **14** up and off of the lowest booklet **14** as the slide **17** and lowest booklet **14'** move to the right as viewed in FIG. **4**, thereby overcoming friction and disengaging snagged staples. Because the second booklet **14'** is thus disengaged from the lowest booklet **14'** and since the horizontal pressure exerted on the second booklet **14''** by the sloped upper surface of slide **17** is slight, the pressure exerted by the side of the second booklet on the beveled lower edge **24** of plate **19** is not sufficient to overcome the weight of plate **19** and lift it any further than the lowest booklet has already lifted it. Also, because the slope of the upper surface of ejector slide **17** is slight relative to the steeper angle of the beveled lower edge **24** of plate **19**, the second book **14''** will move up the slide **17** much more readily than it will slide under and lift the beveled plate **19**. In one embodiment, the lower edge of plate **19** has a 25° bevel while the slope of the upper surface of ejector slide **17** was 7°.

Thus, it can be seen that plate **19** senses the thickness of the booklet **14'** being ejected, is adjusted in height in accordance with the exact thickness of such booklet, and blocks the next booklet **14''** in the stack from moving out with such booklet **14'** while slide **17** lifts the upper booklets off the lower booklet being ejected, to relieve booklet **14'** of their weight. When the ejector slide **17** is returned to its normal position, the stamp books remaining in the hopper are lowered, with book **14''** taking the lowest position for subsequent ejection.

While one specific embodiment of the invention has been illustrated and described in detail herein, it is obvious that many modifications thereof may be made without departing from the spirit of the invention as recited in the appended claims.

I claim:

1. A dispenser machine including a hopper adapted to hold a plurality of articles, said hopper having an egress opening through which said articles may be dispensed and an ejection member for engaging the bottom one of the stacked articles and movable for urging said bottom article out through said egress opening, wherein the improvement comprises a plate mounted on said hopper over said opening and being movable in the vertical direction, the lower edge of said plate having a bevel facing said egress opening, said bottom article engaging the bevel of said plate as the article passes out the opening and lifting said plate so as to pass under the plate.

2. A dispenser as claimed in claim **1** wherein said ejection member has a front edge which contacts said article and a sloped upper surface which engages the underside of the article immediately above said bottom article and relieves the weight of the stack of articles from said bottom article.

3. A dispenser machine including a hopper adapted to hold a plurality of articles, said hopper having an egress opening through which said articles may be dispensed, and an ejection member for engaging the bottom one of the stacked articles and movable for urging said bottom article out through said egress opening, wherein the improvement comprises a sloped upper surface on said ejection member adapted to move under the underside of the article immediately above said bottom article and relieve the weight of the stack of articles from said bottom article.

4. A dispenser machine including a hopper adapted to hold a plurality of articles in a stacked relationship, said hopper having an egress opening in one side thereof through which said articles may be dispensed, an ejection member having a front edge for engaging the bottom one of said stacked articles and having a thickness which increases gradually away from said front edge to produce a sloped upper surface on the ejector member, the member being movable for urging said article out through said egress opening, a plate mounted on the side of said hopper over said egress opening, the plate being mounted so as to have a limited movement in the vertical direction, the lower edge of said plate having a bevel facing said egress opening, and means for activating said ejection member to push its front edge against the lowest article in the stack to urge the article out of the egress opening, said articles engaging the beveled edge of said plate, continued pressure of said articles against said beveled edge raising said plate to permit said article to pass out under the plate, said ejection member meanwhile moving under the article in the stack immediately above said bottom article, the sloped upper surface of said ejection member lifting the stacked articles off of said bottom article, said plate serving to block the egress of said articles other than said one bottom article.