May 24, 1960 A. MULLER 2,937,785

ARTICLE RELEASE MECHANISM

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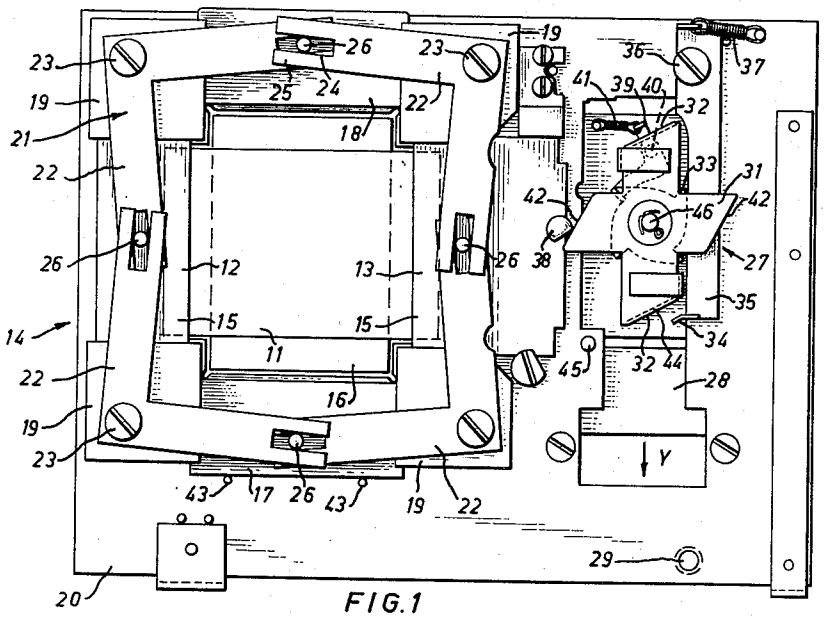


FIG. 1

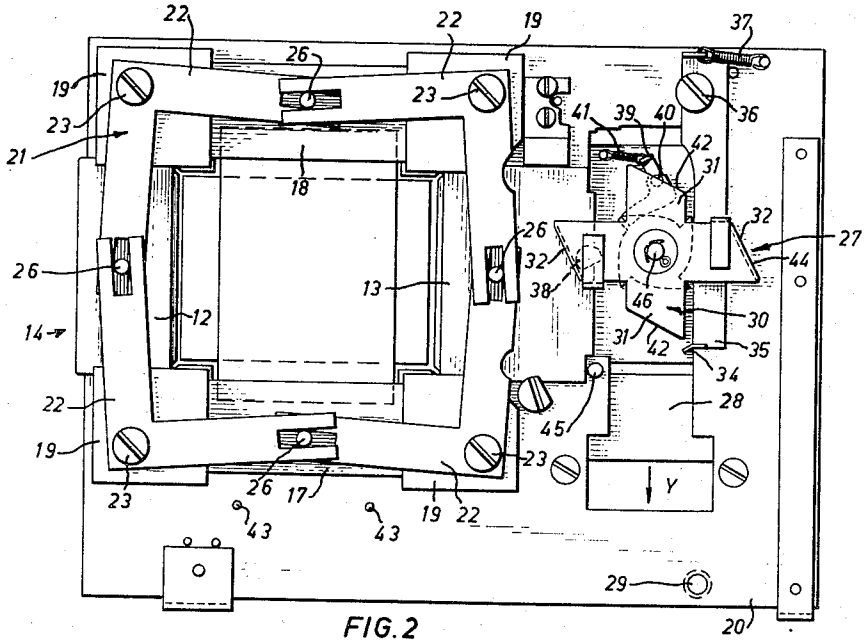


FIG. 2

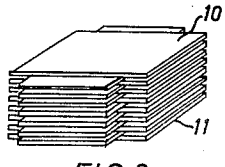


FIG. 3

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ARTICLE RELEASE MECHANISM

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This invention relates to article release mechanism particularly for use in vending machines and the like.

Prior postage stamp vending machines dispense a folded card of rectangular form enclosing the purchased stamps. On occasion, more than one card of stamps may be obtained for one purchasing sum due to imperfect release of the vended article from the article storage magazine.

It is proposed, according to the invention herein, to stack rectangular cards of equivalent articles in alternate arrangement whereby adjacent cards are dissimilar dimensionally with respect to a feeding mechanism to confine the release of said cards to one only during a single release cycle.

It is another object of the invention to provide release mechanism for alternately arranged or "cross-stacked" rectangular articles in a magazine adapted to release no more than one article during each release cycle.

With these and other objects in view, the invention generally comprises a first pair of oppositely disposed lateral support plates movable toward and away from one another; a second pair of like support plates disposed substantially at right angles to said first part; linkage operatively connecting said support plates whereby inward motion of one pair causes outward motion of the other pair; and means limiting the motion of said plates permitting release of a cross-stacked card therethrough at one position of said plates and support of the remaining cards of said stack by the innermost pair of said plates at said position and the alternately arranged card thereon, the latter being released at another limiting position of said plates at which the remaining cards are supported by the following alternately positioned card on the then other innermost pair of said plates.

Other objects of the invention will be appreciated by a study of the following specification taken in conjunction with the accompanying drawings.

In the drawings:

Figure 1 is an underside view of cross-stacked article release mechanism of the invention in one release position;

Figure 2 is another underside view of the mechanism of Figure 1 showing another release position thereof; and

Figure 3 is a perspective view of cross-stacked rectangular articles according to the invention.

In the drawings, a plurality of cross-stacked rectangular articles **10** are shown in Figure 3 as they would be stacked in an article storage magazine of a vending machine according to the invention and wherein the lowermost rectangular card **11** would lie across a first pair of oppositely disposed lateral support plates **12** and **13** shown in their innermost position in Figure 1, the latter being an underside view of article release mechanism **14** of the invention. It will be observed that the articles **10** and the rectangular card **11** have a dimension of greater length than width containing supportable areas **15** defined by the portion thereof projecting beyond the

width dimension of an adjacent right angularly disposed or cross-stacked similar rectangular card **16**. It will be apparent that all of the articles above the article **11** will be supported by the support areas of the card **11** in engagement with the support plates **12** and **13** as shown in the operative position shown in Figure 1. A second pair of support plates **17** and **18** are disposed in an outward position for clearance with the length dimension of the card **16** and cards thereof likewise disposed.

Support plates **12**, **13**, **17** and **18** are slidably supported in guide ways **19** fastened to the base plate **20** and are operatively related by means of the linkage **21** comprising a plurality of right angular arms or levers **22** pivoted at the corners by the pivot screws **23** and extending for engagement by way of guide slots **24** on the free ends **25** thereof with an actuating pin **26** extending downwardly from each support plate. Accordingly, actuation of one of the support plates inwardly will effect a corresponding inward motion of the opposite support plate and corresponding outward motion of the other pair of support plates disposed substantially at right angles thereto. Therefore, assuming actuation of one of the support plates effecting outward motion of the first pair of support plates **12** and **13**, it will be apparent that the card **11** will be released when the first pair of support plates reach the limit of outward motion permitting clearance with the length dimension of the card **11**. Simultaneously during outward motion of the first pair of support plates, the second pair **17** and **18** move inwardly to a position supporting the supportable area of the card **16**, it therefore being apparent that by the support plates and linkage mechanism release device as set forth, no more than one card can possibly be released during any one release cycle.

In Figure 2, the same components are illustrated in a position immediately after the discharge of the card **11**. The manner of actuating one of the support plates, for example, the support plate **13** in the mechanical arrangement shown, is illustrated by way of the actuating mechanism **27** operative from the actuating bar **28** slidable in the direction of the arrow Y over the upper surfaces of the base plate **20**. In operation, the actuating bar **28** is moved in the direction of the arrow Y to a limiting position determined by a stop **29** and then allowed to return to a normal or retracted position shown in Figures 1 and 2 under action of a retracting spring (not shown). During the returning action, the rotor member **30** comprising the alternately arranged extending cam arms **31** and retracting cam arms **32** is caused to rotate in clockwise manner by engagement of the lower toothed wheel **33** thereof with the pawl **34** of the pawl arm **35** pivotally mounted by screw **36** to the base plate **20** and normally biased inwardly under action of spring **37**. Accordingly, upon the return motion of the actuating bar **28**, pawl **34** coming into engagement with a tooth **33**, causes clockwise rotation of the rotor **30** during the retracting motion disposing one of the cam arms in a position for engagement with the cam bar **38** rigidly fastened to and extending downwardly from the support plate **13**.

A ratchet arm **39** pivotally mounted as at **40** to the actuation bar **28**, is effective under action of its biasing spring **41** to prevent counter-clockwise rotation of the rotor while the cam arms are in engagement with the cam bar **38**.

The inclined cam surfaces **42** of cam arms **31** will move the cam bar inwardly upon engagement therewith and effect inward motion of the first pair of support plates **12** and **13** and simultaneous outward motion of the support plates **17** and **18**, the limit of outward motion of the second pair of support plates being determined by the stop pins **43** extending downwardly from

the base plate 20 as indicated in Figure 1. Cam arms 32 are formed to clear the upper surfaces of cam bar 38 to permit engagement of the downwardly extending cam flanges 44 of arms 32 with the cam bar 38. As indicated in Figure 2, the outward limit of motion of the first pair of support plates 12 and 13, when moved outwardly by the retracting cam flanges 44 of the retracting cam arms 32 in engagement with the cam bar 38, is determined by a stop pin 45.

It should be appreciated that the rotor member 30 is rigidly connected to the ratchet 33 but freely rotatably mounted on the shaft 46 extending downwardly from the actuating bar 28 and that the rotor is maintained in a position of actuation during retracting motion by the pawl 39 in engagement with a ratchet tooth 33.

While this disclosure, for clarity, has set forth the application of the invention to a plurality of cross-stacked articles of identical nature, each of which is rectangular and flat, it will also be understood that the invention may be applied to the support of articles having opposed projections disposed in cross-stacked relationship.

For example, a square, flat article embodies projecting corners and such articles may be arranged in cross-stacked relationship wherein the projecting corner portions obviously provide projecting supportable areas. Since the apparatus of the invention releases the article downwardly, it will be apparent that the articles may be of varied thickness. Accordingly, the thickness limitation of prior article release mechanisms is obviated by the present construction.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be appreciated by those skilled in the arm that various changes and modifications can be made therein without departing from the essence of the invention and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

What I claim as my invention is:

1. Release mechanism for cross-stacked identical rectangular flat articles of greater length than width and comprising, in combination: right angularly disposed pairs of opposed support plates; means slidably guiding said support plates between inward and outward limiting positions corresponding to positions of clearance respectively with the width and length dimensions of said articles; linkage means operatively relating said support plates and effecting outward motion of one pair of support plates corresponding to inward motion of the other pair of said plates; a longitudinally reciprocable actuating member having a path of motion at right angles to the motion of one of said support plates and adjacent thereto; means on said member urging said one support plate inwardly and alternately withdrawing the latter outwardly upon successive reciprocating actuation thereof; the said means on said actuating member comprising a rotor element having alternately arranged inwardly and outwardly acting cam arms; and means for rotating said rotor a predetermined increment upon moving said member in one direction.

2. Release mechanism for cross-stacked identical rectangular flat articles of greater length than width and comprising, in combination: right angularly disposed pairs of opposed support plates; means slidably guiding said support plates between inward and outward limiting positions corresponding to positions of clearance respectively with the width and length dimensions of said articles; linkage means operatively relating said support plates and effecting outward motion of one pair of support plates corresponding to inward motion of the other pair of said plates; a longitudinally reciprocable actuating member having a path of motion at right angles to the motion of one of said support plates and adjacent thereto; means on said member urging said one support plate inwardly and alternately withdrawing the latter outwardly upon successive reciprocating actuation thereof; said means on said actuating member comprising a rotor element having alternately arranged inwardly and outwardly acting cam arms; and means for rotating said rotor a predetermined increment upon moving said member in one direction; and means on said one support plate engageable successively by one of said cam arms upon each motion of said member in the opposite direction.

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