

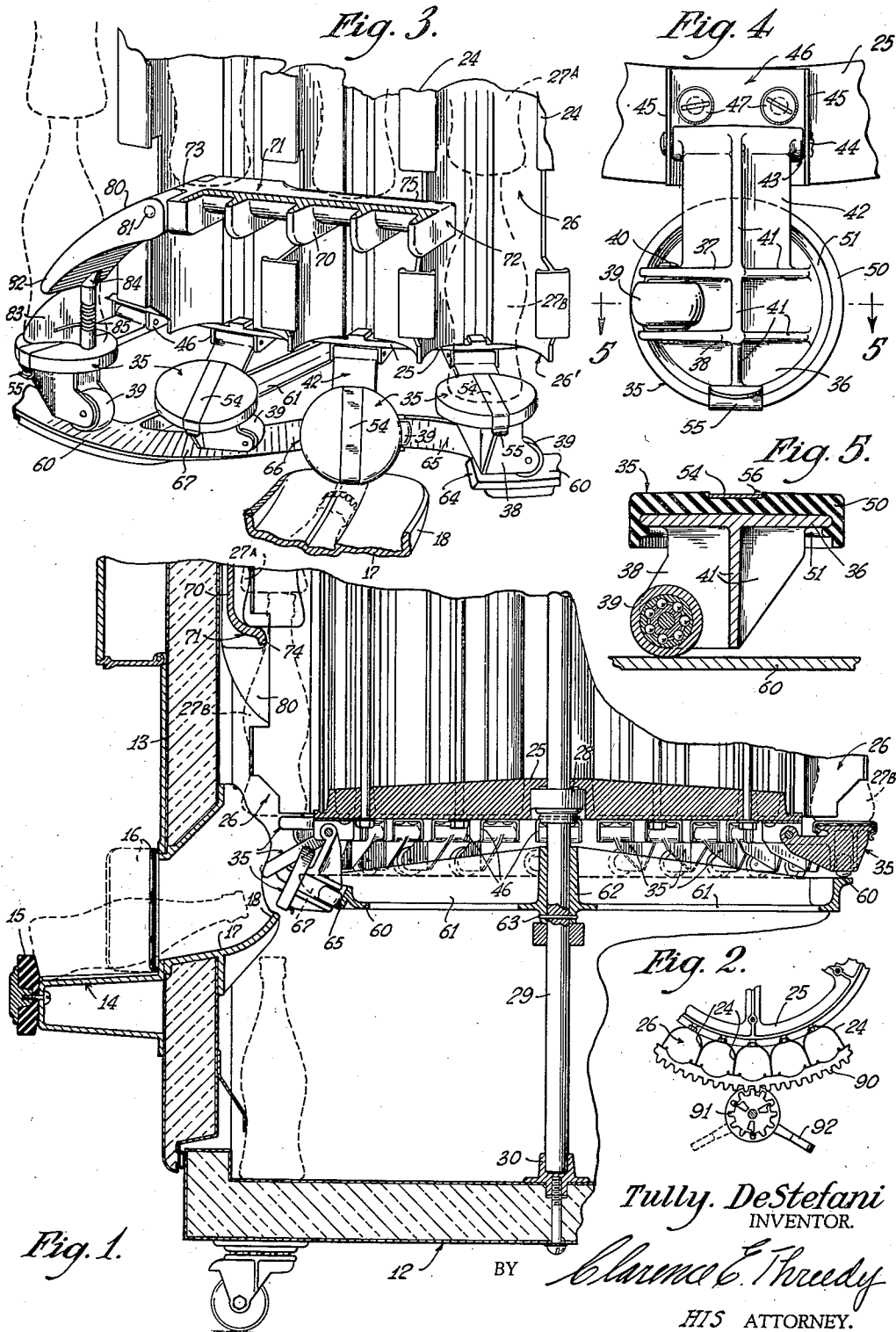
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DISPENSING APPARATUS

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DISPENSING APPARATUS

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16 Claims. (Cl. 312—36)

This invention relates to improvements in dispensing apparatus and has as one of its principal objects the provision of dispensing mechanism including a rotating drum with vertically extending article compartments around its periphery and pivoted carriages underlying each compartment to support the bottommost article of a stack as the carriage rides around a track responsive to rotation of the drum, the track having an interrupted portion constituting a discharge station which permits a carriage to drop and discharge the bottommost article resting thereon.

Another object is the provision of means for sustaining the remaining articles in a compartment of the drum in the region of the discharge station when the lowermost article is discharged by dropping of the carriage.

A further object is the provision in dispensing apparatus of the type characterized, of means for lowering articles from a higher level to a lower level onto empty carriages.

Still another object is the arrangement of a carriage track so formed that a pivoted or dropped carriage will be restored to a normal article-supporting position when the carriage is moved past the discharge station by subsequent rotation of the magazine drum.

Still other objects reside in details of construction of the movable bottom or carriage members, with particular reference to the roller means thereon, means providing a resilient seat for the articles, and means disposed beneath said articles to facilitate sliding movement of the article from the dolly or carriage when the same is tripped or lowered in dispensing operation.

Still other objects reside in specific features of construction of the track means upon which the dollies or carriages ride, and the formation of the track by means of which the carriages are restored from a tripped or dropped position to a normal article-sustaining position.

Still further objects reside in specific details of construction and operation of the article-sustaining and lowering means, whereby articles above a certain level in the drum are temporarily sustained against descending movement during their transit past a discharge station, such articles thereafter being guided in sequence to a lower level.

Other novel aspects of the invention reside in certain details of construction, operation and arrangement of the preferred embodiment herein-after to be described in view of the drawing, in which:

Fig. 1 is a fragmentary vertical section through a dispensing machine showing the lower part of a magazine drum incorporating features of the invention;

Fig. 2 is a fragmentary horizontal section through the drum and the peripheral drive means therefor;

Fig. 3 is an enlarged perspective detail of the dispensing station and article carriages on the magazine drum, together with the article-lowering means;

Fig. 4 is an enlarged bottom plan view of one of the dollies or carriages; while

Fig. 5 is a vertical section through the dolly along line 5—5 of Fig. 4.

The present application constitutes a continuation in part of my copending United States application, Serial No. 198,155 (see also application, Serial No. 198,157) (issued October 22, 1940, as Patent No. 2,219,206), wherein there is described a dispensing apparatus including certain features of construction disclosed herein.

The present invention is illustrated herein as a part of a coin-controlled dispensing apparatus adapted to dispense packaged items of various kinds including food stuffs, ice cream, and bottled goods including beverages, milk, and the like.

The dispensing apparatus includes a cabinet 12 having a door 13 constituting a control panel, upon which is mounted a discharge tray or basket 14 provided with a resilient article stop 15 at its outer end and communicating at its inner end through normally closed yieldable gate means 16 with a discharge chute 17 having its inner end or mouth 18 positioned opposite the article dispensing or discharge station of a drum type magazine dispensing mechanism (Fig. 3 also).

A magazine drum suitable for use with the present invention includes a plurality of vertically extended partition members 24 clamped between opposite axial end castings 25 constituting the bottoms of a skeletonized drum with the partitions 24 arranged about the periphery of the drum and mutually serving to provide adjacent vertical article compartments 26 in which articles such as bottled beverages 27a—27b are stacked one upon another. In the drawing, only the bottom casting 25 is shown, a similar casting being provided at the upper end of the drum, and both castings having some form of bearing means such as the roller bearing 28 (Fig. 1) supporting the drum for free rotation about a vertically extended shaft 29 having a lower end portion secured in a stanchion 30 on the bottom of the cabinet 12 at a distance sufficiently below the bottom drum casting

to provide a precooling storage compartment opposite the lower axial end of the drum.

The casting at the upper axial end of the drum is particularly shaped to provide a maximum clearance between this end of the drum and the upper portion of the cabinet to accommodate certain cooling mechanism (not shown) in the manner set forth in the aforesaid copending application to which reference is invited for further details of construction of the skeletonized drum and the novel mounting means therefor.

It is to be understood, however, that any type of vertical rotatable drum may be employed with the present invention so long as such drum has vertically extensive article compartments open at their bottoms, the invention being particularly concerned with the provision of means for temporarily closing the said open bottoms, in a manner of speaking, to support a stack of articles in the corresponding compartment, the means being movable to withdraw support so that the bottom-most article can gravitate from the compartment, the invention further providing, as heretofore particularized, means for temporarily sustaining the remaining articles in a compartment when the bottom is opened or the bottom support temporarily withdrawn.

The several vertical article compartments 26 of the drum each have open bottom portions 26' (Fig. 3, lower right), and beneath each of these open bottoms there is arranged a movable closing means in the form of a traveling bottom member or carriage 35. These traveling bottom members are variously referred to herein as carriages or dollies, and each of the same is preferably constructed in the nature of a casting having a platform portion 36 (Figs. 4 and 5 also) having a pair of depending spaced legs 37 and 38 between which is mounted a roller 39 on pin means 40 seated in the legs. Extending laterally from the leg members 37 and 38 and connected therewith by reinforcing ribbing 41, is a horizontal arm 42 having a lateral bore 43 at its free end and through which there is extended a pivotal-mounting pin means 44 seated in the spaced arms 45 of a bracket 46 secured by means 47 to the under side of the bottom drum casting 25 in positions beneath each of the vertical magazine compartments.

The dollies or carriages 35 are thus mounted for pivotal movement into and out of raised position beneath the open bottom portions of corresponding magazine compartments 26, and in their raised positions their respective platform portions 36 are disposed in a substantially horizontal plane so as to support articles in the compartments, provided there is some form of support beneath the several dollies. The invention provides a novel supporting track means to be described hereinafter.

It is contemplated that articles in the several magazine compartments will be lowered from higher levels into the corresponding dollies or carriages, and in order to provide a yieldable landing surface on the several carriages to break any shock sustained by the articles, there are provided caps 50 (Fig. 5) of resilient material, such as rubber or the like, the cap in the present embodiment being of cup-like form with an inner flange 51 adapted to underlie the under side of the platform 36 of the carriage to hold the cap in place.

In order to expedite the dispensing action of the carriages when the same are released from article-supporting position, as will be described

hereinafter, each of the resilient cap members 50 is provided with a gliding strap 54 in the nature of an elongated strip of metal having its opposite end portions turned back to provide clamping formations 55 turned around the bottom rim or periphery of the corresponding cap beneath the carriage platform 36. An important feature of the gliding strap arrangement is the provision of a diametric groove or cut 56 across the top of each cap and into which the corresponding gliding strap is closely fitted, the portions of the groove or cut toward the center of the cap being slightly deeper so that the strap may be sunk or depressed a very slight amount beneath the surface level of the resilient cap in its central region, the purpose of this arrangement being to assure a maximum resilient landing surface exposed to the bottom of a descending article as it lands on the cap. It is also important to observe that in the dispensing operation of the carriages, that is, when they drop, the article supported thereon will be tilted by means hereinafter to be described so as to rock such article onto a bottom edge portion thereof, such edge portion riding on the strap 54 with the least amount of friction. By this means, the discharge of the article starts at once upon release of the carriage, and the discharging movement is rapid and positive due to the gliding surface especially provided by the strap 54.

Means for supporting the several carriages in normally raised article-supporting position includes a substantially annular track 60 forming the rim of a casting including spoked member 61 radiating from a hub 62 which embraces the vertical shaft 29 immediately below the bottom axial end plate or casting 25 of the magazine drum, the hub portion 62 being held immovable on the shaft 29 by a transverse stay pin 63 extended there-through.

The track 60 is dimensioned to underlie the roller portions 39 of each of the carriages in their cycle of movement with the rotatable drum or magazine structure so that the carriages are supported in upright or horizontal position beneath their corresponding compartments, closing the open bottom portions 26' of such compartments and thus constituting a releasable or movable bottom support for the several compartments.

Means for effecting release of each of the movable bottom portions or carriages 35 in sequential order as the magazine drum rotates in a given direction, includes the formation of an interruption at the point 64 (Fig. 3) of the track 60 so as to remove support from beneath the carriages moving over that point. The interrupted section of the track is positioned substantially opposite the mouth 18 of the discharge chute 17 so that as the dispensing drum is rotated in steps in a particular direction (toward the left in Fig. 3), the dollies or carriages will drop one by one and effect gravitating movement of any article thereon into the chute 17 for discharge through the gate 16 onto the tray structure 14. It may be pointed out here that the invention further provides means for temporarily sustaining articles in the several compartments resting upon a lowermost article which is discharged by dropping of the movable bottom or carriage member until such articles have passed the dispensing station.

Means for automatically restoring the several dollies to normal article-supporting position includes the provision in the track structure 60,

and particularly in the interrupted portion thereof, of a translatable track section having one endwise section 65 tilted in a vertical sense in the region near the end point 64 of the main track, this offset section 65 being so disposed (Figs. 1 and 3) that as each dolly drops off the end point 64 of the main track, the roller portion 39 thereof will bear against the upright or tilted track section 65; and as the drum continues its unidirectional movement, the dolly will be gradually pivoted back into normal horizontal position as a result of the translatable curvature of the restoring track section by means of which the substantially upright or vertically tilted restoring section 65 gradually curves back in the region 66 into a horizontal plane substantially at the point indicated at 67.

In order to sustain the articles at higher levels in each of the compartments as the several compartments pass before the dispensing station, there is provided an article-sustaining means comprising a bracket structure 70 in the form of a cast ribbed plate supported in a vertical plane behind the door 13. This plate, it may be observed, also constitutes a mounting for a coin-controlled mechanism not shown herein but described in greater detail in the aforementioned copending application. In the present case, the bracket plate 70 may be of any desired form and supported by any suitable means, and in the present embodiment the article-sustaining means is desirably formed as a part of this bracket plate and includes a horizontally extending elongated ledge formation 71 having a receiving edge portion 72 disposed substantially above the track interruption 64, the opposite or discharge end 73 of the sustaining ledge terminating at a point substantially above the restoring point 67 on the translatable track.

The sustaining ledge 71 is disposed at a height above the carriages to underlie the bottoms of articles immediately above the lowermost articles resting upon carriages in each compartment. Thus, when the drum is advanced, as will appear from an inspection of Fig. 3, a second level article, such as the dotted line fragment indicating the bottom portion of a bottle 27A, approaches the end 72 of the ledge 71; such article or bottle is supported by the underlying article or bottle 27B long enough to assure that the advancing bottom edge of the upper bottle will ride onto the horizontal edge of the sustaining ledge, this provision being the result of the particular location of the track interruption 64 with respect to the receiving or leading edge 72 of the sustaining ledge.

In the present dispensing apparatus, the inner vertical surface portions of the sustaining ledge adjoining the receiving end 72 are suitably chamfered to provide a gliding surface 74 (Fig. 1) so positioned with respect to the upper portions of the bottommost article or bottle 27B as to tilt the latter inwardly toward the drum as the latter completes movement of the article to be dispensed toward the dispensing station in such manner that as soon as the corresponding dolly drops, the article to be dispensed will already be in an inclined attitude preparatory to gliding downwardly along the gliding strap 54 and into the chute 17.

Similarly, the inner edge portion 75 (Fig. 3) of the sustaining ledge adjoining the top gliding surface and the inner vertical surface is chamfered to assure smooth gliding action between the same and the bottom of the advancing article.

Means for automatically effecting a lowering

of articles from the higher level on the sustaining means to a lower level, and onto a restored dolly or carriage, includes a restoring ramp 80 pivotally attached as at 81 to a projection at the end 73 of the sustaining ledge or bracket. This ramp is so curved and disposed as to have its lower terminus 82 positioned substantially above a fully restored carriage or dolly advancing from the translatable track section 67 so that when the drum is subsequently advanced after each dispensing operation, the temporarily sustained bottles are advanced step by step toward the ramp 80, such bottles gravitating down the ramp and onto the restored dollies therebelow. Further guiding the automatic lowering of the bottles from the sustaining ledge is a fin 83 pivotally mounted on vertical pin means extended into the lower inner side of the ramp 80 as at 84, there being a coil spring 85 embracing the pin means and bearing against the fin to urge the latter toward the drum, the fin being so curved and disposed as to engage the outer edge portions of a descending article and guide such article into centrally seated position on the restored dolly.

Any suitable means may be provided for advancing or rotating the magazine drum, and for purposes of illustration I have shown to reduced scale in Fig. 2 a fragment in horizontal section through the drum to illustrate one form of drum moving means, which means includes a ring gear 90 preferably formed in segments and extending around the drum in its upper region and secured to the outer portions of the several compartment partitions 24, preferably in the manner set forth in the above-mentioned copending application.

The dispensing apparatus includes a coin-freed control (not shown herein) preferably mounted on the upwardly extending portion of the mounting bracket plate 70 referred to in conjunction with Fig. 3, said control including a driving pinion 91 meshing with the ring gear 90 on the drum and arranged for unidirectional step by step movement through the agency of a special coin-coupled driving mechanism operated by a control handle 92 which is moved through one complete oscillation to effect a partial advance of the pinion 91 with a corresponding movement of the magazine drum a distance equivalent to that between any two adjoining magazine compartments.

A brief summary of the operation of the device set forth herein includes the manipulation of the control handle 92, in the manner set forth, and corresponding advance of the drum to move one of the dollies 35 over the track interruption 64 whereby support of the carriage or dolly is removed and the dolly will drop into lowered position opposite the discharge chute 17, as seen in Figs. 1 and 3, any article such as a bottle on said carriage gravitating into the chute and onto the discharge tray 14.

Any article or bottle above the aforesaid discharged bottle, and supported thereby previous to the discharge, will have moved onto the temporary sustaining ledge 71 meanwhile, that is, just prior to the time the corresponding dolly approaches the end 64 of the track 60. Subsequent advancing movement of the drum will move the temporarily sustained articles along the ledge 71 toward the ramp 80, and at the same time the lowered dollies will ride over the translatable track section 65—66—67 and thus be automatically restored to horizontal or article sustaining position, so that when such restored dollies approach the lower end 82 of the ramp

80. they are in position to receive an article or bottle gravitating down the ramp as a result of continued advancing movement of the drum. In this way, the lowermost articles in each compartment are disposed in sequential order, the articles at the next higher levels being lowered automatically one by one into lower levels.

It is to be understood that the invention is not restricted to any precise form of dispensing drum such as that described in detail herein, nor is its application limited to any particular form of dispensing mechanism so far as the housing, control means and nature of the articles dispensed is concerned, the invention in its broader aspects relating more particularly to the provision of a movable article magazine with serially arranged article compartments each having movable bottom sections and means sustaining the bottom sections during a major part of the movement of the magazine, together with means for effecting removal of the bottom sections one by one to permit discharge of an article thereon as such bottom sections approach a predetermined position. The invention further contemplates means for temporarily sustaining the remaining articles in the magazine compartments as the same move past said predetermined position.

The invention is, therefore, not limited to the precise form of construction, arrangement, or operation set forth herein for illustrative purposes, but embraces all equivalent constructions, arrangements and modes of operation fairly coming within the call of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. Dispensing apparatus including a cyclically movable magazine having a plurality of upright open bottom article compartments adapted to have articles stacked one upon another therein, each of said compartments having a carriage member pivotally mounted therebelow for movement into raised and lowered positions, said carriages being effective when in raised position to support the lowermost article in a corresponding compartment, a discontinuous track arranged below said carriages and upon which the same ride in raised position throughout the major portion of their travel, said carriages dropping into lowered position when the same approach the discontinuous portion of said track whereby articles supported thereon are discharged, said track being provided with means engaged by carriages lowered as aforesaid and effective to pivot the same back into normally raised position responsive to subsequent movement of the magazine, stationary means arranged to underlie the bottoms of higher-level articles immediately above the lowermost articles in each compartment during movement of said compartments past the discontinuous portion of the track, and means for lowering articles one by one from said stationary means down onto restored carriages responsive to subsequent movements of the magazine, and means for moving said magazine in steps in a particular direction, each step moving said magazine a distance adequate to move said carriages one by one into said discontinuous track portion.

2. Dispensing apparatus including a rotatable magazine having means for confining articles in upright stacks thereon, means providing movable bottom supports for each of said stacks, discontinuous track means arranged below said movable bottoms and upon which the latter ride

during rotation of the magazine, a bottom member being supported in article-sustaining position beneath each stack during movement over the continuous portions of said track means, means for rotating said magazine in steps in a particular direction to move said bottom supports one by one onto the discontinuous portion of said track means whereby to effect movement of said supports into non-sustaining position to effect gravitating discharge of an article thereon from the corresponding stack, together with means for preventing descending movement of all higher articles above the lowermost article in each compartment while their respective bottom supports are disposed in lowered position, means arranged at the discontinuous portion of said track means for raising lowered bottom supports back to article-sustaining position responsive to subsequent movements of said magazine, and means for automatically effecting descending movement of said higher-level articles one by one onto bottom supports restored as aforesaid.

3. In a vending machine, a magazine drum arranged for rotation about a vertical axis and having vertically extending article compartments arranged thereabout and adapted to have articles stacked one upon another therein, each compartment having a pivoted bottom member arranged to drop from a normally raised position into an inclined position to discharge an article resting thereon, a discontinuous track upon which said bottom members normally rest to hold the same in normally raised article-sustaining position, and means for moving said drum in a particular direction to move said bottom members successively onto the discontinuous portion of said track to cause the same to drop and discharge an article therefrom, together with means constituting a part of said track for automatically restoring said bottom members to said normally raised position responsive to rotation of said drum subsequent to the dropping action of said bottom members, and stationary means arranged above said discontinuous portion of the track to project beneath the bottoms of articles resting upon articles on said bottom members and advancing toward discharge position, whereby to temporarily support said resting articles for movement past said discontinuous track section, and means cooperable with said temporary supporting means for lowering articles one by one onto restored bottom members.

4. In a device of the class described, a magazine drum arranged for rotation about a vertical axis and having vertically extending article compartments arranged about its periphery in which articles are supported one upon another, each compartment having an open bottom with a carriage movably attached to the drum and constructed and arranged to move from a normally raised article-supporting position to a lowered article-discharging position responsive to rotation of said drum and positioning of said bottom carriages at a particular point in the cycle of rotation whereby to effect sequential discharge of the lowermost article in each compartment, and temporary supporting means including a stationary horizontal ledge disposed opposite the peripheral portions of said compartments and positioned to project beneath the bottoms of articles resting on said lowermost articles in each compartment so as to sustain the higher articles independently of the lowermost articles temporarily during a predetermined part of the cycle

of rotation of the drum, and means for lowering the temporarily supported articles from said ledge automatically as the drum rotates, said means including a ramp descending from said ledge and terminating substantially above the path of movement of said carriages in their normally raised position.

5. In a device of the class described, a magazine drum arranged for rotation about a vertical axis and having a plurality of vertically extending open-bottom article compartments in which articles are to be stacked one upon another, means for rotating said drum in steps, each of said compartments having a bottom support movable into and out of article-supporting position relative to a corresponding compartment, means for maintaining said bottom supports in article-sustaining position throughout a predetermined portion of the travel of said drum, means arranged at a particular position along the path of travel of said drum for effecting movement of said bottom supports sequentially into non-sustaining position relative to their respective compartments and the lowermost article of a stack therein, means for automatically restoring said bottom supports to normal article-sustaining position by subsequent movement of the drum, means including a stationary ledge formation close to the periphery of said drum and positioned to project beneath and temporarily support the bottoms of articles immediately above the bottommost article of a stack the bottom support of which has been moved as aforesaid into non-sustaining position, until said bottom support is again restored as aforesaid to normal article-sustaining position, together with means for automatically effecting movement of temporarily supported articles onto bottom supports restored as aforesaid when said drum is moved a certain distance beyond said nonsustaining position in subsequent dispensing movement.

6. In a dispensing apparatus, a cyclically movable magazine having a plurality of upright open bottom compartments, each compartment having a movable bottom member, track means arranged below said bottom members and upon which the latter ride during movement of said magazine, said track means being arranged to support said bottom members in bottom-closing position throughout the major portion of its length, said track means having a discharge interruption, said magazine being adapted to have articles stacked one upon another in said compartments with the lowermost article of each stack normally resting upon one of said bottom members, means for moving said magazine in a particular direction to advance said compartments and the corresponding bottom members opposite said discharge interruption whereby to cause movement of one of said bottom members into lowered position to effect gravitating discharge of the lowermost article resting thereon, said track means having a restoring formation engageable by bottom members lowered as aforesaid and effective to restore said members to normally raised bottom-closing position when said magazine is subsequently moved, stationary supporting means engageable with the bottom portions of articles above the lowermost articles in each compartment as said compartments are moved past said discharge interruption, together with means cooperatively associated with said stationary means and dependent for operation upon rotative movement of articles by said drum

from said stationary supporting means for automatically lowering temporarily sustained articles one by one onto bottom members from which articles have been discharged as aforesaid and which have been restored to normal position.

7. Dispensing apparatus including a cyclically movable magazine having upright article compartments with open bottom portions and adapted to have articles stacked one upon another therein, each of said compartments having a movable bottom member pivotally attached to said magazine for individual movement from a raised position in which the bottom members underlie corresponding compartments to support an article therein, said articles being adapted to be discharged by gravitation from said bottom members when the same are in lowered position, circuitous track means arranged below said bottom members, the latter riding on said track means and being supported thereby in normally raised position throughout the major portion of travel of said magazine, said track means having a terminus constituting a discharge station past which said bottom members are moved one by one as said magazine is moved, whereby said bottom members are caused to move into lowered article-discharging position, said track means having a restoring formation engageable by lowered bottom members and effective to pivot the latter back into normally raised position upon subsequent movement of said magazine, means for preventing descending movement of higher-level articles above the lowermost articles supported on each bottom member as said compartments are moved past said discharge station, and means for effecting lowering movement of higher-level articles one by one down onto bottom members restored to a normal position as aforesaid responsive to successive movements of said magazine.

8. In a dispensing machine, a magazine drum arranged for rotation about a vertical axis and having vertically extending article compartments arranged thereabout, each compartment having a movable bottom member and means arranged to support said bottom member in article-sustaining position beneath its corresponding compartment throughout a predetermined portion of the cycle of travel of said drum so that a column of articles may be stacked one upon another in each compartment, means at a particular position in the path of travel of said drum for effecting movement of said bottom members into non-article-sustaining position whereby to permit discharging movement of an article from the corresponding compartment, means for effecting rotative movement of said drum to move said bottom members sequentially into said predetermined position, together with means in the form of a stationary ledge close to the periphery of said drum above said predetermined position and constructed to project beneath the bottoms of articles in compartments moving past said predetermined position whereby to temporarily sustain said articles during movement of the same with said drum past said predetermined position, and means for subsequently lowering said temporarily sustained articles onto said bottom members after the latter have passed said predetermined position, said means including a downwardly inclined ramp communicating from said stationary ledge to a point immediately above the path of travel of said bottom members as the same are advanced from said predetermined position in the manner aforesaid.

9. In a device of the class described including a rotatable magazine drum having vertical compartments with open bottom portions and pivoted carriages beneath each compartment for movement from normally raised article supporting position into lowered article discharging position and which compartments are adapted to have articles stacked one upon another therein with the lowermost article supported on the corresponding carriage, carriage supporting and tripping means comprising: a circuitous track arranged beneath said carriages to support the latter in normally raised position throughout a substantial portion of the cycle of movement of said magazine, said track having an interruption arranged to permit a carriage to drop into lowered position when a carriage is moved into said interruption by rotation of the magazine, and means providing an upwardly inclined track portion engaged by a carriage in lowered position and effective to guide said carriage into raised position on said track adjacent said interruption responsive to subsequent rotative movement of the magazine.

10. In a device of the class described, a rotatable magazine drum having vertical open bottom compartments in which articles are adapted to be stacked one upon another, each compartment having a carriage pivoted therebeneath for movement from raised into lowered position, axially extending means providing a support for said drum, and means mounted coaxially with said support beneath said drum and providing a track on which said carriages ride in normally raised position beneath their respective compartments during the major portion of rotative movement of said drum, said track having a discharge portion directed to permit lowering movement of a carriage moving thereover responsive to rotative movement of the drum, said discharge portion of the track being directed to guide a lowered carriage back into normally raised position on the adjoining portions of the track responsive to further rotative movement of said drum for moving the lowered carriage past said discharge portion of the track, and means for preventing descending movement of articles above the lowermost article in a compartment moved opposite said discharge section of the track, together with lowering means cooperating with said last-mentioned means for effecting downward movement of articles in said last-mentioned compartment and onto the corresponding carriage when the latter is restored to normal position as aforesaid and moved into position opposite said lowering means.

11. In a vending machine of the type including a rotatable drum with article supporting and discharging carriages arranged beneath open bottom compartments on the drum and arranged to be moved into and out of article sustaining and discharging position responsive to rotative movement of the drum, article sustaining and lowering means comprising: a ledge member arranged at a height above said carriages to underlie the next higher article in one of said compartments at a predetermined position in the cycle of movement of the drum corresponding to the discharge position of one of said carriages, a downwardly inclined ramp pivotally attached to said ledge at an end thereof remote from said position, said ramp terminating at its lower end above the carriages restored from said discharge position to article sustaining position, and guide means including a wing pivot-

ally mounted on said ramp and provided with spring means urging the same in a direction toward said drum for guiding articles descending down the ramp into a predetermined position on a restored carriage passing beneath the lowered end of the ramp.

12. In a machine of the class described, an article carriage having a platform provided with an annular edge portion, an annular cap of resilient material shaped to fit over said platform and having an annular flange grippingly engaging said annular edge portion of the platform, and means extending diametrically across said cap and providing a gliding surface, said resilient cap providing a shock absorbing landing for articles lowered onto said carriages in the operation of the machine, said gliding surface being arranged to facilitate movement of said articles off of the carriage when the same is lowered from an article sustaining position.

13. In a dispensing machine having a rotatable dispensing drum with article supporting roller carriages each arranged beneath an opened-bottom article compartment, the combination of a track in the form of a substantially closed ring mounted beneath the drum so that the carriages may roll thereon and will be supported by a main portion thereof in raised article supporting condition relative to their respective compartments, said track having an interruption constituting a discharge station at which there is substantially no support for a carriage so that the carriage will drop to discharge an article thereon, said track having opposite said interruption a surface portion which is more nearly vertical than horizontal and which includes an upwardly inclined restoring portion leading from said interruption and curving into a horizontal plane back on to the main portion of the track for restoration of the carriages to normal article supporting condition responsive to rotation of the drum in moving the carriages away from said station.

14. In a dispensing machine having a rotatable dispensing drum with article compartments thereabout and means for opening the bottom of each compartment as the same moves past a dispensing station responsive to rotative movement of the drum, the combination with said drum and bottom opening means, of means for preventing articles above the lowermost article in each compartment from dropping out at said dispensing station when the bottoms are opened as aforesaid, and means comprising a stationary ledge member mounted above said dispensing station close to the periphery of the drum and constructed to project beneath the bottoms of articles next highest above the lowermost article and extending in the direction of rotation of the drum adjacent said station a distance sufficient to carry articles past said station, means for automatically closing the bottom of each compartment as the same is moved a predetermined distance past said dispensing station, and means in the form of a ramp leading down from said ledge member to guide articles in gravitating movement one-by-one from the ledge member on to the closed bottom part of the compartments from which the lowermost articles have been dispensed at the dispensing station as aforesaid, and which compartments have been subsequently moved by the drum said predetermined distance beyond the station.

15. In a dispensing machine the combination with a rotatable drum having opened-bottom ar-

ticle compartments normally closed by individual carriages running on a track having an interrupted portion constituting a discharge station and which permits carriages to lower one-by-one into article discharging position as the drum is rotated, said track including a restoring portion directed to raise the carriages back into article supporting condition as the same are moved away from said station, article supporting and feeding means comprising: A stationary ledge arranged above said dispensing station at a level to underly the bottoms of articles next highest above the lowermost articles in the compartments adjacent said dispensing station to support the higher articles in passing said station so that only one article at a time will be discharged from the carriages moving into said interrupted portion and station, said feeding means

comprising a ramp leading down from said ledge and terminating in a position above and beyond said restoring portion of the track and arranged to guide articles resting on said ledge down on to a restored carriage, articles being transported off the ledge and gravitating down the ramp responsive to rotative movement of the drum.

16. In a dolly structure of the type adapted to have articles lowered thereon and to be lowered from a normally raised position to cause said articles to gravitate therefrom, the combination with said structure of resilient cap means for relieving the shock of articles lowered onto the dolly as aforesaid, and means on said cap means providing a gliding surface extending crosswise of the cap means in the general direction of lowering movement of the dolly.

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