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DISPENSER WITH SUPPLY HOLD-BACK MEANS

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FIG. 1

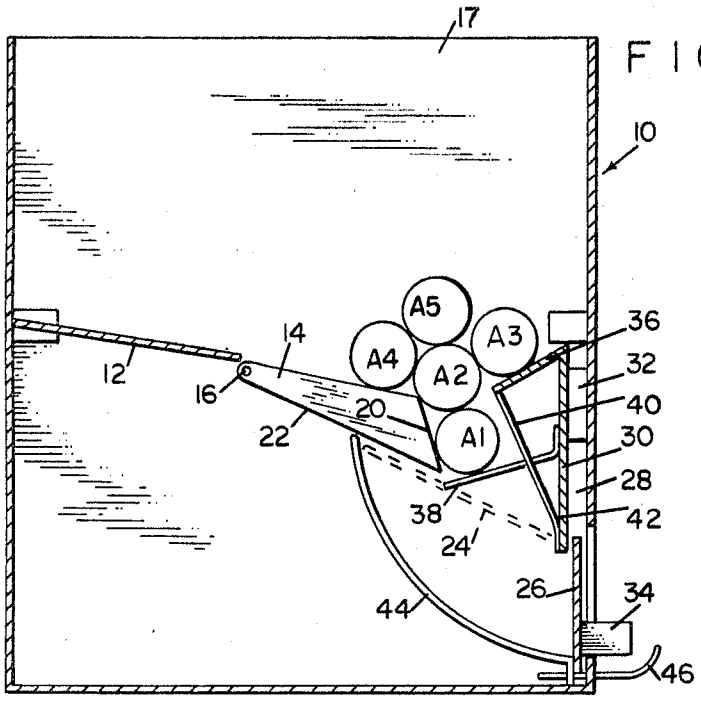
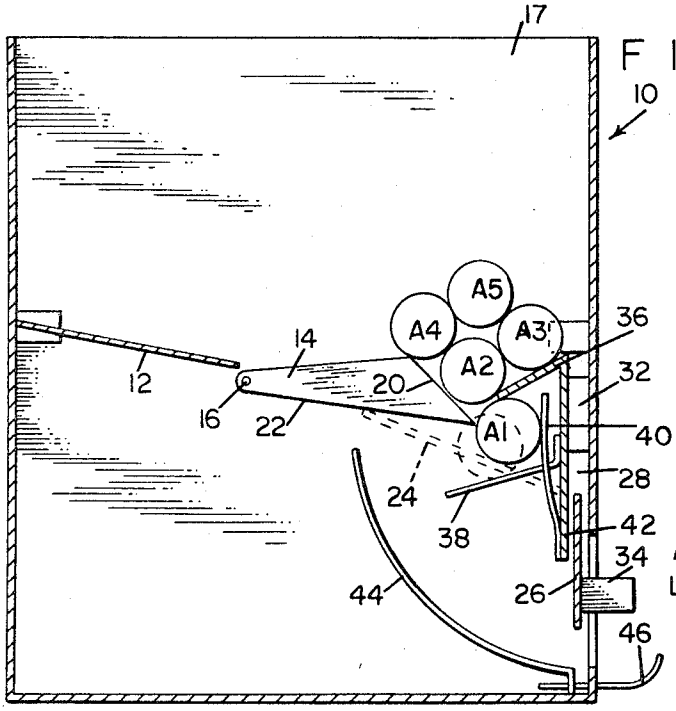



FIG. 2




INVENTOR
ALBERT H. BALLER
LAWRENCE A. WILLETTE

BY Chas. R. Fay

ATTORNEY

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FIG. 3

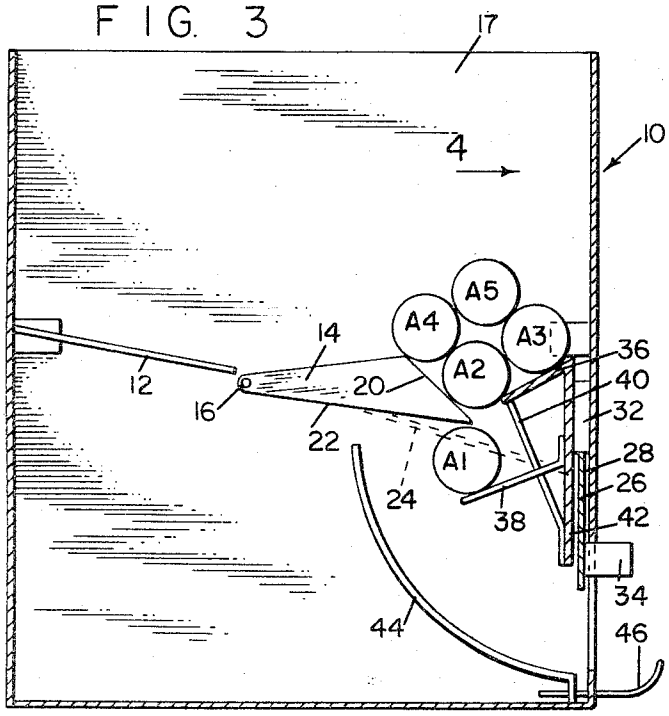



FIG. 10

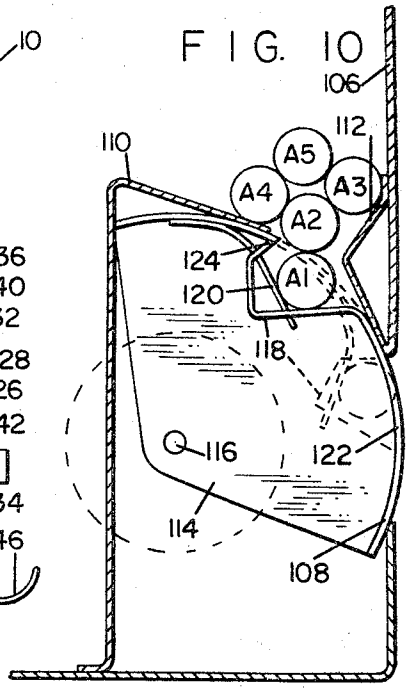
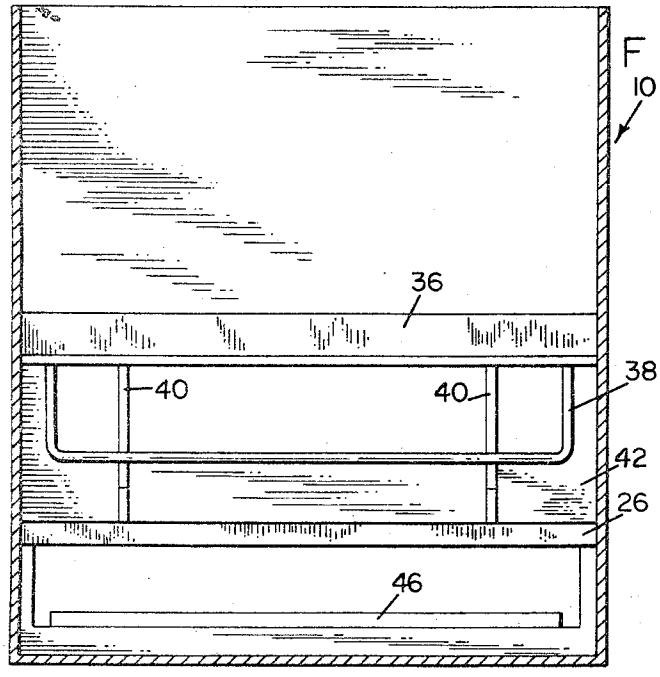



FIG. 4




INVENTOR
ALBERT H. BALLER
LAWRENCE A. WILLETTE

BY Chas. R. Fay,

ATTORNEY

March 4, 1969 A. H. BALLER ET AL 3,430,810

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FIG. 5

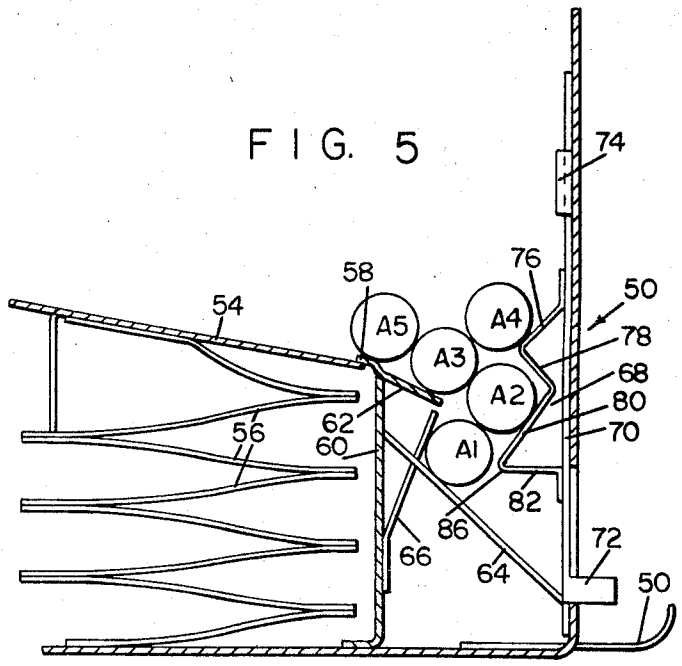
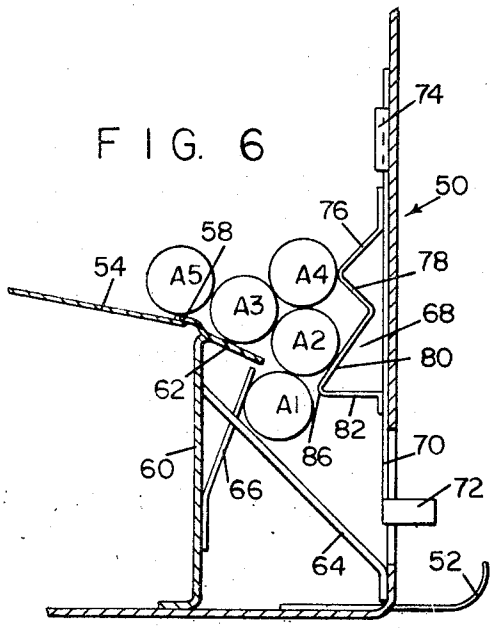



FIG. 6




ALBERT H. BALLER
LAWRENCE A. WILLETTE

BY Chas. P. Gray.

ATTORNEY

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FIG. 8

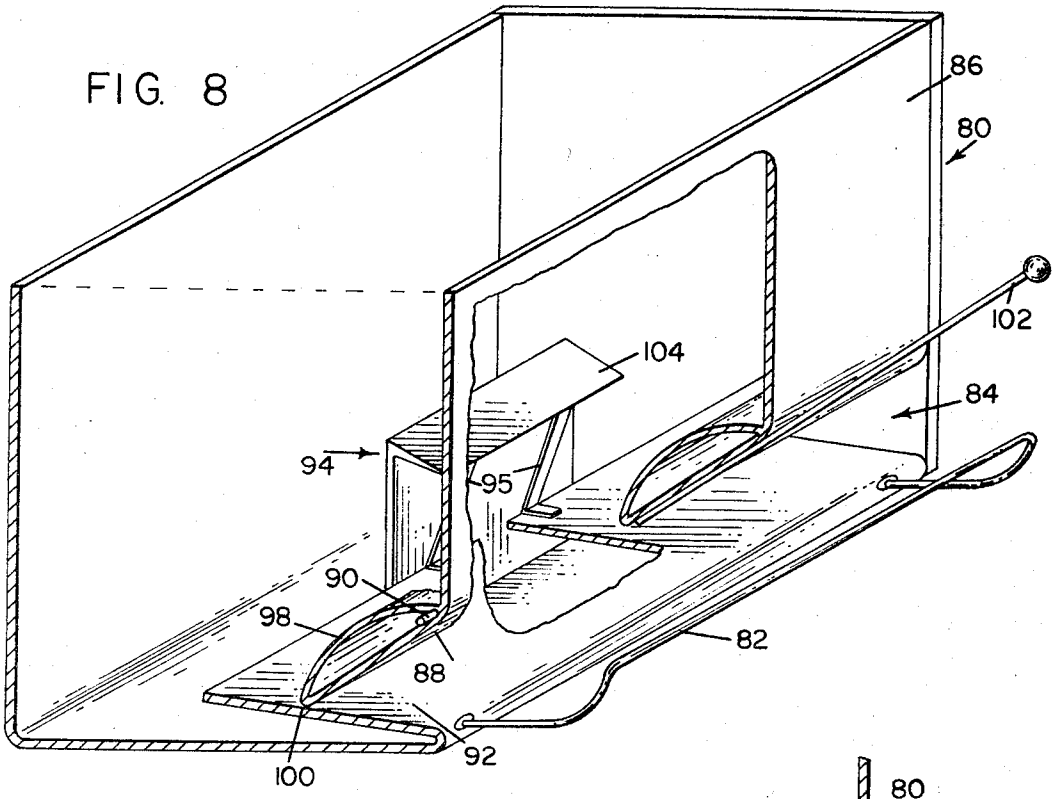



FIG. 9

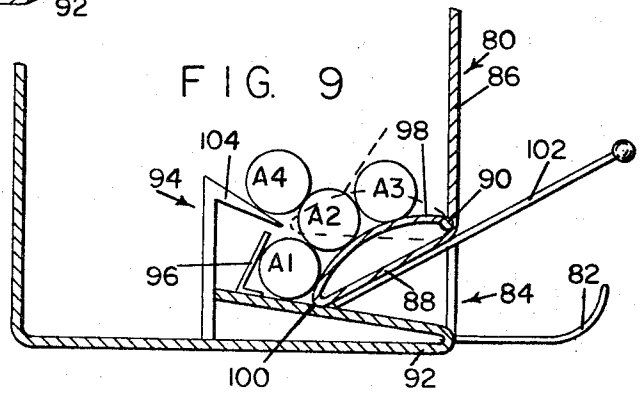
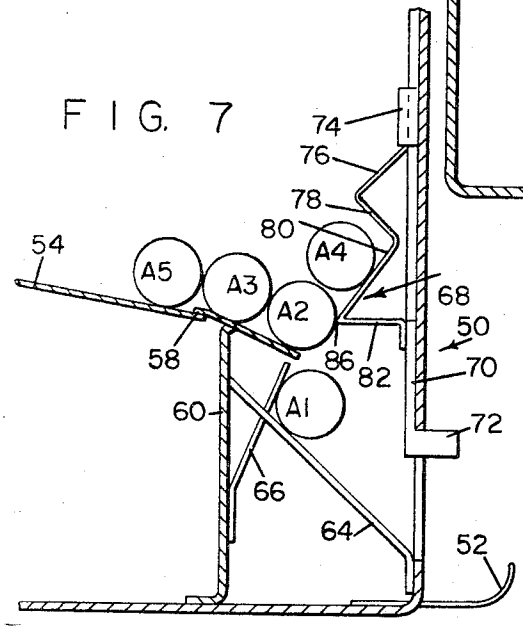



FIG. 7




ALBERT H. BALLER
LAWRENCE A. WILLETTE

BY Chas. R. Fay

ATTORNEY

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3,430,810

# DISPENSER WITH SUPPLY HOLD-BACK MEANS

Albert H. Baller, 59 Beech St., Clinton, Mass. 01510, and Lawrence A. Willette, 764 Arnon Ave., Bronx, N.Y. 10467

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U.S. Cl. 221—205 15 Claims
Int. Cl. B65h 3/32; B65g 59/06

## ABSTRACT OF THE DISCLOSURE

A dispenser for elongated articles including a housing in which there is a hopper, the hopper having an inclined ramp and there being a door in a wall of the housing providing an exit for articles, and including a hold-back means which is manually movable by the operator serving to divide the pile of articles from an initial article which is released by the hold-back means to move down the ramp under gravity and out through the door when the dividing hold-back means is actuated.

This invention relates to a dispenser for discrete articles and particularly for elongated articles. The invention comprises in general a housing with an exit or door through which the articles are dispensed one-by-one upon the actuation of means from the exterior of the housing so that one may obtain a single article for each actuation of such means.

The principal object of the invention resides in the provision of a very simple and easily actuated device of the class described which however will operate repeatedly without malfunction even regardless of the fact that some of the articles which are to be dispensed may be slightly frayed, damaged, bowed, or otherwise nonuniform. The principal parts of the mechanism reside in means for supporting the articles so that one-by-one the same will drop into a throat or chute, there being held until an article is desired to be dispensed whereupon a combination of movable and fixed means provides "splitting" of all of the other articles from the one in the throat or chute, holding these articles back but at the same time allowing the aricle in the chute to be ejected through an exit door provided for the purpose; and the movable means being then returned to its original position, the next single article of a pile supported in the housing is automatically located in the chute where it is held ready to be dispensed by the next actuation of said movable means.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which:

FIG. 1 is a cross sectional view through a form of the device according to the invention and showing the parts in normal door-closed position;

FIG. 2 is a similar view showing the action approximately at a mid point;

FIG. 3 is a similar view showing the extreme position of the mechanism;

FIG. 4 is a view in elevation looking in the direction of arrow 4 in FIG. 1;

FIG. 5 is a view similar to FIG. 1 showing a modification;

FIG. 6 is a view showing the parts of FIG. 5 in partly actuated position;

FIG. 7 is a similar view showing the parts of FIG. 5 in the extreme position of actuation thereof;

FIG. 8 is a perspective view showing a further modification;

FIG. 9 is an end view of the modification of FIG. 8, and



FIG. 10 is a diagrammatic end view of another modification.

While the basic operation of all the mechanisms covered by this invention operate on substantially the same theory and with more or less equivalent parts, nevertheless the details of the invention may assume several diffierent forms. One of these forms is illustrated in FIGS. 1, 2 and 3 wherein the articles to be dispensed are labeled "A1, A2, A3, A4, A5," etc. These articles are contained in a housing **10** of any convenient description and which may be made of any convenient material such as paperboard, plastic, metal, etc. In the housing there is a generally fixed platform **12** which is arranged on an incline, articles on this incline normally moving by gravity to the right onto a member **14** which may be referred to as a sweep. This sweep is mounted to pivot on an axis at **16** which may conveniently be provided by projections extending to the end walls or into appropriate holding means thereon, one of which end walls is indicated for instance at **16**. This sweep has a free longitudinal end edge portion arranged in generally triangular form as shown although other forms are equally useful as long as there is provided the free end edge **18** and the angular forward edge surface at **20** which together with the bottom edge **22** forms a sharp nose, the surface **20** being arranged tangentially with respect to a circle drawn about the axis of pivot of the sweep at **16**.

The sweep **14** has a lowermost position as shown in FIG. 1 and any kind of appropriate stop means can be utilized for maintaining it in this position although it is free to move upwardly or counterclockwise as shown in FIGS. 2 and 3. It is movable upwardly by means of a pair of arms or bails **24** which are conveniently located adjacent the end walls of the housing **10** and which in this case move vertically upwardly having portions thereof contacting the bottom surface **22** so as to move the sweep as is shown in FIGS. 2 and 3. The arms **24** are mounted on a door member **26** which is vertically slidable in a guideway generally indicated at **28** as for instance between the front wall of the housing **10** and a fixed member **30** spaced therefrom and held in position with respect to the front wall of the housing by end spacers or tabs **32**. The door **26** is provided with a handle or handles **34** and the operator desiring to have article A1 dispensed, grasps handle **34** and raises it, the door **26** and arms **24, 24** therefore pivoting the sweep **14** through the positions of FIGS. 2 and 3. The door and sweep, etc. will return to the normal down or door-closed position of FIG. 1 by gravity, or if desired, of course mechanical means may be provided to insure this action.

Mounted on the member **30** or in any other desired or convenient way, there is a fixed projection **36** which essentially is a shelf extending down and to the left as clearly shown and having a clearly defined free end edge. This can be referred to as a "divider" or "splitter" as will be more clear hereinafter.

Also there is a projection or stop member **38** mounted as desired or convenient in fixed relation with respect to the divider or splitter **36** and extending down and to the left as clearly shown, for a slightly greater distance than projection **36**, and also having a free end edge. The free edge of the stop **38** is in juxtaposition with respect to the free end edge at **18** of the sweep **14** when the latter is in the FIG. 1 down position. When the sweep **14** is lifted, the edge **18** approaches the free edge of the divider or splitter **36**. Both the divider or splitter **36** and the stop **38** need not be continuous and as a matter of fact are located generally centrally of the front wall of the housing **10** as shown in FIG. 4. Depending upon the articles which are to be dispensed, these members may merely be arms extending forwardly from the member **30** or from the front wall of the housing.

There is also a leaf or hair spring or springs indicated at **40** which are fixed as at **42** and extend upwardly to the left terminating in free end portions for a purpose to be described but perhaps best illustrated in FIG. 2.

There is also a ramp **44** to receive the articles one by one as they fall from projection or stop **38** thereonto, and they roll down the ramp to be caught in article catcher **46** which again need not be continuous but can be interrupted or merely be provided by a pair of outstanding fingers.

With the parts as shown in FIG. 1 and there being articles arranged in the housing as shown, it will be appreciated that the distance between the surface **20** and the spring **40** is such as to accommodate but a single article which is indicated as article **A1** in FIG. 1. Article **A2** bears down upon article **A1** by gravity and articles **A3** and **A4** tend to bear down on article **A2**, being assisted by other articles. The articles are supported by the divider or splitter **36** by the sweep **14** and by the floor **12**.

It being desired to dispense a single article, the handle **34** is grasped and raised and the action is as shown in FIGS. 2 and 3. The nose or forward edge portion **18** of the sweep **14** forces article **A1** to the right against the action of the leaf spring **40**. This is clearly shown in FIG. 2. At the same time article **A2** is raised so that instead of resting on article **A1**, it rests on the divider or splitter **36** and also partially on surface **20** of the sweep **14**. This action "splits" articles **A1** from all of the other articles in the housing. The heart of the action is this splitting or dividing action which is accomplished by actually moving the articles toward the rear, i.e., the forward wall of enclosure **10**.

When the handle has been pushed to its topmost extent, see FIG. 3, the nose or edge **18** of the sweep **14** passes the center of article **A1** sufficiently to release it and it merely falls by gravity down stop **38** onto ramp **44** and on down to the catchers **46**. However, all of the other articles are still maintained in the FIG. 3 position; but when the sweep starts to return to original position, it will be seen that article **A2** will fall down between surface **20** of sweep **14** and the springs **40** but only article **A2** can be accommodated at this time even though the articles should be comparatively different in diameter from those here illustrated. Any articles can be accommodated as long as their combined diameters are not exceeded by the distance between the free edge of the divider or splitter **36** and the surface **20**. When the sweep returns to the FIG. 1 position, the dispenser is of course once more in condition for operation for the dispensing of one more single article.

A modification of the invention is shown in FIGS. 5, 6 and 7. In this case the enclosure is more or less the same as before and is generally indicated by the reference character **50**. It has catchers **52** as before and it may have if desired a fixed platform such as that at **12** in FIG. 1 but as shown in FIG. 5 it has a movable platform **54** for the same purpose which may be depressed however against the action of magazine spring **56** in order to load more articles, i.e., below the level of the articles **A1**, **A2**, etc., gradually moving upwardly as the articles are dispensed.

A stop **58** may be used to catch the forward edge of the floor **54** to prevent it from rising above the dispensing area.

There is a divider or splitter **60**, this being in the form of an upright wall having a dividing shelf or the like **62** extending down and to the right. There is a ramp **64** and there are free-ended leaf springs **66** which are normally positioned as shown in FIG. 5, but which can be flexed by the articles as they are dispensed, see FIG. 6.

At **68** there is shown an element which is more or less equivalent to the sweep **14** but has definite characteristics similar to the divider **36** and stop **38**. It is conveniently made in one piece and is mounted on a vertically movable door **70** which has a handle **72** as before by which it may be lifted. The door can be guided by any simple guide means such as shown at **74**. Member **68** comprises essentially a distorted M-shaped member having an upper inclined projection **76** extending down and to the left, turning at substantially a right angle into a surface extending down and to the right at **78**, this again turning into another projection **80** extending down and to the left but at a slight angle with respect to the shelf **76**, and an in-turned terminal portion **82** which is fastened to the door.

The distance between springs **66** and the surface **80** will be seen to accommodate but a single article **A1** although smaller articles of course can also be dispensed in a one-by-one relationship as long as the diameters of the articles exceed the distance between the ramp **64** and the junction **86** between surface **80** and surface **82**.

The operation of the device is similar to that described previously although the construction is somewhat different. The handle **72** upon being lifted raises the member **68** through the FIG. 6 position into the topmost or extreme FIG. 7 position. As the FIG. 6 position is approached, the free end edge **86** of the member **68** moves article **A1** back up the ramp **64** against the action of spring **66** tensioning the spring. Thereupon it will be seen that passing through the FIG. 6 position to the FIG. 7 position the article **A1** is split or divided from all the other articles in the enclosure **50** and the other articles are lifted upwardly to the FIG. 7 position where the article **A2** now rests on the shelf **62** being held there by the end edge portion **86** of the member **68**. The article **A1** is substantially ejected by spring **66** down the ramp and out the opening similar to the action previously described as to FIGS. 1, 2 and 3. When the handle is pushed back down again or when gravity moves the door down, then article **A2** comes down into the FIG. 5 position being then borne down upon by the articles **A3**, **A4**, etc., so that the parts will appear as in FIG. 5 except that article **A1** has been dispensed and article **A2** is now in position to be dispensed.

As before, the member **68**, also ramp **64** and spring **66** need not be continuous and as a matter of fact the sweep member **68** is preferred to be located centrally as before described as to the divider and splitter arrangement at **36**, **38** in FIG. 1, for the same reason.

In FIG. 8 there is shown a modification of the pivoted sweep construction of FIG. 1. In this case the enclosure is generally shown at **80** and it may be more or less as generally before described particularly with respect to floor **12** or the follower **54**, etc., not shown in FIG. 9. It has a catcher **82** upon which the articles will be held when discharged through the opening generally indicated at **84** in the forward wall **86** of the enclosure **80**. In this case the forward wall **86** and in fact the entire enclosure may be made of a flexible material such as cardboard or possibly plastic and the lower portion thereof which is integral and indicated at **88** is pivoted on an axis indicated at **90**; whereas the portion of the wall **86** above this axis is fixed, the portion **88** below it may be pivoted inwardly. There is a ramp **92** on which the articles will roll to the catcher **82**. There is a splitter or divider which is in the form of the parts at **30**, **36** and **38** of FIG. 1, and this is indicated at **94** extending forwardly toward the pivoted member **88**, and it may also be provided with article ejection springs **96**.

The pivoted portion **88** of the wall **86** is provided with an enlarged rounded surface **98** and a single article will be held between the springs and this enlarged portion **98** generally as shown in FIG. 9, it being noted that the rounded surface at **98** is more or less the equivalent of the top surface and the forward inclined surface **20** of the sweep **14** in FIG. 1. That is, the article **A1** as seen in FIG. 9 is held in the chute on ramp **92** and is retained there by the rounded surface at **98** on the sweep **88** as shown in solid line position in FIG. 9.

When the sweep **88** is moved upwardly, as by a handle **102**, i.e., counterclockwise from the solid line position to the dotted line position thereof, FIG. 9, the article **A1** is gradually pushed toward the rear against the ac-

tion of springs **96** tensioning the same and finally reaching the dotted line position thereof whereupon the nose portion **100** of the sweep passes the central or diametrical position with respect to article **A1** in the dotted line condition thereof, whereupon the article is free to be ejected out through the opening **84**.

At the same time however it will be seen that the projection **104** together with the sweep **88** have raised and divided or split off the other articles **A2**, **A3**, etc., which are now of course supported on the projection **104** and the top surface **98** of sweep **88** and there is nothing in the chute. However as sweep **88** now returns to its original position, the next article **A2** in effect slides down it and into the solid line position formerly held by article **A1** whereupon the parts are of course ready for the next operation.

The springs **96** can be hair type springs or wires or the like and are spaced sufficiently to provide for smooth operation of the parts without interfering therewith. One good location for these springs is about one-third of the way in with respect to each end wall of the enclosure.

In FIG. 1 the divider **36** is best located centrally with respect to the articles and the sweep and of about one-third of its length and the same is true as to the divider **76** in FIG. 5 and 92 in FIG. 10. With these proportions or approximately, the operation of the device is smooth and without malfunction regardless of damaged, frayed or bowed condition of the articles themselves. Also of course the articles may vary in size to a great extent but it is clear that they should be of a size with relation to the exit chute therefor so that only one article will be held at a time in the chute. For instance looking at FIG. 1, the article **A1** can be much smaller than it is shown, down to just over one-half of the diameter shown, but anything smaller than this would allow more than one article to be dispensed which is not desired.

In FIG. 10 there is shown a further modification. In this case the housing is indicated at **106** and it has an article exit opening at **108**. A shelf **110** extends downwardly to the right toward a projection indicated at **112**, these parts being fixed and defining between them a chute or throat through which the articles **A1**, **A2**, **A3**, etc., can pass one-by-one.

A sweep member **114** is pivoted on a fixed axis **116** and is provided with a longitudinal pocket or the like **118** for the reception of the articles one at a time from the chute between members **110** and **112**. There is a leaf or hair spring or springs **120** projecting into the pocket and the article **A1** tensions this spring.

The sweep is provided with a closure member formed on an arc and indicated at **122** which normally closes the opening **108** but when the sweep is moved in a clockwise direction it is clear that the article **A1** will move into the dotted line position thereof and be dispensed through the opening **108**. At the same time the upper forwardly projecting edge **124** forming a part of the pocket acts as a splitter to divide all of the articles **A2**, **A3**, etc., from article **A1** and to maintain them in this position until the sweep **114** is once more returned to the solid line position shown in FIG. 10.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:

**1.** A dispenser for discrete articles comprising a hopper in which the articles may be assembled in piled-up relation, an inclined ramp, a door in a wall of the hopper adjacent said ramp providing an exit for the articles one-by-one,

and means in said hopper for dividing a single article from the pile of articles and holding the same in isolated position to be released alone, and means for actuating said means,

said first-named means comprising a pair of members, one of said members comprising a pair of projections arranged in mutually spaced relation sufficient for receiving one of said articles between them,

including a single element extending toward the first-named projections, both projections and the single element having cooperating free end edges,

and means providing a relative motion between said members so that the free end edge of said single element is selectively substantially capable of alignment with the free end edge of either one of said projections,

one of said mutually spaced projections holding back the pile of articles at the time when said single element is in alignment therewith and at the same time allows the single article between projections to exit through the opening.

**2.** The dispenser of claim **1** including spring means for ejecting the article from the space between the projections.

**3.** The dispenser of claim **1** wherein said projections are located on an incline downwardly toward their free end edges.

**4.** The dispenser of claim **1** wherein said single element is movable and the projections are fixed.

**5.** The dispenser of claim **1** wherein the member with the projections is movable and the single element is fixed.

**6.** The dispenser of claim **1** wherein said single element is arranged to swing on a pivot in the form of a sweep on an axis removed from the free end edge thereof.

**7.** The dispenser of claim **1** wherein said member with the two projections moves rectilinearly and the single member is fixed.

**8.** The dispenser of claim **1** wherein said single element is swingable on an axis removed from and generally parallel to its free end edge, said axis being located intermediate the sides of the hopper and the member with the two projections being located adjacent to and just above the opening.

**9.** The dispenser of claim **1** wherein said single element is swingable on an axis removed from and generally parallel to its free end edge, said axis being located intermediate the sides of the hopper and the member with the two projections being located adjacent to and just above the opening, a door for closing said opening, the member with the two projections on it being mounted on said door for motion therewith.

**10.** The dispenser of claim **1** wherein said single member is mounted to swing on an axis removed from the free end edge thereof and generally parallel thereto, said axis being located adjacent said opening and just above the same so that said movable member extends from the wall of the hopper inwardly thereof and the member with the two projections on it is located intermediate the side walls of the hopper.

**11.** A dispenser for discrete articles comprising an enclosure in which the articles may be assembled in a piled relationship, an opening in a wall of the enclosure for providing an exit for the articles, a ramp leading on an upward incline from said opening towards the interior of the enclosure,

means in said hopper for dividing a single article from the pile of articles and holding the same in isolated position to be released alone,

said means comprising a fixed projection in the hopper, said projection having a free end edge, a second projection in the hopper, said second projection having a free end edge extending toward the free end edge of the first projection, the second projection being movable between positions where its free end edge is separated from the free end edge of the first projection to a position where it is adjacent the same, and means for moving said movable projection,

and said means including further means cooperating with the movable projection when the latter is in its

position separate from the fixed projection to form a chute for a single article received therein between the free end edges of the projections when the movable projection is remote from the fixed projection,

said movable projection upon being moved by the means to move it toward the first projection, moving the divided off articles in order to pass it, and the free end edge of the movable projection passing the single article sufficient to release the article to move down the ramp to said opening while at the same time maintaining all of the other articles generally supported by the two projections in their free end edge adjacent relation, and said movable projection then moving to its remote position once more allowing a single article between the two projections to be held in said chute in divided condition of the said second single article.

**12.** The dispenser of claim **11** wherein the movable projection is swingable on a fixed axis.

**13.** The dispenser of claim **11** wherein the movable projection is movable rectilinearly.



**14.** The dispenser of claim **11** wherein the movable projection includes another projection siding in the motion of the articles in their piled-up relationship so as to allow the splitting off of the single article.

**15.** The dispenser of claim **11** wherein the fixed projection is provided with another projection in spaced relation with respect to the first-named fixed projection.

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