United States Patent [19]

Doolittle

[11] **3,896,967**

[45] **July 29, 1975**

[54] **ARTICLE HANDLING APPARATUS AND METHOD**

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[21] Appl. No.: **331,516**

[52] **U.S. Cl.** **221/95;** 221/203; 221/266; 221/1

[51] **Int. Cl.** **B65h 3/44**

[58] **Field of Search** 222/368; 221/93, 92, 1, 221/95, 133, 200, 202, 203, 205, 249, 250, 246, 263, 266; 206/42

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Primary Examiner—Stanley H. Tollberg
Assistant Examiner—H. Grant Skaggs
Attorney, Agent, or Firm—Robert F. Ruemeli

[57] **ABSTRACT**

One or a pair of tablets may be dispensed in a single operation from a dispenser having a container with a pair of parallel troughs for holding a series of the tablets. A retainer or receiver is pivotally mounted on a body of the container and has a pair of recesses, one at each of open ends of the troughs, each recess for receiving one tablet from the associated trough. The receiver is pivoted for discharging one or both of the tablets from the recesses. As the receiver is relatively rapidly rotated a resilient member carried by the receiver between the recesses flips the tablets in one of the troughs away from the receiver to avoid jamming of the receiver or damaging the tablets. If the retainer or receiver is rotated slowly, the resilient member is stopped by a tablet in the container, to avoid operation by a small child.

9 Claims, 12 Drawing Figures

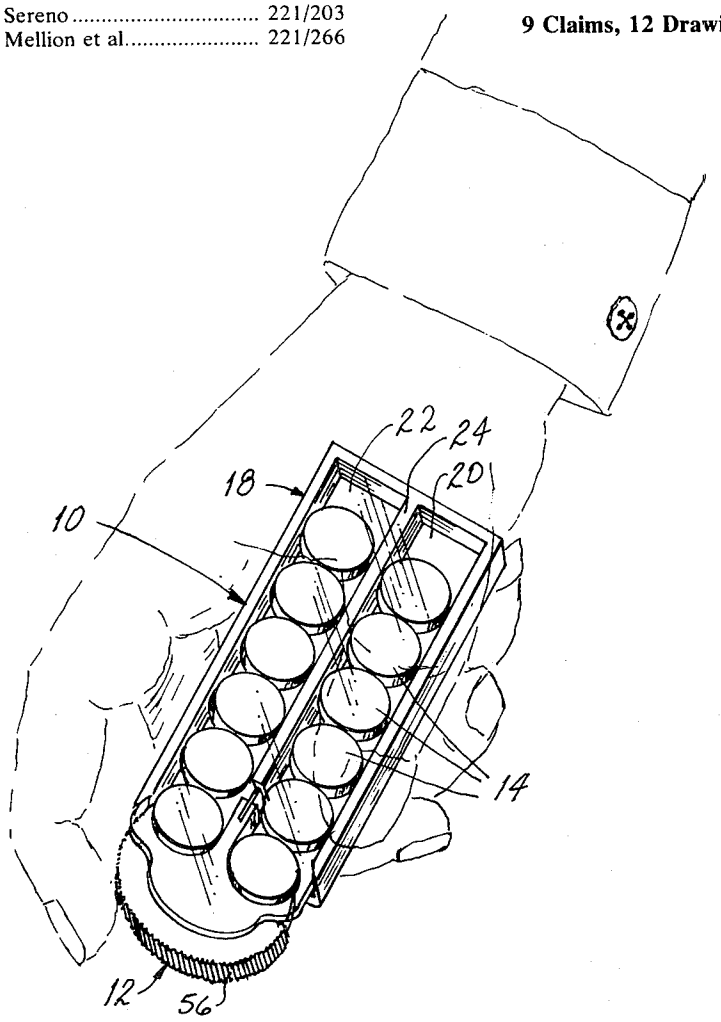


Fig. 2

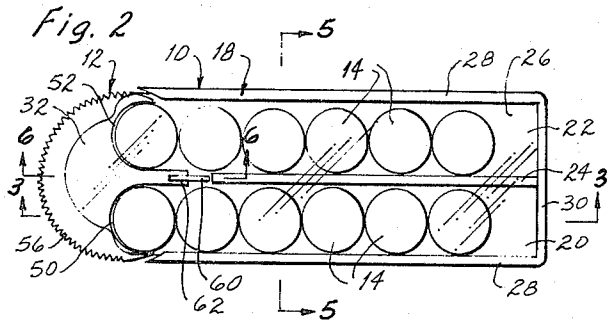


Fig. 3

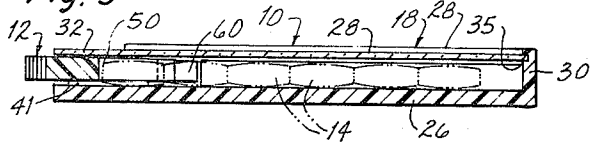


Fig. 4

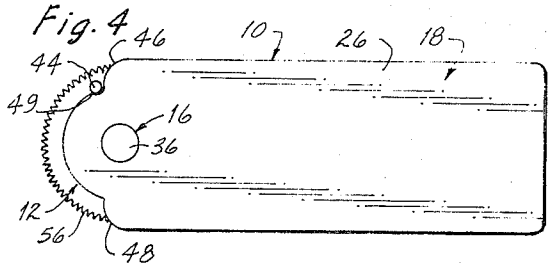


Fig. 1

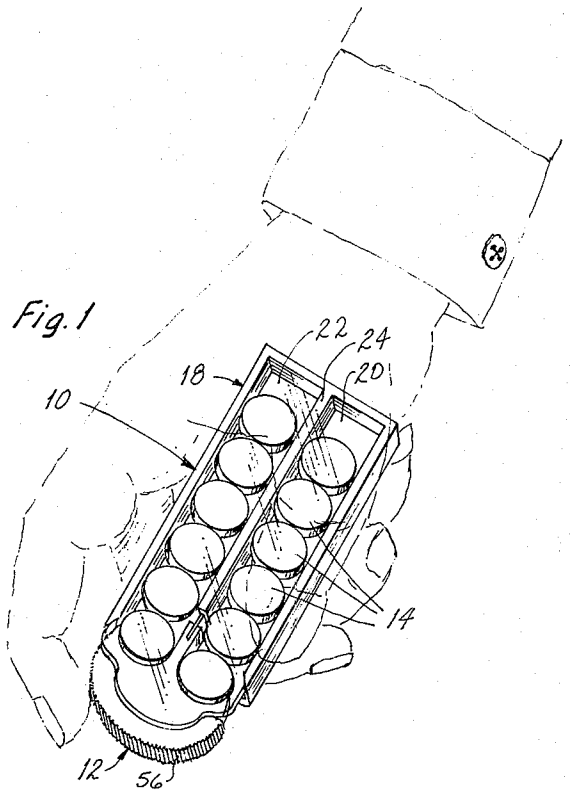


Fig. 5

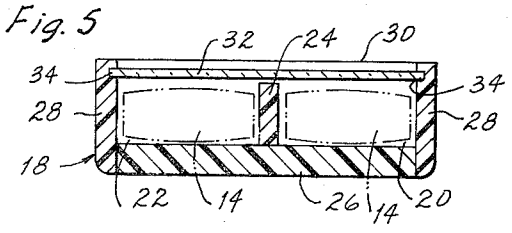


Fig. 6

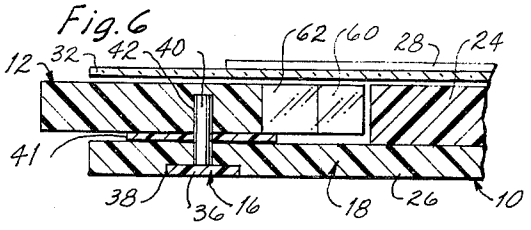


Fig. 7

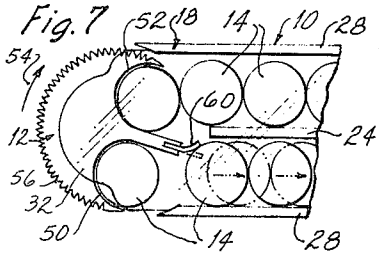


Fig. 8

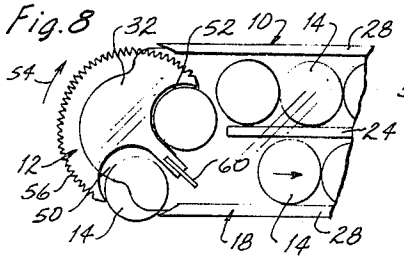


Fig. 9

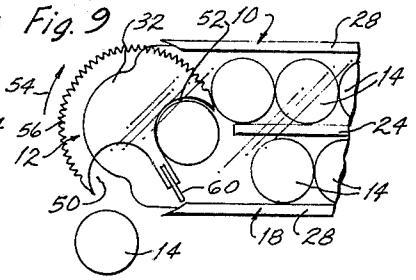


Fig. 10

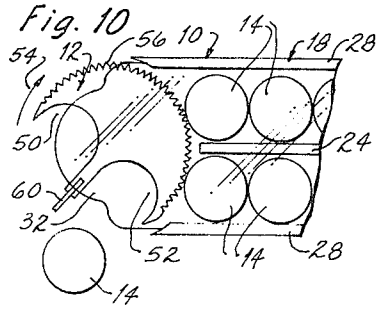


Fig. 11

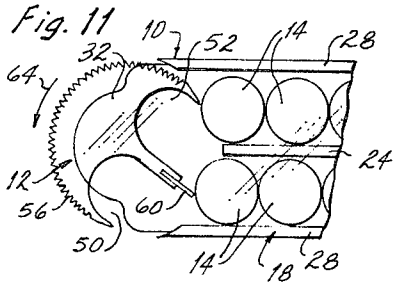
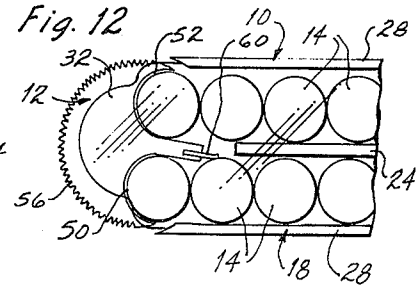


Fig. 12



ARTICLE HANDLING APPARATUS AND METHOD

This invention relates to an article handling apparatus and method and, more particularly, to such an apparatus and method for delivering one or a plurality of articles in a single operation, and to such apparatus for handling medicines and preventing operation by small children.

BACKGROUND OF THE INVENTION

Various article handling apparatuses and methods for dispensing one or a plurality of articles are known from the following patents:

In U.S. Pat. No. 2,580,096 a "Dispensing Container" has a rotatable end closure for receiving spherical pills and discharging the pills one at a time through an opening in a wall of the container. Thus, one or more pills may be dispensed, depending upon the degree of rotation provided the end closure.

In U.S. Pat. No. 2,683,554 a "Pill Dispenser" has a rather complicated dispensing assembly which may be manually preadjusted to dispense one or more pills in a single operation. A rigid finger moves into position to retain the supply of pills in the dispenser as the pill or pills in the discharge assembly are dispensed.

A "Flint Carrier and Dispenser" shown in U.S. Pat. No. 2,878,964. A dispensing disc has a single notch for receiving a flint from a series of flints in a bore of the dispenser body. However, unless the lengths of the flints are very accurately controlled, the dispenser is subject to jamming.

Another "Dispensing Container" for pills is shown in U.S. Pat. No. 2,903,159 wherein an acurate slide moves the pills, one at a time, from a supply of pills to a dispensing opening.

In U.S. Pat. No. 3,161,321 a "Dispensing Device Having a Grooved Dispensing Wheel" dispenses small batteries one at a time as the dispensing wheel is rotated.

U.S. Pat. No. 3,276,636 shows an "Article Dispenser Having A Rotary Trap Chamber" for pills. Only one pill may be dispensed at a time.

In U.S. Pat. No. 3,638,830 a "Pill Dispenser with Top Rotatable Relative to Base" is shown. Upon relative rotation of the top and the base an entrapped pill is moved to a discharge opening.

Under current federal regulations, containers for medicines must be "child-proof." That is, they must be constructed so that a small child cannot get to the contents. One of the problems with some of the current safety containers is that it is also difficult for an adult to get to the contents.

BRIEF DESCRIPTION OF THE INVENTION

The article handling apparatus and method of this invention provides for dispensing one or a plurality of articles in a single operation. The apparatus also prevents operation by a small child while permitting convenient operation by an adult. A dispensing receiver or retainer receives the articles and during normal operation a portion of a supply of the articles is flipped away from the receiver to prevent the articles possibly jamming in the receiver. The receiver has recesses, one associated with each of a plurality of channels, each recess receiving one article from its associated channel. As the receiver is moved from its receiving position, a yieldable member on the receiver engages the end article in one of the channels and flips the articles in this channel away from the receiver to assure free operation of the receiver and to avoid damage to the articles.

The receiver is movably mounted so that upon rapid manual movement it moves freely but, upon relatively slow movement, as by a small child, the yieldable member is stopped and movement of the receiver to its discharge position is prevented.

It is an object of this invention to provide a new and useful article handling apparatus and method.

Another object is provision of a new and useful article handling apparatus and method in which a plurality of articles are stored for delivery to a receiver and upon operation of the receiver the stored articles are moved away from the receiver. A related object is provision for moving the stored articles away from the receiver by flipping the articles away from the receiver. Another related object is provision of a yieldable member on the receiver for flipping the stored articles.

A more specific object is provision of a new and useful article handling apparatus including a supply area for articles, a receiver for receiving one of the articles from the supply area, the receiver being mounted for movement between a first position for receiving one of the articles from the supply area and a second position, and a yieldable member for moving another of the articles at the supply area away from the receiver responsive to the receiver moving between these positions. A related object is provision of the yieldable member in the form of a resilient member. Another related object is provision in the receiver of first and second article receiving recesses and the yieldable member secured to the receiver between the recessed, with channels, one associated with each of the recesses, for storing articles for delivery to the associated recesses, the receiver being pivotably mounted proximate the channels and upon rotary movement of the receiver, the yieldable member flipping the articles in a first of the channels in a direction away from the receiver as the recess associated with the other channel passes the first channel.

A further object is provision of a new and useful article handling apparatus which is substantially child-proof. A related object is provision in such an apparatus of a retainer for retaining an article, the retainer being mounted for movement in a particular manner between a position for retaining the article and a position for removal of the retained article, and provision for effectively preventing attempted operation in said particular manner when applied in a first mode while permitting said operation when applied in a second mode.

Still another object is provision of a new and useful handling method including the steps of moving an article receiver passed article supply locations, and as the receiver passes one of the supply locations, flipping the articles at this location away from the receiver.

These and other objects and advantages of the invention will be apparent from the following description and accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a preferred embodiment of the invention in the form of a dispenser for tablets, with the dispenser in its normally closed position;

FIG. 2 is a top view of the dispenser shown in FIG. 1;

FIG. 3 is an elevation sectional view taken along the line 3—3 in FIG. 2;

FIG. 4 is a bottom view of the dispenser;

FIG. 5 is an enlarged elevation sectional view taken generally along the line 5—5 in FIG. 1;

FIG. 6 is an enlarged fragmentary elevational sectional view taken generally along the line 6—6 in FIG. 2;

FIGS. 7 through 10 are fragmentary top views of the left hand portion of the dispenser in one mode of the operation;

FIG. 11 is a fragmentary top view similar to FIGS. 7–10, but showing the dispenser during operation as it moves from its dispensing position (FIG. 10) to its normal closed position (FIG. 2); and

FIG. 12 is a fragmentary top view similar to FIGS. 7–11, but during another mode of operation.

Referring to the drawing, in FIG. 1 a dispenser 10 is shown held in a right hand (phantom lines) with a dispensing retainer or receiver 12 of the dispenser 10 positioned downwardly for movement by gravity of articles, in the form of tablets 14, toward the receiver 12. A pivot pin 16 (FIGS. 4 and 6) mounts the receiver 12 on a body 18 of the dispenser 10. The body 18 has a pair of channels including a first channel 20 and a second channel 22. As may best be seen in FIG. 5, these channels are separated by a partition 24 extending upwardly from a bottom wall 26 of the body 18 and parallel to sidewalls 28 of the body. The partition 24, sidewalls 28, and an end wall 30 are suitably secured, as by an adhesive, to the bottom wall 26. Obviously, the body may be made in any suitable manner or material as for example, it may be a molded plastic.

A transparent cover 32 extends over the channels 20 and 22 and a portion of the receiver 12. Grooves 34 (FIG. 5) in the sidewalls 26 slideably receive edge portions of the cover 32 so that the cover may be removed or partially removed for placing the tablets 14 into channels 20 and 22. Another groove 35 (FIG. 3) in the end wall 30 receives an end portion of the cover 32.

As shown in FIG. 6, the pivot pin 16 has a flat head 36 received in a recess 38 in the bottom wall 26 of the body 10.

A shank 40 of the pin 16 extends freely through a washer 41 between the bottom wall 26 and the receiver 12, and also through a hole in the bottom wall 26, with an upper end of the shank 40 fixedly secured, in any suitable manner as by an adhesive, for example, a socket 42 in the receiver 12. Movement of the receiver 12 between its closed and discharging position is limited by a pin 44 (FIG. 4) which engages a shoulder 46 on the bottom wall 26 in the closed position and a shoulder 48 in the open position. The pin rides across a protrusion 49 adjacent the shoulder 46 and is thereby releasably retained in the closed position.

A pair of tablet receiving locations in the form of recesses in the receiver 12 include a first recess 50 and a second recess 52. These recesses 50 and 52 are positioned to receive the lower most tablets 14 from a supply area having supply locations at the open ends of the first and second channels 20 and 22, respectively, when the receiver 12 is in its normally closed position (FIGS. 1–4).

When the dispenser is positioned as shown in FIG. 1 with receiver 12 held downward and tablets 14 seated one in each of the recesses 50 and 52, the dispenser 10 is ready to dispense one or two tablets 14. However, the receiver 12 must be moved in a particular manner and mode in order to dispense the tablets. In order to dispense the tablets 14, the receiver 12 is rotated in a relatively rapid mode and in a clockwise manner as indicated by the arrow 54 (FIGS. 7–10) from the closed position shown in FIGS. 1 and 2, through the positions shown in FIGS. 7–9 to the final discharge position shown in FIG. 10. Rotation of the receiver 12 may be accomplished by suitable movement of the index finger engaging knurls 56 along an edge portion of the receiver.

As the receiver 12 is rotated as discussed immediately above, from the position shown in FIG. 2 to the position shown in FIG. 10, a resiliently yieldable member 60 moves the tablets 14 in the first channel 20 upwardly toward the body end wall 30 and away from the receiver 12 and, more particularly, away from the second recess 52 and the tablet 14 carried in this recess.

The yieldable member 60 has an end portion secured in a slot 62 in the receiver 12 between the receiver recesses 50 and 52, and is fixedly secured in the slot in any suitable manner as by an adhesive. In closed position of the receiver (FIG. 2), the free end of the yieldable member 60 is closely proximate the free end of the body partition 24.

In greater detail, and with reference to FIG. 7, as the receiver 12 is rotated clockwise relatively rapidly from the normally closed position (FIG. 2) as indicated by the arrow 54, the member 60 engages the lowermost tablet 14 in the first channel 20 and the member 60 is deflected as shown by solid lines, and flips the lowermost tablet 14 from the solid line position toward the phantom line position of the tablet. This tablet, and the remaining tablets 14 in the first channel 20, are thus flipped away from the receiver to the position generally as shown in FIG. 8. After passing the lowermost tablet 14 in the channel 20, the member 60 returns to its generally straight position as indicated by phantom lines in FIG. 7 and remains in this position as the tablet 14 in the first recess 50 is discharged from the receiver 12 (FIG. 9). As the receiver 12 is rotated additionally to the position shown in FIG. 10, the second tablet 14 is discharged from the second recess 52 in the receiver.

As the receiver 12 is rotated counter-clockwise, as indicated by the arrow 64 in FIG. 11, the resiliently yieldable member 60 is first deflected by the lowermost tablet and flips the other tablets in the first channel toward the body end wall 30 and away from the second recess 52 in the receiver so that the lowermost tablet does not enter the recess 52.

Thus, when the receiver 12 is rotated relatively rapidly, the resiliently yieldable member 60 prevents the tablet 14 at the open end of the first channel 20 from jamming the receiver 12 and possibly damaging the tablet, and also prevents this tablet from entering the second recess 52 of the receiver, as the receiver returns to its closed position. Broken or chipped tablets are particularly likely to jam the receiver.

Thus, when the receiver 12 is rotated in the relatively rapid mode as just described, one or two of the tablets may be discharged, depending on how far the receiver is rotated toward its full discharge position (FIG. 10) to discharge two tablets or, only to the position shown in FIG. 9 to discharge but one tablet.

However, with reference to FIG. 12, if the receiver 12 is rotated in a relatively slow mode and in a clockwise manner from the closed position (FIG. 2), the yieldable member 60 does not flip the tablets 14 in the channel 20 or move past the lowermost of the tablets.

Rather, the yieldable member moves into substantially fixed abutting engagement with the lowermost tablet in the channel **20**. Thus, the tablet **14** serves as a stop for the yieldable member and movement of the receiver **12** to its discharging position is prevented. This feature is particularly desirable in medicine dispensers as it effectively prevents a small child from rotating the receiver **12** rapidly enough to move it past the position shown in FIG. **12**. On the other hand, an adult can easily rotate the receiver **12** relatively rapid to dispense the tablets **14**. In such a dispenser the cover **32** would be fixed.

While this invention has been described with reference to a particular embodiment in a particular environment, various changes may be apparent to one skilled in the art and the invention is therefore not to be limited to such embodiment or environment, except as set forth in the appended claims.

What is claimed is:

1. Article handling apparatus comprising, first means including a supply area for articles, a receiver having first and second receiving locations, one for receiving each of two of said articles from the supply area, means mounting said receiver for movement between a first position for receiving one of said articles from the supply area and a second position, and yieldable means on said receiver between said receiving locations for moving another of said articles in said supply area and adjacent said receiver, in a direction generally away from the receiver responsive to the receiver moving toward at least one of said positions.

2. Apparatus as set forth in claim **1** in which said supply area comprises first and second supply locations for supplying said articles to said first and second receiving locations, respectively, the mounting means mounts said receiver for movement of said second receiving location passed said first supply location, and said yieldable means is positioned for deflecting the article at said first supply location away from said second receiving location as said second receiving location passes said first supply location.

3. Apparatus as set forth in claim **2** in which said yieldable means is disposed for flipping the article at said first supply location in a direction away from said receiver responsive to the receiver moving between said positions.

4. Apparatus as set forth in claim **3** in which said receiving locations are recesses in said receiver, and said mounting means pivotally mounts said receiver for pivotal movement of said recesses by said supply locations.

5. Apparatus as set forth in claim **4** in which said first means further includes a body and said supply area includes first and second channels in said body for holding a plurality of said articles and said first and second channels having open ends at said first and second supply locations, respectively, said mounting means pivotally mounts said receiver on said body, and said yieldable means is a resiliently yieldable member disposed on said receiver between said recesses for engaging the adjacent one of said articles in said first channel and flipping the articles in said first channel away from said second recess as the second recess moves by said second channel.

6. Apparatus as set forth in claim **5** for dispensing in a single operation a plurality of said articles in the form of tablets or the like, and in which said body is generally rectangular and said channels are parallel to each other, each for holding a series of said tablets for movement toward said receiver, said channels being covered for retaining the tablets therein.

7. A method of handling a plurality of articles from a supply to a receiver having first and second articles receiving portions, one for receiving each of a pair of articles from the supply, and between the receiving portions a yieldable member, comprising the steps of moving the receiver past the articles, and flipping an article in the supply of articles and adjacent the receiver away from the receiver as the receiver moves past the supply of articles by engaging the last said article with the yieldable member responsive to movement of the receiver past the last said article.

8. A method as set forth in claim **7** in which the articles are in a plurality of groups, and in which the step of flipping the articles comprises flipping the articles in one of the groups as the yieldable member passes the last said group.

9. A method as set forth in claim **8** in which the yieldable member is resilient, and there are first and second ones of said groups and the articles are in series abutting relationship in each of said groups, the first and second receiving portions associated with the first and second groups, respectively, and in which the step of flipping the articles comprises flipping the articles in the first group as the second receiving portion passes the first group.

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