Feb. 16, 1954

E. C. SILVER

2,669,349

POCKET DISPENSER

Filed March 3, 1952

Fig. 1

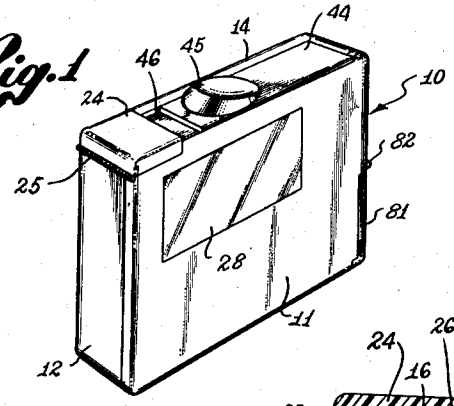


Fig. 2

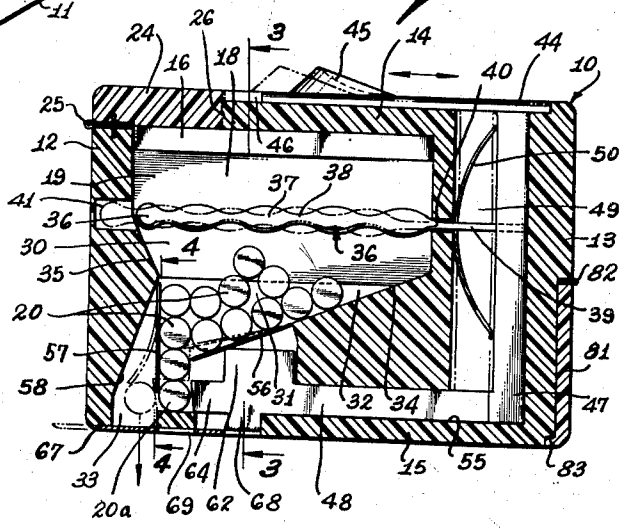


Fig. 3

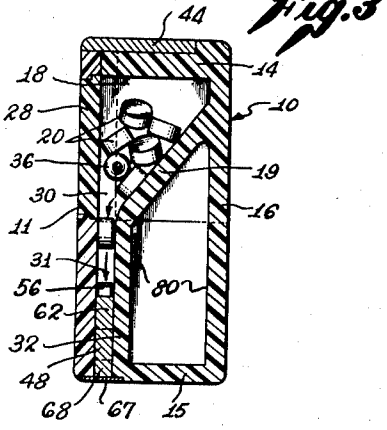


Fig. 4

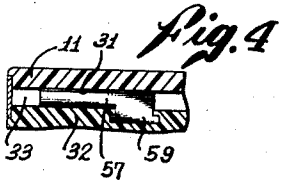


Fig. 5

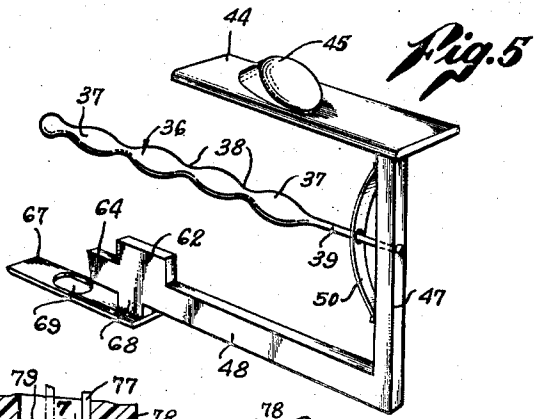


Fig. 6

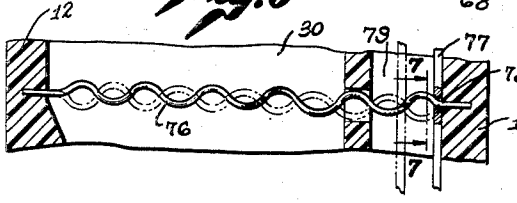


Fig. 7



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POCKET DISPENSER

Edward C. Silver, Los Angeles, Calif.

Application March 3, 1952, Serial No. 274,605

7 Claims. (Cl. 206—42)

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My invention relates generally to dispensing devices, and more particularly to a small pocket dispenser for containing and delivering pills or tablets.

Many persons are required to use daily some form of pill or tablet prescribed by their physicians for diet or health reasons. This necessitates carrying a small bottle or box which must be opened so that a pill may be taken out. Usually the container supplied is not a desirable pocket article, and in addition the pills tend to become damaged or spilled in the continual process of opening the container.

This invention provides a compact dispenser which will eject the pills one at a time without the necessity of opening the case. A preferred embodiment is particularly advantageous for use with the flat circular pill of conventional shape. One kind of tablet carried by a great number of people is the saccharin tablet which is used for daily diet purposes in the place of sugar or other sweeteners. My invention is well adapted for carrying these tablets, but it can be understood that the invention may be used to accommodate other types and sizes of tablets or droplets, and that it is not restricted to a product of a particular nature.

With the foregoing in mind, it is a major object of my invention to provide a pocket dispenser adapted to store tablets or pills and deliver them one at a time.

Another object of my invention is to provide a pocket dispenser of trouble-free design having ejection means to insure the proper and continual delivery of the tablets.

It is also an object of my invention to provide a pocket dispenser having cooperative hopper and agitating means preventing stoppage of material flow, and aligning the tablets for proper operation of the ejecting means.

A further object of my invention is to provide slide actuating means for simultaneously operating the agitating and ejection means together with a gate member which normally prevents the discharge of tablets from the dispenser.

Still another object of my invention is to provide a compact and durable dispenser utilizing the space therein in the most effective manner and having structural elements adapted for mass production at a nominal cost.

These and other objects and advantages of my invention will become apparent from the following detailed description of preferred and modified forms thereof, and from an inspection of the accompanying drawings, in which:

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Fig. 1 is a perspective view of the complete dispenser;

Fig. 2 is a longitudinal vertical section taken through the dispenser;

Fig. 3 is a cross section taken along the line 3—3 of Fig. 2;

Fig. 4 is a cross sectional detail taken along the line 4—4 of Fig. 2;

Fig. 5 is a perspective detail of the operating structure;

Fig. 6 is a detail of a modified form of agitating means; and

Fig. 7 is a cross sectional detail taken along the line 7—7 of Fig. 6.

Referring now to the drawings, and particularly to Figs. 1 and 2 thereof, the numeral 10 designates generally the housing of the dispenser. Housing 10 is of rectangular box shape having a vertical flat front face or cover 11. Narrow end walls 12 and 13, together with top and bottom walls 14 and 15, respectively, define the edge periphery of the housing and are formed integrally with a flat rear face 16 which extends parallel to cover 11. The rear wall and edge walls thus provide a shallow open box which is further divided by internal walls or baffles and is adapted to contain operating mechanism for controlling the delivery of pills or tablets from the dispenser. After the operating structure has been properly positioned within the housing, cover 11 is then secured in place to complete the assembly. Preferably, the entire housing 10 is formed of a suitable plastic material which is molded or extruded into the proper shape.

Within the upper portion of housing 10 is a hopper or container 18 which is formed by the aforementioned exterior walls and a downwardly sloping baffle or bottom wall 19 which extends from the upper corner of rear wall 16 toward front cover 11, as is best seen in Fig. 3. Hopper 18 is adapted to hold a suitable supply of pills or tablets 20 which are to be dispensed from the device. Tablets 20 are shown as flat circular discs for which the invention is especially advantageous. The invention is not, however, limited to a particular kind or shape of tablet, and I wish it to be understood that throughout the specification and claims the term "tablet" is used to include pills, capsules, or small confections which may equally well be dispensed from the device.

In order to re-load hopper 18 when the supply of tablets is exhausted, the upper end corner of housing 10 may be typically provided with a

hinged door 24 opening into the interior of the hopper. Door 24 is supported upon the left end wall 12 by a suitable hinge 25, and normally lies flush with the upper wall 14. A snap detent 26 projects from the inner end of door 24, and is adapted to engage in a cooperative groove provided in the abutting end of wall 14 for maintaining the door in a closed position. For visual observation of the supply of tablets within hopper 18, a transparent window 28 may be provided in front cover 11. It may be desirable to expose the inner working structure of the device, and the entire cover 11 may then be formed of suitable transparent plastic. As can be understood, the housing structure is subject to considerable modification, and is merely illustrative of a preferred embodiment.

Hopper bottom 19 terminates short of front wall 11 and defines a tapered throat 30 which constitutes a discharge exit from hopper 18. Throat 30 communicates into a vertical discharge chute 31 which lies between cover 11 and a parallel interior wall 32 that connects wall 19 and the housing base 15. As is best seen in Fig. 2, chute 31 is substantially the full length of hopper 18 at its upper end and inclines downwardly toward an exit opening 33 formed at the lower left end of the housing. One edge of chute 31 is formed by an inclined ramp 34 which extends laterally approximately half way across hopper 18, and the opposite edge is partially formed by a short downwardly convergent wall section 35.

The space between the front and back walls of chute 31 is made just slightly larger than the edge thickness of tablets 20 which are to be dispensed. Thus, as is seen in Fig. 2, the tablets 20 are stacked on edge in entering chute 31 and thence travel downwardly to be ultimately discharged through exit opening 33 one at a time. In order to prevent jamming of the pills or tablets in throat 30 prior to entering chute 31, I provide agitating means which shakes tablets 20 and aligns them in such a manner that they slide edgewise into the chute. As can be understood, if tablets 20 are not so aligned they would arrive at throat 30 in irregular order and some would wedge crosswise, blocking the passage.

The preferred form of agitator means comprises a horizontally extending rod 36 which extends across throat 30 and moves reciprocably with a shucking motion. Rod 36 has an elongated sinusoidal shape of circular cross section providing alternately spaced humps and depressions 37 and 38, respectively. At one end of rod 36 is a reduced connecting stem 39 which extends outwardly beyond the hopper 18 through an opening 40 formed in the inner portion of wall 13. The opposite end of rod 36 is registered with a bore 41 cut into the housing wall 12. As rod 36 reciprocates, it slides axially within bore 41 and stem 39 slides freely through opening 40.

Movement of humps and depressions 37 and 38 causes agitation or tumbling of tablets 20 and dislodges those which tend to ride above the agitator rod. As is seen in Fig. 3, rod 36 is positioned within throat 30 in such a location as to provide a clearance with wall 19 substantially equal to the edge thickness of the tablets, permitting a single line or row of tablets to pass therebetween. Thus only those tablets 20 which are sliding edgewise may pass under the rod 36 and enter discharge chute 31. The other tablets 20 remain in the hopper 18 until they have been agitated into an edgewise position, at which time they are, of course, free to fall into chute 31.

For the purpose of actuating the agitator means and ejection means later to be described, I provide a manually operable slide piece 44 which extends along the top of the housing and carries a push button 45 which may be conveniently operated by the thumb when the dispenser is held in the hand. Slide 44 is preferably recessed into an elongated slot 46 formed in housing wall 14 so as to be free for limited sliding movement. Secured to slide 44 and extending downwardly therefrom is an actuating bar 47 which turns and continues laterally across the bottom of the housing to form an actuating arm 48. Wall 13 is of substantial thickness, and has an intermediate channel 49 in which bar 47 is mounted. The width of channel 49 is somewhat greater than the width of bar 47, and the latter may therefore move a substantial distance horizontally within the confines of the channel.

A bowed leaf spring 50 is secured to the inner edge of bar 47, and normally urges the bar towards the right as viewed in Fig. 2, so that the bar bears against the corresponding edge of channel 49. Also secured to bar 47 is the end of agitator connecting stem 39 extending through wall opening 40. Spring 50 is secured only at one end to bar 47, and is adapted to flatten or compress upon movement of bar 47 inwardly when slide 44 is pushed manually by force of the thumb against button 45. As bar 47 is moved inwardly, the agitator rod 36 moves across hopper throat 30 and the previously described agitation and alignment of tablets 20 occurs. Likewise, as thumb pressure is released the bar 47 returns to its normal outward position under the urging of spring 50 and further agitation and alignment of the tablets 20 takes place.

The inward stroke of actuator bar 47 and actuating arm 48 is used to simultaneously operate ejection means which control the discharge of tablets 20 from the dispenser. Actuating arm 48 is slidably mounted in a lower groove 55 extending along housing 10 above bottom wall 15. The inner end of arm 48 enters into discharge chute 31 and is formed with several projecting portions for operating the various components of the ejecting means.

As will be remembered, one edge of chute 31 is formed by a downwardly inclined ramp 34 which extends partially across hopper 18. Thus tablets 20 entering chute 31 from the right end of the hopper 18 slide or roll downwardly along ramp 34. Secured to the end of ramp 34 is a flexible extension or plate 56 which inclines downwardly and across a substantial portion of chute 31. A similar flexible spring plate 57 is secured to the opposite chute edge 35 and hangs vertically downwardly in a position free for limited flexing motion. To provide clearance for plate 57, the lower edge of chute 31 is undercut at 58 and extends angularly outward towards exit opening 33. Plates 56 and 57 may be of any suitable material such as spring steel, and are typically anchored in position by an interlocking side hook 59 which is embedded in the material of the housing, as is indicated in Fig. 4.

Plate 56 extends toward plate 57 and has the tip thereof normally spaced from the latter a distance approximately equal to the diameter of a tablet 20, as is indicated in Fig. 2. As should also be noted therein, plate 56 is adapted to swing upwardly to the position shown in phantom outline, while plate 57 swings toward wall 53 and thereby opens the clearance between the plates. The purpose of upward movement of plate 56 is

to prevent a stoppage of flow through chute 31 by shifting the position of the tablets slightly and thereby breaking any jams which may tend to occur. To move plate 56 upwardly, I provide an upper cam lift 62 which is formed integrally with the end of actuating arm 48. The top portion of cam 62 is flat and the outer corner normally seats just under the edge of plate 56. However, when arm 48 moves inwardly the travel of cam 62 causes the free end of plate 56 to lift upwardly.

Also formed on the end of actuating arm 48 is an ejection toe 64 which cooperates with plate 57 to control the ejection of tablets 20 one at a time. Toe 64 projects inwardly toward plate 57 and is normally positioned with its end spaced from the tip of plate 57 a distance just less than the diameter of the tablet 20. The end surface of toe 64 is substantially vertical, being undercut slightly, and a rectangular pocket is defined by the toe and a portion of bottom wall 15. This pocket contains a single tablet 20a which, because of the clearances described, bears against the tip end of plate 57. Above tablet 20a several tablets are stacked vertically as seen in Fig. 2, with the remainder extending across the top portion of chute 31.

When the actuating arm 48 moves inwardly, toe 64 pushes tablet 20a against plate 57 and forces the latter to yield and swing toward wall 58. As this occurs, the tablet 20a moves into the final exit opening 33, and the following tablet passes between plates 56 and 57 so that it is free to drop into the ejection pocket upon retraction of the actuating arm. At the same time, the movement of plates 56 and 57 acts to insure that there will be a continual flow of tablets down the ejection chute 31. The relationship between the tip of plate 57 and the tablet 20a is of importance and should be particularly noted. With plate 57 in its normal position, the tip thereof extends downwardly so as to bear against the edge of tablet 20a. However, when plate 57 is forced into the position shown in phantom outline, the tip is elevated sufficiently so that tablet 20a is freed to drop downwardly into the exit opening.

As a final block upon the discharge of the ejected tablet a slidable gate 67 extends across the bottom of exit opening 33. As is best seen in Fig. 5, gate 67 is secured to actuating arm 48 by a downwardly extending bracket 68 formed integrally with the arm and mounted for sliding movement in a slotted portion of the housing bottom. Gate 67 is provided with an exit aperture 69 of sufficient size to pass a tablet 20, and is located so as to be normally disposed beneath the solid portion of the housing bottom. When gate 67 moves outwardly upon the actuating stroke of arm 48, aperture 69 registers with exit opening 33 and permits the tablet to fall therethrough. At any other time, the tablet is confined within exit opening 33 and cannot be accidentally discharged.

Thus it can be seen that I have provided agitating and ejection means which are operated simultaneously by the manual movement of a single slide plate. It may also be understood that the operation thus described insures a continual flow of tablets and their delivery one at a time. In Figs. 6 and 7 I have illustrated a modified form of agitating means which is generally similar to the preferred form but has a somewhat different mode of operation. The modified form of agitator means comprises a helical or sinusoidal rod or wire 76 of reduced diameter which is rotatably mounted in the hopper discharge throat 30. Rod 76 has one end journaled in the end wall 12 and the opposite end journaled in the outer portion of wall 13 so that it is held against axial movement.

In order to rotate rod 76, a modified form of actuating bar 77 is provided. Bar 77 has a relatively thin central portion which is confined within a channel 79 extended along wall 13. Extended through bar 77 is a small bore 78 which journals rod 76 in a tight slidable fit. As bar 77 moves along the arcuate surface of rod 76, the latter is forced to rotate through a partial turn. When bar 77 retracts to its initial position, the rod 76 is rotated back so as to complete an oscillating motion. As can be appreciated, the oscillation of rod 76 has the desired agitating effect upon the tablets within hopper 18 and turns them until they are positioned to slide edgewise under the rod and enter discharge chute 31. Thus it provides the same general function as the other form of agitator means.

As can be best seen in Fig. 3, the shape of hopper 18 and discharge chute 31 creates an enlarged space 80 within housing 10 on the opposite side of walls 19 and 32. The space 80 may be conveniently used as additional storage space for tablets, and to this end I provide an access door 81 which forms a portion of end wall 13, as is seen in Fig. 2. Door 81 is typically mounted upon a hinge 82 and carries an end detent 83 which frictionally engages bottom wall 15 so as to normally remain closed.

While I have thus shown and described a preferred form of the invention together with contemplated modifications, it can be understood that various other changes of design and construction will be apparent to those skilled in the art. Therefore I do not wish to be limited to the foregoing details of description, except as defined in the appended claims.

I claim:

1. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute formed by lower wall portions; an agitating rod mounted in said housing to extend transversely across said hopper throat parallel to said bottom wall and spaced therefrom to permit the entry of a single line of tablets into said chute, said rod having a generally sinusoidal shape and being movable for agitating said tablets and insuring the proper flow into said chute; ejection means mounted in said chute and movable in a reciprocating motion to eject one of said tablets from said housing upon each cycle of operation; and manual actuating means connected to said agitating means and said ejection means for effecting simultaneous operation thereof.

2. A tablet dispenser comprising: a housing formed with an upper hopper and a substantially vertical lower ejection chute converging downward to an exit opening; a flexible spring plate extending partially across said ejection chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening; an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plate, the inner end of said arm being normally spaced from said plate a distance substantially equal to the diameter of a tablet and being adapted to move a tablet against said plate to displace the latter out of the path of

said tablet whereby said tablet passes into said exit opening; and an exit gate having an aperture therein slidably mounted in said housing and connected to said ejection arm for movement therewith, said gate normally closing said exit opening and moving with said ejection arm to register said aperture with said opening during the stroke of said arm.

3. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute formed by lower wall portions; an agitating rod mounted in said housing to extend transversely across said hopper throat parallel to said bottom wall and spaced therefrom to permit the entry of a single line of tablets into said chute, said rod having a generally sinusoidal shape and being movable for agitating said tablets and insuring the proper flow into said chute; a flexible plate extending partially across said ejection chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening; an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plate, the inner end of said arm being normally spaced from said plate a distance substantially equal to the diameter of a tablet and being adapted to move a tablet against said plate to displace the latter out of the path of said tablet whereby said tablet passes into said exit opening; and an exit gate having an aperture therein slidably mounted in said housing and connected to said ejection arm for movement therewith, said gate normally closing said exit opening and moving with said ejection arm to register said aperture with said opening during the stroke of said arm.

4. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute having an inclined ramp extending partially thereacross and an exit opening in the opposite lower corner; a first flexible plate having a free end forming an extension of said ramp; a second flexible plate having a free end depending from the opposite edge of said chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening, the tip of said first plate being spaced from said second plate a distance sufficient to permit the passage of a tablet therebetween; and an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plates, said arm being mounted below said first plate and having an upper cam portion adapted to spring said first plate upwardly upon inward movement, the inner end of said arm being normally spaced from said second plate a distance substantially equal to the diameter of a tablet and forming with said housing an ejection pocket for containing a single tablet, whereby inward movement of said arm moves said tablet against said second plate to displace the latter out of the path of said tablet and at the same time releases said tablet into said exit opening to permit another tablet to drop into said ejection pocket.

5. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute having an inclined ramp extending partially thereacross and an exit opening in the opposite lower corner; an agitating rod mounted in said housing to extend transversely across said hopper throat parallel to said bottom wall and spaced therefrom to permit the entry of a single line of tablets into said chute, said rod having a generally sinusoidal shape and being movable for agitating said tablets and insuring the proper flow into said chute; a first flexible plate having a free end forming an extension of said ramp; a second flexible plate having a free end depending from the opposite edge of said chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening; and an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plates, said arm being mounted below said first plate and having an upper cam portion adapted to spring said first plate upwardly upon inward movement, the inner end of said arm being normally spaced from said second plate a distance substantially equal to the diameter of a tablet and forming with said housing an ejection pocket for containing a single tablet, whereby inward movement of said arm moves said tablet against said second plate to displace the latter out of the path of said tablet and at the same time releases said tablet into said exit opening to permit another tablet to drop into said ejection pocket.

6. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute having an inclined ramp extending partially thereacross and an exit opening in the opposite lower corner; an agitating rod mounted in said housing to extend transversely across said hopper throat parallel to said bottom wall and spaced therefrom to permit the entry of a single line of tablets into said chute, said rod having a generally sinusoidal shape and being movable with a reciprocating motion for agitating said tablets and insuring the proper flow into said chute; a first flexible plate having a free end forming an extension of said ramp; a second flexible plate having a free end depending from the opposite edge of said chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening; an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plates, said arm being mounted below said first plate and having an upper cam portion adapted to spring said first plate upwardly upon inward movement, the inner end of said arm being normally spaced from said second plate a distance substantially equal to the diameter of a tablet and forming with said housing an ejection pocket for containing a single tablet, whereby inward movement of said arm moves said tablet against said second plate to displace the latter out of the path of said tablet and at the same time releases said tablet into said exit opening to permit another tablet to drop into said ejection pocket; and an exit gate having an aperture therein slidably mounted in said housing and connected to said ejection arm for movement therewith, said gate normally closing said exit opening and moving with said ejection arm to register said aperture with said opening during the stroke of said arm.

7. A tablet dispenser comprising: a housing having an upper hopper with a sloping bottom wall defining with the opposite wall a constricted discharge throat communicating into a substantially vertical ejection chute having an inclined ramp extending partially thereacross and an exit opening in the opposite lower corner; an agitating rod mounted in said housing to extend transversely across said hopper throat parallel to said bottom wall and spaced therefrom to permit the entry of a single line of tablets into said chute, said rod having a generally sinusoidal shape and being movable with an oscillating motion for agitating said tablets and insuring the proper flow into said chute; a first flexible plate having a free end forming an extension of said ramp; a second flexible plate having a free end depending from the opposite edge of said chute adjacent said exit opening and normally disposed to block the passage of a tablet into said opening, the tip of said first plate being spaced from said second plate a distance sufficient to permit the passage of a tablet therebetween; an ejection arm slidably mounted in said housing for reciprocating movement and extending into said ejection chute for cooperation with said plates, said arm being mounted below said first plate and having an upper cam portion adapted to spring said first plate

upwardly upon inward movement, the inner end of said arm being normally spaced from said second plate a distance substantially equal to the diameter of a tablet and forming with said housing an ejection pocket for containing a single tablet, whereby inward movement of said arm moves said tablet against said second plate to displace the latter out of the path of said tablet and at the same time releases said tablet into said exit opening to permit another tablet to drop into said ejection pocket; and an exit gate having an aperture therein slidably mounted in said housing and connected to said ejection arm for movement therewith, said gate normally closing said exit opening and moving with said ejection arm to register said aperture with said opening during the stroke of said arm.

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