April 19, 1960 E. MIHALEK ET AL 2,932,976

VARIATING DEVICE FOR DISPENSING MACHINES

Filed Sept. 15, 1955 4 Sheets-Sheet 1

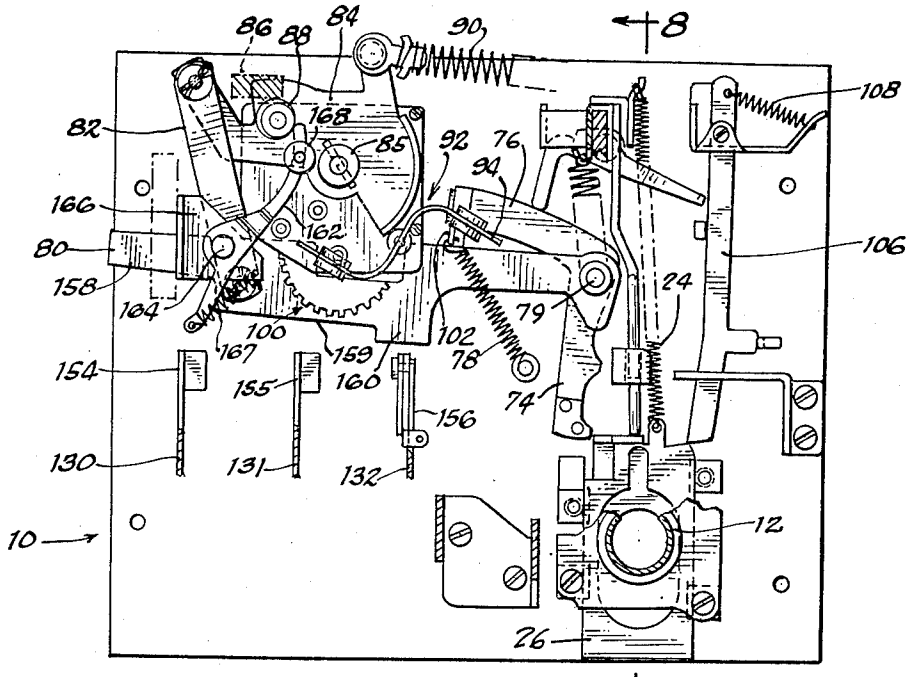


FIG. 1

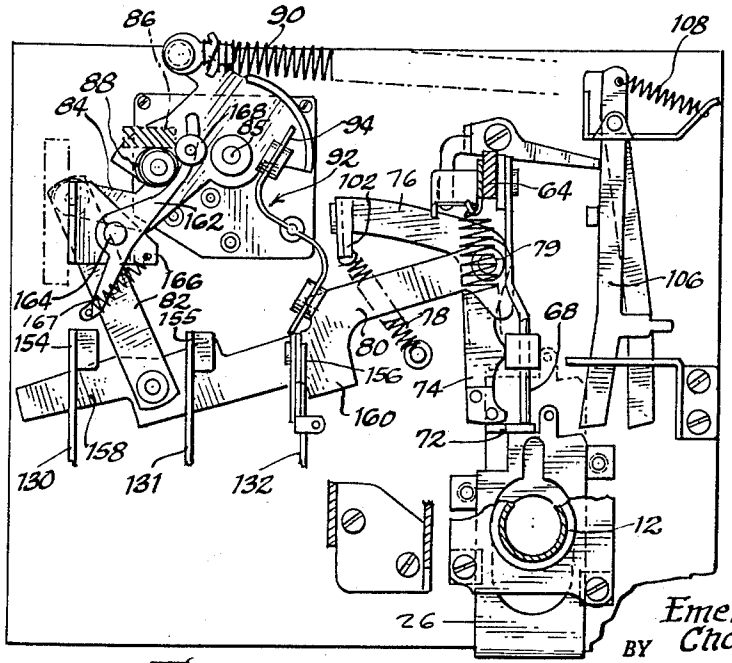


FIG. 2

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FIG. 3

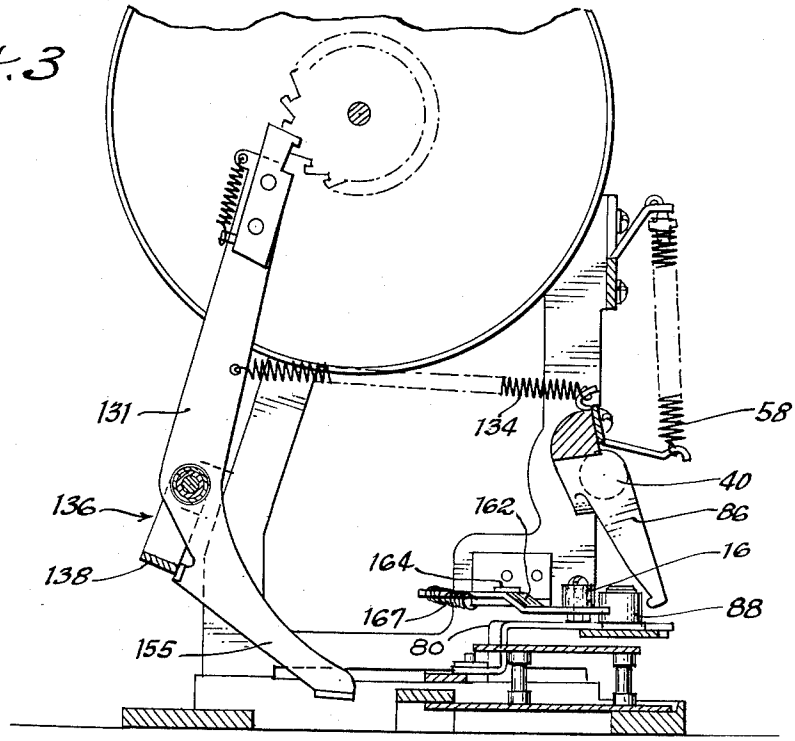


FIG. 4

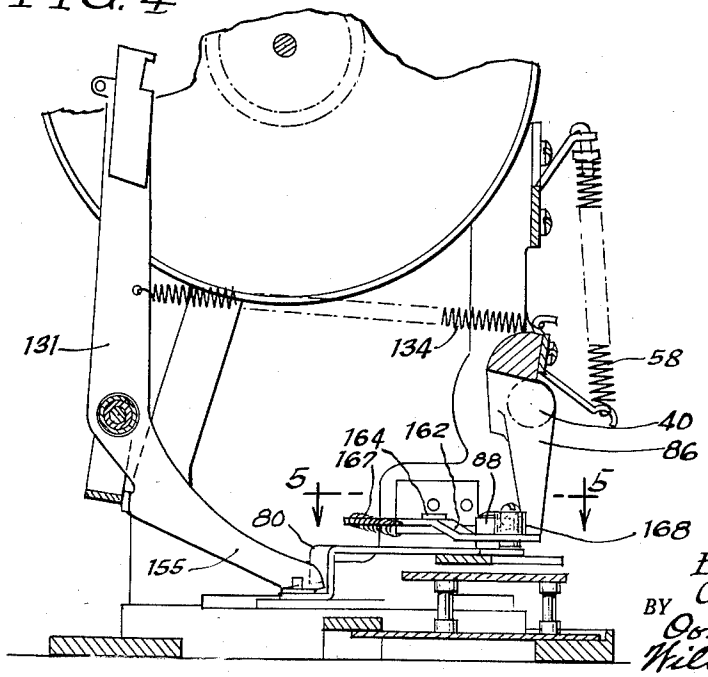
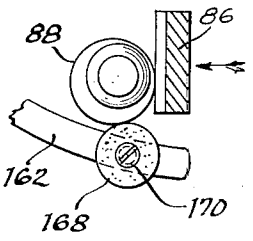


FIG. 5



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VARIATING DEVICE FOR DISPENSING MACHINES

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FIG. 6

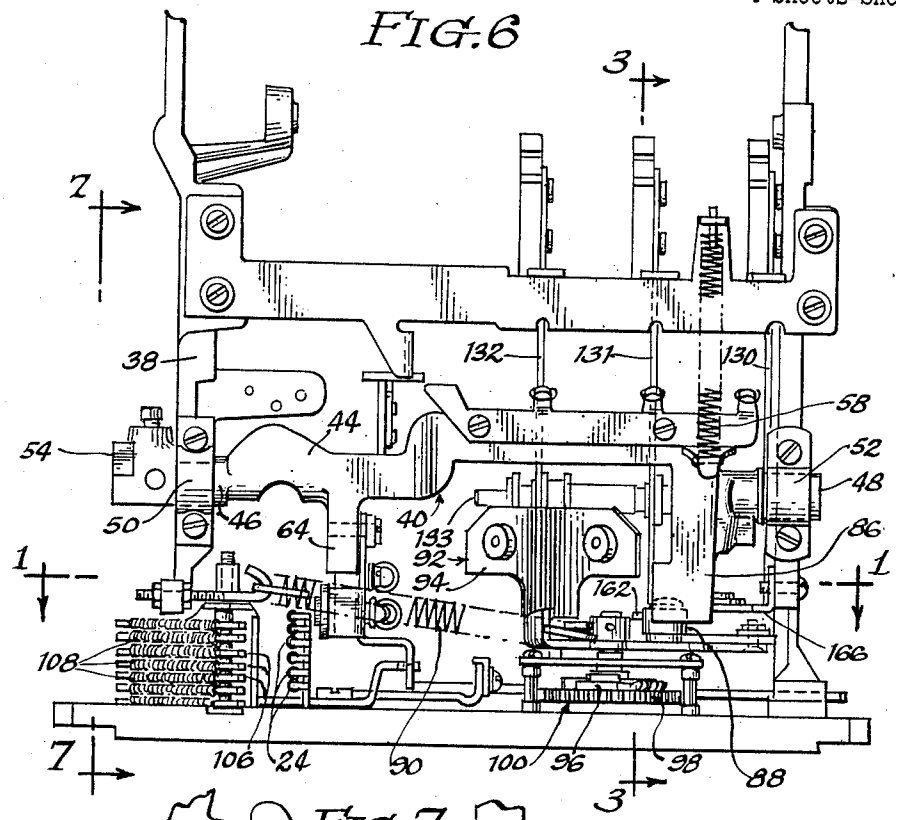
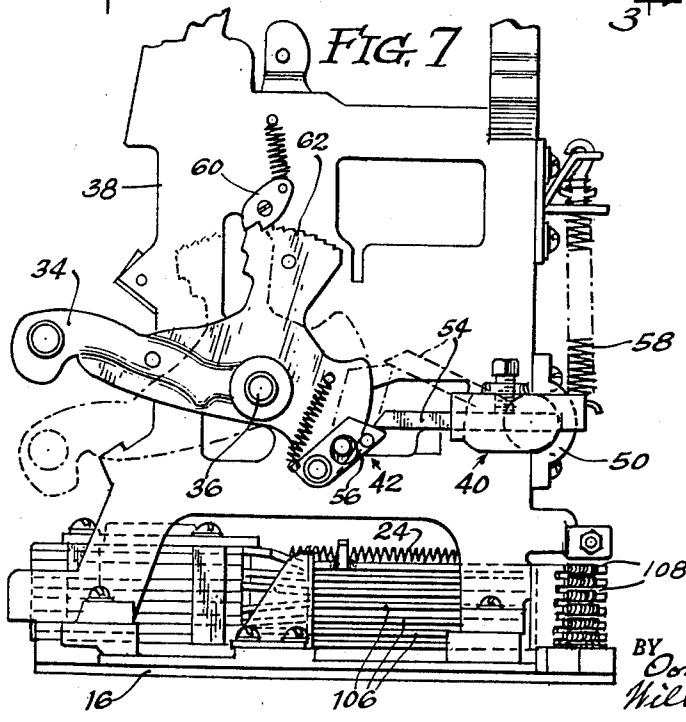


FIG. 7



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VARIATING DEVICE FOR DISPENSING MACHINES

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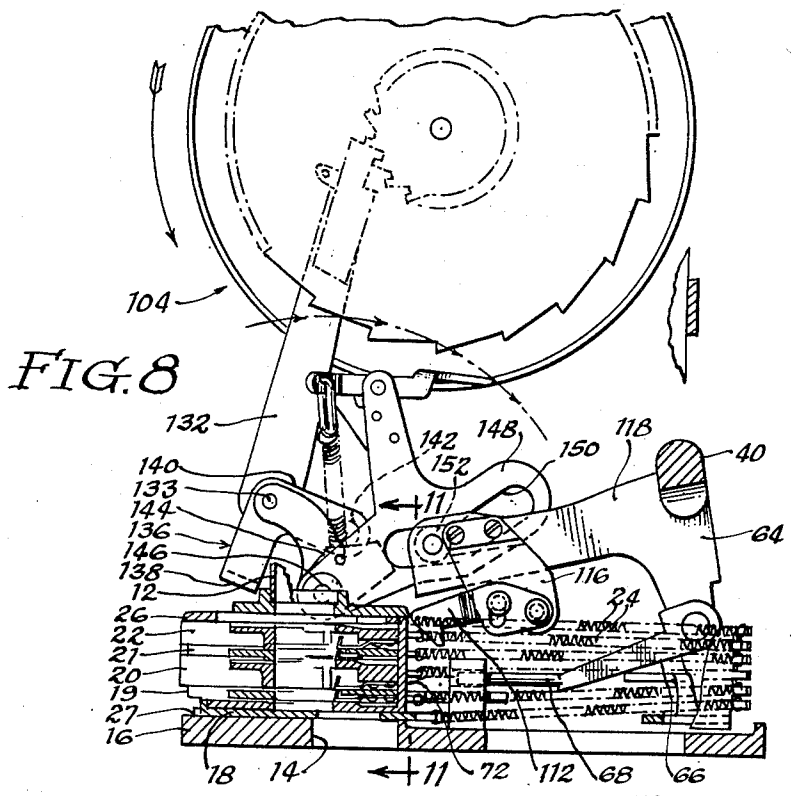


FIG. 8

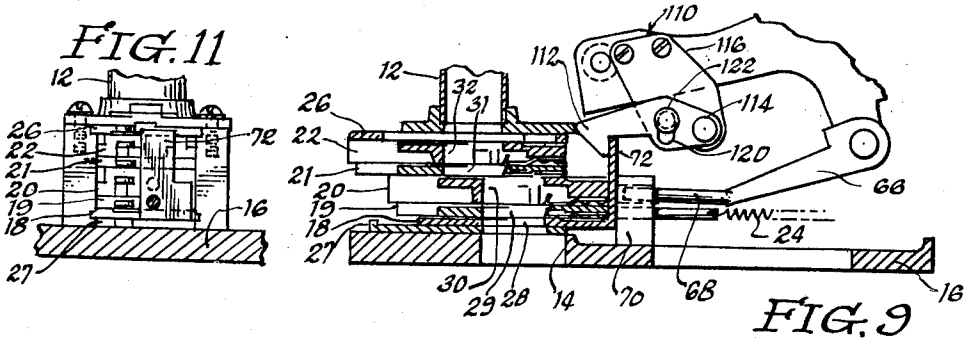


FIG. 11

FIG. 9

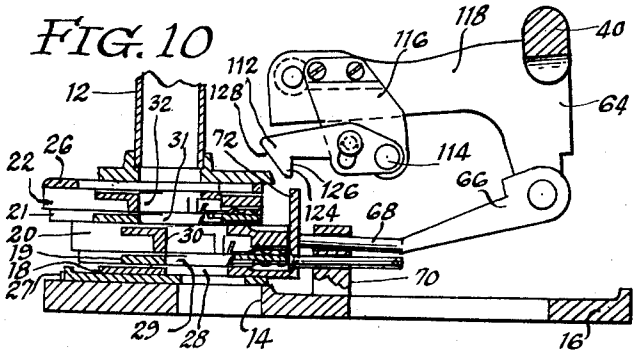


FIG. 10

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United States Patent Office 2,932,976 Patented Apr. 19, 1960

2,932,976

VARIATING DEVICE FOR DISPENSING MACHINES

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Application September 15, 1955, Serial No. 534,566

12 Claims. (Cl. 74—96)

This invention relates to dispensing machines or various other types of machines, and pertains particularly to variating devices for such machines.

The present invention comprises improvements which are applicable to machines of the type disclosed in the following United States patents: 1,562,771, 1,586,455, 1,570,910, 1,677,647, 1,697,537, 1,706,896, 1,798,416, 1,923,945, and 2,477,137.

One principal object of the invention is to provide a new and improved device whereby the operation of a dispensing machine or the like is varied in a random or impositive manner.

It is a further object to provide a new and improved device whereby the interaction between a pair of relatively movable elements of a machine is varied in a somewhat indeterminate manner.

Another object is to provide a new and improved variating device in which a roller of non-uniform radius forms an operating connection between first and second members and is adapted to be rotated impositively by a third member as an incident to relative movement between said first and third members so as to vary the interaction between the first and second members.

Further objects and advantages of the invention will appear from the following description, taken with the accompanying drawings, in which:

Figure 1 is a horizontal sectional view of a dispensing machine constituting an illustrative embodiment of the present invention, the view being taken along a line 1—1 in Fig. 6;

Fig. 2 is a view similar to Fig. 1 but with the machine in a changed position;

Fig. 3 is an elevational sectional view of the machine, taken generally along a line 3—3 in Fig. 6;

Fig. 4 is a view similar to Fig. 3, with the machine shown in a changed position;

Fig. 5 is a fragmentary enlarged horizontal sectional view taken generally along a line 5—5 in Fig. 4;

Fig. 6 is a rear elevational view of the machine with certain parts removed for clarity of illustration;

Fig. 7 is a fragmentary right side elevational view, taken generally as indicated by the line 7—7 in Fig. 6, certain of the parts omitted from Fig. 6 being shown in Fig. 7;

Fig. 8 is an elevational sectional view taken generally along a line 8—8 in Fig. 1;

Figs. 9 and 10 are fragmentary views similar to Fig. 8 but showing the machine in changed positions; and

Fig. 11 is a fragmentary elevational sectional view taken generally along a line 11—11 in Fig. 8.

It will be seen that the drawings illustrate a dispensing machine 10 having a magazine 12 (Figs. 1 and 8–10) adapted to hold a supply of articles to be dispensed. As illustrated, the magazine is in the form of a generally vertical tube adapted to hold a stack of the articles, which may be in the form of flat disks or the like. To discharge the articles, a circular opening 14 is formed in a horizontal base plate 16. It will be seen that the opening 14 is displaced rearwardly from the magazine 12.

To carry the articles from the magazine 12 to the discharge opening 14, the machine is equipped with a plurality of movable slides or other dispensing members arranged in vertically superimposed relation. In this instance, there are five dispensing slides 18, 19, 20, 21 and 22. Each of the slides 18–22 is biased rearwardly by means of a spring 24. Above and below the slides 18–22 are apertured upper and lower gates 26 and 27. However, the construction and function of these gates 26 and 27 is not material to the present invention and hence need not be described in detail. The dispensing slides 18–22 have respective vertical apertures 28–32 adapted to receive one or more of the disk-like articles from the magazine 12 and carry them to the discharge opening 14. In the initial position of the machine, as shown in Fig. 1, all of the apertures 28–32 are alined with the magazine 12. Accordingly, the disk-like articles will descend by gravity from the magazine into the apertures. The dispensing operation is accomplished by moving one or more of the slides rearwardly so that the apertures in the slides will be alined with the discharge opening 14, whereupon the disk-like articles contained in the apertures will fall through the discharge opening.

To actuate the dispensing slides 18–22, the machine is provided with an external, manually operable actuating lever or other member 34 (Fig. 7), which is mounted on the outer end of a pivot shaft 36 supported by and passing through a right hand side frame 38. The lever 34 is conveniently accessible for manual operation. The lever 34, or an extension thereof, not shown, will extend outwardly through an aperture in any casing, not shown, that may be provided to enclose the machine. The lever 34 is adapted to operate a composite trip lever 40 by means of an escapement 42.

It will be seen that the trip lever 40 has a shaft portion 44 (Fig. 6) provided with right and left hand journals 46 and 48 which are mounted in bearings 50 and 52. Extending forwardly on the trip lever 40 is a pointed escapement arm 54 which is normally engaged by a pawl 56 carried by the actuating lever 34. When the actuating lever 34 is swung manually in a counterclockwise direction, as seen in Fig. 6, the pawl 56 lifts the arm 54 so as to swing the trip lever 40 clockwise. After a predetermined amount of movement of the actuating lever 34, the arm 54 escapes from the pawl 56 and returns in a counterclockwise direction under the biasing impetus of a spring 58. The actuating lever 34 must be returned manually in a clockwise direction. To prevent premature return of the lever 34, a two-way pawl 60 is arranged to engage a segmental ratchet 62 on the lever 34.

The initial, clockwise swinging movement of the trip lever 40 is effective to reset the dispensing slides 18–22 into their article-receiving positions in vertical alinement with the magazine 12. Such resetting action is brought about by means of a depending arm 64 (Fig. 8) on the lever 40. It will be seen that a link 66 is connected between the arm 64 and a push pin 68 which is slidably guided in an upright projection 70 formed on the base plate 16. The pin 68 is adapted to engage an upright flange member or finger 72 formed on the rear end of the lowermost dispensing slide 18. This finger 72 extends upwardly along the rear ends of the other dispensing slides 19–22 and hence is adapted to push the slides forwardly. The clockwise initial movement of the trip lever 40 advances the pin 68. As shown to best advantage in Fig. 3, the pin 68 engages the finger 72, which in turn engages any of the slides 19–22 which have been moved to dispensing positions. The finger 72 pushes the slides forwardly into their article-receiving positions.

When the dispensing slides 18–22 reach their fully advanced, article-receiving positions underneath the magazine 12, they are latched by means of a latching arm 74 (Figs. 1 and 2) which swings behind the finger 72 on the lowermost slide 18. It will be seen that the arm 74 is formed on a horizontal latching lever 76 which is biased counterclockwise by a spring 78. Thus the spring is effective to swing the arm 74 into its latching position. A pivot 79 supports the lever 76.

A horizontal, movable member 80, shown as a lever supported on the pivot 79, is provided to swing the latching lever 76 clockwise and thereby disengage the latching arm 74 from the finger 72 on the lowermost dispensing slide 18. In this way, the dispensing slides 18–22 are conditioned for rearward movement between their article-receiving and article-dispensing positions. During the clockwise initial movement of the trip lever 40, the horizontal lever 80 is swung forwardly so as to permit the latching arm 74 to move behind the finger 72. Such forward movement of the lever 80 is effected in the present case by means of a link 82 which is connected between the lever 80 and a second horizontal movable member shown as a lever 84 with a pivot 85. To actuate the lever 84, the machine is provided with a movable member which takes the form of a depending arm 86 on the trip lever 40. The arm 86 is engageable with an eccentric roller 88 mounted on the lever 84. Initial clockwise movement of the trip lever 40 swings the depending arm 86 in a forward direction so that it engages the roller 88 and thereby swings the levers 84 and 80 forwardly. Upon return movement of the trip lever 40, the depending arm 86 moves away from the roller 88 to permit return of the lever 84 under the impetus of a biasing spring 90.

Return movement of the lever 84 is preferably retarded by means of a suitable retarding mechanism 92 (Figs. 1, 2 and 6). The illustrated retarding mechanism 92 is of the air fan type. Thus, a two-armed fan 94 is arranged to be driven at high speed by the lever 84 during its return movement. During return movement of the lever 84, a one-way ratchet clutch 96 (Fig. 6) connects the lever to a gear 98 which drives the fan 94 through a conventional speed-multiplying gear train 100. The air resistance offered to rotation of the fan 94 retards the return movement of the levers 84 and 80. Near its rearward limit of travel, the lever 80 engages an upstanding projection 102 on the latching lever 76 and thereby swings the latching lever in a clockwise direction so as to disengage the arm 74 from the finger 72 on the lowermost dispensing slide 18.

After the slides 18–22 have been released by the master latching arm 74, the rearward movement of the slides is controlled by means of a suitable selector mechanism 104 (Fig. 8) which, however, is not material to the present invention and hence need not be described in detail. The selector mechanism operates in such manner that it may release one or more of the slides for rearward movement into dispensing position. Due to the provision of the finger 72, the lowermost slide 18 must be released for rearward movement before any of the other slides 19–22 can travel rearwardly.

It will suffice to note that the selector mechanism 104 comprises a plurality of individual latches 106 (Figs. 1 and 2), one latch being provided for each of the slides 18–22. The selector mechanism is aranged to release the latches 106 in various combinations during the return movement of the lever 80. When the master latching arm 74 is released, as shown in Fig. 1, those slides for which the individual latches 106 are also released will travel rearwardly under the impetus of the biasing springs 24. When the slides are reset forwardly by the push pin 68, the latches 106 are returned into latching position by means of individual biasing springs 108.

Fig. 9 illustrates one possible dispensing position of the machine in which the three lower dispensing slides

18, 19 and 20 are shifted rearwardly so that the apertures 28, 29 and 30 therein are in overlying relation to the discharge opening 14. With the slides 18, 19 and 20 in this position, the disk-like articles carried in the apertures will be dispensed through the opening 14.

Spurious operation of the lowermost dispensing slide 18 is prevented by means of an automatic locking device 110 which retains the lowermost slide 18 in its dispensing position, once it has been moved to this position by legitimate operation of the machine. It will be seen from Figs. 8–10, that the locking device 110 comprises a locking pawl or latch 112 connected by means of a pivot 114 to a bracket 116 which in turn is mounted on an arm 118 extending forwardly on the trip lever 40. The pawl 112 has a limited range of free swinging movement relative to the arm 118. This range of free movement, or lost motion, is defined by an arcuate slot 120 formed in the pawl 112. The bracket 116 carries a headed pin 122 which extends through the slot 120 and limits the movement of the pawl 112.

It will be seen that the pawl 112 is formed with a depending tooth 124 which defines a rearwardly facing latching shoulder 126. An inclined cam surface 128 is formed along the front of the pawl 112 and is arranged to face downwardly and forwardly. When the lowermost dispensing slide travels rearwardly to its dispensing position, the finger 72 engages the cam surface 128 so as to displace the pawl 112 upwardly. Thus, the pawl 112 offers no resistance to rearward movement of the slides 18–22. Once the lowermost slide 18 has reached its dispensing position at the rearmost limit of its travel, the pawl 112 moves downwardly, under the biasing action of gravity, with the tooth 124 and latching shoulder 126 in front of the finger 72. It is then impossible to move the lowermost dispensing slide 18 in a forward direction until the pawl 112 is released.

The pawl 112 is automatically released by actuation of the machine in the normal manner. Thus, initial clockwise actuating movement of the trip lever 40 swings the arm 118 upwardly. This raises the pawl 112 so that the latching shoulder 126 will be disengaged from the finger 72. Such releasing movement of the pawl 112 occurs before the push pin 68 engages the finger 72.

In addition to operating the latching lever 76, the horizontal lever 80 is arranged to control three brake or stop levers 130, 131 and 132 which in turn are effective to control the operation of the selector mechanism 104, in a manner not material to the present invention. The levers 130–132 are independently swingable on a pivot shaft 133.

During the clockwise operation of the trip lever 40, the levers 130–132 are swung counterclockwise (Fig. 8) against the biasing action of respective springs 134, one spring being provided for each lever. Such joint movement of the levers 130–132 is brought about by means of a bell crank lever 136 which includes a bail rod portion 138 engageable with the levers 130–132, as shown to best advantage in Figs. 3, 4 and 8. The lever 136 also includes an actuating arm 140 which carries a roller 142 adapted to be actuated by a camming arm 144. In the illustrated arrangement, the camming arm 144 is supported on a pivot 146 and is rigidly connected to a lever arm 148 having a cam slot 150 therein. A roller 152 is received in the cam slot 150 and is mounted on the previously mentioned arm 118 of the trip lever 40. Through interaction of the roller 152 and the cam slot 150, the lever arm 148 and the camming arm 144 are swung counterclockwise when the trip lever 40 is actuated in a clockwise direction. The camming arm 144 in turn swings the lever 136 in a counterclockwise direction so that the levers 130–132 will be similarly actuated.

When the trip lever 40 is returned in a counterclockwise direction, under the biasing impetus of the spring 58, the lever arm 148 and the camming arm 144 are returned in a clockwise direction so as to release the levers

130–132 for return movement. However, the horizontal lever 80 prevents immediate return of the levers 130–132. As shown, the levers 130–132 are formed with downwardly and rearwardly extending arms 154, 155 and 156 which are engageable with stepped portions 158, 159 and 160 on the lever 80. During the initial clockwise movement of the trip lever 40, the lever 80 is shifted rearwardly, in the manner already described, so as to move the stepped portions 158–160 underneath the return paths of the arms 154–156. After the trip lever 40 has been returned in a counterclockwise direction, the lever 80 swings rearwardly and successively releases the levers 130–132 for return movement. The successive release of the brake levers 130, 131 and 132 may stop the rotation of a series of wheels or other elements in the selector mechanism 104. Of course, the final position of the selector mechanism depends upon the action of the brake levers 130–132. In Fig. 3, the lever 131 is shown in its initial position, while in Fig. 4 it is shown in its displaced position with its lower arm 155 engaged with the lever 80. The initial and forwardly displaced positions of the lever 80 are illustrated in Figs. 1 and 2, respectively. It will be recalled that the rearward return of the lever 80 is retarded by the retarding mechanism 92. Thus, an appreciable time normally elapses while the levers 130–132 are being successively released.

In accordance with the present invention, the action of the lever 80 is varied in a somewhat indeterminate manner so that the levers 130–132 will be released at different times during successive cycles of the machine. In the illustrated machine, the action of the lever 80 is varied by varying the interaction between the movable arm member 86 and the lever member 84.

As already noted, the arm 86 and the lever 84 are interconnected by means of the roller 88 on the lever 84. A variable factor is introduced between the elements 84 and 86 by making the roller 88 eccentric or of non-uniform radius. By rotating the roller 88 is an impositive or indeterminate manner, it is possible to vary the extent to which the levers 80 and 84 are swung forwardly by the forward swinging movement of the arm 86.

Such indeterminate rotation of the roller 88 is brought about in the present case by means of an element 162 which frictionally engages the roller 88 and thereby tends to rotate the roller, particularly during return movement of the lever 84. During the actuating movement of the lever 84, the roller 88 is engaged and rotated to a certain extent by the arm 86. However, the friction between the arm 86 and the roller 88 tends to prevent the element 162 from rotating the roller. During return movement of the lever 84, the arm 86 is out of engagement with the roller 88 so that the element 162 may readily rotate the roller.

It will be seen that the lever member 84 and the element 162 are mounted for relative movement. As shown, the element 162 takes the form of an arcuate arm supported on a pivot 164 which is mounted on a stationary bracket 166. A spring 167 biases the arm 162 against the roller 88. It will be seen that the arm 162 extends generally along the horizontal path of the roller 88. Thus, the arm 162 rides on the roller 88 during its forward and rearward movement. During the rearward movement of the roller 88, the arm 162 frictionally rotates the roller. Due to the impositive connection between the arm 162 and the roller 88, the extent of rotation imparted to the roller is somewhat indeterminate. Thus, the roller 88 may occupy any position at the beginning of each cycle of the machine. If the roller occupies a position such that its portion of greatest radius engages the arm 86, the levers 80 and 84 will be swung forwardly to a maximum extent during the next forward movement of the arm 86. If a portion of the roller 88 of smaller radius is positioned to be engaged by the arm 86, the levers 80 and 84 will be swung forwardly to a lesser extent.

In order that the effectiveness of the arm 162 may be enhanced, it is preferable that the arm carry magnetic means adapted to attract the roller 88. While the arm 162 might itself be magnetized, it is preferred to mount a separate magnet 168 on the arm. As shown, the magnet 168 takes the form of a small magnetized disk mounted adjacent the end of the arm 162 by means of a machine screw 170. The circular periphery of the disk magnet 168 extends beyond the arm 162 and is adapted to engage the periphery of the roller 88 during a portion of the relative movement between the roller and the arm. The disk magnet 168 is permanently magnetized and may be made of any magnetic material having suitable properties for use in permanent magnets.

In normal operation, the machine is actuated by pushing downwardly on the front end of the actuating lever 34 so as to move the lever counterclockwise. The pawl 56 on the lever 34 raises the trip arm 54 until the arm escapes from the pawls. The raising movement of the arm 54 results in clockwise actuation of the trip lever 40. When the arm 54 escapes from the pawl 56, the biasing spring 58 returns the lever in a counterclockwise direction.

During the clockwise actuation of the trip lever 40, the arm 118 raises the locking pawl 112 and actuates the push pin 68 so as to reset any of the slides 18–22 which might have previously been moved rearwardly. The depending arm 86 on the lever 40 engages the eccentric roller 88 and is effective to swing the levers 84 and 80 forwardly. The extent of forward movement depends upon the initial position of the roller 88. If the roller 88 is positioned so that a portion of relatively great radius is engaged by the arm 86, the forward movement of the levers 84 and 80 will be relatively great. If a portion of relatively small radius is engaged by the arm 86, the forward movement will be relatively small.

The forward movement of the lever 80 releases the master latching lever 76 so that the latching arm 74 can move behind the finger 72 on the lowermost slide 18. The latching arm 74 temporarily retains the dispensing slides 18–22 at their most forwardly displaced positions, out of engagement with the latches 106 and with the apertures 28–32 underneath the magazine 12. The articles held in the magazine are thus enabled to descend by gravity into the apertures in the slides.

During the clockwise actuation of the trip lever 40, the levers 130–132 are swung counterclockwise by the bail rod 138 on the bell crank lever 136, which in turn is actuated by the camming arm 144. It will be recalled that the camming arm 144 is swung counterclockwise by the interaction between the roller 152 on the arm 118 and the cam slot 150 in the lever arm 148. While the levers 130–132 are thus displaced counterclockwise, the horizontal lever 80 moves underneath the lower arms 154–156 of the levers 130–132.

During the rearward return movement of the lever 80, the levers 130–132 are successively released for clockwise return movement. The levers 130–132 control the selector mechanism, in a manner not material to the present invention, so that the latches 106 controlling some or all of the dispensing slides 18–22 may be released. Near the end of its return movement, the lever 80 swings the latching lever 76 clockwise and thereby releases the latching arm 74 from the finger 72 on the lowermost slide 18. The slides are then free to move rearwardly under the control of the latches 106. If the latch 106 for the lowermost slide 18 is released, the lowermost slide will move rearwardly until the aperture 28 therein is alined with the discharge opening 14. In like manner, the other slides 19–22 may be moved rearwardly. The articles in the apertures will thus be enabled to descend through the discharge opening by gravity. The lowermost slide 18 will be locked in its rearmost position by the locking pawl 112.

During the rearward return movement of the levers

80 and 84, the arcuate arm 162 rides along the eccentric roller 88. The frictional drag provided by the arm 162 rotates the roller 88 to an extent which is somewhat indeterminate. During a portion of the return movement of the lever 84, the magnet 168 rides along the roller. The magnetic attraction between the magnet 168 and the roller 88 enhances the frictional drag on the roller and thus insures that the roller will be rotated. The effect of the arm 162 and the magnet 168 is to rotate the roller 83 to a new position so that the interaction between the arm 86 and the lever 84 will be changed during the next cycle of operation.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention as exemplified in the foregoing description and defined in the following claims.

We claim:

1. In a dispensing machine, the combination comprising an actuating lever, an eccentric roller rotatably mounted thereon, a swingable arm engageable with said roller for swinging said lever in one direction, a biasing spring for returning said lever in the opposite direction, means for retarding return movement of said lever, a pivoted arcuate arm swingable against the periphery of said eccentric roller, a biasing spring urging said arcuate arm against said roller to afford drag on the periphery thereof and thereby rotate the same during return movement of said lever, the rotary position of said roller thereby being changed in a random manner during each return movement of said lever to vary the extent of movement of said lever by said first mentioned swingable arm, and a disk-shaped magnet mounted on said arcuate arm for engagement with the periphery of said roller during a portion of the return movement of said lever to afford enhanced drag on said roller.

2. A variating mechanism, comprising, in combination, first and second movable members, a roller of non-uniform radius rotatably mounted on said first member to afford a connection between said first and second members, said second member being engageable with the periphery of said roller to transmit thrust between said members, a third movable member extending along the path of movement of said roller, biasing means urging said third member against said roller to afford frictional drag thereon, said third member thereby being effective to rotate said roller in a random manner during movement of said first member and thereby vary the connection between said first and second members, and magnetic means carried by said third member for enhancing the frictional drag on said roller.

3. A variating mechanism, comprising, in combination, first and second movable members, a roller of non-uniform radius rotatably mounted on said first member to afford a connection between said first and second members, said second member being engageable with the periphery of said roller to transmit thrust between said members, a third movable member extending along the path of movement of said roller, and biasing means urging said third member against said roller to afford frictional drag thereon, said third member thereby being effective to rotate said roller in a random manner during movement of said first member and thereby vary the connection between said first and second members.

4. In a dispensing machine, the combination comprising an actuating member movable in a predetermined path, a roller of non-uniform radius rotatably mounted on said member, a second movable member engageable with said roller for moving said actuating member, a third movable member extending adjacent said path, and biasing means urging said third member against said roller to afford drag thereon and thereby rotate said roller during movement of said actuating member, said third member being effective to vary the rotary position of said roller in a random manner so as to change the range of movement imparted to such actuating member by said second member.

5. In a dispensing machine, the combination comprising an actuating member movable in a predetermined path, a roller of non-uniform radius rotatably mounted on said member, a second movable member engageable with said roller for moving said actuating member, a third movable member extending adjacent said path, biasing means urging said third member against said roller to afford drag thereon and thereby rotate said roller during movement of said actuating member, said third member being effective to vary the movement imparted to such actuating member by said second member, and magnet means on said third member to enhance the drag thereon.

6. In a dispensing machine, the combination comprising an actuating member movable in a predetermined path, an eccentric roller rotatably mounted on said member, a second movable member engageable with said roller for moving said actuating member in one direction along said path, means for returning said actuating member in the opposite direction along said path, means for retarding return movement of said actuating member, a third movable member extending adjacent said path, biasing means urging said third member against said roller to afford drag thereon and thereby rotate said roller during movement of said actuating member, said third member being effective to vary the rotary position of said roller in a random manner so as to change the range of movement imparted to such actuating member by said second member, and magnet means on said third member to enhance the drag thereon.

7. In a dispensing machine, the combination comprising an actuating member movable in a predetermined path, an eccentric roller rotatably mounted on said member, a second movable member engageable with said roller for moving said actuating member in one direction along said path, means for returning said actuating member in the opposite direction along said path, means for retarding return movement of said actuating member, a third movable member having a finger extending adjacent said path, biasing means urging said finger against said roller to afford drag thereon and thereby rotate said roller during movement of said actuating member, said finger being effective to vary the rotary position of said roller in a random manner so as to change the range of movement imparted to such actuating member by said second member, and a magnet element mounted on said finger and engageable with said roller to enhance the drag thereon.

8. In a dispensing machine, the combination comprising an actuating lever, an eccentric roller rotatably mounted thereon, a swingable arm engageable with said roller for swinging said lever in one direction, a biasing spring for returning said lever in the opposite direction, a pivoted arm swingable against said eccentric roller, a biasing spring urging said swingable arm against said roller to afford drag thereon and thereby rotate the same, the rotary position of said roller thereby being changed in a random manner to vary the extent of movement of said lever by said first mentioned swingable arm, and a magnet mounted on said swingable arm for engagement with said roller to afford enhanced drag on said roller.

9. A variating mechanism, comprising first, second and third members, means mounting said members for relative movement between said first and second members and between said first and third members, a roller of non-uniform radius rotatably mounted on said first member to afford a connection between said first and second members, said second member being engageable with the periphery of said roller, said third member extending along the path of relative movement between said third member and said roller and engaging said roller to afford frictional drag thereon, said third member thereby being effective to rotate said roller and thereby vary the connection between said first and second members.

10. A variating mechanism, comprising first, second and third members, means mounting said members for relative movement between said first and second members and between said first and third members, a roller of non-uniform radius rotatably mounted on said first member to afford a connection between said first and second members, said second member being engageable with the periphery of said roller to transmit thrust between said members, said third member extending along the path of relative movement between said roller and said third member, biasing means urging said third member against said roller to afford frictional drag thereon, said third member thereby being effective to rotate said roller in a random manner during relative movement between said first and third members and thereby vary the connection between said first and second members, and magnetic means carried by said third member for enhancing the frictional drag on said roller.

11. A variating mechanism, comprising first and second relatively movable members, a roller of non-uniform radius rotatably mounted on said first member, said second member being engageable with said roller to limit relative movement between said first and second members, a pivoted arm, biasing means urging said arm against said roller, means mounting said first member and said arm for relative movement therebetween, said arm being effective to rotate said roller and thereby vary the interaction of said first and second members, and magnet means on said arm for attracting said roller.

12. A variating mechanism, comprising first and second relatively movable members, a roller of non-uniform radius rotatably mounted on said first member, said second member being engageable with said roller to limit relative movement between said first and second members, a pivoted arm, biasing means urging said arm against said roller, and means mounting said first member and said arm for relative movement therebetween, said arm being effective to rotate said roller and thereby vary the interaction of said first and second members.

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