

March 16, 1965

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3,173,431

DISPENSING MEANS

Filed Dec. 7, 1962

3 Sheets-Sheet 1

FIG. 1

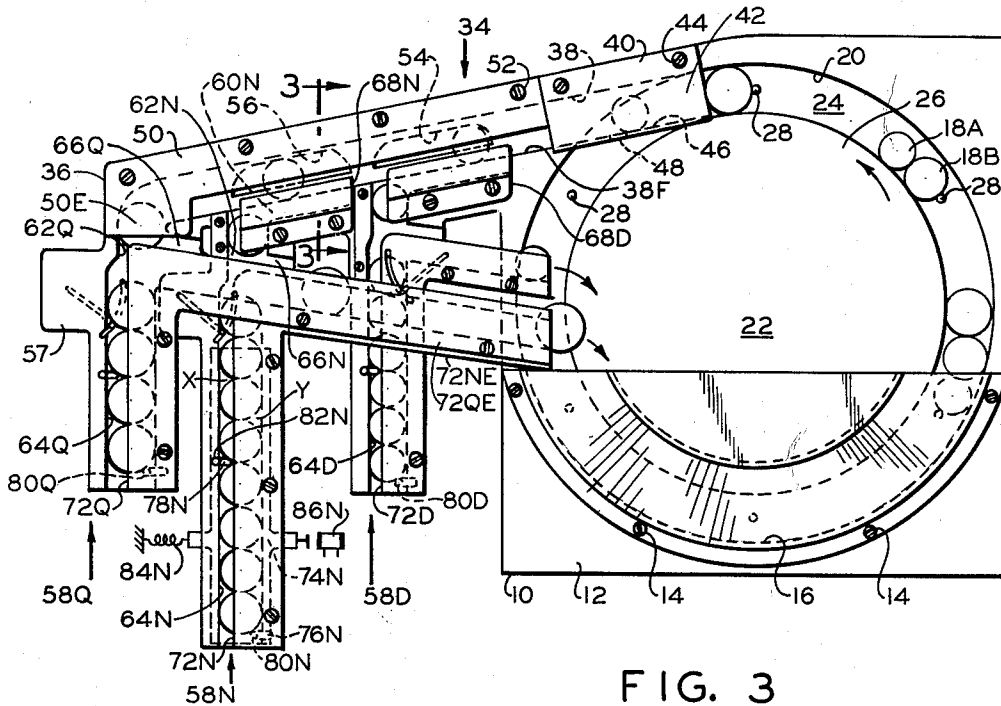


FIG. 2

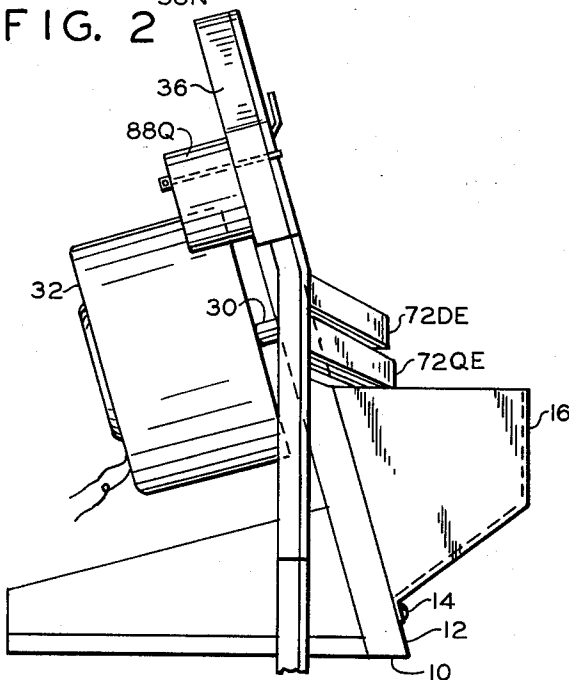
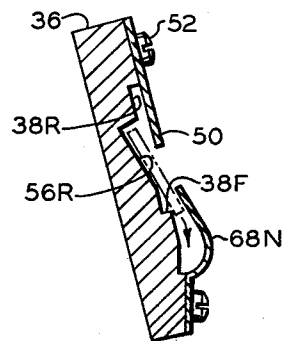


FIG. 3



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3 Sheets-Sheet 2

FIG. 4

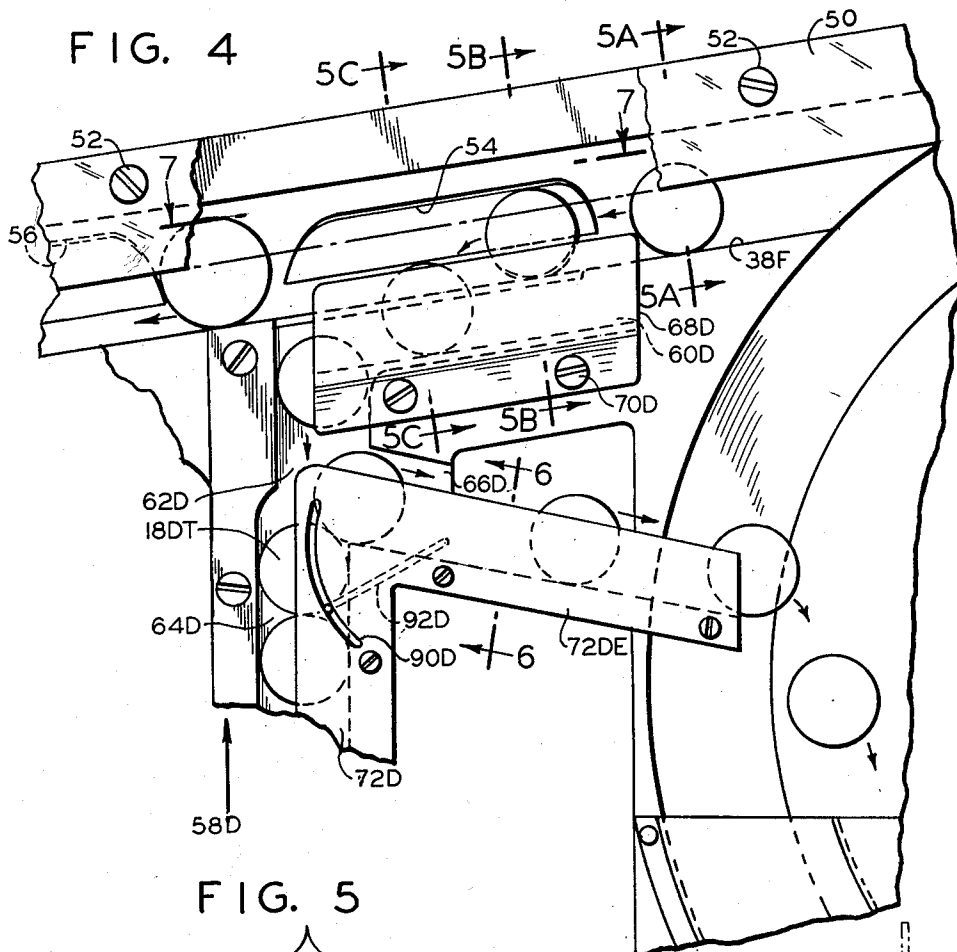


FIG. 5

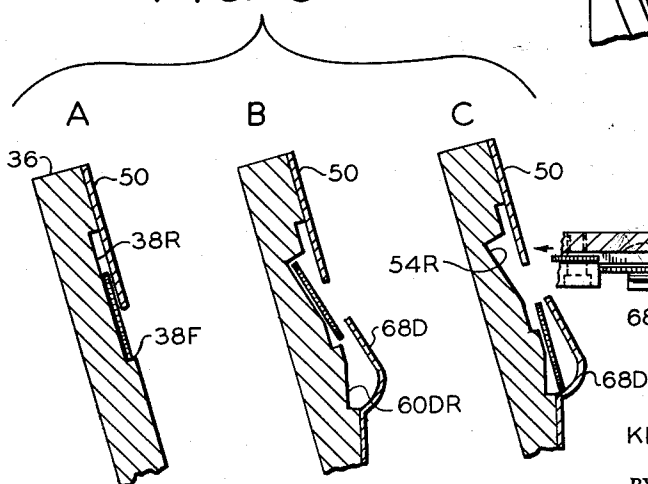


FIG. 6

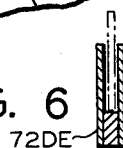
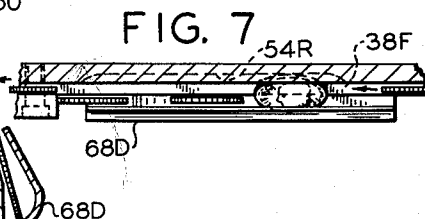


FIG. 7



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3,173,431

Filed Dec. 7, 1962

3 Sheets-Sheet 3

FIG. 8

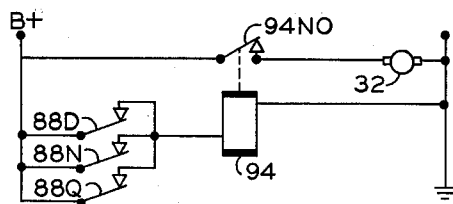
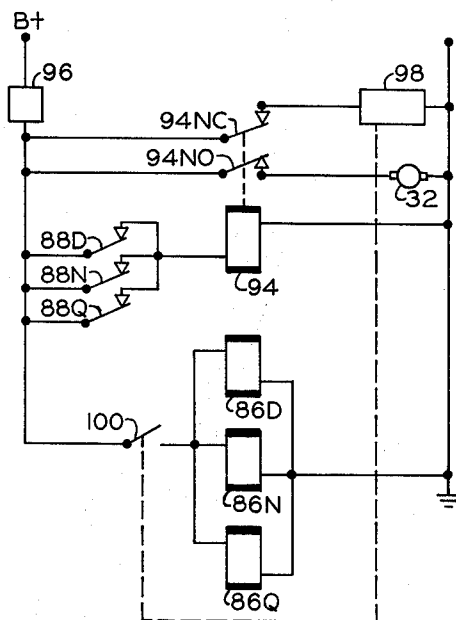


FIG. 9



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1

3,173,431

DISPENSING MEANS

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14 Claims. (Cl. 133—3)

This invention relates to article dispensing means, and more particularly to a coin dispensing system.

Coin dispensing systems are customarily included in change making devices. Examples of these are devices for returning to a depositor a plurality of small denomination coins in exchange for a large denomination coin or paper money, and devices for returning to a depositor goods and small denomination coins in exchange for a large denomination coin or paper money.

An object of this invention is the provision of a system for the accurate dispensation of a predetermined number of coins.

Another object of this invention is the provision of a system for the accurate dispensation of a predetermined number of coins of different denomination from a single supply of intermixed coins of different denominations.

A feature of this invention is an article dispensing system having a reservoir storing an intermixed plurality of articles of different sizes; means for extracting predetermined numbers of articles of each size from said reservoir; and means for dispensing predetermined numbers of articles from said extracted predetermined numbers of articles.

Other and further objects and features of this invention will be more clearly apparent by reference to the following description when taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a front view of the instant coin dispensing device;

FIGURE 2 is a side view of the device of FIGURE 1;

FIGURE 3 is a side view in section taken along line 3—3 of FIGURE 1 of the coin sorting runway;

FIGURE 4 is a front view of a detail of FIGURE 1; FIGURES 5A, 5B, and 5C are side views in section taken along lines 5A—5A, 5B—5B and 5C—5C respectively of FIGURE 4;

FIGURE 6 is a side view in section taken along line 6—6 of FIGURE 4 of a coin return runway;

FIGURE 7 is a top view in section taken along line 7—7 of FIGURE 4 of a coin sorting portion of the runway system;

FIGURE 8 is a schematic electrical diagram of a detail of an embodiment of this invention; and

FIGURE 9 is a schematic electrical diagram of an embodiment of this invention.

Referring now to the drawing and particularly FIGURES 1 and 2, the coin dispensing system embodying this invention includes a baseplate 10 which is inclined at an angle, e.g. 15 degrees, to the vertical. Affixed to the lower portion of the front face 12 of the baseplate by screws 14 is a hopper 16 which holds a jumbled mass of coins (not shown) of various denominations, e.g. dimes, nickels and quarters. The center 20 of the baseplate is cut out and a pickup disc 22 of the substantially same diameter is mounted therein. The pickup disc 22 has a peripheral annular groove or recess 24 in its front face 26. The annular recess 24 is of rectangular

2

cross-section and has fixed therein a plurality of upstanding pins 28 which are disposed in spaced-apart relationship. The width of this annular recess is slightly larger than the diameter of the largest coin being handled. The depth of this annular recess is slightly smaller than the thickness of the thinnest coin being handled. The pickup disc 22 is coupled by a shaft 30 to a motor 32, and is suitably journaled to the baseplate 10 for rotation with respect thereto. As the pickup disc rotates, in the counter-clockwise direction as seen in FIGURE 1, through the mass of coins, individual coins, e.g. 18A, 18B, fall into the annular recess, are abutted by the pins 28, and are carried upwardly.

A coin sorting runway system 34 is provided as an extension to the baseplate and pickup disc assembly. The function of this system is to sort by denomination the various coins which are extracted by the pickup disc from the supply of coins in the hopper 16. The sorting runway system 34 consists of a bar portion 36 of substantially rectangular cross-section, the front face of which is inclined at an angle, e.g. 15 degrees, to the vertical. The length of the bar portion 36 is also tilted with respect to the horizontal, so that as seen in FIGURES 1 and 4 the right end is higher than the left end. A runway recess 38 of rectangular cross-section is milled into the length of the front face of the bar. The height of this recess 38 is slightly larger than the diameter of the largest coin being handled. The depth of this recess is slightly larger than the thickness of the thickest coin being handled. The bar is joined to the baseplate so that the bar recess 38 is tangential to and merges with the annular recess 24. An L-shaped cover plate 40 is fixed to the front faces of the bar portion 36 and the baseplate 10 at the junction of the runway recess 38 and the annular recess 24. The leg portion 42 of the L-shaped cover plate is fixed to the upper faces of the bar portion and the baseplate by screws 44. The foot portion 46 of the plate 40 is directed inwardly into the runway recess 38 and the annular recess 24. The foot portion 46 thus guides all of the coins which have been extracted by the pickup disc 22 from the annular recess 24 into the runway recess 38. A central portion 48 of the foot portion 46, however, is cut away to pass the pins 28 as the disc 22 rotates. As the coins enter and roll down the recess 38, they are tilted with respect to the vertical and are supported on their edges by the bottom or foot 38F of the runway recess and are separated on their back faces by the back or rear 38R of the runway recess. This may also be seen in FIGURE 5A. A cover plate 50 is provided over the upper portion of the runway recess for the length of the recess to prevent accidental loss of the coins from the recess. The plate 50 is fixed to the bar by screws 52.

A plurality of additional recesses is milled into the runway recess 38 for the purpose of sorting the coins by denomination. The first sorting recess 54 along the path of the coins separates out the dimes, and the second sorting recess 56 separates out the nickels. The coins remaining on the runway recess 38 are quarters. The first sorting recess 54 is milled into the rear of the runway recess. The rear 54R of the first sorting recess is tilted at an angle to the rear of the runway recess, e.g. 15 degrees, and thus at a greater angle to the vertical, e.g. 30 degrees. The height of the first sorting recess 54 is made slightly larger than the diameter of dimes and

smaller than the diameter of nickels. Thus, as seen in FIGURES 5B and 5C, when a dime rolls down the runway recess 38 to the first sorting recess 54, the upper portion of the dime will not be separated by the rear 54R of the runway recess, and the upper portion of the dime will tip into the first sorting recess. The lower portion of the dime will thus be swung away from the foot 38F of the runway recess, and the dime will slide out of the runway recess and fall. However, nickels and quarters which roll down the runway recess to the first sorting recess have a diameter which is greater than the height of the first sorting recess. These coins will continue to be supported by the rear 38R of the runway recess, will not tip into the first sorting recess, and will continue to roll down the runway recess.

The second sorting recess 56 is further along the path of the coins as they roll down the runway recess. This second sorting recess is similar to the first sorting recess except that the height of the second sorting recess is slightly greater than the diameter of the nickels and less than the diameter of the quarters. When the nickels reach the second sorting recess they tip into it and fall out of the runway recess. However, the quarters continue to roll along the runway recess past the second sorting recess.

Three counting recess systems 58D, 58N and 58Q are respectively disposed adjacent each of the sorting recesses and the end of the runway recess. The purpose of each of the counting recess systems is to respectively receive the coins which have been sorted by denomination and to respectively store a predetermined number of coins. A return runway is provided for each counting recess system to return to the hopper all of the coins received by the system over the predetermined number.

Each of the counting recess systems is disposed below the bar portion 36 and is formed as an extension thereof. The systems are comprised in a common baseplate 57 into which three recess systems are milled. The first recess system 58D is provided to process dimes. The length of the upper portion 60D of the recess is tilted from the horizontal and is parallel to the runway recess 38 above. The rear 60DR of the upper portion 60D of the recess is substantially vertical. An intermediate portion 62D of the recess is vertical, and at its upper end merges with the upper portion 60D and at its lower end divides into a vertical counting recess 64D and a return recess 66D which is reversely tilted from the horizontal. A bent cover plate 68D is fixed to the baseplate 57 by screws 70D and covers the upper recess portion 60D and the lower portion of the runway recess 38 thereabove. As the dimes fall from the runway recess 38 above at the first sorting recess 54 they are caught by the first cover plate 68D and guided into the upper portion 60D of the first counting recess system. The dimes roll down the upper portion 60D into the intermediate portion 62D and into the counting recess 64D. The central axis of the counting recess 64D is slightly displaced from the central axis of the intermediate portion 62D; however, the dimes fall into the counting recess 64D rather than into the return recess 66D.

An obstruction means, which will be described hereinafter, is disposed to obstruct the lower end of the counting recess 64D, and as each dime falls into the counting recess it is supported therein by the dimes below, which in turn are supported by the obstruction means. When a predetermined number of dimes has fallen into the counting recess, the top of the topmost dime 18DT is level with or slightly higher than the return recess 66D. All further dimes which fall through the intermediate recess 62D are deflected by the topmost dime in the counting recess and pass into the return recess 66D. A cover plate 72D is fitted over a portion of the return recess 66D and the counting recess 64D to prevent the loss of the dimes from these recesses. An extension 72DE of this cover plate is formed with a U-shaped cross-section as seen in FIGURE 6. This extension provides a return

runway for the dimes from the return recess 66D to the hopper 16. The length of the return runway 72DE is tilted from the horizontal, and its open lower end is disposed above the hopper 16.

The second recess system 58N is provided to process nickels. This system is similar to the first recess system 58D and is disposed below the runway recess 38 at the second sorting recess 56. It also comprises an upper recess portion 60N, an intermediate recess portion 62N, a counting recess 64N, a return recess 66N, an upper cover plate 68N, and a lower cover plate 72N with a U cross-section extension 72NE which guides overflow nickels back to the hopper 16.

The third recess system 58Q is provided at the lower end of the runway recess 38 to process quarters. This system is somewhat similar to the other systems. However, since there is no sorting recess for quarters, an extension 50E is provided on the runway recess cover plate 50 to guide the quarters into an intermediate recess portion 62Q. The intermediate recess portion leads to a counting recess 64Q and a return recess 66Q. A lower cover plate 72Q is provided to cover the counting recess 64Q and the return recess 66Q and includes an extension 72QE to provide a return runway for surplus quarters to the hopper 16.

It will thus be seen that the pickup disc extracts intermixed nickels, dimes and quarters in a random sequence from the hopper 16 and feeds them to the runway recess 38. As these coins roll down the runway recess, the first sorting recess 54 tips out the dimes from the runway recess into the first recess system; the second sorting recess 56 tips out the nickels from the runway recess into the second recess system; and the quarters roll out of the end of the runway recess into the third recess system. When the predetermined number of coins in each counting recess 64D, 64N, 64Q, respectively, is collected, the surplus coins are diverted into the return runway and fed back to the hopper.

A reciprocating slide assembly is provided for each of the counting recesses to alternatively obstruct the bottom end of the counting recess and count a predetermined quantity of coins, and to unblock the bottom end of the counting recess to dispense a predetermined quantity of coins from the stored quantity of coins. The dispensed quantity may be equal to or less than the stored quantity. A slide assembly is illustrated in FIGURE 1 in conjunction with the nickel counting recess 64N. A slide 74N is suitably mounted for reciprocation behind the baseplate 57 at the bottom of the counting recess 64N. A horizontal slot 76N is cut through the baseplate 57 and into the counting recess 64N at the bottom of the recess. Another horizontal slot 78N is cut through the baseplate 57 and into the counting recess at the middle of the counting recess. A pin 80N is fixed to the slide 74N and disposed in the lower slot 76N and another pin 82N is fixed to the slide and disposed in the upper slot 78N. When the slide 74N is reciprocated fully to the left, as seen in FIGURE 1, the lower pin 80N obstructs the counting recess 64N while the upper pin 82N clears the recess. When the slide is reciprocated fully to the right, the upper pin 82N obstructs the counting recess while the lower pin 80N clears the recess. The slide is biased into its left or counting position by a tension spring 84N. The slide is actuated into its right or dispensing position by a solenoid 86N. Thus, in this embodiment as seen in the nickel counting recess of FIGURE 1, the slide and counting recess will store eight nickels, and will dispense four nickels for each reciprocation cycle of the slide.

A snap action switch assembly is provided for each of the counting recesses to condition the motor 32 of the pickup disc 22 for operation. A snap action switch 88D, 88N, 88Q is mounted behind the baseplate 57 at the top of each counting recess 64D, 64N, 64Q, respectively. Consider the dime assembly. A circular slot 90D is cut through the baseplate 57 and into the top of the counting

5

recess 64D and the cover plate 72D. The end of the actuator arm 92D of the switch 88D is disposed in this slot. As each dime passes through the counting recess 64D, it abuts and carries the end of the actuator arm 92D downwardly, swinging the end through the length of the slot 90D and beyond the counting recess 64D. When the dime falls beyond the end of the arm 92D, the end of the arm swings back into the counting recess. The last (the sixth) 18DT of the predetermined number of dimes is supported by the rest of the dimes in the counting recess, does not fall beyond the end of the actuator arm, and thus holds the actuator arm down.

As seen in FIGURE 8, the three snap action switches 88D, 88N and 88Q are connected in parallel in the normally closed condition between B+ and one end of the coil of a relay 94. The other end of the relay is coupled to a ground return. Thus, whenever any of the actuator arms of the switches is up, that switch will be closed, and the relay 94 will be energized. The normally open contact set 94NO of the relay 94 connects one terminal of the pickup disc motor 32 to B+. The other terminal of the motor is connected to a ground return. Whenever the relay 94 is energized, the motor 32 rotates the pickup disc 22.

In the illustrated embodiment of FIGURE 9, it is desired to use the dispensing machine in combination with a dollar bill accepting device to dispense a dollar's worth of change in the form of two quarters, four nickels, and three dimes. At the start of the first cycle of operation, the lower pins 80D, 80N, 80Q obstruct the bottom of each respective counting recess 64D, 64N, 60Q; the hopper is filled with a mixture of nickels, dimes and quarters; and the counting recesses are empty. The actuator arm of each of the normally closed snap action switches 88D, 88N, 88Q is up, closing its switch, and connecting the motor relay 94, via a time control 96, to B+. The normally open contact set 94NO of the relay 94 is closed, coupling the pickup disc motor 32 to B+. The time control 96 is a recycling device which is normally closed, and is adapted to open the circuit permanently if it runs without interruption for more than a predetermined interval of time. A control of this type is manufactured by the Industrial Timer Corporation of Newark, N.J., under catalogue number 90-305. This device is used to prevent the motor from running too long in the event of an empty hopper or other malfunction. As the motor turns, the pickup disc extracts coins at random which are fed into the runway recess 38. The coins are sorted by the first and second coin sorting recesses 54, 56. As each coin falls through a counting recess 64D, 64N or 64Q it momentarily opens the respective snap action switch 88D, 88N or 88Q. The motor 32 continues running since not all of the switches are open for any extended period of time. As each counting recess is filled with the respective predetermined number of coins, e.g. six dimes, or eight nickels or four quarters, the top-most coin holds down the respective snap action switch actuator arm and deflects subsequent coins falling through the respective intermediate recess portion 62D, 62N or 62Q into the return recess 66D, 66N or 66Q and return runway 72DE, 72NE or 72QE back to the hopper 16. When all of the counting recesses are filled with the respective predetermined number of coins, all of the actuator arms are held down and all the switches are open, de-energizing the motor relay 94. The normally open contact set 94NO opens, de-energizing the motor 32. A normally closed contact set 94NC connects an associated article receiving means 98, e.g. a dollar bill receiver, to B+ through the time control 96, conditioning it to receive an article. When the article, e.g. a valid dollar bill, has been received and accepted by the article receiving means, this article receiving means closes a switch 100 which connects one end of each of the dispensing solenoids 86D, 86N and 86Q to B+ through the time device; the other ends of the dispensing solenoids are respectively con-

6

nected to the ground return. The dispensing solenoids are thus energized and each operates its respective dispensing slide 74D, 74N, 74Q to its right hand position to dispense those coins which are held in the respective counting recess between the lower pin and the upper pin. The coins fall into a catch chute (which is not shown) and pass into a cup on the outside of the machine where the coins are accessible to the user. When the switch 100 is opened, the slides are restored by their respective springs to their left hand position permitting those coins remaining in the counting recesses to fall to the respective lower pins 80D, 80N, 80Q. The actuator arms of the snap switches are released by the topmost coins, closing these switches, and the motor 32 is energized again, rotating the pickup disc to extract more coins from the hopper for sorting. It will be noted that the counting recesses still contain another dollar's worth of change after they have dispensed a previous dollar's worth. When the hopper runs out of coins, the time control is operated by the motor 32 for more than its predetermined period of time, causing the time control to open the main B+ circuit. The machine will then neither make change, nor accept dollar bills. The last dollar's worth of change left in the counting recesses will thus never be dispensed by the machine. Although a single upper slot 78 and a single lower slot 76 have been shown for each counting recess, additional slots may be cut into each counting recess at coin diameter spacings, and the pins 82 and 80 may be adjustably secured to the slide 74 so that these pins may be selectively inserted in any of these slots. By this means the number of coins to be counted and the number of coins to be dispensed may be varied. For example, if the pin 80N is disposed in a slot cutting into the counting recess 64N at the location indicated in FIGURE 1 at Y, the recess will store three nickels; and if the pin 82N is disposed in a slot cut into the recess at the location X, the recess will dispense one nickel.

We have thus shown and described our invention, but we desire it to be understood that it is not confined to the particular forms or usages shown and described, the same being merely illustrative, and that our invention may be carried out in other ways without departing from the spirit of our invention, and, therefore, we claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and, by means of which, objects of our invention are attained and new results are accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and to accomplish these results.

What is claimed is:

1. An article dispensing system comprising
 - primary means for storing a plurality of each of a given number of different types of articles in a random, intermixed relationship;
 - means for sorting the different articles by type;
 - means for transporting a random sequence of the articles from said primary storing means to said sorting means;
 - intermediate means for storing a predetermined quantity respectively of each type of article by type and for rejecting any surplusage over each predetermined quantity of each type of article;
 - means for transporting the sorted articles by type to said intermediate storing means;
 - means for transporting the rejected surplusage of each type of article to said primary storage means; and
 - means for effecting the dispensation of a predetermined quantity respectively from the predetermined quantity of each type of article which has been stored by said intermediate storing means.

2. A multid denominational coin dispensing system comprising
 - primary means for storing a plurality of each denom-

ination of coin in a random, intermixed relationship;
 means for sorting coins by denomination;
 means for transporting a denominationally random
 sequence of coins from said primary storage means
 to said sorting means;
 intermediate means for storing by denomination a pre-
 determined quantity of each denomination of coin,
 and for rejecting any surplusage over each predeter-
 mined quantity;
 means for transporting by denomination the sorted
 coins to said intermediate storing means;
 means for transporting the rejected surplusage of each
 denomination of coin to said primary storage means;
 means for effecting the dispensation of a predetermined
 quantity of each denomination of coin from the pre-
 determined quantity of each denomination of coin
 which has been stored by said intermediate storing
 means.
 3. A system according to claim 2 further including
 means for precluding further operation of said means
 for transporting coins from said primary storage
 means when said intermediate storing means has
 stored less than the respective predetermined number
 of any denomination of coin after a predetermined
 interval of operation of said means for transporting
 coins from said primary storing means.
 4. A system according to claim 2 further including
 means for precluding further operation of said means
 for transporting coins from said primary storing
 means when said intermediate storing means has
 stored the respective predetermined quantity of each
 denomination of coin.
 5. A system according to claim 2 further including
 means for actuating said means for effecting the dis-
 pensation of coins.
 6. A system according to claim 2 further including
 normally inoperable means for receiving an exchange
 article;
 control means coupled to said exchange article receiv-
 ing means, including
 sensing means for sensing the storage by said inter-
 mediate storing means of the predetermined quantity
 of each denomination of coin, and in response there-
 to conditioning said exchange article receiving means
 for operation.
 7. A system according to claim 2 further including
 means for receiving and accepting an exchange article,
 said receiving means being coupled to said dispensa-
 tion effecting means and actuating the latter in
 response to accepting an exchange article.
 8. In a multid denominational coin dispensing system
 having primary means for storing a plurality of each
 denomination of coin in a random intermixed relation-
 ship, sorting means for sorting coins by denomination,
 means for storing coins by denomination, means for
 transporting coins from the primary means to the sorting
 means:
 intermediate means for storing by denomination a pre-
 determined quantity of each denomination of coin,
 and for rejecting any surplusage over each predeter-
 mined quantity;
 means for transporting by denomination the sorted
 coins from the sorting means to said intermediate
 means;
 means for transporting the rejected surplusage of coins
 from said intermediate means to the primary means.
 9. A multid denominational coin dispensing system
 including:
 primary means for storing a plurality of each denom-
 ination of coin in a random, intermixed relationship;
 sorting means for sorting coins by denomination;
 means for storing coins by denomination;
 first means for transporting coins from said primary
 means to said sorting means;
 intermediate means for storing by denomination a

predetermined quantity of each denomination of
 coin;
 second means for transporting by denomination the
 sorted coins from the said sorting means to said
 intermediate means; and
 means, coupled to said intermediate means and said
 first means, for precluding further operation of the
 first means when said intermediate means has stored
 less than the respective quantity of any denomina-
 tion of coin after a predetermined interval of oper-
 ation of said first means.
 10. An article receiving and multid denominational coin
 dispensing system including:
 primary means for storing a plurality of each denom-
 ination of coin in a random, intermixed relationship;
 means for sorting coins by denomination;
 means for transporting coins from said primary means
 to said sorting means;
 intermediate means for storing by denomination a pre-
 determined quantity of each denomination of coin;
 means for transporting by denomination the sorted
 coins from said sorting means to said intermediate
 means;
 means for effecting the dispensation of a predetermined
 quantity of coins from the quantity of coins which
 has been stored by said intermediate means;
 normally inoperable means for receiving an article;
 control means, coupled to said article receiving means,
 including sensing means for sensing the storage by
 said intermediate means of the predetermined num-
 ber of each denomination of coin, and in response
 thereto conditioning said article receiving means for
 operation.
 11. A system according to claim 10 wherein:
 said article receiving means includes initially operative
 means for receiving an article and subsequently
 operative means for accepting the received article;
 said article receiving means being coupled to said
 dispensation effecting means and actuating the latter
 in response to accepting an article.
 12. In a multid denominational coin dispensing system
 the combination of:
 primary means for storing a plurality of each denom-
 ination of coin in a random, intermixed relationship;
 a rotatable disc adapted to lift, when rotating, coins in
 a random, intermixed relationship from said primary
 means to a sorting means;
 said sorting means comprising an inclined runway
 provided with a plurality of consecutive apertures,
 each aperture being of a size slightly larger than the
 diameter of the coin denomination which is to be
 separated from the random mix so that a respective
 coin denomination passes through a respective aper-
 ture, and said apertures increasing in size in a direc-
 tion away from said rotatable disc;
 a plurality of storage means, one associated with each
 denomination of coin, disposed for receiving from
 said sorting means a respective coin denomination
 and each such storage means adapted to store a pre-
 determined quantity of coins;
 a plurality of transport means, one disposed between
 each of said storage means and said primary means,
 for transporting surplusage over the respective pre-
 determined quantity of coins from a respective stor-
 age means to said primary means,
 and means coupled to each of said storage means for
 dispensing therefrom said predetermined quantity
 of coins.
 13. In a multid denominational coin dispensing system as
 set forth in claim 12 wherein each of said transport
 means comprises an inclined rail for guiding surplus
 coins to said primary means.
 14. In a multid denominational coin dispensing system as
 set forth in claim 12 wherein each of said storage means
 stores the respective coins on edge, and each of said

transport means comprises an inclined rail for causing each surplus coin to roll from a respective storage means along a respective transport means to said primary means.

References Cited by the Examiner**UNITED STATES PATENTS**

2,567,900	9/51	Winkler -----	133—3
2,750,949	6/56	Kulo -----	133—8
2,889,960	6/59	Brancato et al. -----	221—166

References Cited by the Applicant**UNITED STATES PATENTS**

2,877,776	3/59	Hoke.
3,079,934	3/63	Thompson.
3,086,536	4/63	Klopp.

5

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