CONSORTING AND COUNTING MACHINE
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The invention relates to coin sorting and counting machines and more particularly to that type of coin sorting machine in which the coins are fed from a hopper into side pockets of graduated width formed in the peripheral portion of a drum rotatably mounted in an enclosing housing and usually driven by an electric motor which also rotates a scalloped or notched feeder plate disposed at the bottom of the hopper.

The main object of the present invention is to provide controls and mechanism whereby any predetermined number of coins of a particular denomination may be delivered to the discharge passage of the sorter for handling in bags or other receptacles. In this connection coin controlled means for controlling a counter drive are used instead of having the coins operate direct on the counter drive as shown, for instance, in my U. S. Patent No. 2,642,882, dated June 23, 1953. Also the same means that initiates the drive to a predetermined counter for any particular denomination of coin also initiates the drive to a regular counter for that coin denomination.

A further object of the invention is to provide an electrically driven coin sorting and counting machine having a predetermined count mechanism associated therewith and in which at the end of a predetermined count the current to the drive motor is shut off and an electric operated brake is applied to the motor shaft to stop it as soon as the predetermined count is reached.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a side elevation view of a coin sorting and counting machine embodying the invention;
Fig. 2 is a rear elevation view of the machine;
Fig. 3 is a plan view of the sorter drum and its core, other parts being omitted;
Fig. 4 is a side elevation view of the sorter drum and core;
Fig. 5 is a detailed horizontal sectional view taken on the line 5—5 of Fig. 4;
Fig. 6 is a detailed horizontal sectional view taken on the line 6—6 of Fig. 4;
Fig. 7 is a detailed vertical sectional view taken on the line 7—7 of Fig. 2, parts being broken away;
Fig. 8 is a view similar to Fig. 7, showing the parts in a different position;
Fig. 9 is a detailed vertical sectional view taken on the line 9—9 of Fig. 2;
Fig. 10 is a wiring diagram;
Fig. 11 is a detailed front elevation view of a portion of the sorting drum.

The sorting mechanism is of known construction, and so much thereof as is necessary for an understanding of the improvements later described herein has been shown.

The machine includes a hopper 11 supported on the frame thereof at an angle so that the coins to be sorted may be carried upwardly in the notches 12 of a rotary bottom plate 13 and allowed to drop through into a feed slot 14 which communicates with a series of coin sorting slots 15, shown more in my U. S. Patent No. 2,642,882, and formed in the periphery of a sorting drum or core 16 which rotates within a fixed enclosing shell 17 and carries a shaft 18 secured to plate 13. Rotation of the drum and its connected parts is accomplished by a worm and worm wheel drive indicated at 19 in Fig. 2, the worm shaft 20 carrying a pulley 21 connected by a belt 22 with a pulley 23 on the drive shaft of an electric motor 24.

The sorter is of the type in which slots 15 form a series of radially disposed channels 25 whose width decreases from top to bottom, one side of these channels at spaced intervals having inclined shelf or ledge portions 26 forming a series of graduated stops for arranging coins of different denominations. Thus in Fig. 11 in which a portion of the drum is shown through an opening in the shell, the top shelf 26 arrests a half dollar, the next a quarter, one of which is shown in dotted, the next a nickel, the next a penny, and the next or lower slot a dime. As the drum is revolved, coins fed through the slot 14 are free to drop down into the slots 15 of the drum as they pass this slot and in dropping are caught by one or the other shelves 26 depending upon their denomination and are carried around to an outlet. Each one of the tiers of shelves 25 has a separate outlet with a deflector member 27 located at the outlet to push the sorted coin out of its pocket or slot in the drum and permit it to fall into boxes or bags (not shown). In the present instance just before a coin of any particular denomination is delivered from the sorting drum, its presence is recorded by the operation of a coin operated electric switch and its associated mechanism.

Referring to Fig. 6, each coin operated switch includes a coin actuated finger 28 mounted on a shaft 29 journaled in a tubular support 30 secured to the shell, the lower end of the shaft carrying a crank 31 which is operatively connected by a link 32 to a switch operating lever 33 which is adapted to engage the operating button 34 of a push button switch 35. It will be noted from Figs. 3, 4, and 5 that some of the cranks 31 act to pull the links 32 while others act to push their associated links to accommodate the opposite disposition of the switches 35 relative to the levers 33.

Referring to Figs. 7 and 8, the operation of any one of the switches 35 energizes a solenoid 36 whose plunger is operatively connected by a link 37 to a switch 38 mounted on an intermediate end of a switch operating lever 40. Lever 38 is normally held against a stop pin 41 by a spring 42. Lever 40 has a slot 43 intermediate its ends, a clutch shoulder 44, and a spring 45 connected to its lower end normally acting to hold the lever against a fixed pivot pin 46 at the outer end of the lever 43. When lever 40 is engaged and moved by lever 38 to the dotted line position shown in Fig. 7, its shoulder 44 comes into the path of an eccentrically disposed pin 47 on a crank disk 48 mounted on a continuously rotating shaft 49. As shown in Figs. 7 and 9, the bottom of the sorter drum carries a gear 50 which meshes with a pinion 51 on a shaft 52 that carries a bevel gear 53 meshing with a bevel gear 54 on the shaft 49.

When the lever 40 comes into clutching association with the pin 47, it is projected upwardly and guided by a guide roller 46, it engages one arm of, and swings a bell crank lever 55, pivoted at 56, clockwise. The other arm of the lever 55 works in a slot of a disk 57 loose on the ing shaft 58. The disk 57 is connected by a link 58 with a regular counter C and by a link 59 with a prede-termined amount counter PC.

With the exception of the links 59 all of the described mechanism is duplicated for each denomination of coin.
and may be duplicated in its entirety for such denominations, but in the present instance three of the denominations, twenty-five cents, ten cents, and five cents, are connected up with the predetermined counters PC.

Referring to Fig. 1, each link 58 is connected to a lever 69 pivotally mounted on the frame of the machine at 61 and operatively connected by a link 62 with a counter operating lever 63. A resilient spring 64 anchors lever 69 at one end on a frame part of the machine and connected at its other end with lever 69 serves to return the linkage including disk 57 and lever 55 to its initial position. Each link 59 is operatively connected with a counter operating lever 66.

As described above, lever 55 swings clockwise as shown in Fig. 8, the disk 57 turns counterclockwise exerting a pull on its associated links 58 and 59, if used, to actuate its associated counter C and counter PC, if used. Each of the predetermined counters PC may be of any standard make or suitable construction, and these counters as usually provided with an electric switch that can be used for controlling other devices at the end of a predetermined count so that a detailed showing of each counter and its switch is not considered necessary, and the counter controlled switch with an additional switch has been indicated in the diagram shown in Fig. 10.

Referring to Fig. 10, the numeral B designates an electromagnetic brake for the motor M receiving current from the rectifier RT. S designates the coil of solenoid 36, R a relay having switches normally open RS and normally closed RS', L a signal lamp, PS the switch controlled by the predetermined counter PC, PL the switch controlling the lamp L, and 35 the coin controlled switches.

The current supply line 67 connects through a hand switch 68 with either a conductor 69 or a conductor 70. The rectifier RT is connected across the conductor 70 and the other supply line 71. The solenoids S with their control switches 35 are connected across the conductor 69 and a conductor 72 connected with line 71. Conductor 76 connects with a conductor 73 with which one of the terminals of the switches RS is connected.

A conductor 74 connects the other of the terminals of all the switches RS and one of the terminals of all the relays R with conductor 75. The other terminal of each relay coil is connected by a conductor 75 with one of the terminals of switches PS. The switches RS are in a conductor 76 connecting the conductor 69 with one terminal of the motor M whose other terminal is connected to the line 71. A conductor 77 connects conductor 78 with which the other terminals of switches PS and one of the terminals of switches PL are connected. The other terminal of each switch PL is connected by a conductor 79 with a terminal of its associated lamp L. The other terminals of the lamps are connected to the conductor 69.

With the above arrangement when the switch 68 connects with conductor 69, a circuit through conductor 76, switches RS', motor M, line 71 is established so that the motor then drives the sorting drum 16 through the drive connections including the worm and worm wheel 19, and the shaft 49 is also driven. Each time the counter delivers a coin from its sorting channel one of the switches 35 is closed so that a coil S is energized by current flowing from conductor 69 through solenoid S, conductor 72 to line 71. Operation of any solenoid S operates its associated regular registering counter; and if used, the predetermined counter PC. When the counter PC reaches the end of its predetermined count, switches PS and PL controlled thereby are closed, and current then passes from conductor 69 to conductor 74, the relay R associated with this counter, conductor 75, switch PS, conductor 78, conductors 77, 72 the line 71. Also current now flows from conductor 69 through lamp L and its conductor 79 and closed switch PL to conductors 78, 77, 72 and line 71 to light the lamp to show which of the counters has finished its count. Energization of relay R opens switch RS', thereby opening the motor circuit, and closes switch RS of that relay so that current now flows from conductor 69 to conductor 74, switch RS, conductors 73 and 70 through the rectifier RT to the line 71, thus energizing the brake B to bring the motor to a stop. If the hand switch 68 is moved by the operator into contact with conductor 70, the current then flows from conductor 70 through the rectifier RT to the line 71 and energizes the brake to stop the machine when desired.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims. What I claim as my invention is:

1. In a coin sorting and counting machine including a rotatable sorting member and means for rotating said member, the combination of a counter, a continuously rotating shaft having a drive connection, counter drive mechanism including an oscillatory member operatively connected to said counter, a lever for oscillating said last named member, and an oscillatory and reciprocable spring returned clutch member for operating said lever, and means for connecting said clutch member with the drive connection of said shaft for operation of said lever including a lever and a solenoid operated to said last named lever, a current supply circuit for said solenoid including a switch, and means operable by a sorted coin for controlling said switch.

2. In a coin sorting and counting machine including a rotatable sorting member and means for rotating said member, the combination of a counter, a continuously rotating crank, counter drive mechanism including an oscillatory member operatively connected to said counter, a lever for oscillating said last named member, and a pivoted crank-engageable lever movable lengthwise relative to its pivot for operating said last named lever and adapted to engage said crank, said lever being spring biased to a return position and crank operated to its lever operating position; means including a solenoid for swinging said crank-engageable lever into position to be engaged by said crank, a current supply circuit for said solenoid including a switch, and means operable by a sorted coin for controlling said switch.

3. In a coin sorting and counting machine including a rotatable sorting member and an electric motor operatively connected to rotate said member, the combination of a predetermined counter having a switch operatively connected thereby at the end of a predetermined count, drive mechanism for said counter including a continuously rotating shaft, a clutch operatively connected to said counter, clutch shifting mechanism to connect said clutch to said shaft, electrically operated means for actuating said clutch shifting mechanism to connect said clutch to said shaft for operation of said counter, a control circuit for said means to cause its actuation including a switch operable by a sorted coin, an electrically operated brake for said motor, a current supply circuit for said motor and a current supply circuit for said brake including a relay having switches in said motor supply circuit and said brake supply circuit and a control circuit including said counter operated switch and said relay whereby the operation of said counter operated switch causes operation of said relay and its switches to open the motor circuit and close the brake operating circuit.

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