

United States Patent

[11] 3,561,579

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 [21] Appl. No. **830,417**
 [22] Filed **June 4, 1969**
 [45] Patented **Feb. 9, 1971**
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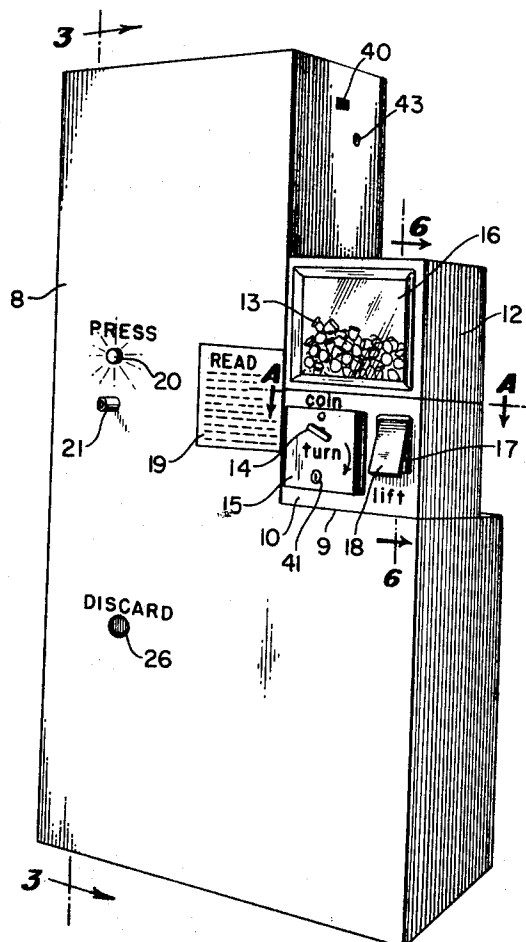
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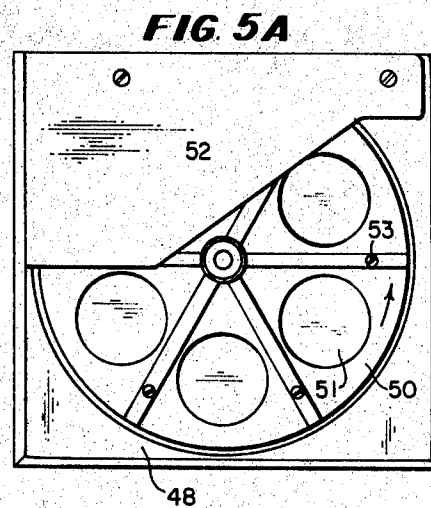
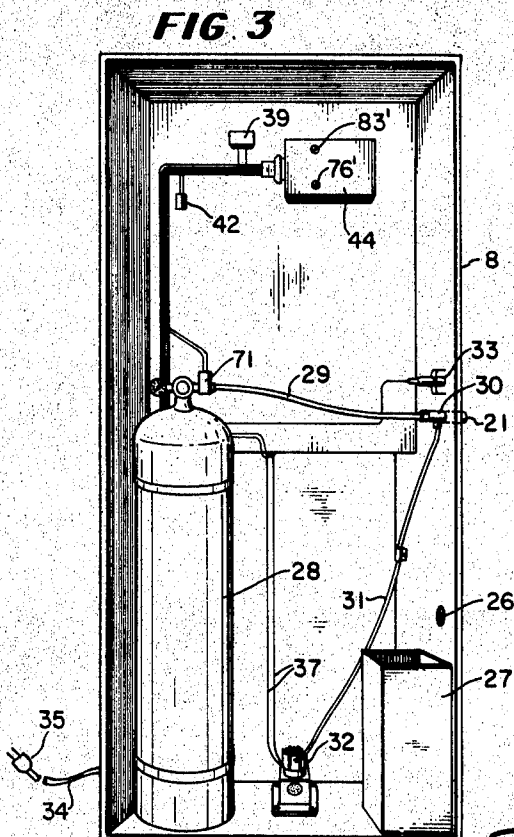
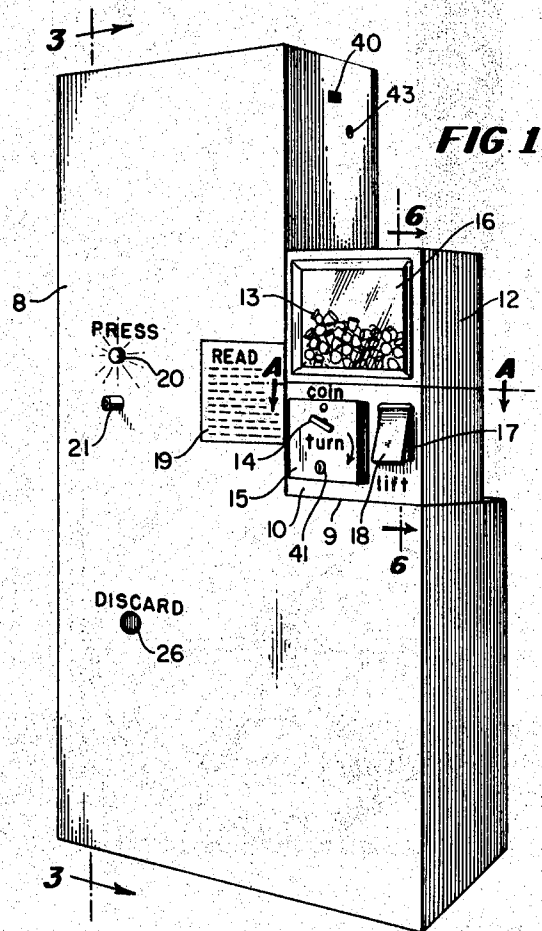
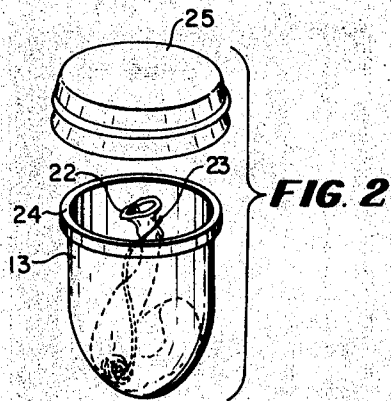
[54] **SEMIAUTOMATIC TOY BALLOON VENDING AND INFLATING MACHINE**
24 Claims, 8 Drawing Figs.

[52] U.S. Cl..... **194/1,**
194/2, 194/3, 194/63; 221/96, 221/199; 222/4,
222/52
 [51] Int. Cl..... **G07f 1/00**
 [50] Field of Search..... **194/2, 7, 9,**
10, 13, 3, 1; 222/3, 4, 52; 221/96, 25, 26, 199

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ABSTRACT: This machine vends the balloon envelope and string in a capsule upon deposit of a coin and turning of a knob. Then a button on the machine is automatically lighted signalling the customer that upon depression of the button, after application of the neck of the balloon to a nozzle adjacent the button, the balloon will be inflated. The vending mechanism released for operation of the knob by depositing a coin has a novel arrangement of magnetically operable electrical switches that are so connected in an electrical circuit that they have to be operated in succession to light the signal light and activate the inflation means, thereby preventing activation of the inflation means more than once per coin deposited. There is also novel memory means in the electrical circuit which permits depositing several coins at one time for the vending of a number of balloon capsules in succession, the memory means serving after the first of the balloons has been inflated to cause the button to be lighted again signalling that the machine is ready for another cycle, and so on until all of the coins deposited have been accounted for.





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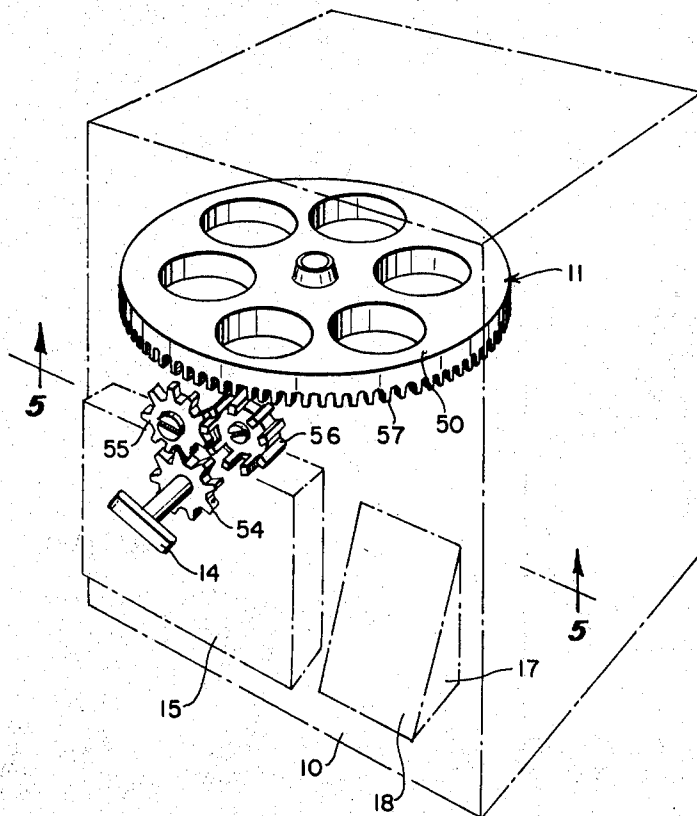


FIG. 4

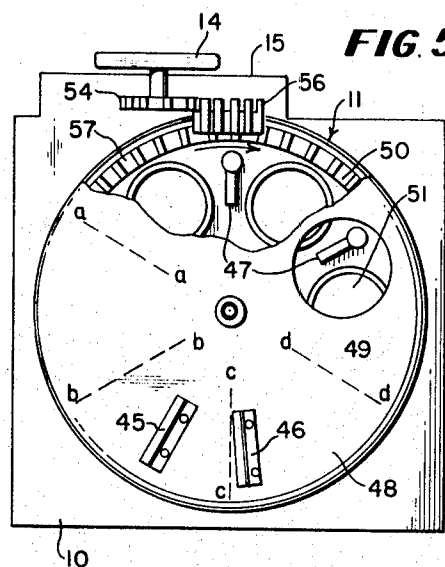


FIG. 5

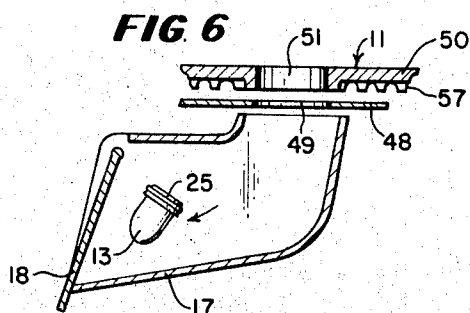
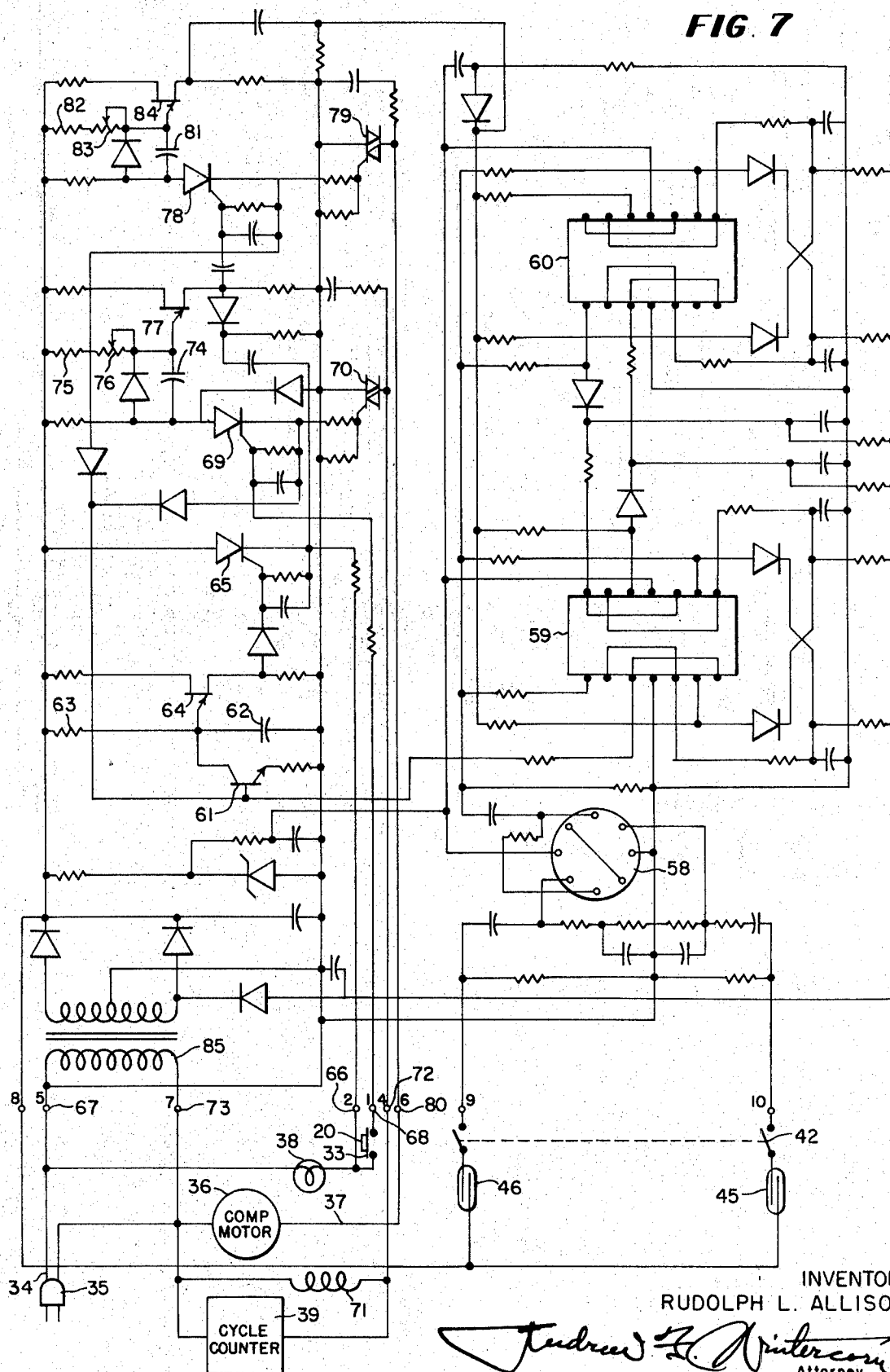


FIG. 6

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FIG. 7



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SEMI-AUTOMATIC TOY BALLOON VENDING AND INFLATING MACHINE

This invention relates to a semiautomatic toy balloon vending and inflating machine.

The principal object is to provide a simple, inexpensive, and substantially foolproof, semiautomatic machine of the kind mentioned, and with that objective in view the machine of my invention provides the following cycle:

1. A coin, such as a quarter, for example, is inserted;
2. A knob is turned manually to collect the coin or coins deposited, and, through a novel arrangement of two interconnected switches designed to prevent "cheating" by manipulation of the knob, close an electrical circuit and thereby activate a source of gas and air supply for inflation purposes and also dispense a capsule containing a string and a balloon envelope to be inflated;
3. The mouth end of the balloon envelope is applied to a nozzle on the front of the machine and an illuminated button nearby is depressed to release helium for the inflation, the flow of this gas being controlled by a timer switch, the inflation being completed with compressed air, the flow of which is also controlled by a timer switch, both timers being set into operation by the depression of the one button;
4. The mouth end of the balloon is thereafter slipped off the nozzle and sealed by tying the end of a string onto it in the usual way, the string of suitable length being furnished with the balloon envelope in the aforementioned capsule; and
5. If more than one coin, such as a quarter for purchase of a balloon, has been deposited, for the purchase of more than one balloon, the purchaser can turn the knob several times to dispense as many capsules as have been paid for (up to four) and the button will light up soon after completion of the first cycle, showing that the machine is ready for the next cycle, and so on until all of the coins deposited have been accounted for.

The invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of a balloon vending and inflating machine embodying my invention;

FIG. 2 is an exploded perspective view of one of the capsules containing the balloon envelope and its string;

FIG. 3 is a view on line 3-3 of FIG. 1, with a closure for one side of the housing removed to illustrate the apparatus inside the housing;

FIG. 4 is a more or less diagrammatic illustration of the balloon capsule vending mechanism;

FIG. 5 is a bottom view of the dispensing mechanism on the line 5-5 of FIG. 4 showing the location of two reed switches on the fixed dispenser plate in such relation to the location of six permanent magnets in equally spaced relation on the rotary dispenser plate, so that it is only when two of these magnets have been moved past the two reed switches in each coin released operation of the manually rotated knob through the 60° rotation of the rotary dispenser plate that the machine is set for a cycle, operation of both reed switches being essential for the cycling of the machine so as to make the machine foolproof and cheat-proof, as later explained;

FIG. 5A is a top view of the dispensing mechanism on line A-A of FIG. 1;

FIG. 6 is a section in the plane of line 6-6 of FIG. 1 to show the registering relationship of the holes in the fixed and rotary plates to the discharge chute at the point in the 60° turning of the rotary plate by the knob that a capsule will be dispensed; and

FIG. 7 is the electrical circuit.

The same reference numerals are used to designate corresponding parts in all of these figures.

Referring to the drawings and at first mainly to FIGS. 1 to 6, the housing 8 which is usually placed in a conspicuous location, in a shopping center, for example, has a ledge 9 on one side thereof on which a small housing 10 containing a dispensing mechanism 11 is secured under a second small housing 12 containing the capsules 13 to be dispensed. The

dispensing is done by turning a knob 14 after inserting a coin in the slot in the top of the coin box 15. The capsules 13, as shown, are visible through a window 16 provided in the front of the housing 12. The capsule dispensed drops into a chute 17 from which it is easily removed by lifting the pivoted front closure 18. It is important for the purchaser to read the operating instructions 19 provided in any suitable location, either on the front of the housing 8 or housing 12, so that the purchaser will know that he or she should first look for the button 20 to light up and is not to press the button for discharge of the helium gas and air until the neck of the balloon envelope has been properly applied to the nozzle 21. The capsule containing the balloon envelope 22 and a string 23 is open at one end 24 and has a cap 25 removably attached thereto. A hole 26 is provided in the front wall of the housing 8 in proper relation to a waste receptacle 27 inside the housing to receive the discarded capsules 13 and caps 25.

Compressed helium gas is provided in a tank 28 set on the bottom wall of the housing 8 and connected through a tube 29 with the nozzle 21 by means of a T-fitting 30, the latter having another tube 31 connected therewith and extending to an air compressor 32 mounted on the bottom wall of the housing 8 alongside the tank 28. A closure panel (not shown) is removably locked in place to close the open side of the housing. The switch 33 is operated by the pushbutton 20 which includes a small light bulb 38 (FIG. 7) that lights up the button automatically when the machine is ready for operation. An extension cord 34 has a plug 35 on its outer end for insertion in a suitable receptacle to furnish the electric current for all electrical needs of the machine, as, for example, operation of the motor 36 (FIG. 7), the leads for which are shown at 37 in FIG. 3. The electric light 38 (FIG. 7) illuminates the button 20 only after the proper coin has been dropped into the box 15 and the knob 14 has been turned to dispense the capsule 13, the lighting up of button 20 serving to signal the operator that all is in readiness for the start of a cycle and that he should therefore apply the neck of the balloon envelope 22 to the nozzle 21 and press the button 20 get the balloon inflated, when, of course, the end of the string 23 should be wound on the neck and tied tightly to seal it against loss of helium gas and air. A counter 39 (FIG. 3) has its readings visible through a window 40 in one side of the housing 8 so that the owner of the balloon vending and inflating machine has a means of quickly checking on the number of balloons sold, as a means of checking against the money recovered from the box 15, which the owner can unlock by insertion of the proper key in the lock 41. A key-operated switch 42 (FIG. 3) is operable by insertion of the proper key in the lock 43 (FIG. 1) to enable the owner, or one authorized by him, as, for example, the proprietor of the store where the machine is stationed, to hand out a capsule from a reserve supply and then, by use of a key in the lock 43, activate the gas and air supply and cause the button 20 to be illuminated for the start of a cycle without having to deposit the coin otherwise required, such procedure being occasionally required to settle the few complaints of individuals who allege a capsule was not dispensed or that the balloon received was defective. The box illustrated at 44 in FIG. 3 inside housing 8 contains nearly all of the electronic equipment shown in the circuit diagram (FIG. 7) to which reference will be made later, after the operation of the reed switches 45 and 46 by permanent magnets 47 in the operation of the dispensing mechanism 11 has been described.

In FIGS. 5, 5A and 6 a fixed bottom plate 48 is shown as having a circular hole 49 provided therein, which, in a 60° indexing movement of the rotary dispensing plate 50, will have one of six holes 51 brought into register with the hole 49 as the operator turns the knob 14, whereby to drop a capsule 13 into the chute 17. There is only room enough for one capsule in each of the openings 51 between the bottom plate 48 and a top plate 52, shown in FIG. 5A, the latter covering a portion of the rotary plate 50 that registers with the hole 49 in the dispensing operation, so a pile of capsules 13, like that shown in FIG. 1, resting on top of the plate 52 and as much of the ro-

tary plate 50 as is left uncovered by plate 52, cannot affect the dispensing operation and it is certain that only one capsule per coin deposited will be dispensed. No novelty is claimed insofar as the dispensing mechanism itself is concerned. However, the feature that makes this dispensing mechanism foolproof and cheat-proof insofar as insuring that the machine cannot be made to go into a cycle more than once per coin deposited is believed to be new and patentable. There are two circumferentially spaced radially disposed reed switches 45 and 46 affixed to the bottom of the plate 48 and it requires the magnetic closing of both of these reed switches by two permanent magnets 47 in a 60° turning of the rotary plate 50 to complete the circuit for the start of a cycle. There are six of these permanent magnets carried on rotor 50 spaced 60° apart and all disposed radially as shown by the two that are shown in full lines in FIG. 5 as carried on the under side of the rotor 50, each being secured in place by a screw 53, as seen in FIG. 5A. The locations of the other four permanent magnets are indicated in FIG. 5 by center lines *a-a*, *b-b*, *c-c* and *d-d*, all six permanent magnets being located midway between neighboring holes 51 in the rotor 50. The reed switches 45 and 46, as clearly appears in FIG. 5, are spaced approximately 30° apart on opposite sides of any one of said permanent magnets 47. Thus, when a coin is deposited in box 15, releasing the knob 14 for a single indexing movement of rotor 50 through 60°, switch 45 is closed first and thereafter switch 46, line *c-c* representing the first permanent magnet 47 to come into play and line *d-d* representing the next one to come into play. The switch 46 is close enough to the second magnet that it remains closed until the next indexing of rotor 50, which is of advantage so far as the key operation of switch 43 is concerned in that it simplifies and cheapens the switch 43, which need only close the circuit otherwise closed by switch 45. Hence, regardless of the looseness of the knob 14 and the play between the gears in the train 54-57 (FIG. 4), the operator cannot by any amount of jiggling have the knob 14 make the machine go into a cycle more than once per coin deposited, inasmuch as both switches must be closed in succession and that is possible only by completing 60° indexing movement of rotor 50, and one such index is all that is permitted per coin deposited.

Another important feature is the "memory" feature of the present machine provided by the novel circuit of FIG. 7 so that if more than one quarter, for example, is deposited for the purchase of more than one balloon, the purchaser can turn the knob 14 several times to dispense as many capsules as he is entitled to (up to four), and soon after completion of the first cycle the button 20 will light up showing that the machine is ready for the next cycle, and so one until all of the coins deposited (up to four) have been accounted for.

In operation, insertion of the coin releases the rotor 50 which carries the six permanent magnets 47 on the under side, and any two of these upon turning of knob 20 through 60°, after coin release of the dispensing mechanism, are arranged to operate the reed switches 45 and 46 in succession, 45 first and 46 next. These switches are connected, as shown in FIG. 7, to the positive direct current supply and their closing produces positive pulses into the flip-flop multivibrator 58, the function of which is to provide immunity from reed switch electrical disturbances. After reed switch 46 closes, a positive pulse is stored in the up-down counters 59 and 60 which include various components for rejection of electrical disturbance, whereby they can accept up to four cycles from 58, allowing up to four quarters to be deposited at one time for four balloons. If only one quarter is deposited, and accordingly only one signal is received in the up-down counter, a signal is sent to turn switch 61 off allowing capacitor 62 to charge through resistance 63. When the voltage at 62 reaches the correct point the unijunction transistor 64 fires, providing a pulse to turn on silicon controlled rectifier 65, providing power to light the bulb 38 for illumination of pushbutton 20 of switch 33. When pushbutton 20 is depressed, the voltage across the common terminals 66 and 67 is coupled to terminal

68, firing another silicon controlled rectifier 69. This firing turns on the timer transistor 70, operating the helium solenoid 71 (FIG. 3) via terminals 72 and 73. Rectifier 69 also grounds capacitor 74 allowing it to charge via resistances 75 and 76, the latter being a time adjustment for the helium gas, adjustable by turning screw 76' (FIG. 3). When capacitor 74 reaches the correct level, unijunction transistor 77 fires and a pulse is coupled to another silicon controlled rectifier 78, which also fires. The discharge of capacitor 74 produces a negative voltage on the anode of rectifier 69, turning it off, and ending the helium cycle. Rectifier 78 turns on time transistor 79 which causes circuit for the motor 36 driving the air compressor 32 to be completed through terminals 73 and 80. Rectifier 78 also grounds capacitor 81, allowing it to charge through resistances 82 and 83, the latter being the time adjustment for the compressor, adjustable by turning screw 83' (FIG. 3). When capacitor 81 charges to the correct level, unijunction transistor 84 fires, turning off rectifier 78 and providing a pulse to the up-down counters 59 and 60, telling these counters that one cycle has been completed, and, if more than one reed switch signal was received, there is issued another turnoff signal to unijunction transistor 64 to start the next cycle, and so on for whatever coins (up to four) have been deposited. Unijunction transistors 61 and 64 provide circuit delay to insure that a coin has been inserted before providing the customer with a visual indication by the illuminated button 20 that he should put a balloon in place on nozzle 21 for inflation. In passing, 85 indicates a stepdown transformer or the equivalent required for the lower voltage operation of the electronic equipment just described, while still providing line voltage for operation of the compressor motor 36 and button illuminating lamp 38. 42 represents the key-operated switch operable by a key inserted at 43 (FIG. 1).

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. While a preferred embodiment of the invention has been illustrated and described, this is only for the purpose of illustration, and it is to be understood that various modifications in structure will occur to a person skilled in this art.

I claim:

1. An article vending and processing machine comprising, in combination, a housing for storage of a pile of the articles to be vended one at a time, a rotor on which the articles are piled having evenly circumferentially spaced opening provided therein to receive an article in each, a bottom plate under said rotor having an opening provided therein through which an article is dropped when said opening registers with an opening in said rotor, a top plate over a portion of said rotor and over the opening in said bottom plate restricting each vending to a single article, said rotor with said top and bottom plates forming parts of a coin controlled manually operated dispensing mechanism and said rotor being adapted to be indexed a fraction of a turn upon each coin released manual operation of said rotor, the fractional turn corresponding to the distance between openings in said rotor, magnetically operable switch means connected in an electrical circuit controlling the operation of the machine for performing an operation on each of the articles after the vending thereof, said switch means being mounted on one of said plates in close enough proximity to said rotor to be operable by magnet means carried thereon, and magnet means carried on said rotor in operative relationship to said switch means.

2. A machine as set forth in claim 1 wherein the magnet means comprises a magnet between each pair of openings provided in said rotor, and said switch means comprises a pair of magnetically operable switches in circumferentially spaced relation relative to said rotor and so disposed that two of said magnets operate said switches in succession in each indexing movement of said rotor.

3. A machine as set forth in claim 2 wherein the magnets are elongated permanent magnets disposed substantially radially relative to said rotor, and said magnetically operable switches are elongated reed switches disposed substantially radially relative to said rotor.

4. A machine as set forth in claim 1 including electronic memory means in said electrical circuit pulsed by the firing of said magnetically operable switches each time a coin is deposited in the dispensing mechanism whereby to enable vending of a plurality of articles in close succession, the machine then operating on one after another of the articles until all of the coins have been accounted for.

5. A balloon vending and inflating machine comprising, in combination, a housing for storage of a pile of the packaged balloons to be vended, one at a time, a rotor on which the packaged balloons are piled having evenly circumferentially spaced openings provided therein to receive a packaged balloon in each, a bottom plate under said rotor having an opening provided therein through which a packaged balloon is dropped when said opening registers with an opening in said rotor, a top plate closely covering a portion of said rotor and extending over the opening in said bottom plate restricting each vending to a single packaged balloon, said rotor with said top and bottom plates forming parts of a coin-controlled manually operated dispensing mechanism and said rotor being adapted to be indexed a fraction of a turn on each coin released manual operation of said rotor, the fractional turn corresponding to the distance between openings in said rotor, magnetically operable switch means connected in an electrical circuit controlling the inflation operation of the machine in inflating each of the balloons after the vending thereof, said switch means being mounted on one of said plates in close enough proximity to said rotor to be operable by magnet means carried thereon, and magnet means carried on said rotor in operative relationship to said switch means.

6. A machine as set forth in claim 5 wherein the magnet means comprises a magnet between each pair of openings provided in said rotor, and said switch means comprises a pair of magnetically operable switches in circumferentially spaced relation relative to said rotor and so disposed that two of said magnets operate said switches in succession in each indexing movement of said rotor.

7. A machine as set forth in claim 6 wherein the magnets are elongated permanent magnets disposed substantially radially relative to said rotor and so disposed that two of said magnets operate said switches in succession in each indexing movement of said rotor.

8. A machine as set forth in claim 5 including electronic memory means in said electrical circuit pulsed by the firing of said magnetically operable switches each time a coin is deposited in the dispensing mechanism whereby to enable vending of a plurality of articles in close succession, the machine then inflating the balloons vended one after another until all of the coins have been accounted for.

9. In an article vending and processing machine comprising, in combination, a housing for storage of a pile of the articles to be vended, one at a time, a manually movable vending element on which the articles are piled having an opening provided therein to receive one of said articles, top and bottom plates above and below said element, the lower plate having an opening provided therein through which an article vended is dropped when said opening registers with the opening in said element, magnetically operable switch means connected in an electrical circuit controlling the operation of the machine for performing an operation on each of the articles after the vending thereof, said switch means being mounted on the lower one of said plates in close enough proximity to said element to be operable by magnet means carried thereon, and magnet means carried on said element in operative relationship to said switch means in the dispensing operation.

10. A machine as set forth in claim 9 wherein the switch means comprises a pair of magnetically operable switches and the magnet means comprises two magnets, which in a dispensing operation serve to operate said switches in succession.

11. A machine as set forth in claim 10 wherein the magnets are elongated permanent magnets and said magnetically operable switches are elongated reed switches arranged to come into alignment with the reed switches in succession in each dispensing operation.

12. A machine as set forth in claim 8 including electronic memory means in said electrical circuit pulsed by the firing of said magnetically operable switches each time a coin is deposited in the dispensing mechanism whereby to enable vending of a plurality of articles in close succession, the machine then operating on one after another of the articles until all of the coins have been accounted for.

13. A balloon vending and inflating machine comprising, in combination, a housing for storage of a pile of the packaged balloons to be vended, one at a time, a manually movable vending element on which the articles are piled having an opening provided therein to receive a packaged balloon, top and bottom plates above and below said elements, the lower plate having an opening therein through which a packaged balloon vended is dropped when said opening registers with the opening in said element, magnetically operable switch means connected in an electrical circuit controlling the operation of the machine for performing an inflation operation on each of the balloons after the vending thereof, said switch means being mounted on the lower one of said plates in close enough proximity to said element to be operable by magnet means carried thereon, and magnet means carried on said element in operative relationship to said switch means in the dispensing operation.

14. A machine as set forth in claim 13 wherein the switch means comprises a pair of magnetically operable switches and the magnet means comprises two magnets, which in a dispensing operation serve to operate said switches in succession.

15. A machine as set forth in claim 14 wherein the magnets are elongated permanent magnets and said magnetically operable switches are elongated reed switches arranged to come into alignment with the reed switches in succession in each dispensing operation.

16. A machine as set forth in claim 13 including electronic memory means in said electrical circuit pulsed by the firing of said magnetically operable switches each time a coin is deposited and the dispensing mechanism is operated, whereby to enable vending of a plurality of articles in close succession, the machine then inflating the balloons vended one after another until all of the coins have been accounted for.

7. In a balloon vending and inflating machine comprising housing means having balloon dispensing means therein operable manually from outside the housing means upon depositing a coin in a coin release on the dispensing means and manual operation of a knob or the like on the outside of said housing means, and inflating means in said housing means for supplying a lighter than air gas under pressure and compressed air to a nozzle projecting from said housing means, the gas and air discharge being under electronic control of means in said housing means electrically connected in circuit with a source of electric current supply and said dispensing means, the improvement which consists in an electrically operable signal means connected in the aforesaid circuit to initiate a cycle by indicating when the inflating means is ready to operate and the balloon should be applied to the nozzle for inflation.

18. A machine as set forth in claim 17 including a manually operable pushbutton, the depression of which controls delivery of the gas and air to said nozzle for inflation of the balloon, said button being operable for the purpose mentioned only after operation of the signal means.

19. A machine as set forth in claim 18 wherein the electrically operable signal means comprises a light bulb for illuminating said pushbutton.

20. A machine as set forth in claim 17 including electrical memory means in said electrical circuit arranged to be pulsed as a counter each time a coin is inserted and a balloon is vended, whereby upon completion of a vending and inflating cycle for the first of a plurality of coins deposited at a given time the signal means and inflating means are adapted to be cycled repeatedly until all of the coins deposited at one time have been accounted for.

21. A machine as set forth in claim 17 wherein the balloon dispensing means includes a pair of magnetically operable switches both of which must be closed in succession to complete the electrical circuit for activation of the inflating means and closing of the signal circuit, said switches being operable by any neighboring pair of magnets of a plurality of evenly spaced magnets mounted on a rotor that is indexed a predetermined amount for each coin deposited.

22. A machine as set forth in claim 17 wherein the balloon dispensing means includes a pair of magnetically operable switches both of which must be closed in succession to complete the electrical circuit for activation of the inflating means and closing of the signal circuit, said switches being operable by any neighboring pair of magnets of a plurality of evenly spaced magnets mounted on a rotor that is indexed a predetermined amount for each coin deposited, one of said magnetically operable switches being so disposed relative to the second magnet at the end of an indexing movement to

remain closed until the next indexing movement of the rotor.

23. A machine as set forth in claim 17 including a key operable switch in said housing means operable by a key inserted in a lock exposed on the outside of said housing means, said key operable switch being so connected in the electrical circuit to activate the inflation means and signal means independently of the coin operated balloon dispensing means.

24. A machine as set forth in claim 22 including a key operable switch in said housing means operable by a key inserted in a lock exposed on the outside of said housing means, said key operable switch being so connected in the electrical circuit to activate the inflation means and signal means independently of the coin operated balloon dispensing means, said key operable switch means serving to close the circuit otherwise closed by the other of said pair of magnetically operable switches.

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