July 12, 1966 H. GREENWALD ETAL 3,260,339

WIPE-OUT MECHANISM

Filed Feb. 1, 1965 2 Sheets-Sheet 1

FIG. 1.

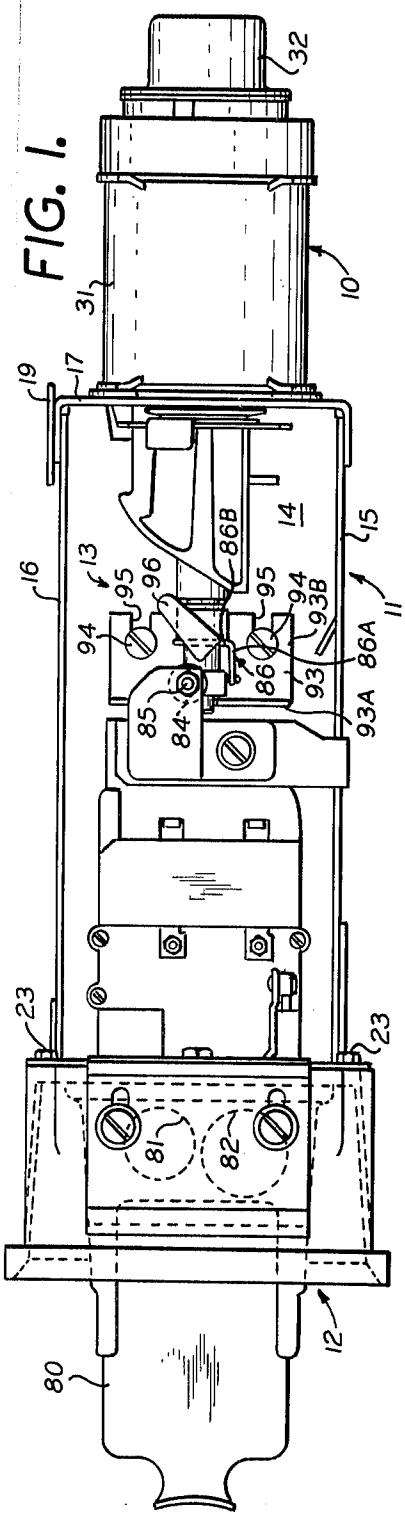
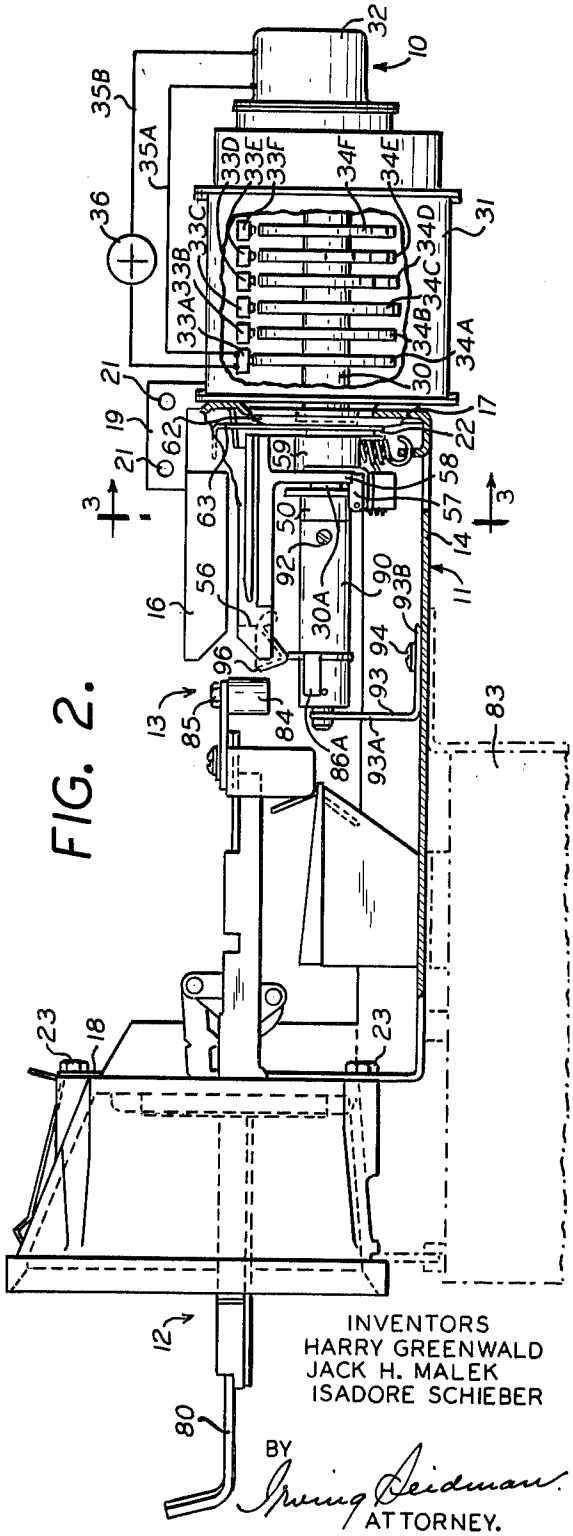


FIG. 2.

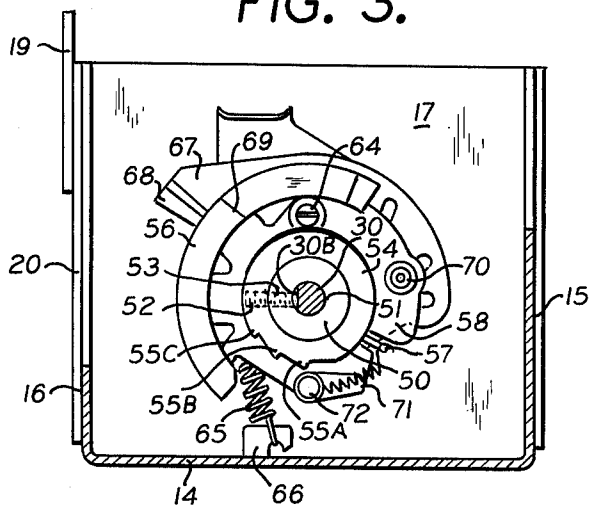


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FIG. 3.



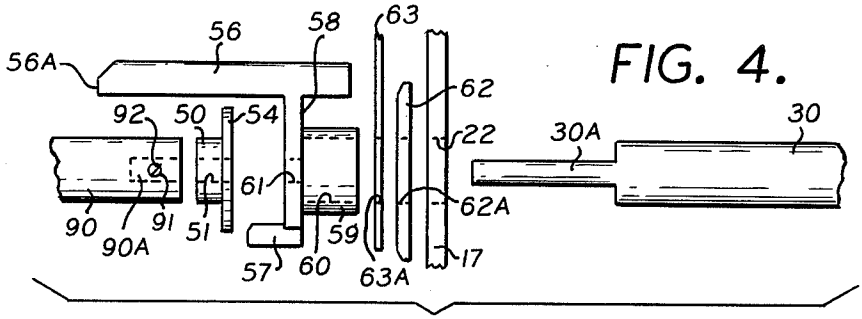
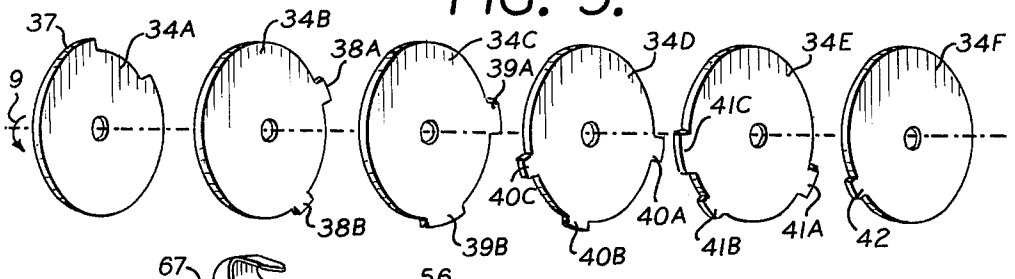


FIG. 4.

FIG. 5.



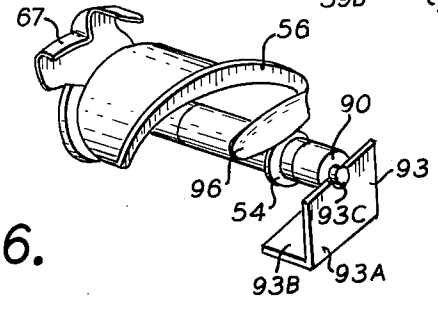


FIG. 6.

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United States Patent Office 3,260,339 Patented July 12, 1966

3,260,339

WIPE-OUT MECHANISM

Harry Greenwald, Whitestone, N.Y., Jack H. Malek, Parsippany, N.J., and Isadore Schieber, Bronx, N.Y., assignors of one-third to said Greenwald, one-third to Louis Wolff, Brooklyn, N.Y., and one-third to Harry Silberglait, Brooklyn, N.Y.

Filed Feb. 1, 1965, Ser. No. 429,221
9 Claims. (Cl. 194—92)

This invention relates to improvements in a wipe-out mechanism which is adapted to eliminate preselected operations in an associated coin-controlled device wherein the sequence of operation is controlled by a switching arrangement.

The present invention is ideally suited for use in a coin-operated washing machine and will be disclosed in conjunction therewith; however, it is to be understood that this is by way of illustration only and not by way of limitation. That is, the present invention may be utilized in association with any coin-controlled device requiring a switching arrangement to control the operation thereof, and wherein some of the controlled operations may be eliminated.

The normal complete washing cycle in conventional coin-operated washing machines usually comprise the following operations: fill; slow agitation; drain; spin; fill; slow agitation; drain; spin; rinse; drain; and spin shutoff. During the fill operation the clothes retaining portion of the machine which may comprise a drum, fills with water and thereafter the drum slowly agitates the clothes and, at the end of the slow agitation cycle, the water is drained off and the drum spins very fast to spin excess water from the clothes. These four operations are usually referred to as the soak portion of the washing cycle. The soak portion is repeated and, at the end of the second spin operation, the clothes are rinsed and the water is drained. Lastly, in the spin shutoff operation, the excess water is spun from the clothes and the machine is shut off. Each of the aforementioned operations is controlled by a plurality of cam-operated switches. The cams that operate the switches are positioned and arranged on a shaft which is rotated at a predetermined speed by a motor to cause sequential operation of the switches. Thus, a timer and switching arrangement such as that described above is disclosed in Patent No. 3,138,724, issued to P. L. Wood on June 23, 1964 and one is referred to this patent if more information on this device is desired.

In many instances it is highly desirable to bypass the first soak portion of the washing cycle such as when delicate fabrics or baby clothes are to be washed. Additionally, it is desirable to bypass the soak portion of the washing cycle when time does not permit the user of the machine to remain in the vicinity of the machine, thereby decreasing the time interval for the washing cycle. This latter situation arises most often in self-service coin-operated laundries where the housewife using the washing machine is required to remain nearby since the laundry is the individual's responsibility.

While it is a relatively simple matter to incorporate devices in a home washing machine which are adapted to bypass portions of the washing cycle since the machine is always under the control of the operator, a problem is encountered in making such provisions in a coin-operated washing machine because once the cycle is initiated the customer no longer has any control over the machine's operation. Additionally, even if new coin-operated machines were provided with a soak portion bypass or elimination device, it is highly unlikely that a washing machine laundry owner would purchase the new machines to replace the machines in use.

Accordingly, it is an object of the present invention to

provide a wipe-out mechanism for a coin-operated switching arrangement wherein the operation of preselected switches may be bypassed.

It is another object of the present invention to provide a wipe-out mechanism for a coin-controlled switching arrangement which is compatible for utilization in washing machines now in use and which provide for the bypassing of portions of the washing cycle upon operation of the coin slide.

In a conventional coin slide of the type utilized in a coin-operated washing machine the inward movement of the coin slide is limited to a small portion of its path of travel unless a predetermined amount of money has been inserted into appropriate apertures in a coin-receiving portion of the slide whereupon the movement of the slide is no longer limited and the coin-receiving portion is free to be moved to the extent of its travel. In a washing machine as described above, cooperable members are provided between the coin-receiving portion of the slide and the timing shaft and are positioned for engagement when the coin slide is pushed to the limit of its travel to rotate the timing shaft from a first or normal position to a second position. When the shaft is in the second position a cam-operated switch is operated to energize the timing motor to rotate the shaft through one revolution and thereby sequentially operate other switches to control the washing cycle. In accordance with the present invention a shaft extension is provided which is coaxial to the timing shaft and is non-rotatably connected thereto and rotatable therewith. The shaft extension is further provided with a projecting cam which is adapted to rise on a cam surface on the coin-receiving portion of the coin slide. The cam and cam surface are positioned so that when the timing shaft is in the second position and the coin slide is operated and moved the said small portion of its travel, the cam will engage and ride upon the cam surface to further rotate the shaft through a predetermined angle. The said predetermined angle is made to correspond to a rotation of the shaft which will cause preselected cams controlling the first soak portion of the washing cycle to move past their associated switches thereby eliminating the operations controlled by the preselected cams from the washing cycle.

It is a feature of the present invention to provide a wipe-out mechanism for a coin-operated switching arrangement wherein the wipe-out mechanism includes cooperating members between a shaft which controls the operation of the switches and a coin slide; said members being operable to rotate the shaft upon operation of the coin slide to bypass the operation of preselected switches.

The above and other objects and features of the present invention will become more apparent from a consideration of the following detailed description when taken in conjunction with the drawings in which:

FIG. 1 is a top plan view of the wipe-out mechanism of the present invention in conjunction with a coin-controlled washing machine timer;

FIG. 2 is a front elevational view, with parts broken away, of the device illustrated in FIG. 1;

FIG. 3 is a sectional view taken along the lines 3—3 in FIG. 2;

FIG. 4 is an exploded fragmentary view of the timer shaft and ratchet mechanism shown in FIGS. 1 and 2 to an enlarged scale;

FIG. 5 is a perspective exploded view of the various cams forming a portion of the timer shown in FIGS. 1 and 2; and

FIG. 6 is a perspective view of the timer shaft shown in FIGS. 1 and 2, as viewed from the rear.

The drawings are substantially to scale of a working model of the present invention. Like numbers in the various figures indicate identical elements.

As noted above, the present invention is particularly suited for use in conjunction with a coin-controlled washing machine switching arrangement. As shown in FIGS. 1 and 2, the invention may comprise a frame **11** having a timer unit **10** connected to the rear wall thereof which sequentially controls the operations of an associated device; a coin slide **12** connected to the front of the frame for actuating the timer unit, and a wipe-out mechanism **13**, which is adapted to eliminate a number of the aforementioned operations in the associated device.

More particularly, frame **11** comprises a base **14**, respective side walls **15** and **16**, a rear wall **17** and a front wall **18**. A flange **19** is connected to side wall **16** adjacent rear wall **17** by a depending foot **20** in any conventional manner and contains two apertures **21** therein. These apertures are adapted to receive screws to mount the arrangement to the associated coin-controlled device which, in this particular illustration, is a washing machine. The timing unit **10** is connected to the outer surface of rear wall **17** in any conventional manner. Wall **17** is provided with a centrally located bore **22** which rotatably receives the end of a timing shaft **30** therethrough.

Timing unit **10** is similar in construction to the timing unit disclosed in the aforementioned patent to Wood and will be discussed here only briefly. If more information on this device is desired, one is referred to the Wood patent. Timing unit **10** comprises a casing **31**. A synchronous motor **32** is connected to the end of casing **31** and includes an output shaft which is connected to timer shaft **30** through appropriate gearing to thereby drive timer shaft **30** at a predetermined rate of speed. Cam-operated switches **33A–33F** are mounted above timer shaft **30** and are adapted to be operated by the respective cams **34A–34F** which are non-rotatably mounted on shaft **30**. An energizing source **36** is serially connected between motor **32** and switch **33A** by the leads **35A**, **35B** and is adapted to energize motor **32** when switch **33A** is operated. Switches **33B–33F** are adapted to be connected to the associated machine (not shown) and are operable to control the operations of the associated machine or device in the conventional manner. For example, switch **33B** may control the fill cycle of the washing machine; switch **33C** may control the slow agitation operation of the washing machine; switch **33D** may control the spin operation of the associated washing machine and switch **33F** may control the rinse portion of the washing cycle. As will be evident from a consideration of FIGURE 5, the cams are provided with cam lobes which are spaced about the periphery of the cams in such a manner that the various cam operated switches will be sequentially operated as the cams are rotated by shaft **30** in the direction indicated by arrow **9**. Thus, cam **34A** is provided with cam lobe **37**; cam **34B** is provided with lobes **38A**, **38B**; cam **34C** is provided with lobes **39A**, **39B**; cam **34D** is provided with cam lobes **40A**, **40B**, **40C**; cam **34E** is provided with lobes **41A**, **41B**, **41C**; and cam **34F** is provided with cam lobe **42**. Cam lobe **37** extends about the major portion of the periphery of cam **34A** to maintain switch **33A** operated (to thereby keep motor **32** energized) from the start of the washing cycle to the end of same.

Shaft **30** includes a reduced diameter extension **30A** having a flat surface **30B**, as shown in FIG. 3. A bushing **50**, provided with a centrally located bore **51** extending therethrough, is received on extension **30A**. Bushing **50** is further provided with a threaded transverse aperture **52** which threadedly receives a setscrew **53** therein, the end of which is adapted to abut flat surface **30B** to non-rotatably secure bushing **50** on extension **30A**. Bushing **50** is further provided with an integral radially extending peripheral flange **54** at the end thereof. Flange **54** is provided with respective teeth **55A**, **55B** and **55C** over a portion of its periphery and serves as the ratchet wheel in the ratchet mechanism described below.

A barrel cam **56** having a frontwardly projecting cam surface **56A** is rotatably received on shaft **30** and is provided with a pawl **57** (FIGS. 3 and 4) which is engageable with the ratchet wheel to rotate bushing **50** and, consequently, to rotate shaft **30**. Thus, barrel cam **56** is provided with a web **58** adjacent the end thereof and an integral rearwardly extending projection **59** connected to the web. A bore **60** is provided in member **59** and is adapted to rotatably receive shaft **30** therein while web **58** is provided with a coaxial bore **61** of reduced diameter which is adapted to receive shaft extension **30A** therethrough in rotatable engagement. A nylon bushing **62** having a central bore **62A** therein and a retaining spring **63**, having a central bore **63A** therein, are respectively mounted on shaft **30** between member **59** and rear wall **17**. Retaining spring **63** serves to maintain shaft **30** in place. Web **58** is further provided with a screw **64** (FIG. 3) which is in threaded engagement with a suitably threaded aperture and which receives one end of tension spring **65** thereabout. The other end of spring **65** is connected to an upstanding hook member **66** which may be struck up from base **14** of frame **11**. Thus, spring **65** biases cam **56** in a counter-clockwise direction as taken in FIG. 3. A stop plate **67** is connected to rear wall **17** and is provided with a frontwardly projecting flange **68** which is adapted to engage an upwardly projecting stud **69** on barrel cam **56** to limit counter-clockwise rotation of the barrel cam. The pawl **57** is rotatably mounted on web **58** by means of the pivotal connection **70** and is biased against flange **54** of bushing **50** by a spring **71** which engages one end of pawl **57** and a stud **72** on web **58**.

A coin slide **12** is connected to the front wall **18** of frame **11** by the screws **23**. The coin slide is conventional and may be of the type disclosed in Patent No. 2,095,431, issued to K. C. Bugg on October 12, 1937. Briefly, the coin slide comprises a coin-receiving portion **80** whose inward movement toward rear wall **17** is limited to a small portion of its path of travel unless preselected coins are deposited in the apertures **81** and **82** (FIG. 1) in the coin-receiving portion whereupon the coin-receiving portion **80** of the slide may be moved to the full extent of its travel and the coins will fall into a vault **83**. A downwardly projecting block **84** is connected to the end of coin-receiving portion **80** by a screw **85**. Block **84** supports a cam surface **86** which comprises respective rearwardly and transversely extending arms **86A** and **86B**. Cam surface **86** is positioned so that when coin-receiving portion **80** is pushed to the full extent of its travel (in response to the deposit of predetermined coins) surface **86** will engage barrel cam **56** and rotate the cam in a clockwise direction as taken in FIG. 3. Thus, pawl **57** will engage tooth **55C** of the ratchet wheel **54** to thereby rotate shaft **30** through a preselected angle. When coin-receiving portion **80** is moved back to its initial position, barrel cam **56** wil rotate back to its respective initial position (with stud **69** abutting flange **68**) by means of biasing spring **65**. Operation of the coin-receiving portion **80** of coin slide **12** will cause pawl **57** to engage tooth **55B** of the ratchet wheel to rotate shaft **30** through another preselected angle. When the pre-determined coins are again inserted into apertures **81** and **82** and coin-receiving portion **80** is again moved to the full extent of its travel thereby rotating barrel cam **56** for the third time, pawl **57** will engage tooth **55A** of the ratchet wheel and again rotate shaft **30** thruogh a third preselected angle. For ease of reference, the position of the shaft at this point will be referred to hereinafter as the first position. The angular movement of shaft **30** is arranged so that when coin-receiving portion **80** is operated for the third time, i.e. when the shaft is in the first position, lobe **37** of cam **34A** will operate switch **33A** to thereby energize timing motor **32**. Thereafter, rotation of shaft **30** will be effected through motor **32** which will cause the respective lobes of the respective cams to sequentially engage the associated cam-operated switches to sequentially control the operations in the associated washing machine. As will

be obvious from FIG. 5, when motor **32** has rotated shaft **30** to the point where switch **33A** is no longer in contact with lobe **37** motor **32** will be deenergized and the machine will be ready for a new cycle of operation.

In accordance with the present invention, a shaft **90**, having a centrally located bore **90A** extending through a portion of the shaft from the rear end thereof, is mounted on shaft extension **30A** with the shaft extension being received in bore **90A**. A transverse threaded aperture **91** is provided in shaft **90** with a set screw **92** in threaded engagement therewith, the end of which is adapted to abut shaft extension **30A** to non-rotatably connect shaft extension **30A** and shaft **90** together. Adjustable support bracket **93**, having a downwardly projecting leg **93A** and rearwardly projecting leg **93B**, is mounted on base **14** and is affixed in place by screws **94** which are received in respective slots **95** provided adjacent each side edge of the rearwardly projecting leg **93B** of support **93**. Slots **95** are provided to allow for the alignment of support **93** with respect to shaft **90**. That is, support **93** is further provided with a slot **93C** (FIG. 6) adjacent its upper edge which rotatably supports the end of shaft **90** therein.

Shaft **90** is further provided with a cam **96** which may be connected to shaft **90** by any conventional means (not shown).

Cam **96** is sized and positioned to be engaged by cam surface **86** when shaft **30** has been rotated to the aforementioned first position. Thus, inward movement of coin-receiving portion **80** will cause cam **96** to ride up upon cam surface **86** to thereby rotate shaft **30** through an additional predetermined angle. It is to be especially noted that in the preferred embodiment no coins need be received in coin-receiving portion **80** to accomplish this result. In other words, cam **96** is so positioned that when shaft **30** is in the first position, the movement of coin-receiving portion **80** of coin slide **12** over the portion of its path of travel to which the portion **80** is limited when no coins are deposited therein will cause the aforementioned inter-engagement of cam **96** and cam surface **86** to rotate shaft **30**. In the present example (i.e. when the present invention is utilized in conjunction with a coin-operated washing machine), the rotation of shaft **30** will be such as to cause the first soak cycle of the washing machine to be completely eliminated. That is, shaft **30** will be rotated very quickly through an angle such that lobes **38A** of cam **34B**, lobe **39A** of cam **34C**, and lobe **40A** of cam **34D** will have been rotated past the associated cam-operated switches to thereby eliminate the operations controlled by the aforementioned cams. That is, the cam lobes will very quickly operate their respective switch as the shaft is moved through the aforementioned angle. However, the speed of rotation of the shaft in this latter case is such that albeit the switches are momentarily operated they will not be operated a sufficient interval of time to allow the respective switches to actuate the respective controlled operation in the associated device.

In accordance with the objects and features of the present invention, a wipe-out mechanism for a coin-operated switching arrangement has been provided which simply and easily eliminates preselected operations in the associated device by an additional movement of the coin-receiving slide.

While a preferred embodiment of the present invention has been disclosed, it will become obvious to those skilled in the art that modifications may be made therein without departing from the spirit or scope of the present invention. That is, it will be apparent that the present invention may be utilized in devices other than a washing machine to obtain the same results (i.e., it may be utilized in any device which includes a switching arrangement which controls the operations of the associated device and wherein some of the operations may be eliminated).

What is claimed is:

1. In a coin-operated switching arrangement for controlling a plurality of respective operations in an associated device including in combination, a frame, a shaft rotatably mounted on said frame, said shaft normally being in a first position, a plurality of switches adapted to control respective operations in the associated device, a like plurality of operating means fixed on said shaft and rotatable therewith respectively associated with said switches and positioned and arranged to operate the associated switches in a predetermined sequence as said shaft is rotated through respective different angles of rotation from said first position, a coin slide having a coin receiving member operable to traverse a predetermined path of travel when a preselected amount of money is inserted into said coin-receiving member, the extent of travel of said coin-receiving member being limited to a portion of its path of travel when said preselected amount of money is not inserted into said coin slide and advancing means on said shaft engageable with said coin slide when said coin slide is operated in response to the deposit of a predetermined amount of money for rotating said shaft from said first position to a second position whereby said plurality of operating means operates at least one of said plurality of switches, the invention comprising wipe-out means mounted on said shaft and responsive to the operation of said coin slide for rotating said shaft past said second position to by-pass the operation controlled by said one of said plurality of switches.

2. In a coin-operated switching arrangement as defined in claim **1**, wherein said wipe-out means is operatively positioned to be engaged by said coin slide when said shaft is in said second position and is arranged to rotate said shaft past said second position when the extent of travel of said coin-receiving member is limited to the said portion of its path of travel.

3. In a coin-operated switching arrangement as defined in claim **1**, wherein said advancing means comprises a barrel cam rotatably mounted on said shaft and initially being in a normal position, a ratchet wheel mounted on said shaft and rotatable therewith, and a pawl pivotally connected to said barrel cam and engageable with said ratchet wheel to rotate the shaft in response to rotation of said barrel cam by said coin slide, and biasing means for biasing said barrel cam to said normal position.

4. In a coin-operated switching arrangement for sequentially controlling respective operations in an associated device including a frame, a timing shaft rotatably mounted on said frame and normally being in a first position, a timing motor connected to said timing shaft for rotating said timing shaft at a predetermined rate of speed, a plurality of switches, one of said plurality of switches being adapted to connect a source of energy to said timing motor to energize said timing motor, and different ones of the other of said plurality of switches being adapted to control respective operations in the associated device, a like plurality of operating members fixed on said shaft and rotatable therewith respectively associated with different ones of said switches and positioned and arranged to operate the associated switches in a predetermined sequence, and advancing means connected to said shaft and positioned to be engaged by a coin slide when the coin slide is operated in response to the deposit of a preselected amount of money to rotate said shaft from the first position to a second position; the invention comprising wipe-out means on said shaft positioned to be engaged by the coin slide for further rotation of said timing shaft past said second position to eliminate sequential operations in the associated device controlled by preselected ones of said other of said plurality of switches.

5. In a coin-operated switching arrangement for sequentially controlling respective operations in an associated device including a frame, a timing shaft rotatably mounted on said frame, said timing shaft normally being in a first position, a timing motor connected to said timing shaft for rotating said timing shaft at a predetermined rate of speed, a first switch adapted to connect a source

of power to said timing motor to energize said motor, a plurality of second switches adapted to control respective operations in the associated device, a plurality of operating means on said timing shaft cooperable with said first and second switches and arranged to operate said first switch upon rotation of said timing shaft through a predetermined angle and to sequentially operate said plurality of second switches upon further rotation of said timing shaft past said predetermined angle, advancing means connected to said timing shaft and operatively positioned to be engaged by a coin slide when the coin slide is operated in response to the deposit of a predetermined amount of money for rotating said timing shaft through said predetermined angle, and wipe-out means on said timing shaft operatively positioned to be engaged by the coin slide for rotation of said timing shaft past said predetermined angle to quickly operate preselected ones of said plurality of second switches whereby preselected operations of the respective operations of the associated device are eliminated.

6. In a coin-operated switching arrangement as defined in claim 5, wherein said wipe-out means comprises a second shaft connected to said timing shaft and rotatable therewith, and a cam mounted on said second shaft and positioned to be engaged by the coin slide when said timing shaft has been rotated through said predetermined angle.

7. In a coin-operated switching arrangement as defined in claim 6, wherein said cam is positioned to rotate said timing shaft when the coin slide is operated over a limited portion of its path of travel.

8. A coin-operated switching arrangement of the type for sequentially controlling respective operations in an associated device including a frame, a timing shaft rotatably mounted on the frame, a timing motor connected to said timing shaft for rotating said timing shaft at a predetermined rate, a first switch adapted to connect a source of power to said timing motor to energize said motor, a plurality of second switches adapted to control respective operations in the associated device, a plurality of operating means on said timing shaft cooperable with said first and second switches and arranged to operate said first switch upon rotation of said timing shaft through a predetermined angle and to sequentially operate said plurality of second switches upon further rotation of said timing shaft past said predetermined angle, a coin slide having a coin-receiving member which is operative to traverse a predetermined path of travel when a preselected amount of money is inserted into said coin-receiving member, the extent of travel of said coin-receiving member being limited to a portion of its path of travel when said preselected amount of money is not inserted into said coin-receiving member, advancing means connected to said timing shaft and positioned to be engaged by said coin-receiving member when the coin-receiving member is operated in response to the insertion of said preselected amount of money for rotating said timing shaft through said predetermined angle; the invention comprising wipe-out means connected to said timing shaft and operatively positioned to be engaged by said coin-receiving member for further rotation of said timing shaft past said predetermined angle to quickly move preselected ones of said plurality of operating means past the associated switches, whereby preselected operations in the associated device are eliminated.

9. A coin-operated switching arrangement as defined by claim 8, wherein said wipe-out means is positioned to be engaged by the coin-receiving member when the extent of travel of said coin-receiving member is limited to said portion of its path of travel.

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