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A. H. MESSLER

2,281,852

DISHWASHING MACHINE

Filed July 8, 1940

Fig. 1

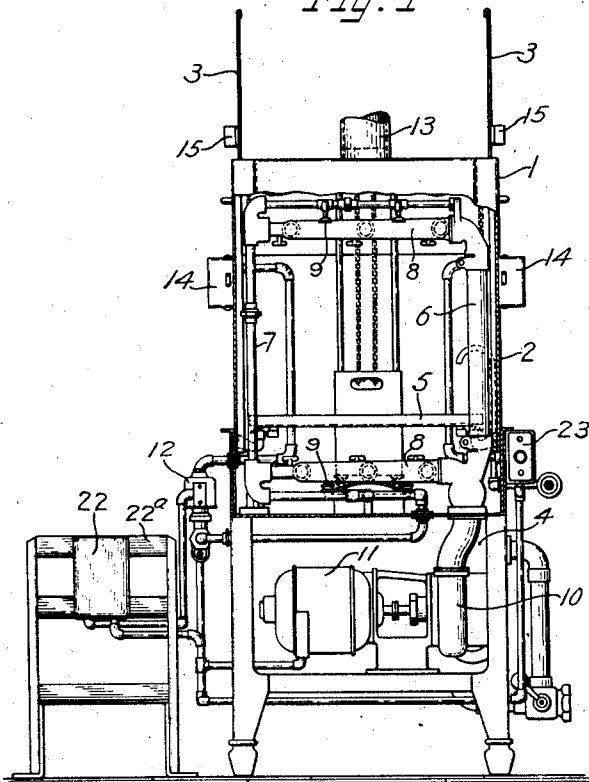


Fig. 2

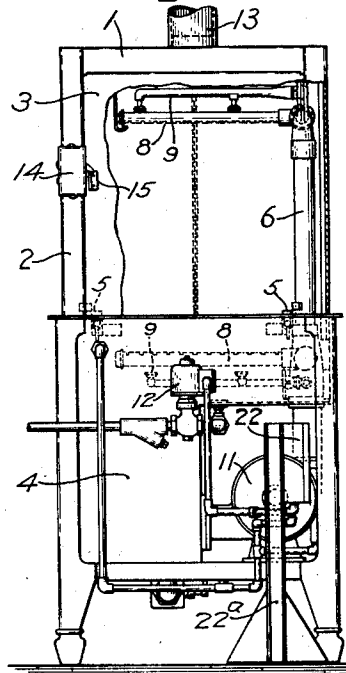


Fig. 3

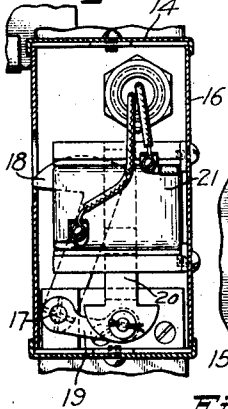


Fig. 4

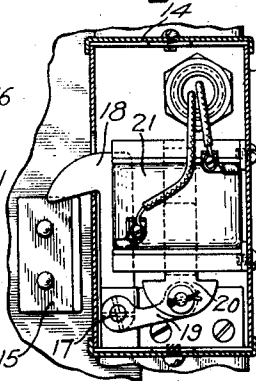


Fig. 5

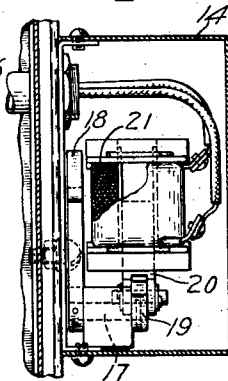


Fig. 6

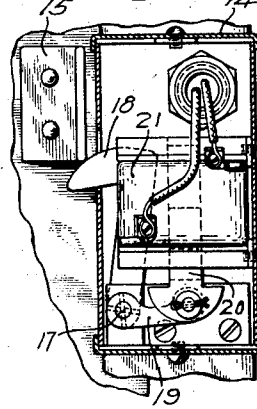
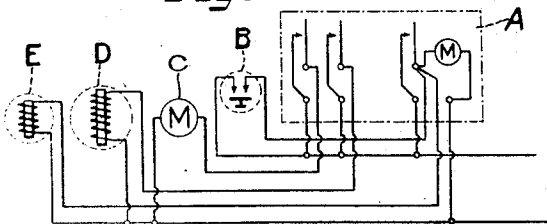


Fig. 7



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UNITED STATES PATENT OFFICE

2,281,852

DISHWASHING MACHINE

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Connecticut

Application July 8, 1940, Serial No. 344,297

7 Claims. (Cl. 141—9)

The invention relates to dish washing machines of the type including a casing equipped with a loading door and an exhausting vent, and has for its principal object the provision of means for preventing the loading door from being opened for a predetermined time following the completion of the washing operation.

Another object is to provide a dish washing machine of the above character in which provision is made for both automatically controlling the washing interval and the locking of the loading door closed during the washing operation and for a predetermined time interval thereafter.

Other objects and advantages of the invention will be apparent from this specification to those skilled in the art.

In the accompanying drawing I have shown the now preferred embodiment of the invention, but it will be understood that the drawing is intended for illustrative purposes only and is not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawing:

Fig. 1 is a side elevational view of a dish washing machine incorporating the invention, a part of the casing being broken away to show certain details of construction.

Fig. 2 is an end elevational view of the washing machine shown in Fig. 1, a portion of the casing also broken away.

Figs. 3 and 4 are enlarged front sectional views of the solenoid door latch, the latching member being shown in retracted position in Fig. 3 and in projected position in Fig. 4.

Fig. 5 is an end sectional view of the solenoid door latch.

Fig. 6 is a front sectional view of the solenoid door latch, the latching member being shown in an intermediate retracted position.

Fig. 7 is a wiring diagram showing the electrical circuits.

It should be understood that the principles of the invention are applicable to many kinds and types of dish washing machines. However, for the purposes of this specification they have been illustrated in connection with a machine of the type shown and described in U. S. Patent No. 2,051,233 to George Webb, certain changes, of course, having been made therein for particularly adapting it for use in connection with the invention.

Referring now to the drawing, a casing is shown at 1 which comprises an upper portion 2 having

slidable counterbalanced loading doors 3 on opposite sides thereof, and a lower portion 4 adapted to serve as a washing fluid reservoir or tank. Within the casing are suitable guide rails 5 for supporting dish racks, and also mounted therein are fluid distribution systems 6 and 7 including discharge heads 8 and 9, respectively. When the invention is incorporated in a machine having two distribution systems, one system is preferably adapted to discharge washing fluid and the other to discharge rinsing fluid. In the illustrated construction the system 6 is intended for washing fluid distribution and includes circulating pump 10 adapted to withdraw fluid from the tank 4 and forcibly discharge it from the heads 8, and electric motor 11 serving to drive the pump.

As the motor is directly connected with the pump, starting and stopping the motor will also start and stop the flow of washing fluid in the distribution system 6. The rinsing fluid distribution system 7 is adapted to be connected to a suitable source of rinsing fluid and includes a solenoid operated valve 12 for starting and stopping the flow of fluid in the system.

The construction so far described, with the exception of the solenoid operated valve 12, is substantially the same as that shown in the above-mentioned U. S. Patent No. 2,051,233.

An exhaust vent 13 is provided in the top of the casing and it is intended that this shall be connected with a suitable exhaust system, such, for example, as is often present in restaurant kitchens. In order to insure ample time for the exhaustion of any accumulated vapor within the casing after the cleansing operation has been completed and before the loading doors are opened, automatically operable means are provided for locking the loading doors closed during cleansing operations and for a predetermined time interval thereafter. The at present preferred construction for accomplishing this will now be described.

Mounted on the frame of the casing and adjacent each of the loading doors are latches 14 adapted to cooperate with keepers 15 carried by the doors. Referring more particularly to Figs. 3-6, each latch comprises a casing 16 having a rotatable shaft 17 carrying a latching member 18 mounted therein. The shaft 17 also carries an arm 19 pivotally secured to armature 20 which is movable within solenoid coil 21. When the coil is energized (in a manner hereinafter described) the armature is moved from the position of Fig. 3 to that of Fig. 4, thus moving latching member 18 into projected or locking position relatively

to the keeper 15. Deenergization of the coil permits the armature to move by gravity to its lower position and thus retract the latching member to unlock the door.

Any desired type of control mechanism may be used in carrying out the principles of the invention, but for use in a machine embodying details of construction such as illustrated it is now preferred to use the control system illustrated. An electrical synchronous motor driven timed circuit controller 22 is provided which may, if desired, be mounted on a panel board 22^a as illustrated. The controller may be one of many of well-known constructions and, consequently, is not described in detail other than to note that it includes contacts for controlling two external circuits and one internal circuit by means of cams mounted on a shaft rotated by a motor. One set of contacts serves to open and close the pump motor circuit, another set to open and close the solenoid operated valve circuit. In the illustrated construction the third set of contacts function to open and close both the timer motor and the solenoid latch circuits. The timed circuit controller is of the type which may be set in operation by the momentary closing of a remote control circuit and accordingly a remote control push button station switch 23 is mounted on the machine so as to be readily accessible to the operator. A schematic wiring diagram of the timed circuit controller and various electrical control circuits is shown in Fig. 7 wherein the timed circuit controller is indicated at A, the push button station at B, the pump motor at C, the solenoid valve at D, and the solenoid door latches at E.

The operation of the machine will now be described, it being assumed that the dish washing machine is properly connected to suitable sources of washing and rinsing fluids, electric power, and the vent 13 connected with an exhaust system. The rack of dishes to be washed is placed within the machine and the loading doors closed. The remote control circuit is momentarily closed by pushing the button of the control station switch 23, thus initiating operation of the timed circuit controller 22. As is apparent from the wiring diagram, the door latch solenoid circuits are controlled by the same switch as the synchronous driving motor of the timer itself and, consequently, the doors will be locked in closed position by the door latches so long as the timer motor circuit is energized. It is, of course, understood that any desired predetermined timing and sequence of the cleansing operations may be effected by adjusting the timed circuit controller 22, but the now preferred operation is to first close the pump motor circuit for sixty seconds to thus cause washing fluid to be discharged upon the dishes for that length of time, the pump motor circuit is then opened and the solenoid valve circuit closed for fifteen seconds during which rinsing fluid is discharged upon the dishes. After the solenoid valve closes the timer motor continues to run for ten seconds before its circuit is opened and, of course, the doors remain locked during this ten seconds as the door latch solenoid circuits are controlled by the same contacts. This method of operation prevents the doors from being opened until any fluid vapor accumulated within the casing during the cleansing operations has been exhausted through the vent 13. With the opening of the timer motor circuit, the latch solenoids are deenergized and the doors unlocked so that they may be opened.

It is desirable to provide for the possibility of the machine being set in operation while the loading doors are open. While this could be accomplished by placing a door operated master switch in the push button control circuit or in the timer circuit, the now to be described construction is at present preferred. Referring particularly to Fig. 6, the upper edge of the latching member 18 is suitably shaped so that if keeper 15 is pushed downwardly against it the member will be cammed into retracted position to permit closing of the doors. With this construction it is apparent that if the machine should be set in operation while the doors are open, it is only necessary to move the doors downward to closed position as the latching members will be cammed to retracted position by keepers 15 and will be again projected as the keepers move past the latching members.

Various changes and modifications within the scope of the invention and the appended claims will be apparent to those skilled in the art.

What I claim is:

1. A dish washing machine comprising a casing having a vapor exhausting vent therein, a fluid discharge system within the casing, means for starting and stopping the discharge of fluid from said system, a loading door in said casing, a latch movable to and from a position preventing opening movement of said loading door, and automatically operable means for controlling said latch to effect movement thereof to latching position upon initiation of operation of the dish washing machine and for maintaining said latch in latching position during operation of the machine and for a predetermined time interval thereafter to permit the exhaustion of fluid vapor from within the casing before the door can be opened.

2. A dish washing machine comprising a casing having a vapor exhausting vent therein, a fluid discharge system within the casing, means for starting and stopping the discharge of fluid from said system, a plurality of loading doors in said casing, a latch for each of said loading doors movable to and from latching position to prevent opening movement of a loading door, and automatically operable means for controlling each of said latches to effect movement thereof to latching position upon initiation of operation of the dish washing machine and for maintaining said latches in latching position during operation of the machine and for a predetermined time interval thereafter whereby said loading doors are latched for a predetermined time interval thereafter to permit the exhaustion of fluid vapor from within the casing before the doors can be opened.

3. A dish washing machine comprising a casing having a vapor exhausting vent therein, a fluid discharge system within the casing means for starting and stopping the discharge of fluid from said system, a loading door in said casing, a latch movable to and from a position preventing opening movement of said loading door, and electrically operable means for automatically controlling said latch to effect movement thereof to latching position upon initiation of operation of the dish washing machine and for maintaining said latches in latching position during operation of the machine and for a predetermined time interval thereafter whereby said loading doors are latched for a predetermined time interval thereafter to permit the exhaustion of

fluid vapor from within the casing before the door can be opened.

4. A dish washing machine comprising a casing having a vapor exhausting vent therein, a fluid discharge system within the casing, a loading door in said casing, a latch movable to and from a position preventing opening movement of said loading door, time controlled means for automatically starting the discharge of fluid from said system, automatically stopping the discharge after a predetermined time interval, and for controlling said latch to effect movement thereof to latching position upon initiation of operation of the dish washing machine and for maintaining said latch in latching position during operation of the machine and for a predetermined time interval thereafter to permit the exhaustion of fluid vapor from within the casing before the door can be opened.

5. A dish washing machine comprising a casing having a vapor exhausting vent therein, a plurality of fluid discharge systems within the casing, a loading door in said casing, a latch movable to and from a position preventing opening movement of said loading door, and time controlled means for automatically and sequentially effecting discharge of fluid from the discharge systems for predetermined time intervals, for automatically controlling said latch to effect movement thereof to latching position upon initiation of operation of the dish washing machine, and for maintaining said latch in latching position during operation of the machine and for a predetermined time interval thereafter to permit the exhaustion of fluid vapor from within the casing before the door can be opened.

6. A dish washing machine comprising a cas-

ing having a vapor exhausting vent therein, a plurality of fluid discharge systems within the casing, a loading door in said casing, a latch movable to and from a position preventing opening movement of said loading door; and electrically operated time controlled means for automatically and sequentially effecting discharge of fluid from the discharge systems for predetermined time intervals, for automatically controlling said latch to effect movement thereof to latching position upon initiation of operation of the dish washing machine and for maintaining said latch in latching position during operation of the machine and for a predetermined time interval thereafter to permit the exhaustion of fluid vapor from within the casing before the door can be opened.

7. A dish washing machine comprising a casing having a vapor exhausting vent therein, a fluid discharge system including an electrically driven pump for starting and stopping the discharge of fluid from said system, a second fluid discharge system including an electrically operated valve for starting and stopping the discharge of fluid from said second system, electrically controlled means for automatically operating said pump and valve to sequentially discharge fluid from the said systems for predetermined time intervals, a loading door in said casing, and an electrically operated means for automatically locking said loading door closed during the discharge of fluid and for a predetermined time interval thereafter to thereby permit the exhaustion of fluid vapor from within the casing before the door can be opened.

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