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COIN CONTROL PROTECTION SYSTEM FOR VENDING MACHINES

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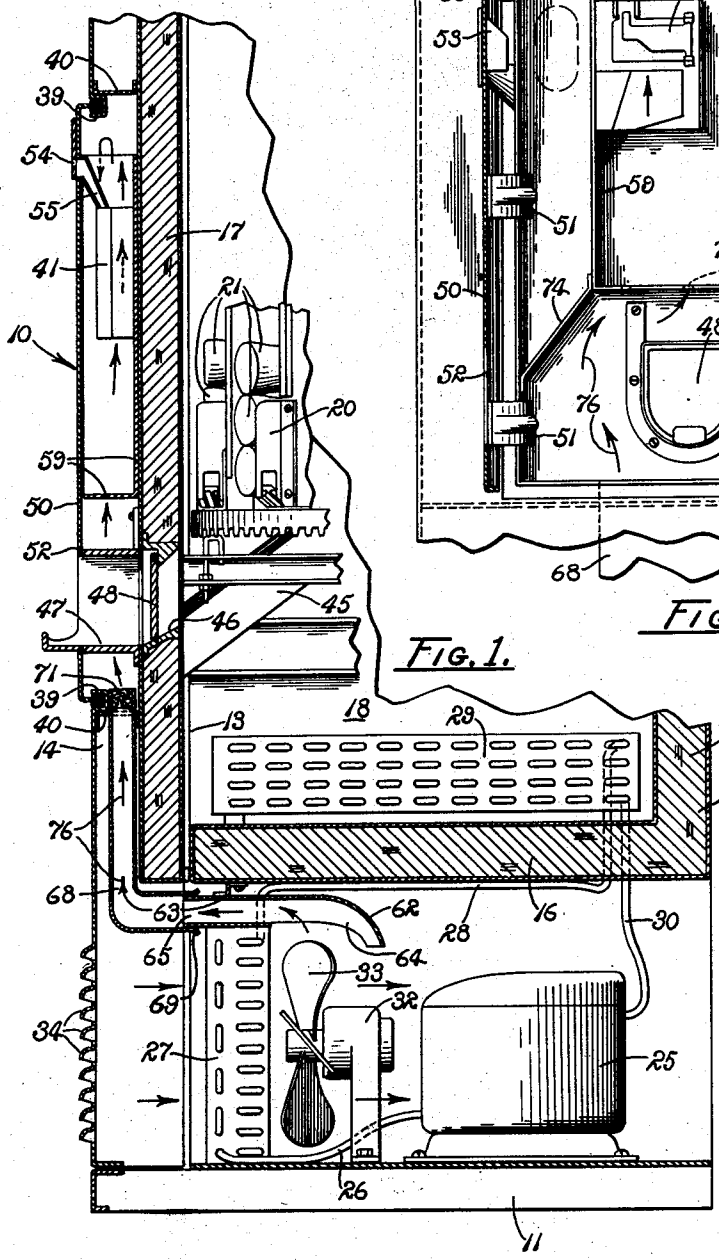


FIG. 1.

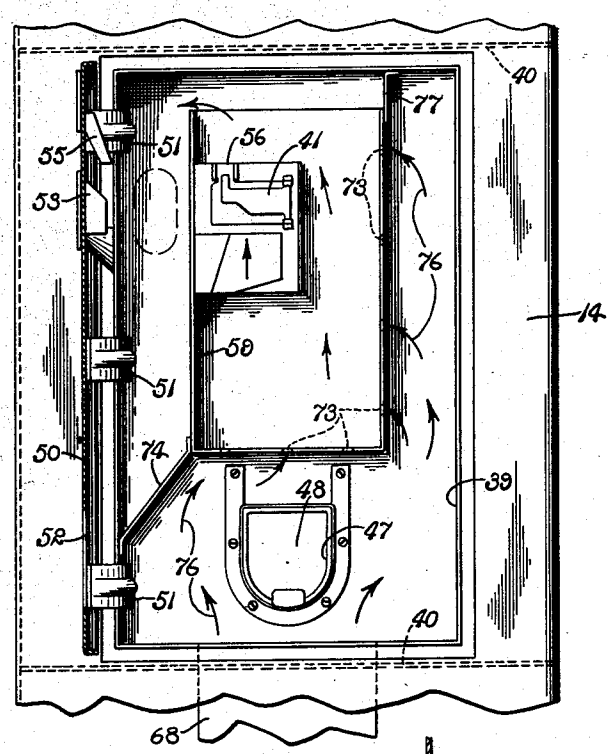


FIG. 2.

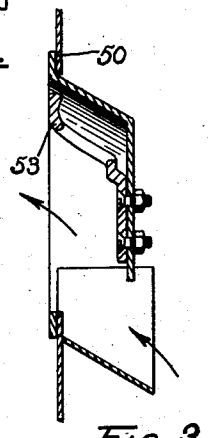


FIG. 3.

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COIN CONTROL PROTECTION SYSTEM FOR VENDING MACHINES

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4 Claims. (Cl. 194—1)

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The present invention relates to vending machines and the like and more particularly to a coin controlled vending machine for refrigerated merchandise.

Coin controlled refrigerated vending machines must function with a minimum of operational failure, structural breakdown, and servicing requirements to be economically feasible. Such machines are usually characterized by delicate and complex operating mechanisms, particularly the slug rejecting and coin control system thereof, and are called upon to perform their intended functions in widely varied environments presenting wide ranges of temperature variation and other operational hazards. Further, the slug rejecting and coin control systems are usually mounted in such machines because of design considerations such as convenient customer access, where they are cooled below atmospheric temperature incident to refrigeration operations. This has been found to cause condensation of air-borne water vapor on such systems and their failure properly to operate.

For example, certain parts in coin control systems are so delicate that the mere presence of water thereon precludes proper operation because of the surface tension of the water. In addition, such accumulated moisture is conducive to rust and corrosion. Further, many industrial and other locations in which vending machines are popular have excessive air-borne impurities which tend to collect in the coin control systems, particularly in the presence of moisture. Before the present invention, it was considered impossible to keep vending machines in proper operation for even reasonable periods in such locations as cement plants, cotton gins, spray paint shops, electroplating plants, and the like.

The obvious expedient of hermetically sealing coin control systems and the like to preclude the collection of moisture and air-borne impurities has been impractical. Coin reception has always precluded effective shielding or the systems from the air.

An object of the present invention is to provide for the effective protection of delicate operating mechanisms in refrigerated vending machines and similar apparatus from air-borne moisture and impurities where hermetical sealing is impossible or undesirable.

Another object is to provide a coin-controlled, refrigerated vending machine characterized by reduced service requirements and increased dependability of operation as compared to conventional machines of the type.

Another object is to minimize or to preclude moisture collection in coin control and other intricate mechanisms in refrigerated vending machines and the like.

Another object is to reduce to a point of substantial elimination the collection of air-borne impurities in coin control and other intricate

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mechanisms employed in refrigerated vending machines.

Another object is to provide for the effective protection of coin control mechanisms in refrigerated vending machines from moisture and air-borne impurities with a minimum of expense and no appreciable increase in power requirements.

Other objects and advantages will become apparent in the subsequent description in the specification.

In the drawing:

Fig. 1 is a fragmentary vertical section of a refrigerated bottle vending machine embodying the principles of the present invention.

Fig. 2 is a fragmentary front elevation of the vending machine of Fig. 1 illustrating a front door thereof having an openable servicing panel pivotally mounted therein, the servicing panel being shown in open position and in vertical section for illustrative convenience.

Fig. 3 is an enlarged vertical section through a crown puller mounted in the servicing panel shown in Figs. 1 and 2.

Referring in greater detail to the drawing:

A refrigerated coin control bottle vending machine is indicated generally at 10 of any suitable form. The machine generally provides a support frame 11 mounting a refrigerated cabinet 12 providing an open forward side 13. The open forward side is closed by a door 14 of any convenient form, preferably having a hollow interior for housing a coin control mechanism. It is the usual practice to provide suitable means, not shown, for locking the door 14 in closed position during vending operations. The door is conventionally hingeably mounted so that it may be swung open when unlocked in order to load the vending machine.

The cabinet 12 provides insulated walls 16 and the door 14 and insulated inner wall 17 defining a refrigerated chamber, indicated at 18.

A magazine 20 is rotatably mounted in the chamber 18 in any suitable manner and is rotated in stepped progression by a drive linkage, not shown, in order to vend articles such as bottles 21 of soft drinks from the machine.

The machine is provided with a refrigeration system including a motor driven compressor 25 connected by means of a conduit 26 to a condenser 27. The condenser is connected by a conduit 28 to an evaporator coil 29 located in the bottom of the chamber 18 or other convenient location for refrigeration of the bottles 21. The evaporator coil is connected to the compressor by means of a conduit 30. The refrigeration system described is essentially conventional and is alluded to for purposes of clearly describing the subject invention. The refrigeration system is a simple heat exchange mechanism whereby heat is transferred from the chambers 18 into the condenser 27 for dissipation into the air. Other forms of vending machines and the like and other forms of refrigeration systems may be employed

without departing from the spirit or the scope of the present invention.

In order to facilitate dissipation of heat from the condenser 27, a motor 32 is mounted at a side thereof connected in driving relation to a fan 33 positioned adjacent to the condenser and arranged to draw air therethrough. The door 14 at the forward side of the vending machine provides louvers 34 admitting air for passage through the condenser and discharge rearwardly of the machine.

The door 14 is provided with a substantially rectangular central servicing opening 39. The opening is circumscribed by a substantially rectangular wall 40 mounted in the door and with the insulated wall 17 provides a housing accessible through the opening 39. A slug rejector and coin control mechanism 41 is mounted in the door in a position conveniently accessible through the opening 39. The slug rejector and coin control mechanism may take any suitable form but uniformly are intricate and easily rendered inoperable by the collection of moisture and/or air-borne impurities. The coin control mechanism is mounted at a height suited to customer convenience and thus is adjacent to the refrigerated chamber 18. Even though the insulated wall 17 is located between the coin control mechanism and the chamber, it is well known in refrigeration mechanisms for the control mechanisms so mounted to be sufficiently cooled from the chamber to collect moisture by condensation of water vapor from the air.

A delivery chute 45 is mounted in the cabinet 12 adjacent to the magazine 20 and downwardly inclined therefrom. An auxiliary chute 46 is mounted in the door 14 in juxtaposition with the delivery chute 45 and extends through the insulated wall 17. The chute 46 terminates in a delivery compartment 47 provided in the door and a flap 48 is pivotally mounted in closing relation to the compartment. In usual operation, a customer conditions the vending machine for operation by depositing a coin of suitable denomination in the coin control mechanism 41 which either electrically energizes an electric delivery mechanism, not shown, or conditions a manual operating mechanism, also not shown. The bottles are individually released from the magazine 20 for delivery down the chutes 45 and 46 to the compartment 47 for convenient access by opening of the flap 48. The opening through the insulated wall 17 and the delivery of refrigerated bottles or other merchandise to the compartment 47 further serves to cool the interior of the door and increase the condensation of moisture on the coin control mechanism 41.

A panel 50 is pivotally mounted as by hinges 51 in closing relation to the opening 39. The panel is apertured, as at 52, for convenient access to the compartment 47 and flap 48 which are extended to the forward face of the door 14. The panel is lockable in closed position by any suitable means, not shown, and provides a crown puller 53 mounted therein and providing an opening therethrough whereby the crowns removed from the bottles 21 descend inwardly through the panel and are collected within the door in the well known manner. The opening in the crown puller permits air and air-borne impurities also to enter the door. A coin slot 54 is provided in the panel above the coin control mechanism 41 and a coin tube 55 mounted on the panel in registry with the slot 54 and with a coin receiving opening 56 in the coin control mechanism 41 when the panel is locked in closed position.

As a convenience in mounting the coin control mechanism 41, a rectangular bracket box 59 is mounted in the door inwardly of the access opening 39 and intermediate the panel 50 and the insulated wall 17. It is usual practice to bolt or otherwise secure the coin control mechanism 41 on a vertical wall of the bracket box 59. Coins accepted by the coin control mechanism may be collected in the bracket box 59 or any other suitable container desired.

The parts of the vending machine heretofore described are essentially conventional and serve to illustrate an operational environment suitable to the present invention. The coin control mechanism 41 illustrates operating mechanisms generally which are used in connection with refrigerated vending machines or other refrigeration apparatus which are intricate in structure and subject to being rendered inoperable by the condensation of water vapor thereon and/or the collection of air-borne impurities therein. It will also be noted that the door 14 provides a housing intermediate the insulated wall 17 and the panel 50 for the coin control mechanism. This housing generally characterizes housings in refrigerated vending machines and refrigeration apparatus generally which are substantially non-communicative with the refrigerated chambers 18 thereof and yet subject to a certain amount of incidental cooling conducive to condensation of water vapor therein. Further, the crown puller 53 and the coin slot 54 exemplify porting of such housings whereby they are open to the atmosphere and receive air-borne impurities and water vapor.

The present invention utilizes air warmed by the condenser 27 thrown radially of the fan 33 to maintain a pressure around the coin control mechanism 41 in excess of atmospheric pressure. The air is filtered, as will soon become apparent, and provides a clean, dry, operating atmosphere for the coin control mechanism which moves outwardly through all of the openings in the housing, thereby precluding inward movement of moist air bearing objectionable impurities.

A scoop 62 is mounted in the frame 11 of the vending machine as by brackets 63. The scoop has an enlarged intake opening 64 radially adjacent to the fan 33 and outlet end 65 extended forwardly in the machine to a point of termination adjacent to the inner surface of the door 14. As is well known, rotary fans although designed to move air axially of their rotary motion, throw a certain amount of air radially outwardly in a peripherally discharged slip stream. The arrangement of the scoop described takes advantage of such radially thrown air and a current of air is forced through the scoop toward the outlet end 65 without imposing any appreciable drag on the fan or reduction in air flow through the condenser.

A lower duct 68 is mounted in the door 14 and provides a flared end 69 positioned to receive the outlet end 65 of the scoop 62 when the door is closed. The duct and scoop have their adjacent ends loosely telescopically associated so that no appreciable opposition to movement of the door is offered thereby. The duct is extended upwardly in the door through the rectangular wall 40 and into the housing for the coin control mechanism 41.

A filter 71 is located within the housing over the upper end of the duct 68 and serves to filter

warm dry air moving upwardly through the duct into the housing. The filter may be formed from any suitable material such as fiberglass, steel wool, or other material providing effective air cleansing with a minimum of air impedance. As shown, the filter is conveniently accessible through the servicing opening 39 by opening the servicing panel 50. As evident in Figs. 1 and 2, the upper end of the duct 68 is of substantial cross sectional area so that effective cleaning with a minimum resistance to air movement can be accomplished.

The bracket box 59 is provided with apertures 73 in positions desired for movement of air through the bracket box to the coin control mechanism. In order to direct the air stream so as to pass around the coin control mechanism, it is usually desirable to provide a baffle plate 74 between the filter 71 and the crown puller 53 and coin slot 54 extended between the housing 40 and the bracket box.

As shown by the arrows 76, air collected at the periphery of the fan 33 is forced upwardly into the scoop 64 through the duct 68 and filter 71 and passes upwardly in the housing 40 for movement across the coin control mechanism 41 according to the arrangement of the apertures 73. The bracket box 59 conveniently provides an open top and air is free to move upwardly therefrom and out of the crown puller 53. It is to be understood that the bracket box may be dispensed with entirely without departing from the spirit or scope of the present invention, it comprising a simple mounting convenience for the coin control mechanism. When the bracket box is utilized, it has been found of aid also provide a baffle 77 extended between one side thereof and the top of the housing 40. It will be apparent that any desired arrangement of baffles and the like may be utilized to direct the air stream through or over the coin control mechanism, the significant feature being that an operating environment of clean dry air is provided for the coin control mechanism which is maintained at a pressure slightly in excess of atmospheric so that there is no movement of air theretoward except that directed through the scoop, duct, and filter.

In most areas, the refrigeration system operates intermittently but such intermittent operation is adequate to keep the coin control mechanism entirely dry and to provide clean air for its operation. In exceedingly humid areas occasion has been found for running the fan 33 continuously in order to maintain adequate protection against the collection of moisture and/or air-borne impurities in the mechanism. In such instances an incidental advantage is the additional cooling of the condenser 27 by the continuous movement of air therethrough. Normally, the motor 32 is of such low power that continuous running is not objectionable.

The present invention has successfully obviated the rendering of coin control mechanisms and the like inoperable incidental to the collection of moisture and dirt therein even in such locations as cement plants, cotton gins, spray paint shops, electroplating plants, and the like, and the servicing requirements incident thereto.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices, systems and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a coin operated vending machine having a cabinet providing a portion housing a coin control mechanism and having an air outlet port and a separate portion housing a refrigerating system having a condenser and a fan arranged to motivate air through the condenser, an air scoop arranged to receive fan motivated air after its passage through the condenser, an air duct connected to the scoop and arranged to direct air therefrom to the portion of the cabinet housing the coin control mechanism, and a filter mounted in the air duct.

2. In combination with a refrigerated cabinet having an operating mechanism mounted thereon, and a refrigeration system connected to the cabinet including a condenser and a motor driven fan arranged to motivate air through the condenser; a ported housing containing the operating mechanism; a scoop arranged to receive air after passage through the condenser; a duct interconnecting the scoop and the ported housing; and an air filter mounted in the duct between the scoop and housing, the air filter having an air transfer capacity greater that the venting capacity of the ported housing.

3. In a coin controlled vending machine, the combination of a cabinet having a refrigerated chamber, an operating mechanism for the vending machine mounted on the cabinet exteriorly of the chamber and cooled thereby, a housing for the operating mechanism, a refrigeration system for the cabinet having a condenser positioned exteriorly of the chamber and a motor-driven fan positioned to draw air through the condenser to cool the same, a scoop mounted peripherally adjacent to the fan to receive radially directed air therefrom drawn through the condenser, and a duct interconnecting the scoop and the housing whereby warmed air is directed from the condenser to the housing and exhausted therefrom.

4. The combination of a coin controlled vending machine having insulated walls forming a chamber having an access opening, an insulated door mounted in the access opening and having a hollow interior provided with a coin receiving slot, a coin control mechanism mounted in the hollow interior of the door to receive coins through the slot, a vending mechanism adapted to dispense articles from the chamber having controlled connection to the coin control mechanism, a refrigeration system for the chamber having a condenser positioned exteriorly of the chamber, and a motor driven fan for driving air through the condenser; an air scoop mounted radially adjacent to the fan; a duct connected to the scoop having an open end extended into the access opening at a position covered by the door when the door is closed; a filter mounted in the open end of the duct accessible when the door is open; and means in the door in registry with the duct when the door is closed for directing air from the duct to the hollow interior of the door for exhaust through the coin slot.

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