A cabinet housed dispenser for the simultaneous filling of a tray of drinking glasses. Multiple valve stems seat within discharge orifices with the stems urged upwardly to an open position by a cam or solenoid actuated plate. Spring means seats each valve stem downwardly to a closed position. Diversion means divert a trough carried water flow into multiple recessed areas of equal size for the collection therein of an equal volume of liquid which is subsequently discharged into each glass. A modified form of the dispenser includes a float actuated valve to regulate the flow of incoming fluid into a tank. An operator lever uniformly controls the flow from each tank orifice.

8 Claims, 12 Drawing Figures
LIQUID DISPENSING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates generally to a dispensing device for the simultaneous equal filling of drinking glasses or other vessels.

In restaurants it is common practice to individually fill a quantity of water glasses some time in advance of their being served to customers in order that the time consuming task be avoided during peak customer period. The task of filling large numbers of water glasses entails the glasses being hand held separately under a tap in the well known manner. Trays of filled glasses may sit for a considerable period prior to being served during which time the drinking water warms to room temperature and is subject to dust and germ contamination.

SUMMARY OF THE INVENTION

The present invention is embodied within a structure receiving a volume of liquid for subsequent apportionment to a number of drinking glasses. The glasses or other vessels are filled simultaneously to a uniform level.

The dispensing device includes tray receiving means enabling the insertion and filling of a tray of glasses within a matter of seconds. A specific volume of water or other fluid is temporarily stored within multiple measuring recesses within the dispenser. Another form of the invention relies on uniform flow through valve orifices for uniform filling of glasses. A multitude of valve stems are simultaneously upwardly positioned by a valve carrier in response to movement of a manual control. A valve stem plate is cam actuated to a raised valve opening position. Incoming liquid flow, in one form of the invention, flows unimpeded along a trough to prevent fluid entry into the multiple measuring recesses during glass filling. For filling of the recesses the trough flow is blocked by a gate to cause fluid to overflow the trough walls.

Important objects of the present invention include the provision of a dispenser for rapidly and uniformly filling a quantity of glasses with a desired equal volume of fluid; a dispenser for use in establishments serving large numbers enabling an employee to rapidly fill glasses as they are needed without interfering with the employees food serving tasks; a dispenser which includes flow diversion means to permit a constant flow of water to be momentarily diverted during glass filling operation to insure a precise quantity of fluid in the receptacles; a dispenser unit with inlet valves operable to fill a common holding chamber to a desired level and which chamber is emptied by liquid flow through a multitude of orifices. The foregoing and other objects are further elaborated upon in the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a perspective view of one form of the present dispenser,

FIG. 2 is a front elevational view of FIG. 1 with fragments broken away for illustrative purposes,

FIG. 3 is a view looking downwardly along line 3—3 of FIG. 2 showing a positionable flow diverter,

FIG. 4 is a view looking downwardly along line 4—4 of FIG. 2 with a valve cover and valve plate removed to show cam means actuating said plate,

FIG. 5 is a sectional elevation taken along line 5—5 of FIG. 3,

FIG. 6 is a complete valve stem removed from associated structure,

FIG. 7 is a schematic of the liquid flow with the flow diverter in a flow obstructing position,

FIG. 8 is a sectional view of flow diversion means taken along line 8—8 of FIG. 5,

FIG. 9 is a side elevational view of a modified form of the dispenser with wall fragments broken away,

FIG. 10 is a plan view of FIG. 9 with the top housing removed and the valve plate sectioned along its centerline,

FIG. 11 is a vertical section taken along line 11—11 of FIG. 10 showing cam and valve details, and

FIG. 12 is a fragmentary elevational view of a valve plate and valve guide structure with solenoid means imparting movement to said plate.

DESCRIPTION OF PREFERRED EMBODIMENTS

With continuing reference to the accompanying drawing wherein applied reference numerals indicate parts similarly identified in the following specification, the reference numeral 10 indicates generally the dispenser defining an open area therewithin at 11 for the reception of a glass bearing tray T on a rack 12. A fluid source is indicated at 13 which may be in communication with a water tap or other source.

A base portion at 14 supports tray rack 12 and has an inclined bottom wall 15 defining an opening 16 at one end. Front and rear walls 17 and 18 along with side walls 19 channel any liquid escaping the glasses to drainage opening 16 emptying into a sink 5.

The first form of the invention is directed toward filling rows of glasses at 21 and while only two rows are shown in place the device may be modified in an obvious manner to simultaneously fill more than the two rows shown. In the present embodiment, the sidewalls 19 taper upwardly and are thereof integral with a tank structure generally at 22. Superimposed on tank structure 22 is a later described valve assembly generally at 23. With attention to tank structure 22, the same includes a rectangular walled enclosure shouldered at 24 to receive the valve housing 23. The walled enclosure defining the tank structure includes front and rear walls 25, 26 with side walls 27, 28 all best viewed in FIG. 4. Extending longitudinally of the tank and centrally disposed therein is a trough 29 defined by coextensive walls 30. Laterally disposed from each trough wall 30 are a series of recessed areas 31 each laterally defined by the tank and trough walls and inclined bottom walls 32. The apices at 33 of the inclined walls 32 intermediate adjacent inclined walls of two different recessed areas 31 are of a height somewhat lower than the upper edges of trough walls 30 whereby liquid filling one recessed area will spill into adjacent recessed areas and fill the same subsequent to which a continuing fluid flow will rise to and flow over the upper edge of trough wall 30 for re-entry into the trough and discharge as later described.

Serving the tank is an inlet at 34 and an outlet duct 35 located at opposite ends of tank trough 29. A tubular conduit 36 (FIG. 7) occupies approximately one half of the trough length for fluid delivery from inlet 34.
directly against diversion means medially located along trough 29.

With attention to FIGS. 2, 3, 5 and 8 the diversion means generally at 40 constitutes a gate valve or dam for alternatively blocking the incoming flow causing same to be diverted laterally from trough 29 or permitting uninterrupted linear flow through the trough for discharge via outlet 34. The diversion means further comprises a gate 41 with vertical edges 41A of reduced thickness for guided travel within ways 30A in trough walls 30. Integral with gate 41 is a flow detector 42 of concave shape 43 on its underside with the deflector extending laterally beyond the trough walls 30. Liquid impinging against gate 41 is deflected upwardly and thence outwardly and downwardly through the relieved underside of deflector 42 directly into at least two opposed recessed areas 31. As earlier mentioned, fluid will enter and progressively fill all of said areas prior to cascading over the upper edge of trough walls 30 downstream from gate 41. Accordingly fluid enters the trough via tubular conduit 36, impinges against gate 41, is diverted upwardly and outwardly through concave area 43 of the diversion means and rapidly fills the two parallel rows of recessed areas 31. Rapid filling said areas is accomplished by the progressive filling from the middle of each row outwardly toward the ends of the tank structure. A stem at 44 imparts vertical motion to deflector 42 and gate 41 coincident with a later described valve plate.

The valve assembly, generally at 23, includes a housing 46 enclosing parallel valve guide structures 47 supported by a base 48 which rests upon the upper rim of the tank structure. Screws 49 secure the base 48 to said tank structure. Separate valve guides at 50 define spaced apart, vertical bores 51 within which are slidably carried rows of valve stems 52. With attention to FIG. 6 each valve stem is biased downwardly to a closed position by a helical spring 53 the upper end of which spring is confined by a reduced diameter of valve bore 51. The valve stems 52 terminate downwardly in a pliable tip 54 which normally seats within an outlet opening 56 in the tank structure. Said openings are located at the downward juncture of inclined bottom walls 32 of each recessed area 31. Immediately above each discharge openings or orifice 56 is an enlarged cup-shaped recess 55 the circular wall of which acts to center the tip 54 during its downward spring urged travel.

For lifting of the valve stems 52 from their normal seated position 1 provide operator controlled means comprising a valve plate 58 superimposed substantially the length of the valve guides 47 and apertured to receive therethrough the upper ends of each valve stem 52. Locking nuts 59 at the upper end of each stem permit imparting lifting movement to same against helical springs 53 which otherwise cause valve plate 58 to be held firmly in place on top of the valve guides 47.

Cam means are disposed within the valve assembly 23 and include a linkage actuated by manual movement of a lever 60 to exert a lifting force on valve plate 58 to lift simultaneously valve stems 52 for tank discharge. Said linkage, as viewed in FIGS. 2 and 4, includes lever 60 rotatably supported by a shaft 61 journalled within the valve guide walls. A central linkage member 62 thereon pivotally receives the inner ends of links 63. Shafts 64, carried by the valve guides, swingably carry cams 65 for arcuate rotation into plate lifting contact with the underside of the valve plate. The links 63 are pivotably attached at their ends in an offset manner from the axes of the central linkage member and each cam element 65 so as to move the latter into upright disposition upon downward lever movement. Accordingly, actuation of lever 60 rotates cam elements 65 into their upright positions to lift the valve plate and hold same until the handle is returned to its starting position. Springs 53 urge each stem 52 downwardly to return plate 58 to its lowestmost position. In the interim the valve stems 52 are lifted to open outlet orifices 56 in the tank whereupon each of the recessed areas 31 is drained. In addition to the lifting of the valve stems, the stem 44 of the diversion means is lifted to elevate the gate 41 permitting the continuing flow of fluid to pass directly along trough 29 and out discharge duct 35. Accordingly, only that known volume of water stored in each recessed area and immediately thereafter is released into its respective glass or other receptacle.

In FIG. 9, 10 and 11 I show a modified form of dispenser wherein the discharge orifices exhaust a common tank with the quantity of fluid discharged regulated by the operator. A supporting base 70 includes a tray supporting rack 71 for inserted reception of a glass filled tray T. Base 70 includes a perimeter type framework 72 which supports a tank structure 73 within which is a valve 74 controlled by a float 75. An inlet 76 discharges via valve 74 into tank 73 to at all times provide a fluid quantity within the tank. A tank bottom wall 77 is apertured to provide outlet orifices 78 preferably spaced to discharge into a loaded tray of conventional glass holding capability.

A valve assembly generally at 80 includes a bottom wall 81 removably mounted upon the upper perimeter of tank 73 with said bottom wall in turn supporting parallel rows of valve guide structures 82. The remaining structure of the modified form of the invention is similar to the corresponding portion of the first form. Valve stems 83 are urged downwardly by means of springs 84 concealed within the valve guide structures 82 with the lower end of each stem fitted with a resilient tip 85. The tips 85 seat within cup-shaped recesses 86 and discharge orifices 78 in the tank bottom wall. A valve plate 88, upon actuation raises the stems simultaneously for fluid discharge.

Cam means are arranged in tandem fashion to provide adequate lifting force to the underside of valve plate 88. A lever 90 rotates a central shaft 91 within bearing blocks 92 to impart rotational movement to central linkage members 93. Linkage at 94 terminates outwardly in pivotal connection with cams 95 which may be roller equipped as at 96 to reduce frictional resistance. The valve plate is lifted with consequent lifting of each valve stem 83. The discharge of fluid from tank 73 will rapidly fill the tray carried glasses with valve 74 opening as necessary to assure a fluid supply within the tank. Float 75 closes the valve upon a certain tank level being reached and functions independently of movement of operator lever 90 which simply regulates fluid discharge from tank 73. In FIG. 12, solenoid means at 97 are utilized to impart vertical lifting motion to a valve plate 88 with other earlier described components being identified with as prime numerals.

While I have shown but two embodiments of the invention it will be apparent to those skilled in the art that the invention may be embodied still otherwise.
Having thus described the invention what is claimed and desired to be secured under a Letters Patent is:

1. A dispensing device for dispensing uniform fluid quantities, said device comprising,
a base for the reception of a quantity of glasses or the like to be filled to a desired level,
a tank structure above said base, a bottom wall of the tank structure defining rows of discharge orifices, said tank structure additionally defines rows of recessed areas of uniform size with each of said areas in communication with one of said orifices, said areas for the momentary storage of a like quantity of fluid prior to discharge into a glass or other vessel, a trough, a tubular conduit disposed within the trough, diversion means disposed within said trough to divert a flow of water therefrom into said recessed areas to fill said areas, said diversion means positionable to terminate fluid diversion during emptying of the recessed areas to prevent entry of additional fluid into said areas during a glass filling operation, and
a valve assembly including valve stems, the lower ends of which normally close said orifices, a valve plate engaging each of said valve stems for lifting same simultaneously out of orifice engagement, operator controlled means engagable with said plate for lifting the plate and all of said valve stems for simultaneously filling of the glasses at a uniform rate.

2. The dispensing device as claimed in claim 1 wherein said tank structure includes a fluid operated valve operable to maintain a fluid quantity within the tank.

3. The dispensing device as claimed in claim 2 wherein said operator controlled means comprises pairs of cam elements uniformly acting on said valve plate at spaced apart locations to lift same.

4. The dispensing device as claimed in claim 1 wherein said operator controlled means includes multiple cams, means linking each of said cams to a central actuating shaft whereby uniform upward forces may be imparted to the valve plate at spaced apart locations to lift same.

5. A dispensing device for water or beverages, said device comprising,
a base for the reception of a tray bearing a multitude of glasses or the like to be filled to a desired level,
a tank structure above said base and served by an inlet and an outlet, said tank structure defining rows of recessed areas with each of said areas in communication with a discharging orifice, a trough adjacent said areas and in communication with said inlet and outlet, diversion means positionable in one direction within said trough to block fluid flow therethrough causing filling of the recessed areas, said diversion means positionable in an opposite direction permitting unimpeded trough flow coincident with the discharge of fluid from said recessed areas whereby the entry of additional fluid into said areas during glass filling is prevented, and
a valve assembly including valve stems the lower ends of which normally close said orifices, a valve plate engaging each of said valve stems for simultaneous lifting of same to an orifice opening position, operator controlled means engagable with said plate for lifting the plate and said valve stems for simultaneously filling of the glasses at a uniform rate.

6. The dispensing device as claimed in claim 5 wherein said diversion means comprises a gate, a flow deflector integral with said gate, said deflector having a concave surface disposed above the trough for the lateral deflection of fluid outwardly and downwardly into the recessed areas.

7. The dispensing device as claimed in claim 6 additionally including a tubular conduit disposed within said trough interposed between said inlet and said gate and discharging fluid in the proximity of said gate.

8. The dispensing device as claimed in claim 6 wherein said operator controlled means includes cam elements acting on said valve plate.

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