This invention relates to automatic laundry machines, and more particularly to such machines where it is intended that a treating agent be automatically introduced into the receptacle holding the articles being treated at the proper time in a treating sequence.

There is described and claimed, in application Serial Number 25,411, filed on April 28, 1960, by John Bochan and assigned to General Electric Company, assignee of the present invention, a machine having an improved treating agent dispenser system. The invention of the aforesaid Bochan application relates to the portion of the system wherein the liquid to be stored in a container which has at least a portion thereof susceptible to an increase in pressure. A conduit connects this container to a suitable means such as a dispensing container so that an increase in pressure in the storage container will cause treating liquid to be passed through the conduit into the dispensing container where it is injected into the article receptacle at the suitable time.

It is an object of my invention, in the type of system described above, to insure that all of the liquid in the storage container may be used up prior to requiring refilling, thus eliminating the possibility that some of the liquid will always be left over. Certain types of treating agents such as chlorine bleaches lose some of their effectiveness as they age, and where this is true it is desirable that some treating agent should not remain in the storage container when additional agent is added, since agent which is left over will lose its effectiveness and by mixing with the new agent will decrease the total effectiveness of the mixture.

A further object of my invention is to provide, in a system of the type described above, a storage container structure wherein a single injection operation will always provide the same maximum amount of treating liquid to be dispensed. This is important, both for decreasing the possibility and frequency of excessive amounts of liquid agent being dispensed and for providing the same amount in cases where the liquid is dispensed in such a way that the quantity thereof is not measurable in any other way.

In one aspect of my invention, I provide, in an article treating machine, a receptacle assembly for the articles to be treated. The machine also includes a storage container for a liquid treating agent, which container has a first relatively large section and a second relatively small section formed to withstand pressure and having its top at a level at least as low as the bottom of the large section. The two sections are connected by means which join the bottom of the large section to the small section and provide fluid communication between them; pressure-responsive valve means is positioned so as to close the connecting means when there is an excess of fluid pressure in the small section over that in the large section, and to open the connecting means for liquid flow when the fluid pressures in the sections are substantially equal and the small section is not filled. Together with means for increasing the pressure on the liquid in the small section, I provide conduit means having one end communicating with the small section and the other end positioned to discharge liquid so that it is introduced into the receptacle assembly. The pressure increasing means is effective to force liquid from the one portion through the conduit means; when the pressure increasing means is so forcing liquid, the valve means is closed so that the total amount that can be forced from the small section through the conduit means is limited by the volume of the small section. In addition, the position of the small section relative to the large section insures that all of the liquid in the large section will drain down into the small section before it is time for refilling; since liquid from the small section is dispensed prior to any further liquid passing into the small section from the larger section, this prevents the system from retaining some old and possibly stale treating liquid while at the same time requiring the addition of fresh treating liquid.

The features of my invention which are believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following detailed description taken in connection with the accompanying drawing.

In the drawing, the single figure is a schematic front elevational view of a typical laundry machine, in particular a clothes washing machine in this instance, which includes my new and improved treating agent dispensing system, the view being partially broken away and partially in section in order to illustrate details.

Referring now to the drawing, I have shown therein in schematic form an agitator-type washing machine generally indicated by the numeral 1 having a treating receptacle assembly, in this case including a clothes basket 2 disposed within an outer imperforate tub or casing 3. Tub 3 is mounted within an appearance cabinet, generally indicated in dotted outline by the numeral 4, which includes an appropriate body portion 5 enclosing the operating components of the machine and, in addition, the usual backplasher 6 which is secured to the top of body portion 5 at the rear thereof and normally includes an appropriate dial 7 so as to permit selection of a particularly desired sequence of washing operation. Dial 7 may be connected into a conventional sequence control mechanism 8 of the type generally commercially available and which is, therefore, not further described herein. At the center of basket 2 there is provided a vertical axis agitator 9 which includes a center post 10 and a plurality of radially extending vanes 11. The agitator is further provided with an outwardly and downwardly flared skirt 12 to which the vanes are joined at their lower ends.

Both the clothes basket 2 and the agitator 9 are rotatably mounted. In one conventional structure, the clothes basket 2 may be secured to a hollow shaft member 13 and the agitator may be secured to a shaft 14 which extends up within shaft 13 in rotatable relation thereto. Agitator 9 is secured to shaft 13 by any suitable means (not shown). During the cycle of operation of machine 1, the agitator is first oscillated back and forth within the basket 2 to wash the clothes therein. Then, after a predetermined period of this washing action, the basket 2 is rotated at high speed to extract centrifugally the washing liquid and discharge it into the outer tub 3 through appropriate small openings 15 provided adjacent the top of basket 2. In one usual construction the openings 15 extend in a horizontal line along the outer wall of the basket adjacent the top thereof slightly below the inwardly turned flange 16 which may be provided (or some equivalent structure) to prevent the flotation of clothes over the top of the basket 2 into the outer tub 3. Following this extraction operation, a supply of clean liquid is introduced into the wash basket for rinsing the clothes as the agitator is again oscillated. Finally, the basket is once more rotated at
high speed to extract the rinse water and discharge it into the outer tub. Basket 2 and agitator 9 may be driven by any suitable means. By way of example I have shown them as driven from a reversible motor 17 which drives the basket and agitator through a drive including a clutch 18 mounted on the motor shaft. Clutch 18 allows the motor to start without load and then picks up the load as it comes up to speed. A suitable belt 19 transmits power to transmission assembly 20 through a pulley 21. Thus, depending upon the direction of motor rotation, pulley 21 of transmission 29 is driven in opposite directions.

The transmission 29 is so arranged that it supports and drives both the shafts 13 and 14. When motor 17 is rotated in one direction the transmission causes the agitator 9 to be oscillated within basket 2 by shaft 14. Conversely, when the motor is driven in the opposite direction, the transmission drives the wash basket 2 and the agitator 9 together at high speed for centrifugal extraction of liquid from the clothes. While the particular form of the drive means does not form part of the present invention, reference is made to Patent 2,844,225, issued on July 22, 1958, to James R. Hubbard et al. and owned by the General Electric Company, assignee of the present invention.

In order to introduce washing and rinsing liquid into the assembly of basket 2 and tub 3, a pair of conduits 22 and 23 leading from, respectively, cold water and hot water sources (not shown) are provided. For cold water entering through conduit 22, the passage of the water from conduit 22 into conduit 24 and out through opening 25 into tub 3 is controlled by a valve 26 whose position in turn is controlled by a solenoid assembly partially shown by the numeral 27. As is well known in the art, when the solenoid 27 is energized valve 26 is open and cold water may flow from conduit 22 out through opening 25 into tub 3. When solenoid 27 is de-energized, the valve 26 is closed and there is no flow of cold water into the tub 3. In similar fashion, the flow of water from conduit 23 through outlet 25 is controlled by a valve 28 which in turn is controlled by a solenoid partially shown by the numeral 29. Energization of the solenoid 29 causes hot water to flow from conduit 23 out through opening 25 and de-energization of the solenoid closes the valve.

In addition to operating transmission 29 as described, motor 17 drives a pump 30 through a flexible coupling 31 which connects the motor shaft and the pump shaft. During washing and rinsing operations of the machine, pump 30 discharges into a conduit 32 which leads to a nozzle 33 positioned above a perforated filter pan 34 secured to the agitator 9 so that liquid overflowing through openings 15 may be recirculated through the filter pan 34 in order to clean and filter the liquid during operation prior to its re-entry into basket 2. The system constantly circulates the washing liquid from tub 3 through conduit 32 and nozzle 33 back through filter pan 34 into basket 2 where it flows through openings 15 into tub 3 to repeat the cycle. At the end of the washing and rinsing portions of the cycle, and in response to reverse direction of rotation of motor 17 (effective to spin basket 2), pump 30 discharges into a drain conduit 35 which is adapted for discharge to a stationary tub or drain line so that the pump is effective to drain tub 3. Any suitable pump may be used for draining purposes, such as the one just now described; it is described in full detail and claimed in Patent No. 2,883,845, issued to John Bohan on April 28, 1959, and assigned to General Electric Company.

It will be understood that, in the particular example of a laundry machine shown, it is contemplated that the tub 3 is rigidly secured to the cabinet 4 by any suitable means and that the driving parts of the machine, including the motor 17, clutch 18, transmission 20, and the basket 2 and agitator 9, are suspended from the housing by suitable means (not shown) so that during the high speed rotation of the basket and agitator some limited amount of movement of the suspended system may take place in response to the presence of unbalances in the system. In order to permit this, there is a resilient boot member 36 of any desired configuration may be used to connect the moving system to the tub 3 in leak-proof relation so that water will be retained within the tub 3 and will not escape down into the lower part of the machine which contains the driving components.

As mentioned above, it is one of the purposes of any invention to provide suitable means for storing and automatically dispensing various treating agents at appropriate times during the washing cycle. Inasmuch as bleach is one of the most commonly used liquid treating agents in domestic washing machines, it will be used for purposes of illustration. The use of bleach has heretofore presented substantial problems, primarily because of the corrosive nature of chlorine bleaches (the most commonly used type), and the fact that, because of this corrosive nature, any substantial amount of handling of the bleach by the operator is undesirable.

In addition to structural changes in the machine, I provide a suitable storage container assembly generally indicated by the numeral 37 which is preferably, as shown, positioned low in the machine to avoid the difficulties which are created by the provision of a substantial amount of weight and volume relatively high in a machine having a centrifugal extraction operation. Storage container assembly 37 includes a first relatively large section 38 and a second relatively small section 39. While the particular sizes of these two sections is not critical, it is anticipated that in the conventional type of washing machine where the dispensing system is used for dispensing of any liquid bleach, the large section 38 will have a capacity on the order of one gallon so as to be able to accept the contents of a full jug of liquid bleach of the type commonly provided at retail (the bleach to be introduced through any suitable conduit means, not shown), and that the small section 39 will have a capacity on the order of one and one-half cups, which is considered to be the maximum amount of bleach suitable for use in a washing operation provided within the basket 2. Container 39 is formed to withstand pressures which are higher than atmospheric which may be formed, if desired, but need not necessarily be so formed; the only criterion being that the lid 40 of section 38 fit sufficiently tightly so that there will not be an excessive amount of bleach fumes escaping into the air nor will there be an excessive amount of contact of fresh air with the bleach in section 38 since such contact tends to increase the rate at which the effectiveness of the bleach deteriorates.

The bottom 41 of container section 38 slopes downwardly toward a low area 42 in which an opening 43 is provided to permit liquid communication between sections 38 and 39. Opening 43 is preferably covered by any suitable one-way pressure responsive valve means such as that indicated schematically by the numeral 44 and held in place by suitable means such as a very light spring 45. When the fluid pressure in the containers is substantially equal, the fact that, as shown, the bottom of container section 38 is positioned above the top of container section 39 causes the very small force of the valve spring 45 to be overcome; the liquid consequently flows through opening 43 down from section 38 into section 39. The calibration is such that this will occur whenever there is any liquid at all in section 38 and section 39 is not entirely filled. However, when for any reason the pressure in section 39 is higher than that in section 38, the pressure will bear on the ball valve member 44 and cause it to close the opening 43 thereby cutting off communication between the two sections 38 and 39.
Communicating with the section 39, and preferably extending through the top thereof as shown in my embodiment, are a pair of openings 46 and 47. Opening 46 terminates directly at the top of the container 39 while, to the contrary, opening 47 communicates with a conduit portion 48 extending down to a point 49 so that the communication between the section 39 and opening 47 is actually adjacent to the bottom of container 39. Opening 46 is connected to a suitable hose or conduit 50 which is secured thereto in any conventional manner, such as by forming the opening 46 as a protrubance rising from the top of section 39 and then securing the end of conduit 50 over the protrubance. In similar fashion, a conduit 51 is secured to opening 47. I also provide an opening 52 in the lid 40 of the large section 38 with a conduit 52a being secured thereto. I contemplate that in my preferred embodiment, particularly where the treating liquid is bleach, the conduits 50, 51 and 52a may be of any well-known type resistant to the action of chlorine bleach.

Conduit 50 extends up into the backblasher portion schematically shown by the numeral 6 and terminates in two openings 53 and 54 which are connected respectively to openings 55 and 56 formed in a valve member generally indicated by the numeral 57. Valve member 57 has a longitudinally extending inner chamber 58 within which a member 59 is position to slide. Member 59 is biased to the left by a relatively light spring member 60 engaging its right end, and the other end 61 of member 59 is formed as a pushbutton extending from backblasher 6 as to be accessible to an operator. When the operator pushes on end 61 of member 59 she overcomes the action of spring 60 and thereby moves the member 59 to the right from its position as shown (which is the position to which it is normally biased by the spring 60).

Member 59 is provided with a single opening 62 extending therethrough from top to bottom. In the normal position of member 59, opening 62 connects with an opening 63 on the other side of the valve, and opening 63 is vented to atmosphere. Thus, with the valve 57 in the position shown, the small section 39 is vented to atmosphere through the valve structure 57 so that there is no pressure built up therein. However, when the member 59 is manually pushed to the right, as described, the opening 62 then lines up with opening 56 and connects it with an opening 64 in the other side of valve 57. Opening 64 is connected to a conduit 65 leading to an air compressor generally shown at 66. The air compressor 66 may, as shown, be directly connected to the motor 17 so as to be driven thereby. It will be apparent that the air compressor may be of any conventional structure, for instance as provided in many commercially available rotary air compressors.

During operation of motor 17 the air compressor takes air in through opening 67 and discharges it under pressure through conduit 65. It will be observed that member 59, when in the position shown causing opening 52 to connect openings 55 and 63, provides a barrier between openings 56 and 64 so that there is no communication between them. Thus, with the valve member 59 in this position air from the compressor 66 is effectively prevented from travelling from conduit 65 into conduit 50 and therefore is prevented from getting into container section 39. At the same time, the venting of section 39 is insured as previously described.

However, when the operator pushes on end 61 of member 59 the opening 62 of member 59 connects openings 56 and 64 and at the same time the member 59 effectively cuts off communication between the openings 55 and 63. Thus, with the member 59 pushed to the right against the action of spring 60, communication is provided from conduit 65 to conduit 50 through the opening 62, and at the same time the section 39 is no longer vented because the end of opening 55 is blocked by the member 59.

The conduit 51 extends to an opening 68 provided near the top of the dispensing container generally indicated by the numeral 69. Dispensing container 69 includes a chamber 70 of the appropriate dimensions so that when it receives the full contents of section 39 the liquid level in it is well beneath an opening 71 which connects with conduit 52a. Chamber 69 includes an opening 72 at the bottom thereof leading from chamber 70 to a lower or discharge section 73 of the dispensing container. Opening 72 is accessible for a substantial flow of liquid from chamber 70 only through a funnel 74, so that the liquid level in the container must rise above the top of the funnel before liquid can pass down at a relatively high rate into the discharge section 73. The normal liquid level for the maximum regular charge of bleach, that is, the full contents of section 39, in addition to being well below opening 71 will also be below the top of funnel 74. For a purpose which will appear more clearly herebelow, one or more bleed openings 75 in funnel 74 are preferably provided at the lowest point in chamber 70.

The opening 72 is normally closed by a valve member 76 which, together with a valve member 77 closing an opening 78 in the top of chamber 70, is controlled by a solenoid partially shown by the numeral 79. When solenoid 79 is energized the valve members 76 and 77 move against the action of a spring member 80 so as to free the openings 72 and 78. Above the opening 78 and dispensing container 69 is a compartment 81 which is accessible through an inlet 82 so that water may be passed from the cold water inlet 22 through a conduit 83 and then out through its end 84 through an appropriate air space into the compartment 81. As one typical means of controlling the flow of water through conduit 83, it may be under the control of a valve schematically indicated by the numeral 85 which is in turn controlled by a solenoid member schematically shown at 86, the solenoid causing the valve 85 to open when the solenoid is energized and to close when it is de-energized. It is contemplated that, in the control of my structure, either the solenoid 79 or 86 will be energized and de-energized at the same time so that whenever water is allowed to pass into compartment 81 the valve members 76 and 77 will be moved away from openings 72 and 78, or else that the solenoid 79 will be de-energized slightly after solenoid 86.

With this structure, when the chamber 70, as will be described in connection with the operation of my invention, and solenoids 79 and 86 are energized, a small amount of bleach will initially pass through the opening 72 from bleed holes 75 into compartment 73 and thence through an outlet 87 into the tub 3. At the same time, water passing from the conduit 83 into compartment 81, and thence through opening 87, rapidly fills the chamber 70 to a level above the top of funnel 74. Once this happens, substantial quantities of bleach diluted with water pass down through opening 72 and then through the compartment 73 and outlet 87 into tub 3.

It will be clear that, where several dispensing chambers such as 69 are provided, each for a different treating agent, the chamber 81 may be formed to extend over all of them so that water from the single chamber 81 may be caused to flow into any one appropriate chamber 69 depending on which one has its solenoid 79 energized at any given time.

The operation of my invention will now be described. It is to be understood, in connection with the following description, that while bleach is normally injected into a washing machine container during the washing operation, the preferred time for so injecting the bleach is not at the beginning of the operation, but rather after a substantial part of the washing operation has already taken place. This results from the fact that if the bleach is injected at the beginning of the washing operation it has a tendency to counteract the beneficial whitening effect which is embodied in many modern detergents in the form of a fluorescent dye; consequently, in such a case, the full whitening effect of the detergent is not achieved. The
result of introducing the bleach toward the end of a washing operation has been shown in laboratory tests to be visibly better than where bleach and detergent are both introduced at the beginning of a cycle.

At any time prior to the injection of bleach into the clothes receptacle the operator causes operation of motor 17 by any suitable control means (which are not shown, being of any conventional type, and which may be included in control device 8 or made entirely separate for purposes of bleach injection only) and depresses the end 61 of member 59. Of course, the operation of motor 17 may be done with the depression of member 61 so that even outside a regular cycle of operation the motor 17 operates when member 61 is moved to the right. Appropriate circuitry for such an approach is obvious and simple and is not described further herein as it forms no part of the present invention.

With motor 17 operating to cause effective operation of air compressor 66 and with the member 59 moved to the right, air under pressure passes through conduit 65 from the compressor and then through the valve structure 57 and conduit 58 into the small section 39. The pressure within section 39 therefore rises rapidly. Two results are obtained from this increase in pressure and the venting of section 39's surface in section 39 is forced down, with liquid consequently passing up through tube 47 and conduit 51 into chamber 70 of dispensing container 69; second, the increase in pressure forces the valve member 44 firmly up against its seat to close off communication between sections 38 and 39. As can be seen, the dispensing container structure is preferably positioned in the back-splasher of machine 1 and a suitable portion of the back-splasher may be made transparent, or some suitable visible indicia of level may be provided, so as to indicate to the operator when the desired amount of bleach has passed up through conduit 51 into chamber 70. When the bleach level within chamber 70 reaches the desired level the operator releases the member 59 which then returns to its unbiased position toward the left as shown. This returning of the member 59 to the left performs the dual function of sealing off further communication between the air compressor and section 39 so that there is no longer any pressure delivered by the air compressor into the container, and also of venting section 39 through conduit 58 so that the pressure therein drops immediately.

The combination of the lack of communication between compressor 66 and section 39 and the venting of section 39 causes the passage of liquid through conduit 51 to cease immediately so that the level of the liquid in chamber 70 remains as desired.

It will be apparent that should the operator continue to press in on end 61 of member 59, section 39 will be substantially completely emptied, with the entire contents thereof passing into chamber 70. However, since the section 39 and the chamber 70 are proportioned so that the full content of section 39 comes to a level below the top of funnel 74, it will be observed that, short of the deliberate release of member 59 by the operator, followed by immediate redempess thereof, the maximum amount that can be injected into the chamber 70 will always be the same, that is, the contents of section 39 which represents the maximum safe single load of bleach for a washing operation. In addition, as a further safeguard, even should the depressions exerted by member 59, the bleach will, once it reaches the level of opening 71 in container 69, then merely flow back down through conduit 52a into section 38.

It will further be observed that once the measuring out of the bleach into chamber 70 has been completed and the operator has released button 61, the venting of section 39 will cause the pressure therein to drop very quickly to a level wherein the liquid in section 38 will cause the valve member 44 to be moved away from opening 43 and a fresh charge of liquid will then flow into section 39 to fill it up completely in readiness for a subsequent discharge operation. Because of the relative positioning of sections 38 and 39, this will always occur as long as there is any liquid at all in section 38 so that inherently section 38 may be completely emptied of its contents thereby preventing the retention of any substantial quantity of stale bleaching agent.

Once the transfer of a charge of bleach into chamber 79 has been effected, the operator may then load clothes into the machine, if this has not been done, and start the operation or, as is possible if the bleach was passed into container 69 after a washing operation had been started, for operation with the depression of member 61 so that it will be noted that the complete operation of the machine of the figure may be controlled by a suitable control arrangement incorporated in and connected through the control mechanism 8. One such typical arrangement for providing the complete automatic circuit and also automatic injection of bleach from a dispensing container at an appropriate time is described in application Serial No. 829,644 for Treating Agent Dispenser System for Washing Machines, filed on July 27, 1959, by Philip H. House and Winston L. Shelton, now Patent No. 2,979,936 of April 18, 1961, and assigned to the General Electric Company, assignee of the present invention. In fact, the circuit of the invention described in that application is applicable substantially in its entirety to the machine shown in my drawing, and is deemed to be incorporated by reference into the present application for purposes of illustration.

The bleeding period continues until the time when the injection of bleach is desired. At this point, the control mechanism causes the solenoid members 79 and 86 both to be energized. The energization of solenoid 86 permits cold water to pass into the compartment 81 of dispensing container 69. Energization of solenoid 79 permits this water to pass into the chamber 70 and also permits the passage of liquid from chamber 70 down into compartment 73 and thence through outlet 87 into the tub 3. The incoming water from conduit 83, when it passes into chamber 70, mixes with the bleach thereby diluting it substantially so that before any substantial amount of bleach is passed down into compartment 73 over the top of funnel 74, the bleach has been substantially diluted. Thus, except for a very small amount which will escape through the bleed holes 75 prior to the time the level within chamber 70 rises above the top of funnel 74, no raw bleach, which is highly corrosive in nature where chlorine bleach uses are used, is permitted to escape into the tub 3.

This action, with the water passing into the dispensing container, mixing with the bleach, and then with the bleach and water mixed together passing out into the tub 3, continues for an appropriate period of time while solenoids 79 and 86 are energized. At the end of this period of time, the two solenoids are de-energized with the result that water ceases to pass into compartment 81 and also liquid ceases to pass through the openings 78 and 72. It will, of course, be recognized that it may be preferable to delay the deenergization of solenoid 79 for a brief period of time after the deenergization of solenoid 86 so that all of the liquid in chamber 70 will have time to drain out through opening 72 prior to the time it closes and after water has ceased to be introduced through opening 78.

In this manner, the bleach is injected at the correct time in diluted form so as to effect its desired function. It will be observed that in this particular embodiment the bleach passes into the outer tub 3 of the washing machine so that it is further diluted by mixing with the water which has overflowed from basket 2 through openings 15, and must be recirculated through conduit 32 before it actually enters basket 2 so as to contact the clothes therein.

It will be seen that by provision of my invention the storage container assembly portion of the dispensing system is improved so that it constitutes an automatically limiting factor on the amount of bleach which may be passed into chamber 70 for any one depression of mem-
bar 59 by pushing on button 61. In addition, the structure provides the advantage that the small section 39 automatically fills itself up in readiness for the dispensing of bleach into the chamber 70 and that this continues until section 38 of the assembly 37 has been completely drained of bleach so that each gallon of bleach may be fully utilized without permitting bleach to be left over from operation to operation where so desired.

It will be understood that my invention resides primarily in the modification of the dispensing system by the use of a novel storage container assembly and its cooperation with the other elements of the dispensing system, and that the system as a whole, and all the other elements of the system (such as the dispensing container 69 and the valve assembly 57) represent the invention of John Bochan and are described and claimed in the aforementioned Bochan application.

It will be seen that while in accordance with the patent statutes I have described what at present is considered to be the preferred embodiment of my invention, various changes and modifications will occur to those skilled in the art and, therefore, may be made without departing from my invention. For instance, means other than the motor-driven compressor 66 may be used to increase the pressure in section 39; also, as another instance, it is obvious that by connecting the bottom 42 of section 38 to the bottom of section 39 (instead of the top of section 39) a gravity-operated check valve may be used in lieu of the specific valve means 44. It is, therefore, aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In an article-treating machine: a receptacle assembly for articles to be treated; storage container means for a liquid article-treating agent having a first relatively large section and a second relatively small section, said small section being formed to withstand pressure and having the top thereof at a level at least as low as the bottom of said large section, means connecting the bottom of said large section to said small section and providing fluid communication between said sections, and pressure responsive valve means positioned to close said connecting means upon an excess of fluid pressure in said small section over the fluid pressure in said large section and to open said connecting means for liquid flow when the fluid pressures in said sections are substantially equal and said small section is not filled; means for increasing the pressure on the liquid in said small section; a dispensing container; a conduit interconnecting said dispensing container and said storage container means and extending to a point adjacent the bottom of said small section, said means for increasing the pressure being effective to force liquid from said small section through said conduit into said dispensing container; means controlling the operation of said means for increasing the pressure; means for providing water into said dispensing container; means for guiding a mixture of liquid and water from said dispensing container into said receptacle assembly; means controlling the flow of water into said dispensing container; and means controlling flow of mixture through said guiding means.

5. The apparatus defined in claim 4 wherein said guiding means prevents any substantial flow of liquid from said dispensing container through said guiding means until a predetermined volume of liquid is present in said dispensing container, said small section being so proportioned relative to said dispensing container that the full contents of said small section reach to a level below said predetermined level when passed into said dispensing container.

6. The apparatus defined in claim 3 wherein a second conduit has its upper end connected to said dispensing container adjacent the top thereof and its lower end connected to said large section thereby to provide an overflow return if an excessive quantity of liquid is dispensed into said dispensing container.

References Cited in the file of this patent

UNITED STATES PATENTS

1,897,435 McKnight Feb. 14, 1933
1,960,300 Hanks Aug. 29, 1950
2,520,398 Woodson Sept. 26, 1950

3,021,702