An aseptic filling system receives preformed containers through an intake sanitizing lock into a closed system. The containers move through sanitizing and sterilizing zones to a filling and closure zone. Filled containers exit the system through a discharge sanitizing lock. Both intake and discharge sanitizing locks are subjected to flooding with sterilant each time a container enters or leaves the system and provide a seal to prevent the entry of airborne contaminants or micro-organisms when the locks are opened.
ASEPTIC BOTTLE FILLING SYSTEM

TECHNICAL FIELD

[0001] The present invention relates generally to systems for the aseptic packaging of food products, pharmaceuticals and the like and deals more particularly with a preformed container sanitizing and aseptic filling system and related method for sanitizing and aseptically filling such preformed containers.

BACKGROUND OF THE INVENTION

[0002] Sterilized packaging systems in which a sterile food product, pharmaceutical and the like, such as a liquid, is placed and sealed in a container to preserve the product for later use are well known in the art. Methods of sterilizing incoming containers, filling the containers with the product and sealing the containers in an aseptic environment are also known. For example, liquid product fillers include placing the container under a filler head, wherein the filler head opens and dispenses the liquid product. When the container is filled to a desired level, the filler head closes and stops the flow of the liquid product into the container. These systems typically begin the process with cleaned and sanitized containers. Other systems may include washing and rinsing of the container as part of the filling or bottling process. Generally, in such systems, the container is advanced through a washing station and may be advanced to a rinsing station prior to moving to a filling station, wherein the desired liquid or product is dispensed into the container. The container is then moved to a sealing station, and thereafter the sealed container is discharged for packaging and subsequent shipment. Although these systems may integrate one or more functions, such systems are typically exposed in one way or another to the environment such that contaminants or other micro-organisms can enter into the filling or bottling process at one or more locations along the processing path.

[0003] U.S. Pat. No. 3,481,109 discloses a bottle sterilizing and filling apparatus wherein the bottles are preheated and sterilized with steam prior to filling. However, the entire filling line is not enclosed and the exterior of the container is exposed to the environment in transition between stations and thus susceptible to the entry of contaminants and micro-organisms.

[0004] U.S. Pat. No. 5,313,990 sterilizes and fills bottles at a filling station wherein the bottle is placed in a scaling relationship for sterilization with hot steam and for filling. The container is not maintained in a sterilized environment, and only the interior is sterilized by the filling tube. The contents of the filled container are exposed when the filling tube is removed and therefore susceptible to contaminants or micro-organisms.

[0005] U.S. Pat. No. 5,848,515 discloses a continuous sterilization and filling system including four different sterile chambers housing a different function group wherein the chambers are isolated by walls. To assist in sterilization, the sterilizing function group is kept at a pressure slightly lower than the other chambers but higher than the pressure outside the chamber. The containers are not maintained in a sterilized environment upon entering or leaving the system, and therefore the system is susceptible to the entry of contaminants or micro-organisms.

[0006] Other systems only partially maintain a sterilized environment for filling but leave the container exposed and susceptible to the entry of contaminants or microorganisms during and after the filling process.

[0007] Accordingly, it is an object of the present invention to provide an aseptic filling system for preformed containers that overcomes the disadvantages and shortcomings of the prior art by eliminating airborne contaminants from the container prior to intake into the filling system.

[0008] It is a further object of the present invention to provide a continuous line bottling system wherein the container to be filled enters the intake station in an isolated manner through a sterilization chamber to prevent the entry of contaminants or micro-organisms into the system.

[0009] It is also a further object of the present invention to maintain a container to be filled in a sterilized environment throughout the functions of washing, rinsing, filling, and closure to prevent contact with contaminants or micro-organisms.

[0010] It is a still further object of the present invention to discharge a filled and closed container in an isolated manner through a sterilization chamber to the exterior of the system without permitting entry of contaminants or micro-organisms into the system through the discharge path.

SUMMARY OF THE INVENTION

[0011] In accordance with the present invention, an aseptic container filling system comprises an intake station, including an intake sanitizing lock, to admit entry of a container into the system in an isolated manner to prevent the entry of airborne contaminants or micro-organisms into the system along with the container. The system is an in-line system and includes at least one sanitizing zone for washing and sterilizing the containers. The containers are then transported to a filling and closing zone for filling and capping of the containers. A discharge station includes a discharge sanitizing lock to emit a filled and capped container from the system in an isolated manner to prevent the entry of airborne contaminants or micro-organisms into the system through the discharge station when a filled container exits the system.

[0012] Preferably, the system includes at least one zone for rinsing the washed containers.

[0013] Preferably, the intake station includes dispensing a predetermined volume of sterilant into a container positioned at the intake to the intake sanitizing lock while the container is still external to the system and the sanitizing lock.

[0014] Preferably, the intake sanitizing lock admits the container after a predetermined sterilant volume is dispensed into the container, and the container is maintained at a predetermined position within the sanitizing lock and isolated from the remaining portion of the system.

[0015] Preferably, the intake sanitizing lock is flooded with sterilant to completely immerse the container within the lock.

[0016] Preferably, the sanitizing lock completely admits the sterilant filled container to the system for subsequent movement through secondary sanitizing and sterilization zones and rinsing zones.
Preferably, the containers are filled with a desired product and capped at a filling and closure station in the filling and closing zone.

Preferably, the discharge sanitizing lock is flooded with sterilant subsequent to a filled and capped container being discharged from the system.

Preferably, the filling and closing zone sanitizes the caps and admits the caps in an isolated manner to the system.

A second aspect of the invention relates to a method for aseptically filling a preformed container and includes the steps of partially filling the container with a sanitizing agent; receiving the partially filled container through an intake sanitizing lock into an intake chamber; completely filling and submersing the container in a sanitizing agent in the intake chamber; moving the submersed container through the intake chamber and evacuating the sanitizing agent from the container; filling the container at a filling station with a predetermined volume of a desired liquid; sealing and capping the filled container and discharging the filled container through an exit sanitizing lock to a discharge staging area.

Preferably, the method includes the step of rinsing the container.

Preferably, the method includes the step of drying the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the present invention will become readily apparent from the following written description of preferred embodiments of the invention together with the accompanying drawings, wherein:

FIG. 1 is a somewhat schematic side elevational view of the aseptic filling system embodying the present invention;

FIG. 2 is a somewhat schematic top plan view of an embodiment of the container in-feed, intake and preliminary sanitizing and sterilizing zone wherein containers are positioned for movement to the entry of the intake sanitizing lock;

FIG. 3 is a schematic top plan view showing the containers indexed into position for entry to the intake sanitizing lock;

FIG. 4 is a schematic side elevational view showing a sterilant-filled container in position for entry to the intake sanitizing lock;

FIG. 5 is a schematic side elevational view showing a sterilant-filled container lowered to a paused position within the intake sanitizing lock;

FIG. 6 is a schematic side elevational view wherein the intake sanitizing lock is sealed and flooded with sterilant to submerge the container;

FIG. 7 is a schematic side elevational view showing the sterilant-filled container fully lowered into the preliminary sanitizing and sterilizing zone chamber and positioned for horizontal indexing to the secondary sanitizing and sterilizing zone;

FIG. 8 is a schematic side elevational view showing a walking beam assembly for moving the sterilant-filled containers to the secondary sanitizing and sterilizing zone;

FIG. 9 is a schematic side elevational representation of a pick-up, inverting, indexing and placing mechanism for transporting containers through the secondary sanitizing and sterilizing zone;

FIG. 10 is a schematic side elevational view showing a filled and sealed container indexed into position for entry into the discharge sanitizing lock;

FIG. 11 is a schematic side elevational view showing a filled and sealed container within the sealed discharge sanitizing lock;

FIG. 12 is a schematic side elevational view showing a filled and sealed container fully exited from the discharge sanitizing lock and in position for indexing along the discharge feed path;

FIG. 13 is a schematic side elevational view showing the lift table at a paused position in the sterilant-flooded discharge sanitizing lock;

FIG. 14 is a schematic side elevational view showing the discharge sanitizing lock purged of sterilant;

FIG. 15 is a schematic cross-sectional view showing one embodiment of a container closure feed and sterilization apparatus that may be utilized in the aseptic filling system of the present invention; and

FIG. 16 is a schematic cross-sectional view showing the sealing arrangement of the drive shaft at the entry point to the system.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Turning now to the drawings and considering the invention in further detail, a somewhat schematic side elevational view of the aseptic filling system embodying the present invention is illustrated therein and generally designated 10. As will become readily apparent from the following detailed description, the aseptic filling system is a substantially closed system from container intake to container discharge to minimize or substantially eliminate the possibility of ingress of contaminants or viable microorganisms to the system. In the drawings that follow, like references refer to like parts. The aseptic filling system 10 comprises a container in-feed staging and entry zone generally designated 20, a preliminary sanitizing and sterilizing zone generally designated 30, a secondary sanitizing and sterilizing zone generally designated 40, a container rinsing zone generally designated 50, a container filling and closing zone generally designated 60, a closure entry and sanitizing and sterilizing zone generally designated 70 and a discharge zone for the filled and sealed containers generally designated 80. The discharged filled and sealed containers exit to a discharge staging area for movement along a discharge feed path.

A general overview of the aseptic filling system 10 embodying the invention is first provided with a more detailed description following hereinafter. Containers such as plastic or glass, well known to those skilled in the container art, are presented at the entry to an intake sani-
tizing lock, designated generally 14. The container is partially filled with sterilant and admitted in an isolated manner as explained in further detail below. Sterilants are generally well known to those skilled in the art and may include, for example, hydrogen peroxide 35%, which is approved by the Food and Drug Administration (FDA). Additionally, a hypochlorite solution may be used. Generally, containers to be filled with highly acidic food products such as fruit juices are only sanitized, for example, with a mixture of peracetic acid and hydrogen peroxide.

[0042] The sterilant filled container 16 is indexed in the direction of arrow 18 and positioned for pick-up and inversion for movement through the secondary sanitizing and sterilizing zone 40. The inverted container 42 is emptied of its initial charge of sterilant, which collects and is designated as 22 in the lower portion 24 of the preliminary sanitizing and sterilizing zone chamber 32. The inverted containers 42 are indexed in the direction of arrow 44 during which time the inverted containers receive additional sterilizing and sanitizing in the secondary sanitizing and sterilizing zone 40. Sterilant is sprayed and applied to both the interior and exterior of the containers and is collected in the chamber portion 46 for return to a sterilant tank 48, which is vented via conduit 106. Sterilant is delivered from the sterilant tank 48 means of an in-line pump 52 and conduit 54 to spray nozzle assemblies 36, 38 to apply sterilant to the interior and exterior of the containers. The assemblies 36, 38 may be repeated at desired intervals to provide multiple applications of sterilant as desired. The thus sterilized and sanitized containers 42 are indexed in the direction of arrow 44 to the rinsing zone 50, wherein both the interior and exterior of the containers are rinsed. A rinsing agent such as sterile water is delivered to spray nozzle assemblies 56, 58 to rinse the interior and exterior of the container. The rinsed containers may receive additional treatments such as drying with air jets of warm air and the like. It will be recognized by those skilled in the art that the rinsing function may not be required dependent upon the sterilant utilized and the product to be placed into the container.

[0043] The containers 42 are indexed and positioned for pick-up by an inverting, lowering and placement mechanism wherein the container 42 is now placed in an upright position for delivery to the filling and closing zone 70. A filling apparatus and mechanism 62 that is well known to those skilled in the art of container filling and capping is used to fill the container as the container passes the filling station 64. Substantially at the same time, caps or closures are delivered to the closing station 72, wherein caps are delivered and sanitized as they move through the closure feed apparatus represented by the dashed line box 68 and explained in further detail in connection with FIG. 16. The caps or closures pass through sterilant supplied from conduit 54 and excess sterilant is returned to the sterilant tank 48 via conduit 66. The caps or closures are rinsed with sterile water from a sterile water source, generally designated 78, coupled to the closure feed apparatus 68 via the conduit 77. Spent rinse water 67 is discharged from the closure feed apparatus 68 via the conduit 79 and collects in the bottom portion of the chamber 80 generally designated 81 and is drained from the system 10 via an “S” trap drain generally designated 83 when the valve 85 is opened. The “S” trap 83 is also used to vent excess pressure from the system.

[0044] The caps or closures pass through the delivery mechanism 74 to the cap indexing and placement station 76 wherein a chuck apparatus generally designated 73 picks up and places a cap on the container to close the filled container in a manner well known to those skilled in the art. The closed container is indexed in the direction of arrow 82 and positioned for entry to the discharge sanitizing lock, generally designated 84, whereby the container is discharged from the system in an isolated manner. The closed and filled container is moved to the discharge staging area in the discharge zone 80 for movement to a packaging mechanism or other container handling apparatus now known to those skilled in the art or future developed.

[0045] The system 10 is preferably pressurized with sterilized air or other inert, odorless, tasteless gas to assist in preventing the entry of contaminants or microorganisms. Preferably, the pressure is around 3 inches H2O. In the illustrated embodiment, a sterile air supply 270 provides pressurization to the system 10 via the conduit 278 coupled between the supply 270 and the system 10 and the valve 280.

[0046] Turning now to FIG. 2, a schematic top plan view of one embodiment of the container in-feed and intake staging area is illustrated therein. Empty containers 86 are shuttled and ultimately delivered to an in-feed tunnel generally designated 88. The containers 86 are indexed in the direction of the arrow 90 until reaching the end 92, wherein the containers 86 are aligned with and located for movement to the entry of the intake sanitizing locks 14. A pushing and indexing mechanism 94 moves in the direction of arrow 96 substantially perpendicular to the direction 90 of the container in-feed tunnel 88 and in the same plane. The indexing mechanism 94 includes a sweeping head 95 and moves from its at-rest container receiving position 98 to its container placement position 100 as shown in the schematic top plan view of FIG. 3. The indexing mechanism 94 includes a wall portion 102 that interrupts the container in-feed path to prevent containers from moving in the direction 90 when the indexing mechanism sweeping head 95 moves the containers to the entry of the intake sanitizing lock 14. Once the containers are moved to the entry of the intake sanitizing lock, the indexing mechanism retracts to its receiving position 98 and the containers move along the in-feed path in the tunnel 88 to deliver the next containers to the indexing mechanism sweeping head 95. It will be understood that the container in-feed and intake mechanisms as well as the indexing mechanisms may be of numerous designs now known or future developed, and therefore the present invention contemplates usage of any such mechanisms.

[0047] As illustrated in FIG. 4, the intake sanitizing lock 14 includes a slidable gate generally designated 110 at its entrance, a chamber generally designated 112 and a reciprocating platform table mechanism generally designated 114 for transporting containers from the sanitizing lock entry point into the preliminary sanitizing zone chamber 32. The reciprocating mechanism 114 comprises a platform 116 supported for rectilinear movement by and with the rod 118 which is coupled to the lifting link arm mechanism generally designated 120. The platform 116 includes a gasket or seal 122 that provides a fluid seal between the exterior internal wall 124 and the platform 116. The purpose in operation of the gasket/seal 122 will become readily apparent during the explanation of the operation of the platform 116.
Sterilant from the supply 130 is dispensed into the interior of the container 12 positioned at the entry to the sanitizing lock 14. The container 12 rests on the outer surface 126 of the slidable gate 110. An actuator mechanism 150 more clearly illustrated in FIG. 5 includes a retractable foot 152 that is operated to apply pressure to the surface 126 of the gate 110 to seal the entry opening to the sanitizing lock 14. The container 12 is filled with a predetermined volume of sterilant from the dispensing head 26 coupled to the supply 130. The volume is determined by a timed fill. The actuator mechanism 150 now retracts the foot 152 which removes pressure from the surface 126 of the gate 110, allowing the gate to slide away from the entry as the containers 16 are lowered into the chamber 32 to prevent contaminants or micro-organisms from entering into the system. The containers 16 are now in position for horizontal indexing to the secondary sanitizing and sterilizing zone 40. The sterilant-filled containers 16 are horizontally indexed as illustrated in FIG. 8 by means of a walking beam assembly, generally designated 170, which comprises a walking beam 172 and a walking beam lift linkage 174, 176. The operation of a walking beam for moving articles is generally well understood in the article transport art and for purposes of brevity will not be explained in detail herein. The reader is referred to literature and textbooks for additional explanation and description of walking beam transport mechanisms.

[0048] Although a walking beam assembly is illustrated for indexing the sterilant-filled containers, any means for transporting the containers may be used to accomplish the function. The sterilant-filled container 16 is indexed along the walking beam to the bottle carrier inverter assembly, generally designated 180. The assembly 180 includes a receiving carrier portion 182 into which the sterilant-filled container 16 is placed during the horizontal index movement. As illustrated in FIG. 9, a sterilant-filled container 16 is lifted by the carrier inverter assembly 180 to a position 184 in which the container is in an inverted orientation, top down, and located for horizontal indexing through the secondary sanitizing and sterilizing zone in the direction shown by arrow 44. The containers are subjected to further washing, sanitizing and sterilizing on both the interior and exterior of the container as they are indexed through the secondary sanitizing and sterilizing zone as illustrated in FIG. 1. Once the container reaches the end 186, a carrier inverter assembly generally designated 190, and similar to the carrier inverter assembly 180 receives the rinsed and sanitized container 192 and lowers and inverts the container to its upright position for indexing to the filling and capping zone. The filling and capping mechanisms and apparatus are well known to those skilled in the art, and any appropriate filling and capping mechanisms now known or future developed are usable with the present invention. The important feature to note here is that the system is a closed and pressurized system, and the filling and capping mechanisms are enclosed within the closed system and therefore are protected from exposure to contaminants and micro-organisms via entry from the outside.

[0051] Referring now to FIGS. 10-14, the process of removing the filled and capped containers is illustrated therein. A filled and capped container 202 is indexed from the filling and closing zone to the discharge zone 80 for entry into and exit from the discharge sanitizing lock 84. The container 202 is horizontally indexed by a walking beam assembly or other appropriate transport conveyor onto a platform lift table 204 for vertical movement into the chamber 206 of the sanitizing lock 84. The platform lift table 204 moves along a rectilinear path by means of the lifting link arm mechanism 210, which operates in a similar manner as the lift link arm mechanism 120 at the intake sanitizing lock 14. The sanitizing lock 84 includes a slidable gate 220, which is used to seal the upper opening 222 of the discharge sanitizing lock 84. A foot 224 and actuator mechanism 226 applies pressure to the surface 228 of the slidable gate 220 to maintain the gate in a sealing relationship with the opening of the discharge sanitizing lock 84. As shown in FIG. 11, the container 202 is positioned fully within the chamber 206 of the discharge sanitizing lock 84. A flexible
seal or gasket 230 is attached to the platform lift table 204 and is in slidable sealing contact with the inner wall of the chamber 206 to provide a sealing barrier between the interior of the system and the interior of the sanitizing lock 84. The container 202 is now in position for discharge to the exterior of the system. As illustrated in FIG. 12, the pressure foot 224 is retracted from the surface 228 of the slidable gate 220, allowing the gate to move horizontally to uncover the upper portion of the sanitizing lock 84. During this operation, the lifting link arm mechanism 210 causes the platform lift table 204 to vertically extend fully from the sanitizing lock 84 to allow the container 202 to be moved along the discharge path by a suitable article sweeping means well known to those skilled in the art. The flexible seal 230 maintains contact with the inner surface wall of the chamber 206 to prevent entry of contaminants or microorganisms into the system through the discharge sanitizing lock 84.

[0052] As illustrated in FIG. 13, the foot 224, which is now re-actuated by the actuating assembly 226, applies pressure to the surface 228 of the slidable gate 220 to seal the opening 222 of the sanitizing lock 84. The platform lift table 204 is retracted to a pause position generally designated 240, and sterilant 242 from a sterilant supply 244 is pumped via the conduit 246 through a valve 250, which is open to admit the sterilant into the chamber 206 of the sanitizing lock 84. Air within the chamber and conduit is purged via the purge line 260 through the valve 262 into the sterilant chamber 252. After a timed interval, the sterilant inlet valve 250 is closed, and the sterilant is purged into the sterilant tank 252 through the conduit 248 and valve 254 which is open. The sterilant is forced through the chamber by means of sterilized air received from the sterile air supply 270 through the valve 272 and air conduit 274 coupled to an air inlet port 276 at the sanitizing lock 84. Once the chamber is purged, the valve 272 is closed as is the valve 254.

[0053] As illustrated in FIG. 14, the discharge sanitizing lock 84 is fully purged of sterilant, and the discharge zone and discharge sanitizing lock are conditioned for receiving another filled and sealed container when the platform lift table 204 is cycled to its lowest position, as illustrated in FIG. 10, to receive another container. Sterilant is pumped from the sterilant recovery tank 252 to the sterilant supply tank 244 by means of the supply conduit 280 and in-line pump 282. An overflow conduit 284 is coupled between the sterilant supply tank 244 and sterilant tank 252 to maintain the sterilant at a predetermined maximum level and any excess sterilant is returned to the sterilant tank 252 via the overflow conduit 284. Excess pressure air is vented to the atmosphere through the vent conduit 286 from the sterilant tank 252.

[0054] Turning now to FIG. 15, a schematic cross-sectional view showing one embodiment of a container closure feed and sterilization apparatus that may be utilized in the aseptic filling system of the present invention is illustrated therein and corresponds to the dashed line box 68 shown in FIG. 1. The closure feed and sterilization apparatus is designated generally 300 in FIG. 15. Caps or closures are fed from a source in the direction of arrow 302 and fed side by side along a feed path formed by a rail or slot, generally designated 304, extending from the input 306 to the cap indexing and placement station 76 as illustrated in FIG. 1. The slot 304 guides the caps through the apparatus 300 which further includes an outer casing generally designated 308 which is shaped to provide a bend generally designated 310 which is somewhat U-shaped. Sterilant from the sterilant tank 48 is supplied via the conduit 54 to a manifold array generally designated 312 located in the region near the entry 306 and along the slot 304. The manifold 312 includes one or more nozzles or orifices 314, 316 through which the sterilant is sprayed or otherwise applied to the caps following the slot 304 as the caps pass the manifold 312 to sanitize the caps or closures. Sterilant 320 is collected in the bend or U-shaped portion 310 of the casing 308 and forms a further bath through which the caps or closures pass as they advance to the cap indexing and placement station 76. Excess sterilant is returned to the sterilant tank 48 via the conduit 66. The advancing caps or closures are rinsed at a rinsing station, generally designated 330, within the casing 308 and comprises a manifold 332 having one or more nozzles or orifices 334, 336 to spray or apply sterile water supplied via the conduit 77 to the caps as they move through the slot 304 past the rinsing station 330. The sterile water that is used to rinse the caps at the rinsing station 330 is returned to the chamber 81 of the aseptic filling system of the present invention via the conduit 79. The sterilant 320 also acts as a barrier to prevent the entry of contaminants or microorganisms to the system along the cap feed path formed by the slot 304. It will be recognized that the material of the casing 308 and the form of the manifolds 312 and 330 may be of various designs well known to those skilled in the art.

[0055] All of the drive mechanisms for activating the lifting mechanisms, walking beams and other transport mechanisms are coupled from the exterior of the system via drive shafts, which are sealed to prevent the entry of contaminants or microorganisms. A representative drive shaft entry is shown in a cross-sectional view in FIG. 16, wherein the drive shaft 300 passes through a bearing or other suitable bushing held by a flange 304 mounted to the wall 306 of the system. A seal or gasket, generally designated 310, is in contact with the peripheral surface 312 of the drive shaft 300 and the inner wall 314 of the flange 304 to provide a seal between the drive shaft and the flange to prevent the entry of contaminants or microorganisms to the system. The gasket 310 may be of any suitable material well known to those skilled in the sealing and gasket art to accommodate a rotating member and for maintaining the sealing function.

[0056] It should also be noted that the transport mechanisms in each of the zones operate within each of the respective zones and do not extend through the system, thereby minimizing and substantially eliminating the possibility that a contaminant or micro-organism, should one be present, be transported throughout the system.

[0057] An aseptic filling system has been disclosed above in a preferred embodiment. It is understood that numerous changes and modifications may be made to the system by those skilled in the art of container filling systems, and therefore the invention has been described by way of illustration rather than limitation.

What is claimed is:
1. An aseptic container filling system comprising:
a container intake station including an intake sanitizing lock for admitting a container and for preventing the entry of airborne contaminants or micro-organisms into the system during the container intake process;
at least one sanitizing zone for washing and sterilizing the container;
a filling and closing zone for filling the container with a desired product and for capping the filled container; and
a discharge station including a discharge sanitizing lock for discharging a filled container and for preventing the entry of airborne contaminants or microorganisms into the system during the filled container discharge process.

2. The aseptic container filling system as defined in claim 1, further comprising at least one zone for rinsing the washed container.

3. The aseptic container filling system as defined in claim 1, further comprising said intake sanitizing lock including a slidable gate for selectively covering and sealing the inlet to said sanitizing lock.

4. The aseptic container filling system as defined in claim 3, further comprising said intake sanitizing lock including a container supporting means for transporting a container from the inlet to the sanitizing lock into the system.

5. The aseptic container filling system as defined in claim 4, wherein said container supporting means is stoppable at a predetermined position within the sanitizing lock and along the container intake path through the sanitizing lock.

6. The aseptic container filling system as defined in claim 5, further comprising said intake station including means for dispensing a volume of sterilant into a container positioned at the inlet to said intake sanitizing lock.

7. The aseptic container filling system as defined in claim 6, further comprising said intake sanitizing lock admitting the container subsequent to a volume of sterilant being dispensed into the container, said container being admitted to a predetermined position to be fully enclosed within said sanitizing lock and isolated from the remaining portion of the system.

8. The aseptic container filling system as defined in claim 7, further comprising means for flooding the intake sanitizing lock with a sterilant to completely immerse the container in sterilant within the sanitizing lock.

9. The aseptic container filling system as defined in claim 8, further comprising means for transporting the containers through the system.

10. The aseptic container filling system as defined in claim 1, further comprising said discharge sanitizing lock including a slidable gate for selectively covering and sealing the outlet from said discharge sanitizing lock.

11. The aseptic container filling system as defined in claim 10, further comprising said discharge sanitizing lock including a container supporting means for receiving and transporting a container from said filling and closing zone to a container discharge staging area outside the system.

12. The aseptic container filling system as defined in claim 11, wherein said container supporting means is stoppable at a predetermined position within said discharge sanitizing lock along the container discharge path through the discharge sanitizing lock.

13. The aseptic container filling system as defined in claim 12, wherein said slidable gate moves to uncover the outlet of the discharge sanitizing lock and the container supporting means moves the container to the discharge staging area.

14. The aseptic container filling system as defined in claim 13, further comprising means for flooding the discharge sanitizing lock with sterilant subsequent to said container supporting means returning to its position to receive a container from said filling and closing zone.

15. The aseptic container filling system as defined in claim 14, further comprising means for purging said discharge sanitizing lock of sterilant.

16. The aseptic container filling system as defined in claim 15, further comprising means for purging said discharge sanitizing lock with sterilized air.

17. The aseptic container filling system as defined in claim 1, further comprising means for pressurizing the system.

18. The aseptic container filling system as defined in claim 17, further comprising pressurizing the system to about 3 inches H₂O.

19. The aseptic container filling system as defined in claim 1, further comprising said filling and closing zone including cap sanitizing means for admitting the caps to the system in an isolated manner and for preventing the entry of contaminants or micro-organisms during the cap delivery process.

20. A method for aseptically filling a container comprising the steps of:
   partially filling the container with a sanitizing agent;
   receiving the partially filled container through an intake air lock into an intake chamber;
   completely submersing and filling the partially filled container with sanitizing agent in the intake chamber;
   moving the submersed container through the intake chamber;
   evacuating the cleansing agent from the container;
   filling the container at a filling station with a predetermined volume of a desired liquid;
   sealing and capping the filled container; and
   discharging the filled container through an exit air lock.

21. The method for aseptically filling a container as defined in claim 20, further including the step of rinsing the evacuated container.

22. The method for aseptically filling a container as defined in claim 20, further including the step of drying the rinsed container.