

[54] **APPARATUS FOR ADDING
MEDICAMENTS TO A SEALED
EXPANDABLE PARENTERAL FLUID
CONTAINER**

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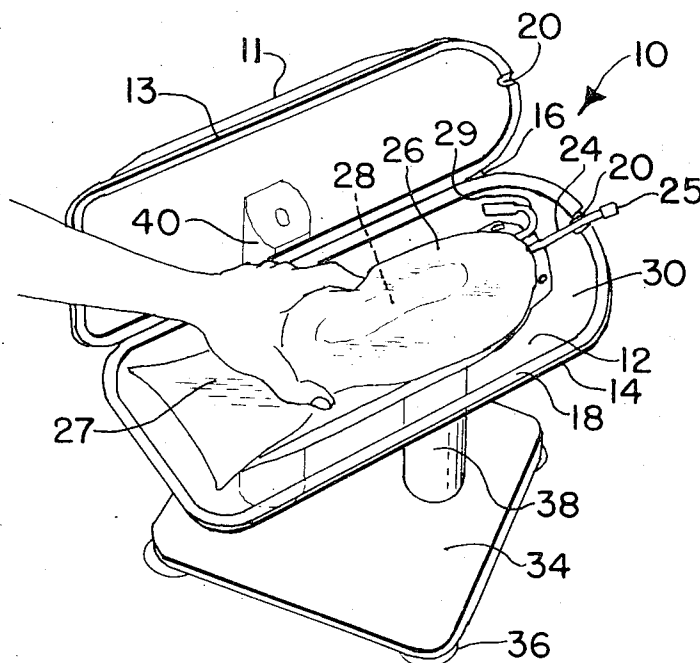
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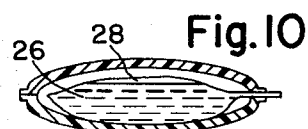
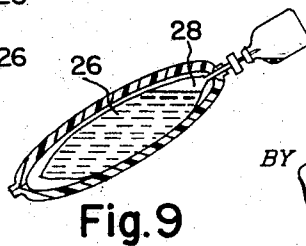
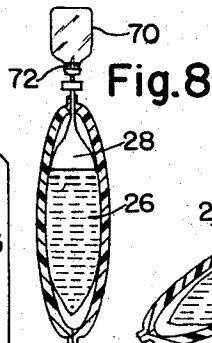
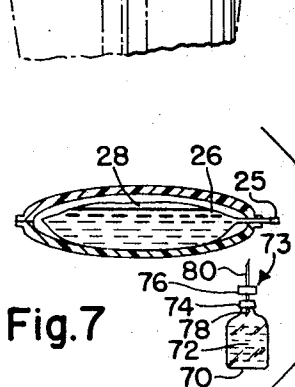
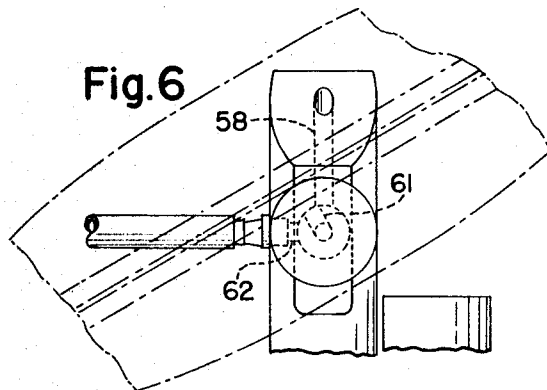
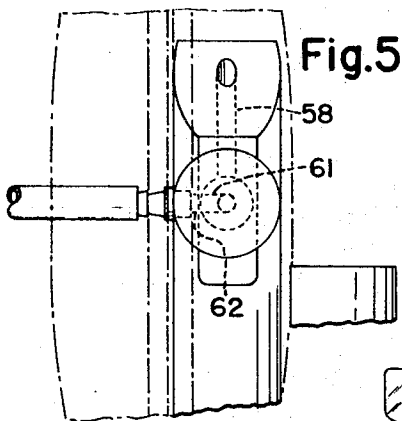
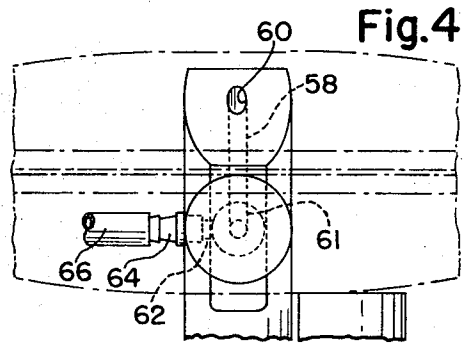
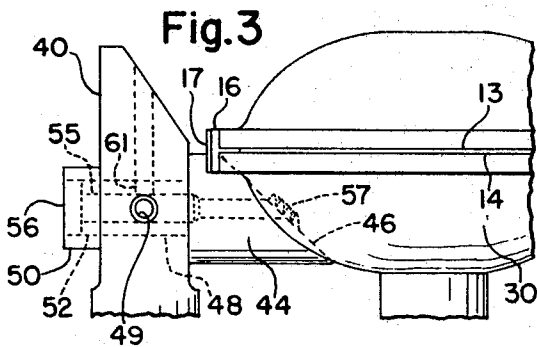
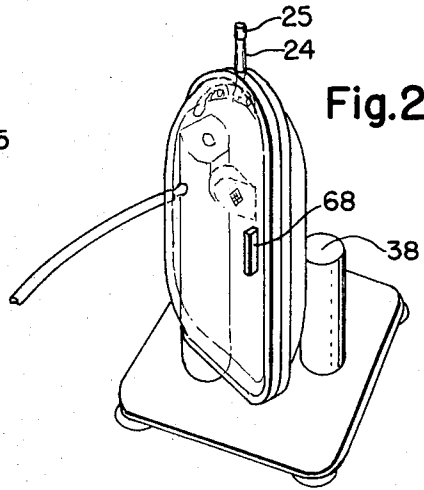
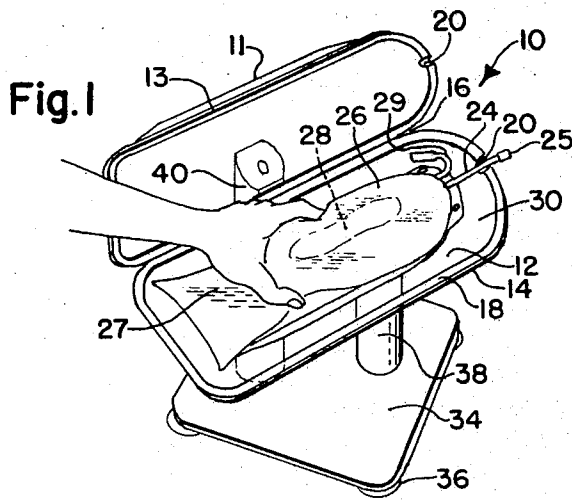
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ABSTRACT

A rigid chamber formed by a pair of hinged members which are shaped to receive an expandable container such as a plastic bag of parenteral fluid contains a first opening which is selectively connected to a source of vacuum and a second opening through which a sealed tubular port on the container may be placed so that it will be accessible from the exterior of the chamber to permit the connection thereto of a vial containing a material such as a medicament to be added to the bag. The chamber is pivotally mounted for movement between a horizontal bag loading and unloading position and a vertical position for adding medicaments. The vacuum supply to the chamber is automatically controlled by a valve built into the pivotal mounting so that in the horizontal position of the chamber the vacuum is shut off and in the vertical position it is actuated. The arrangement makes it possible to add the contents of vials containing not only freely flowing liquid additives but also very viscous ones as well as powdered or granular materials. The system can also be operated in such a way that the contents of a plurality of medicament vials or syringes can be added to the bag even though the volume of the material to be transferred from the plurality of medicament containers is greater than the initial free air volume in the bag.

18 Claims, 10 Drawing Figures





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APPARATUS FOR ADDING MEDICAMENTS TO A SEALED EXPANDABLE PARENTERAL FLUID CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to an apparatus for adding liquid or dry medicaments or other materials to the liquid contents of an expandable container of parenteral solution and is an improvement upon the apparatus disclosed and claimed in copending application Ser. No. 120,411, filed Mar. 3, 1971 filed in the name of John L. Quick and assigned to a common assignee.

It is extremely common to add medicaments such as vitamins and drugs to parenteral fluids. When such parenteral fluids are packaged in glass containers which commonly contain a vacuum, it is quite easy to add liquid medicaments to them since the vacuum in the bottle will pull the liquid out of the medicament vial and into the bottle. When the medicament is viscous or in a lyophilized state, a pump stopper on the vial of the type shown in U.S. Pat. No. 3,059,643 can be used to pump a portion of the liquid which is in the bottle into the vial. The transferred liquid is then mixed with the material in the vial and the mixture is retransferred to the bottle. Alternatively, liquid can be added to the vial with a syringe, the contents dissolved, and then injected into the bottle. The later process utilizes extra liquid which of course decreases the capacity of the bottles.

By packaging parenteral solutions in plastic bags instead of bottles it has become possible to eliminate the major drawback of glass container systems, namely, the requirement that room air enter the solution bottle during administration to displace the liquid administered. By using a flexible, collapsible plastic parenteral solution bag such as that sold under the trademark VIAFLEX by Travenol Laboratories, Inc. it is possible to achieve a closed administration system in which no air is required to enter the bag to displace the fluid since the collapsing of the bag as it empties serves the same purpose. Thus, no bacteria can enter the bag. However, since the bag does collapse, it is not possible for the bag to contain a vacuum for the purpose of aspirating liquid medicaments into the bag. To overcome this problem, it has been common practice to add the contents of medicament vials to plastic parenteral solution bags by repeatedly squeezing the bag while the vial is above it to force air out of the bag and into the vial and thereby permit the medicament to enter the bag. This known process is also mentioned in U.S. Pat. No. 3,554,256.

Although it is presently possible, as previously noted, to add supplemental medication to a parenteral solution bag by repeatedly squeezing the bag, this method is somewhat strenuous and time consuming as compared to adding medication to bottles which contain a vacuum. The problem is particularly significant for a hospital pharmacist who must add up to 10 different medications to a single container of parenteral solution and process hundreds of such containers during the course of a day. Where plastic containers are used, in addition to the work of squeezing the plastic containers to get supplemental medications into them, the pharmacist must also deal with an additional problem that arises due to the nature of the bags being flexible. The flexible nature of the bags makes them somewhat unwieldy when the pharmacist is trying to connect the

spike or needle of the medicament vial or syringe to the inlet port of the bag. The latter operation is quite simple with glass solution containers since they stand vertical without additional support.

A disadvantage of adding medicaments to plastic bags by hand squeezing of the bag to force air into the vial and liquid from the vial into the bag is that the free air volume of the bag is ordinarily little greater than the contents of one medicament vial to be added to it. Since it requires great force to expand the bag by squeezing, it is difficult to place the contents of more than a few medicament vials into the bag.

Although glass solution containers offer an advantage in that they contain a vacuum which will draw a liquid medicament into them, they have a disadvantage in that when a medicament vial is inserted into them by means of a spike type of connector the vacuum is lost when the spike is removed so that additional medication must be added by means of a syringe. Even where the medicament is added by means of a double-ended needle which permits the bottle to reseal as the needle is removed, the vacuum is used up after only a few medicaments have been added.

Although it is common practice to draw blood into a plastic bag by placing the bag into a chamber which is then evacuated, (U.S. Pat. Nos. 2,982,286 and 3,032,037), or into a chamber which limits the amount of fill (U.S. Pat. No. 3,042,086); such apparatuses would not be suitable for adding medicaments to already filled bags since they positively prevent adding materials to a filled bag and teach no way to transfer liquid from the bag to a separate rigid container which is attached to it. For example, the device in U.S. Pat. No. 2,982,286 clamps the bag tubing and opens the door to the vacuum chamber when the bag is full.

U.S. Pat. Nos. 3,291,348, 3,375,824 and 2,290,355 utilize positive pressure or a pressure differential to mix a liquid in one container with a lyophilized material in another. However, there is no way to move the mixed product back to the liquid container.

The deficiencies of the aforementioned prior art devices are overcome by the apparatus and method of the earlier mentioned copending application assigned to a common assignee. In that apparatus, a solution bag is placed in a chamber formed of two separate rigid box-like members so that the bag's inlet port tube protrudes through an opening in the walls of the chamber. A tube fitting adapted to accept a length of tubing connected to a vacuum source is attached to one of the box-like members. In use, one of the two separate members must be lifted and exactly aligned with the other and pressed against it with one hand as the control valve for the vacuum is operated with the other. The two boxes must then be lifted to a vertical position and stood on their end surfaces in order to most easily add drugs to them. Obviously, the aligning operation and the lifting, positioning, and vacuum actuation operations consume valuable time and are somewhat burdensome to perform.

SUMMARY

It is an object of this invention to provide an apparatus for adding medicaments regardless of whether they are free flowing liquids, viscous liquids or dry materials, to a sealed expandable container of parenteral fluid in a quick and easy manner.

It is a further object to provide a method and apparatus for permitting a greater volume of medicaments to be added to a plastic solution container than has previously been possible.

An additional object is to provide a method and apparatus for adding the contents of a medicament vial to an expandable container of parenteral fluid without the necessity for using pumps or syringes or hand squeezing of the bag.

Another object is to improve upon the apparatus of the aforementioned copending application by eliminating the need to lift, handle and align separate vacuum chamber forming box members, as well as eliminating the need to manually control the supply of vacuum to the chamber.

These and other objects are obtained by the present invention wherein a chamber which is formed by at least a pair of hinged rigid members, preferably formed of transparent plastic such as acrylic, has a sealing member positioned between its mating parts. An opening into the chamber communicates with a fitting member on the outside of the chamber which is in turn connected to a suitable source of vacuum which can be automatically turned on and off in a manner to be described. Preferably, the fitting is connected to the vacuum source by a length of flexible tubing. Another opening into the chamber, located in the vicinity of the sealing member, is adapted to fit snugly around a sealed tubular inlet port member extending outwardly from a bag of parenteral fluid made from a material such as flexible polyvinyl chloride which can be expanded. The assembly of hinged members which forms the chamber shall hereinafter be referred to as a vacuum box. The lower portion of the vacuum box is pivotally mounted on a post which is in turn mounted on a base. The pivotal mounting permits the vacuum box to be readily rotated between a horizontal bag loading position and a vertical position in which medicaments may be added to it. The pivotal mounting elements also form a valve means which shuts off the vacuum when the vacuum box is in a horizontal position and turns it on as the box is pivoted to its vertical position. In addition to its function of controlling the vacuum to the chamber, the valve also controls a vent port so that the vacuum in the chamber will be quickly dissipated to the atmosphere as the box is pivoted to its horizontal position after a medicament has been added to it in the vertical position.

The operation of the apparatus and process is as follows: With the vacuum box in its horizontal position, a bag of solution is placed into the lower portion of the chamber formed by one of the rigid members and the upper rigid member or lid is then pivoted on its hinge into engagement with it so that a sealed tubular port extension on the bag extends through the opening in the sealing area. A slight pressure by the operator's fingers is applied to the rigid members to squeeze them together as the operator pivots the box to its vertical position. The pressure causes the seal between the members to be compressed sufficiently so that the vacuum can take over and complete the sealing operation as the box is pivoted to its vertical position.

As the chamber is quickly exhausted of air by the vacuum source, the small amount of air normally sealed in the bag will expand the bag. As the bag air expands, its pressure will be greatly reduced so that the

interior of the bag will be at a relative vacuum as compared to the atmosphere outside the chamber.

With the box and bag in a vertical position and the chamber evacuated, the contents of a medicament vial can then be added to the bag by connecting the vial to a self sealing medication site on the inlet port tube which protrudes upwardly from the opening in the vacuum box. Connection is preferably made between the port tube and vial by means of a double ended needle which punctures the self sealing rubber stoppers of the tube and vial. Where the vial is of the type having a large diameter plastic spike rather than a rubber seal, an adaptor member which snugly surrounds the spike and terminates in a small diameter needle can be used in order not to destroy the ability of the bag stopper to reseal itself. Liquid medication in a vial can also be withdrawn from the vial with a syringe and injected with the syringe into the port tube. Since air which is normally in the vial along with the liquid will be pulled into the bag along with the liquid medication and increase the normal internal air volume of the bag, it is highly desirable that such air be eliminated. This can be accomplished by turning off the vacuum source while the vial is connected to the port tube and above the level of liquid in the bag. As the pressure in the chamber increases, due to air leaking into the chamber as the vacuum is released, the air in the bag will decrease in volume while it increases its pressure. A portion of it will also go into the vial which had been partially evacuated. Since it is not desirable that more air be returned to the vial than was removed from it, the vial should be disconnected from the bag before the bag has expelled more air than it contained when the contents of the vial were added to it. This insures that the bag graduations will read accurately as the bag empties during administration. It also provides sufficient air for bag expansion when additional medications are to be added. A free air volume in the bag of about 12-25 cc has been found to be satisfactory, regardless of whether there is 150 or 1000 ml of liquid in the bag. Significantly larger amounts could present a possibility of infusing air to a patient whereas the volumes noted avoid this possibility since they are less than the volume of the administration set tubing and the air which will remain in the bag when it has collapsed as much as it physically can. In order to return only that amount of air to the vial that it originally contained, the box is pivoted to a position intermediate its horizontal and vertical positions wherein the valve has shut off the vacuum and just started to vent the chamber. When the bag has collapsed to where it has approximately its original air volume, the vial is disconnected.

The foregoing and other objects, features and advantages will be apparent from the following more particular description of a preferred embodiment thereof, as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing the hinged rigid members which form the vacuum box of the present invention in their open position for the loading therein of a plastic solution bag;

FIG. 2 is a perspective view showing the vacuum box of FIG. 1 in its closed vertical position wherein the in-

terior chamber is connected to a vacuum source and the bag therein is in condition for having medicaments added to it;

FIG. 3 is a side view of the vacuum box of FIG. 1 showing the vacuum control valve in its "off" position when the box is in its horizontal closed condition;

FIG. 4 is a front view of the vacuum control valve of FIG. 3 and vacuum box where the vacuum box is in phantom, showing the vacuum control valve in its "off" position and the chamber vented to the atmosphere when the box is horizontal;

FIG. 5 is a front view similar to FIG. 4 but showing the vacuum control valve in its "on" position and the vent in its "off" position when the box is vertical;

FIG. 6 is a front view similar to FIG. 4 but showing the vacuum control valve in an "off" position and the vent in a slightly "open" position when the box is between its horizontal and vertical positions; and

FIGS. 7-10 are schematic views of the vacuum box with a solution bag therein in their: loading position (no vacuum); medicament adding position (vacuum); medicament vial withdrawal position (partial vacuum); and unloading position (no vacuum), respectively.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The vacuum box device indicated generally at 10 is formed from a pair of hinged, rigid, preferably transparent plastic members including a top lid member 11 and a bottom member 12 which are adapted to engage each other along cooperating edges 13 and 14. The top and bottom members 11 and 12 are hinged together by a elongated hinge member 16 which is preferably formed of a T-shaped section of silicone rubber which is bonded to each of the top and bottom members 11 and 12 along the underside of the cross bar of the T and to one of the edges 13,14 along one side of the vertical portion of the T. To provide additional strength to the silicone rubber hinge 16, a strip 17 of a material such as polyester cloth may be bonded to the silicone rubber. A seal member 18 which also is preferably formed of silicone rubber is placed completely around one of the members 11,12. An opening 20 formed in one end of the vacuum box 10 has an internal diameter of a size to provide a tight sealing engagement with an inlet port tube 24 which includes a resealable rubber diaphragm member 25 on its outward end and is integrally attached to a solution bag 26 which is adapted to be placed into the vacuum box 10. The solution bag 26 contains a parenteral solution 27 and a quantity of air 28 and is preferably formed of flexible polyvinyl chloride which is capable of being expanded. A tube 29 which is also integral with bag 26 is sealed. It is used to connect the bag to a recipient administration set when the solution 27 is to be administered. To permit the bag 26 to expand, the interior of the vacuum box 10 is hollowed out so as to form chamber 30 which is somewhat larger than the bag 26.

The vacuum box 10 is supported for pivotal movement relative to a base 34 having a plurality of suction cup feet 36. A stop member 38 positioned on the base 34 determines the degree of pivotal movement which the vacuum box 10 can have in both the horizontal and vertical directions. The pivot means for the vacuum box 10 comprises a rigid support post 40 and a pivot

arm 44 which is integrally attached to the lower member 12 along a flat plane of attachment 46. A reduced diameter section 48 of the pivot arm 44 passes through a horizontal hole or bearing 49 in the support post 40 and is held against relative axial movement by a collar member 50 which is sealed to it at its outer end 52. A hole 55 bored along the axis of pivot arm 44 and extending into the chamber 30 forms the channel which communicates the chamber 30 to a vacuum source or the atmosphere. The outer end of hole 55 is sealed by a plug 56 while the inner end, which is in the chamber 30, is preferably covered by a cross-ribbed screen member 57 having a different height for the ribs in one direction than the other. The screen member 57 prevents the flexible plastic of the bag 26 from being sucked against the inner end of hole 55 so as to seal the hole 55 while a vacuum is being drawn.

A vent hole 58 bored through support post 40 communicates with the atmosphere at opening 60. A radial hole 61 (FIGS. 3-6) in the reduced diameter section 48 of pivot arm 44 is aligned with vent hole 58 (FIG. 4) so as to vent the chamber 30 to the atmosphere when the vacuum box 10 is in its horizontal loading position. When the vacuum box 10 is moved to its vertical position as shown in FIG. 5, the radial hole 61 communicates the chamber 30 to the source of vacuum (not shown) through a hole 62 to which a hose fitting member 64 for vacuum hose 66 is integrally attached. When the vacuum box 10 is pivoted to a position exactly between the horizontal and vertical, the radial hole 61 is not aligned with either the vent port 58 or the vacuum port 62, but rather, is sealed closed by the wall of hole 49. However, by pivoting the box 10 slightly toward its horizontal position as shown in FIG. 6 the chamber 30 can be vented very slowly as is desirable when an operator wants to return a limited amount of air to a vial before it is disconnected from the bag. As can be seen from the preceding description, the valve means of the invention comprises the various holes and passages 55,58 and 62 which are selectively connected by the radial hole 61 in pivoted member 48 as the vacuum box 10 is pivoted in hole 49 in post 40.

In operation of the vacuum box 10, a bag 26 is placed into the chamber 30 (FIG. 1) and the lid member 11 is pivoted down by means of handle 68 into contact with the sealing member 18 on the bottom member 12. The chamber 30 is then evacuated by manually squeezing the two members 11,12 together in the region of handle 68 and simultaneously pivoting the box 10 to its vertical position so that the inlet port tube 24 and the diaphragm 25 will be uppermost. The port tube 24 is held in a somewhat rigid position by the box 10 making it substantially as easy to add medications to the bag 40 as it is to add medication to a conventional self supporting parenteral solution bottle standing on a table.

The medications which may be added to the bag 26 may comprise freely flowing liquids, quite viscous liquids, or be dry as in the case of lyophilized materials. One type of container in which liquid medicaments are often provided is shown in FIG. 7 wherein a glass vial 70 contains a liquid 72 which is sealed into the vial by means of the self sealing diaphragm member 74. In order to transfer the liquid medicament 72 from the vial 70 to the bag 26 a connector member indicated generally at 73 may be used. The connector member 73

includes a hub 76 and a double-ended needle having one end 78 which may be passed through the diaphragm 74 in vial 70 to communicate with the fluid 72 and an opposite end 80 which can puncture the diaphragm 25 on the port tube 24 to communicate with the interior of the bag 26. The container 70 could also contain dry material although such material is usually packaged in a vial having a plastic spike which is of a larger diameter than needle 78. To accommodate a vial having a spike to the resealable diaphragm 25, an adaptor member (not shown) having a hub surrounding the spike in sealing relation and terminating in a needle point may be used.

When it is desired to add a freely flowing liquid medication, such as medication 72 in vial 70, to the bag 26, it is merely necessary to place the bag 26 in the vacuum chamber 30, close the lid 11 and squeeze it against the bottom member 12, pivot the box 10 to a vertical position, and release it. To connect the vial 70 to the bag 26 the needle end 80 of adapter 73 is placed into the diaphragm 25 after the end 78 of the needle has been placed into the vial 70 through the diaphragm 74. The relative vacuum created in the bag 26 by the vacuum in the chamber 30 on the outside of the bag will cause the volume of air 28 in the bag to expand and create a partial vacuum which will immediately draw into the bag 26 the contents 72 of the vial 70. Since the partial vacuum in the bag will also draw into the bag the air which was present in vial 70, a similar volume of air should be expelled back to the vial 70 before the vial is disconnected from the bag. This may be done by partially releasing the vacuum by moving the box 10 to the position shown in FIG. 6. When the level of air 28 in the bag 26 approaches its initial volume the vial 70 should be withdrawn and the box 10 pivoted to its horizontal position.

Where the vial 70 contains lyophilized or viscous material the material may be added to the bag 26 as follows: The bag 26 is loaded into the box 10 in a horizontal position. Vacuum is then applied by turning the box to its vertical position to cause the air 28 in the bag 26 and thus the bag, to expand outwardly toward the walls of the chamber 30. At this point, a vial 70 containing lyophilized material is connected to the inlet port tube 24 of the bag 26 by means of the connector member 73. As soon as the connection is made, any air within the vial 70 will be drawn into the bag 26 until the interior of the bag and the vial are at the same pressure. The vacuum supply is then turned off by pivoting the box to its horizontal position to cause the bag 26 to collapse to its normal size and to cause a portion of the liquid in the bag to go into the vial 70 which had been substantially evacuated in the preceding step. The vial 70 may then be agitated by swinging it back and forth to cause the dry material 72 to mix with the liquid. The box 10 is then pivoted to its vertical position to cause the liquid in vial 70 to be drawn back into the bag 26. The box is then rotated to the position shown in FIG. 6 and the vial 70 is removed from the inlet port tube 24 at about the time that the bag has partially collapsed due to the air returning to the vacuum chamber to a point where the volume of air 28 in the bag is substantially the same as it was before the contents 72 of vial 70 were added.

FIGS. 7-10 schematically illustrate the positions assumed by the bag 26 and the vacuum box 10 as well as

the variation in volume of the bag air space 28: at the time of loading (FIG. 7); at the time the bag is expanded by vacuum and the liquid medicament 72 added to it from the vial 70 (FIG. 8); at the time the vial 70 is removed (FIG. 9); and at the time the bag is unloaded (FIG. 10).

Although the vacuum box 10 and the chamber 30 have been shown as accommodating a single expandible container, it would be possible to make the chamber wider so that a plurality of expandible containers could be handled at one time. Furthermore, although a flexible bag type of parenteral solution container has been shown, it is within the scope of the invention to permit medicaments to be added to expandible containers which are more rigid than bags.

I claim:

1. Apparatus for holding an expandable container of parenteral solution having a normally sealed inlet port comprising: a plurality of rigid members which cooperate in one position to form a chamber for enclosing said container; an opening in the chamber permitting said inlet port to communicate with the exterior; cooperating means for aligning said plurality of rigid members relative to each other and permitting them to be separated from one another for loading and unloading of expandable containers into said chamber; sealing means affixed to at least one of said plurality of rigid members and adapted to contact the other of said plurality of rigid members when said chamber is closed; support means for supporting at least one of said plurality of rigid members including a base, at least one first support member carried by said base, and a second support member affixed to said at least one of said plurality of rigid members, said first and second support members being mounted for movement relative to each other so that at least the portion of said chamber formed by said plurality of rigid members which includes said opening for said inlet port can be moved between a lower and a higher position relative to said base; means for connecting said chamber to a source of vacuum; and valve means for selectively connecting said chamber to the source of vacuum as said portion of chamber including said opening for said inlet port is moved to its higher position relative to said base, and for disconnecting said chamber from said source of vacuum as said portion of said chamber is moved to its lower position relative to said base.

2. The apparatus of claim 1 wherein said chamber is formed of a pair of rigid members, and said cooperating means for aligning the rigid members are hinges.

3. The apparatus of claim 2 wherein each of said pair of rigid members is hollow.

4. The apparatus of claim 3 wherein at least one of said pair of rigid members is transparent.

5. The apparatus of claim 4 wherein said chamber is elongated and hinged along a longitudinal edge and said opening is formed at one end of said chamber.

6. The apparatus of claim 5 wherein said pair of hollow rigid members are made of plastic and have integral flanges which extend outwardly around their periphery in a common plane, said flanges being joined to the remainder of said rigid members by smooth curved surfaces.

7. The apparatus of claim 6 in which said cooperating means for aligning the rigid members comprises a

hinge of silicone rubber, and in which said sealing means comprises silicone rubber.

8. The apparatus of claim 1 wherein said base is adapted to be placed on a generally horizontal surface and said at least one first support member comprises a post extending generally upwardly from said base, said post having a generally horizontal hole near its upper end in which said second support member is mounted for pivotal movement.

9. The apparatus of claim 8 wherein said second support member is integrally attached to one of said plurality of rigid members which forms the bottom portion of said chamber, another of said plurality of rigid members forming the top portion of said chamber and being hinged to the bottom portion, said second support member and said chamber being pivotally movable between a horizontal and a vertical position.

10. The apparatus of claim 8 wherein a stop means is mounted on said base, said stop means serving to limit the amount of horizontal and vertical movement of said chamber.

11. The apparatus of claim 1 wherein said valve means includes a first channel communicating with said chamber, a vacuum channel communicating with said source of vacuum, and a second channel communicating with said first channel and movable with said second support member into and out of communication with said vacuum channel.

12. The apparatus of claim 11 wherein said valve means further includes a vent channel, said vent channel being positioned so as to be in alignment with said movable channel when said chamber has its said opening at said lower position, said movable channel being in alignment with said vacuum channel when said chamber has its said opening at said higher position.

13. The apparatus of claim 11 wherein said chamber includes a screen member covering the channel which communicates with said chamber, said screen member having crossed rib members at different distances from the chamber walls.

14. The apparatus of claim 12 which comprises a pair of rigid members forming half portions of said

chamber, said second support member and pair of rigid members being pivotally movable between a horizontal position in which said movable channel communicates with said vent channel and a vertical position in which said movable channel communicates with said vacuum channel.

15. In an evacuating apparatus for providing a vacuum to the exterior of a flexible fluid container, a casing defining an evacuation chamber; port means in said casing to permit a conduit communicating with said flexible container to pass out of said chamber; pivot means for permitting said evacuation chamber to be rotated about a transverse axis thereof; conduit means permitting evacuation of said container; and valve means associated with said conduit means for occluding said conduit means when the container is in one rotational position, and for opening said conduit means for evacuation when said container is in another rotational position.

16. The apparatus of claim 15 in which said casing comprises rigid hollow members movable between an open position for access to the casing interior, and a closed position for evacuation of said chamber, said casing being carried by a base, said casing being rotatable about said pivot means between vertical and horizontal positions relative to said base, said valve means occluding said evacuation conduit means in the horizontal position and opening said evacuation conduit means in the vertical position.

17. The apparatus of claim 16 wherein said valve means includes a first channel communicating with said chamber, a vacuum channel communicating with said source of vacuum, and a second channel communicating with said first channel and movable with said casing into and out of communication with said vacuum channel, said first and second channels being positioned to communicate when the casing is in said vertical position.

18. The apparatus of claim 17 in which said valve means further includes a vent channel, said vent channel being positioned to communicate with said movable channel in said horizontal position.

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