A plurality of discrete and individually movable storage vessels are provided each having a hollow interior. The vessels may be of various different shapes and may be rigid but are preferably at least in part of elastic material so that they can be collapsed when empty. They are superimposed in vertically stacked relationship, or they are arranged in side-by-side or horizontally stacked relationship and can be connected with one another so that their respective interiors communicate. They are supported and guided by suitable guide means and weights or spring-biased devices may be provided for applying a predetermined force to a terminal one of the vessels of a respective stack, to thereby subject the contents to a predetermined pressure and to expel them at a predetermined rate of flow through conduits provided for this purpose.

22 Claims, 16 Drawing Figures
STORAGE SYSTEM FOR GASEOUS FLUIDS AND THE LIKE

BACKGROUND OF THE INVENTION

The present invention generally relates to a storage system, and more particularly to a storage system for various different media, especially gaseous media. Still more specifically the invention relates to a storage system for gaseous media at low pressure.

Storage systems for this type of storage are already known. Generally speaking they employ hollow bodies of spherical form, cylindrical form, conical form or the like which may consist of plastic material, metal or another essentially rigid material. In other words these systems employ storage tanks made of such materials. The problem with these prior-art constructions resides in the fact that the quantity of gas which can be stored in the respective containers depends on two factors, namely firstly on the permissible maximum pressure which is dictated by the material used for the container, and on the other hand from the actual volume of the container itself. At a predetermined maximum pressure, for instance a discharge pressure, selected for such a container it is necessary to produce a different container for each different application, for instance for storage of gases which become available in different quantities, or at different locations. The container must always be changed in its dimensions and frequently in other respects as well. The result of this is that these known containers are expensive to construct and not economical, and that their erection at requisite locations is time-consuming.

A further proposal known from the art is to use a container of rigid or substantially rigid material, for instance an upright cylinder having an upper open end, and in this end there is accommodated a disk-shaped plate which is tightly fitted and sealed in the interior of the container so that it can move downwardly and upwardly therein. Also, so-called gasometers are known in which two of such cylinders are telescoped one within the other. In either case, the interior of the respective cylinder or of the dual cylinders is filled with gas and depending upon the quantity or the pressure of the gas the disk or the uppermost one of the two cylinders is raised and lowered with reference to the single cylinder or the second cylinder of the pair. This construction suffers from the disadvantage that it requires elaborate foundation and support structures which are time-consuming to produce and expensive. Furthermore it is very difficult in these constructions to seal the rather long gap between the respectively sliding elements, that is the disk with reference to the cylinder, or the two cylinders with reference to one another, so that absolute gas-tightness is achieved.

SUMMARY OF THE INVENTION

It is, accordingly, an object of the present invention to overcome the disadvantages of the art.

More particularly it is an object of the present invention to provide an improved storage system of the type under discussion which is not possessed of these disadvantages.

A concomitant object is to provide such an improved storage system which can be readily accommodated to different storage requirements as to contents and/or pressure of the gas.

A further object of the invention is to provide such a storage system which is light in weight, which can be readily constructed and which can be inexpensively constructed.

In pursuance of the above objects, and others which will become apparent hereafter, one feature of the invention resides, briefly stated, in a storage system which is particularly suited for storage of gaseous fluids, and which comprises a plurality of discrete and individually movable storage vessels having respective interiors, and connecting means for connecting the interiors of respective ones of the vessels in communicating relationship. According to the invention it is advantageous that the storage vessels be stacked in vertical or substantially vertical superimposed relationship. However, it is also possible in an advantageous manner to stack the vessels horizontally or substantially horizontally, by which is meant that they are arranged in side-by-side relationship to form what amounts to a stack lying on its side.

The invention further provides for making at least some parts of the peripheral wall of the vessels of a flexible material. Particularly, the top and/or bottom wall of such containers should at least be of flexible material, if this embodiment is chosen, the purpose being to permit the containers or vessels to collapse when they are empty. The vessels themselves are advantageously in this case of substantially lenticular or bladder-shaped configuration. However, it is also possible to make the vessels as essentially rigid hollow bodies.

The coupling means or connecting means for connecting the interiors of adjacent ones of the vessels with one another in communicating relationship may be combined with mechanical connectors for also obtaining a mechanical connection between adjacent ones of the vessels, such as screw-threaded connectors, clamping connectors or other connectors known from the art.

Stacked—either vertically or horizontally-stacked—vessels may be supported by standing or suspended guide elements which may themselves be vertical or substantially horizontal. The containers or vessels may have rim portions constructed and configured, and provided with suitable engaging means, so that they can be suspended or mounted on the respective guide elements from these rim portions. The coupling elements which couple the interiors of the containers with one another may also be made to carry inlet and outlet means, such as conduits or the like, for establishing communication between the combined interiors of the stacked vessels and exterior locations from which or to which the contents of the vessels are to be supplied.

A further embodiment of the invention provides for having at least one—usually a terminal one—vessel of a respective stack to be loaded by a weight or a spring-loaded device in such a manner that pressure is exerted upon the stack in a sense tending to compress and collapse the same. Thus, the contents of the vessels are placed under a pressure which can be determined as to its magnitude.

The vessels themselves may be annular of substantially doughnut-shaped configuration, or they may be circular. If they are annular they may also be circumferentially incomplete having a circumferential gap which is, of course, sealed at opposite sides of the gap. Then means may be provided for preventing the gap from changing its circumferential dimensions.
The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

**BRIEF DESCRIPTION OF THE DRAWING**

FIG. 1 is a diagrammatic elevational view, partly sectioned, of a first storage system according to the present invention, illustrated in filled state;

FIG. 2 is a view similar to FIG. 1 but showing the storage system in empty state;

FIG. 3 is a fragmentary vertical section in an enlarge detail view, illustrating a detail of the embodiment of FIGS. 1 and 2;

FIG. 4 is a view similar to FIG. 3 but illustrating a further embodiment of the invention;

FIG. 5 is a fragmentary elevational view of a further embodiment of the invention;

FIG. 6 is a perspective view of a vessel for use in the embodiment of FIG. 5;

FIG. 7 is a perspective view of another vessel for use in the embodiment of FIG. 5;

FIG. 8 is a view similar to FIG. 5 illustrating a further embodiment of the invention;

FIG. 9 is a view similar to FIG. 8 illustrating another embodiment of the invention;

FIG. 10 is a view similar to FIG. 9 illustrating still a further embodiment of the invention;

FIG. 11 shows, in another view analogous to FIG. 10, a further embodiment of the invention;

FIG. 12 is similar to FIG. 11 but showing still an additional embodiment of the invention;

FIG. 13 is a side elevational view showing a further embodiment of the invention;

FIG. 14 is a view similar to FIG. 13 showing another embodiment of the invention;

FIG. 15 shows in a side-elevational view yet a further embodiment of the invention; and

FIG. 16 shows in a partially sectioned elevational view a final embodiment of the invention.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Discussing now the drawing in detail, and firstly FIGS. 1–3 thereof, it will be seen that reference numeral 1 identifies a base plate on which there is mounted a supporting structure composed of upright guide rods 2 and a protective roof 3. Within the confines of the supporting structure, those surrounded by the guide rods 2, there is positioned on the base 1 a plate 4 on which there is provided a vertical stack of superimposed individual storage vessels 5. These are of substantially cushion-shaped, lenticular or bladder-shaped configuration as illustrated.

The vessels 5 are each provided with rim portions 7 of suitable configuration, such as the one illustrated, in which cut-outs or eyes 6 are provided which surround the respective guide rods 2, usually with adequate play so that they can slide longitudinally of the guide rods 2.

In the illustrated embodiment the vessels are of a flexible material, for instance a fabric-reinforced rubber or synthetic plastic material and they may for instance be made by connecting a lower flat sheet material section with an upper sheet material section under concomitant formation of the rim portions 7. The point is that the vessels 5 are to be collapsible when empty.

The eyes 6 may be circular or elongated and may be either simply stamped out of the material of the rim portions 7 if the material is of requisite characteristics, or they may be vulcanized into the material, sewn into the material or otherwise secured to the material in the form of metallic, synthetic plastic or eyes of other materials. However, the eyes 6 may also be connected with the rim portions 7 in suitable manner, so that they can be released, for instance by means of carbine hooks, shackles, rings or the like, clamps, screw connections or other connections. By making the eyes slidable with reference to the guide rods 2, the vessels 5 may contract in the general plane of the rim portions 7 as they are being expanded axially on filling with gaseous fluid or the like. This prevents clamping or other engaging of the expanding vessels 5 on the guide rods 2.

As illustrated in FIGS. 1 and 2, each of the vessels 5 is provided with two (at opposite axial sides) coupling elements 8 which are known in themselves and are therefore diagrammatically illustrated only. These may for instance be arranged where adjacent ones of the vessels 5 will contact one another so that the central axis of all coupling elements 8 will at least approximately be located in the vertical central axis of the stack of vessels. A closure device 9 seal-tightly closes the coupling element 8 of the lowermost vessel 5 which is supported on the plate 4.

A connecting element 10 is secured to the upper coupling element 8 of the uppermost vessel 5 as illustrated, and is preferably provided with a filler arrangement 11 and a discharge arrangement 12, both of which are well known and utilize suitable valves, all as known to those conversant with this art. The coupling elements 8 of all of the vessels 5 are connected in such a manner with one another—by means of screw connections, clamping connections, or other connections known per se—that the hollow interiors of the respective vessels are in seal-tight communication with one another, that is, seal-tight with reference to the ambient atmosphere. A ring or similar element 13 of requisite weight may be supported on the uppermost vessel 5 and the weight of the ring 13, reinforced if necessary or desired by auxiliary weights 14, exerts a downwardly directed pressure upon the stack of vessels whereby a predetermined internal pressure of the gaseous contents of all communicating vessels 5 is obtained, such a pressure for instance being desired for contents which are being withdrawn. The pressure can be precisely determined by regulation of the weight which acts upon the stack of vessels, and is dependent upon this weight.

It will be appreciated from a comparison of FIGS. 1 and 2 that as the contents of the vessels are withdrawn the weights 13 and/or 14 guarantee that the vessels 5 will collapse in downward direction so that they become compressed until they are almost entirely evacuated. During such compression and collapsing they are guided by the guide rods 2 and they finally become stacked upon the element 4 in collapsed condition. Conversely, when they are in the condition shown in FIG. 2, and when gaseous fluid is introduced into
them via the inlet 11, the vessels 5 expand and slide upwardly along the guide rods 2 until they finally reach the position illustrated in FIG. 1. The distance to which they expand and travel upwardly is dependent upon the degree to which the total interior volume of all vessels 5 is filled, assuming an approximately constant internal pressure. This makes it possible to provide a marking, for instance of the guide rods 2 and on the element 13, which indicates continuously the quantity of stored contents.

Naturally, the number of vessels 5 in a stack such as shown in FIGS. 1 and 2 is dependent upon the quantity of gaseous medium which becomes available and which is to be stored. It can be increased or decreased at any time by adding or removing individual ones of the vessels 5. If vessels 5 are to be added, they are simply added on top of the stack with their respective eyes 6 surrounding the associated guide rods 2 and are then coupled in communicating relationship with the next-lower vessel which heretofore was the uppermost one of the stack. Previously, the element 10 has been removed from the previously uppermost vessel of the stack and is subsequently secured to the uppermost connecting element 8 of the newly added vessel 5. Analogously, vessels can also be added at the bottom of the stack.

If the eyes are provided with means by which they can be releasably connected with the guide rods 2, for instance with carbine hooks or the like, the connection or removal is even simpler because it is then merely necessary to open the hooks, place them about the guide rods 2 and close them again, or following the reversed procedure. It is also possible to have the eyes 6 permanently secured to the guide rods and to provide suitable connecting means such as carbine hooks or the like on the rim portions 7 of the vessels which are then simply connected with the eyes which are permanently secured to the guide rods 2.

If different types of gases are to be stored in one and the same system, the system may be composed of several stacks of vessels with the vessels of one stack all communicating with one another, but with the vessels of the different stacks not communicating. Conversely, however, it is also possible to connect the vessels of different stacks with one another, for instance to connect the uppermost or lowermost vessel of one stack with the uppermost or lowermost vessel of another stack in the system.

In FIG. 3 we have illustrated the uppermost portion of a guide arrangement for an embodiment such as that in FIGS. 1 and 2. It is provided with a protective roof 14 which is here combined with a weight 16 and is slidable along the guide rods 2. In this arrangement a supply conduit 17 and a discharge conduit 18 is built into the weight 16 itself and they can be respectively connected with the inlet 11 and the outlet 12 of the element 10. Here, of course, both the groove 15 and the weight 16 will follow any expanding or contracting movements of the stack of vessels 5, by moving upwardly or downwardly, and their weight will produce a predetermined internal pressure in the connected stacked vessels.

The embodiment of FIG. 4 avoids the use of a weight but shows an arrangement which makes it possible to exert a requisite pressure to obtain an internal pressure in the conduits—upon a stack of vessels irrespective of whether they are stacked in upright or in substantially horizontal position. Evidently this will not be possible with the embodiment of FIG. 3.

For this purpose FIG. 4 provides a plate 19 which is slidable mounted on the rods 2 and which can be secured in any desired position on the rods 2 by the clamping devices 50. Spaced from the plate 19 is a further plate 21, and biasing means, such as metallic or synthetic plastic expansion springs, both pneumatic or hydraulic springs 20 are provided which bear upon the plate 19 and exert a force on the plate 20 urging the latter away from the former. The plate 20 bears upon a terminal one of the stack of vessels 5 which of course are again slidedly connected with the guide rods 2. Thus, the plate 21 is a pressure plate and transmits the force exerted by the springs 20 upon the adjacent vessel 5. In this embodiment it is advantageous that the supply and discharge conduits 17 and 18 be passed through the biasing device.

Coming to FIGS. 5 and 6 it will be seen that here the vessels 22 having a substantially torus-shaped configuration by contrast to the circular, elliptical, quadratic, or similarly configured vessels 5 of the preceding embodiments. The vessels 22 of FIGS. 5 and 6 are stacked about a guide element 23 which they surround and which is mounted on a base plate 24. Here the coupling elements 8 are provided eccentrically as shown in FIG. 6. The vessels 22 may be annular with a central aperture 51 so that they must be slipped over one end of the rod 23 when they are stacked or when they are removed from the stack. They may, however, also be circumferentially incomplete and have a peripheral gap 25 as is illustrated with reference to the vessels 26 shown in FIG. 7. The gap 25 is slightly wider than the diameter of the guide element 23 so that the vessels 26 can simply be slipped onto and removed from the guide element 23 laterally rather than from one end thereof.

In order to prevent the gap from changing dimensions circumferentially, and particularly from becoming enlarged in circumferential direction, it may be closed temporarily—that is when the vessels are not to be placed onto or removed from the guide element 23—or at least bridged by a suitable bridging or connecting device 27 which need not be illustrated in detail because it is not novel per se and is well known to those skilled in the art.

Coming to FIG. 8 it is pointed out that a base is provided with an upright support 29 on which there can be stacked cannister-like vessels 30 whose walls in this embodiment are of non-flexible, homogeneous material, such as metal or synthetic plastic. A protective roof 31 is again provided and the vessels 30 are coupled in such a manner that two adjacent vessels are always coupled with one another. Inlet and outlet conduits similar to conduits 17 and 18 of FIG. 3 are provided at the uppermost vessel 30. These vessels of course are capable of withstanding a higher internal pressure and are more resistant to mechanical damage. On the other hand they can be evacuated or emptied only by special means provided therefor, for instance a suction pump or by a suitable medium which is admitted into them and which displaces the gaseous medium from their interior.
Coming to the embodiment of FIG. 9 it will be seen that here there is illustrated a storage system in which a stationary ceiling or other support structure has suspended from it a guide or mounting element 33, such as a rod, a rope or the like. At the lower free end of this element 33 a supporting plate 34 is secured and vessels 22, 26 or 50 surround the element 33 and are stacked around the same, resting upon the plate 34. If these vessels are of the flexible or partially flexible type described earlier, then a ring or similar means 35 may rest upon the uppermost one and exert a downward pressure in the manner and for the reasons described earlier.

Naturally, it is also possible to use vessels of different sizes and configurations, for instance as to height, diameter or length of side edges. Diagrammatic examples of such possibilities are illustrated in FIGS. 10–12 which are not believed to require detailed discussion because they are self-explanatory. Vessels which are to be coupled so as to have their interiors communicate with one another are provided either with identical coupling components or, if they have different coupling components, suitable adaptors are provided.

FIGS. 13 and 14 show two possibilities of storage systems in which the vessels are arranged in horizontal or at least substantially horizontal manner, with the vessels being identified with reference numerals 37 in FIG. 13 and with reference numeral 41 in FIG. 14. This type of arrangement may become necessary due to problems of space availability, or for other considerations. In FIG. 13 the vessels 36 are supported upon a supporting element 37 which is for instance a substantially horizontal rope or the like. To subject their contents to requisite pressure a device such as the one shown in FIG. 4 may be utilized which is supported upon the element 37. Of course, two such devices may also be provided and act upon this stack of vessels from opposite sides, or a single such device may be provided acting upon the stack of vessels from one side and a suitable support must then be provided at the other side or end of the stack against which the stack can bear.

The embodiment illustrated in FIG. 14 shows a horizontal or substantially horizontal guide rail 14 to which vessels 38 are connected by means of hooks 40 which are secured to their rim portions 39 and which are hooked onto the rail 40 in suitable manner so as to be slidable therealong. The vessels 38 are connected with one another so as to communicate, for instance by means of pipe couplings or hose couplings 42.

In the embodiment of FIG. 15 we have illustrated a support system which is composed of several stacks 43, 44 and 45. The stacks may be of the type as disclosed with respect to FIGS. 1, 5 or 8–12 and will be arranged adjacent one another and beneath a common protective roof 46. If the stacks 43, 44 and 45 are each to receive different gaseous media, or different media whatever, then each stack 43, 44 and 45 is provided with separate supply and discharge conduits. However, if the stacks are all to accommodate only one type of medium, then they may be connected with one another by means of couplings 47 and may be also connected to joint supply and discharge conduits 48 and 49, respectively.

FIG. 16, finally, shows a support plate 52 on which there is arranged vertically a hollow guide element 53 of tubular configuration whose walls are provided with apertures 54. The lower end and the upper end of the element 53 are each provided with a flange 55 and 56, respectively. The element 53 is surrounded with radial play by two vessels 57 each of which may be of cushion-shaped lenticular or similar configuration. In addition, the embodiment of FIG. 16 is provided with several of the vessels analogous to those for instance of FIG. 1 but which are connected so as to form a bellows-shaped element having three folds. The vessels 57 each have identical upper and lower connecting rings 59 and the lower ring 59 of the lower vessel 57 is connected in suitable seal-tight manner but removable with the flange 55. Similarly, the upper connecting ring 59 of the lower vessel 57 is connected with the lower ring 59 of the upper vessel 57 releasably but seal-tightly. Finally, the upper connecting ring 59 of the upper vessel 57 is connected in releasable seal-tight manner with the lower opening of the bellows-shaped opening 60, with the upper opening thereof being seal-tightly clamped between the flange 56 and a cover 61 which is supported by the flange and seals with the same the bellows element 60.

As the drawing shows, each of the vessels 57 is open to the element 53 from cell to cell.

If, now, internal pressure is applied by introduction of gaseous medium through the element 53 and the cut-out 54 to the interior of the vessels 57, then the bellows member 60 is compressed to a greater or lesser degree as shown in the right-hand side of FIG. 16. Conversely, when little or no pressure exists in the vessels 57, then the bellows member 60 is longitudinally drawn apart as shown at the left-hand side of FIG. 16. This of course indicates that the vessels 57 are of the flexible construction discussed earlier so that they can collapse as indicated at the left-hand side of FIG. 16.

The vessels 57 can each individually also be configured as non-flexible vessels, analogous to the vessels 30 of FIG. 8. These, also, could of course be connected to form a common storage unit between three of them, just as in the case of FIG. 16, and they could be connected in the same manner as in FIG. 16 via the rings 59 with the flanges and the bellows member. In this case the bellows member would serve for sealing the internal space of the vessels at different quantitative contents in the vessels, the latter also being open with respect to the apertures 54 in the element 53, as discussed above with reference to FIG. 16.

Parenthetically it is pointed out that the element 53 of FIG. 16 can also be configured in the analogous manner as that of FIG. 9, if desired. The element 53 can also be suspended from above and may be provided at its upper or lower end for any desired number of individual vessels 57 with inlet and outlet conduits 62 and 63 of known type, being common to all of the vessels.

In the event that the cover 61 is so arranged with respect to the uppermost flange 56 of the element 53 that it loosely engages the flange 56 when the system is not under pressure, that is when it does not contain gaseous fluid under pressure, then the upper outlet of the bellows member 60 may be sealingly and for instance removably secured on the outer end face of the cover 61 in well known and therefore not separately illustrated manner. In this case the cover 61 is provided with a guide rod or the like which extends into the in-
terior of the element 53 and which is guided therein. If internal pressure builds up in the system, then the cover 61 is raised when the bellows member 60 has been completely collapsed by the expanding vessels 57 whereby a particularly good usage of the available medium storage space is obtained.

It will be appreciated that systems of the type under discussion have a wide variety of uses, and that storage of gaseous media is by no means their only application, although it has been employed herein for purposes of explanation. Such systems are particularly suitable for storage of sewer gases and the like which develop upon cleaning or transfer of certain liquids and which become available in differing quantities and with a maximum of pressures between 0.01 and 0.05 atm. Such gases are withdrawn in an irregular manner for further use, and the pressure at which they are to be withdrawn sometimes is required to be higher than the pressure at which they become available. Naturally, systems of this type can be utilized both for stationary applications as well as being transportable, so that they become available for a wide range of situations, including for military applications, for use in case of emergencies caused by natural catastrophes, and the like.

It goes without saying that suitable protecting means may be provided for storage systems of the type under discussion to protect them against possible damage. Thus, they may be surrounded and embedded in a medium which exerts a pressure upon them and constitutes a shield against possible damage, for instance water, a protective gas, particulate material or the like.

It is an especial advantage of the present invention that it makes it possible to subdivide the storage system into individually separately transportable vessels which may be of identical size or may be available in a relatively small range of different sizes. This makes it possible that it is no longer necessary to produce expensive systems for each application, where each system must always be different in size and volumetric capacity from every other system, so that at low expense any necessary number of identical or even dissimilar individual vessels may be combined to make up a total system of requisite volumetric capacity. At the same time, stocking the simple and uncomplicated constituent components needed for making up such a system, that is the vessels—particularly if the latter are collapsible—and the various supporting and guide elements thereof, is economically highly advantageous because little capital need be tied up in stock, little storage space is required for the stock, and the erection can be carried out wherever desired and with a minimum of time and effort.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in a storage system for gaseous fluids and the like, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention and, therefore, such adaptations should and are intended to be comprehended within the scope and meaning of the following claims.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended

1. A storage system, particularly for gaseous fluids, comprising an elongated stack of discrete storage vessels having respective interiors and consisting at least partially of flexible material so as to be collapsible; guide means engaging said vessels and maintaining the same in predetermined relative positions; releasable connecting means for connecting the interiors of respective ones of said vessels in communicating relationship; and compressing means acting upon said stack in direction of elongation of the same in a sense tending to compress and collapse said vessels.

2. A storage system as defined in claim 1; and further comprising support means for supporting said vessels in substantially vertically stacked relationship.

3. A storage system as defined in claim 1; and further comprising support means for supporting said vessels in substantially horizontally stacked relationship.

4. A storage system as defined in claim 1, each of said vessels having a top wall, a bottom wall and a peripheral wall; and wherein said top and bottom walls consist at least predominantly of said flexible material.

5. A storage system as defined in claim 4, wherein at least some of said vessels are of at least substantially lenticular configuration.

6. A storage system as defined in claim 4, wherein at least some of said vessels are of at least substantially bladder-shaped configuration.

7. A storage system as defined in claim 1, wherein said vessels are stacked at least substantially vertically, and wherein said guide means comprise guide elements oriented in at least substantially vertical direction.

8. A storage system as defined in claim 1, wherein said vessels are stacked at least substantially horizontally, and wherein said guide means comprise guide elements oriented in at least substantially horizontal direction.

9. A storage system as defined in claim 1, said vessels each having a rim portion; and further comprising engaging means on said rim portion engageable with said guide means for connecting said vessels with the same.

10. A storage system as defined in claim 1; and further comprising inlet means and outlet means provided on said connecting means.

11. A storage system as defined in claim 1, said compressing means comprising weight means.

12. A storage system as defined in claim 1, said compressing means comprising spring-loaded biasing means.

13. A storage system as defined in claim 1, said vessels being of annular outline.

14. A storage system as defined in claim 1, said vessels being of substantially annular but circumferentially incomplete outline having a circumferential gap; and limiting means for preventing changes in the circumferential dimension of said gap.
15. A storage system as defined in claim 1, said vessels including a lowermost vessel; and further comprising a support plate sealingly engaging and supporting said lowermost vessel.

16. A storage system as defined in claim 1, said vessels including an uppermost vessel having a top wall; and further comprising a compensating element provided on and in engagement with said top wall for compensating variations in the height of the stack of vessels.

17. A storage system as defined in claim 16; further comprising a cover element above said upper most vessel; and wherein said compensating element bears upon said cover element and is sealingly connected with the same and with said top wall.

18. A storage system as defined in claim 17, wherein said compensating element is a bellows element.

19. A storage system as defined in claim 1, said vessels being of annular outline and said guide means comprising at least one guide element extending centrally through the stacked vessels and provided with inlet and outlet conduits; and further comprising coupling means for coupling the interiors of the respective vessels with said conduits.

20. A storage system as defined in claim 28, said one guide element having spaced end portions; and wherein at least one of said end portions is provided with parts communicating with the respective conduits.

21. A storage system as defined in claim 28, said one guide element having a peripheral wall which is apertured, and wherein said coupling means is connectable with the apertures of said wall.

22. A storage system as defined in claim 28, each of said vessels having an inner wall facing and at least partially open to said one guide element, and said coupling means connecting the opening in said inner wall and the aperture in said peripheral wall.