

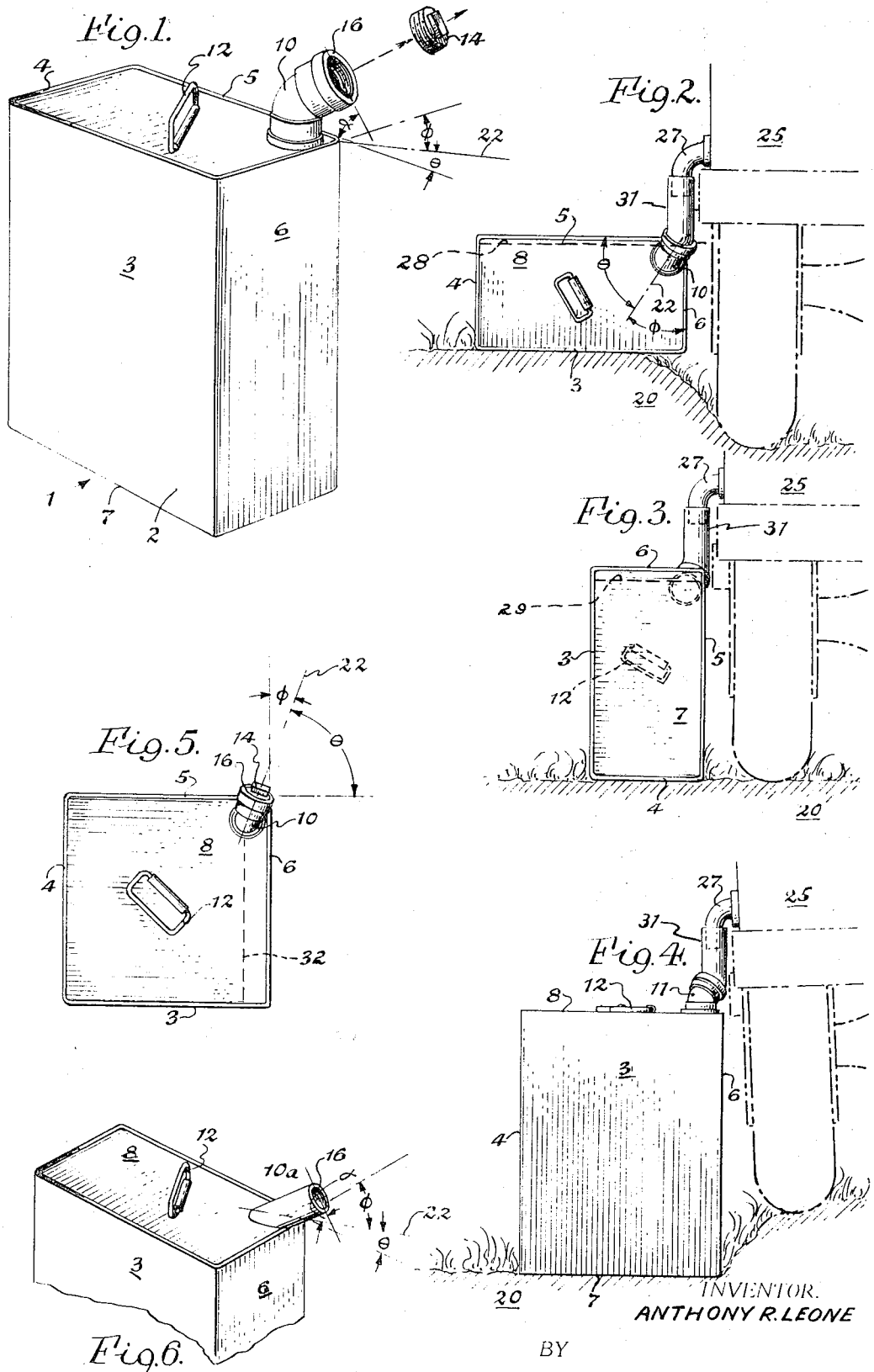
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CAMPER LIQUID WASTE COLLECTOR

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CAMPER LIQUID WASTE COLLECTOR

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13 Claims

ABSTRACT OF THE DISCLOSURE

A liquid waste collector for campers comprising a can of hexahedral configuration having first and second adjacently disposed side walls and a bottom wall adapted to be disposed in can supporting engagement with the ground, and a relatively rigid spout non-movably connected into the can through a nonsupporting top wall thereof and defining an inlet opening spaced above the top wall of the can and disposed outwardly of the remaining nonsupporting side walls thereof; the collector being constructed such that the inlet opening may be selectively disposed at three different elevations with respect to the ground depending upon whether the first supporting side wall, the second supporting side wall or the bottom wall of the collector is disposed in contact with the ground.

BACKGROUND OF THE INVENTION

Campers and trailers, presently in wide use by families for summer vacations and weekend outings are normally provided with toilet and kitchen sink facilities. In that draining of the toilet and sink wastes directly on the ground presents a serious problem of sanitation, the toilet and/or the sink is normally drained into a temporary camper storage tank having sufficient capacity to permit normal operation of such facility for one or two days before the storage tank itself must be drained. A drain outlet for the camper storage tank is conventionally placed so as to extend through either the bottom or side walls of the camper.

In the more developed public and commercial camping areas, individual camper parking sites are provided with special drain inlets to which the drain outlet from the camper may be connected by a long flexible drain hose, which is a conventional camper accessory. When wishing to park in other than a fully developed camping area, however, one is faced with the two-fold problem of draining the storage tank and thereafter transporting the drained liquid in a suitable receptacle to a point at which the liquid may be conveniently dumped. The first problem mentioned is particularly critical in that the ground on which it is desired to park the camper is quite often sloping in nature and/or uneven, such that when the camper is leveled to permit normal use thereof, the drain outlet from the storage tank is greatly above or below the elevation at which it would be if the camper were parked on level ground. Furthermore, due to variations in camper designs, the height of drain outlets will vary between campers, even though parked on level ground. Thus, a conventional bucket, which the average camper might use to catch the waste liquid, may be either too tall to be properly positioned under the drain outlet or too short to receive the liquid waste therefrom without undesired splashing of material from the receiving bucket. Also, when using a conventional bucket there is no way to prevent the escape of unwelcome fumes from the collected liquid waste, either during the draining thereof or while the bucket is being transported to a convenient dumping area. Still further, the bucket must be immediately sanitized and deodorized if it is to be stored in or adjacent the camper.

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SUMMARY OF THE INVENTION

The present invention is directed towards a liquid waste collector for campers which is constructed so as to permit the elevation of the inlet opening thereof to be selectively varied for the purpose of receiving waste material from the camper drain outlet whose elevation is variable depending upon the slope and/or contour of the ground upon which the camper is parked.

In all forms of the present invention, the collector includes a can of hexahedral configuration having first and second adjacently disposed side walls and a bottom wall which are alternately adapted to support the can on the ground, and a relatively rigid spout, which is nonmovably connected into the can through a nonsupporting top wall of the can. The spout defines an inlet opening spaced above the top wall of the can and disposed outwardly with respect to the nonsupporting side walls of the can. The design of the collector is such that the inlet opening may be selectively positioned at three different elevations with respect to the ground, depending upon which of the supporting side or bottom walls is employed to support the can. Preferably, the spout is provided with a screw plug type inlet opening closure to prevent the escape of fumes from the collector both while the collector is transported to a suitable liquid waste dumping area and when the collector is stored in the camper between periods of use.

In the preferred embodiment of the present invention, variation in elevation of the inlet opening is achieved by proportionately varying the width, depth and height dimensions of the can.

In a second embodiment of the present invention, the top wall of the can is substantially square and variation in elevation of the inlet opening is achieved, when the can is supported on one or the other of its supporting side walls, by affixing the spout to the can such that a plane, which bisects the spout along a line disposed lengthwise thereof, is disposed at an acute angle other than 45° to such side walls. Otherwise stated, the plane passing through the spout is disposed at an acute angle of less than 45° with respect to a plane passing diagonally of the can top wall between adjacent marginal edges of the first and second supporting side walls and adjacent marginal edges of the first and second nonsupporting side walls.

DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood by reference to the following description taken with the accompanying drawing, wherein:

FIG. 1 is a perspective view showing a collector formed in accordance with the preferred embodiment of the present invention;

FIG. 2 shows the collector illustrated in FIG. 1 ground supported by one of its supporting side walls;

FIG. 3 shows the collector of FIG. 1 ground supported on a second of its supporting side walls;

FIG. 4 shows the collector of FIG. 1 ground supported by its bottom supporting wall;

FIG. 5 is a plan view, showing a second embodiment of a collector according to the present invention; and

FIG. 6 is a fragmentary perspective, similar to FIG. 1, but showing a modified spout design.

DETAILED DESCRIPTION

The liquid waste collector according to the present invention is generally designated as **1** in the drawing. Collector **1** includes a can body **2** of hexahedral configuration having adjacent first and second supporting side walls **3, 4**, adjacent first and second nonsupporting side walls **5, 6**, a supporting bottom wall **7** and a nonsupporting top wall **8**; and a relatively rigid receiving and pour spout **10**. Pour

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spout 10 is nonmovably connected into can body 2 through top wall 8 at a point which is preferably immediately adjacent the intersection of can side walls 5, 6 in order to maximize the amount of liquid waste which may be accommodated by can body 2 in all supported portions thereof, which will hereinafter be discussed.

Preferably, in all forms of collector 1, a suitable handle 12 is affixed to top wall 8 in order to facilitate manipulation of the collector and suitable means, such as a screw plug closure 14, is provided to selectively seal inlet opening 16 of spout 10.

In accordance with the preferred embodiment of the present invention, which is illustrated in FIGS. 1-4, the width, depth and height of can body 2 are proportioned so as to vary the distance between inlet opening 16 and walls 3, 4 and 7, and thereby permit the elevation of the inlet opening with respect to ground 20 to be selectively varied depending upon which of walls 3, 4 and 7 are employed to ground support the can body in the manner shown in FIGS. 2-4, respectively. While not limited thereto, it is preferable to proportion can body 2, such that three elevated positions of inlet opening 16 are attainable, which vary one from another by equal amounts. This is most readily attainable, as best illustrated in FIGS. 2-4 by forming the width of the can body 2, as measured between the side walls 4 and 6, greater than its depth, as measured between side walls 3 and 5, but less than its height, as measured between bottom and top walls 7 and 8.

Referring particularly to FIGS. 1 and 2, it will be noted that spout 10 is curved lengthwise thereof so as to position spout inlet opening 16 within a plane disposed at an angle α with respect to top wall 8, and positioned such that a plane 22, which is arranged normal to top wall 8 and bisects the spout along a line extending lengthwise thereof, is disposed at angles θ and ϕ with respect to nonsupporting side walls 5 and 6, respectively. When each of angles α , θ , and ϕ are less than 90° , inlet opening 16 is arranged so as to permit it to face or open upwardly when can body 2 is supported on ground 20 by any one of walls 3, 4 and 7, respectively. This permits a user to drain liquid waste from a camper 25 through a camper drain 27 directly into inlet opening 16 in any of the adjusted ground supported positions of can body 2.

The tendency of a flowing stream of waste to pivot spout 10 about a horizontal axis passing through the point at which the spout is connected into top wall 8, when the can body is supported, as shown in either FIGS. 2 or 3, is overcome by making spout 10 of a rigid construction and nonmovably connecting it to the top wall. Thus, inlet opening 16 may be accurately maintained in waste receiving position.

The length of spout 10 or the radius through which it is curved and the relative values of angles θ and ϕ determines the positioning of inlet opening 16 with respect to the intersection of nonsupporting side walls 5 and 6, and thus the volume of liquid waste which may be properly admitted to the collector when it is supported by either of side walls 3 or 4. Thus, for instance when a relatively short spout is arranged in the manner illustrated in FIGS. 1-4, can body 2 may be filled only to the level indicated by dashed lines 28 and 29, when the can body is ground supported on side walls 3 and 4, as shown in FIGS. 2 and 3, respectively. The use of a relatively short spout is permissible in the case where excessive projection or overhang of the spout is undesired from the standpoint of difficulty in storing the collector in a confined space within the camper and where the can body is of a capacity exceeding that required to accommodate waste from a temporary camper storage tank, not shown.

To permit complete filling of can body 2 in either of its supported positions shown in FIGS. 2 and 3, it is necessary to position inlet opening fully outwardly of the projections or extensions of side walls 5 and 6. For this arrangement, the shortest possible spout length is achieved when angles θ and ϕ are equal to 45° . In the preferred

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form of this embodiment, each of angles θ , ϕ and α are equal to 45° .

Desirably, a short length of flexible hose 31, for instance about 6 inches, is employed to compensate for slight differences in elevation between camper drain 27 and inlet opening 16 when in one of its adjusted positions, so as to positively insure against splashing and the escape of fumes. The upper end of hose 31 may be either frictionally fitted or manually held on camper drain 27, while its other or lower end is merely inserted into spout 10 through inlet opening 16. While the length of hose 31 will depend both on the size of the collector and possible variations in elevations in the camper drains of different campers, it is preferably sufficiently short such that under normal circumstances the inserted end thereof does not extend into the interior of can body 2. This not only prevents possible interference of the inserted end of the hose with proper filling of the collector, but insures against excessive flexure or bowing of a noninserted portion of the hose to a point below the elevation of the inlet opening. Otherwise, bowing of the hose would likely result in the accidental withdrawal or pulling out of the hose from spout 10, due to the weight of liquid waste flowing or collecting within such bowed portion. The tendency of hose 31 to bow or be pulled out of spout 10 is further diminished by the positioning of spout inlet opening 16, which permits the hose to be passed vertically downwardly into the spout for all adjusted positions of the collector.

FIG. 5 illustrates a second embodiment of collector 1, wherein top and bottom walls 7, 8 are substantially square, and spout 10 is positioned such that bisecting plane 22 is arranged at an angle θ with respect to side wall 5, which is substantially greater than the angle ϕ . Otherwise stated, plane 22 is disposed at an acute angle of less than 45° but greater than 0° with respect to a plane passing diagonally of top wall 8 between the intersection of side walls 3, 4 and the intersection of side walls 5, 6.

It will be apparent that in the embodiment, shown in FIG. 5, variation in the elevation of inlet opening 16, when can body 2 is supported on one or the other of supporting side walls 3 and 4, depends on the difference between angles θ , ϕ , and the length of spout 10. When, as shown in FIG. 5 for purposes of illustration, spout 10 is relatively short, the resultant positioning of inlet opening 16 permits can body 2 to be completely filled when supported on side wall 3, but only partially filled, as indicated by dashed line 32, when supported by side wall 4. It will be apparent that the collector can be completely filled and the variation in elevation of spout inlet opening 16 increased by merely lengthening spout 10 so as to position inlet opening 16 progressively outwardly of the extensions of side walls 5 and 6.

Further, in the embodiment illustrated in FIG. 5 a third adjustment in the elevation of inlet opening 16 may be provided by alternatively making the height of can body 2 less or greater than the depth and width thereof.

FIG. 6 illustrates a modified spout design 10a which may be employed in place of spout 10 in either of the embodiments discussed above. Spout 10a differs from curved spout 10 only in that it is straight and thus uniformly inclined with respect to top wall 8.

Can body 2 and spout 10 are preferably of a one-piece, molded plastic construction, so as to provide a low cost, light-weight collector. However, the can and spout may be separately fabricated from sheet metal or dissimilar materials and joined to form a completed collector by any suitable means, such as by welding or adhesives. While various sizes of collectors may be formed in accordance with the present invention, I have found that a collector having a capacity of about 8 gallons and which is provided with a spout inlet opening on the order of about three inches in diameter is sufficient for the most present day trailer waste collection needs.

Various modifications of the present invention will

likely become apparent to those skilled in the art in view of the foregoing description. Exemplary thereof would be to provide a telescopic extension for the otherwise rigid spout to permit the inlet opening to be extended any desired distance beyond the non-supporting side walls and/or to provide a swivel mounting for the spout in combination with means to adjustably lock the spout in a desired swivel position.

While these variations would make fabrication of the collector more difficult, add to its overall cost, and make it readily subject to damage, it is wished to include same within the scope of the present invention. Thus, it will be understood that the recitation that the inlet opening is "fixably" positioned above the top wall is meant to include where appearing in the depending claims, possible modification of the present collector, wherein the spout is constructed so as to permit the inlet opening to be fixed or locked in a desired adjusted position.

Accordingly, I wish to be limited only by the scope of the appended claims wherein I claim:

1. A liquid waste collector for campers comprising a can of hexahedral configuration having a pair of adjacently disposed side walls and a bottom wall adapted to be disposed in can supporting engagement with the ground; and a spout connected into the can through a nonsupporting top wall thereof, said spout defining a liquid inlet opening fixably positioned above said top wall, said inlet opening being disposed at least partially outwardly of remaining, nonsupporting side walls of said can, and said collector being constructed such that said inlet opening may be selectively disposed at different elevations with respect to the ground depending upon which of said supporting walls is disposed in engagement with said ground.

2. A collector according to claim 1, wherein said spout is connected into said top wall adjacent the intersection of said nonsupporting side walls.

3. A collector according to claim 2, wherein said top wall is rectangular and said spout is connected into said top wall such that a plane arranged normal to said top wall and bisecting said spout along a line extending lengthwise thereof is disposed at an acute angle less than 90° with respect to each of said nonsupporting side wall, whereby said inlet opening faces upwardly when either of said supporting side walls is disposed in engagement with said ground.

4. A collector according to claim 3, wherein said inlet opening is disposed outwardly of each of said nonsupporting side walls and said bisecting plane is disposed at an angle of about 45° with respect to each of said nonsupporting side walls.

5. A collector according to claim 3, wherein said inlet opening lies within a plane disposed at an acute angle with respect to said top wall, whereby said inlet opening faces upwardly when any of said supporting walls is disposed in engagement with said ground.

6. A collector according to claim 5, wherein the second said plane forms an acute angle of about 45° with respect to said top wall.

7. A collector according to claim 6, wherein said inlet opening is disposed outwardly of each of said nonsupporting side walls, said bisecting plane is disposed at an angle of about 45° with respect to each of said nonsupporting side walls, and said can body is proportioned such

that said inlet opening may be selectively disposed at three different elevations with respect to the ground depending upon which of said supporting walls is disposed in engagement with said ground.

8. A collector according to claim 2, wherein said top wall is square, and said spout is connected into said top wall such that a plane arranged normal to said top wall and bisecting said spout along a line extending lengthwise thereof is disposed at an acute angle of less than 45° but greater than 0° with respect to a plane passing diagonally of said top wall between the intersection of said supporting side walls and the intersection of said nonsupporting side walls, whereby said inlet opening faces upwardly when either of said supporting side walls is disposed in engagement with said ground, and whereby the elevation of said inlet opening is greater when one of said supporting side walls is disposed in engagement with said ground than when the other of said supporting side walls is so disposed.

9. A collector according to claim 8, wherein said inlet opening lies within a plane disposed at an acute angle with respect to said top wall, and the distance measured between said inlet opening and said bottom wall differs from the distances measured between said inlet opening and said supporting side walls, whereby said inlet opening faces upwardly when any of said supporting walls are disposed in engagement with said ground, and whereby said inlet opening may be selectively disposed at three different elevations depending on which of said supporting walls are disposed in engagement with said ground.

10. A collector according to claim 2, wherein the distances measured between said inlet opening and said supporting walls differ, whereby said inlet opening may be selectively disposed at three different elevations depending on which of said supporting walls is disposed in engagement with said ground.

11. A collector according to claim 10, wherein said inlet opening faces upwardly when any of said supporting walls are disposed in engagement with said ground.

12. A collector according to claim 1, wherein said spout is of rigid construction and nonmovably connected into said top wall.

13. A collector according to claim 12, wherein said spout is curved lengthwise thereof such that said inlet opening lies within a plane disposed at an acute angle with respect to said top wall, and said spout is connected into said top wall such that a plane arranged normal to said top wall and bisecting said spout along a line extending lengthwise thereof is disposed at an acute angle less than 90° with respect to each of said nonsupporting side walls, whereby said inlet opening faces upwardly when any of said supporting walls are disposed in engagement with said ground.

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LEONARD H. GERIN, Primary Examiner

U.S. Cl. X.R.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,540,062

November 17, 1971

Anthony R. Leone

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 6, line 29, "there" should read -- three --.

Signed and sealed this 30th day of March 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER,
Commissioner of Patents