A fuel tank for a piece of machinery able to be used in a generally vertical in-use position and able to be stored in a generally horizontal resting position. The fuel tank has a fill inlet neck extending at an angle from the tank so that fuel stored within the tank will not leak out of the inlet or attached fuel cap when the machinery is placed in its in-use position or in its resting position.
VIBRATION RAMMER FUEL TANK

BACKGROUND OF THE INVENTION

[0001] The present invention generally relates to soil-packing compactors of the rammer-type, also known as tampers, and more particularly relates to fuel tanks utilized with the same as well as with any type of machinery having generally perpendicular resting and in-use positions.

[0002] A vibration rammer is a portable, self-propelled device used to tamp soil or other materials, thereby compacting it. Such tampers typically have a housing having a handle extending therefrom for allowing a user to maneuver the rammer, a transmission located in the housing for converting rotary movement to reciprocating movement, a tamper plate/shoe/foot underneath the transmission and connected to the transmission for tamping material over which the tamper is moved, a gasoline or diesel fueled engine mounted on the housing for supplying rotary movement to the transmission, and a fuel tank mounted on the housing for supplying a supply of fuel to the engine.

[0003] A four-cycle gasoline engine typically has vents within the fuel tank cap for allowing air to enter into the tank as fuel, fed by gravity, is drawn from the tank by the engine. A downside to the use of such a venting system is that if the gasoline tank of the engine is tilted so that the fuel level contained therein covers the cap’s vents, fuel will leak through the vents and out of the gas tank. This problem does not serve as much of a problem for most engine applications, such as lawn mower engines, because the engines tend to be used and stored in the same general plane relative to the ground surface, thereby allowing for easy configuration and location of the fuel tank fill inlet.

[0004] However, vibration tampers have two positions: a generally vertical “in-use” position, and a generally horizontal storage/transportation/resting position. Because the fuel level is more critical when the rammer is in use rather than at rest, the fuel tank inlets on prior art tampers are oriented generally parallel to the ground surface. Thus, the use of vented fill caps on four-cycle engine powered vibration tampers has always resulted in the dripping of fuel from the fill cap when the rammer is placed in its resting (and storage/transportation) position. Many users attempt to overcome this dripping problem through resting or storing the rammer with an empty or mostly empty status. Others just accept the fact that the rammer will drip a small amount of fuel on to the ground surface or trailer. An additional problem is the fact that when the fuel tank inlet is so located, the rammer must be vertically oriented in order to fill the fuel tank, often requiring a user to get another individual’s assistance to easily fill the tank.

[0005] What is needed is an improved fuel tank for vibration tampers whereby fuel does not leak through the vented cap of the fuel tank when the rammer is in its in-use or resting positions and which allows the rammer to be filled while the rammer is in its resting position. The present invention solves these needs.

SUMMARY OF THE INVENTION

[0006] The present invention is a fuel tank for use on machinery having a generally vertical, in-use orientation defining a vertical axis, and a generally horizontal, at-rest orientation defining a horizontal axis. In one embodiment, the fuel tank has a reservoir for holding a supply of fuel for combustion in the engine. The reservoir has a top side which is generally parallel to the horizontal axis. The reservoir has a back side generally parallel to the vertical axis. The supply of fuel, when contained in the reservoir, defines a fuel level. The fuel tank further has a fuel inlet spout which is fluidly connected to the reservoir. The fuel inlet spout allows a user to fill the reservoir with fuel. The fuel inlet spout has a neck which has an end defining an opening (the inlet). The neck is oriented in a plane oblique to the vertical axis and oblique to the horizontal axis and is of sufficient length to always position the opening above the fuel, when the tank is filled to capacity with fuel irrespective of whether the rammer is in its “in-use” position or its transport and storage position.

[0007] Other advantages of the present invention will become readily apparent to those skilled in this art from the following detailed description wherein I have shown and described only the preferred embodiment of the invention, simply by way of illustration of the best mode contemplated by carrying out my invention. As will be realized, the invention is capable of modification in various obvious respects without departing from the invention. Accordingly, the drawings and description of the preferred embodiment are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1A (PRIOR ART) is a side view of a typical rammer, with a prior art gas tank, said rammer in its generally horizontal, “resting” position.

[0009] FIG. 1B (PRIOR ART) is a side view of the rammer of FIG. 1A, said rammer in its generally vertical, “in-use” position.

[0010] FIG. 2A is a side view of a rammer utilizing one embodiment the invented fuel tank, said rammer in its generally horizontal, “resting” position.

[0011] FIG. 2B is a side view of the rammer of FIG. 2A, said rammer in its generally vertical, “in-use” position.

[0012] FIG. 3A is a side view of a second embodiment of the present invention.

[0013] FIG. 3B is a side view of a third embodiment of the present invention.

[0014] FIG. 3C is a side view of a fourth embodiment of the present invention.

[0015] FIG. 3D is a side view of a fifth embodiment of the present invention.

[0016] FIG. 3E is a side view of a sixth embodiment of the present invention.

[0017] FIG. 3F is a side view of a seventh embodiment of the present invention.

[0018] FIG. 3G is a side view of an eighth embodiment of the present invention.

[0019] FIG. 3H is a side view of a ninth embodiment of the present invention.

[0020] FIG. 3I is a side view of a tenth embodiment of the present invention.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] While the invention is susceptible of various modifications and alternative constructions, certain illustrated embodiments thereof have been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention as defined in the claims.

[0022] The present invention is an improved fuel tank for a piece of machinery which is able to be used in a generally vertical "in-use" position and able to be stored, transported, and/or rested in a generally horizontal, or laid down, position. A common type of such machinery are known as packing compactors of the rammer-type. Referring initially to FIG. 1A, and FIG. 1B, shown are side views of one embodiment of a prior art rammer utilizing the prior art style of fuel tank. This prior art rammer 80 has a fuel tank 82 having a top 84 in which an inlet and fuel cap 86 are located. The rammer has a frame 88 and a tamping foot 90. FIG. 1A shows the rammer 80 placed in its transportation and/or storage position where the user lays the rammer 80 forward so that it rests in a generally horizontal orientation upon a pair of rollers 76 which are attached to the front of frame 88, and foot 90. In such a manner, fuel 92 contained within the prior art fuel tank 82 may leak or drip out through the vent hole located in the fuel filler cap.

[0023] Referring now to FIG. 1B, the rammer 80 is shown in its generally vertical, "in-use" orientation. In this orientation, the foot 90 is rested upon the ground and the fuel within the fuel tank 82 is oriented so that the fuel does not spill or drip out of the cap 86.

[0024] Referring now to FIG. 2, one embodiment of the present invention is shown. In this embodiment, the improved fuel tank 10 has a reservoir 12 and a fuel inlet spout 30. The fuel inlet spout 30 is in fluid connection with the reservoir 12 so that a user can input fuel through the fuel inlet 30 and into the reservoir 12 for storage. The embodiment shown is a rectangular, prismatic-shaped reservoir 12, however, other shapes are also envisioned. The reservoir has a top side 14, a bottom side 18, a back side 16, and a front side 20. When installed in a typical rammer, the back side 16 would generally face the user; the top side 14, when the unit is in use, would be oriented upward with the bottom side 18 oriented downwards; and the front side 20 would be generally oriented towards the mass of the rammer 80 itself, as shown. Reservoir 12 is able to contain therein a quantity of fuel 64. When reservoir 12 is filled to capacity with fuel, the top surface of the fuel defines a first plane, which is labeled A-A, and when rammer 80 is laid down, either for storage or transport the same capacity fuel load defines a second plane B-B. Also, with this configuration, it should be apparent that reservoir 12 can be filled when rammer 60 is resting in the transport and/or storage position. This eliminates the need for someone to assist the user in filling the fuel reservoir since it is no longer necessary for one person to hold the rammer 60 in the upright "in-use" position while another person fills the tank.

[0025] Still referring to FIG. 2A, and likewise to FIG. 2B, the vibration rammer 60 has an engine 62 for combusting fuel. This rammer 60 has a generally vertically elongated rammer main body 66 having a lower end 70 extending to an upper end 72. A stamping plate 68 attaches to the lower end 78 of the main body 66 and a frame portion 72 attaches at or near the upper end 72 of the main body as well. While this disclosure discusses one form of rammer body or rammer style, the particular configuration of a rammer is not intended as a limitation upon the applicability of this invention to such differing rammer styles, or styles of machinery in general. The length of the main body 66 extends from the upper end 72 to the lower end 70, as shown in FIG. 2B, and defines a generally vertical axis ("V"). The handle or frame portion 74 of the rammer 60 likewise in a standard manner is typically oriented generally perpendicular to this vertical axis thereby defining a horizontal axis ("H"). In FIGS. 2A and 2B, the vertical axis is generally referred to through the use of the dotted line marked "V," and likewise, the horizontal axis is denoted by the dotted line labeled "H." The fuel inlet spout 30 of the present invention 10 is oriented in a manner so that the rammer and/or vibration rammer 60 is positioned or laid down in its resting position as shown in FIG. 2A or in its "in-use" position as shown in FIG. 2B, fuel 64 will not spill out of the fuel tank 10 because the inlet to the fuel inlet spout will always be above the plane defined by the fuel in reservoir 12, whether that be the first plane, A-A in the "in-use" position, or the second plane B-B in the laid down position.

[0026] Referring now to FIGS. 3A through 3I, various embodiments of fuel tanks 10 utilized in the present invention are shown. FIG. 3A shows an embodiment where the fuel inlet spout 34 extends obliquely from the top side 14 itself, as does FIG. 3B. FIGS. 3C and 3D show fuel inlet spout 34 extending from the juncture of the top side 14 and the back side 16. FIGS. 3E and 3F show the oblique extension of the fuel inlet spout 34 from the back side 16. FIG. 3G shows a embodiment having an extremely short fuel inlet spout 34. FIG. 3H shows an embodiment where the fuel inlet spout 34 extends from an oblique surface, and FIG. 3I shows one possible non-rectangular prismatic embodiment.

[0027] While there is shown and described the present preferred embodiment of the invention, it is to be distinctly understood that this invention is not limited thereto but may be variously embodied to practice within the scope of the following claims.

I claim:

1. An improved fuel tank for use on and attaching to a compacting rammer having an engine for combusting fuel, said fuel tank generally located at the upper end of said rammer, said rammer having a generally vertically elongated rammer main body having a stamping plate at a lower end thereof and having fuel tank receiving means at its upper end, the length of said body defining a vertical axis, said rammer being positionable to a generally vertical orientation when in use, and to a transport and/or storage position in a generally horizontal orientation when not in use, wherein said fuel tank comprises:

a tank, of a given fuel capacity, for holding a supply of fuel for combustion in said engine, said tank attached to said fuel tank receiving means, said tank defining a generally horizontal first plane coincident to the surface of the fuel when the tank is filled to capacity and when
said rammer is in the generally vertical orientation and a generally horizontal second plane when the tank is filled to capacity and when said rammer is in the transport and/or storage position; and

a fuel inlet spout fluidly connected to said reservoir for allowing a user to fill said reservoir with fuel, said fuel inlet spout defining an opening, said opening oriented in a plane oblique to said main and tank and configured in shape and length such that said opening remains above said first plane when the rammer is in a generally vertical orientation and above said second plane when the rammer is in the transport and/or storage position.

2. An improved fuel tank for use on a vibration rammer having an engine for combusting fuel, said rammer having a generally vertically elongated rammer main body having a stamping plate at a lower end thereof and having an upper end, the length of said body defining a vertical axis, and

a horizontally elongated frame portion attaching to said main body at said upper end, the length of said frame portion defining a horizontal axis,

a fuel tank fluidly connected to said engine, said fuel tank for holding a supply of fuel for combustion in said engine, said fuel tank having a top side generally parallel to said horizontal axis and a back side generally parallel to said vertical axis; and

a fuel inlet fluidly connected to said fuel tank for allowing a user to fill said fuel tank, said fuel inlet having a neck defining an opening, said neck oriented in a plane oblique to said vertical axis and oblique to said horizontal axis, said fuel inlet adjacent said fuel tank top and back sides.

3. A vibration rammer, said vibration rammer comprising:

a generally vertically elongated frame portion attaching to said main body at said upper end, the length of said frame portion defining a horizontal axis;

a fuel tank fluidly connected to said engine, said fuel tank for holding a supply of fuel for combustion in said engine, said fuel tank having a top side generally parallel to said horizontal axis and a back side generally parallel to said vertical axis; and

a fuel inlet fluidly connected to said fuel tank for allowing a user to fill said fuel tank, said fuel inlet having a neck defining an opening, said neck oriented in a plane oblique to said vertical axis and oblique to said horizontal axis, said fuel inlet adjacent said fuel tank top and back sides.

4. A fuel tank for use on machinery having a generally vertical, in-use orientation defining a vertical axis, and a generally horizontal, at-rest orientation defining a horizontal axis, said fuel tank comprising:

a reservoir for holding a supply of fuel for combustion in said engine, said reservoir having a top side generally parallel to said horizontal axis and a back side generally parallel to said vertical axis; and

a fuel inlet fluidly connected to said reservoir for allowing a user to fill said reservoir with fuel, said fuel inlet having a neck defining an opening, said neck oriented in a plane oblique to said vertical axis and oblique to said horizontal axis, said fuel inlet adjacent said reservoir top and back sides;

whereby when said machinery is oriented in its generally vertical, in-use orientation, said fuel level is below said fuel inlet opening; and

whereby when said machinery is oriented in its generally horizontal, at-rest orientation, said fuel level is below said fuel inlet opening.