CLAIMS

1. A container (10) intended to contain a liquid product, and provided with at least one non-return valve (20), the non-return valve (20) comprising:

- a base (21) having a central opening (23) for the passage of a fluid,
- a valve (22) that can be moved between a first closed position of said central opening and a second open position of said central opening (23),
- means (25) for guiding the translation of the movable valve between the first position and the second position, in a direction of movement substantially perpendicular to a plane of said central opening (23),

the container (10) comprising a bottom (11) provided with at least one passage (24) connecting the inside and the outside of the container, wherein the non-return valve (20) is arranged on the bottom (11) of the container, the base (21) of the non-return valve being borne by the bottom (11) of the container and the movable valve (22) being capable of occupying its first closed position and obstructing the passage (24) when a pressure differential exerted on the movable valve (22) between the outside of the container and the inside of the container is less than a predetermined positive threshold, and occupying its second open position and freeing the passage (24) when the pressure differential is greater than said threshold, wherein the means for guiding (25) comprise evenly distributed securing members (27) each extending from the base (21) along an axis parallel to an axis (A) of the central opening (23), from an upper surface (28) of the base (21), wherein the upper surface (28) is opposite a lower surface facing towards the bottom of the container (21),

characterized in that the means for guiding (25) comprise a single central guiding element (26) aligned on the axis (A) of the central opening and rigidly connected to the securing members (27) via a connecting member (30), the movable valve (22) being mounted free to translate relative to the central guiding element (26),

wherein the connecting member (30) comprises a central portion (31) supporting the central guiding element (26) and arms (32) spaced apart from each other and each rigidly connected to a securing member (27) and to the central portion (31), wherein the central guiding element (26) is rigidly connected to the base (21) via the connecting member (30) and the securing members (27).

2. The container (10) as claimed in claim 1, characterized in that the connecting member (30) is fixed relative to the securing members (27) and the central guiding member (26).

3. The container (10) as claimed in any one of the previous claims, characterized in that the central guiding element (26) has a circular cross-section with a predetermined outer diameter.

4. The container (10) as claimed in any one of the previous claims, characterized in that the movable valve (22) moves according to a predetermined guiding length between a first stop (44, 45) and a second stop (48, 53).

5. The container (10) as claimed in the previous claim, characterized in that the second stop (48, 53) is situated in the vicinity of one end of the central guiding element (26) and the first stop is formed by a first beveled surface (44) borne by the base (21), which complements a second beveled surface (45) borne by the movable valve (22), the first and second beveled surfaces (44, 45) being capable of coming into contact in a sealed manner around the central opening (23).

6. The container (10) as claimed in claim 4 or 5, in which the central guiding element (26) has a circular cross-section with a predetermined outer diameter,
characterized in that the ratio between the guiding length and the predetermined outer diameter of the central guiding element (26) is between 1 and 2.

7. The container (10) as claimed in any one of the previous claims, characterized in that the central guiding element (26) comprises a central rod (38) extending along the axis (A) of the central opening, the movable valve (22) including a through-orifice (43) receiving the central rod (38).

8. The container (10) as claimed in any one of claims 1 to 7, characterized in that the central guiding element (26) comprises a through-hole (50), the movable valve (22) bearing a rod (38') extending along the axis (A) of the central opening (23) and received in the through-hole (50).

9. The container (10) as claimed in any one of the previous claims, characterized in that the base (21) with said central opening (23) is an additional part that is fixed onto the bottom (11) of the container, said central opening (23) communicating with the passage (24) of the container (10) in which the base is formed by a portion of the bottom (11) of the container (10) and defines the central opening (23).

10. The container (10) as claimed in any one of the previous claims, characterized in that the container (10) is intended to contain a liquefied natural gas.

11. A thermally insulated tank (3) intended to contain a liquid product, the tank (3) comprising at least one container (10) as claimed in one of claims 1 to 10, and a pump (8) including a pump head (9) intended to suck up the liquid product contained inside the tank, the bottom (11) of the container (10) facing towards a bottom wall of the tank (3) and the pump head (9) being arranged in the container (10), near the bottom of the container (10).

12. A thermally insulated tank (3) as claimed in claim 11, characterized in that the tank (3) is intended to contain a liquefied natural gas.

13. A vessel (1), comprising a tank (3) as claimed in claim 11 or 12.

14. A vessel (1) as claimed in claim 13, characterized in that the vessel (1) is a liquefied natural gas carrier vessel.