closes off the end port to prevent water from entering, until the water has flowed away and the float descends back to its lowermost position again leaving the end port of the vent free. Depending on the extent to which the entry of water through the pipe head must be avoided, the side ports may have an upper end that is above or near the upper end of the float in its lowermost position for achieving high flow rates or have an upper end at a much lower level, for instance below a center of the float in its lowermost position or near the lower end of the float in its lowermost position to more effectively shield the end port from water ingress.

In many applications, an important characteristic of such air pipe heads is the flow rate of air into the tank, so that the tank can be emptied quickly, and the flow rate of liquid out of the tank so that no damage occurs even when the tanks is filled at a high flow rate until it flows over via the vents. Arranging the upper contour of the side ports lower will generally go at the expense of achievable flow rates.

SUMMARY OF THE INVENTION

~~It is an object~~ Embodiments of the invention seek to provide an air pipe head that allows a higher flow rate of ambient air into the tank.

According to a first aspect of the invention, ~~this object is achieved by providing~~there is provided an air pipe head comprising a housing bounding both a venting channel and a chamber, wherein the venting channel has an end port opening downwards into the chamber, wherein a float member is arranged in the chamber and guided for guided movement between an uppermost position closing off the end port and a lowermost position spaced below the end port, and wherein the chamber communicates with surroundings of the air pipe head via at least one side port, **characterized in that** a downwardly facing surface portion of the float member in its lowermost position is shielded in substantially all

lateral directions and an upper surface portion of the float member in its lowermost position is left exposed through said side port. ~~according to claim 1.~~

Because a downwardly facing portion of the float member in its lowermost position is shielded in substantially all lateral directions, i.e. also in the lateral directions in which the side port or side ports are facing, and an upper surface portion of the float member in its lowermost position is left exposed through the side port or ports, the downwardly facing surface portion of the float member is substantially shielded from air that flows in through the side port or side ports towards the venting channel, so lift exerted by the air flow onto the float member is at least reduced and a

higher flow rate can be reached without causing the float member to be lifted towards its uppermost position closing off the end port. Because an upper portion of the float member is left exposed, the shielding does not form a restriction that reduces the free cross-sectional area in the chamber available for air passing in and out or for liquid flowing out. Thus the capacity of the air pipe head with the float member in its lower position is substantially uncompromised.

~~The~~According to a second aspect of the invention, ~~may also be embodied in~~ there is provided a method of venting a tank of a vessel or allowing liquid to escape when the tank is filled to its full capacity, via a vent comprising an air pipe head as described herein.~~according to claim 11 in which such an air pipe head is used.~~

Further objects, features, effects and details of the invention are described below with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of an example of an air pipe head according to the invention;

Fig. 2 is a perspective cross-sectional view of the air pipe head according to Fig. 1, with arrows indicating inward air flow;

Fig. 3 is a side view in cross-section of halves of two examples of an air pipe head according to the invention, the left hand half being an air pipe head according to Figs. 1 and 2;

Fig. 4 is a side view of the air pipe head according to Figs. 1 and 2 and the left hand part of Fig. 3 with a float member in its lowermost position; and

Fig. 5 is a side view of the air pipe head according to Figs. 1 and 2, the left hand part of Fig. 3 and Fig. 4 with the float member in its uppermost position.

Claims

1. An air pipe head comprising a housing (1) bounding both a venting channel (2, 4) and a chamber (3), wherein the venting channel (2, 4) has an end port (5) opening downwards into the chamber (3), wherein a float member (6, 6') is arranged in the chamber (3) and guided for guided movement between an uppermost position (6') closing off the end port (5) and a lowermost position (6) spaced below the end port (5), and wherein the chamber (3) communicates with surroundings of the air pipe head via at least one side port (7; 57), **characterized in that** a downwardly facing surface portion (8) of the float member (6) in its lowermost position is shielded in substantially all lateral directions and an upper surface portion (9) of the float member (6) in its lowermost position is left exposed through said side port (7; 57).

2. An air pipe head according to claim 1, wherein a portion of ~~said~~ a shielding in said at least one laterally oriented side port (7) or forming a lower boundary of said side port (57) has an outer, upper end (16; 66) extending closely along said float member (6) in said lowermost position and more remote from an inner upper boundary (18) of said side port (7; 57) than a portion of said float member (6) in said lowermost position closest to said inner upper boundary (18) of said side port (7; 57).

3. An air pipe head according to claim 1 ~~or 2~~, further comprising a shielding, wherein said shielding includes at least one shield (19) arranged in and substantially closing off a lower portion of the at least one laterally oriented side port (7).