

Claims

1. An apparatus (2) for accumulating a fluid, the apparatus (2) comprising:
 - a drain bottle (4) for containing the fluid,
 - a reservoir (8) having an outlet (10) towards the drain bottle (4), the reservoir (8) and the drain bottle (4) communicating with each other via a valve (12) provided in the outlet (10),
 - a suction aperture (14) connectable with a suction pump for creating a vacuum in the reservoir (8),
 - an optical sensing device (22) operably coupled to the reservoir (8) and adjusted to measure the volume of the fluid standing in the reservoir (8), the optical sensing device (22) comprising a light source (26) and a detector (28), wherein the light source (26) is configured to emit light towards the reservoir (8) and the detector (28) is configured to detect an intensity of the light emanating from the reservoir (8), and
 - at least one light directing means (30, 32) for directing the light on its path from the light source (26) to the detector (28).
2. The apparatus (2) according to claim 1, **characterized in that** the optical sensing device (22) is configured as a structural unit being detachable from the reservoir (8).
3. The apparatus (2) according to claim 2, **characterized in that** the optical sensing device (22) is housed by a cap (24) detachably mounted to a bottle top attachment (6) connected to the drain bottle (4), the reservoir (8) being provided in the bottle top attachment (6).
4. The apparatus according to any one of claims 1 to 3, wherein the light source (26) and the detector (28) are provided at the same level along a milk path (P) in the reservoir (8).
5. The apparatus according to any one of the preceding claims, wherein the light source (26) and the detector (28) are spatially separated from a reservoir wall.
6. The apparatus according to any one of the preceding claims, wherein a spatial distance (D) between the light source (26) and the detector (28) corresponds at minimum to a width of the reservoir (8) transverses to the milk path (P).
7. The apparatus according to any one of the preceding claims, wherein the at least one light directing means (30, 32) is provided at or in a side wall of the reservoir (8).

8. The apparatus according to any one of the preceding claims, wherein the at least one light directing means (30, 32) comprises a reflecting surface (34, 36).
9. The apparatus according to any one of the preceding claims, wherein at least one light guide element (30) of the light directing means (30, 32) is provided between the light source (26) and the reservoir (8) such that light emitted from the light source (26) is redirected by the light guide element (30) to pass the reservoir wall (38) at an right angle.
10. The apparatus according to claim 9, wherein at least one light guide element (20.2) of the light directing means (30, 32) is provided between the reservoir (8) and the detector (28) such that light emanating from the reservoir (8) at a substantially right angle with respect to a reservoir wall (40) is redirected towards the detector (26).
11. The apparatus according to any one of the preceding claims, wherein
 - a plurality of light sources (26) are provided in an array, each light source (26) having a different level along the milk path (P),
 - a plurality of detectors (28) are provided in an array, each detector (28) having a different level along the milk path (P), and
 - each of the light sources (26) forms a pair with one of the detectors (28) which is provided at the same level.
12. The apparatus according to claim 10, wherein
 - a plurality of light sources (26) are provided in a row transvers to the milk path (P) to face, in a direction essentially parallel to the milk path (P), the light guide element (30) provided between the light source (26) and the reservoir (8),
 - a plurality of detectors (28) are provided in a row transvers to the milk path (P) to face, in a direction essentially parallel to the milk path (P), the light guide element (32) provided between the reservoir (8) and the detector (28),
 - the light guide element (30) provided between the light source (26) and the reservoir (8) comprises a plurality of reflecting surfaces arranged in a stair at or in the reservoir wall, each reflecting surface being provided at a different height of the reservoir wall and being assigned to one of the light sources (26),

the light guide element (32) provided between the reservoir (8) and the detector (28) comprises a plurality of reflecting surfaces arranged in a stair at or in the opposite reservoir wall, each reflecting surface being provided at a different height of the opposite reservoir wall and being assigned to one of the detectors (26), and

each of the light sources (26) forms a pair with one of the detectors (28) which is provided at the same level in a direction transvers to the milk path (P).