PATENT CLAIMS

1. A method for filtering a liquid (2) in a membrane filter (64) immersed in the liquid (2) and including membranes (76), the method comprising:
introducing a gas (1) through a gas introduction device (63) into a base of the membrane filter (64) in successive pulses so that the membranes (76) are cleaned wherein the gas introduction device (3, 63) includes a liquid flow channel (83) which vertically penetrates a gas collection space (7, 65) and admits the liquid (2) into a bottom of membrane filter (64); and initially

filling a gas volume (6) arranged below a surface (4) of the liquid (2) and defined in a downward direction by a level (5) of the liquid (2) with the gas (1) wherein the gas (1) simultaneously displaces the liquid (2) from a top down from a gas lifting channel (14, 70) until the level (5) drops below an inlet cross section (12, 72) of a gas flow out channel (13, 73); and subsequently

flowing the gas (1) out of the gas volume (6) downward through the gas lifting channel (14, 70), a deflection portion (11, 71) adjoining at a bottom of the gas lifting channel, in upward direction through the inlet cross section (12, 72) and through the gas flow out channel (13, 73) adjoining the inlet cross section (12, 72) at a top and flowing the gas to the surface (4),

characterized in that a housing (80) laterally surrounds the membranes (76) and adjoins the gas introduction device (63) on top.

2. The method according to the preceding claim, characterized in that a blocking flow (18) of the liquid runs through a compensation inlet (17, 75) below a gas

lifting inlet (16, 69) to the inlet cross section (12, 72) and is pulled along by the gas (1) until the liquid (2) fills the deflection portion (11, 71) and thus closes the inlet cross section (12, 72) for the gas (1).

3. The method according to the preceding claim, characterized in that

after the level (5) has dropped below the inlet cross section (12, 72) initially only the gas (1) flows through the gas outflow channel (13, 73) until the level (5) rises above the compensation inlet (17, 75), and

only then does the blocking flow (18) run through the compensation inlet (17, 75) to the inlet cross section (12, 72).

4. A filter device (84), comprising:

a membrane filter (64) for filtering a liquid (2), the membrane filter including membranes (76) and a gas introduction device (3, 63) arranged below the membranes (76), the gas introduction device including

a liquid flow channel (83) which vertically penetrates the gas collection space (7, 65) and admits the liquid (2) into a bottom of membrane filter (64);

a gas collection space (7, 65) which is open at a base and defined by an upper wall (8, 68) and a lateral wall (9, 66),

a gas inlet (10, 67) configured to flow a gas (1) into the gas collection space (7, 65),

a gas lifting channel (70) configured to siphon a gas out of the gas collection space (7,65) and empty the gas collection space (7, 65), the gas lifting channel including a gas lifting inlet (16, 69) at a top in the gas collection space (7, 65),

a deflection portion (11, 71) arranged at a bottom of the gas lifting channel (14, 70), and

an inlet cross section (12, 72) arranged at a top of the deflection portion (11, 71) wherein a gas outflow channel (13, 73) is connected at a top of the inlet cross section (12, 72),

characterized by a housing (80) which laterally surrounds the membranes (76) and which is connected to the gas introduction device (63) at a top of the gas introduction device.

5. The filter device (84) according to the preceding claim, characterized in that a compensation inlet (17, 75) is arranged below the gas lifting inlet (16, 69) and flowable towards the inlet cross section (12, 72).

6. The filter device (84) according to the preceding claim, characterized in that the compensation inlet (17, 75) is arranged at a level of the inlet cross section (12, 72) or above.

7. The filter device (84) according to one of Claims 5 and 6, characterized in that the compensation inlet (17, 75) is formed on the gas lifting channel (14, 70).

8. The filter device (84) according to one of Claims 5 to 7, characterized by a compensation channel (15, 74) which connects to the compensation inlet (17, 75) in a direction towards the deflection area (11, 71).

9. The filter device (84) according to the preceding claim, characterized in that the compensation channel (15, 74) leads into the gas lifting channel (14, 70).

10. The filter device (84) according to one of claims 8 and 9, characterized in that the compensation channel (15, 74) leads parallel to the gas lift channel (14, 70) into the deflection area (11, 71).

11. The filter device (84) according to one of claims 8 to 10, characterized in that a cross section of the compensation inlet (17, 75) is larger than a minimum cross section of the compensation channel (15, 7 4).

12. The filter device (84) according to one of claims 4 to 11, characterized in that the housing (80) is a continuous tube (81).

13. The filter device (84) according to one of claims 4 to 12, characterized by a gas distributor (82) below the membranes (76) wherein the gas outlet channel (13, 73) leads into the gas distributor.