CLAIMS

1. A process for separation of hydrocarbons from hydrocarbon-containing produced water in a pressure tank,
characterized by a first stage where the hydrocarbon-containing produced water is supplied and mixed with a gas-containing component, whereupon the gas- and hydrocarbon-containing produced water mixture is fed to an inlet tube (22, 27) in the centre of a tank, whereupon said mixture via a branch means (6) is tangentially distributed along the tank wall via at least one tube with at least one outlet nozzle (7) and at least one baffle plate (8.1), mounted under each inlet, leading water over the next inlet, whereupon hydrocarbons and gas with adherent oil droplets will rise to at least one outlet (9, 35, 36) from the tank and being discharged; and cleaned water is conveyed to an outlet (12) in the bottom of the tank.

2. Process according to claim 1,
characterized in that the water mixture from the first stage is fed to at least one separate stage via at least one plate (30) and at least one annulus chamber (28), and is further distributed tangentially along the tank wall via at least one tube with at least one outlet nozzle (32) and at least one baffle plate (8.2.) mounted under each inlet leading water over the next inlet; gas is supplied the annulus chamber (28) via gas addition (34).

3. Process according to claim 1,
characterized by in that a fraction of the water from outlet (12) is added gas via injection point (18) and recirculated via a stream (15) and fed to an annulus chamber (23) and distributed tangentially along the tank wall via branch means (24) comprising at least one tube with at least one outlet nozzle (25) and at least one baffle plate (8.2) mounted under each inlet leading water over the next inlet, countercurrently or cocurrently the descending water mixture from the first stage .

4. Process according to claims 1 to 3,
characterized in that the descending water mixture is fed over a layer of packing material (11).

5. Process according to any of the preceding claims,

characterized by hydrocarbon-containing produced water being further distributed via at least one branch means (26) in the top portion of the inlet tube (22, 27).

6. Process according to any of the preceding claims, characterized in that the gas-containing component is supplied via an extern addition point (2) or is recirculated with an injector(3) from the top of the tank (4).

7. Process according to claim 3, characterized in that the gas-containing component is recirculated with a injector(19) via tube (20) or is supplied via injection point (18).

8. Process according to any of the preceding claims, characterized in that pressure in the tank is controlled by means of a valve (PCV) in the outlet tube (12).

9. Apparatus for separation of hydrocarbons from hydrocarbon-containing produced water, characterized in that the apparatus comprises the following;

- a pressure tank ,
- at least one inlet tube (22, 27) in the centre of the tank,
- at least one branch means (6) in the top portion of the inlet tube, at least one nozzle (7) and at least one baffle plate (8.1) mounted under each inlet and leading water over the next inlet;
- at least one outlet (12) in the bottom of the tank for cleaned water;
- at least one outlet (9, 35, 36) rejecting rising gas with adherent oil droplets.

10. Apparatus according to claim 9, characterized in that the apparatus further comprises at least one vortex breaker (38), at least one plate (30) and at least one annulus chamber (28) which encircles the inlet tube (22, 27) and which has at least one branch means (31), at least at one level, and comprises at least one tube with at least one outlet nozzle (32) and at least one baffle plate (8.2) mounted under each inlet leading water over the next inlet.

11. Apparatus according to claim 9, characterized in that it further comprises an annulus chamber (23) which encircles the inlet tube (22, 27), comprising at least one branch means (24), at least at one level, and comprises at least one outlet nozzle (25) and at least one baffle plate (8.2) mounted under each inlet leading water over the next inlet; and a recycle tube supplying water from outlet (12) to the chamber (23).

12. Apparatus according to claims 9 to 11, characterized by a layer comprising a packing material (11).

13. Apparatus according to any of the preceding claims, characterized in that it comprises an adjustable nozzle means (26) mounted on the top of the inlet tube (22, 27).

14. Apparatus according to any of the preceding claims, characterized in that it comprises a valve (PCV) in the outlet tube (12) for control of the pressure.

CLAIMS

1. A process for separation of hydrocarbons from hydrocarbon-containing produced water in a pressure tank,
characterized by a first stage where the hydrocarbon-containing produced water is supplied and mixed with a gas-containing component, whereupon the gas- and hydrocarbon-containing produced water mixture is fed to an inlet tube (22, 27) in the centre of a tank, whereupon said mixture via a branch means (6) in the top portion of the inlet tube (22, 27) is tangentially distributed along the tank wall via more than one tube with at least one outlet nozzle (7) and at least one baffle plate (8.1), mounted under each outlet nozzle, whereupon gas with adherent oil droplets will rise to at least one submerged outlet (9, 35, 36) in the top of the tank and being discharged; and cleaned water is conveyed to an outlet (12) in the bottom of the tank.

2. Process according to claim 1,
characterized in that the water mixture from the first stage is fed to at least one separate stage via at least one plate (30) and at least one annulus chamber (28), and is further distributed tangentially along the tank wall via more than one tube with at least one outlet nozzle (32) and at least one baffle plate (8.2.) mounted under each outlet nozzle (32); gas is supplied the annulus chamber (28) via gas addition (34).

3. Process according to claim 1,
characterized in that a fraction of the water from outlet (12) is added gas via injection point (18) and recirculated via a stream (15) and fed to an annulus chamber (23) and distributed tangentially along the tank wall via branch means (24) comprising more than one tube with at least one outlet nozzle (25) and at least one baffle plate (8.2) mounted under each outlet nozzle (25), countercurrently or cocurrently the descending water mixture from the first stage.

4. Process according to claims 1 to 3,
characterized in that the descending water mixture is fed over a layer of packing material (11).

5. Process according to any of the preceding claims,
characterized by hydrocarbon-containing produced water being further distributed via at least one branch means (26) in the top portion of the inlet tube (22, 27).

6. Process according to any of the preceding claims,
characterized in that the gas-containing component is supplied via an extern addition point (2, 34) or is recirculated with an injector(3) from the top of the tank (4).

7. Process according to claim 3,
characterized in that the gas-containing component is recirculated with a injector(19) via tube (20) or is supplied via injection point (18).

8. Process according to any of the preceding claims, characterized in that pressure in the tank is controlled by means of a valve (PCV) in the outlet tube (12).

9. Apparatus for separation of hydrocarbons from hydrocarbon-containing produced water,
characterized in that the apparatus comprises the following;
- a pressure tank ,
- at least one inlet tube (22, 27) in the centre of the tank,
- at least one branch means (6) in the top portion of the inlet tube, more than one tube with at least one outlet nozzle (7) ending tangentially along the tank wall, and at least one baffle plate (8.1) mounted under each outlet nozzle (7);
- at least one outlet (12) in the bottom of the tank for cleaned water;
- at least one submerged outlet in the top of the tank (9, 35, 36) rejecting rising gas with adherent oil droplets.

10. Apparatus according to claim 9,
characterized in that the apparatus further comprises at least one vortex breaker (38), at least one plate (30) and at least one annulus chamber (28) which encircles the inlet tube (22, 27) and which has at least one branch means (31), at least at one level, and comprises more than one tube each having at least one outlet nozzle (32) and at least one baffle plate (8.2) mounted under each outlet nozzle (32).

11. Apparatus according to claim 9,
characterized in that it further comprises an annulus chamber (23) which encircles the inlet tube (22, 27), comprising at least one branch means (24), at least at one level, and comprises more than one tube with at least one outlet nozzle (25) and at least one baffle plate (8.2) mounted under each outlet nozzle (25); and a recycle tube supplying water from outlet (12) to the chamber (23).

12. Apparatus according to claims 9 to 11,
characterized by a layer comprising a packing material (11).

13. Apparatus according to any of the preceding claims, characterized in that it comprises an adjustable nozzle means (26) mounted on the top of the inlet tube (22, 27).

14. Apparatus according to any of the preceding claims,
characterized in that it comprises a valve (PCV) in the outlet tube (12) for control of the pressure.