THE EMBODIMENTS OF THE INVENTION FOR WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A vessel for removing particulates from a multiple-phase fluid stream containing gas, entrained liquid and particulates, the vessel comprising:

a volume having a diverging bounding wall, a distal base, and an apex; the diverging bounding wall having a top wall at a first inclination angle and a bottom wall at a second inclination angle; the second inclination angle at a greater angle than the first inclination angle;

a fluid inlet interface at the apex for receiving said fluid stream into the volume of the vessel;

a fluid outlet on the top wall and spaced from the fluid inlet interface;

a horizontally extending freeboard interface separating a freeboard portion formed adjacent an upper portion of the vessel above the freeboard interface and a belly portion therebelow, the belly portion being bounded at its bottom by the bottom wall, the freeboard portion forming a freeboard cross-sectional area for a freeboard velocity of the fluid stream less than a fluid stream velocity at the fluid inlet interface; and

an elongated flow path for receiving the fluid stream from the fluid inlet interface and directing the fluid stream to the fluid outlet; wherein

said length of the elongated flow path and the freeboard velocity being such that at least a portion of the entrained liquid and particulates fall out of the fluid stream, the particulates settle towards the bottom wall of the belly portion, and desanded gas is collected in the freeboard portion; and

wherein the desanded gas flows out of the freeboard portion through the fluid outlet and is free of at least a portion of the particulates.

2. The vessel of claim 1 wherein the second inclination angle is greater than the angle of repose of settled particulates.

3. The vessel of claim 1 or 2 wherein the first inclination angle is inclusively between 2 and 20 degrees.

4. The vessel of any one of claims 1 to 3 wherein the shape of the distal base is circular.

5. The vessel of any one of claims 1 to 4 wherein the central axis is perpendicular to the distal base.

6. The vessel of any one of claims 1 to 4 wherein the central axis is oblique to the distal base.

7. The vessel of any one of claims 1 to 6 further comprising a lower discharge for discharging liquid and particulates.

8. The vessel of claim 7 wherein the lower discharge further comprises:

an inlet valve adjacent and fluidly connected to the lower discharge;

a particulate accumulation chamber; and

a discharge valve, wherein

the particulate accumulation chamber is sandwiched between the inlet valve and the discharge valve.

9. The vessel of any one of claims 1 to 8 wherein the fluid inlet interface has a discharge end, and wherein the discharge end is oriented for discharging the gas stream into the freeboard portion at about the top inclination angle.

10. The vessel of any one of claims 1 to 9 wherein the fluid inlet interface further comprises a replaceable nozzle having a discharge end oriented for discharging the gas stream into the freeboard portion.

11. The vessel of claim 10 wherein the replaceable nozzle is connected to the fluid inlet interface at a flange.

12. The vessel of any one of claims 1 to 11 wherein the gas stream emanates from a wellhead, and wherein the fluid inlet interface further comprises a receiving end orthogonal to the wellhead for receiving the gas stream.

13. The vessel of any one of claims 1 to 12 wherein the first inclination angle is variable for adapting to fluid stream conditions.

14. The vessel of any one of claims 1 to 13 wherein the second inclination angle is variable for adapting to particulate stream conditions.

15. The vessel of any one of claims 1 to 14 wherein the fluid outlet is located on the top of the top wall.

16. A method for desanding a fluid stream emanating from a wellhead, the fluid stream containing gas, entrained liquid and particulates, the method comprising:

providing an elongated vessel extending from a proximal end downwardly towards a distal end and having a diverging bounding wall to define a top inclination angle and a bottom inclination angle larger than the top inclination angle;

injecting, at a first fluid velocity, the fluid stream into the vessel from the proximal end;

directing, at a second fluid velocity slower than said first fluid velocity, said fluid stream along an elongated flow path in the vessel from the proximal end towards the distal end to allow at least a portion of the particulates to fall out of the fluid stream and collect in a belly portion;

collecting desanded gas in a freeboard portion, said freeboard portion being above the belly portion and being separated therefrom by a gas/liquid interface; and

discharging the desanded gas from the freeboard portion at the distal end; wherein

said desanded gas is free of at least a portion of the particulates.

17. The method of claim 16 further comprising:

collecting particulates in the belly portion; and

discharging at least the collected particulates from the belly portion.

18. The method of claim 16 further comprising:

collecting liquid and particulates in the belly portion; and

discharging collected particulates and liquid from the belly portion.

19. The method of any one of claims 16 to 18 further comprising:

discharging the desanded gas and liquid from the freeboard portion at the distal end.

20. The method of any one of claims 16 to 19 wherein injecting the fluid stream into the vessel from the proximal end comprises:

injecting, at a first fluid velocity, the fluid stream into the vessel from the proximal end at about the top inclination angle.

21. A vessel for removing particulates from a multiple-phase fluid stream containing at least gas, liquid and entrained particulates, the vessel comprising:

a volume defined by a diverging bounding wall, a distal base, and an apex; the diverging bounding wall having a top wall at a first inclination angle and a bottom wall at a second inclination angle; the second inclination angle being a greater angle than the first inclination angle;

a fluid inlet at the apex;

a fluid outlet having an intake opening spaced from the fluid inlet;

wherein the fluid inlet injects the fluid stream into the volume and directs the fluid stream along an elongated flow path from the fluid inlet towards the fluid outlet, to allow at least a portion of the entrained particulates fall out of the fluid stream and move into a lower portion of the volume, and to allow gas being collected in an upper portion of the volume in fluid communication with the intake opening of the fluid outlet for being discharged via the fluid outlet; and

wherein the intake opening of the fluid outlet determines a horizontally extending freeboard interface, said freeboard interface separating the upper portion of the vessel above the interface and the lower portion therebelow, the upper portion forming a cross-sectional area for establishing a velocity of the fluid stream therein being slower than the fluid stream velocity at the fluid inlet.

22. The vessel of claim 21 wherein at least a portion of the liquid falls into the lower portion of the volume.

23. The vessel of claim 21 or 22 wherein, at a steady state, the level of the liquid surface is at an elevation about the intake opening of the fluid outlet.

24. The vessel of claim 23 wherein, at the steady state, at least a portion of the liquid is re-entrained with the gas and discharged from the fluid outlet.

25. The vessel of any one of claims 21 to 24 wherein the second inclination angle is greater than the angle of repose of settled particulates.

26. The vessel of any one of claims 21 to 25 wherein the first inclination angle is inclusively between 2 and 20 degrees.

27. The vessel of any one of claims 21 to 26 wherein the shape of the distal base is circular.

28. The vessel of any one of claims 21 to 27 wherein the central axis is perpendicular to the distal base.

29. The vessel of any one of claims 21 to 27 wherein the central axis is oblique to the distal base.

30. The vessel of any one of claims 21 to 29 further comprising a lower discharge for discharging liquid and particulates.

31. The vessel of claim 30 wherein the lower discharge further comprises:

an inlet valve adjacent and fluidly connected to the lower discharge;

a particulate accumulation chamber; and

a discharge valve, wherein

the particulate accumulation chamber is sandwiched between the inlet valve and the discharge valve.

32. The vessel of any one of claims 21 to 31 wherein the fluid inlet interface has a discharge end, and wherein the discharge end is oriented for discharging the fluid stream into the volume at about the first inclination angle.

33. The vessel of any one of claims 21 to 32 wherein the fluid inlet interface further comprises a replaceable nozzle having a discharge end oriented for discharging the fluid stream into the volume.

34. The vessel of claim 33 wherein the replaceable nozzle is connected to the fluid inlet interface at a flange.

35. The vessel of any one of claims 21 to 34 wherein the gas stream emanates from a wellhead, and wherein the fluid inlet interface further comprises a receiving end orthogonal to the wellhead for receiving the gas stream.

36. The vessel of any one of claims 21 to 35 wherein the first inclination angle is variable for adapting to fluid stream conditions.

37. The vessel of any one of claims 21 to 36 wherein the second inclination angle is variable for adapting to particulate stream conditions.

38. The vessel of any one of claims 21 to 37 wherein the fluid outlet is located on the top of the top wall.