CLAIMS

1. A method for conditioning a filter assembly which includes a permeable filter medium having an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the method comprising:

opening the inlet and the vent and closing the outlet, and passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent of the filter assembly; and

opening the inlet and the outlet and closing the vent, and first passing purging liquid at a first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet of the filter assembly, and then passing purging liquid at a second flow rate greater than the first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet of the filter assembly, thereby filling the filter assembly with the purging liquid.

2. The method of claim 1 wherein passing purging liquid includes passing a solvent.

3. The method of claim 1 or 2 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent includes increasing the pressure at the inlet of the filter assembly.

4. The method of claim 1, 2, or 3 wherein passing purging liquid at the first flow rate includes decreasing the pressure at the outlet of the filter assembly.

5. The method of claim 4 wherein decreasing the pressure at the outlet of the filter assembly includes vacuum drawing the purging liquid from the outlet of the filter assembly.

6. The method of any of claims 1-5 wherein passing the purging liquid at the second flow rate includes increasing the pressure of the purging fluid at the inlet of the filter assembly.

7. The method of any of claims 1-6 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent of the filter assembly includes directing purging liquid from the open vent to a waste reservoir fluidly coupled to the vent of the filter assembly.

8. The method of any of claims 1-7 wherein passing purging liquid at a first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, and through the open outlet of the filter assembly includes directing purging liquid from the outlet to a waste reservoir coupled to the outlet of the filter assembly.

9. The method of claim 3 or 6 wherein increasing the pressure of the purging liquid at the inlet of the filter assembly includes applying pressure against a container which contains the purging liquid and is fluidly coupled to the inlet of the filter assembly, thereby forcing purging liquid from the container to the inlet of the filter assembly.

10. The method of any of claims 1-8 further comprising supplying purging liquid from a first container fluidly coupled to the inlet of the filter assembly.

11. The method of claim 10 wherein passing purging liquid at a second flow rate through the open inlet, through the filer medium from the upstream side to the downstream side, and through the open outlet of the filter assembly includes directing purging liquid from the outlet to a second container capable of containing purging liquid.

12. The method of claim 11 further comprising coupling the second container to the inlet of a second filter assembly and conditioning the second filter assembly with the purging liquid in the second container.

13. The method of claim 12 wherein conditioning the second filter assembly includes passing purging liquid through a filter between the second container and the inlet of the second filter assembly.

14. The method of claim 11 or 12 wherein directing purging liquid from the outlet of the filter assembly to the second container includes passing purging liquid through a filter between the outlet and the second container.

15. A method for conditioning a filter assembly which includes a permeable filter medium having an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter assembly, and an outlet on the downstream side of the filter assembly, the method comprising:

opening the inlet and the vent and closing the outlet and:

supplying purging liquid from a first container fluidly coupled to the inlet of the filter assembly;

passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent; and

directing the purging liquid from the open vent to a waste reservoir; and

then opening the inlet and the outlet and closing the vent and:

supplying purging liquid from the first container fluidly coupled to the inlet of the filter assembly;

initially passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir; and

then passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to a second container capable of containing purging liquid, thereby filling the filter assembly with purging liquid and recovering a portion of the purging liquid.

16. The method of claim 15 further comprising coupling the second container to the inlet of a second filter assembly and conditioning the second filter assembly with the purging liquid in the second container.

17. The method of claim 15 or 16 further comprising directing the purging fluid through a filter coupled between the outlet of the filter assembly and the second container.

18. The method of claim 16 further comprising directing the purging fluid through a filter coupled between the second container and the second filter assembly.

19. The method of any of claims 15-18 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the waste reservoir includes passing purging liquid through the open inlet at a first flow rate and wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to a second container capable of containing purging liquid includes passing purging liquid through the open inlet at a second flow rate greater than the first flow rate.

20. The method of any of claims 15-19 wherein passing purging liquid includes passing a solvent.

21. The method of any of claims 15-20 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, through the open vent to the waste reservoir includes increasing the pressure at the inlet of the filter assembly.

22. The method of any of claims 15-20 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the waste reservoir includes decreasing the pressure at the outlet of the filter assembly.

23. The method of claim 22 wherein decreasing the decreasing the pressure at the outlet of the filter assembly includes vacuum drawing the purging liquid from the outlet of the filter assembly.

24. The method of any of claims 15-23 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the second container includes increasing the pressure at the inlet of the filter assembly.

25. A system for conditioning a filter assembly having a filter medium which includes an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the system comprising:

a purging liquid supply coupleable to an inlet of a filter assembly;

a waste reservoir coupleable to an outlet and a vent of the filter assembly;

a pressure source arranged to drive purging liquid from the purging liquid supply to the inlet of the filter assembly;

an inlet valve operable to open and close the inlet of the filter assembly;

an outlet valve operable to open and close the outlet of the filter assembly;

a vent valve operable to open and close the vent of the filter assembly;

a controller connected to the pressure source, the inlet valve, the outlet valve, and the vent valve, wherein the controller is operable in a first stage to open the inlet valve and the vent valve, close the outlet valve and direct purging liquid from the purging liquid supply, through the open inlet of the filter assembly, along the upstream side of the filter medium, through the open vent to the waste reservoir, wherein the controller is operable in a first phase of a second subsequent stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the purging liquid supply at a first flow rate through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir, and wherein the controller is operable in a second subsequent phase of the second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the purging liquid supply at a greater second flow rate through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet, thereby filling the filter assembly with purging liquid.

26. The system of claim 25 further comprising a vacuum device coupleable to the outlet of the filter assembly, wherein the controller is coupled to the vacuum device and is operable to control the vacuum source to decrease the pressure at the outlet of the filter assembly during the first phase of the second stage.

27. The system of claim 25 or 26 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the first stage.

28. The system of claim 25 or 26 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the second phase of the second stage.

29. The system of claim 25 or 26 wherein the purging liquid supply comprises a container and the pressure source is controlled by the controller to exert pressure on the exterior of the container to drive purging liquid from the container to the inlet of the filter assembly.

30. The system of any of claims 25-28 wherein the purging liquid supply comprises a first container for containing purging liquid, the system further comprising a second container for containing purging liquid and a first valve arrangement coupled between the outlet of the filter assembly, the waste reservoir and the second container, the controller being connected to the first valve arrangement to direct purging liquid from the open outlet to the waste reservoir during the first phase of the second stage and to direct purging liquid from the open outlet to the second container during the second phase of the second stage.

31. The system of claim 30 wherein the second container is coupleable to an inlet of a second filter assembly.

32. The system of claim 30 further comprising a second valve arrangement coupled between the first container, the outlet of the filter assembly, and the inlet of the filter assembly and a third valve arrangement coupled between the second container, the outlet of the filter assembly, and the inlet of the filter assembly, wherein the purging liquid supply comprises the first container and the second container and wherein the controller is connected to the second and third valve arrangements to alternately drive purging liquid from the first container through an open inlet and an open outlet of a first filter assembly to the second container and drive purging liquid from the second container through an open inlet and an open outlet of a second filter assembly to the first container.

33. The system of any of claims 25-32 wherein the filter medium has a removal rating of about 0.05 micron or less.

34. A system for conditioning a filter assembly having a filter medium which includes an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the system comprising:

a first container containing purging liquid and being coupleable to the inlet of a filter assembly;

a second container for containing purging liquid and being coupleable to an outlet of the filter assembly;

a waste reservoir coupleable to the outlet and the vent of the filter assembly;

a pressure source arranged to drive purging liquid from the first container to the inlet of the filter assembly;

an inlet valve operable to open and close the inlet of the filter assembly;

an outlet valve operable to open and close the outlet of the filter assembly;

a vent valve operable to open and close the vent of the filter assembly; and

a controller coupled to the pressure source, the inlet valve, the outlet valve, and the vent valve, wherein the controller is operable in a first stage to open the inlet valve and the vent valve, close the outlet valve and direct purging liquid from the first container through the open inlet of the filter assembly, along the upstream side of the filter medium, through the open vent to the waste reservoir, wherein the controller is operable in a first phase of a second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging fluid from the first container through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir, and wherein the controller is operable in a second subsequent phase of the second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the first container, through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the second container, thereby filling the filter assembly with purging liquid and recovering a portion of the purging liquid.

35. The system of claim 34 further comprising a first valve arrangement coupled between the outlet of the filter assembly, the waste reservoir, and the second container, the controller being connected to the first valve arrangement and operable to direct purging liquid to the waste reservoir during the first phase of the second stage and direct purging liquid to the second container during the second phase of the second stage.

36. The system of claim 34 or 35 further comprising a vacuum device coupleable to the outlet of the filter assembly, wherein the controller is coupled to the vacuum device and is operable to control the vacuum source to decrease the pressure at the outlet of the filter assembly during the first phase of the second stage.

37. The system of any of claims 34-36 wherein the pressure source is controlled by the controller to exert pressure on the exterior of the first container to drive purging liquid from the container to the inlet of the filter assembly.

38. The system of any of claims 34-36 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the first stage.

39. The system of any of claims 34-36 and 38 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the second phase of the second stage.

40. The system of any of claims 34-39 wherein the second container is coupleable to the inlet of the filter assembly.

41. The system of any of claims 34-39 further comprising a second valve arrangement coupled between the first container, the outlet of the filter assembly, and the inlet of the filter assembly and a third valve arrangement coupled between the second container, the outlet of the filter assembly, and the inlet of the filter assembly, wherein the pressure source is arranged to drive purging liquid from the second container and the controller is coupled to the second and third valve arrangements to alternatively drive purging liquid from the first container through an open inlet and an open outlet of a first assembly to the second container and drive purging liquid from the second container through an open inlet and an open outlet of a second filter assembly to the first container.

42. The system of any of claims 34-41 wherein the filter medium has a removal rating of about 0.05 micron or less.

CLAIMS

1. A method for conditioning a filter assembly which includes a permeable filter medium having an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the method comprising:

opening the inlet and the vent and closing the outlet, and passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent of the filter assembly; and

opening the inlet and the outlet and closing the vent, and first passing purging liquid at a first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet of the filter assembly, and then passing purging liquid at a second flow rate greater than the first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet of the filter assembly, thereby filling the filter assembly with the purging liquid.

2. The method of claim 1 wherein passing purging liquid includes passing a solvent.

3. The method of claim 1 or 2 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent includes increasing the pressure at the inlet of the filter assembly.

4. The method of claim 1, 2, or 3 wherein passing purging liquid at the first flow rate includes decreasing the pressure at the outlet of the filter assembly.

5. The method of claim 4 wherein decreasing the pressure at the outlet of the filter assembly includes vacuum drawing the purging liquid from the outlet of the filter assembly.

6. The method of any of claims 1-5 wherein passing the purging liquid at the second flow rate includes increasing the pressure of the purging fluid at the inlet of the filter assembly.

7. The method of any of claims 1-6 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent of the filter assembly includes directing purging liquid from the open vent to a waste reservoir fluidly coupled to the vent of the filter assembly.

8. The method of any of claims 1-7 wherein passing purging liquid at a first flow rate through the open inlet, through the filter medium from the upstream side to the downstream side, and through the open outlet of the filter assembly includes directing purging liquid from the outlet to a waste reservoir coupled to the outlet of the filter assembly.

9. The method of claim 3 or 6 wherein increasing the pressure of the purging liquid at the inlet of the filter assembly includes applying pressure against a container which contains the purging liquid and is fluidly coupled to the inlet of the filter assembly, thereby forcing purging liquid from the container to the inlet of the filter assembly.

10. The method of any of claims 1-8 further comprising supplying purging liquid from a first container fluidly coupled to the inlet of the filter assembly.

11. The method of claim 10 wherein passing purging liquid at a second flow rate through the open inlet, through the filer medium from the upstream side to the downstream side, and through the open outlet of the filter assembly includes directing purging liquid from the outlet to a second container capable of containing purging liquid.

12. The method of claim 11 further comprising coupling the second container to the inlet of a second filter assembly and conditioning the second filter assembly with the purging liquid in the second container.

13. The method of claim 12 wherein conditioning the second filter assembly includes passing purging liquid through a filter between the second container and the inlet of the second filter assembly.

14. The method of claim 11 or 12 wherein directing purging liquid from the outlet of the filter assembly to the second container includes passing purging liquid through a filter between the outlet and the second container.

15. A method for conditioning a filter assembly which includes a permeable filter medium having an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter assembly, and an outlet on the downstream side of the filter assembly, the method comprising:

opening the inlet and the vent and closing the outlet and:

supplying purging liquid from a first container fluidly coupled to the inlet of the filter assembly;

passing purging liquid through the open inlet, along the upstream side of the filter medium, and through the open vent; and

directing the purging liquid from the open vent to a waste reservoir; and

then opening the inlet and the outlet and closing the vent and:

supplying purging liquid from the first container fluidly coupled to the inlet of the filter assembly;

initially passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir; and

then passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to a second container capable of containing purging liquid, thereby filling the filter assembly with purging liquid and recovering a portion of the purging liquid.

16. The method of claim 15 further comprising coupling the second container to the inlet of a second filter assembly and conditioning the second filter assembly with the purging liquid in the second container.

17. The method of claim 15 or 16 further comprising directing the purging fluid through a filter coupled between the outlet of the filter assembly and the second container.

18. The method of claim 16 further comprising directing the purging fluid through a filter coupled between the second container and the second filter assembly.

19. The method of any of claims 15-18 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the waste reservoir includes passing purging liquid through the open inlet at a first flow rate and wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to a second container capable of containing purging liquid includes passing purging liquid through the open inlet at a second flow rate greater than the first flow rate.

20. The method of any of claims 15-19 wherein passing purging liquid includes passing a solvent.

21. The method of any of claims 15-20 wherein passing purging liquid through the open inlet, along the upstream side of the filter medium, through the open vent to the waste reservoir includes increasing the pressure at the inlet of the filter assembly.

22. The method of any of claims 15-20 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the waste reservoir includes decreasing the pressure at the outlet of the filter assembly.

23. The method of claim 22 wherein decreasing the decreasing the pressure at the outlet of the filter assembly includes vacuum drawing the purging liquid from the outlet of the filter assembly.

24. The method of any of claims 15-23 wherein passing purging liquid through the open inlet, through the filter medium from the upstream side to the downstream side, through the open outlet to the second container includes increasing the pressure at the inlet of the filter assembly.

25. A system for conditioning a filter assembly having a filter medium which includes an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the system comprising:

a purging liquid supply coupleable to an inlet of a filter assembly;

a waste reservoir coupleable to an outlet and a vent of the filter assembly;

a pressure source arranged to drive purging liquid from the purging liquid supply to the inlet of the filter assembly;

an inlet valve operable to open and close the inlet of the filter assembly;

an outlet valve operable to open and close the outlet of the filter assembly;

a vent valve operable to open and close the vent of the filter assembly;

a vacuum device coupleable to the outlet of the filter assembly; and

a controller connected to the pressure source, the inlet valve, the outlet valve, and the vent valve and coupled to the vacuum device,

wherein the controller is operable in a first stage to open the inlet valve and the vent valve, close the outlet valve and direct purging liquid from the purging liquid supply, through the open inlet of the filter assembly, along the upstream side of the filter medium, through the open vent to the waste reservoir,

wherein the controller is operable in a first phase of a second subsequent stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the purging liquid supply at a first flow rate through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir, and to control the vacuum device to decrease the pressure at the outlet of the filter assembly during the first phase of the second stage, and

wherein the controller is operable in a second subsequent phase of the second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the purging liquid supply at a greater second flow rate through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet, thereby filling the filter assembly with purging liquid.

26. The system of claim 25 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the first stage.

27. The system of claim 25 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the second phase of the second stage.

28. The system of claim 25 wherein the purging liquid supply comprises a container and the pressure source is controlled by the controller to exert pressure on the exterior of the container to drive purging liquid from the container to the inlet of the filter assembly.

29. The system of any of claims 25-27 wherein the purging liquid supply comprises a first container for containing purging liquid, the system further comprising a second container for containing purging liquid and a first valve arrangement coupled between the outlet of the filter assembly, the waste reservoir and the second container, the controller being connected to the first valve arrangement to direct purging liquid from the open outlet to the waste reservoir during the first phase of the second stage and to direct purging liquid from the open outlet to the second container during the second phase of the second stage.

30. The system of claim 29 wherein the second container is coupleable to an inlet of a second filter assembly.

31. The system of claim 29 further comprising a second valve arrangement coupled between the first container, the outlet of the filter assembly, and the inlet of the filter assembly and a third valve arrangement coupled between the second container, the outlet of the filter assembly, and the inlet of the filter assembly, wherein the purging liquid supply comprises the first container and the second container and wherein the controller is connected to the second and third valve arrangements to alternately drive purging liquid from the first container through an open inlet and an open outlet of a first filter assembly to the second container and drive purging liquid from the second container through an open inlet and an open outlet of a second filter assembly to the first container.

32. The system of any of claims 25-31 wherein the filter medium has a removal rating of about 0.05 micron or less.

33. A system for conditioning a filter assembly having a filter medium which includes an upstream side and a downstream side, an inlet and a vent on the upstream side of the filter medium, and an outlet on the downstream side of the filter medium, the system comprising:

a first container containing purging liquid and being coupleable to the inlet of a filter assembly;

a second container for containing purging liquid and being coupleable to an outlet of the filter assembly;

a waste reservoir coupleable to the outlet and the vent of the filter assembly;

a pressure source arranged to drive purging liquid from the first container to the inlet of the filter assembly;

an inlet valve operable to open and close the inlet of the filter assembly;

an outlet valve operable to open and close the outlet of the filter assembly;

a vent valve operable to open and close the vent of the filter assembly; and

a controller coupled to the pressure source, the inlet valve, the outlet valve, and the vent valve, wherein the controller is operable in a first stage to open the inlet valve and the vent valve, close the outlet valve and direct purging liquid from the first container through the open inlet of the filter assembly, along the upstream side of the filter medium, through the open vent to the waste reservoir, wherein the controller is operable in a first phase of a second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging fluid from the first container through the open inlet of the filter assembly, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the waste reservoir, and wherein the controller is operable in a second subsequent phase of the second stage to open the inlet valve and the outlet valve, close the vent valve, and direct purging liquid from the first container, through the open inlet, through the filter medium from the upstream side to the downstream side, along the downstream side of the filter medium, and through the open outlet to the second container, thereby filling the filter assembly with purging liquid and recovering a portion of the purging liquid.

34. The system of claim 33 further comprising a first valve arrangement coupled between the outlet of the filter assembly, the waste reservoir, and the second container, the controller being connected to the first valve arrangement and operable to direct purging liquid to the waste reservoir during the first phase of the second stage and direct purging liquid to the second container during the second phase of the second stage.

35. The system of claim 33 or 34 further comprising a vacuum device coupleable to the outlet of the filter assembly, wherein the controller is coupled to the vacuum device and is operable to control the vacuum source to decrease the pressure at the outlet of the filter assembly during the first phase of the second stage.

36. The system of any of claims 33-35 wherein the pressure source is controlled by the controller to exert pressure on the exterior of the first container to drive purging liquid from the container to the inlet of the filter assembly.

37. The system of any of claims 33-35 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the first stage.

38. The system of any of claims 33-35 and 37 wherein the controller is operable to control the pressure source to increase the pressure at the inlet of the filter assembly during the second phase of the second stage.

39. The system of any of claims 33-38 wherein the second container is coupleable to the inlet of the filter assembly.

40. The system of any of claims 33-38 further comprising a second valve arrangement coupled between the first container, the outlet of the filter assembly, and the inlet of the filter assembly and a third valve arrangement coupled between the second container, the outlet of the filter assembly, and the inlet of the filter assembly, wherein the pressure source is arranged to drive purging liquid from the second container and the controller is coupled to the second and third valve arrangements to alternatively drive purging liquid from the first container through an open inlet and an open outlet of a first assembly to the second container and drive purging liquid from the second container through an open inlet and an open outlet of a second filter assembly to the first container.

41. The system of any of claims 33-40 wherein the filter medium has a removal rating of about 0.05 micron or less.