WHAT IS CLAIMED IS:

1. A variable flow resistance system for use in a subterranean well, the system comprising:

a vortex device through which a fluid composition flows; and

wherein a resistance to flow of the fluid composition through the vortex device is dependent on a rotation of the fluid composition at an inlet to the vortex device.

2. The system of claim 1, wherein the resistance to flow of the fluid composition through the vortex device increases in response to an increased rotation of the fluid composition at the inlet to the vortex device.

3. The system of claim 1, wherein the rotation of the fluid composition at the inlet increases in response to a decrease in viscosity of the fluid composition.

4. The system of claim 1, wherein the rotation of the fluid composition at the inlet increases in response to an increase in velocity of the fluid composition.

5. The system of claim 1, wherein the rotation of the fluid composition at the inlet increases in response to a decrease in a ratio of desired to undesired fluid in the fluid composition.

6. The system of claim 1, wherein an outlet of the vortex device comprises an inlet of another vortex device.

7. The system of claim 1, wherein the inlet of the vortex device comprises an outlet of another vortex device.

8. The system of claim 1, wherein the vortex device comprises at least first and second passages which receive the fluid composition from an outlet of another vortex device, and wherein a difference in proportions of the fluid composition which flows through the respective first and second passages is dependent on the rotation of the fluid composition at the outlet.

9. The system of claim 8, wherein the difference in the proportions of the fluid composition which flows through the first and second passages increases in response to an increase in velocity of the fluid composition.

10. The system of claim 8, wherein rotation of the fluid composition in a vortex chamber increases in response to an increase in the difference in the proportions of the fluid composition which flows through the first and second passages.

11. A variable flow resistance system for use in a subterranean well, the system comprising:

a first vortex device having an outlet; and

a second vortex device which receives a fluid composition from the outlet of the first vortex device, a resistance to flow of the fluid composition through the second vortex device being dependent on a rotation of the fluid composition at the outlet of the first vortex device.

12. The system of claim 11, wherein the rotation of the fluid composition at the outlet increases in response to a decrease in viscosity of the fluid composition.

13. The system of claim 11, wherein the rotation of the fluid composition at the outlet increases in response to an increase in velocity of the fluid composition.

14. The system of claim 11, wherein the rotation of the fluid composition at the outlet increases in response to a decrease in a ratio of desired to undesired fluid in the fluid composition.

15. The system of claim 11, wherein the resistance to flow of the fluid composition through the second vortex device increases in response to an increase in the rotation of the fluid composition at the outlet of the first vortex device.

16. The system of claim 11, wherein an outlet of the second vortex device comprises an inlet of a third vortex device.

17. The system of claim 11, wherein the second vortex device comprises at least first and second passages which receive the fluid composition from the outlet of the first vortex device, and wherein a difference in proportions of the fluid composition which flows through the respective first and second passages is dependent on the rotation of the fluid composition at the outlet of the first vortex device.

18. The system of claim 17, wherein the difference in the proportions of the fluid composition which flows through the first and second passages increases in response to an increase in velocity of the fluid composition.

19. The system of claim 17, wherein rotation of the fluid composition in a vortex chamber of the second vortex device increases in response to an increase in the difference in the proportions of the fluid composition which flows through the first and second passages.

20. A variable flow resistance system for use in a subterranean well, the system comprising:

a first vortex device which causes increased rotation of a fluid composition at an outlet of the first vortex device in response to an increase in a velocity of the fluid composition; and

a second vortex device which receives the fluid composition from the outlet of the first vortex device, a resistance to flow of the fluid composition through the second vortex device being dependent on the rotation of the fluid composition at the outlet of the first vortex device.

21. The system of claim 20, wherein the resistance to flow of the fluid composition through the second vortex device increases in response to an increase in the rotation of the fluid composition at the outlet of the first vortex device.

22. The system of claim 20, wherein an outlet of the second vortex device comprises an inlet of a third vortex device.

23. The system of claim 20, wherein the second vortex device comprises at least first and second passages which receive the fluid composition from the outlet of the first vortex device, and wherein a difference in proportions of the fluid composition which flows through the respective first and second passages is dependent on the rotation of the fluid composition at the outlet of the first vortex device.

24. The system of claim 23, wherein the difference in the proportions of the fluid composition which flows through the first and second passages increases in response to the increase in the velocity of the fluid composition.

25. The system of claim 23, wherein rotation of the fluid composition in a vortex chamber of the second vortex device increases in response to an increase in the difference in the proportions of the fluid composition which flows through the first and second passages.

WHAT IS CLAIMED IS:

1. A variable flow resistance system for use in a subterranean well, the system comprising:

a vortex device through which a fluid composition flows, the vortex device including an inlet which is connected to a vortex chamber by at least two passages; and

wherein a resistance to flow of the fluid composition through the vortex device is dependent on a rotation of the fluid composition at the inlet to the vortex device.

2. The system of claim 1, wherein an outlet of the vortex device comprises an inlet of another vortex device.

3. The system of claim 1, wherein the at least two passages comprises first and second passages which receive the fluid composition from an outlet of another vortex device, and wherein a difference in proportions of the fluid composition which flows through the respective first and second passages is dependent on the rotation of the fluid composition at the outlet.

4. The system of claim 3, wherein the difference in the proportions of the fluid composition which flows through the first and second passages increases in response to an increase in velocity of the fluid composition.

5. The system of claim 3, wherein rotation of the fluid composition in a vortex chamber increases in response to an increase in the difference in the proportions of the fluid composition which flows through the first and second passages.

6. A variable flow resistance system for use in a subterranean well, the system comprising:

a first vortex device having an outlet; and

a second vortex device which receives a fluid composition from the outlet of the first vortex device via an inlet which is connected to a vortex chamber by at least two passages, a resistance to flow of the fluid composition through the second vortex device being dependent on a rotation of the fluid composition at the outlet of the first vortex device.

7. The system of claim 6, wherein an outlet of the second vortex device comprises an inlet of a third vortex device.

8. The system of claim 6, wherein the at least two passages comprises first and second passages which receive the fluid composition from the outlet of the first vortex device, and wherein a difference in proportions of the fluid composition which flows through the respective first and second passages is dependent on the rotation of the fluid composition at the outlet of the first vortex device.

9. The system of claim 8, wherein the difference in the proportions of the fluid composition which flows through the first and second passages increases in response to an increase in velocity of the fluid composition.

10. The system of claim 8, wherein rotation of the fluid composition in a vortex chamber of the second vortex device increases in response to an increase in the difference in the proportions of the fluid composition which flows through the first and second passages.