We claim:

1. An actuator for a sealed fluid-filled lens comprising:

a housing;

a reservoir disposed within the housing; and

a compression arm having a first end that is fixed and a second end that is not fixed, wherein the compression arm is disposed adjacent to the reservoir, and

wherein said compression arm flexes to compress the reservoir.

2. The actuator of claim 1, further comprising:

a slider slidingly disposed within the housing and disposed adjacent to the compression arm,

wherein sliding the slider from the first end of the compression arm to the second end of the compression arm causes the slider to push the second end of the compression arm so as to compress the reservoir.

3. The actuator of claim 1, wherein the housing comprises a temple chassis and temple cover.

4. The actuator of claim 2, further comprising a wheel attached to the slider.

5. The actuator of claim 4, wherein the wheel is rotatably attached to the slider and wherein rotation of the wheel causes the slider to slide.

6. The actuator of claim 4, wherein translation of the wheel causes the slider to slide.

7. The actuator of claim 1, wherein the compression arm compresses the reservoir against a vertical surface of the housing.

8. The actuator of claim 1, wherein the compression arm compresses the reservoir against a horizontal surface of the housing.

9. The actuator of claim 1, wherein the first end of the compression arm is distal to a fluid lens attached to the actuator.

10. An actuator for a fluid-filled lens comprising:

a housing having a first end and a second end;

a reservoir disposed within the housing; and

a slider slidingly disposed within the housing and disposed adjacent to the reservoir,

wherein the slider includes a first end having a wedge shape configured to compress the reservoir, and

wherein sliding of the slider from the second end of the housing to the first end of the housing causes the first end of the slider to compress the reservoir.

11. The actuator of claim 10, further comprising a wheel attached to the slider.

12. The actuator of claim 11, wherein the wheel is rotatably attached to the slider and wherein rotation of the wheel causes the slider to slide.

13. The actuator of claim 11, wherein translation of the wheel causes the slider to slide.

14. The actuator of claim 10, wherein the slider compresses the reservoir against a vertical surface of the housing.

15. The actuator of claim 10, wherein the slider compresses the reservoir against a horizontal surface of the housing.

16. The actuator of claim 10, further comprising:

a pinion; and

a rack connected to the slider,

wherein rotation of the pinion causes teeth on the pinion to engage with and push teeth of the rack so as to move the slider.

17. The actuator of claim 10, further comprising:

a screw having an axis of rotation collinear with a line formed between the first and second ends of the housing; and

a rack connected to the slider,

wherein rotation of the screw causes teeth on the screw to engage with and push teeth of the rack so as to move the slide.

18. The actuator of claim 10, further comprising a pulley arrangement to slide the slider.

We claim:

1. An endovascular valve device for reducing reflux of an infusate having an embolic agent in a vessel during a therapy procedure, comprising:

a) a delivery catheter having a distal end, an outer diameter, and a lumen defining an inner diameter; and

b) a valve in combination with said delivery catheter, said valve including,

i) a plurality of elongate first filaments in a braid, each of said first filaments having a diameter of 0.025 mm to 0.127 mm, said first filaments having a proximal end, a distal end, and a length extending therebetween,

said proximal ends secured relative to each other such that a central opening is provided between said secured proximal ends, said first filaments along said lengths distal of said proximal ends not bonded to each other such that said first filaments are movable relative to each other,

said distal ends of said first filaments fully collapsible relative to each other into an undeployed state, and expandable from said undeployed slate into a radially-expanded deployed state by a spring bias of said first filaments,

said valve in said deployed state having an opening in fluid communication with said lumen of said delivery catheter for delivery of the infusate from said delivery catheter to the vessel,

wherein in said deployed state said first filaments cross one another at an angle of 100° to 150°, and said first filaments have a Young's modulus of elasticity greater than 100 MPa; and

ii) a filter comprising a polymeric coating on said braided first filaments between said proximal and distal ends of said first filaments, said filter defining a pore size not exceeding 500μm,

wherein said valve expands from said undeployed state to said deployed state in less than one second in an at-rest fluid having a viscosity of 3.2 cP, and

wherein once said valve is in said deployed state in the vessel, said valve is dynamically movable between an expanded valve-open configuration and a collapsed valve-closed configuration depending on a local fluid pressure about said valve,

when the fluid pressure is higher on a proximal side of said valve, said valve is in said valve-closed configuration in which said distal end of said valve assumes a first diameter smaller than the diameter of the vessel such that fluid flow about the said valve and said

filter is permitted, and

when said fluid pressure is higher on a distal side of said valve, said valve is in said valve-open configuration in which said distal end of said valve assumes a second diameter relatively larger than said first diameter, and in which said valve contacts the vessel wall and said pore size of said filter renders said filter impermeable to the embolic agent of the infusate such that the valve is thereby adapted to reduce reflux, and

wherein said coating of said filter onto said first filaments of said valve constrains said filter to change shape and move with said valve between said valve-open and valve-closed configurations as fluid pressure conditions about said valve change.

2. An endovascular valve device according to claim 1, wherein:

said valve automatically expands when either

(i) a biological fluid flows against said valve in a distal to proximal direction,

(ii) the biological fluid is at a static flow condition, or

(iii) there is a fluid pressure on a proximal side of said valve which is greater than a fluid pressure on a distal side of said valve thereby creating a difference in fluid pressure, said difference in fluid pressure creating a net fluid pressure on said proximal side of said valve which is less than said fluid pressure on said distal side of said valve and which is insufficient to overcome said radial force of expansion.

3. An endovascular valve device according to claim 2, wherein:

said valve is permeable to the biological fluid in the vessel when said valve assumes said second diameter.

4. An endovascular valve device according to claim 1, wherein:

said valve automatically collapses into said valve-closed configuration during systole and automatically expands into said valve-open configuration during diastole.

5. An endovascular valve device according to claim 1, wherein:

said polymeric coating comprises polymeric second filaments electrostatically deposited or spun onto said braided first filaments.

6. An endovascular valve device according to claim 1, wherein:

said first filaments are comprised of a material chosen from polyethylene terephthalate (PET), polyethylene-napthalate (PEN), liquid crystal polymer, stainless steel, Nitinol,

fluorinated polymers, nylon, polyamide, platinum or platinum-iridium.

7. An endovascular valve device according to claim 1, wherein:
said first filaments form a substantially frustoconical shape when said valve is in said deployed state.

8. An endovascular valve device according to claim 1, wherein:
said valve in said undeployed state has a diameter smaller than or approximately equal to said inner diameter of said lumen of said delivery catheter, and in said deployed state has a diameter substantially larger than said outer diameter of said delivery catheter.

9. An endovascular valve device according to claim 8, further comprising:
a flush valve in the delivery wall of the catheter proximal the valve, the flush valve is a normally closed position and openable upon actuation or meeting a preset condition.

10. An endovascular valve device according to claim 1, further comprising:
a second catheter extending over said delivery catheter, wherein in said undeployed state said second catheter also extends over said valve and in said deployed state said valve extends distal of said second catheter.

11. An endovascular valve device according to claim 1, further comprising:
a control member having a distal end, said valve coupled to said distal end of said control member.

12. An endovascular valve device according to claim 11, wherein:
said valve comprises a tubular sleeve.

13. An endovascular valve device according to claim 11, further comprising:
a self-expanding loop, wherein a proximal end of said valve is coupled to said self-expanding loop, said valve having an open distal end.

14. An endovascular valve device according to claim 1, further comprising:
a self-expanding collar, wherein a proximal end of said valve is coupled to said self-expanding collar.

15. An endovascular valve device according to claim 1, wherein:
said valve comprises a plurality of flaps.

16. An endovascular valve device according to claim 1, further comprising:
a deployment control member controllable from said proximal end of said delivery catheter, said control member adapted to move said valve from said undeployed state to said deployed state, wherein in said undeployed state said valve has a diameter smaller than or approximately equal to said inner diameter of said lumen of said delivery catheter, and in said deployed state said valve has a diameter substantially larger than said outer diameter of said delivery catheter.

17. An endovascular valve device according to claim 16, wherein:
said distal end of said delivery catheter includes a valve seat, said valve has mating structure engageable relative to said valve seat, and when said valve is in said deployed state, said mating structure of said valve is engaged relative to said valve seat to lock said valve at said distal end of said delivery catheter.

18. An endovascular valve device according to claim 17, wherein:
said deployment control member is retractable from said delivery catheter while said valve is locked at said distal end of said valve seat.

19. An endovascular valve device according to claim 17, wherein:
said deployment control member is a wire advanceable through said delivery catheter, said wire in contact with a portion of said valve to distally advance said valve through said lumen and to said valve seat.

20. An endovascular valve device according to claim 17, wherein:
said deployment control member is a wire coupled to said valve when said valve is locked at said distal end of said valve seat.

21. An endovascular valve device according to claim 17, further comprising:
a refraction element attached to said valve and extending through said length of said delivery catheter, said retraction element capable of applying a sufficient tensile force to said valve unlock said valve from said valve seat.

22. An endovascular valve device according to claim 21, wherein:
said deployment control member is retractable from said delivery catheter while said valve is locked at said distal end of said valve seat, and
said retraction element extends within said delivery catheter and is coupled to said valve when said deployment control member is removed from said delivery catheter.

23. An endovascular valve device according to claim 22, wherein:
said retraction element is one or more wires.

24. An endovascular valve device according to claim 22, wherein:
said retraction element includes a braid of wires.

25. An endovascular valve device according to claim 24, wherein:
said braid of wires is provided with a polymer coating.

26. An endovascular valve device according to claim 17, wherein:
said valve seat includes an inner circumferential groove provided at said distal end of said delivery catheter, and said mating structure includes an element that expands into said groove when longitudinally aligned with said groove.

27. An endovascular valve device according to claim 26, wherein:
said valve seat comprises a plurality of longitudinally displaced grooves.

28. An endovascular valve device according to claim 26, wherein: said mating structure includes an expandable flange.

29. An endovascular valve device according to claim 28, wherein:
said flange is circumferentially uninterrupted.

30. An endovascular valve device according to claim 28, wherein:
said flange is comprised of a plurality of discrete elements radially displaced about a periphery of a proximal portion of said valve.

31. An endovascular valve device according to claim 28, wherein:
said flange has a proximal end and a distal end, and said proximal end has a reduced diameter

relative to said distal end.

32. An endovascular valve device according to claim 16, further comprising:
an introducer surrounding said valve and said deployment control member, said introducer having a distal end with a diameter smaller than said inner diameter of said lumen of said delivery catheter,
said introducer constraining said diameter of said valve for introduction into said delivery catheter.

33. An endovascular valve device according to claim 16, wherein:
said deployment control member is an inner catheter extending through said delivery catheter and said valve is mounted on said inner catheter, wherein said delivery catheter and said inner catheter are axially displaceable relative to each other.

34. An endovascular valve device according to claim 1, wherein:
said valve has a radial force of expansion of less than 40 mN.

35. An endovascular device according to claim 8, wherein:
said valve is longitudinally fixed to said distal end of said first catheter.

36. An endovascular device according to claim 35, further comprising:
a second catheter extending over the delivery catheter, wherein in said undeployed state said second catheter also extends over said valve and in said deployed state said valve extends distal of said second catheter.

37. An endovascular valve device according to claim 1, wherein:
said polymeric coating comprises polymeric second filaments electrostatically deposited or spun onto said braided first filaments.

38. An endovascular valve device for reducing reflux of an infusate in a vessel during a procedure, the device comprising:

a) an elongated delivery catheter having a proximal end and a distal end, a lumen defining an inner diameter, and an outer diameter, wherein the infusate can be delivered through said lumen;

b) a substantially frustoconical valve longitudinally fixed at said distal end of said delivery

catheter, said valve having a housed state with a first smaller diameter and a radially-expanded deployed state with a second larger diameter, said second larger diameter being substantially larger than said outer diameter and capable of extending across a vessel through which said device is used, said valve comprising,

i) a plurality of elongate first filaments in a braid, each of said first filaments having a diameter of 0.025 mm to 0.127 mm, said first filaments having a proximal end, distal end, and a length extending therebetween,

said proximal ends secured relative to each other, said first filaments along said lengths distal of said proximal ends not bonded to each other such that said first filaments are movable relative to each other,

said distal ends of said first filaments fully collapsible relative to each other into an undeployed state, and expandable from said undeployed state into a radially expanded deployed state by a spring bias of said first filaments,

wherein in said deployed state said first filaments cross one another at an angle of 100° to 150°, and

ii) a filter comprising a polymeric coating on said braided first filaments between said proximal and distal ends of said first filaments, said filter defining a pore size not exceeding 500μm,

wherein once said valve is in said deployed state in the vessel, said valve is dynamically movable between an expanded valve-open configuration and a collapsed valve-closed configuration depending on a local fluid pressure about said valve,

when the fluid pressure is higher on a proximal side of said valve, said valve is in said valve-closed configuration in which said distal end of said valve assumes a first diameter smaller than the diameter of the vessel such that fluid flow about the said valve and said filter is permitted, and

when said fluid pressure is higher on a distal side of said valve, said valve is in said valve-open configuration in which said distal end of said valve assumes a second diameter relatively larger than said first diameter, and in which said valve contacts the vessel wall and said pore size of said filter renders said filter impermeable to the infusate such that the valve is thereby adapted to reduce reflux of the infusate, and

wherein said coating of said filter onto said first filament causes both of said filter and said first filaments to change shape and move together when said valve moves between said valve-open and valve-closed configurations as the pressure conditions about said valve change; and

c) a control element movable relative to said delivery catheter for deploying said valve

from said housed state to said deployed state, and, said valve in said deployed state having an opening through which infusate can be delivered along a pathway extending through said delivery catheter and into the vessel, said valve in said deployed state automatically allowing biological fluid in the vessel to flow in a proximal to distal direction relative to the valve and preventing reflux of the infusate in the distal to proximal direction.

39. An endovascular device according to claim 38, wherein:
said valve has a radial force of expansion of less than 40 mN.

40. An endovascular valve device according to claim 38, wherein:
said polymeric coating comprises polymeric second filaments electrostatically deposited or spun onto said braided first filaments.

41. An endovascular valve device according to claim 38, wherein:
said first filaments have a Young's modulus of elasticity greater than 100 MPa, and said valve expands from said undeployed state to said deployed state in less than one second in an at-rest fluid having a viscosity of 3.2 cP.

42. An endovascular device for reducing reflux of an infusate in a vessel during a procedure, the device comprising:

a) an elongated delivery catheter having a proximal end and a distal end, a lumen defining an inner diameter, and an outer diameter, wherein the infusate can be delivered through said lumen to the vessel;

b) a valve seat provided at said distal end of said delivery catheter; and

c) a valve distally displaceable through said delivery catheter to said valve seat, said valve having:

i) a plurality of elongate first filaments in a braid, each of said first filaments having a diameter of 0.025 mm to 0.127 nm, said first filaments having a proximal end, distal end, and a length extending therebetween,

said proximal ends secured relative to each other, said first filaments along said lengths distal of said proximal ends not bonded to each other such that said first filaments are movable relative to each other,

said valve fully collapsible into an undeployed state, and expandable from said undeployed state into a radially-expanded deployed state by a spring bias of said first filaments,

wherein in said deployed state said first filaments cross one another at an angle of 100° to

150°, and said first filaments have a Young's modulus of elasticity greater than 100 MPa:

ii) a filter comprising a polymeric coating on said braided first filaments between said proximal and distal ends of said first filaments, said filter defining a pore size not exceeding 500 μm, and

iii) mating structure that is engaged with said valve seat when said valve is advanced to said valve seat to thereby lock said valve relative to said valve seat, wherein said valve in said undeployed state has a diameter smaller than or approximately equal to an inner diameter of said catheter, and in said deployed state has a diameter substantially larger than an outer diameter of said catheter, and said valve in said deployed state having an opening in fluid communication with said lumen for delivery of the infusate from said delivery catheter to the vessel,

wherein said valve expands from said undeployed state to said deployed state in less than one second in an at-rest fluid having a viscosity of 3.2 cP, and

wherein once said valve is in said deployed state in the vessel, said valve is dynamically movable between an expanded valve-open configuration and a collapsed valve-closed configuration depending on a local fluid pressure about said valve,

when the fluid pressure is higher on a proximal side of said valve, said valve is in said valve-closed configuration in which said distal end of said valve assumes a first diameter smaller than the diameter of the vessel such that fluid flow about the said valve and said filter is permitted, and

when said fluid pressure is higher on a distal side of said valve, said valve is in said valve-open configuration in which said distal end of said valve assumes a second diameter relatively larger than said first diameter, and in which said valve contacts the vessel wall and said pore size of said filter renders said filter impermeable to the infusate such that the valve is thereby adapted to reduce reflux of the infusate, and

wherein said coating of said filter onto said first filament causes both of said filter and said first filaments to change shape and move together when said valve moves between said valve-open and valve-closed configurations as the pressure conditions about said valve change.

43. A device according to claim 42, wherein:

said valve seat is located at said distal end of said delivery catheter.

44. A device according to claim 42, wherein:

said valve seat is provided within said lumen of said delivery catheter.

45. A device according to claim 42, wherein:
said valve seat includes a circumferential groove provided along an inner surface of said lumen of said delivery catheter, and said mating structure comprises at least one element which expands into said groove.

46. A device according to claim 42, further comprising:
a deployment element controllable from said proximal end of said delivery catheter, said deployment element adapted to distally advance said valve from said proximal end to said distal end of the delivery catheter.

47. A device according to claim 46, wherein:
said deployment element is a push wire advanceable through said delivery catheter, said push wire abutting a portion of said valve to distally advance said valve through said delivery catheter to said valve seat.

48. A device according to claim 46, further comprising:
a refraction element coupled to said valve, said retraction element controllable from said proximal end of said delivery catheter and structured to apply a tensile force to said valve to hold said valve relative to said valve seat.

49. A device according to claim 46, further comprising:
a refraction element coupled to said valve, said retraction element controllable from said proximal end of said delivery catheter and structured to apply a tensile force to said valve to release said valve from said valve seat and draw said valve into said delivery catheter.

50. A device according to claim 46, further comprising:
a refraction element coupled to said valve and discrete from said deployment element, said retraction element controllable from said proximal end of said delivery catheter to applying a tensile force to sufficient to release said valve from said valve seat and draw said valve into said delivery catheter.

51. An endovascular device according to claim 42, wherein:
said valve has a radial force of expansion of less than 40 mN.

52. An endovascular valve device according to claim 42, wherein:
said polymeric coating comprises polymeric second filaments electrostatically deposited or spun onto said braided first filaments.