WHAT IS CLAIMED IS:

1. A fluid lens assembly, comprising:

a front rigid lens;

a semi-flexible membrane that is adapted to be expanded from a minimum inflation level to a maximum inflation level; and

a fluid layer therebetween,

wherein the front lens is configured to have a negative optical power.

2. The fluid lens assembly of claim 1 wherein said front lens is further configured to have a biconcave geometry.

3. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall negative optical power when the membrane is expanded to the maximum inflation level.

4. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall negative optical power when the membrane is expanded between the minimum inflation level and the maximum inflation level.

5. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall positive optical power when the membrane is expanded to the maximum inflation level.

6. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall positive optical power when the membrane is partially expanded between the minimum inflation level and the maximum inflation level.

7. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have a 3 diopter range of optical power between the minimum inflation level and the maximum inflation level.

8. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have a non-round shape.

9. The fluid lens assembly of claim 1, wherein the surface of the front lens adjacent to the fluid layer is concave.

10. The fluid lens assembly of claim 8, wherein the surface of the front lens not adjacent to the fluid layer is concave.

11. A corrective eyepiece comprising two fluid lens assemblies, each fluid lens assembly comprising:

a front rigid lens;

a semi-flexible membrane that is adapted to be inflated from a minimum inflation level to a maximum inflation level; and

a fluid layer therebetween,

wherein the front lens is configured to have a negative optical power.

12. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have an overall negative optical power when the membrane is expanded to the maximum inflation level.

13. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have an overall negative optical power when the membrane is expanded between the minimum inflation level and the maximum inflation level.

14. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have an overall positive optical power when the membrane is expanded to the maximum inflation level.

15. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have an overall positive optical power when the membrane is partially expanded between the minimum inflation level and the maximum inflation level.

16. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have a 3 diopter range of optical power between the minimum inflation level and the maximum inflation level.

17. The corrective eyepiece of claim 10, wherein one or more of the fluid lens assemblies is configured to have a non-round shape.

18. The corrective eyepiece of claim 10, wherein one or more of the fluid lenses includes a concave surface adjacent to the fluid layer.

19. The corrective eyepiece of claim 17, wherein one or more of the fluid lenses includes a concave surface adjacent to the fluid layer.

Claims:

1. A fluid lens assembly, comprising:

a front rigid lens;

a semi-flexible membrane that comprises:

(i) a membrane, wherein the membrane is:

a. uniform in thickness, and

b. prior to being used in the fluid lens assembly, configured to be in a strained condition having a strain ratio between 2.0:1 to 3.0:1, and

(ii) a contoured membrane coating, wherein the contoured membrane coating covers an entire surface of the membrane;

wherein the semi-flexible membrane is adapted to be expanded from a minimum inflation level to a maximum inflation level,

a contoured membrane coating; and

a fluid layer located between the front rigid lens and the semi-flexible membrane,

wherein the front lens is configured to have a negative optical power,

wherein a stiffness of the semi-flexible membrane is a function of a direction of applied mechanical or hydrostatic stress, and

wherein the thickness of the membrane coating varies from across the semi-flexible membrane.

2. The fluid lens assembly of claim 1 wherein the front lens has a biconcave geometry.

3. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall negative optical power when the membrane is expanded to the maximum inflation level.

4. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall negative optical power when the membrane is expanded between the minimum inflation level and the maximum inflation level.

5. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall positive optical power when the membrane is expanded to the maximum inflation level.

6. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have an overall positive optical power when the membrane is partially expanded between the minimum inflation level and the maximum inflation level.

7. The fluid lens assembly of claim 1, wherein the fluid lens assembly is configured to have a 3 diopter range of optical power between the minimum inflation level and the maximum inflation level.

8. The fluid lens assembly of claim 1, wherein the entire fluid lens assembly has a non-round shape.

9. The assembly of claim 8, wherein the surface of the front lens not adjacent to the fluid layer is concave.

10. The fluid lens assembly of claim 1, wherein the surface of the front lens adjacent to the fluid layer is concave.

11. A corrective eyepiece comprising two fluid lens assemblies, each fluid lens assembly comprising:

a front rigid lens;

a semi-flexible membrane that comprises:

(i) a membrane, wherein the membrane is:

a. uniform in thickness, and

b. prior to being used in the fluid lens assembly, configured to be in a strained condition having a strain ratio between 2.0:1 to 3.0:1, and

(ii) a contoured membrane coating, wherein the contoured membrane coating covers an entire surface of the membrane;

wherein the semi-flexible membrane is adapted to be expanded inflated from a minimum inflation level to a maximum inflation level,

a contoured membrane coating; and

a fluid layer located between the front rigid lens and the semi-flexible membrane,

wherein the front lens is configured to have a negative optical power,

wherein a stiffness of the semi-flexible membrane is a function of a direction of applied mechanical or hydrostatic stress, and

wherein the thickness of the membrane coating varies from across the semi-flexible membrane.

12. The corrective eyepiece of claim 11, wherein one or more of the fluid lens assemblies is configured to have an overall negative optical power when the membrane is expanded to the maximum inflation level.

13. The corrective eyepiece of claim 11, wherein one or more of the fluid lens assemblies is configured to have an overall negative optical power when the membrane is expanded between the minimum inflation level and the maximum inflation level.

14. The corrective eyepiece of claim 11, wherein one or more of the fluid lens assemblies is configured to have an overall positive optical power when the membrane is expanded to the maximum inflation level.

15. The corrective eyepiece of claim 11, wherein one or more of the fluid lens assemblies is configured to have an overall positive optical power when the membrane is partially expanded between the minimum inflation level and the maximum inflation level.

16. The corrective eyepiece of claim 11, wherein one or more of the fluid lens assemblies is configured to have a 3 diopter range of optical power between the minimum inflation level and the maximum inflation level.

17. The corrective eyepiece of claim 11, wherein the entirety of one or more of the fluid lens assemblies has a non-round shape when viewed from the front of the fluid lens assembly.

18. The corrective eyepiece of claim 17, wherein one or more of the fluid lenses includes a concave surface adjacent to the fluid layer.

19. The corrective eyepiece of claim 11, wherein one or more of the fluid lenses includes a concave surface adjacent to the fluid layer.