CLAIMS

1. A compression garment for circulatory-related disorder therapy comprising:

a first layer comprising an inner skin contacting layer;

a second layer comprising an outer surface, the first and second layers forming a garment wearable by a user including a plurality of macro-chambers formed according to a seal connecting the first and second layers, each of the macro-chambers including a plurality of micro-chambers that are fluidly interconnected, wherein the first layer forms a portion of the plurality of micro-chambers;

a middle layer between the first and second layers forming the seal that connects the first and second layers, the middle layer including a plurality of micro-conduits acting as passive valves between the plurality of micro-chambers; and

pneumatic couplings for each macro-chamber, the pneumatic couplings being coupled to the second layer and configured to supply pressurized air to the plurality of micro-chambers in a predetermined sequence.

2. The compression garment of claim 1, wherein at least two of the plurality of micro-chambers have different resistances to flow.

3. The compression garment of claim 1, wherein the plurality of micro-chambers forms a matrix pattern having a width and a height.

4. The compression garment of claim 3, wherein the width of the matrix pattern is at least eight micro-chambers wide and the height is at least eight micro-chambers high.

5. The compression garment of claim 1, wherein the first layer is formed or moulded from a material that is elastic, tacky, textured, or any combination thereof.

6. A garment for providing circulatory-related disorder therapy, the garment comprising:

a skin contacting layer; and

a backing layer coupled to the skin contacting layer such that the skin contacting layer and the backing layer are attached to each other along a seal that forms a plurality of macro-chambers, each macro-chamber including a plurality of micro-chambers, each of the plurality of micro-chambers being in direct fluid communication with at least one other of the plurality of micro-chambers, wherein each macro-chamber includes a pneumatic coupling coupled to the backing layer and configured to supply pressurized air to a first one of the plurality of micro-chambers; and

a sealing layer positioned between the skin contacting layer and the backing layer, the sealing layer forming a plurality of micro-conduits between the plurality of micro-chambers of a first macro-chamber such that pressurized air in the first micro-chamber is able to move via a first one of the plurality of micro-conduits into at least one other one of the plurality of micro-chambers.

7. The garment of claim 6, wherein each of the plurality of macro-chambers has a length, a width, and a depth, the length being between 20 millimeters and 120 millimeters, the width being between 10 millimeters and 80 millimeters, the depth being between 1 millimeter and 10 millimeters.

8. The garment of claim 6, wherein each of the plurality of micro-chambers has a micro-length, a micro-width, and a micro-depth, the micro-length being between 0.25 inches (6 mm) and two inches (50 mm), the width being between 0.25 inches (6 mm) and two inches (50 mm), the micro-depth being between 0.1 inches (0.25 mm) and 0.5 inches (12.5 mm).

9. The garment of claim 8, wherein the micro-length, the micro-width, and the micro-depth are selected to aid in emulating a manual massage of a user of the garment.

10. The garment of claim 6, wherein each of the plurality of micro-conduits has a minimum diameter, the minimum diameter being between 0.001 inches (25 microns) and 0.25 inches (6 mm), wherein the minimum diameter is selected to aid in emulating a manual massage of a user of the garment.

11. The garment of claim 6, wherein the plurality of micro-chambers is pressurized in a predetermined sequence.

12. The garment of claim 11, wherein the predetermined sequence follows a generally circular path about a limb of a user of the garment.

13. The garment of claim 11, wherein the pressurization of the plurality of micro-chambers in the predetermined sequence emulates a manual massage on a body part of the user wearing the garment.

14. The garment of claim 11, further comprising a controller that is configured to cycle the pressurization of the plurality of micro-chambers between at least two different pressure levels to emulate a manual massage of a body part of the user wearing the garment.

15. The garment of claim 6, wherein the first one of the plurality of micro-conduits has a first minimum diameter and a second one of the plurality of micro-conduits has a second minimum diameter that is different from the first minimum diameter such that the pressurized air moves through the first micro-conduit and the second micro-conduit at different flow rates.

16. The garment of claim 6, wherein the skin contacting layer includes an elastic material and the backing layer includes a rigid material.

17. The garment of claim 6, wherein the skin contacting layer includes a first material having a first Young's modulus and the backing layer includes a second material having a second Young's modulus that is different from the first Young's modulus.

18. The garment of claim 17, wherein the second Young's modulus is greater than the first Young's modulus.

19. The garment of claim 17, wherein the second Young's modulus is between two and ten times greater than the first Young's modulus.

20. The garment of claim 6, wherein at least a portion of the plurality of micro-chambers has a generally trapezoidal profile shape when pressurized.

21. The compression garment of claim 6, wherein the plurality of micro-conduits act as passive valves between the plurality of micro-chambers.

22. The compression garment of claim 1, wherein at least one of the plurality of macro-chambers is partitioned into at least two of the plurality of micro-chambers.

23. The compression garment of claim 1, wherein at least two of the plurality of macro-chambers are fluidly independent.

24. The compression garment of claim 1, further comprising a plurality of active valves distributed throughout the compression garment.

25. The compression garment of claim 1, wherein the first layer and/or the second layer are airtight or near airtight.

26. The compression garment of claim 1, wherein the first layer and/or the second layer are fabricated with a breathable fabric.

27. The compression garment of claim 1, wherein the plurality of micro-chambers and/or plurality of macro-chambers are elongated and arranged such that in an operational configuration with the garment placed on a limb of the patient, one or more of the plurality of micro-chambers and/or one or more of the plurality of macro-chambers form, individually or in combination, a generally toroidal shape about a circumference of the limb.

28. The garment of claim 6, wherein the plurality of macro-chambers is pressurized in a predetermined sequence.

29. The garment of claim 14, wherein the predetermined sequence follows a direction from a distal to the proximal end of a limb of a user of the garment.

30. The garment of claim 6, wherein the pneumatic coupling is configured to supply the pressurized air directly into the first macro-chamber such that the plurality of micro-chambers is pressurized in a predetermined sequence.

31. The garment of claim 6, further comprising a controller configured to cycle the pressurization of the plurality of micro-chambers between at least two different pressure levels to provide a massage on a body part of the user wearing the garment.

32. The garment of claim 6, wherein the skin contacting layer is continuous.

33. The garment of claim 6, wherein the plurality of macro-chambers is fluidly independent.

34. The garment of claim 6, wherein at least some of the plurality of micro-chambers or the plurality of macro-chambers are connected to other micro-chambers or other macro-chambers, respectively, via passive valves to allow a predetermined timing in the pressurisation sequence of the plurality of micro-chambers or plurality of macro-chambers.