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 ~~profile~~ 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 ~~profile~~ 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 ~~about~~ 20 millimeters and ~~about~~ 120 millimeters, the width being between ~~about~~ 10 millimeters and ~~about~~ 80 millimeters, the depth being between ~~about~~ 1 millimeter and ~~about~~ 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 ~~about~~ 0.25 inches (6 mm) and ~~about~~ two inches (50 mm), the width being between ~~about~~ 0.25 inches (6 mm) and ~~about~~ two inches (50 mm), the micro-depth being between ~~about~~ 0.1 inches (0.25 mm) and ~~about~~ 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-chambers is in direct fluid communication with at least one other of the plurality of micro-chambers via a plurality of openings, each of the plurality of openings having~~ micro-conduits has a minimum diameter, the minimum diameter being between ~~about~~ 0.001 inches (25 microns) and ~~about~~ 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 seal profile includes a sealing layer positioned between the skin contacting layer and the backing layer, wherein the sealing layer forms a plurality of micro-conduits between the plurality of micro-chambers of the first 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.~~

~~16~~15. The garment of claim ~~15~~6, wherein the first one of the ~~openings~~ plurality of micro-conduits has a first minimum diameter and a second one of the plurality of micro-conduits ~~openings~~ has a second minimum diameter that is different from the first minimum diameter such that the pressurized air moves through the first micro-conduit ~~opening~~ and the second micro-conduit ~~opening~~ at different flow rates.

~~17~~16. The garment of claim 6, wherein the skin contacting layer includes an elastic material and the backing layer includes a rigid material.

~~18~~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.

~~19~~18. The garment of claim ~~18~~17, wherein the second Young's modulus is greater than the first Young's modulus.

~~20~~19. The garment of claim ~~18~~17, wherein the second Young's modulus is between two and ten times greater than the first Young's modulus.

~~21~~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.

~~22. The compression garment of claim 1, wherein the seal profile is a middle layer forming side walls for each of the plurality of micro-chambers.~~

~~23~~21. The compression garment of claim ~~22~~6, wherein the ~~middle layer further includes a~~ plurality of micro-conduits ~~acting~~ act as passive valves between the plurality of micro-chambers.

~~24. The compression garment of claim 22, wherein the middle layer is a different layer from the first layer and the second layer.~~

~~25~~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.

~~26~~23. The compression garment of claim 1, wherein at least two of the plurality of macro-chambers are fluidly independent.

~~27~~24. The compression garment of claim 1, further comprising a plurality of active valves distributed throughout the compression ~~device~~garment.

~~28~~25. The compression garment of claim 1, wherein the first layer and/or the second layer are airtight or near airtight.

~~29~~26. The compression garment of claim 1, wherein the first layer and/or the second layer are fabricated with a breathable fabric.

~~30~~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.

~~31~~28. The garment of claim 6, wherein the plurality of macro-chambers is pressurized in a predetermined sequence.

~~32~~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.

~~33. The garment of claim 6, wherein at least one of the plurality of macro-chambers and one or more of the plurality of the micro-chambers are connected via the plurality of openings operating as passive valves between the one or more of the plurality of micro-chambers such that pressurized air is allowed to move from a first one of the plurality of micro-chamber through at least one of the plurality of openings into another of the plurality of micro-chambers.~~

~~34. The garment of claim 33, wherein the first one of the plurality of openings has a first minimum diameter and a second one of the plurality of openings has a second minimum diameter that is different from the first minimum diameter such that the pressurized air moves through the first opening and the second opening at different flow rates.~~

~~35~~30. The garment of claim 6, wherein the pneumatic coupling is configured to supply the pressurized air directly into ~~a~~ the first ~~one of the plurality of~~ macro-chamber~~s~~ such that the plurality of micro-chambers is~~are~~ pressurized in a predetermined sequence.

~~36~~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.

~~37~~32. The garment of claim 6, wherein the skin contacting layer is continuous.

~~38~~33. The garment of claim 6, wherein the plurality of macro-chambers is fluidly independent.

~~39~~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.