CLAIMS

I/We claim:

1. A controller comprising:

a structural body that includes –

a~~n ingress~~ first fluid interface fluidically coupled to a pump, and

a ~~first egress~~ second fluid interface fluidically coupled to a pressure-mitigation apparatus disposed between a human body and a surface,

wherein the pressure-mitigation apparatus includes a plurality of chambers;

one or more sensors that are arranged proximate to the second fluid interface;

a processor; and

a memory that includes instructions for regulating a flow of air provided by the pump to inflate the plurality of chambers of the pressure-mitigation apparatus in a controlled manner,

wherein the instructions, when executed by the processor, cause the processor to:

determine, based on analysis of outputs produced by the one or more sensors, that the pressure-mitigation apparatus is connected to the ~~first egress~~ second fluid interface,

identify a programmable pattern corresponding to the pressure-mitigation apparatus, and

cause the plurality of chambers of the pressure-mitigation apparatus to be inflated to varying degrees via inflatable means in accordance with the programmable pattern, thereby shifting a point of contact pressure applied by the surface to the human body over time.

2. The controller of claim 1 wherein the structural body further includes a second egress interface through which air can be discharged into an ambient environment.

3. The controller of claim 1 further comprising:

a manifold that includes the inflatable means, the inflatable means comprising :–

a plurality of valves,

wherein each valve is configured to regulate airflow into a corresponding chamber of the plurality of chambers of the pressure-mitigation apparatus, and

a plurality of transducers,

wherein each transducer is configured to monitor pressure of a corresponding chamber of the plurality of chambers of the pressure-mitigation apparatus.

4. The controller of claim 1 wherein the ~~first egress~~ second fluid interface includes a plurality of channels, and wherein each channel of the plurality of channels corresponds to a different chamber of the plurality of chambers of the pressure-mitigation apparatus ~~corresponds to a different channel of the plurality of channels~~.

5. The controller of claim 1 further comprising:

a mechanical input component operatively coupled to the processor,

wherein upon receiving input indicative of an interaction with the mechanical input component, the processor is configured to identify an appropriate instruction for regulating the flow of air.

6. The controller of claim 1 further comprising:

a display configured to present information related to the flow of air, the pressure-mitigation apparatus, an individual presently undergoing treatment, or any combination thereof.

7. The controller of claim 1 wherein, upon deployment of the pressure-mitigation apparatus, the processor causes the plurality of chambers to be in a naturally inflated state.

8. The controller of claim 7 wherein the processor is configured to mitigate contact pressure on an anatomical region of the human body in accordance with the

programmable pattern, and wherein the programmable pattern causes contact pressure on the anatomical region to be lessened by prompting the processor to cause deflation of at least one chamber positioned beneath the anatomical region.

9. The controller of claim 1 wherein, upon deployment of the pressure-mitigation apparatus, the processor causes the plurality of chambers to be in a naturally deflated state.

10. The controller of claim 9 wherein the processor is configured to mitigate contact pressure on an anatomical region of the human body in accordance with the programmable pattern, and wherein the programmable pattern causes contact pressure on the anatomical region to be lessened by prompting the processor to cause inflation of at least one chamber positioned adjacent to the anatomical region.

11. The controller of claim 1, wherein the one or more sensors are operable to detect one or more magnets that are included in a connector of the pressure-mitigation apparatus that is fluidically coupled to the second fluid interface.

12. The controller of claim 11, wherein the instructions further cause the processor to:

establish a type of the pressure-mitigation apparatus based on a number or an arrangement of the one or more magnets;

wherein the programmable pattern is associated with the type of the pressure-mitigation apparatus.

~~11. A manifold comprising:~~

~~an ingress interface fluidically coupled to a pump;~~

~~a plurality of piezoelectric valves through which air can be delivered to a plurality of chambers of a pressure-mitigation apparatus,~~

~~wherein each piezoelectric valve is associated with a discrete airflow destined for a corresponding chamber of the pressure-mitigation apparatus;~~

~~a plurality of transducers configured to monitor pressure of the plurality of chambers of the pressure-mitigation apparatus,~~

~~wherein each transducer is configured to generate an electrical signal based on the pressure of a corresponding chamber of the pressure-mitigation apparatus; and~~

~~a processor configured to:~~

~~examine data representative of the electrical signals generated by the plurality of transducers, and~~

~~control the plurality of piezoelectric valves based on the data.~~

~~12. The manifold of claim 11 further comprising:~~

~~an egress interface through which air can be discharged into an ambient environment.~~

~~13. The manifold of claim 11 further comprising:~~

~~a compressor configured to pressurize air received from the pump before delivery to the plurality of chambers of the pressure-mitigation apparatus via the plurality of piezoelectric valves.~~

~~14. The manifold of claim 11 wherein at least one piezoelectric valve is a bidirectional valve that permits airflow in multiple directions.~~

~~15. The manifold of claim 11 wherein at least one piezoelectric valve is a unidirectional valve that only permits airflow in a single direction.~~

~~16. The manifold of claim 11 wherein the manifold resides within a controller, and wherein the processor is further configured to transmit at least some of the data to another processor housed within the controller for further examination.~~

13~~17~~. A method comprising:

determining, by a controller, that a pressure-mitigation apparatus disposed between a human body and a surface has been fluidically coupled to a second fluid ~~first egress~~ interface of the controller based on analysis of an output produced by a sensor that is proximate to the second fluid interface,

wherein the pressure-mitigation apparatus includes a plurality of chambers;

identifying, by the controller from among a plurality of programmable patterns, a programmable pattern corresponding to the pressure-mitigation apparatus; and

causing, by the controller, the plurality of chambers of the pressure-mitigation apparatus to be inflated to varying degrees via inflatable means in accordance with the programmable pattern, thereby shifting a point of contact pressure applied by the surface to the human body over time.

1418. The method of claim 1317 wherein said determining is based oncomprises: detecting, by the controller, how many a number of magnets, if any, are that are detected by the sensor and located within a specified proximity of the first egress second fluid interface.

1519. The method of claim 1418 further comprising:

identifying, by the controller, a type of pressure-mitigation apparatus fluidically coupled to the first egress second fluid interface based on a count of the magnets located within the specified proximity.

1620. The method of claim 1519 wherein the programmable pattern corresponds to the type of pressure-mitigation apparatus.

1721. The method of claim 1317 further comprising:

receiving, by the controller, input indicative of a request to initiate a deflation procedure; and

causing, by the controller, deflation of at least one chamber of the pressure-mitigation apparatus.

1822. The method of claim 1721 wherein the request is manually provided by an operator through an interaction with a mechanical input component of the controller.

1923. The method of claim 1721 wherein the request is automatically provided by the controller responsive to a determination that the pressure of a chamber of the pressure-mitigation apparatus exceeds an upper threshold.

2024. The method of claim 1317 further comprising:

acquiring, by the controller, data indicative of the pressure of each chamber of the plurality of chambers of the pressure-mitigation apparatus; and

examining, by the controller, the data to identify movements, if any, performed by the human body.

2125. The method of claim 2024 further comprising:

determining, by the controller, that the human body has performed no movements for a specified period of time; and

causing, by the controller, a notification to be transmitted to an electronic device,

wherein the notification specifies that no movements have been performed by the human body for the specified period of time.

2226. The method of claim 2024 further comprising:

determining, by the controller, that the movements performed by the human body match a specified pattern; and

causing, by the controller, a notification to be transmitted to an electronic device,

wherein the notification specifies that the movements performed by the human body match the specified pattern.

2327. The method of claim 1317 further comprising:

acquiring, by the controller, data indicative of the pressure of each chamber of the plurality of chambers of the pressure-mitigation apparatus; and

estimating, by the controller, a characteristic of the human body based on the data.

2428. The method of claim 2327 wherein the characteristic is a weight, a heart rate, or a respiration rate.