SUMMARY

[0007] In one form, a system for prevention of hypertrophic scars is disclosed. The system includes a first patch configured to be affixed to a first portion of skin proximate to a first side of a skin irregularity. The system further includes a second patch configured to be affixed to a second portion of skin proximate to a second side of the skin irregularity. The system also includes a first actuation wire positioned between the first patch and the second patch and is selectively placed in (i) a contracted state when an electrical current passes through the first actuation wire and (ii) a relaxed state when the electrical current ceases to pass through the first actuation wire.

[0008] In another form, a method of prevention of hypertrophic scars is disclosed. The method includes affixing a first patch to a first portion of skin proximate to a first side of a skin irregularity. The method also includes affixing a second patch to a second portion of skin proximate to a second side of the skin irregularity. The method further includes fixedly coupling a first actuation wire to the first patch. The method also includes fixedly coupling the first actuation wire to the second patch. The first actuation wire is configured to be selectively placed in (i) a contracted state when an electrical current passes through the first actuation wire and (ii) a relaxed state when the electrical current ceases to pass through the first actuation wire.

BRIEF DESCRIPTION OF DRAWINGS

[0009] FIG. 1 is a block diagram of a system for prevention of hypertrophic scars by actuatable patches that can be used for wound healing.

[0010] FIG. 2 is a schematic of a system similar to that depicted in FIG. 1 in use in a noncontracted position.

[0011] FIG. 3 is a schematic of a system similar to that depicted in FIG. 1 in use in a contracted position.

[0012] FIG. 4 is a photograph of a system similar to that depicted in FIG. 1 in use in a noncontracted position.

[0013] FIG. 5 is a photograph of a system similar to that depicted in FIG. 1 in use in a contracted position.

[0014] FIG. 6 is a schematic of an excitation circuit used in a system similar to that depicted in FIG. 1, in accordance with one embodiment.

[0015] FIG. 7 is a circuit board layout of the excitation circuit of FIG. 6.

[0016] FIG. 8 is an exemplary cyclic waveform generated by the excitation circuit of FIG. 6.

and teachings disclosed herein, including those that are presently unforeseen or unappreciated, and that, for example, may arise from applicants/patentees and others.

Claims:

1. A system for prevention of hypertrophic scars, comprising:

a first patch configured to be affixed to a first portion of skin proximate to a first side of a skin irregularity;

a second patch configured to be affixed to a second portion of skin proximate to a second side of the skin irregularity; and

a first actuation wire disposed between the first patch and the second patch and selectively placed in (i) a contracted state when an electrical current passes through the first actuation wire and (ii) a relaxed state when the electrical current ceases to pass through the first actuation wire.

2. The system of claim 1, further comprising:

a switching circuit configured to selectively provide an electrical current to the first actuation wire.

3. The system of claim 2, further comprising:

a power source coupled to the switching circuit for providing the electrical current.

4. The system of claim 3, further comprising:

a timing circuit coupled to the power source and the switching circuit, the timing circuit configured to provide activation pulses to the switching circuit, wherein (i) during an on state of the activation pulse the switching circuit couples the power source to the first actuation wire, and (ii) during an off state of the activation pulse the switching circuit isolates the power source from the first actuation wire.

5. The system of claim 3, further comprising:

a first excitation wire configured to couple a positive terminal of the power source to the first actuation wire; and

a first electrical conduction path configured to couple the first excitation wire to the first actuation wire.

6. The system of claim 5, further comprising:

a second actuation wire disposed between the first patch and the second patch and selectively placed in (i) a contracted state when an electrical current passes through the second actuation wire and (ii) a relaxed state when the electrical current ceases to pass through the second actuation wire, the second actuation wire being electrically connected to the first actuation wire in a series manner;

a second excitation wire configured to couple a negative terminal of the power source to the second actuation wire;

a second electrical conduction path configured to couple the second excitation wire to the second actuation wire; and

a third electrical conduction path configured to couple the first actuation wire to the second actuation wire.

7. The system of claim 5, further comprising:

a second actuation wire disposed between the first patch and the second patch and selectively placed in (i) a contracted state when an electrical current passes through the second actuation wire and (ii) a relaxed state when the electrical current ceases to pass

a feedback circuit configured to (i) measure current passing through the first actuation wire; (ii) associate the current to a temperature; and (iii) deactivate the switching circuit when the temperature of the first actuation wire has passed a predetermined threshold.

12. The system of claim 11, wherein the feedback circuit activates and deactivates the switching circuit according to a hysteresis.

13. The system of claim 12, wherein the feedback circuit comprises a sense resistor.

1 . The system of claim 3, wherein the power source is a DC voltage source.

1 . The system of claim 3, wherein the power source is a DC current source.

1 . The system of claim 1, wherein the at least one section of the actuator wire is composed of a nitinol.

1 . The system of claim 1, wherein the first actuation wire is positioned on a plane that is substantially pe endicular to planes associated with the position of the first and the second patches .

18. The system of claim 1, further comprising:

a first deformation limiter disposed betwee· th f t t h d th d t h d

l nrrs mrr t · s t t seet s

e s

ts rs rt

ceasing the electrical current passing through the first actuation wire when the temperature of the first actuation wire has increased above a first threshold; and

reapplying the electrical current when the temperature of the first actuation wire has decreased below a second threshold.

25. The method of claim 24, wherein the temperature of the first actuation wire is measured by a thermocouple.

26. The method of claim 24, wherein the temperature of the first actuation wire is measure by measuring current passing through the first actuation wire and associating the current to the temperature of the first actuation wire.