

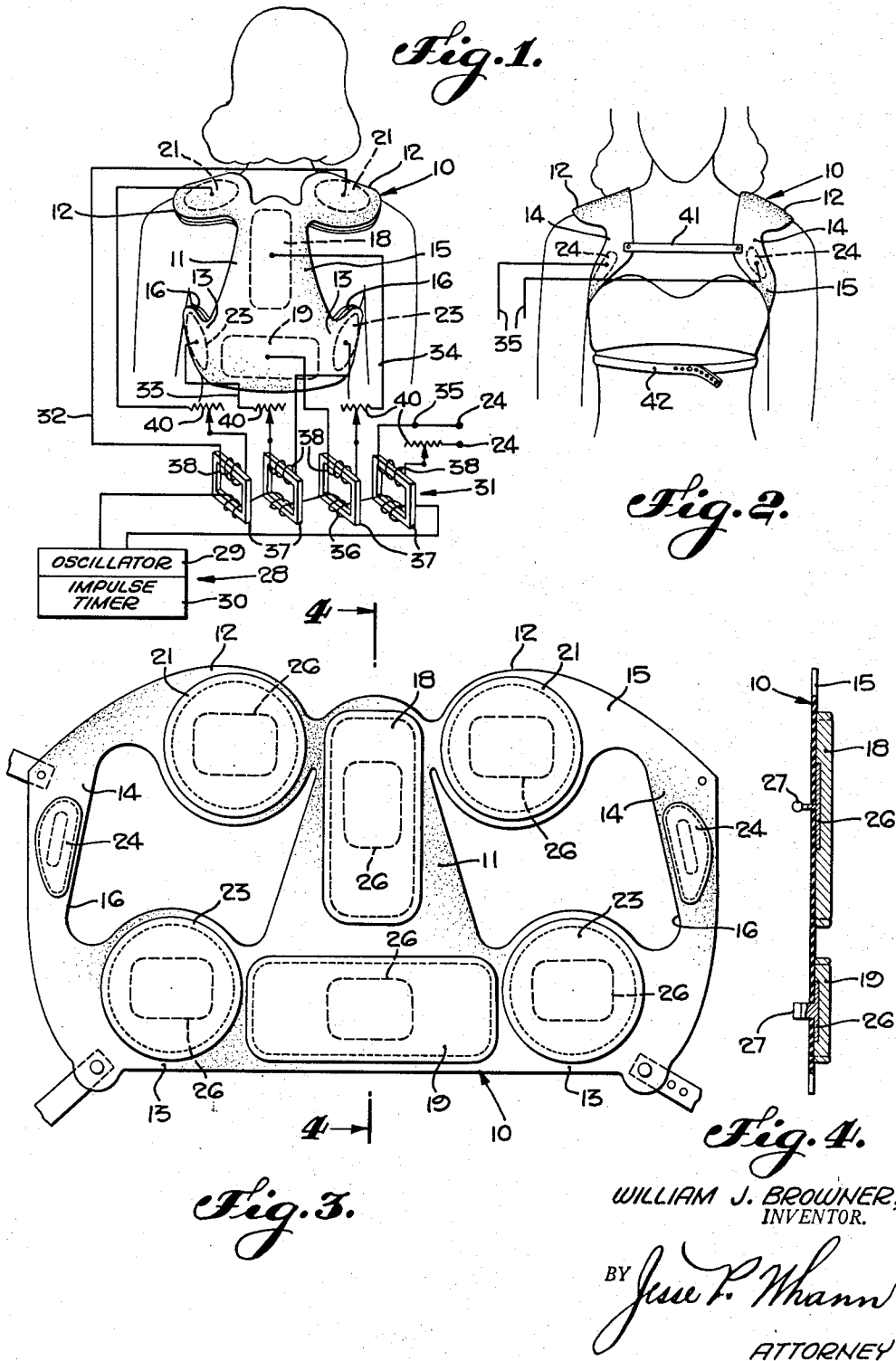
Dec. 8, 1953

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2,661,744

DEVICE FOR TREATMENT OF THE MUSCLES OF THE UPPER TORSO

Filed May 9, 1950



## UNITED STATES PATENT OFFICE

2,661,744

DEVICE FOR TREATMENT OF THE MUSCLES  
OF THE UPPER TORSO

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Application May 9, 1950, Serial No. 160,936

3 Claims. (Cl. 128—379)

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My invention relates to method and means for improving posture and for accomplishing a number of other valuable results which will be hereinafter explained, and relates in particular to a method and apparatus for application to selected parts of the body contractural current which will act to effect a sequential contraction of muscles.

It is an object of the invention to provide a method and means for improvement of posture by reducing spinal curvature and lifting and enlarging the thorax by the lifting of the anterior portions of ribs which slope downwardly and forwardly.

An important accomplishment of the present invention is derived from the improvement in oxygenation by increasing the size of the thoracic cavity and training the user of the device in better and deeper breathing habits so that there is an increase in oxygen intake and accordingly improved metabolism from greater oxygenation of the blood stream.

It is an object of the invention to provide for cooperation with sources of contractural current, means for applying contractural currents to nerve centers or nerves of specified muscles, and the invention further embraces a method wherein contractural currents of regulated strengths are applied to the nerves of selected muscles, thereby producing an ordered and rhythmic contraction of the selected muscles, thereby accomplishing the desired results hereinafter specified.

A further object of the invention is to provide a simple means for applying contractural currents of adjusted intensity to the motor nerve systems of the muscles latissimus dorsi, infra spinatus, trapezius and pectoralis major.

A further object of the invention is to provide a jacket of stretchable material having therein electrodes and/or pads for engaging specified surface areas of the skin to accomplish excitation by contractural currents of muscles which will act to reduce kyphosis of the dorsal region of the spine, rearwardly flex the shoulders and lift the thoracic cage.

Further objects and advantages of the invention may be brought out in the following part of the specification, wherein I have described for purpose of disclosure a preferred embodiment of my invention, without limiting the scope of the invention set forth in the accompanying claims.

Referring to the drawings which are for illustrative purposes only,

Fig. 1 is a view showing apparatus, for prac-

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tice of my invention, connected to the back of a patient;

Fig. 2 is a fragmentary face view supplementing Fig. 1;

Fig. 3 is a face view, to enlarged scale, showing the jacket disclosed in Figs. 1 and 2; and

Fig. 4 is a section taken as indicated by the line 4—4 of Fig. 3.

In the preferred form of my invention disclosed in Figs. 1 and 2, I provide a harness or jacket 10 formed of flexible, elastic material, such as a rubber compound, so formed that it will fit snugly upon the dorsal-thoracic region of the human body. This jacket 10, as further shown in Fig. 3, includes a central or spinal section 11, shoulder sections 12, lower back sections 13, and pectoral sections 14 which are spaced from the spinal section 11 and connect the distal portions of the shoulder and lower back sections 12 and 13. The portions 11, 12, 13 and 14 are cut from a continuous rubber sheet 15, and openings 16 exist on opposite sides of the central portion 11, through which the arms of the patient extend when the jacket 10 is donned as shown in Figs. 1 and 2.

When the jacket 10 is upon the person of the wearer, the shoulder portions 12 extend over the lateral portions of the trapezius muscle, connecting the cervical and upper dorsal vertebrae with the spine of the scapula and with the acromium and the lateral third of the clavicle. The lower back portions 13 extend across the lower posterior portion of the thoracic cage and along the lower portion of the axilla. The pectoral portions extend principally across the pectoralis major.

To the inner face of the central portion 11, a vertically elongated electrode or pad 18 is secured, this pad being referred to as the middle trapezius pad 18 for the reason that it is located so as to engage the skin surface in the intermediate region of the origin of the trapezius muscles along the spinous processes of the middle dorsal region. The lower part of the central section 11 is widened, and a laterally elongated pad 19 is secured thereto so as to engage the inferior or lower portion of the trapezius muscles where they are attached to the spinous processes of the lower dorsal vertebrae, the lateral portions of this pad 19 extending over the portions of the latissimus dorsi muscles which make their appearance at the margins of the lower trapezius muscles. This pad 19 may be referred to as the lower trapezius and/or the upper latissimus dorsi electrode.

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Upper trapezius electrodes or pads 21 are secured to the shoulder portions 12 of the jacket 10, these pads 21 being preferably made of a cotton felt so that they will retain water. The pads 21 are shown as circular, but they may be of other outline, the principal requirements concerning these pads 21 being their support so as to engage the divisions of the trapezius muscle which extend between the spinous processes and acromium, the scapula, and at least a part of the fibers which extend to the outer portion of the clavicle. The pads 21 are referred to as the upper trapezius pads. In Fig. 3 these pads 21 are disposed laterally on opposite sides of the upper portion of the pad 18, but when the jacket or harness 10 is placed upon the patient as shown in Fig. 1, the pads 21 are shifted upwardly so as to lie more upon the shoulders.

Electrodes or pads 23 are secured to the lower back portions 13 of the jacket 10 in positions to lie externally of the fibers of the latissimus dorsi muscle which slope upwardly and outwardly from the posterior layer of the lumbo-dorsal fascia. These pads are referred to as the lower latissimus dorsi and/or infra spinatus pads. Pads 24 are secured to the pectoral portions 14 of the jacket 10 in positions to lie over the pectoralis major adjacent the axilla.

It will be understood that in the preferred practice of the invention the pads 18, 19, 21, 23 and 24 are made from a cotton felt or other similar fibrous material capable of holding water. Between each of these pads and the adjacent rubber wall of the jacket 10, there are electrode plates 26 of Phosphor bronze or stainless steel, with connectors 27 extending from these plates through openings in the rubber wall 15 of the jacket 10, for connection to wires which extend, as shown in Fig. 1, to a generator 28 of contractural current. This generator 28 is of the type disclosed in my application, Serial No. 116,552, filed September 19, 1949, for Method and Means for Electrical Therapy. It includes an electronic oscillator 29 with an associated impulse timer 30, and with transformer means 31 adapted to feed separate circuits 32, 33, 34 and 35. A characteristic of this transformer means 31 is that a single primary winding 36 produces a magnetic field for permeating the separate transformer cores 37, each having wound thereon a separate secondary winding 38. For regulating the strengths of the separate contractural currents flowing in the circuits 32, 33, 34 and 35, rheostats 40 are provided.

Connected as shown in Fig. 1, the circuit 32 includes the upper trapezius pads or connections 21 and the intervening tissues of the trapezius muscles, the circuit 33 includes the pads 23 and the intervening musculature, the circuit 34 includes the pads 18 and 19 and the intervening bodily tissues, and the circuit 35 includes the pectoralis major pads 24 which are schematically shown in Fig. 1 and in Fig. 2 are shown in their proper relation to the pectoralis major muscles.

It is possible by use of the rheostats 40 to adjust the flows of contractural currents through each of these circuits so that the motor nervous systems of the respective muscles will be energized to the required extent or in such relation that there will first be a contraction of the trapezius, latissimus dorsi and infra spinatus muscles to reduce kyphosis, energization of the upper sections of the trapezius muscles to flex the shoulders posteriorly and upwardly and to lift the anterior portion of the thoracic cage. Simultaneously therewith, or closely following the foregoing mus-

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cular action, there will be an energization of the pectoralis major muscles which will act to lift the breast and also to lift the anterior portions of the ribs, thereby expanding the chest and moving the sternum forwardly with respect to the dorsal section of the spine. The action of the device is to produce passive exercise of muscles associated with the upper back and chest, producing valuable results, including more erect posture, expansion of the chest, improved breathing habits, increased oxygenation, and improvement in the tone and health of those tissues forming or located upon the anterior wall of the thoracic cage.

The upper trapezius pads 21 and the dorsalis major pads 24 may be used simultaneously, but this is not necessary. For example, if the contractile current generator 28 has only three outlets instead of four, as shown, a number of treatments may be given without electrification of the pads 24, then, for the succeeding treatment, the conductors of the circuit 32 may be transferred from their connection with the pads 21 to the pads 24.

I claim as my invention:

1. A device of the character described, comprising: a jacket of sheet rubbery material comprising a central spinal section, upper and lower laterally extending sections connected to the upper and lower portions of said central section, and pectoral sections connecting the extremities of said laterally extending sections, thereby forming armholes in the jacket, said sections having small openings therethrough; electrode members on the inner faces of said sections; and connector stems extending from said electrode members out through said openings to the rear faces of said sections.

2. In a device of the character described: a jacket formed of elastic material so that it will conform to the body of the wearer, said jacket having a central spinal section with a relatively small upper opening therethrough and a relatively small lower opening therethrough, a pair of shoulder sections extending from said central spinal section and respectively having small openings extending therethrough, and a pair of lower back sections extending laterally from the lower part of said central spinal section and respectively having relatively small openings extending therethrough; electrical connector stems extending through said openings; a middle trapezius electrode on the inner surface of said central spinal section connected to the inner end of the connector stem which extends through said upper opening; a lower trapezius electrode on the inner face of the lower part of said central spinal section connected to the inner end of the connector stem which passes through the lower opening of said central spinal section; upper trapezius electrodes on the inner faces of said shoulder sections and being connected respectively to the inner ends of the connector stems which pass through the openings in said shoulder sections; and infraspinatus electrodes on the inner faces of said lower back sections and being respectively connected to the connector stems which pass through said openings of said lower back sections.

3. A device as defined in claim 2 wherein said jacket has pectorales sections connecting the ends of said shoulder and lower back sections, small openings in said pectorales sections, stems extending through said openings of said pectorales sections and pectorales electrodes on the

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inner faces of said pectorales sections and being connected to said last named stems.

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