United States Patent

Raffel

[15] **3,653,375**

[45] **Apr. 4, 1972**

[54] MASSAGING CHAIR

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[21] Appl. No.: **85,598**

[52] **U.S. Cl.** **128/33**

[51] **Int. Cl.** **A61h 1/00**

[58] **Field of Search** 128/24.2, 32–36

[56] **References Cited**

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[57] **ABSTRACT**

Two vibrators are mounted on opposite sides of a chair frame below the seat so that the path lengths of the waves traveling through the chair from the vibrators are equal in both directions in a closed path. There are two controls for the vibrator motors, one control regulating the amount of massaging action by controlling the speed of both the vibrators, while the other control regulates the speed and direction of massaging action by controlling the differential speed between the two vibrator motors.

11 Claims, 6 Drawing Figures

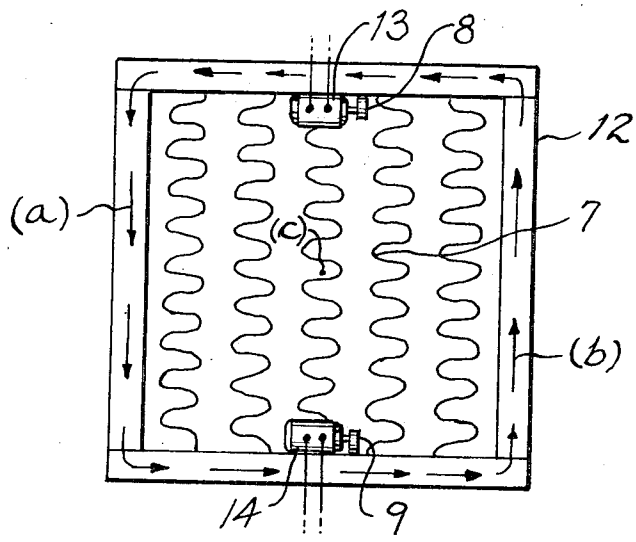


Fig. 1

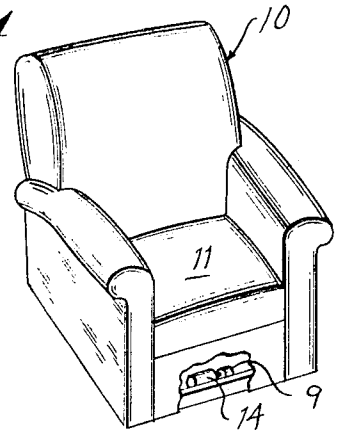


Fig. 2

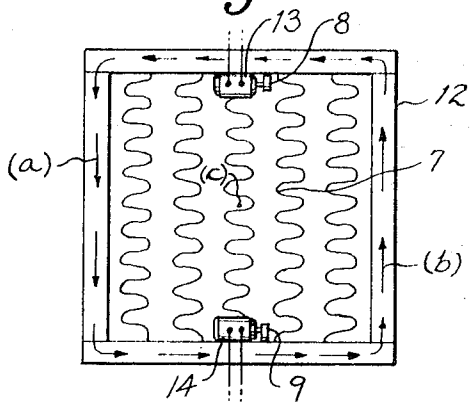


Fig. 4

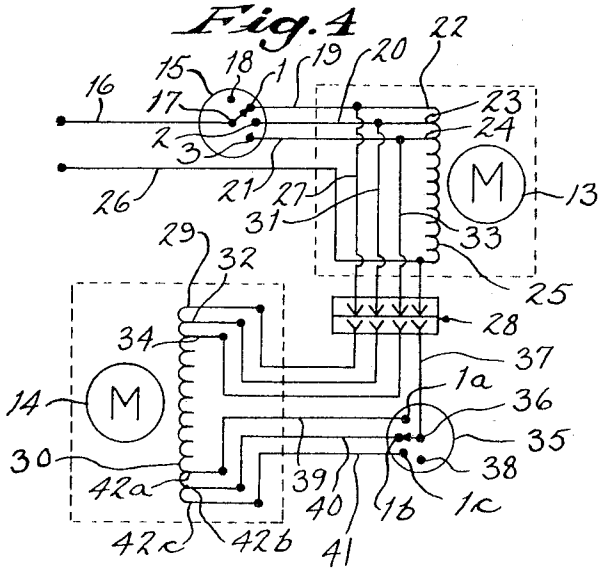


Fig. 5

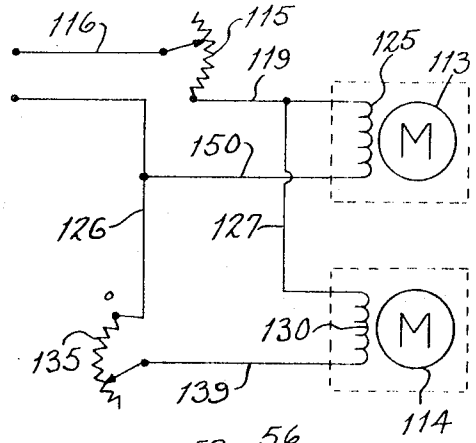


Fig. 3

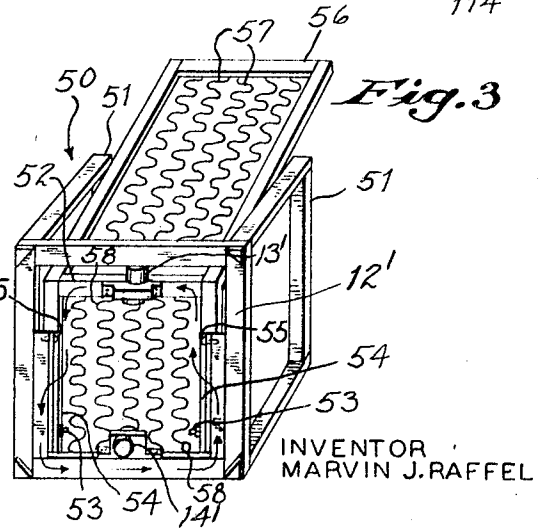
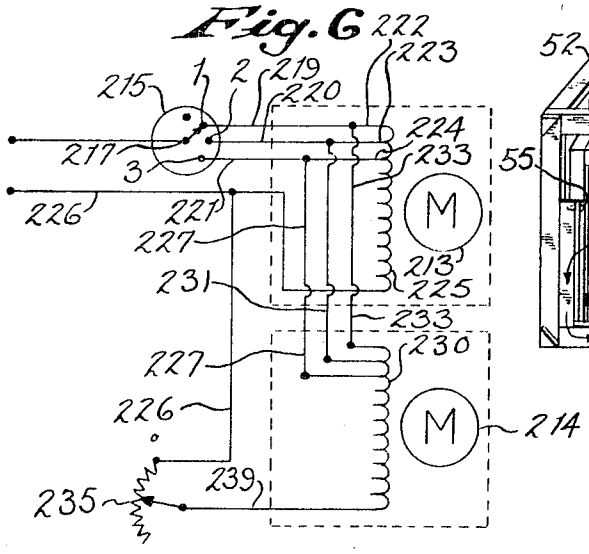


Fig. 6



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MASSAGING CHAIR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is useful in furniture, and is particularly suitable for use in reclining chairs to provide massaging waves for the occupant of the chair.

2. Description of the Prior Art

Heretofore there have been vibrating chairs such as those disclosed in the Blake U.S. Pat. No. 2,715,901, the Oetinger U.S. pat. No. 2,937,641, and in the Leach U.S. Pat. No. Re. 24,487 relating to a couch. In these constructions the vibrating motors have been located in particular places on the chair or couch to affect a particular portion of the body. Two vibrating motors have not been positioned on opposite sides of a chair frame portion in such a manner that the path lengths of the waves from the plural vibrators are equal in both directions in a closed path of travel formed by solid members. Nor has there been a dual control system for plural vibrating motors wherein one control regulates the amount of massaging action by controlling the speed of two vibrator motors while the other control regulates the differential speed between the two vibrator motors to thereby control the speed and direction of the interference massaging waves in a surrounding path around a center.

SUMMARY OF THE INVENTION

The present invention provides controlled rotary massaging action on the body of the user. This is accomplished through the use of controlled interference waves that are caused by two out-of-phase vibrator motors mounted on opposite sides of a surrounding frame path formed of solid members to which all parts of the chair are connected.

A further object of the invention is to provide a two control system for the above whereby one control regulates the amount of massaging action generated by both vibrator motors, and the other control regulates the speed and direction of the rotary interference wave massaging action by controlling the differential speed between the two vibrator motors.

A further object of the invention is to provide, in a chair or the like, novel positioning of two vibrators on a single surrounding frame portion of solid material or on two interconnecting frame portions properly arranged and balanced to obtain maximum effective interference waves traveling in a closed path around the center of the chair, the massaging waves being transmitted to the person sitting in the chair by the sag-resistant springs which are stretched across the frame, and by other frame members that come in direct contact with the body through padding on the chair, so that the entire body of the occupant receives the stimulating and relaxing effect of the massaging waves.

A further object of the invention is to provide an improved vibrating chair which is relatively simple to manufacture, which does not affect the normal appearance of the chair, which produces beneficial and pleasing massaging action, and which is otherwise well adapted for the purposes described.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, in which the same reference numerals designate the same parts in all of the views:

FIG. 1 is a perspective view of a chair, part being broken away to show one of the vibrating motors;

FIG. 2 is a view looking up from underneath one type of chair to show the position of the vibrator motors on a surrounding frame portion for one type of chair;

FIG. 3 is a perspective view looking principally at the bottom of a reclining chair to show the position of the vibrator motors on interconnecting frame portions;

FIG. 4 is a diagrammatic view showing a preferred electrical circuit utilizing plural speed vibrator motors;

FIG. 5 is a similar view showing a modified circuit wherein there are motors with untapped field coils, and wherein both of the controls are rheostats; and

FIG. 6 is a similar diagrammatic view showing still another modification wherein the vibrator motors are standard three speed motors, and wherein the speed control for the motors is a switch, and wherein the differential speed control is a rheostat.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more particularly to the drawing, the numeral **10** designates a chair having a seat portion **11** and a surrounding frame portion **12** between the seat and the bottom of the chair forming a portion of the frame of the chair and providing a surrounding path for vibrations as shown in FIG. **2**. In the case of some chairs the frame **12** is formed of four pieces of interconnected wood connected by sag-resistant springs **7**. However, in certain instances such frame may be metal or part wood and part metal, but the frame elements, forming the surrounding path shown by the arrows in FIGS. **2** or **3**, are formed of rigid material as distinguished from flexible material. While the invention is particularly suitable for use in chairs, it is nevertheless useful in other articles of furniture such as couches, beds, mattresses, or the like, it being only important that there be a surrounding frame portion of rigid material such as the frame portion **12** of FIG. **2**, or **12'–52** of FIG. **3**, which may be either square, rectangular, or any other shape, as long as it forms a surrounding path for vibrations. The effect may also be produced by the use of interconnected frame portions as will be hereinafter discussed in connection with FIG. **3**.

In accordance with the present invention, vibrating motors **13** and **14** are mounted on the closed frame path **12** so as to be directly opposite one another, whereby the vibration path (*a*) is equal in length to the vibration path (*b*). These motors are conventional vibrator motors having their shafts connected to eccentric weights **8** and **9**, respectively. They are preferably AC–DC induction motors, and the motors are firmly clamped or otherwise attached to the frame portions **12** to impart vibration thereto. The purpose of this arrangement is to obtain maximum effective interference waves from the vibrating motors which travel in a surrounding path around a center, such as the center (*c*) of the chair frame **12**. With this arrangement the two vibrators work together to affect all parts of the chair, as distinguished from prior art constructions wherein each vibrator is located to have its principal affect on a certain section of the chair and hence on a certain portion of the body of the occupant.

FIG. **3** illustrates the application of the invention to a certain type of reclining chair **50** which has arm portions **51**, a base frame **12'** which corresponds to the frame **12** of FIG. **2**, and a seat frame **52** which is positioned upwardly from the base frame **12'**. The seat frame is pivoted as at **53** to the forward ends of metal arms **54**. The inner or rear ends of said arms are pivoted as at **55** to the base frame **12'** or to rigid connections therewith. Suitably connected to the seat frame is a back frame **56**. Sag-resistant springs, such as the sinusoidal springs **57** illustrated, extend longitudinally of the back frame, and similar springs **58** are stretched from the front to the back of the seat frame. In this type of frame there is also usually a foot rest (not shown) which is suitably connected to the lower frame. In this type of reclining chair it is preferred to maintain the surrounding path by the use of two interconnecting frames **12'** and **52**. Therefore, the vibrator motor **14'** which corresponds to the motor **14** of FIG. **2** is connected to the frame **12'** similar to the motor **14** of FIG. **2**. The other motor **13'** which corresponds to the motor **13** of FIG. **2** is, however, connected to the rear portion of the seat frame **52**, preferably to the underside thereof. This creates the same effect as is illustrated in FIG. **2** inasmuch as the massaging waves will travel as shown by arrows in FIG. **3** from the solid frame **52** through the solid metal hinge connections **54** into the lower frame **12'**. Thus a closed or surrounding path through solid members is still provided, the massaging waves being transmitted to the occupant of the chair both by the springs **57** and **58** and by

other frame members which come in direct contact with the body of the occupant through the surface padding on the chair so that the entire body receives the stimulating and relaxing affects of the massaging waves.

In the present invention two controls are employed, one control regulating the amount of massaging action by controlling the speed of both vibrator motors **13** and **14**, while the other control regulates the speed and direction of the massaging action by controlling the differential speed between the motors **13** and **14** in such a way that interference frequency waves are produced.

Referring now to FIG. **4**, the switch **15**, designated a common switch, is a four-position switch for the purpose of controlling the amount of massaging action by regulating the speed of both motors **13** and **14**. One wire **16** leading from a source of current connects with the central pole **17** of the switch **15**. The switch has an "off" position **18** and speed positions **1**, **2** and **3**. These are connected by wires **19**, **20** and **21** with taps **22**, **23** and **24** of the field coil **25** of the motor. The other end of the field coil is connected with the wire **26** connecting with the other side of the source of electricity. The electric wire **19** is connected by a wire **27**, through a four-wire jack and plug set **28**, with a tap **29** on the field coil **30** of the other motor **14**. The electric wire **20** is connected by conduit **31** with a tap **32** of the field coil **30**, and electric wire **21** is connected by a wire **33** with the tap **34** of the field coil **30** for the motor **14**.

The field coil of the motor **13** is a standard coil for a three-speed motor. The field coil **30** for the motor **14** has three more taps at the other end in addition to the taps **29**, **32** and **34**. A differential speed switch **35** is similar to the switch **15**. Its central pole **36** is connected by an electric conduit **37** with the source wire. The terminal **38** is in "off" position and there are other positions **1***a*, **1***b* and **1***c*. These are connected by electric conduits **39**, **40** and **41** with the three extra taps **42***a*, **42***b* and **42***c*.

With the above arrangement, assuming that common switch **15** is set as illustrated in FIG. **4**, to complete the circuit to terminal **1** for minimum speed this will, of course, cause the motor **13** to operate at its minimum speed. At the same time, due to the connection provided by the electric wire **27** with the top of the coil **30** for the motor **14**, the latter will be operated at its minimum speed as far as switch **15** is concerned. By switching the switch lever for the switch **15** to contact **2**, both motors will be operated at an increased speed, and by switching to terminal **3** the speed of both motors will be still further increased. Thus the amount of massaging action is regulated by controlling the speed of both vibrators simultaneously.

Through use of the differential switch **35** and a properly wired and tapped coil **30**, if the switch lever is set to contact terminal **1***a* of switch **35** the speed of the motor **14** will be increased, for example, by 100 r.p.m. over the speed of the motor **13**. If the switch **35** is set to engage terminal **1***b* as illustrated, the speed of the motor **14** will be decreased a small amount, such as 30 r.p.m. under the speed of motor **13**, and by regulating the switch **35** to contact terminal (*c*) of the switch the speed of the motor **14** will be decreased, such as 100 r.p.m., under the speed of motor **13**. Thus the switch **35** regulates the speed and direction of the massaging action by controlling the differential speed between the motors **13** and **14** in such a way that interference frequency waves are controlled.

The switches **15** and **35** may, of course, have more or less than the four positions illustrated and described, depending upon the number of motor speeds desired.

In the form of the invention of FIG. **5** the motors **113** and **114** both have untapped field coils. However, motor **114** is modified so that it runs at least 100 r.p.m. faster than motor **113** when the rheostats **115** and **135** are in a position for zero resistance. In this form of the invention the rheostat **115** serves the same function as the switch **15**, i.e. to control the amount of massaging action by regulating the speed of both vibrator motors **113** and **114**. Here the rheostat finger is connected by electric wire **116** with one side of the source and the resistance coil of the rheostat is connected by the wire **119** with the field coil **125** for the motor **113**. The electric wire **119** is also connected by wire **127** with the field coil **130** for the motor **114**. The other end of the coil is connected by wire **139** with the movable contact finger of the rheostat, the coil of the rheostat being connected by electric wire **126** with the other side of the source of current, and there being a wire **150** connecting the other end of the field coil **125** with the source wire **126**.

With the arrangement of FIG. **5** the rheostat **115** controls the speed of both motors **113** and **114** and the rheostat **135** controls the speed of motor **114** only so that it, in effect, controls the differential speed between the two motors **113** and **114**.

In the modification of FIG. **6** the motor **213** corresponds to the motor **13** of FIG. **2** or **13'** of FIG. **3**, and all of the wiring for the motor **213** is the same as heretofore described in connection with FIG. **4**. The various parts will, therefore, be designated by the same numerals preceded by the digit 2. Motor **214**, instead of being a three-speed motor with three extra taps as in FIG. **4**, is a standard three-speed motor, the same as motor **213**. The wire **233** connects with the first tap of the motor **214**. The line **231** connects with the second tap, and the line **227** with the third tap. Thus the switch **215** controls the speed of both motors. The rheostat **235**, however, has its coil connected by wire **226** with the source of current and has its movable finger connected by wire **239** with the lower end of the field coil **230** for the motor **214**. Thus the rheostat controls the speed of only the motor **214** and, hence, the differential speed between the motors **213** and **214**. The circuits of FIGS. **4**, **5** and **6**, therefore, merely show three different ways of accomplishing the same net result.

When a person is sitting in the chair **10** or **50**, the interference waves from motor **14** or **14'** and **13** or **13'**, operating out of phase, travel around the frame as shown by the arrows (*a*) and (*b*) in frame **12** or **12'–52** in combination, which frames are all comprised of structural elements formed of rigid material as distinguished from flexible material. Thus the two vibrators either **13** and **14** or **13'** and **14'** work together to create a predetermined effect on all portions of the chair, producing a sensation of traveling waves of vibration. By use of the controls **15**, **115** or **215** the speed of both motors may be increased or decreased as desired to regulate the amount of massaging action. By manipulating the controls **35**, **135** or **235** the differential speed between the two motors may be controlled so that the vibrators produce vibrations of different frequencies, which frequencies combine to produce interference waves which result in an apparent motion of the lines of massage. When two motors are operating at identical speed there is little effect of moving lines of massage. When, however, the controls **35**, **135** or **235** are operated to produce different speeds between the two motors, then the effect of motion is produced by the lines of vibration traveling in the closed path (*b*) of the frame portion **12** in FIG. **2** for example. With predetermined settings for the controls **35**, **135** or **235** the direction of the waves may be reversed by reversing the relative speeds of the two motors.

For example, if the pointer switch **35** of FIG. **4** is at position **1***a*, which would be the fastest position for motor **14**, then motor **14** is operating faster than motor **13** because of differences in the number of turns in the field coils of the two motors or because of variations in the gauge of the wire which is used in the field coils, or due to any other conventional change which affects the normal speed. When the switch **35** is in position **1***b*, this produces a speed for motor **14** which is slower than the speed of motor **13**, and when this occurs this reverses the direction of the massaging waves from the direction shown by the arrows in FIG. **2**. When the switch is at position **1***c*, the motor **14** is operated at a still slower speed with respect to motor **13** which increases the differential and, therefore, increases the frequency of the interference waves, the latter being proportional to the differential speed.

In FIG. 5, when the rheostat 135 is at 0° resistance the motor 114 will be running faster than the motor 113 because the motor 114 has fewer turns in its field coil or is otherwise varied to produce this result. As the rheostat 135 is moved, it will gradually reduce the speed of the motor 114 until it matches the speed of the motor 113. Further movement in the same direction of the switch will then cause the motor 114 to operate at a slower speed than the motor 113, at which point the interference massaging waves will be reversed from the direction shown by the arrows in FIG. 2.

Likewise, in FIG. 6, when rheostat 235 is at 0° resistance the motor 214 runs faster than motor 213 because it has fewer turns in its field coil or has been otherwise modified to produce this result.

As a result of the above construction, wherein moving waves of vibration are created by controlling the differential speed between the two vibrators, an effect more like a body massage is created which is more soothing and relaxing to the body of the occupant.

In the claims the word "rigid" as used in connection with the frame portion 12, or 12'–52 in combination, denotes that the frame portions comprise elements formed of rigid material as distinguished from flexible material, and the term "frame portion" contemplates either a frame as shown in FIG. 2 or a frame portion comprising part of each of a plurality of interconnected frames as in FIG. 3.

It is to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What I claim is:

1. In an article of furniture having a frame portion whose elements are formed of rigid material and are arranged to provide a closed path surrounding a portion of the article, two electric motor-operated vibrators mounted opposite one another on said frame portion, electric circuit means for the motors of said vibrators, a source of current, and means for controlling the differential speed between the two motors to thereby control the speed and direction of the interference waves in said closed path formed by the frame portion whereby a massaging action is produced.

2. An article of furniture as claimed in claim 1 in which there are sag-resistant springs interconnecting opposite parts of said frame portion.

3. An article of furniture as claimed in claim 1 in which there is also means for regulating the amount of massaging action by simultaneously controlling the speed of both motors.

4. An article of furniture as claimed in claim 1 in which the electric circuit is a common circuit for the two motors, and in which the controlling means is in said common circuit.

5. An article of furniture as claimed in claim 3 in which the electric circuit is a common circuit for the two motors, and in which both controlling means are in said common circuit.

6. An article of furniture as claimed in claim 1 in which the article of furniture is a chair, and in which the frame portion is a rectangular frame portion at least part of which is a part of the base of the chair.

7. An article of furniture as claimed in claim 6 in which there are sag-resistant springs interconnecting opposite parts of said frame portion.

8. An article of furniture as claimed in claim 1 in which each vibrator motor is a multi-speed motor having a field coil with optional taps, in which the field coil of one of the motors has extra taps for producing speeds which are optionally greater than or less than the speed of the first motor, and in which the means for controlling the differential speed between the two motors comprises a switch for controlling the tap selection of said last-mentioned motor.

9. An article of furniture as claimed in claim 3 in which both motors are multi-speed motors with optional taps, and in which the means for regulating the massaging action is a common switch for selecting corresponding taps of the two motors to simultaneously control the speed of both motors.

10. An article of furniture as claimed in claim 1 in which the means for controlling the speed and direction of massaging action by controlling the differential speed between the two motors includes a rheostat for at least one of said motors.

11. An article of furniture as claimed in claim 1 in which the two motors are multi-speed motors, in which there is a common switch for simultaneously controlling the speed of both motors, and in which there is a rheostat for controlling the speed of one of the motors only.

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