



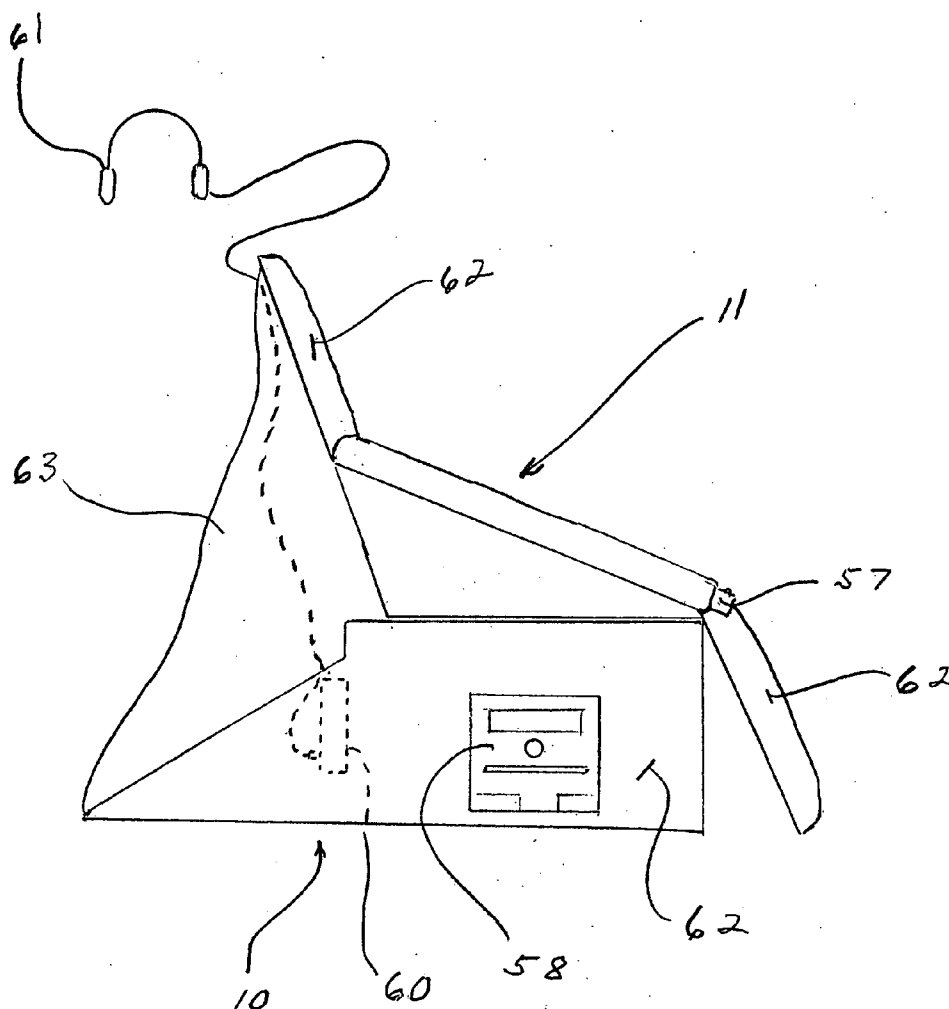
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(19) **United States**(12) **Patent Application Publication**
Dodd(10) **Pub. No.: US 2007/0052267 A1**(43) **Pub. Date: Mar. 8, 2007**(54) **RECLINING THERAPEUTIC CHAIR WITH
MULTIPLE ACOUSTIC SOURCES**(52) **U.S. Cl. 297/217.3**(76) **Inventor: Thomas Dodd, Tyler, TX (US)**

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RONALD B. SEFRNA**P.O. BOX 567****TYLER, TX 75710 (US)**(21) **Appl. No.: 11/514,619**(22) **Filed: Sep. 1, 2006****Related U.S. Application Data**(60) **Provisional application No. 60/714,170, filed on Sep.
2, 2005.****Publication Classification**(51) **Int. Cl.**
A47C 31/00 (2006.01)(57) **ABSTRACT**

A therapeutic reclining chair includes a base unit and a reclining chair unit pivotally connected to the base unit, with a motor drive unit for smoothly moving the chair unit between an upright and a reclining position; and further includes three independent audio sources which provide signals to two sets of speakers or transducer units for generating acoustic and tactile output to a user's body through the structure of the chair unit, and one set of speakers, preferably but not necessarily limited to headphones, for providing sounds to a user's ears. A user of the therapeutic chair experiences a combination of partial sensory deprivation in a floating-like orientation, two distinct, but coordinated tactile/auditory sensations, and a third, also coordinated, auditory sensation through the headphones, all cooperating to induce a state of deep relaxation in which conscious mental activity is discouraged and subconscious mental activity and receptivity is enhanced.



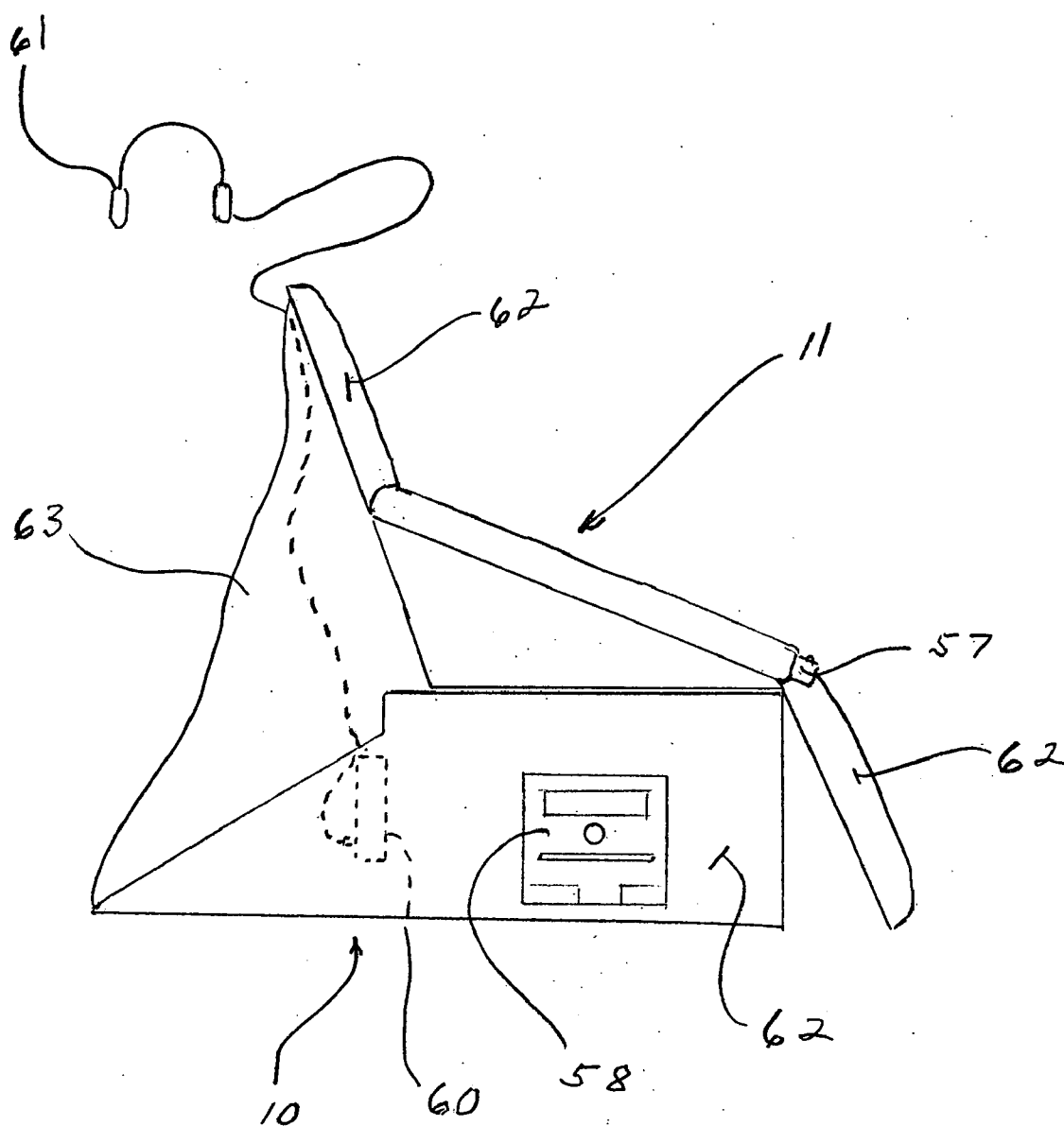
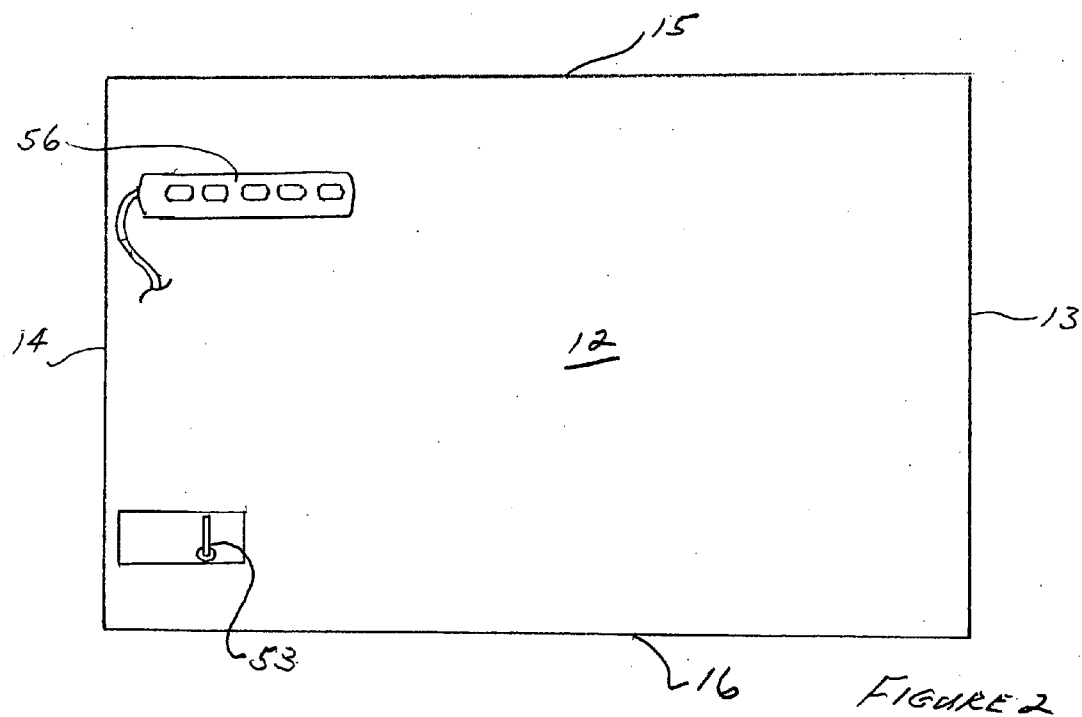
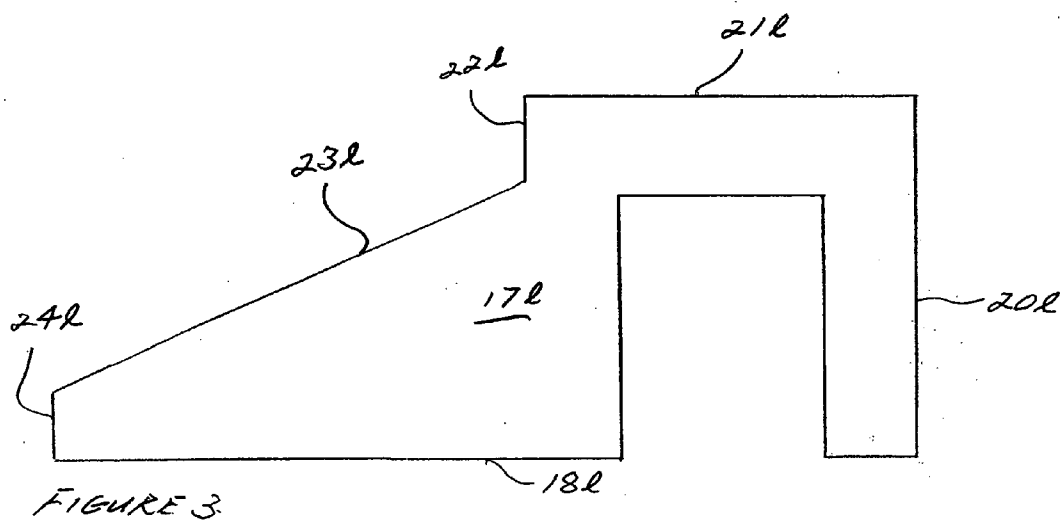


FIGURE 1



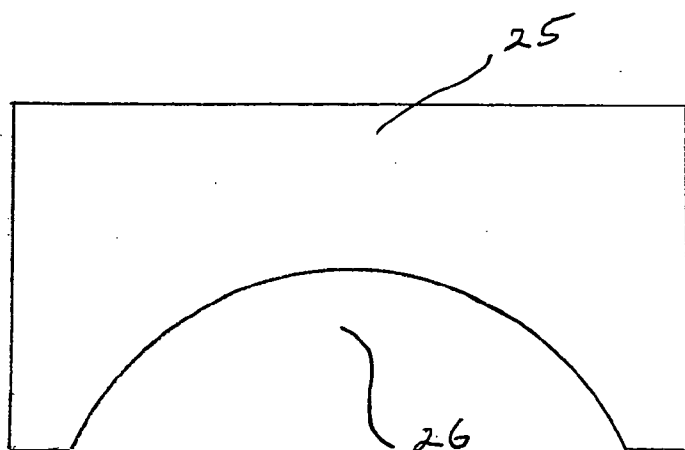
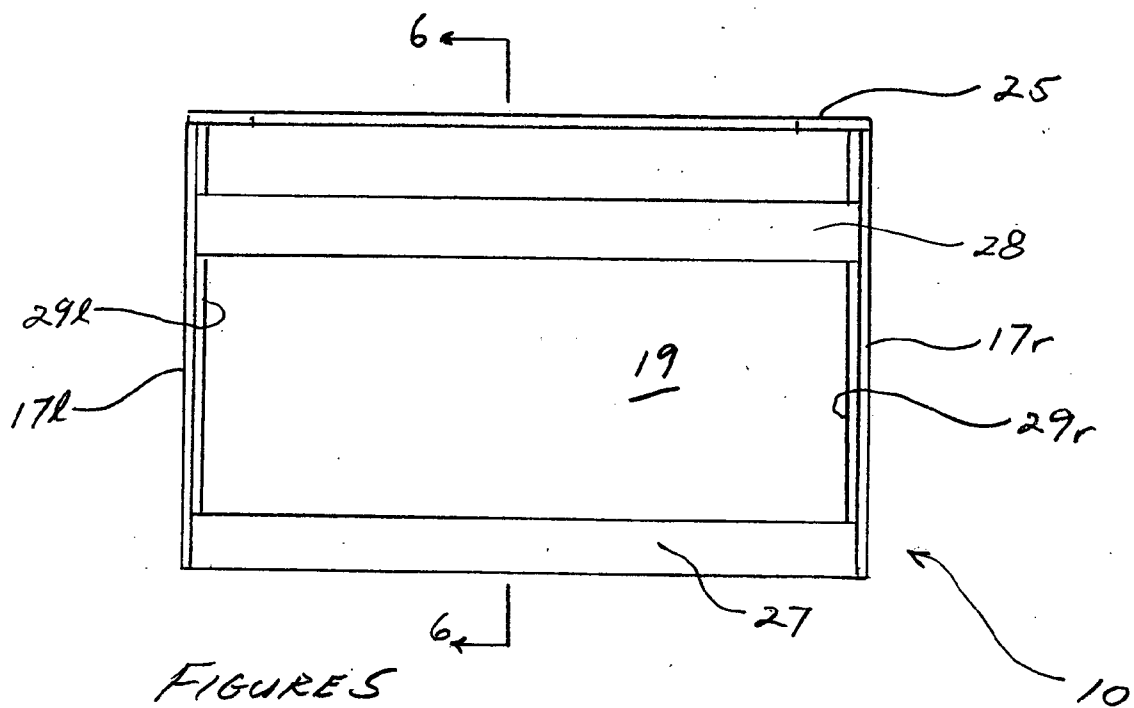
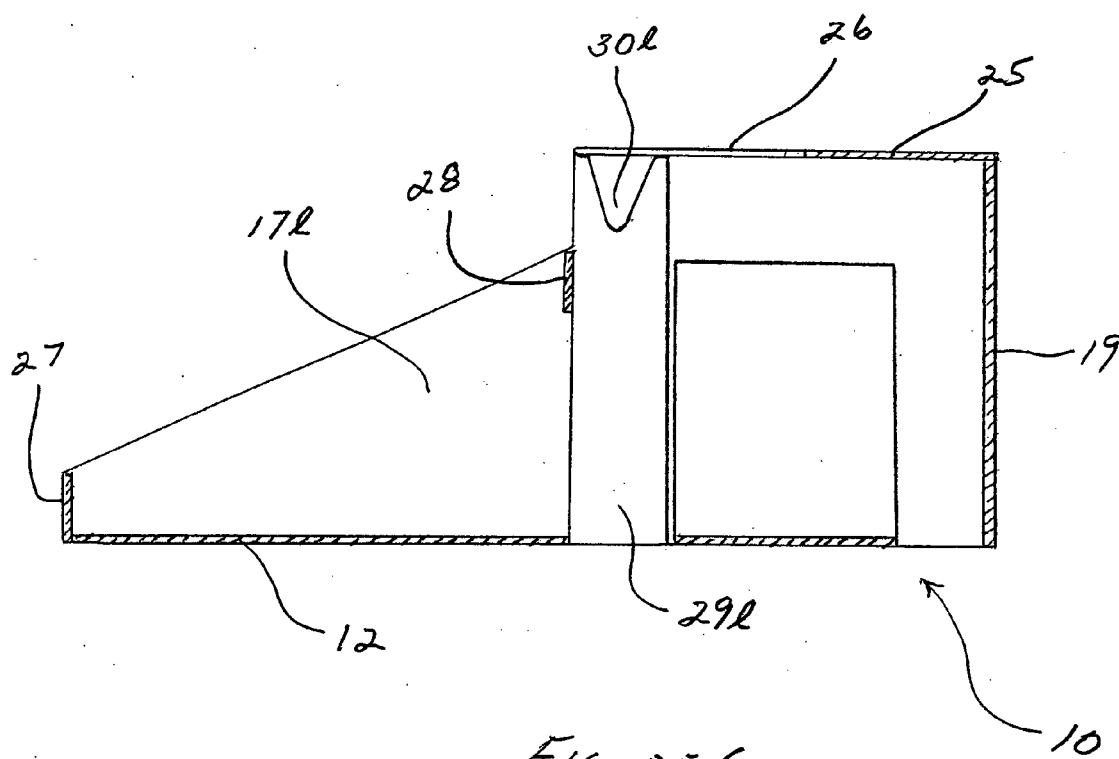


FIGURE 4



FIGURES



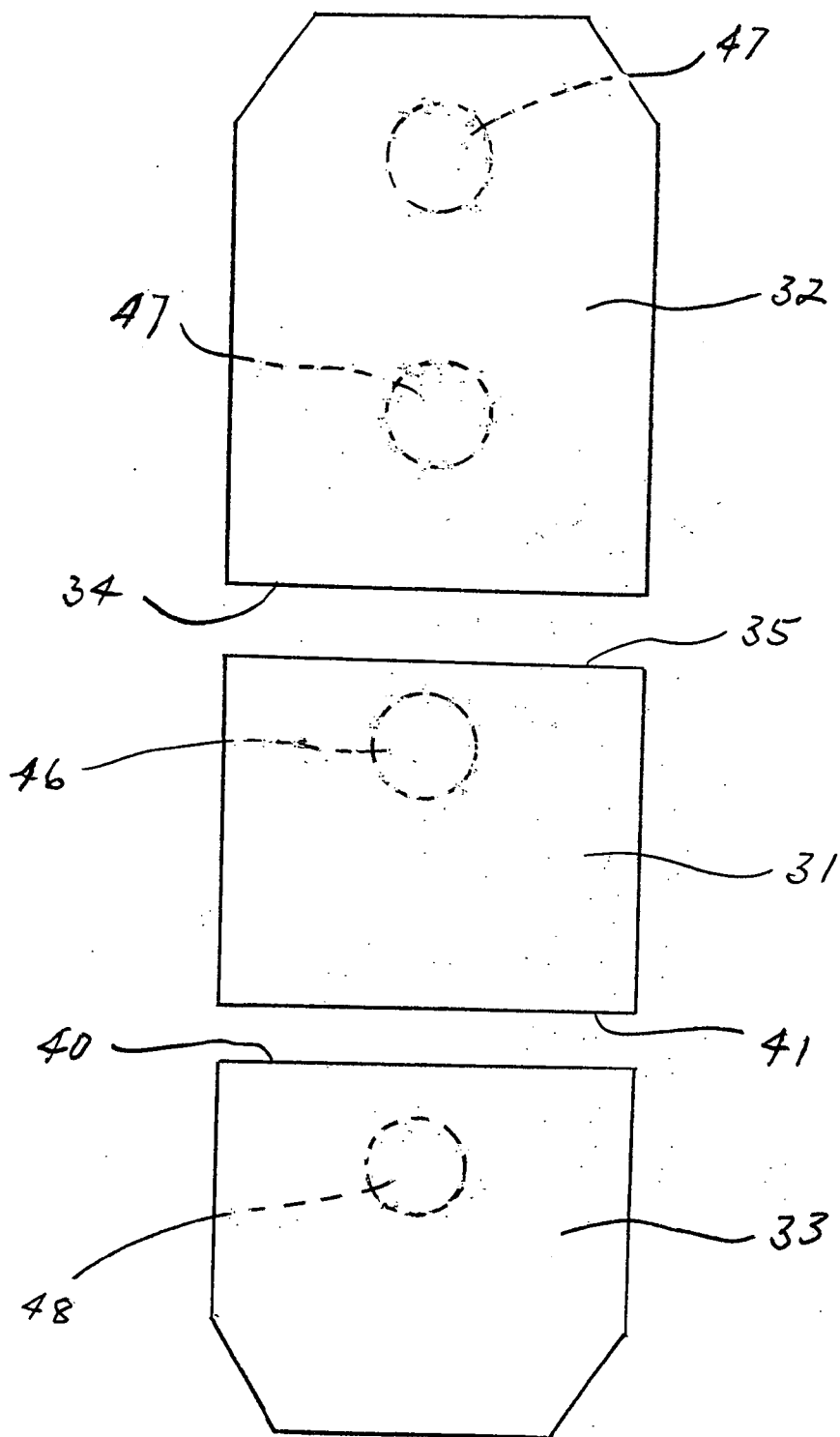


FIGURE 7

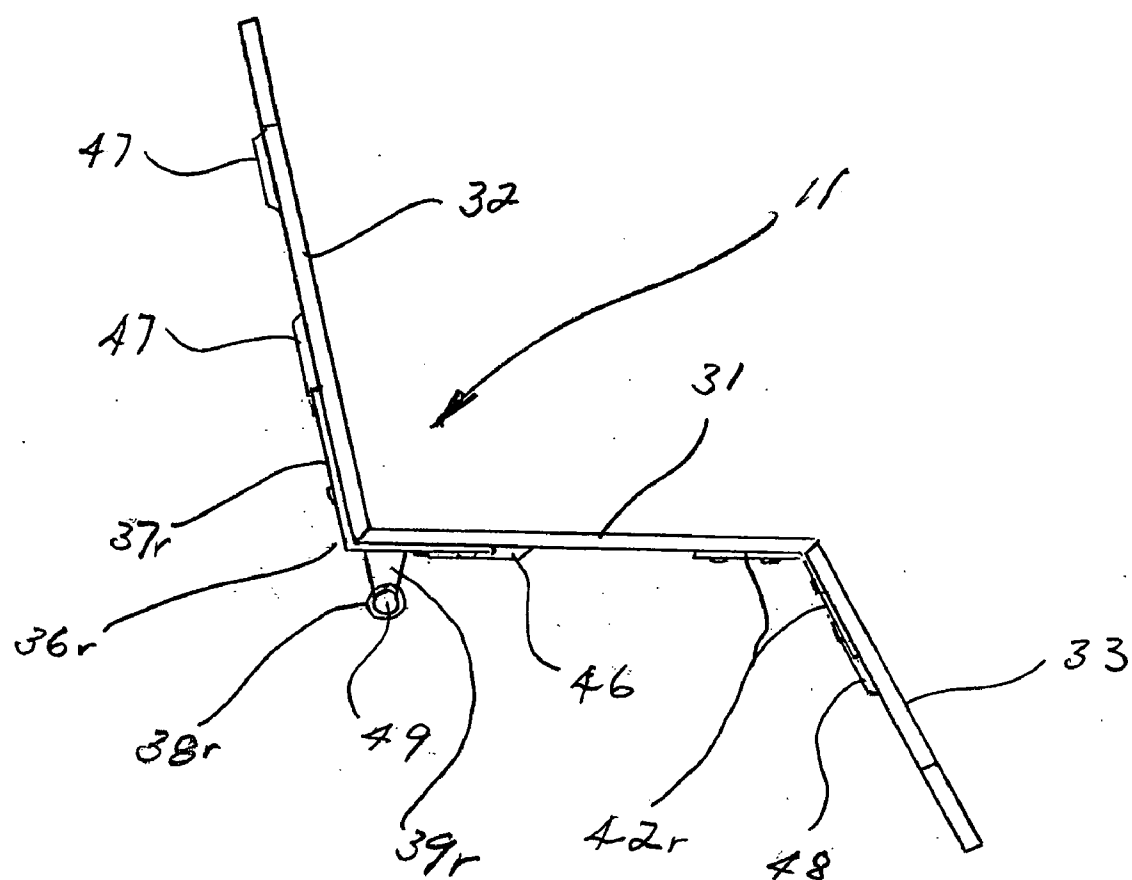


FIGURE 8

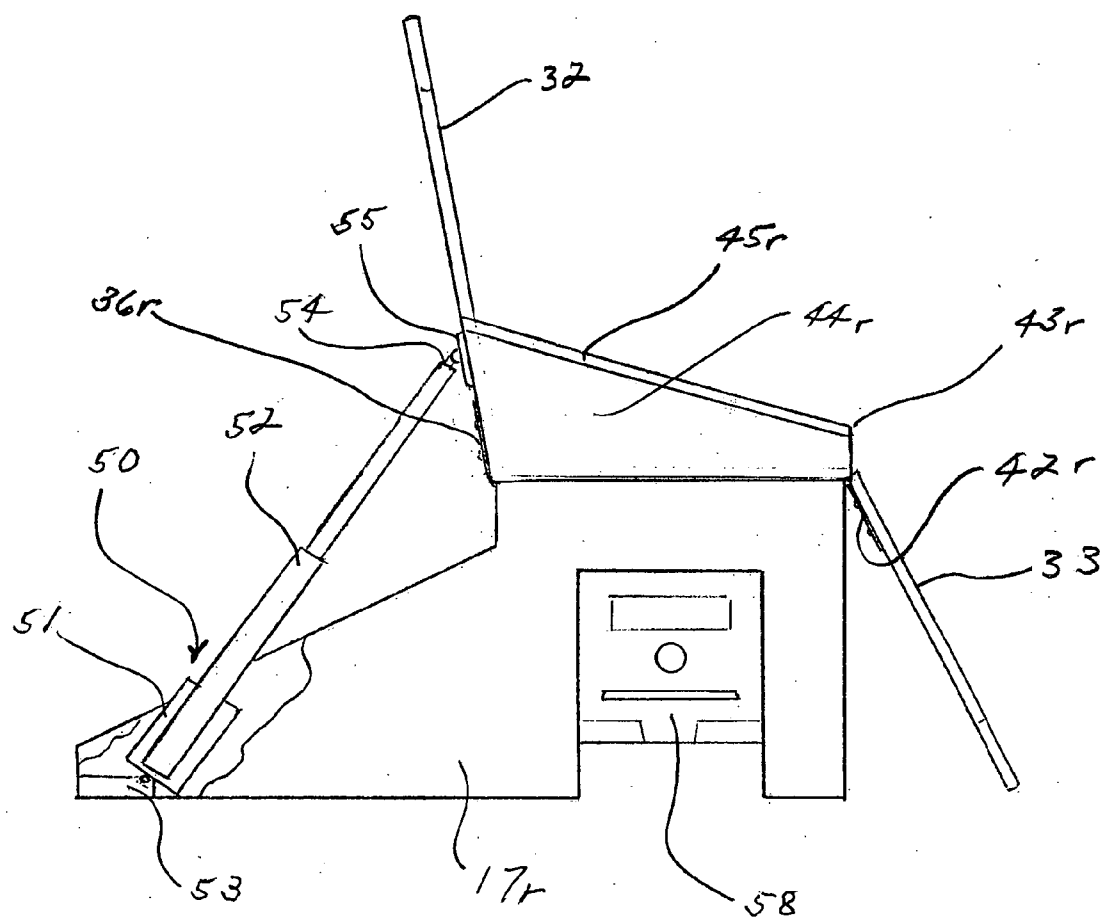


FIGURE 9

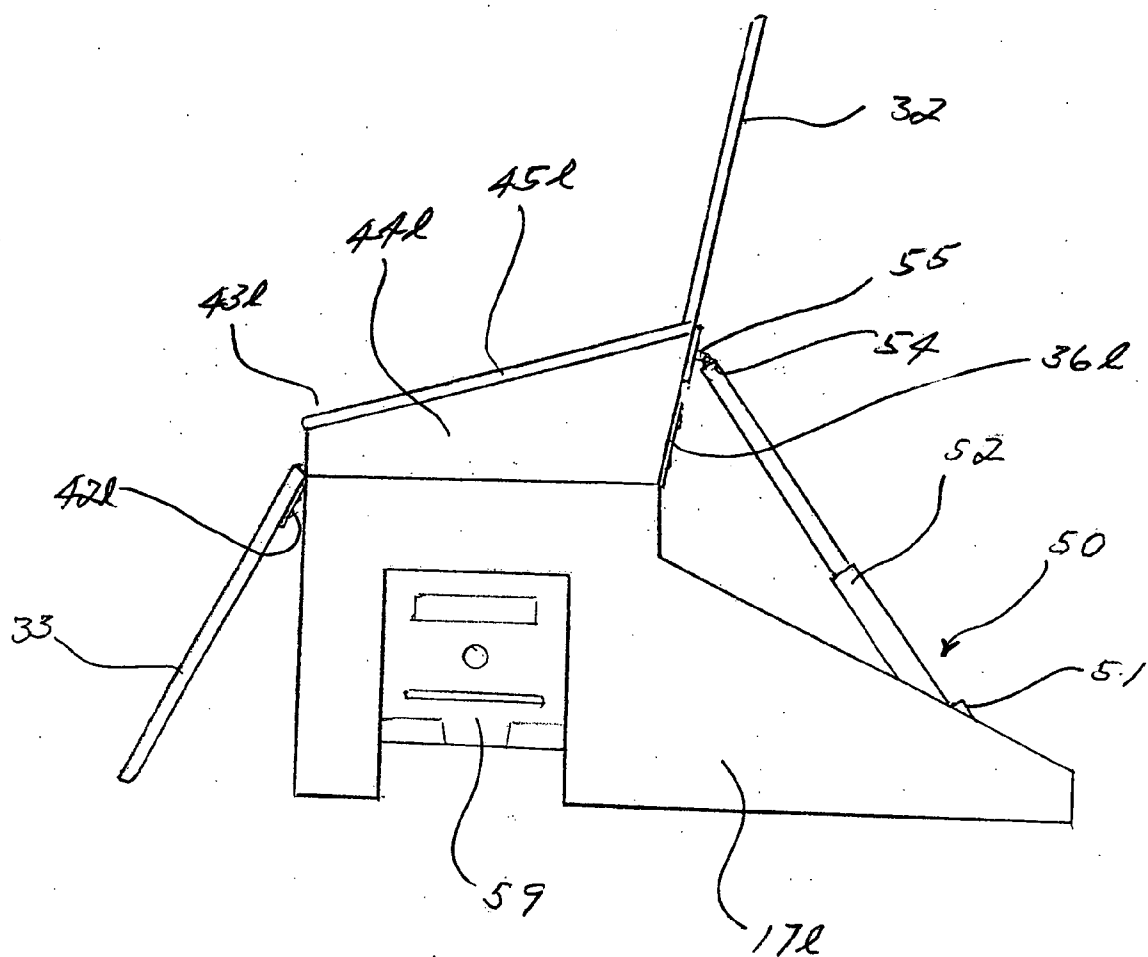


FIGURE 10

RECLINING THERAPEUTIC CHAIR WITH MULTIPLE ACOUSTIC SOURCES

RELATED APPLICATION DATA

[0001] This application claims the benefits of U.S. Provisional Patent Application Ser. No. 60/714,170, filed Sep. 2, 2005.

FIELD OF THE INVENTION

[0002] The present invention generally relates to the field of therapeutic and relaxation chairs, and in its preferred embodiments more specifically relates to a motorized reclining chair with multiple acoustic sources for independently providing a combination of auditory and tactile stimulus to a subject for relaxation and therapy.

BACKGROUND

[0003] It is known that sensory stimuli can have a significant effect on a person's mental and emotional state. Isolating a person from certain stimuli, and/or providing controlled stimuli can induce a state of physical relaxation, and can also induce mental and emotional states that can be directly therapeutic as well as increasing receptivity to therapy and suggestion.

[0004] Various approaches to inducing a desired mental and emotional state have been used, with differing degrees of success. Sensory deprivation, or isolation of a person from some or all normal sensory stimuli, has been used both to induce relaxation and in an effort to achieve alterations in consciousness and/or emotional state. However, different people react differently to sensory deprivation. For some, isolation from sensory stimulation is relaxing and useful in attaining the desired mental and emotional state, but in others the deprivation of sensory stimuli increases anxiety and the effect can be the opposite of what is desired.

[0005] In another approach mechanically induced vibration is applied through a chair or similar structure upon which a person reclines, with or without removal or reduction of visual and/or auditory stimuli. This tactile approach can be effective in relaxation of skeletal muscles, but typically has a limited effect upon mental and emotional state and the interplay between the conscious mind and the unconscious mind.

[0006] Sound is also sometimes used to assist a person in achieving a desired mental and emotional state, and to facilitate physical relaxation. Sound may be used alone or in combination with, e.g., tactile vibratory stimulation. Relaxation or therapy chairs are known in the prior art, in which, e.g., music from a single source is played through acoustic speakers or transducers mounted in the chair, and in some designs also played through headphones worn by the person using the chair. One or more of the chair mounted speakers or transducers produce acoustic vibrations that can be tacitly perceived by a person seated in or reclining in the chair. In some approaches visual stimulation is restricted and in others visual stimuli such as colors or other images are provided to the person in conjunction with the auditory and tactile stimulation.

[0007] Although all of these approaches known in the prior art have proven to be reasonably effective in assisting a person in achieving a state involving both physical and

mental/emotional relaxation, they are less effective in altering the normal interplay between conscious mind and subconscious mind. In many, if not most, therapies, such as behavior modification therapies, bringing about a change in a person's behavior is more a function of the subconscious mind than of the conscious mind, and the goal of essentially all such therapy techniques is reaching the subconscious through what is often the interference of the conscious mind.

SUMMARY OF THE INVENTION

[0008] The present invention provides a therapeutic chair apparatus that is highly effective in placing a person in a physically relaxed condition and in a mental and emotional state in which the normal waking constraints upon the person's subconscious mind are relaxed. The invention also provides a method for achieving this desirable state and the therapeutic benefits associated with it.

[0009] The apparatus of the invention is structured as a reclining chair with a motor activated mechanism for smoothly moving the chair from an upright position to an optimal reclining orientation. The chair of the invention includes three independent audio sources, such as but not limited to tape players or CD players, which provide signals to two sets of speakers or transducer units for generating audio/acoustic output to the person's body through the structure of the chair, and one set of speakers, preferably but not necessarily limited to headphones, for providing sounds to the person's ears.

[0010] In the method of use of the chair apparatus of the invention a person is seated in the chair, his or her eyes are gently covered to exclude visual stimuli, and headphones are positioned over the user's ears. Three selected audio sources are activated and the chair is slowly tilted to the reclined position. The audio/acoustic sources provide a coordinated tactile and audible program to the user of the chair from the independent sources, through the independent output transducers and speakers to assist the user in achieving and maintaining the desired state through the duration of the program. As the program concludes the chair is gently and smoothly returned to an upright position in coordination with the audio/acoustic program to return the person to normal consciousness.

[0011] The structure of the chair apparatus of the invention, and the method of the invention, will be described in detail below, with reference to the accompanying drawing figures to illustrate the preferred structural embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a side view of a preferred embodiment of the chair apparatus of the invention, in upright orientation.

[0013] FIG. 2 is top plan view of the bottom plate of the base unit of the chair of the invention.

[0014] FIG. 3 is a side elevation view of the left side plate of the base unit of the chair of the invention.

[0015] FIG. 4 is a top view of the top plate of the base unit of the chair of the invention.

[0016] FIG. 5 is a rear elevation view of the base unit of the preferred embodiment of the chair of the invention.

[0017] FIG. 6 is a sectioned side view of the base unit of the preferred embodiment of the chair of the invention, along line 6-6 in FIG. 5.

[0018] FIG. 7 is a top plan view of the seating plates of the preferred embodiment of the seat unit of the chair of the invention, prior to connection to each other.

[0019] FIG. 8 is a side elevation view of the seat unit of the chair of the invention, as connected, with speakers installed.

[0020] FIG. 9 is a left side elevation view of the preferred embodiment of the chair of the invention, without padding and upholstery.

[0021] FIG. 10 is a right side elevation view of the preferred embodiment of the chair of the invention, without padding and upholstery.

DESCRIPTION OF THE INVENTION

[0022] Referring to the drawing figures, the preferred embodiment of the chair apparatus of the invention includes a base unit 10 and a reclining seat unit 11, pivotally interconnected to the base unit so as to move between an upright orientation and a reclining orientation.

[0023] Base unit 11 includes a rectangular bottom plate 12, which rests flat upon a floor or other supporting surface upon which the chair apparatus is positioned. In the preferred embodiment bottom plate 12 is approximately twenty-four inches wide and approximately thirty-six inches long, but it is to be understood that the specific dimensions of the components of the chair apparatus are not critical to the invention, and variations in the dimensions or proportional relationships may be made within the scope of the invention. Bottom plate 12 has a front edge 13, a rear edge 14, and left and right side edges 15 and 16, respectively.

[0024] A left side plate 17_l and a right side plate 17_r, formed as mirror images of each other, are connected at their lower edges 18_l and 18_r to side edges 15 and 16, respectively of base plate 12, with the side plates extending upwardly perpendicular to the base plate and parallel to each other. A front plate 19 is connected between front edges 20_l and 20_r of the side plates and to front edge 13 of the base plate. The forward portion of each of side plates 17 is generally rectangular in configuration, each having an upper edge 21_l and 21_r, respectively, disposed perpendicular to front edges 20_l and 20_r. The upper edges of the side plates step down at the rear of the rectangular portion to form step edges 22_l and 22_r. The rear portion of side plates 17 is trapezoidal in shape, each having an inclined edge 23_l and 23_r extending to rear edges 24_l and 24_r, which are parallel to front edges 20_l and 20_r. Each of side plates 17 includes a cutout 25_l and 25_r in the rectangular portion of the plate, extending from the bottom edge toward the top edge. In the preferred embodiment, front plate 19 and each of side plates 17 extend upwardly from bottom plate 12 approximately fifteen inches so that their respective upper edges are aligned and parallel to the bottom plate, although, as noted above, variations in dimension may be made within the scope of the invention.

[0025] In the preferred embodiment a top plate 25 disposed on the upper edges of the front plate and the rectangular portions of the side plates and connected thereto in parallel relation to bottom plate 12. It is preferred that a generally semi-circular cutout 26 be formed in the top plate to facilitate access to the interior of the base unit after

assembly of the chair apparatus, and to assure clearance for rotation of the seat unit between upright and reclined orientations.

[0026] A rear plate 27 is interconnected between side plates 17_l and 17_r adjacent to their rear edges 24_l and 24_r, and to the rear edge 14 of bottom plate 12. An axle support brace 28 is connected between side plates 17_l and 17_r immediately below step edges 22_l and 22_r. An axle support 29_l extends between bottom plate 12 and the upper edge 21_l of side plate 17_l perpendicular to the bottom plate, and is connected to side plate 17_l adjacent to axle support brace 28. A second axle support 29_r is similarly disposed and connected to side plate 17_r. Notches 30_l and 30_r are formed in the upper ends of axle supports 29_l and 29_r to receive the ends of an axle upon which the seat unit of the chair apparatus pivots.

[0027] The structure of the base unit of the chair apparatus as described above is illustrative of the preferred embodiment, but is not intended to be limiting, and it is to be understood that other structural designs may be used, so long as they provide a sufficiently strong and stable base platform for the seat unit of the chair apparatus, provide space for audio components, drive components, and power connections, and allow access to the interior of the base unit. It is further to be understood that bracing and stabilizing members may be added to the described structure if desired, within the scope of the invention. The preferred material of construction of the base unit is $\frac{3}{4}$ inch plywood, but the scope of the invention is not limited to the use of any particular material, and other materials with appropriate strength and rigidity may be used if desired.

[0028] Seat unit 11 of the preferred embodiment includes three primary components or sections; a seat plate 31, a back rest plate 32, and a leg rest plate 33. The lower edge 34 of the back rest plate is aligned with the rear edge 35 of the seat plate, with the back rest plate disposed at an angle of approximately one hundred five degrees relative to the seat plate, and those two plates are connected together using bracket and axle mounts 36_l and 36_r, disposed adjacent to the left side edges and to the right side edges, respectively, of the seat plate and backrest plate and connected to the lower surfaces of those plates by screws or other suitable fastening means. Each bracket and axle mount includes an plate 37 formed at an angle equal to the angle between the seat plate and the back rest plate, and an annular axle mount 38, connected to plate 37 by axle mount support 39.

[0029] The upper edge 40 of leg rest plate 33 is aligned with the front edge 41 of the seat plate, with the leg rest plate disposed at an angle of approximately one hundred twenty degrees relative to the seat plate and extending in generally the opposite direction from the seat plate as the back rest plate, so that seat unit 11 has a generally Z-shaped configuration. The leg rest plate is connected to the seat plate by brackets 42_l and 42_r, disposed adjacent to the left side edges and the right side edges, respectively, of the seat plate and leg rest plate, and connected to the lower plate surfaces by screws or other suitable fastening means. In the preferred embodiment a pair of armrests 43_l and 43_r are connected to the seat plate and back rest plate on the left and right sides of the seat plate, respectively. Each arm rest of the preferred embodiment includes a trapezoidal support member 44, and an arm plate 45 connected to the upper edge of the support member.

[0030] It is preferred that the upper corners of the back rest plate and the lower corners of the leg rest plate be beveled, as shown in the drawing figures, but the corner treatment is not an element of the invention and other forms may be used if desired. The preferred length of the seat plate, between the front and rear edges, is approximately nineteen inches, slightly longer than the length of upper edges 21 of side plates 17. The preferred length of the back rest plate between its lower and upper edges, is approximately thirty-two inches, and the preferred length of the leg rest plate between its upper and lower edges is approximately twenty-one inches. These specific dimensions, though preferred, are not limitations of the scope of the invention, and it is to be understood that variations in the dimensions and proportional relationships may be made.

[0031] A seat transducer 46 is connected to the lower surface of the seat plate, generally centered between the side edges of that plate and adjacent to the rear edge of the plate, so that the transducer is acoustically coupled with the seat plate. Two back rest transducers 47 are connected to the rear surface of back rest plate 32, symmetrically disposed between the upper and lower edges of that plate and generally centered between the side edges. A leg rest transducer 48 is connected to the rear surface of leg plate 33, disposed adjacent to the upper edge of the leg rest plate and also generally centered between the side edges of that plate. All transducers are acoustically coupled to the respective plates of the seat unit structure, so that upon activation of the transducers the entire surface to which they are connected become part of the acoustic system, and the sound signals transmitted to the transducers are emitted from the entirety of the structure.

[0032] Because the plates of the seat unit themselves perform an acoustic function, that feature should be taken into consideration in selecting the material of construction. The preferred material of construction of the plates of the seat unit is $\frac{3}{4}$ inch plywood, which has been found to have good acoustic characteristics as well as appropriate strength and rigidity for the mechanical functions of the chair. The scope of the invention is not limited to any particular material of construction, however, and it is to be understood that other materials with appropriate characteristics and properties may be used.

[0033] Seat unit 11 is pivotally connected to base unit 10 by axle 49, which is preferably formed from an elongate cylindrical pipe or rod. Axle 49 extends through axle mounts 38 of bracket and axle mounts 36, and the ends of axle 49 are received in notches 30 of axle supports 29, to suspend the seat unit slightly above the base unit and allow the seat unit to rotate on axle 49 relative to the base unit. Rotation of the seat unit is activated by a motor assembly 50, connected between back rest plate 32 of the seat unit and bottom plate 12 of the base unit.

[0034] In the preferred embodiment motor assembly 50 is a screw drive linear actuator assembly, with a motor 51 and a variable length actuator 52. Motor 51 is pivotally connected to bottom plate 12 of the base unit by a motor mount 53, and the outer end 54 of actuator 52 is connected to back rest plate 32 by actuator mount 55. The connection of motor assembly 50 between the seat unit and the base unit stabilizes the seat unit and prevents rotation of the seat unit on axle 49 except when motor 51 is operated to shorten or

lengthen actuator 52. Motor 51 is preferably a reversible electric motor that when operated in one direction will shorten actuator 52 to rotate the seat unit to a reclining orientation, and that when then reversed will lengthen actuator 52 to rotate the seat unit back to an upright orientation. Limit switches (not shown) may be used to prevent excessive rotation of the seat unit in either direction. In the preferred embodiment a power strip 56, with multiple electrical outlets is connected to bottom plate 12 adjacent to motor 51, to be plugged into a convenient source of electrical power. Motor 51 may be plugged into power strip 56. Alternatively, although not preferred, motor 51 could be directly wired to an electrical junction box mounted in the base unit, or could be plugged directly into a wall outlet or connected to another available power source outside the chair apparatus. Operation of motor 51 is preferably controlled using a switch control unit 57. Although the use of an electric motor and screw drive actuator is preferred, it is to be understood that other types of motors and actuators could be used within the scope of the invention if desired. For example, a hydraulic pump and hydraulic cylinder and piston could be used in an alternative embodiment.

[0035] In the chair of the invention three independent audio sources are mounted to the chair structure and connected to the chair mounted transducers referred to above and to a set of headphones to direct output from one of the audio sources directly to the ears of a person using the chair. In the preferred embodiment a first audio source 58 is mounted in the base of the chair structure, preferably to one of side plates 17, so as to be readily accessible. The first audio source is connected to back rest transducers 47, so that the audio signal from the first audio source is output from the back rest transducers. A second audio source 59 is mounted to the opposite side plate 17, and is connected to seat transducer 46 and leg rest transducer 48. A third audio source 60 is preferably mounted in base unit 10, in a location selected to allow access to the third audio source without interfering with motor assembly 50, such as on axle support brace 28. The third audio source is connected to a set of headphones 61 to be placed over a user's ears. All three audio sources are preferably connected to power strip 56 as a source of electrical power, but other means of connection to a source of electrical power may be used if desired. In the preferred embodiment the audio sources are CD players, but the invention is not limited to any particular audio format, and it is to be understood that any available audio format may be used.

[0036] The exterior surfaces of the structural members and the seating surface of the chair are covered by padding and upholstery 62 for an aesthetic appearance and for the comfort of a person sitting in the chair. The upholstery provides a comfortable seating surface without interfering with the transmission of sound waves through the covering padding and upholstery. The composition of the padding material used and the composition and design of the upholstery covering is not significant to the invention, and it will be understood that a wide variety of options are available for use as a matter of design preference. It is generally preferred that the upholstery material be durable and easily cleaned. In the preferred embodiment a curtain or panel 63 is removably connected between the back of the seat unit 11 and the rear of bottom plate 12 of the base unit 10, to cover the components mounted in the base unit (e.g., motor assembly, power strip and audio source) from view. The panel may be

easily disconnected to allow access to the covered space to, e.g., change the CD in the sound source.

[0037] The chair of the invention provides the unique feature of allowing a person seated in the chair to experience audio stimulation from three different sources, playing three different programs. The sound waves emitted from the transducers mounted to the back, seat, and leg rest of the seat unit are generally perceived as tactile sensations as much as or more so than as auditory sensations, depending upon the program selected for the associated sound sources. The availability of two distinct means of providing tactile or vibratory sensations to a user, along with a third means for providing auditory signals to the user, affords a previously unprecedented level of flexibility in selecting and employing a program of sensory stimulation for relaxation and therapy.

[0038] In a typical method of using the chair of the invention, a subject is seated in the chair, with the seat unit in an upright orientation, the subject's eyes are covered to exclude visual stimulation during the session, and the headphones connected to the third audio source are placed over the subject's ears. The first, second, and third audio sources are activated to play a pre-selected coordinated audio program from the three sets of media in the three audio sources, and the seat unit is slowly moved to a reclining orientation by activating the motor assembly. Activation of the audio sources and/or movement of the seat unit may be controlled by the subject, or by another person such as a therapist.

[0039] In a therapeutic application, the combination of partial sensory deprivation, the replacement of normal spatial orientation with a floating-like orientation, coupled with the receipt of two distinct, but coordinated tactile/auditory sensations, and the receipt of a third, also coordinated auditory sensation through the headphones, cooperate to quickly and easily transport a subject into a state of deep relaxation in which conscious mental activity is discouraged and subconscious mental activity and receptivity is encouraged and enhanced. In the preferred method of use, the first and second audio sources and transducers are used to provide low range frequencies directly to the subject's body in a highly tactile experience. The third audio source is preferably used to provide "theta wave" signals and other sounds through the subject's auditory sense. In the desired state of relaxation and receptivity a motivated subject is able to much more easily bring about changes in his or her subconscious mental patterns and modes. A subject in the state brought about with the chair of the invention is also receptive to therapeutic suggestion that may, for example, be introduced through, e.g., the auditory program delivered to the subject through the headphones, or in a preparatory session prior to use of the chair.

[0040] A number of case studies have demonstrated that the chair of the invention, used with a tactile and auditory program and with guided meditation, facilitates rapid and effective change, with benefits including, but not limited to, stress relief, pain reduction, help with addictive behaviors, smoking cessation, and weight loss.

[0041] The chair of the invention may be used for purposes that are not at least directly oriented toward therapeutic objectives. For example, with minor modifications in transducer or speaker connections, the chair may be used for the enjoyment of a single audio program, such as music. Lower frequency ranges in a music selection will be experienced

by a user through the transducers mounted in the seating unit with a tactile component, while higher frequency ranges will be more predominantly experienced through the headphones. Even though direct therapy may not be the primary goal of the user, many of the same benefits, including but not limited to relaxation, are provided to the user.

[0042] The foregoing description of preferred embodiments of the chair apparatus and of methods of use of the chair are intended to be illustrative and not limiting. Additional embodiments and variations may be devised, all within the scope of the invention, in accordance with the following claims.

1. A therapeutic reclining chair apparatus, comprising,
 - a base unit to be disposed upon a generally horizontal supporting surface;
 - a seat unit disposed upon and pivotally connected to said base unit such that said seat unit is rotatable relative to said base unit between a first, generally upright position and a second, generally reclining position, said seat unit including a seat plate having a rear edge and a front edge and an upper surface and a lower surface, a back rest plate having a lower edge and an upper surface and a lower surface, said back rest plate connected to and extending outwardly from said seat plate with said lower edge of said back rest plate aligned with said rear edge of said seat plate, and a leg rest plate having an upper edge and a lower edge and an upper surface and a lower surface, said leg rest plate connected to and extending outwardly from said seat plate in generally opposed relation to said back rest plate with said upper edge of said leg rest plate aligned with said front edge of said seat plate;
 - a drive means connected between said base and said seat unit for rotating said seat unit relative to said base;
 - a back rest plate acoustic transducer connected to said lower surface of said back rest plate for transmitting tactilely perceivable vibrations to said back rest plate upon activation of said back rest plate transducer;
 - a seat plate acoustic transducer connected to said lower surface of said seat plate for transmitting tactilely perceivable vibrations to said seat plate upon activation of said seat plate acoustic transducer;
 - a leg rest plate acoustic transducer connected to said lower surface of said leg rest plate for transmitting tactilely perceivable vibrations to said leg rest plate upon activation of said leg rest plate transducer;
 - an auditory speaker for emitting audibly perceivable sounds;
 - a first audio source operatively connected to said back rest plate acoustic transducer;
 - a second audio source operatively connected to said seat plate acoustic transducer and to said leg rest plate acoustic transducer; and
 - a third audio source operatively connected to said auditory speaker.