A chair including a seat support pivotally attached to a back support and a leg support, wherein the back support, the seat support and the leg support are adjustable relative to one another such that the chair is adjustable between reclining, sitting and standing positions, wherein in the standing position the back support, the seat support and the leg support are all generally vertical. The supports may be formed with liquid conduits for passing a bathing liquid therethrough, and may further include massage elements adapted for applying a massaging motion to a person.
MASSAGE AND BATHING CHAIR

FIELD OF THE INVENTION

[0001] The present invention relates generally to chairs for massaging and bathing persons and particularly to such a chair which is adjustable from reclining to sitting to standing positions.

BACKGROUND OF THE INVENTION

[0002] Many devices are known for massaging and bathing persons. For example, British Patent GB1461618 describes an underwater massage apparatus, which includes a bath tub, a carrier frame freely movable into and out of the bath tub, a flexible mesh for supporting a patient mounted on the carrier frame, and a plurality of nozzles for producing jets of liquid for massaging the patient during the bath. The bathtub has different adjustments for supporting the patient in different sitting or reclining positions, but cannot position the patient upright.

[0003] French Patent FR2851152 describes a retention water tub filled with water. A user can operate a variable slope jack through a remote control to pass from an upright seated position to a reclining position and vice-versa. Here again, one cannot position the patient upright.

[0004] U.S. Pat. No. 5,537,697 describes a bath for use by elderly or disabled persons, which has a bath tub and a seat that is movable between a lower, bathing position and an upper position for the user to mount and dismount. The seat is tiltable between a generally upright mode for use when in the upper position for mounting and dismounting and a reclined mode for use when in the lower position for bathing. However, the "upright mode" does not position the patient upright, i.e., the patient is not standing. Rather the patient remains sitting on the seat, which is merely raised higher. The patient cannot stand and his/her back is not straight.

SUMMARY OF THE INVENTION

[0005] The present invention seeks to provide novel apparatus and methods for massaging and bathing persons, as described in detail hereinbelow. Unlike the prior art, in the present invention, the patient can be positioned in a completely upright, standing position. The chair is adjustable from reclining to sitting to standing positions.

[0006] There is thus provided in accordance with an embodiment of the invention a chair including a seat support pivotally attached to a back support and a leg support, wherein the back support, the seat support and the leg support are adjustable relative to one another such that the chair is adjustable (e.g., by means of adjustable links) between reclining, sitting and standing positions, wherein in the standing position the back support, the seat support and the leg support are all generally vertical. The chair may be provided with bathing conduits and massage elements, as is described hereinbelow.

[0007] The system may include further features. For example, in accordance with non-limiting embodiments of the invention, the leg support may include a calf support member and a foot-sole support member. The seat support may include a pair of buttocks support members separated from one another by a recess formed in the seat support. The recess may be formed with a plurality of liquid conduits for passing a bathing liquid therethrough directed at a groin area of a person sitting in the chair.

[0008] A head bathing member may be attached to an upper portion of the back support, the head bathing member being formed with liquid conduits for passing a bathing liquid therethrough directed at a scalp of a person sitting in the chair. The seat support may be pivotally attached to a base.

[0009] A drying device may be mounted on the back support, the seat support, the leg support and/or the head bathing member, the drying device being adapted to direct drying air at a person sitting in the chair.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention will be understood and appreciated more fully from the following detailed description taken in conjunction with the drawings in which:

[0011] FIGS. 1, 2 and 3 are simplified pictorial illustrations of a massage and bathing chair, constructed and operative in accordance with an embodiment of the present invention, in respective reclining, sitting and standing positions;

[0012] FIGS. 4, 5 and 6 are simplified side-view illustrations of the massage and bathing chair, in respective reclining, sitting and standing positions, with massaging and bathing elements omitted for simplicity;

[0013] FIGS. 7 and 8 are simplified pictorial illustrations of an oscillatory massage and bathing device used in the chair of FIGS. 1-6, showing massage elements with liquid conduits mounted for oscillatory motion on an oscillator, constructed and operative in accordance with an embodiment of the present invention;

[0014] FIGS. 9 and 10 are simplified pictorial illustrations of massage pads that overlay the oscillatory massage and bathing device of FIGS. 7 and 8, shown from two different views; and

[0015] FIG. 11 is a simplified pictorial illustration of the massage and bathing chair with a bathing console, constructed and operative in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0016] Reference is now made to FIGS. 1-6, which illustrate a massage and bathing chair 10, constructed and operative in accordance with an embodiment of the present invention.

[0017] Chair 10 may include a seat support 12 pivotally attached to a back support 14 and a leg support 16. Chair 10 may be immersed in a bathtub or placed in a shower (not shown). As will be described more in detail hereinbelow with reference to FIGS. 7-10, all the supports of chair 10 may be formed with liquid conduits 18 through which a bathing liquid can pass through (e.g., water, water with soap or bathing oil, etc.), and with a plurality of massage elements 20 that can apply a massaging motion to a person sitting in the chair 10.
In one embodiment of the invention, as seen in FIG. 11, the chair 10 may be placed near a bathing console 70, which includes a plurality of liquid conduits 72 through which bathing liquid can pass through (e.g., water, water with soap or bathing oil, etc.), or for supplying steam (for sauna, for example) towards a person sitting in chair 10. The bathing console 70 may further include one or more hoses 74 with outlets for hot air to pass through (for drying the body after the bath, for example), or one or more hoses 76 with brushes (which may rotate) for scrubbing or massaging the body. A control panel 78 may be provided for remote control of movement of chair 10 and/or operation of bathing console 70.

The back support 14, seat support 12 and leg support 16 are adjustable relative to one another such that the chair 10 may be adjusted between reclining (FIGS. 1 and 4), sitting (FIGS. 2 and 5) and standing positions (FIGS. 3 and 6). In the reclining position, the back support 14, seat support 12 and leg support 16 are all generally horizontal. In the sitting position, the seat support 12 is generally horizontal, while the back support 14 and the leg support 16 may be tilted at any desired angle from the vertical. In the standing position, the back support 14, seat support 12 and leg support 16 are all generally vertical.

The leg support 16 may include a calf support member 22 and a foot-sole support member 24. The seat support 12 may include a pair of buttocks support members 26 separated from one another by a recess 28 formed in the seat support 12. The recess 28 may be formed with a plurality of liquid conduits 30 for passing a bathing liquid therethrough directed at a groin area of a person sitting in chair 10 (serving as a bidet, for example). A sensor 23 may be mounted on the bottom of foot-sole support member 24, adapted to sense if an object (e.g., foot or other portion of a person) is underneath foot-sole support member 24 in order to prevent accidental crushing of that object. Sensor 23 may be, without limitation, a proximity sensor, electric eye, capacitance sensor, volume sensor, temperature sensor and others. Foot-sole support member 24 may be extended or retracted in and out of calf support member 22, such as telescopically.

A head bathing member 32 may be attached to an upper portion of the back support 14. Head bathing member 32 may be formed with liquid conduits 34 for passing a bathing liquid therethrough directed at a scalp of a person sitting in the chair.

Throughout the specification, the phrase “liquid conduits for passing a bathing liquid therethrough” covers both passive conduits and active conduits and any combination thereof. Passive conduits are channels, tubes, holes, apertures and the like through which liquid flows through or seeps through when the chair 10 is immersed in a bathtub or placed in a shower stall. Active conduits are channels, tubes, holes, apertures and the like that are in fluid communication with a pump or other source of pressurized liquid (not shown) that force pressurized liquid (e.g., stream or jet) through the conduits to the person’s body. The action of the pressurized liquid may enhance the massage effect on the body. The chair 10 may be equipped with or connected to a manifold (not shown) that directs the liquid to the conduits from the pump.

The seat support 12 may be pivotally attached to a base 36. Adjustable links may be provided for adjusting the orientation of the portions of chair 10. The adjustable links may include, without limitation, gas springs, linear actuators, solenoids, pistons and many others, all commercially available from many manufacturers. The adjustable links may be remote controlled and may cooperate with sensors and a controller in a closed control loop to adjust the chair 10 as needed or desired by the person or a healthcare provider, for example. In accordance with a non-limiting embodiment of the invention, a first adjustable link 38 may be attached to the base 36 and the leg support 16, which can modify the angular orientation of leg support 16 relative to base 36. A second adjustable link 40 may be attached to seat support 12 and leg support 16 (or alternatively to base 36), which can modify the angular orientation of seat support 12 relative to leg support 16 (or base 36). A third adjustable link 42 may be attached to seat support 12 and back support 14, which can modify the angular orientation of seat support 12 relative to back support 16.

A drying device 44 (shown optionally in FIG. 2 alone) may be mounted on the back support 14, seat support 12, leg support 16 and/or head bathing member 32. For example, without limitation, the drying device 44 may be a hot air blower that directs drying air at a person sitting in chair 10. Arm rests 37 may be provided, which may be adjustable.

Reference is now made to FIGS. 7-10, which illustrate more in detail liquid conduits 18 and massage elements 20. The invention is not limited to the illustrated embodiment and other massaging devices may be employed.

Massage elements 20 may include semi-spherical elements mounted on rows or columns of bars 46. The middle of bars 46 may be pivotedly mounted on posts 48. Inner ends of bars 46 may be pivotedly attached to links 50 mounted on an oscillatory bar 52. The oscillatory bar 52 may be attached to a servomotor, solenoid or other suitable actuator (not shown). The whole assembly may be mounted on a plate 53. As seen by comparing FIGS. 7 and 8, oscillatory motion of oscillatory bar 52 (arrows 54 and 56, respectively) inverts the position of massage elements 20, thus providing a massage effect.

Massage elements 20 may be constructed of metal (e.g., stainless steel) or plastic (e.g., polyurethane, acetyl resin and others). A tray 57 with an array of massage pads 58 may be provided that overlays massage elements 20. Massage pads 58 may be constructed of an elastomeric material (e.g., natural or synthetic rubber) and may be formed with apertures 60 for liquid to pass through (thus being part of the liquid conduits). Massage pads 58 (and massage elements 20) may move in a circular and/or translatory motion, as indicated by arrows 62 in FIG. 9. Massage elements 20 and/or massage pads 58 may be mounted so that they float on tray 57 (or any other support surface). In this manner, the elements 20 or pads 58 can match the contour of the body.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and subcombinations of the features described hereinabove as well as modifications and variations thereof which would occur to a person of skill in the art upon reading the foregoing description and which are not in the prior art.
What is claimed is:

1. A chair comprising:
   - a seat support pivotally attached to a back support and a leg support, and supported by a base;
   - a first adjustable link attached to said base and said leg support adapted to modify an angular orientation of said leg support relative to said base;
   - a second adjustable link attached to said seat support and said leg support adapted to modify an angular orientation of said seat support relative to said leg support; and
   - a third adjustable link attached to said seat support and said back support adapted to modify an angular orientation of said seat support relative to said back support, wherein said back support, said seat support and said leg support are adjustable relative to one another such that said chair is adjustable between reclining, sitting and standing positions, wherein in the standing position said back support, said seat support and said leg support are all generally vertical.

2. The chair according to claim 1, further comprising a head bathing member attached to an upper portion of said back support, said head bathing member being formed with liquid conduits for passing a bathing liquid therethrough directed at a scalp of a person sitting in said chair.

3. The chair according to claim 1, wherein said leg support comprises a calf support member and a foot-sole support member.

4. The chair according to claim 1, wherein all the supports are formed with liquid conduits for passing a bathing liquid therethrough.

5. The chair according to claim 1, further comprising a plurality of massage elements adapted for applying a massaging motion to a person, said massage elements being positioned on said back support, said seat support and said leg support.

6. The chair according to claim 1, wherein said seat support comprises a pair of buttocks support members separated from one another by a recess formed in said seat support.

7. The chair according to claim 6, wherein said recess is formed with a plurality of liquid conduits for passing a bathing liquid therethrough directed at a groin area of a person sitting in said chair.

8. The chair according to claim 1, wherein said seat support is pivotally attached to said base.

9. The chair according to claim 3, further comprising a sensor mounted on said foot-sole support member, adapted to sense if an object is underneath said foot-sole support member.

10. The chair according to claim 2, further comprising a drying device mounted on at least one of said back support, said seat support, said leg support and said head bathing member, said drying device being adapted to direct drying air at a person sitting in said chair.

11. The chair according to claim 5, wherein said massage elements comprise semi-spherical elements mounted on rows or columns of bars which are pivotally mounted on posts, said bars being pivotally attached to links mounted on an oscillatory bar, wherein oscillatory motion of said oscillatory bar imparts an oscillatory motion to said massage elements.

12. The chair according to claim 11, wherein an array of massage pads overlays said massage elements.

13. The chair according to claim 11, wherein at least one of said massage elements and said massage pads are floatingly mounted on a support surface.

14. The chair according to claim 1, further comprising a bathing console that includes a plurality of liquid conduits through which bathing liquid can pass towards a person sitting in said chair.

15. The chair according to claim 3, wherein said foot-sole support member is adapted to be extended or retracted in and out of said calf support member.

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