A juvenile relaxation apparatus includes a juvenile holder including a seat and a frame adapted to set on an underlying floor surface. The juvenile holder is either a bouncer, rocker, lounger, crib, bassinet, cradle, or other juvenile seat. The juvenile relaxation apparatus further includes a rocker blade and a rocker motion system coupled to the rocker blade. The rocker motion system produces side-to-side rocking motion of the rocker blade and frame.
FIG. 1
JUVENILE RELAXATION APPARATUS WITH MOTION SYSTEM

[0001] This application claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Application Ser. No. 60/664,769, filed Mar. 24, 2005, which is expressly incorporated by reference herein.

BACKGROUND

[0002] The present disclosure relates to juvenile relaxation apparatus, and particularly to juvenile bouncers, rockers, loungers, cribs, cradles, and bassinets. More particularly, the present disclosure relates to systems for imparting rocking motion to a frame while a juvenile occupies a seat carried on the frame.

SUMMARY

[0003] According to the present disclosure, a juvenile relaxation apparatus is provided with a side-to-side rocker motion system. The juvenile relaxation apparatus includes a juvenile holder configured to hold a juvenile, a rocker blade coupled to the juvenile holder, and a “side-to-side” rocker motion system coupled to the rocker blade. Illustratively, the juvenile holder includes a seat for holding a juvenile and a frame coupled to the rocker blade and configured to support the seat in an elevated position above an underlying floor surface.

[0004] In illustrative embodiments, the juvenile relaxation apparatus is a bouncer including a rocker blade that is coupled to a flexible seat-bouncer frame configured to support an elevated seat. The rocker motion system is operable to produce side-to-side rocking motion of the rocker blade and the flexible seat-bouncer frame coupled to the rocker blade. In use, a juvenile seated in the seat is free to bounce the flexible seat-bouncer frame supporting the seat up and down during side-to-side rocking motion of a bouncer unit including the seat and the flexible seat-bouncer frame.

[0005] In illustrative embodiments, the rocker motion system includes a stationary floor base and a drive linkage. The stationary floor base is coupled to the drive linkage and is configured to extend through an aperture formed in the rocker blade to contact the underlying floor surface. The drive linkage is located in a chamber formed in the rocker blade and is configured to use rotation of a motor-driven rotatable drive shaft included in the rocker motion system to rock the rocker blade (and the frame coupled to the rocker blade) from side to side relative to the stationary floor base.

[0006] In other embodiments, the juvenile holder comprises a bassinet, a lounger, a hammock, a cradle, or other means for supporting a juvenile in a seat on a frame. In each embodiment, the juvenile holder is coupled to a rocker blade that is coupled to a rocker motion system.

[0007] Additional features of the disclosure will become apparent to those skilled in the art upon consideration of the following detailed description of illustrative embodiments exemplifying the best mode of carrying out the disclosure as presently perceived.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The detailed description particularly refers to the following figures in which:

[0009] FIG. 1 is a diagrammatic view of a juvenile relaxation apparatus in accordance with the present disclosure showing a rocker blade coupled to a juvenile holder comprising a seat and a frame and to a rocker motion system;

[0010] FIG. 2A is a perspective view of a bouncer having a rocker motion system in accordance with the present disclosure in a “side-to-side rocking” mode owing to rotation of frame kickstands mounted on opposite ends of a rocker blade carried on a seat-bouncer frame to retracted positions alongside the ends of the rocker blade;

[0011] FIG. 2B is a view similar to FIG. 2A showing the bouncer in a non-rocking mode owing to rotation of the two frame kickstands to extended positions to steady the rocker blade relative to the underlying floor surface to inhibit side-to-side rocking of the rocker blade and the seat-bouncer frame;

[0012] FIG. 3 is an enlarged partial front elevation view of the bouncer of FIG. 2 upon movement of both frame kickstands to the extended positions and showing projection of first, center, and second feet included in a “floor base” mounted in the rocker blade through openings formed in a bottom portion of the rocker blade to engage the floor underlying the rocker blade;

[0013] FIG. 4 is a view similar to FIG. 3 showing side-to-side rocking motion of the rocker blade and the seat-bouncer frame to the “left” (relative to the stable floor base) to assume a “left-tilting” orientation;

[0014] FIG. 5 is a view similar to FIGS. 3 and 4 showing a “first stage” of side-to-side rocking motion of the rocker blade and the seat-bouncer frame “back” to the “right” (relative to the stable floor base) to resume a “level orientation” as shown earlier in FIG. 3;

[0015] FIG. 6 is a view similar to FIGS. 3-5 showing a “second stage” of side-to-side rocking motion of the front rocker blade and the seat-bouncer frame further to the right (relative to the stable floor base) to assume a “right-tilting” orientation;

[0016] FIG. 7 is an exploded perspective view of illustrative components included in a rocker motion system located inside a chamber formed in the front rocker blade that is coupled to the seat-bouncer frame and showing spaced-apart top and bottom shells that cooperate to form the rocker blade and showing (from bottom to top between the bottom and top shells), a blade vibrator, a floor base (contained within a phantom perimeter line) including spaced-apart first and second feet arranged to project downwardly through foot receiver channels formed in the bottom shell to set on a floor underlying the rocker blade and a foot foundation adapted to be coupled to the feet and formed to include a rounded center foot arranged to project downwardly through a central opening formed in the bottom shell, and a rocker blade mover (positioned above the floor base and contained within another phantom perimeter line) including a motor housing adapted to be anchored to the rocker blade and a blade mount tilt including an eccentric disk cam coupled to a rotatable cam shaft rotated by a motor (not shown) located inside the motor housing and adapted to move in a
“U-shaped” cam receiver formed in the foot foundation of the floor base (as suggested in FIGS. 11-22) to cause the motor housing and the rocker blade coupled to the motor housing to rock from side to side relative to the floor base as suggested, for example, in FIGS. 3-6;

[0017] FIG. 8 is another exploded perspective view similar to FIG. 7 showing coupling of the first and second feet to the floor foundation to form the floor base, first and second oblong openings in the bottom shell into the first and second foot receiver channels, the central opening formed in the bottom shell to receive the rounded center foot included in the foot foundation, and two spaced-apart post retainers extending downwardly from an underside of the top shell to help retain the motor housing in a fixed position coupled to the top and bottom shells of the rocker blade so that the rocker blade will rock back and forth relative to the stable floor base in response to rocking motion of the motor housing relative to the floor base;

[0018] FIG. 9 is an exploded perspective assembly view of components included in a motorized cam shaft rotation system located inside the motor housing and showing (on the right side) the eccentric disk cam provided on a left end of the rotatable cam shaft and showing (on the left side) a momentary contact switch above a rotatable switch-actuation cam adapted to mount on a left end of the rotatable cam shaft for providing additional power to the drive motor (inside the motor housing) after the rocker blade mover is “shut off” so that the cam shaft will continue to rotate causing the motor housing to continue to rock relative to the stable floor base until the seat-bouncer frame comes to rest in an upright/level attitude;

[0019] FIG. 10 is a perspective view of the bouncer of FIGS. 1-9 showing each of the first, center, and second feet of the stable floor base extending through openings formed in the bottom shell of the rocker blade;

[0020] FIGS. 11-22 show rotation of the cam shaft to cause movement of the eccentric disk cam that is constrained to remain in the U-shaped cam receiver formed in the foot foundation to produce side-to-side rocking motion of the motor housing and the rocker blade relative to the floor base while the floor base is retained in a non-moving, stable position relative to the underlying floor owing to engagement of the first, center, and second floor base feet projecting through openings formed in the bottom shell of the rocker blade against the floor underlying the rocker blade;

[0021] FIG. 11 is a sectional view taken along line 11-11 of FIG. 1 showing the first, center, and second feet of the floor base in contact with the floor underlying the rocker blade and showing that the rocker blade has moved relative to the floor base to assume a “first” upright level attitude shown in FIG. 3 in response to rotation of the eccentric disk cam on the cam shaft to assume a “6 o’clock” position in the cam receiver formed in the foot foundation;

[0022] FIG. 12 is a perspective view of certain of the components illustrated in FIG. 11 showing the orientation of the eccentric disk cam to “lie” at a “low” spot in the U-shaped cam receiver formed in the foot foundation and bordered, in part, by spaced-apart vertical side walls while the rocker blade is in the FIG. 11 position;

[0023] FIG. 13 is a top plan view of a portion of the assembly shown in FIG. 12 showing the “lateral location” of the rotatable cam shaft included in the rocker blade mover and arranged to project outwardly from the motor housing and showing that the cam shaft is located in a “centered” position (relative to the floor base) that is located midway between the spaced-apart vertical side walls bordering the U-shaped cam receiver and associated with a “first” upright/level attitude of the rocker blade as shown in FIG. 11;

[0024] FIG. 14 is a sectional view similar to FIG. 11 showing that the three feet included in the floor base remain in contact with the floor during side-to-side rocking movement of the rocker blade and showing that the rocker blade has moved relative to the floor base to assume the left-tilting orientation shown in FIG. 4 in response to “counterclockwise” rotation of the eccentric disk cam on the cam shaft to assume a “3 o’clock” position in the U-shaped cam receiver formed in the foot foundation;

[0025] FIG. 15 is a perspective view similar to FIG. 12 showing the orientation of the eccentric disk cam in the U-shaped cam receiver to produce “left” tilting (e.g., rocking) movement of the motor housing and the rocker blade coupled to motor housing relative to the stable floor base;

[0026] FIG. 16 is a top plan view of a portion of the assembly shown in FIG. 15 showing that the rotatable cam shaft is now located in a “first offset” position (relative to the floor base) that is located to the left of the centered position shown in FIG. 13 and associated with a left-tilting attitude of the rocker blade as shown in FIG. 14;

[0027] FIG. 17 is a sectional view similar to FIGS. 11 and 14 showing that the three feet included in the floor base continue to remain in contact with the underlying floor surface during side-to-side rocking movement of the rocker blade and showing that the rocker blade has moved relative to the floor base to assume a “second” upright/level attitude shown in FIG. 5 in response to continued counterclockwise rotation of the eccentric disk cam on the cam shaft to assume a “12 o’clock” position in the U-shaped cam receiver formed in the foot foundation;

[0028] FIG. 18 is a perspective view similar to FIGS. 12 and 15 showing the orientation of the eccentric disk cam in the U-shaped cam receiver to produce sufficient movement of the motor housing and the rocker blade relative to the stable floor base to return the rocker blade to the second upright/level attitude;

[0029] FIG. 19 is a top plan view of a portion of the assembly shown in FIG. 18 showing that the rotatable cam shaft has “shifted” laterally to the “right” (as compared to FIG. 16) to once again lie in the centered position located between the spaced-apart vertical side walls bordering the U-shaped cam receiver formed in the foot foundation and associated with the second upright/level attitude of the rocker blade;

[0030] FIG. 20 is a sectional view similar to FIGS. 11, 14, and 17 showing that the three feet included in the floor base are still in contact with the underlying floor surface and showing that the rocker blade has moved relative to the floor base to assume the right-tilting orientation shown in FIG. 6 in response to still further counterclockwise rotation of the eccentric disk cam on the cam shaft to assume a “9 o’clock” position in the U-shaped cam receiver formed in the foot foundation;
FIG. 21 is a perspective view similar to FIGS. 12, 15, and 18 showing the orientation of the eccentric disk cam in the U-shaped cam receiver to produce "right" tilting (e.g., rocking) movement of the motor housing and the rocker blade coupled to the motor housing relative to the stable floor base;

FIG. 22 is a top plan view of a portion of the assembly shown in FIG. 21 showing that the rotatable cam shaft is now located in a "second offset" position (relative to the floor base) that is located to the right of the center position shown in FIGS. 13 and 19 and associated with a right-tilting attitude of the rocker blade as shown in FIG. 20;

FIG. 23 is an illustrative circuit diagram associated with the rocker motion system of FIGS. 1-22;

FIG. 24 is a perspective view of a bassinet having a rocker motion system in accordance with another embodiment of the present disclosure;

FIG. 25 is a cross-sectional view, with portions cut away, showing illustrative components included in a rocker motion system in accordance with another embodiment of the present disclosure, the rocker blade including spaced-apart top and bottom shells defining a chamber therebetween and the rocker motion system being located inside the chamber and including a floor base including a cam carriage having spaced-apart cam follower plates and spaced-apart first and second feet coupled to the cam follower plates and arranged to project downwardly through foot receiver channels formed in the bottom shell to set on a floor underlying the rocker blade, and a rocker blade mover positioned above the floor base and including a motor housing adapted to be anchored to the rocker blade, a shaft and a wobble gear located between the cam follower plates, the wobble gear being coupled to the shaft, the shaft penetrating through a central opening in the wobble gear and through an elongated opening in each of the cam follower plates and coupled at each end of the shaft to the rocker blade, the wobble gear having cam follower extensions of unequal length and which cam follower extensions, upon rotation of the gear via a gear box coupling the motor housing to the gear, impart a wobble motion to the gear and cause the motor housing, shaft and rocker blade coupled to the motor housing to rock from side-to-side in a tilting motion relative to the floor base, and the rocker blade shown here in a left-tilting position;

FIG. 26 is a cross-sectional view, with portions broken away, showing the rocker blade of FIG. 25 in a right-tilting position;

FIG. 27 is a cross-sectional, view with portions broken away, showing illustrative components included in a rocker motion system in accordance with another embodiment of the present disclosure, wherein this embodiment is essentially the same as that of FIG. 25 except that the motor housing is coupled through a gear box to the shaft;

FIG. 28 is an exploded perspective view, with portions cut away, showing illustrative components included in a rocker blade and rocker motion system in accordance with another embodiment of the present disclosure, the rocker motion system being located inside a chamber formed in the rocker blade that is coupled to a bumper frame (as illustrated for the rocker motion system in FIG. 1); and

FIG. 29 is an enlarged front section view of a right side portion of FIG. 28 showing a bottom curved portion of a rocker blade in contact with an underlying floor surface and showing direction of movement of the rocker blade (see phantom lines and arrow) as rocker wheels are moved into and out of apertures of the rocker blade.

DETAILED DESCRIPTION

As suggested diagrammatically in FIG. 1, a juvenile relaxation apparatus 10 includes a juvenile holder 12 coupled to a rocker blade 14 provided with a downwardly facing curved surface 15 and also includes a rocker motion system 16 coupled to rocker blade 14. Rocker motion system 16 is adapted to contact a floor surface 18 underlying rocker blade 14 and is configured to produce side-to-side rocking motion of rocker blade 14 and juvenile holder 12 coupled to rocker blade 14.

As suggested in FIG. 1, juvenile holder 12 includes a frame 20 coupled to rocker blade 14 and a seat 22 coupled to frame 20. As used herein, “seat” means a unit for supporting an infant or other juvenile in an upright or supine position. In illustrative embodiments, juvenile holder 12 is a bouncer 12′ as shown, for example, in FIGS. 2-10, a bassinet 12″ as shown, for example, in FIG. 24, or other suitable means for supporting an infant or other juvenile in a “relaxation” position above an underlying floor surface.

In an illustrative embodiment, rocker motion system 16 operates to cause side-to-side rocking motion of rocker blade 14 on underlying floor surface 18 as suggested in FIGS. 3-6. In operation, rocker blade 14 is moved continuously by rocker motion system 16 to assume, in sequence, a first upright/level attitude as shown in FIGS. 3 and 11-13, a left-tilting orientation as shown in FIGS. 4 and 14-16, a second upright/level attitude as shown in FIGS. 5 and 17-19, and a right-tilting orientation as shown in FIGS. 6 and 20-22. An illustrative electrical circuit 11 for use with rocker motion system 16 is shown in FIG. 23. In illustrative embodiments described and illustrated herein, rocker motion system 16 is configured to operate always to cause rocker blade 14 to "come to rest" on underlying floor surface in either the first or the second upright/level attitude shown in FIGS. 3 and 5 whenever rocker motion system 16 is deactivated by a user.

A bouncer 12′ provides a juvenile holder 12 in the juvenile relaxation apparatus 10′ illustrated in FIGS. 2A and 2B. In this embodiment, frame 20′ includes left and right support members 24, 26 and an auxiliary rocker blade 28. Each of left and right support members 24, 26 is made of a flexible elastic material and is coupled to seat 22′ to support seat 22′ in an elevated position above underlying floor surface 18 and so that seat 22′ can move up and down in a “bouncing motion” during flexure of the elastic left and right support members 24, 26 (at the instigation of a juvenile occupying seat 22′ or a nearby caregiver).

Auxiliary rocker blade 28 is interposed between left and right support members 24, 26 and provided with a downwardly facing curved surface 115 that is adapted to contact underlying floor surface 18. In the illustrated embodiment, auxiliary rocker blade 28 is arranged to interconnect left and right support members 24, 26. Up-and-down bouncing motion of seat 22′ relative to rocker blade 14 can occur at the same time that rocker motion system 16 is operating to cause side-to-side rocking motion of the rocker
blade 14 and the bouncer unit 12 comprising seat 22’, right support member 24, left support member 26, and auxiliary rocker blade 28.

[0045] As shown in FIG. 2A, right support member 24 of frame 20’ is arranged to underlie a right-side portion of seat 22’. Right support member 24 includes a right knee 30 coupled to a right side 31 of rocker blade 14, a lower right leg 32 extending from right knee 30 to a right side 33 of auxiliary rocker blade 28, and an upper right leg 34 extending from right knee 30 to a right side 35 of seat 22’. Upper and lower right legs 34, 32 cooperate to define an acute included angle 36 therebetween. During up-and-down bouncing motion of frame 20’, upper right leg 34 moves toward and away from lower right leg 32 owing to the elasticity of right support member 24.

[0046] As shown in FIG. 2A, left support member 26 of frame 20’ is arranged to underlie a left-side portion of seat 22’. Left support member 26 includes a left knee 40 coupled to a left side 41 of rocker blade 14, a lower left leg 42 extending from left knee 40 to a left side 43 of auxiliary rocker blade 28, and an upper left leg 44 extending from left knee 40 to a left side 45 of seat 22’. Upper and lower left legs 44, 42 cooperate to define an acute included angle 46 therebetween. During up-and-down bouncing motion of frame 20’, upper left leg 44 moves toward and away from lower left leg 42 owing to the elasticity of left support member 26.

[0047] Another view of left and right support members 24, 26 and auxiliary rocker blade 28 interposed between left and right support members 24, 26 is shown in FIG. 10. Seat 22’ includes a pad support 50 comprising a U-shaped head loop 51, a U-shaped foot loop 52, a right head loop interlock 53 coupled to upper right leg 34 at right side 35 of seat 22’, and a left head interlock 54 coupled to upper left leg 44 at left side 45 of seat 22’. As suggested in FIG. 2, a pad 55 is coupled to head loop 51 to provide a headrest 56 and to foot loop 52 to provide a footrest 57. In the illustrated embodiment, footrest 57 is arranged to lie in spaced-apart relation to headrest 56 and rocker blade 14 is arranged to lie under footrest 57 as suggested in FIG. 2. Auxiliary rocker blade 28 is arranged to underlie headrest 56 of seat 22’ as also suggested in FIG. 2. In an illustrative embodiment, a single elastic rod is used to form left and right support members 24, 26 and auxiliary rocker blade 28.

[0048] As shown, for example, in FIGS. 7 and 11, rocker blade 14 includes a bottom shell 58 formed to include downwardly facing curved surface 15 and a top shell 60 configured to be coupled to bottom shell 58 to define a chamber 59 therebetween. Rocker motion system 16 is located in chamber 16 and includes a floor base 64 arranged to extend through first and second foot-receiver channels or apertures 61, 62 formed in bottom shell 58 to engage underlying floor surface 18 and a rocker blade mover 66 coupled to and interposed between rocker blade 14 and floor base 64. In use, as suggested, for example, in FIGS. 11-22, rocker blade mover 66 is configured to provide means for repeatedly moving rocker blade 14 and frame 20’ coupled to rocker blade 14 relative to floor base 64 to assume, in sequence, a first upright/level attitude shown in FIGS. 3 and 11-13, a left-tilting orientation as shown in FIGS. 4 and 14-16, a second upright/level attitude as shown in FIGS. 5 and 17-19, and a right-tilting orientation as shown in FIGS. 6 and 20-22 to establish the side-to-side rocking motion of rocker blade 14 on underlying floor surface 18.

[0049] As shown, for example, in FIGS. 7 and 8, bottom shell 58 is formed to include a right-side battery storage compartment 68 adjacent to first foot-receiver aperture 61 and a left-side battery storage compartment 69 adjacent to second foot-receiver aperture 62. A right compartment lid 70 can be coupled to bottom shell 58 using suitable fasteners to retain a first set of batteries 71 in right-side battery storage compartment 68. A left compartment lid 72 can be coupled to bottom shell 58 using suitable fasteners to retain a second set of batteries 71 in left-side battery storage compartment 69.

[0050] As suggested in FIGS. 7, 8, and 23, blade vibrator means 74 is located in chamber 59 for vibrating the bouncer unit comprising frame 20’ and seat 22’. Blade vibrator means 74 includes an eccentric mass 75 mounted on a shaft 76 rotated by a motor 77 energized by batteries 71. In an illustrative embodiment, motor 77 is mounted in a motor housing 78 provided in bottom shell 58 as suggested in FIG. 7. An on/off switch 79 illustrated in circuit 11 shown in FIG. 23 can be actuated to energize blade vibrator means 74 using batteries 71.

[0051] A first frame kickstand 81 is mounted on right side 31 (e.g., first end) of rocker blade 14 and a second frame kickstand 82 is mounted on left side 41 (e.g., second end) of rocker blade 14 as suggested in FIGS. 2A, 2B, and 7. Each kickstand 81, 82 is mounted on a pivot post 83 coupled to rocker blade 14 for rotation about an axis of rotation 84 relative to rocker blade 14 as suggested in FIGS. 1 and 2. Each of first and second frame kickstands 81, 82 is mounted for movement relative to frame 20’ between an extended position (shown, for example, in FIGS. 2B and 3) extending below curved bottom surface 15 of rocker blade 14 to inhibit side-to-side rocking motion of rocker blade 14 on underlying floor surface 18 and a retracted position (shown, for example, in FIGS. 2A and 4-6) lying alongside rocker blade 14 to allow side-to-side rocking motion of rocker blade 14 on underlying floor surface 18 produced by rocker motion system 16.

[0052] Floor base 64 includes a foot foundation 86, a pivot axle 88 coupled to rocker blade 14, a right foot 91, and a left foot 92 a shown, for example, in FIGS. 7, 11, and 12. Foot foundation 86 is mounted on pivot axle 88 to pivot relative to rocker blade 14 about a pivot axis 90 established by pivot axle 88 in response to “pivoting-inducing” forces applied to foot foundation 86 by rocker blade mover 66 as shown, for example, in FIGS. 11-22. Right foot 91 is coupled to foot foundation 86 and arranged to extend through first foot-receiver aperture 61 as suggested, for example, in FIGS. 11, 14, 17, and 20 during rocking motion of rocker blade 14. Similarly, left foot 92 is coupled to foot foundation 86 and arranged to extend through second foot receiver aperture 62 as also suggested, for example, in FIGS. 11, 14, 17, and 20.

[0053] In an illustrative embodiment, first and second upright plates 93, 94 are provided in chamber 59 in rocker blade 14 and are formed to include, respectively, axle receivers 95, 96. In the illustrated embodiment, bottom shell 58 is formed to include upright plates 93, 94. Pivot axle 88 is coupled to foot foundation 86 and placed into axle receivers 95, 96 provided in bottom shell 58 to support rocker blade 14 for pivotal movement about pivot axis 90 relative to stationary floor base 64 as suggested, for example, in FIGS. 11, 14, 17, and 20.
Foot foundation 86 includes a cam support fixture 102 coupled to pivot axle 88 and configured to include a cam receiver 104 adapted to mate with rocker blade mover 66 as suggested, for example, in FIGS. 7, 8, and 11-13. Foot foundation 86 also includes a first foot mount 106 having one end coupled to a cam support fixture 102 and another end coupled to right foot 91 and a second foot mount 108 having one end coupled to a cam support fixture 102 and another end coupled to left foot 92. A first tension spring 110 in foot foundation 86 includes a lower end coupled to a right outboard portion 112 of a cam support fixture 102 and a upper end coupled to a mid-portion 114 of a first foot mount 106 as shown, for example, in FIGS. 11 and 12. A second tension spring 116 in foot foundation 86 includes a lower end coupled to a left outboard portion 118 of cam support fixture 102 and an upper end coupled to a mid-portion 120 of second foot mount 108 as also shown, for example, in FIGS. 11 and 12.

Foot foundation 86 remains stationary and in contact with underlying floor surface 18 through right and left feet 91, 92 while rocker blade 14 rocks back and forth relative to foot foundation 86 on pivot axle 88 as shown, for example, in FIGS. 11, 14, 17, and 20. In the illustrated embodiment, cam support fixture 102 also includes a center foot 120 that is arranged to extend through a center aperture 122 formed in bottom shell 58 as suggested in FIGS. 8 and 10 to contact underlying floor surface 18 as shown, for example, in FIG. 11. Center foot 120 is located in a space provided between right and left feet 91, 92. It is within the scope of this disclosure to reconfigure foot foundation 86 in a suitable manner to include left and right feet 91, 92 and cam receiver 104.

In the illustrated embodiment, cam support fixture 102 includes first and second spaced-apart vertical walls 97, 98 and a curved wall 99 interconnecting vertical walls 97, 98. These walls 97, 98, 99 border and cooperate to define cam receiver 104 to provide a substantially U-shaped cam receiver 104 as shown, for example, in FIGS. 7 and 8. In the illustrated embodiment, cam receiver 104 is located above pivot axle 88 and between right and left feet 91, 92.

In the illustrated embodiment, rocker blade mover 66 includes a motor housing 124, a rotatable cam shaft 126, and an eccentric disk cam 128 as shown, for example, in FIGS. 7-9 and 23. Motor housing 124 is coupled to rocker blade 14 to move therewith as suggested in FIGS. 7, 8, 12, 15, 18, and 21. Rotatable cam shaft 126 engages into motor housing 124 and is supported for rotation about axis of rotation 130. Eccentric disk cam 128 is coupled to rotatable cam shaft 126 to rotate therewith and is arranged to extend into cam receiver 104 formed in cam support fixture 102 of floor base 64 to mate rocker blade mover 66 to cam receiver 104.

Rocker blade mover 66 also includes motorized rotary transmission means 135 including a drive motor 132 located in motor housing 124 (as suggested in FIGS. 7 and 9) for rotating rotatable cam shaft 126 about axis of rotation 130 to move eccentric disk cam 128 in an eccentric pattern about axis of rotation 130 in cam receiver 104 as suggested in FIGS. 11-22 to cause motor housing 124 and rocker blade 14 coupled to motor housing 124 to rock from side to side (e.g., pivot about pivot axle 88) relative to floor base 64. In an illustrative embodiment, motor housing 124 includes a chamber 125 containing drive motor 132 as shown in FIG. 23 and first and second blade connector posts 134, 136 mating with rocker blade 14 as suggested, for example, in FIGS. 7 and 8. Bottom shell 58 includes two upright plates 137, 139 formed to include, respectively, a first post receiver 138 configured to receive first blade connector post 134 and a second post receiver 140 configured to receive second blade connector post 136 as suggested in FIG. 7. Top shell 60 includes first and second retainer plates 142, 144 that are aligned with plates 137, 139 and cooperate as suggested in FIGS. 8 and 11 to provide means for retaining first blade connector post 134 in first post receiver 138 and second blade connector post 136 in second post receiver 140 once top shell 60 is coupled to bottom shell 58.

One illustrative embodiment of rocker blade mover 66 is shown in FIG. 9. Left and right motor case covers 146, 148 mate to form chamber 125 containing drive motor 132. Drive motor 132 is held in place by lower and upper motor mounts 150, 152. A rotatable drive shaft 154 turns by drive motor 132 turns a drive belt 156 coupled to a pulley 158 mounted to rotate on an axle 160. A small-diameter gear 162 coupled to pulley 158 to rotate therewith engages a large-diameter gear 164 mounted to rotate on an axle 166 that mates with and turns a worm reduction gear 168. Worm reduction gear 168 turns a drive gear 170 mounted to rotate with rotatable cam shaft 126 to cause cam shaft 126 to rotate about axis of rotation 130. First blade connector post 134 is defined by a rubber isolator 172 mounted on isolator mount sections 176, 177 on motor case covers 146, 148. Second blade connector post 136 is defined by a rubber isolator 178 mounted on isolator mount sections 180, 182 on motor case covers 146, 148.

Side-to-side rocking motion of rocker blade 14 relative to floor base 64 is shown, for example, in FIGS. 3-6 and, in more detail, in FIGS. 11-22. Pivot axle 88 is coupled to floor base 64 and to rocker blade 14 to support rocker blade 14 for pivotable movement about pivot axis 90 relative to floor base 64 to a first tilted position shown in FIGS. 4 and 14, a centered position shown in FIGS. 3, 11, and 17, and a second tilted position shown in FIGS. 6 and 20. In the first tilted position, left foot 92 is retracted substantially into chamber 59 formed in rocker blade 14 and a portion of right foot 91 is extended out of chamber 59 to establish a left-tilting orientation of rocker blade 14 (and frame 20 coupled to rocker blade 14) relative to floor base 64. In the centered position, each of right and left feet 91, 92 is extended through apertures 61, 62 to establish an upright/level attitude of rocker blade 14 (and frame 20 coupled to rocker blade 14). In the second tilted position, left foot 92 is extended out of chamber 59 and right foot 91 is retracted substantially into chamber 59 to establish a right-tilting orientation of rocker blade 14 (and frame 20 coupled to rocker blade 14) relative to floor base 64.

Eccentric disk cam 128 is arranged to maintain contact with first and second spaced-apart vertical side walls 97, 98 bordering U-shaped cam receiver 104 formed in cam support fixture 102 of floor base 64 during rotation of rotatable cam shaft 126 about axis of rotation 130 as suggested in FIGS. 7 and 9. As shown best in FIG. 9, eccentric disk cam 128 includes a mount portion 190 and an eccentric portion 193. Mount portion 190 is coupled to rotatable cam shaft 126 and arranged to extend a first radial distance 191 away from axis of rotation 90. Eccentric portion 193 is
coupled to mount portion 190 and arranged to extend a greater second radial distance 192 away from the axis of rotation 130.

[0062] Eccentric portion 193 of eccentric disk cam 128 is arranged to move in sequence in cam receiver 104 in response to rotation of rotatable cam shaft 126 about axis of rotation 130 between:

[0063] (1) a 6 o’clock position associated with the first upright/level attitude of rocker blade 14 as shown, for example, in FIGS. 11-13;

[0064] (2) a 3 o’clock position associated with the left-lifting orientation of rocker blade 14 as shown, for example, in FIGS. 14-16;

[0065] (3) a 12 o’clock position associated with the second upright/level attitude of rocker blade 14 as shown, for example, in FIGS. 17-19; and

[0066] (4) a 9 o’clock position associated with the right-lifting orientation of rocker blade 14 as shown, for example, in FIGS. 20-22. Rotatable cam shaft 126 is located in a “centered” position about midway between the spaced-apart first and second vertical side walls 97, 98 bordering cam receiver 104 upon movement of eccentric disk cam 128 in cam receiver 104 to assume the 6 o’clock and 12 o’clock positions as shown, for example, in FIGS. 11-13 and in FIGS. 17-19. Rotatable cam shaft 126 is located in a “first offset” position to lie closer to second vertical side wall 98 than to first vertical side wall 97 (and to cause axis 130 to be offset a first distance 131 from axis 90) upon movement of eccentric disk cam 128 in cam receiver 104 to assume the three o’clock position shown, for example, in FIGS. 14-16. Rotatable cam shaft 126 is located in a “second offset” position to lie closer to first vertical side wall 97 than to second vertical side wall 98 (and to cause axis 130 to be offset a second distance 133 from axis 90) upon movement of eccentric disk cam 128 in cam receiver 104 to assume the 9 o’clock position as shown, for example, in FIGS. 20-22.

[0067] As shown in FIGS. 2A, 3-7, and 23, an on/off switch 200 is included in electric circuit 11 and provided to activate and deactivate drive motor 132. Portions of electrical circuit 11 cooperate to provide “first means” coupled to power supply 71 for energizing motorized shaft rotation system 135 to move eccentric disk cam 128 in an eccentric pattern about axis of rotation 130 in cam receiver 104 to cause motor housing 124 and rocker blade 14 coupled to motor housing 124 to rock from side to side relative to floor base 64 about pivot axis 90 so that rocker blade 14 is moved repeatedly relative to floor base 64 to assume, in sequence, a first upright/level attitude, a left-lifting orientation, a second upright/level attitude, and a right-lifting orientation to establish side-to-side rocking motion of rocker blade 14 on underlying floor surface 18.

[0068] As suggested in FIGS. 7 and 23, a momentary contact switch 202 is coupled electrically to power supply 71 and a switch-actuation cam 204 is mounted on a rear end of rotatable cam shaft 126 for rotation about axis of rotation 130. Switch-actuation cam 204 is configured to provide means for actuating momentary contact switch 202 temporarily to energize motorized cam shaft rotation system 135 upon disablement of the first means (e.g., movement of on/off switch 200 to “off” position) until frame 20 moves relative to floor base 64 to assume either the first upright/level attitude shown in FIGS. 3 and 11-13 or the second upright/level attitude shown in FIGS. 5 and 17-20. In the illustrated embodiment, switch-actuation cam 204 includes two separate tips 205, 206 as shown best in FIG. 23. When cam shaft 126 rotates about axis 130, these tips 205, 206 are moved to “close” momentary contact switch 202 twice during each cycle of rotation. When on/off switch 200 is operated to deactivate drive motor 132, one of tips 205, 206 will be rotated about axis 130 to close momentary contact switch 202 temporarily. Such temporary closure will activate drive motor 132 for a time period long enough to pivot the rocker blade to one of the first and second upright/level attitudes owing to the shape and orientation of switch-actuation cam 204 on camshaft 126.

[0069] A bassinet 10” as illustrated in FIG. 24 is another example of a juvenile relaxation apparatus 10 in accordance with the present disclosure. In this illustration, juvenile holder 12 is provided by bassinet unit 122 comprising frame 20” and seat 22”.

[0070] Frame 20” includes right and left support members 224, 226 and an auxiliary rocker blade 228. Each of right and left support members 224, 226 is a substantially U-shaped element coupled to rocker blade 14. Right support member 224 includes a first right knee 231 coupled to rocker blade 14, a second right knee 232 coupled to auxiliary rocker blade 228, an elongated right stretcher 233 interconnecting first and second right knees 231, 232, a first right upright leg 234 extending upwardly from first right knee 231 to a footrest 257 of seat 22”, and a second right upright leg 235 extending upwardly from second right knee 232 to a headrest 255 of seat 22”. Left support member 226 includes a first left knee 241 coupled to rocker blade 14, a second left knee 242 coupled to auxiliary rocker blade 228, an elongated left stretcher 243 interconnecting first and second left knees 241, 242, a first left upright leg 244 extending upwardly from first left knee 241 to footrest 257, and a second left upright leg 245 extending upwardly from second left knee 242 to headrest 255.

[0071] Right and left support members 224, 226 further include (1) a first pivot axle 246 coupled to first right and left upright legs 234, 244 and to footrest 257 and (2) a second pivot axle 247 coupled to second right and left upright legs 235, 245 and to headrest 255. First and second pivot axles 246, 247 cooperate with headrest 255 and footrest 257 to support seat 22” for swinging movement relative to frame 20” about a pivot axis 248 extending through first and second pivot axles 246, 247.

[0072] An illustrative embodiment of a rocker blade 300 is shown in FIGS. 25 and 26. Rocker blade 300 includes a bottom shell 302 formed to include downwardly facing curved surface 304 and a top shell 306 configured to be coupled to bottom shell 302 to define a chamber 308 therebetween. A rocker motion system 310 is located in chamber 308 and includes a floor base 312 arranged to extend through first and second foot-receiver channels or apertures 314, 316 formed in bottom shell 302 to engage underlying floor surface 318. Rocker motion system 310 also includes a rocker blade mover 320 coupled to top shell 306 and interposed between top shell 306 and floor base 312.

[0073] In use, as suggested in FIGS. 25 and 26, rocker blade mover 320 is configured to provide means for repeatedly moving rocker blade 300 and frame 20” coupled to
rocker blade 300 (e.g., see FIGS. 1, 2A, 2B, 7 and 10 for illustrative examples of coupling of other embodiments of a rocker blade to frame 20) relative to floor base 312 to assume, in sequence, a first upright/level attitude (not shown), a left-tilting orientation as shown in FIG. 25, a second upright/level attitude (not shown), and a right-tilting orientation as shown in FIG. 26 to establish side-to-side rocking motion of rocker blade 300 on underlying floor surface 318.

Floor base 312 includes a right foot 322, a left foot 324, a cam carriage 325 having an upper cam follower plate 326 and a lower cam follower plate 328 coupled together and coupled to right and left feet 322, 324 by, for example, screws 330, as shown in FIGS. 25, 26. Right foot 322 is coupled to lower cam follower plate 328 and arranged to extend through first foot-receiver aperture 314, as suggested in FIGS. 25 and 26. Left foot 324 is coupled to lower cam follower plate 328 and arranged to extend through second foot-receiver aperture 316, as suggested in FIGS. 25 and 26. Left and right feet 314, 316 may include pads 332 at a bottom end 334, such pads 332 being made of rubberized material to provide a cushioning effect and a non-skid effect when the feet 314, 316 are in contact with underlying floor base 318.

Rocker blade mover 320 includes motorized rotary transmission means 336 including a wobble gear 338, a shaft 340, a drive motor 342 located in motor housing 344 (as suggested in FIGS. 25 and 26), and a gear box 346 coupled to motor housing 344 and wobble gear 338. Wobble gear 338 includes cam follower extensions 348 and 350 of unequal first and second lengths 352 and 354, respectively, each cam follower extension 348, 350 having respective first and second cam follower surfaces 356 and 358 for engaging inner surfaces 360 and 362 of cam follower plates 326 and 328. Shaft 340 is coupled at an upper end 364 to top shell 304, at a lower end 366 to bottom shell 302 and to wobble gear 338 therebetween. Rotary transmission means 336 is configured to rotate wobble gear 338 about an axis of rotation 368 to move wobble gear 338 in an eccentric pattern between cam follower plates 326, 328 causing motor housing 344, shaft 340, and rocker blade 300 coupled to motor housing 344 to rock from side-to-side about pivot axis 370 relative to floor base 312, as suggested by arrow 372 in FIGS. 25 and 26. The position of wobble gear 338 in the left-tilting position of rocker blade 300 shown in FIG. 25 is reversed in the right-tilting position of rocker blade 300 shown in FIG. 26, as reflected by the location of cam follower extensions 348 and 350. During the movement of rocker blade 300, feet 322 and 324 remain stationary.

Alternatively, in another embodiment of a rocker blade 300', shown in FIG. 27, shaft 340 is coupled or journaled to wobble gear 338 and to shells 302 and 304. Motor housing 344 is coupled to shaft 340 by a gear box 346 to permit drive motor 342 to rotate shaft 340 and wobble gear 338 causing motor housing 344 and rocker blade 300' to rock from side-to-side about pivot axis 370 relative to floor base 312. For components not identified in the embodiment shown in FIG. 27, they have the same numerical designations as the components shown in the embodiment of FIGS. 25 and 26.

An illustrative embodiment of a rocker blade 400 is shown in FIGS. 28 and 29. Rocker blade 400 includes a front shell 402 and a rear shell 404 formed to include downwardly facing curved surface 406. Front shell 402 and rear shell 404 are configured to be coupled to each other to define a chamber 408 therebetween. A rocker motion system 410 is located in chamber 408 and includes a floor base 412 having feet or rocker wheels 414, 416 arranged to extend through first and second foot-receiver channels or apertures 418, 420 formed in shells 402, 404 to engage underlying floor surface 422 and a rocker blade mover 424 coupled to rocker blade 400 and floor base 412. Foot-receiver channels or apertures 418, 420 may also be designated herein as tilt openings and feet or rocker wheels 414, 416 may also be designated herein as tilters. Rocker blade mover 424 is configured to provide means for repeatedly moving tilters or rocker wheels 414, 416 of floor base 412 relative to floor surface 422 to assume in sequence a first upright/level attitude (not shown), a left-tilting orientation (not shown), and a right-tilting orientation (see FIG. 29) to establish side-to-side rocking motion of rocker blade 400 on underlying floor surface 418.

Floor base 412 includes right and left rocker wheels 414, 416, right and left rocker arms 426, 428 coupled, respectively, to rocker wheels 414, 416 and a linkage bar 430 coupled to and interposed between rocker arms 426, 428. Linkage bar 430 includes right and left extension arms 432, 434 pivotedly coupled at axes 435, 437, respectively, to right and left rocker arms 426, 428, which extension arms 432, 434 are coupled to linkage bar 430 by a spring assembly 431. Rocker arms 426, 428 are pivotally coupled to wheels 414, 416 via pivot axes 413 and 415, respectively. Spring assembly 431 includes springs 436, 438, pins 440, 442 on linkage bar 430 and pins 444, 446 on extension arms 432, 434, respectively. Pins 440 and 444 couple spring 436 to linkage bar 430 and extension arm 432. Pins 442 and 446 couple spring 438 to linkage bar 430 and extension arm 434. Spring assembly 431 is configured to provide a cushioning effect and/or a back-up rocking function whereby pins 444, 446 are adapted to move in elongated slot 456 of linkage bar 430 thereby expanding springs 436 and/or 438 when a pressure or force is applied to wheels 414 and/or 416 by contact with floor surface 422.

Rocker blade mover 424 includes motorized rotary transmission means 448 including a drive motor 450 for rotating a rotatable drive shaft 452 about axis of rotation 454 to move drive linkage 458 coupled to linkage bar 430, thereby causing rocker wheels 414, 416 to impart a rocking side-to-side motion to rocker blade 400 relative to floor surface 422. Drive shaft 452 is configured to move within elongated slot 460 of drive linkage 458 during the side-to-side motion of rocker blade 400.

Although the present disclosure has been described and illustrated in detail, it is to be clearly understood that this is done by way of illustration and example only and is not to be taken by way of limitation. The scope of the present disclosure is to be limited only by the terms of the appended claims.

1. A juvenile relaxation apparatus comprising a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface,
a rocker blade coupled to the frame and formed to include a curved bottom surface adapted to contact the underlying floor surface, and

a rocker motion system coupled to the rocker blade and configured to provide means for producing side-to-side rocking motion of the rocker blade and the frame coupled to the rocker blade.

2. The apparatus of claim 1, wherein the means for producing side-to-side rocking motion of the rocker blade and the frame coupled to the rocker blade includes a stationary floor base adapted to contact the underlying floor surface, a rocker blade mount coupled to the rocker blade, and a rocker blade tiltter supported for rotation relative to the rocker blade mount about an axis of rotation and to cooperate with the stationary floor base to provide mover means for repeatedly moving the rocker blade mount and the rocker blade coupled to the rocker blade mount relative to the stationary floor base to assume, in sequence, a left-tilting orientation, a first upright/level attitude, a right-tilting orientation, and a second upright/level altitude to establish the side-to-side rocking motion of the rocker blade on the underlying floor surface.

3. The apparatus of claim 2, wherein the rocker blade tiltter includes a rotatable cam shaft and an eccentric disk cam coupled to the rotatable cam shaft to rotate therewith and arranged to extend into a cam receiver formed in the stationary floor base.

4. The apparatus of claim 3, wherein the rocker blade mount includes motorized rotary transmission means for rotating the rotatable cam shaft about an axis of rotation to move the eccentric disk cam in an eccentric pattern about the axis of rotation in the cam receiver formed in the stationary floor base to cause the rocker blade mount and the rocker blade coupled to the rocker blade mount to rock from side to side relative to the stationary floor base.

5. The apparatus of claim 1, wherein the seat includes a headrest and a footrest in spaced-apart relation to the headrest, the frame includes a right support member arranged to underlie a right-side portion of the seat and a left support member arranged to underlie a left-side portion of the seat, and the rocker blade is arranged to lie under the footrest of the seat and interconnect the left and right support members of the frame.

6. The apparatus of claim 5, wherein the frame further includes an auxiliary rocker blade arranged to underlie the headrest of the seat and interconnect the left and right support members and the auxiliary rocker blade is formed to include a downwardly facing curved bottom surface adapted to contact the underlying floor surface.

7. The apparatus of claim 5, wherein the juvenile holder is a bouncer unit, the left and right support members are each made of an elastic material, the right support member includes a right knee coupled to a right side of the rocker blade, a lower right leg extending from the right knee to a right side of the auxiliary rocker blade, and an upper right leg extending from the right knee to a right side of the seat and cooperating with the lower right leg to define an acute included angle therebetween, and the left support member includes a left knee coupled to a left side of the rocker blade, a lower left leg extending from the left knee to a left side of the auxiliary rocker blade, and an upper left leg extending from the left knee to a left side of the seat and cooperating with the lower left leg to define an acute included angle therebetween.

8. The apparatus of claim 5, wherein each of the left and right support members and the auxiliary rocker blade is made of a metal rod and the auxiliary rocker blade is interposed between and coupled to the left and right support members.

9. The apparatus of claim 5, wherein the juvenile holder is a bassinet unit, each of the left and right support members is a U-shaped element, the right support member includes a first right knee coupled to the rocker blade, a second right knee coupled to the auxiliary rocker blade, an elongated right stretcher interconnecting the first and second right knees, a first right upright leg extending upwardly from the first right knee to the footrest of the seat, and a second right upright leg extending upwardly from the second right knee to the headrest of the seat, the left support member includes a first left knee coupled to the rocker blade, a second left knee coupled to the auxiliary rocker blade, an elongated left stretcher interconnecting the first and second left knees, a first left upright leg extending upwardly from the first left knee to the footrest of the seat, and a second left upright leg extending upwardly from the second left knee to the headrest of the seat.

10. The apparatus of claim 9, wherein the left and right support members further include a first pivot axle coupled to the first left and right upright legs and to the footrest and a second pivot axle coupled to the second left and right upright legs and to the headrest and wherein the first and second pivot axles cooperate with the footrest and headrest to support the seat for swinging movement relative to the frame about a pivot axis extending through the first and second pivot axles.

11. The apparatus of claim 1, further comprising a first frame kickstand mounted on a first end of the rocker blade for movement relative to the frame between an extended position extending below the curved bottom surface of the rocker blade to inhibit side-to-side rocking motion of the rocker blade on the underlying floor surface and a retracted position lying alongside the rocker blade to allow side-to-side rocking motion of the rocker blade on the underlying floor surface produced by the rocker motion system.

12. The apparatus of claim 11, further comprising a second frame kickstand mounted on an opposite second end of the rocker blade for movement relative to the frame between an extended position extending below the curved bottom surface of the rocker blade to cooperate with the first frame kickstand to maintain the rocker blade in an upright/level attitude relative to the underlying floor surface upon movement of the first frame kickstand to the extended position further to inhibit side-to-side rocking motion of the rocker blade on the underlying floor surface and a retracted position lying alongside the rocker blade to allow side-to-side rocking motion of the rocker blade on the underlying floor surface upon movement of the first frame kickstand to the retracted position.

13. A juvenile relaxation apparatus comprising

a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface,

a rocker blade coupled to the frame and formed to include a curved bottom surface adapted to contact the underlying floor surface, and
a rocker motion system coupled to the rocker blade and configured to provide means for producing side-to-side rocking motion of the rocker blade and the frame coupled to the rocker blade, wherein the rocker blade is formed to include a chamber, the rocker motion system includes a floor base located in the chamber and arranged to extend through at least one aperture formed in the rocker blade to contact the underlying floor surface to remain in a stationary position during relative side-by-side rocking motion of the rocker blade.

14. The apparatus of claim 13, wherein the rocker motion system further includes a rocker blade mover located in the chamber and coupled to the floor base and the rocker blade mover is configured to provide mover means for repeatedly moving the rocker blade and the frame coupled to the rocker blade relative to the floor base to assume, in sequence, a first upright/level attitude, a left-tilting orientation, a second upright/level attitude, and a right-tilting orientation to establish the side-to-side rocking motion of the rocker blade on the underlying floor surface.

15. The apparatus of claim 14, wherein the seat includes a headrest and a footrest in spaced-apart relation to the headrest, the frame includes a right support member arranged to underlie a right-side portion of the seat and a left support member arranged to underlie a left-side portion of the seat, the rocker blade is arranged to lie under the footrest of the seat and interconnect the left and right support members of the frame, and the chamber formed in the rocker blade is located between the right and left support members.

16. The apparatus of claim 15, wherein the rocker blade includes a bottom shell and a top shell interposed between the bottom shell and the seat and coupled to the bottom shell to define the chamber therebetween and wherein the bottom shell is formed to include the at least one aperture.

17. The apparatus of claim 14, wherein the rocker blade includes a bottom shell and a top shell interposed between the bottom shell and the seat and coupled to the bottom shell to define the chamber therebetween, the bottom shell is formed to include the at least one aperture, the floor base includes a pivot axle, and the bottom shell is formed to include means for supporting the pivot axle to permit pivoting movement of the top and bottom shells about a pivot axis established by the pivot axle relative to the floor base during side-to-side rocking motion of the rocker blade on the underlying floor surface.

18. The apparatus of claim 14, further comprising blade vibrator means located in the chamber formed in the rocker blade for vibrating the bouncer unit.

19. The apparatus of claim 14, wherein the floor base further includes a cam support fixture configured to include a cam receiver, the rocker blade mover includes a motor housing coupled to the rocker blade to move therewith, and the mover means includes a rotatable cam shaft extending into the motor housing, an eccentric disk cam coupled to the rotatable cam shaft and arranged to extend into the cam receiver formed in the cam support fixture of the floor base, and motorized rotary transmission means including a drive motor located in the motor housing for rotating the rotatable cam shaft about an axis of rotation to move the eccentric disk cam in an eccentric pattern about the axis of rotation in the cam receiver to cause the motor housing and the rocker blade coupled to the motor housing to rock from side to side relative to the floor base.

20. The apparatus of claim 19, wherein the floor base further includes left and right feet arranged to lie in laterally spaced-apart relation to one another to locate the cam receiver formed in the cam support fixture therebetween, each of the left and right feet is arranged to extend through and move in a companion aperture formed in the rocker blade to contact the underlying floor surface, and the floor base further includes axle means coupled to the rocker blade for supporting the rocker blade for pivotable movement about a pivot axis relative to the floor base in sequence between a first tilted position causing the left foot to be retracted substantially into the chamber formed in the rocker blade and a portion of the right foot to be extended out of the chamber to establish the left-tilting orientation of the rocker blade and the frame coupled to the rocker blade, a centered position causing each of the left and right feet to be extended through the companion apertures to establish first and second upright/level attitudes of the rocker blade and the frame coupled to the rocker blade, and a second tilted position causing the left foot to be extended out of the chamber and the right foot to be retracted substantially into the chamber to establish a right-tilting orientation of the rocker blade and the frame coupled to the rocker blade.

21. The apparatus of claim 19, wherein the cam support fixture includes first and second spaced-apart vertical side walls bordering the cam receiver and maintaining contact with the eccentric disk cam during rotation of the rotatable cam shaft about the axis of rotation, the eccentric disk cam includes a mount portion coupled to the rotatable cam shaft and arranged to extend a first radial distance away from the axis of rotation and an eccentric portion coupled to the mount portion and arranged to extend a greater second radial distance away from the axis of rotation, and the eccentric portion is arranged to move in sequence in the cam receiver, in response to rotation of the rotatable cam shaft about the axis of rotation, between a 6 o'clock position associated with the first upright/level attitude of the rocker blade, a 3 o'clock position associated with the left-tilting orientation of the rocker blade, a 12 o'clock position associated with the second upright/level attitude of the rocker blade, and a 9 o'clock position associated with the right-tilting orientation of the rocker blade, and wherein the rotatable cam shaft is located in a centered position about midway between the spaced-apart first and second vertical side walls bordering the cam receiver upon movement of the eccentric disk cam in the cam receiver to assume the 6 o'clock and 12 o'clock positions, the rotatable cam shaft is located in a first offset position to lie closer to the second vertical side wall than to the first vertical side wall upon movement of the eccentric disk cam in the cam receiver to assume the 3 o'clock position, and the rotatable cam shaft is located in a second offset position to lie closer to the first vertical side wall than to the second vertical side wall upon movement of the eccentric disk cam in the cam receiver to assume the 9 o'clock position.

22. The apparatus of claim 13, wherein the rocker motion system further includes a motor housing coupled to the rocker blade to move therewith, a rotatable cam shaft mounted to rotate about an axis of rotation relative to the motor housing, an eccentric disk cam coupled to the rotatable cam shaft and arranged to extend into a cam receiver formed in the floor base, a motorized cam shaft rotation system located in the motor housing and coupled to the rotatable cam shaft, a power supply, first means coupled to
the power supply for energizing the motorized cam shaft rotation system to move the eccentric disk cam in an eccentric pattern about the axis of rotation in the cam receiver to cause the motor housing and the rocker blade coupled to the motor housing to rock from side to side relative to the floor base so that the rocker blade is moved repeatedly relative to the floor base to assume, in sequence, a first upright/level attitude, a left-tilting orientation, a second upright/level attitude, and a right-tilting orientation to establish the side-to-side rocking motion of the rocker blade on the underlying floor surface, and second means coupled to the power supply for energizing the motorized cam shaft rotation system automatically whenever the first means is disabled to stop side-by-side rocking motion of the rocker blade on the underlying floor surface to cause the rotatable cam shaft to continue to rotate about the axis of rotation until the frame coupled to the rocker blade comes to rest on the underlying floor surface in one of the first and second upright/level attitudes.

23. The apparatus of claim 14, wherein the seat includes a headrest and a footrest in spaced-apart relation to the headrest, the frame includes a right support member arranged to underlie a right-side portion of the seat and a left support member arranged to underlie a left-side portion of the seat, the rocker blade is arranged to lie under the footrest of the seat and interconnect the left and right support members of the frame, and the chamber formed in the rocker blade is located between the right and left support members.

24. The apparatus of claim 22, wherein the second means includes a momentary contact switch coupled electrically to the power supply and a switch-actuation cam mounted on the rotatable cam shaft for rotation about the axis of rotation and wherein the switch-actuation cam is configured to provide means for actuating the momentary contact switch temporarily to energize the motorized cam shaft rotation system upon disassembly of the first means until the frame moves relative to the floor base to assume said one of the first and second upright/level attitudes.

25. A juvenile relaxation apparatus comprising

- a first rocker blade formed to include a curved bottom surface adapted to contact an underlying floor surface,
- a bouncer unit including a seat and a flexible seat-bouncer frame adapted to set on the underlying floor surface, the flexible seat-bouncer frame including a second rocker blade formed to include a second curved bottom surface adapted to contact the underlying floor surface, an elastic right support member coupled to right sides of the first and second rocker blades, an elastic left support member coupled to left sides of the first and second rocker blades, the seat being coupled to the left and right support members to lie in an elevated position above the underlying floor surface and to move up and down in a bouncing motion during a flexure of the elastic left and right support members, and

a rocker motion system coupled to the first rocker blade, the rocker motion system being configured to include a stationary floor base adapted to contact the underlying floor surface and a rocker blade mover coupled to the stationary floor base and to the first rocker blade and configured to produce side-to-side rocking motion of the rocker blade relative to the stationary floor base to cause the elastic left and right support members and the second rocker blade and seat coupled to the left and right support members to rock from side to side relative to the stationary floor base with the first rocker blade.

26. The apparatus of claim 25, wherein the floor base further includes a cam support fixture formed to include a cam receiver, the first rocker blade mover includes a motor housing coupled to the first rocker blade to move therewith, and the mover means includes a rotatable cam shaft extending into the motor housing, an eccentric disk cam coupled to the rotatable cam shaft and arranged to extend into the cam receiver formed in the cam support fixture of the floor base, and motorized rotary transmission means including a drive motor located in the motor housing for rotating the rotatable cam shaft about an axis of rotation to move the eccentric disk cam in an eccentric pattern about the axis of rotation in the cam receiver to cause the motor housing and the first rocker blade coupled to the motor housing to rock from side to side relative to the floor base.

27. The apparatus of claim 26, wherein the floor base further includes left and right feet arranged to lie in laterally spaced-apart relation to one another to locate the cam receiver formed in the cam support fixture therebetween, each of the left and right feet is arranged to extend through and move in a companion aperture formed in the rocker blade to contact the underlying floor surface, wherein the floor base further includes axle means coupled to the rocker blade for supporting the rocker blade for pivotable movement about a pivot axis relative to the floor base in sequence between a first tilted position causing the left foot to be retracted substantially into a chamber formed in the rocker blade and a portion of the right foot to be extended out of the chamber to establish a left-tilting orientation of the rocker blade and the flexible seat-bouncer frame coupled to the rocker blade, a centered position causing each of the left and right feet to be extended through the companion apertures to establish an upright/level attitude of the rocker blade and the flexible seat-bouncer frame coupled to the rocker blade, and a second tilted position causing the left foot to be extended out of the chamber and the right foot to be retracted substantially into the chamber to establish a right-tilting orientation of the rocker blade and the flexible seat-bouncer frame coupled to the rocker blade.

28. The apparatus of claim 25, wherein the seat includes a headrest and a footrest in spaced-apart relation to the headrest, the first rocker blade is arranged to lie under the footrest, and the second rocker blade is arranged to lie under the headrest.

29. The apparatus of claim 28, wherein the flexible right support frame includes a right knee coupled to the right side of the first rocker blade, a lower right leg extending from the right knee to the right side of the second rocker blade, an upper right leg extending from the right knee to a right side of the seat, and wherein the flexible left support frame includes a left knee coupled to the left side of the first rocker blade, a lower left leg extending from the left knee to the left side of the second rocker blade, and an upper left leg extending from the left knee to the seat.

30. The apparatus of claim 29, further comprising first and second frame kickstands mounted on the first rocker blade and arranged to lie in spaced-apart relation to one another to locate the left and right knees therebetween and wherein each of the first and second frame kickstands is mounted for movement relative to the flexible seat-bouncer frame between an extended position extending below the curved bottom surface of the first rocker blade to inhibit side-to-side
rocking motion of the first rocker blade on the underlying floor surface and a retracted position alongside the first rocker blade to allow side-to-side rocking motion of the first rocker blade on the underlying floor surface provided by the rocker motion system.

31. A juvenile relaxation apparatus comprising

a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface,

a rocker blade coupled to the frame and formed to include a curved bottom surface adapted to contact the underlying floor surface, and

a rocker motion system coupled to the rocker blade, the rocker motion system including a stationary floor base adapted to contact the underlying floor surface to lie in a stationary position relative to the rocker blade, a motor housing coupled to the rocker blade to move therewith, a rotatable drive shaft rotated about an axis of rotation by a drive motor assembly located in the motor housing, and linkage means coupled to the rotatable drive shaft and to the floor base for using rotation of the rotatable drive shaft about the axis of rotation to cause the motor housing and the rocker blade coupled to the motor housing to rotate about the axis of rotation relative to the stationary floor base in sequence first in a counterclockwise direction to assume a left-tilting orientation, second in a clockwise direction to assume a first upright/level attitude and then a right-tilting orientation, and third in a counterclockwise direction to assume a second upright/level orientation so that side-to-side rocking motion of the rocker blade and a bouncer unit coupled to the rocker blade relative to the stationary floor base is produced.

32. The apparatus of claim 31, wherein the stationary floor base includes a cam support fixture formed to include a cam receiver and the linkage means includes an eccentric disk cam coupled to the rotatable shaft and arranged to extend into the cam receiver and to move in an eccentric pattern about the axis of rotation in the cam receiver to cause the motor housing and the rocker blade coupled to the motor housing to rock from side to side relative to the stationary floor base.

33. The apparatus of claim 32, wherein the rocker blade is formed to include a chamber containing the stationary floor base, the stationary floor base further includes left and right feet arranged to lie in laterally spaced-apart relation to one another to locate the cam receiver formed in the cam support fixture therebetween, each of the left and right feet is arranged to extend through and move in a companion aperture formed in the rocker blade to contact the underlying floor surface, and the stationary floor base further includes axle means coupled to the rocker blade for supporting the rocker blade for pivotable movement about a pivot axis relative to the stationary floor base in sequence between a first tilted position causing the left foot to be retracted substantially into the chamber formed in the rocker blade and a portion of the right foot to be extended out of the chamber to establish the left-tilting orientation of the rocker blade and the frame coupled to the rocker blade, a centered position causing each of the left and right feet to be extended through the companion apertures to establish the first and second upright/level attitudes of the rocker blade and the frame coupled to the rocker blade, and a second tilted position causing the left foot to be extended out of the chamber and the right foot to be retracted substantially into the chamber to establish the right-tilting orientation of the rocker blade and the frame coupled to the rocker blade.

34. The apparatus of claim 32, wherein the cam support fixture includes first and second spaced-apart vertical side walls bordering the cam receiver and maintaining contact with the eccentric disk cam during rotation of the rotatable cam shaft about the axis of rotation, the eccentric disk cam includes a mount portion coupled to the rotatable cam shaft and arranged to extend a first radial distance away from the axis of rotation and an eccentric portion coupled to the mount portion and arranged to extend a greater second radial distance away from the axis of rotation, and the eccentric portion is arranged to move in sequence in the cam receiver, in response to rotation of the rotatable cam shaft about the axis of rotation, between a 6 o’clock position associated with the first upright/level attitude of the rocker blade, a 3 o’clock position associated with the left-tilting orientation of the rocker blade, a 12 o’clock position associated with the second upright/level attitude of the rocker blade, and a 9 o’clock position associated with the right-tilting orientation of the rocker blade, and wherein the rotatable cam shaft is located in a centered position about midway between the spaced-apart first and second vertical side walls bordering the cam receiver upon movement of the eccentric disk cam in the cam receiver to assume the 6 o’clock and 12 o’clock positions, the rotatable cam shaft is located in a first offset position to lie closer to the second vertical side wall than to the first vertical side wall upon movement of the eccentric disk cam in the cam receiver to assume the 3 o’clock position, and the rotatable cam shaft is located in a second offset position to lie closer to the vertical side wall than to the second vertical side wall upon movement of the eccentric disk cam in the cam receiver to assume the 9 o’clock position.

35. The apparatus of claim 32, wherein the linkage means further includes a power supply, first means coupled to the power supply for energizing the drive motor assembly to move the eccentric disk cam in the eccentric pattern about the axis of rotation in the cam receiver, and second means coupled to the power supply for energizing the drive motor assembly automatically whenever the first means is disabled to stop side-to-side rocking motion of the rocker blade and the bouncer unit coupled to the rocker blade relative to the stationary floor base until the rocker blade comes to rest on the underlying floor surface in one of the first and second upright/level attitudes.

36. The apparatus of claim 35, wherein the rocker blade is formed to include a chamber containing the stationary floor base and the seat includes a headrest and a footrest in spaced-apart relation to the headrest, the frame includes a right support member arranged to underlie a right-side portion of the seat and a left support member arranged to underlie a left-side portion of the seat, the rocker blade is arranged to lie under the footrest of the seat and interconnect the left and right support members of the frame, and the chamber formed in the rocker blade is located between the right and left support members.

37. The apparatus of claim 35, wherein the second means includes a momentary contact switch coupled electrically to the power supply and a switch-actuation cam mounted on the rotatable cam shaft for rotation about the axis of rotation
and wherein the switch-actuation cam is configured to provide means for actuating the momentary contact switch temporarily to energize the motorized cam shaft rotation system upon disablement of the first means until the frame moves relative to the stationary floor base to assume said one of the first and second upright/level attitudes.

38. A juvenile relaxation apparatus comprising

a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface,

a rocker blade coupled to the frame and formed to include a curved bottom surface adapted to contact the underlying floor surface, and

a rocker motion system coupled to the rocker blade and configured to provide means for producing side-to-side rocking motion of the rocker blade and the frame coupled to the rocker blade, wherein the rocker blade is formed to include a chamber, the rocker motion system includes a floor base located in the chamber and arranged to extend through at least one aperture formed in the rocker blade to contact the underlying floor surface during side-by-side rocking motion of the rocker blade relative to the underlying floor surface.

39. A juvenile relaxation apparatus comprising

a first rocker blade formed to include a curved bottom surface adapted to contact an underlying floor surface,

a bouncer unit including a seat and a flexible seat-bouncer frame adapted to set on the underlying floor surface, the flexible seat-bouncer frame including a second rocker blade formed to include a curved bottom surface adapted to contact the underlying floor surface, an elastic right support member coupled to right sides of the first and second rocker blades, an elastic left support member coupled to left sides of the first and second rocker blades, the seat being coupled to the left and right support members to lie in an elevated position above the underlying floor surface and to move up and down in a bouncing motion during flexure of the elastic left and right support members, and

a rocker motion system coupled to the first rocker blade, the rocker motion system being configured to include a floor base adapted to contact the underlying floor surface and a rocker blade mover coupled to the floor base and to the first rocker blade and configured to produce side-to-side rocking motion of the rocker blade and to cause the elastic left and right support members and the second rocker blade and seat coupled to the left and right support members to rock from side-to-side relative with the first rocker blade.

40. A juvenile relaxation apparatus comprising

a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface,

a rocker blade coupled to the frame and formed to include a curved bottom surface adapted to contact the underlying floor surface, and

a rocker motion system coupled to the rocker blade, the rocker motion system including a floor base adapted to contact the underlying floor surface, a motor housing coupled to the rocker blade to move therewith, a rotatable drive shaft rotated about an axis of rotation by a drive motor assembly located in the motor housing, and linkage means coupled to the rotatable drive shaft and to the floor base for using rotation of the rotatable drive shaft about the axis of rotation to cause the motor housing and the rocker blade coupled to the motor housing to rotate about the axis of rotation in sequence first in a counterclockwise direction to assume a left-tilting orientation, second in a clockwise direction to assume a first upright/level attitude and then a right-tilting orientation, and third in a counterclockwise direction to assume a second upright/level orientation so that side-to-side rocking motion of the rocker blade and the bouncer unit coupled to the rocker blade relative to the stationary floor base is produced.

41. A juvenile relaxation apparatus comprising

a juvenile holder including a seat and a frame adapted to set on an underlying floor surface, the seat being coupled to the frame to lie in an elevated position above the underlying floor surface, and

a frame rocker including a rocker blade coupled to the frame and configured to include a curved bottom surface adapted to set on the underlying floor surface and a rocker blade mover coupled to the rocker blade and configured to act against the underlying floor surface to roll the curved bottom surface of the rocker blade back and forth along the underlying floor surface to impart a side-to-side rocking motion to the rocker blade and the frame coupled to the rocker blade.

42. The apparatus of claim 41, wherein a left side of the curved bottom surface is formed to include a first tilter opening, a right side of the curved bottom surface is formed to include a second tilter opening, and the rocker blade mover includes a first tilter arranged to move up and down through the first opening to engage and disengage the underlying floor surface underlying the rocker blade, a second tilter arranged to move up and down through the second opening to engage and disengage the underlying floor surface underlying the rocker blade, and a drive system coupled to each of the first and second tilters and configured to extend one of the first and second tilters through a companion tilter opening and simultaneously retract another of the first and second tilters through another companion tilter opening to initiate and maintain back and forth rolling motion of the curved bottom surface of the front rocker blade on the underlying floor surface.

*   *   *   *