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INFANT'S ROCKING CRADLE

Filed Dec. 27, 1960

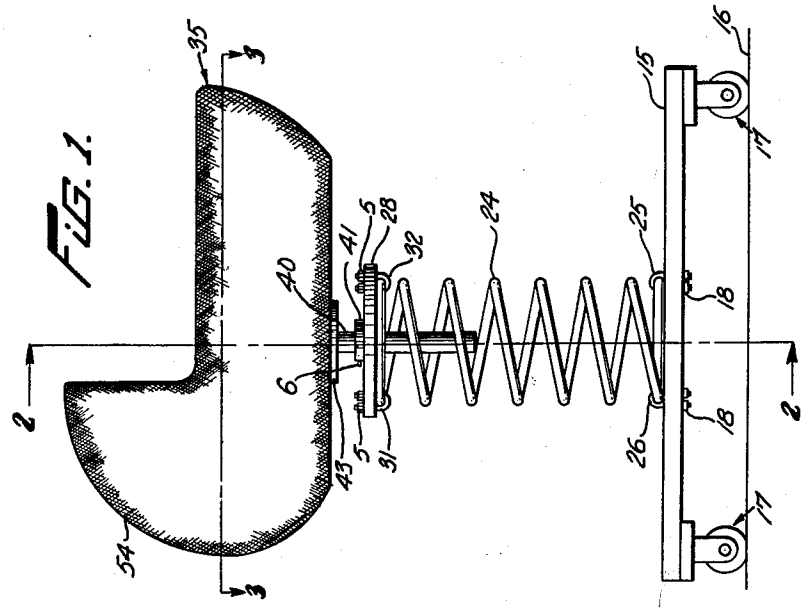


FIG. 1.

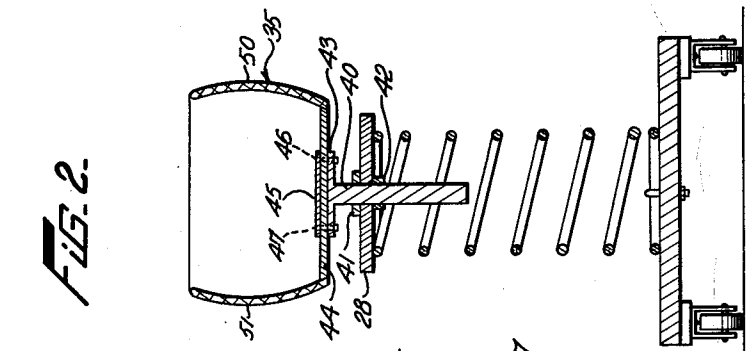


FIG. 2.

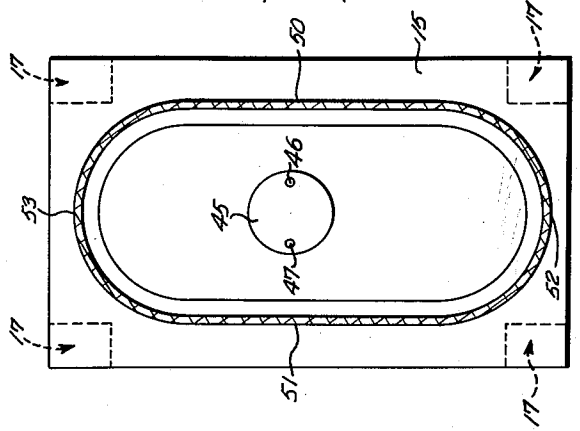


FIG. 3.

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INFANT'S ROCKING CRADLE

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6 Claims. (Cl. 5—104)

The invention relates to rocking cradles for infants and more particularly to such cradles wherein the rocking motion is induced responsive to physical movement of the infant.

This application is a continuation-in-part of our application entitled, "Child's Rocking Device," filed April 13, 1959, Serial No. 805,815, issued August 15, 1961, as United States Letters Patent 2,996,298.

Conventional rocking cribs and cradles for infants may have several disadvantages. The rocking motion of the cradle may be produced with a motor or vibrator associated with the cradle and mechanically linked to the cradle to produce the desired rocking movement. This type of rocking cradle has the disadvantage of being relatively expensive because of the apparatus involved, and a safety hazard may exist in the infant getting his fingers or the like caught between relatively moving parts of the device. Moreover, these conventional rocking cradles have the disadvantage that the rocking motion is usually in one direction only and of constant amplitude.

The invention removes the above disadvantages by providing a rocking cradle wherein the rocking action of the cradle is induced by physical movement of an infant contained in the cradle and wherein the rocking movement is in random directions and of random amplitude depending upon the character of the movements of the infant. The apparatus of the invention does not present relatively moving parts between which an infant may be caught and is simple and relatively inexpensive.

The apparatus of the invention comprises broadly an infant containing member mounted on the upper end of a vertically oriented compression spring which is fixed at its bottom to a base. The infant containing member has vertically extending sides and ends to contain and confine an infant occupant, and the supporting spring is of such physical properties that normal physical activity of an infant will cause oscillation of the infant containing member and the infant about the vertical axis of the compression spring. A bassinet may be used as the infant containing member. An infant of the size and age normally accommodated in a bassinet is not sufficiently coordinated to induce regular motion of the supporting compression spring, and consequently a soothing rocking motion in random directions and of random amplitude can be induced through physical activity of the infant to the pleasure of the infant.

The invention will be fully understood from a reading of the following description thereof taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side view of the invention;

FIG. 2 is a sectional view along the line 2—2 in FIG. 1; and

FIG. 3 is a sectional view along the line 3—3 in FIG. 1.

Referring to FIG. 1, a horizontally extending planar base 15 is supported from a surface 16 by means of casters 17 attached to the base. The casters 17 may be conventional casters wherein a wheel is rotatably mounted on a horizontal axis in a fork which is connected to the remainder of the caster for rotation of the fork about a vertical axis. Conventional casters with freely rotatable wheels and with full swiveling action about the vertical axis are preferred to facilitate movement of the apparatus relative to the surface 16 and to help prevent overturning

of the apparatus due to lateral external forces exerted thereon, but if desired, the wheels of the casters may have conventional releasable locks to prevent unwanted lateral movement of the apparatus. Alternatively, gliders or other supports may be utilized to support the base 15 from surface 16.

A heavy compression spring 24 is mounted on the base 15 with its longitudinal axis vertical. The spring 24 is mounted with its longitudinal axis at the geometrical center of the base 15. The bottom end of the spring is fixed to the base 15 with U-bolts 25 and 26 which extend over the bottom coil of the spring and through the base 15 with nuts 18 on the legs of the U-bolts engaging the underside of the base 15. The spring 24 extends upwardly to a horizontally extending planar coupling plate 28 to which its upper coil is attached by means of U-bolts 31, 32 which extend over the top coil of the spring and through the coupling plate 28 with nuts 5 on their legs engaging the upper side of the coupling plate. The ends of the spring 24 are squared to produce a planar engagement between the ends of the spring and the members to which such ends are connected so that a fixed connection without relative movement is made between the ends of the spring and the members to which such ends are connected with the U-bolts as described above. It is to be understood that the upper end of the spring may be connected directly to the bottom 44 of the below described member 35 in the same manner as the lower end of the spring is connected to the base 15, in which case the coupling plate 28 and supporting shaft 40 are not used.

The characteristics of the spring 24 are of considerable importance to the invention. The spring 24 must be sufficiently rigid to support an infant containing member with an infant occupant and permit oscillation of same but still be sufficiently flexible to permit physical activity of the infant to produce lateral and axial movement of the upper end of the spring. The spring 24 is a cylindrical helicoidal spring, but alternatively it may be a conical helicoidal spring with the base of cone disposed on the base 15. It has been found satisfactory that the spring 24 be a cylindrical helicoidal spring made from round stock having a diameter of .670 inch with an outside diameter of five and one-eighth inches and a free length of thirteen and three-eighths inches. Such a spring has a "spring rate," that is, pounds per inch of axial deflection, of four hundred and twenty-five pounds per inch and a total capacity of three thousand pounds. Springs of other sizes may be used, but they should be on the order of five inches outside diameter, have a length in the range of ten inches to thirty inches, have a spring rate in the range of one hundred to five hundred pounds per inch, and a total capacity in the range of about one thousand to three thousand pounds.

A supporting shaft 40 is mounted on the coupling plate 28 with its axis vertical and concentric with the longitudinal axis of the spring 24. The supporting shaft 40 is securely fixed to the coupling plate 28 by means of a radially extending flange 41 secured to the coupling plate 28 with bolts (not shown) extending through the flange 41 and the coupling plate. A collar 42 may be secured to the supporting shaft 40 in engagement with the underside of the coupling plate 28 to give further rigidity to the connection between the supporting shaft 40 and the coupling plate 28. The shaft 40 extends vertically upwardly and terminates at its upper end with a horizontally extending circular flange 43. The flange 43 is secured to the bottom 44 of an infant containing member 35 by means of a cover plate 45 and bolts 46 and 47 which sandwich the bottom 44 between the cover plate 45 and the flange 43, thus securely and fixedly attaching the infant containing member 35 to the supporting shaft 40. If de-

sired, the supporting shaft 40 may be slidably received in the coupling plate 23, flange 41, and collar 42 and releasably secured thereto in conventional manner by means of set-screws, such as the set-screw 6, threadedly received in the flange 41 and collar 42 and extending therethrough to bearing engagement with the supporting shaft 40 so that the height of the member 35 is adjustable, the supporting shaft being elongated, as shown, to provide a range of adjustability of height.

The infant containing member 35 has a substantially horizontally extending bottom 44, upwardly extending and horizontally elongated sides 50 and 51, and upwardly extending ends 52 and 53 which connect together the ends of the two sides. The upwardly extending sides and ends are curved outwardly in order that their upper edges curve inwardly in order to enhance the ability of the member 35 to contain and confine an infant within its sides and ends. The infant containing member 35 may have a upwardly extending hood 54 on one end which extends over and above one end of the infant containing member 35 in spaced relation to the uppermost extent of the sides 50 and 51. The infant containing member 35 may be a wicker bassinet as illustrated, or it may be a cradle or other infant container which has vertically extending sides and ends on it to contain and confine an infant occupant therein.

When an infant is placed in the containing member 35, the physical activity of the infant produces random axial compression of small amounts of the spring 24 and random lateral displacement of the upper end of such spring. This random motion is pleasing to the infant and thus soothes the infant. The areal extent of the base 15 and the location of the casters 17 from the vertical axis of the spring 24 are designed to be outside of the vertical resultant of the forces applied to the upper end of the spring to prevent overturning tendencies of the apparatus, and, if necessary, the base 15 may be weighted to further any tendency of the apparatus to overturn as a result of the forces applied to the upper end of the spring 24.

We claim:

1. A rocking cradle for infants comprising a horizontally extending base, a compression spring with its central axis vertical and with one end fixed to the base, and an infant containing member fixedly coupled to the other end of the spring, said infant containing member having a horizontally extending bottom, vertically extending spaced sides and vertically extending ends connecting the sides to contain and confine an infant within its sides and ends, the spring constituting the sole connection between the infant containing member and the base, the spring being substantially incompressible by the weight of the infant in the infant containing member while being laterally deformable in response to movements of the infant in the infant containing member.

2. A rocking cradle for infants comprising a horizontally extending base, a cylindrical helicoidal compression spring with its longitudinal axis vertical and with one end fixed to the base and the other end fixed to a horizontally extending coupling plate, the spring constituting the sole connection between the coupling plate and the base and being freestanding between the coupling plate and the base, a vertically extending shaft fixed to the coupling plate and extending upwardly from the coupling plate, a horizontally extending flange on the upper end of said shaft, an infant containing member having a horizontally extending bottom fixed to the flange on the shaft, said infant containing member having spaced sides extending upwardly from said bottom and ends extending upwardly from said bottom and extending between the sides to contain and confine an infant within its sides and ends, the spring being substantially incompressible by the weight of the infant in the infant containing member while being laterally deformable in response to movement of the infant in the infant containing member.

3. A rocking cradle for infants comprising a horizontally extending base, supports carried on the base and supporting the base from a supporting surface, a cylindrical helicoidal compression spring with its longitudinal axis vertical and with one end fixed to the base and the other end fixed to a horizontally extending coupling plate, the spring constituting the sole connection between the coupling plate and the base and being freestanding between the coupling plate and the base, a vertically extending shaft fixed to the coupling plate coaxially with the longitudinal axis of the compression spring and extending upwardly from the coupling plate, a horizontally extending flange on the upper end of said shaft, an infant containing member having a horizontally extending bottom fixed to the flange on the shaft, said infant containing member having upwardly and arcuately outwardly extending spaced sides and upwardly extending ends extending between the sides to contain and confine an infant within its sides and ends, and said infant containing member having a portion at one end extending upwardly from that end and the sides and over the containing member from side to side in spaced relation from the uppermost extent of the sides to form a hood over that end, the spring being substantially incompressible by the weight of the infant in the infant containing member while being laterally deformable in response to movements of the infant in the infant containing member.

4. Apparatus in accordance with claim 2 wherein the spring has a spring rate in the range of from one hundred to five hundred pounds per inch and a length in the range of ten to thirty inches.

5. Apparatus in accordance with claim 3 wherein the vertically extending shaft is elongated, extends through the coupling plate on both sides thereof in slidable engagement therewith, and is fixed to the coupling plate with means for releasably fixing such shaft to such coupling plate in preselected vertical positions of such shaft relative to such coupling plate.

6. A rocking cradle for infants comprising a planar horizontally extending base, a cylindrical helicoidal compression spring disposed on the base with its longitudinal axis perpendicular to the base and located at approximately the geometrical center of the base, a plurality of U-shaped members surrounding the bottom coil of the spring and fixing it to the base, a planar horizontally extending coupling plate disposed on the upper end of the spring, a plurality of U-shaped members surrounding the top coil of the spring and fixing it to the coupling plate, the spring constituting the sole connection between the coupling plate and the base and being freestanding between the coupling plate and the base, a shaft with its axis vertical and coaxial with the longitudinal axis of the spring fixed to the coupling plate and extending upwardly therefrom, a horizontally extending flange on the uppermost end of the shaft, an infant containing member having a horizontally disposed bottom fixed to the horizontally extending flange on the upper end of the shaft, said infant containing member having horizontally spaced and horizontally elongated elongated sides extending upwardly from said bottom and a pair of horizontally spaced ends extending upwardly from said bottom and extending between the ends of the sides to contain and confine an infant between the sides and ends of the infant containing member, the spring being substantially incompressible by the weight of the infant in the infant containing member while being laterally deformable to response to movement of the infant in the infant containing member.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,078,479 February 26, 1963

Frank Grosse et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 38, before "any" insert -- inhibit --.

Signed and sealed this 1st day of October 1963.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents