The present invention relates in general to baby crib rocking devices and more particularly to a motor driven attachment for imparting a gentle rocking motion to the mattress frame of conventional crib structures.

Difficulty has been experienced in prior art in providing a crib attachment of the character referred to which is simple enough in structure to be readily installed by the average housewife and adapted to accommodate a wide variety of crib structures available on the market. In addition, the presence of electrical motors and exposed moving parts renders prior art devices unsafe for use around small children. Expense has also been a factor since specially constructed crib frames have heretofore been necessary to accommodate the rocking attachment.

The primary object of the present invention is, therefore, to provide a crib rocking attachment which is simplified in structure, easy to install and inexpensive to manufacture with the relatively few moving parts being enclosed to render the device harmless to children.

Another object of the present invention is to provide a crib rocker which comprises a unitary device separate from the crib structure and adapted for use with a wide variety of conventional crib structures without alteration of the crib and which also accommodates the normal adjustment of the crib for children of different age brackets.

Another object of the present invention is to provide a device of the character described which utilizes a small inexpensive electrical motor to produce an even smooth motion and which cooperates with an adjustable spring device for varying the capacity of the motor to accommodate varying loads.

A further object of the present invention is to provide a device of the character described which is powered by an electrical motor with the motor being insulated from the metal mattress frame and with the motor and drive connection being located on the floor beneath the crib, inaccessible to a child in the crib.

A still further object of the present invention is to provide a crib rocking attachment which may be positioned at different locations on the mattress spring frame to obtain a variety of rocking motions as desired.

The means by which the foregoing objects and other advantages, which will be apparent to those skilled in the art, are accomplished, are set forth in the following specification and claims and are illustrated in the accompanying drawings dealing with a preferred embodiment. Reference is now made to the accompanying drawings in which:

FIG. 1 is a perspective view of a conventional crib with the device of the present invention attached thereon;

FIG. 2 is an enlarged fragmentary perspective view showing the details of attachment between the crib structure and the rocking device; and

FIG. 3 is a cross sectional view of the rocking device.

Referring now to the drawings, wherein like reference numerals indicate identical parts in the various views, FIG. 1 illustrates a conventional crib structure which includes four upright post members 1, a head board 2 and a foot board 3. The head board and foot board are connected to the respective posts 1 in the conventional manner and side frames 4 and 5 extend between the head board and the foot board. The side frames may be justably attached to the posts 1 in any well known manner familiar to those versed in the art so as to form a rectangular crib frame. The actual manner of constructing the side frames, head board and foot board form no part of the present invention and the particular crib illustrated is offered by way of example only.

A mattress 6 is located within the rectangular frame of the crib and is supported by means of a mattress frame which includes a wire grid arrangement 7 connected by the tension springs 8 to a rectangular frame 9. The rectangular frame 9 is constructed of angle iron members having vertical legs 10 and horizontal legs 11.

As mentioned, the rectangular frame 9, with the accompanying wire grid 7, supports the mattress 6 within the enclosure provided by the head board 2, the foot board 3 and the side boards or rails 4 and 5 respectively. In the embodiment illustrated, the frame 9 is supported by means of protruding flange members 12 located at the corners of the frame 9. The flanges 12 may be separate elements as illustrated in the drawings and secured to the vertical legs 10 of the frame 9 by any suitable means such as welding or bolting, or in the alternative, may comprise turned out portions of the vertical or horizontal legs of the frame. The flanges 12 engage brackets 13 secured to the vertical faces of the posts 1 by means of screw fastening members 14 in a conventional manner. In conventional models a plurality of such brackets 13 are provided on the faces of each of the posts 1 to permit the frame 9 to be adjusted vertically within the crib frame structure. This is usually done to accommodate children of different age groups or to accommodate different size mattresses etc. With this arrangement, each corner of the frame 9 may be freely raised and lowered to engage bracket 13. It will be understood that different arrangements for supporting the corners of the frame 9 may be utilized in connection with the present invention and that the essential feature is that at least one corner of the frame 9 be capable of being freely raised and lowered as will be presently described.

Referring now to FIG. 3, the motor driven attachment according to the present invention comprises a base member indicated generally by the numeral 15 which may conveniently be in the form of a hollow box-like housing having a top wall 16, side walls 17 and a bottom wall 18. It will be understood that the base member 15 may be constructed in any convenient configuration but should form a complete enclosure for the electric motor and drive connection presently to be described for the purpose of rendering the device harmless to children. Any suitable form of access opening, not shown, may be provided for assembling the device.

Mounted within the enclosure 15 is an internal panel or frame member 19 which is rigidly affixed in any suitable manner to the housing proper. The member 19 serves as a rigid mounting for an electric motor and gear box 20 and 21 respectively which may be secured to the member 19 by means of a plurality of attaching bolts 22. A suitable electrical lead wire 23 from the motor 20 passes through a grommet 24 in the top wall 16 of the housing and may be connected to a household outlet by conventional electrical plug.

An output shaft 25 from the gear box 21 is keyed or otherwise connected to rotate a crank disc 26 which carries a connecting pin 27 on its face and spaced from the output shaft 25. The pin 27 is in turn pivotally connected to a pitman or connecting rod 28 which externally vertically upwardly through a suitable opening 29 in the top wall 16 of the housing. As will be well understood, rotation of the output shaft 25 and the crank disc 26 serves to vertically reciprocate the connecting rod 28.

The upper end of the connecting rod 28 has a threaded portion 30 provided with an upper wing nut 31 and a lower
wing nut 32 threadedly engaged therewith. A tubular connector member 33 is slidably received on the threaded portion 30 above the upper wing nut 31 and is provided with a connector element 34. The connector element 34 is fabricated from a dielectric material which is preferably a resilient rubber or plastic composition. The connector element contains a suitable opening into which the upper end of the tubular member 33 is inserted with a snug or tight engagement.

The outer surface of the connector element 34 includes a slot 35 which extends the full length of the connector element and which is deep enough to receive the major width of a portion of the vertical leg 10 of the rectangular frame 9 as illustrated in FIG. 3. With this structure, the base 15 may be placed on either side beneath the frame 9 and the tubular member 33 raised until the slot 35 in the connector member 34 receives the vertical leg 10 of the frame 9. The upper wing nut 31 is then threaded upwardly to engage the bottom of the tubular member 33 thus providing flexible driving connection between the frame 9 and the rotatable crank disc 26. The adjustment permits the rocking device to be fitted to any size or height crib frame. The use of a rubber or plastic connector element 34 provides a yieldable connection between the frame 9 and the tubular member 33 which is extremely easy to assemble and which also provides a measure of safety in insulating the electrical motor from the mattress frame 9.

As aforementioned, the present invention makes it possible to utilize an extremely small and inexpensive motor 20 and provides means for increasing the capacity of the motor and adjusting the forces applied to the connecting rod 28 depending upon the load carried by the mattress frame 9. To accomplish this purpose, a helical compression spring 36 surrounds the connecting rod 28 and rests on the top wall 16 of the housing about the opening 29. The spring 36 is surrounded by a cylindrical bellows 37 which is open at its bottom and includes a stiffened top wall 38 against which the top of the spring 36 bears. The bellows 37 may be compressed of any suitable material such as plastic or rubber and serve to completely enclose the spring member 36 so as to prevent tampering by children. Although the bellows 37 has been described as having a stiffened top wall 38, it will be understood that the entire bellows 37 may be of uniform composition as long as provision is made to provide a seat for the upper end of the spring 36, such as a bearing plate or the like. One or more washer members 39 may be placed about the connecting rod 28 to provide a rigid surface for engagement by the lower wing nut 32 such that, in any given position of the rod 28, the wing nut 32 may be threaded downwardly to adjust the bias of the spring 36.

To complete the structure of the device, a standard U-bolt 40 is mounted in suitable holes in a side 17 of the base member, with the legs thereof extending outwardly away from the side 17. The legs of the U-bolt are provided with a connecting member 41 and nuts 42 for the purpose of securing the base member 15 to one of the upright posts 1 as illustrated in FIG. 2. This connection along with the engagement of the base 5 with the floor beneath the crib provides complete rigidity for the base member 15.

When it is desired to utilize the attachment of the present invention, the apparatus is first located beneath one corner of the mattress frame 9 with the connector member 34 being positioned to engage a vertical leg of the frame. Although the device may be positioned so as to act against either an end or side section of the frame 9, best results are obtained by engaging a section of the side of the frame as illustrated in FIGS. 1 and 2 of the drawings. With the device mounted in this manner, the mattress frame 9 is given a compound movement by lifting only one corner of the mattress frame thus tilting the frame both in a longitudinal and a transverse direction. It is possible, however, to obtain either a simple transverse or longitudinal rocking of the mattress frame by placing the connector element 34 near the center of either the side or end reaches of the frame 9.

After the device has been located in the desired position, the tubular member 33 is raised to the proper height for engaging a vertical leg of the frame within the slot 35 of the connector member 34. The upper wing nut 31 is then threaded upwardly to maintain the tubular member 33 in the extended position. After this has been accomplished, the U-bolt clamp 40, or other equivalent clamping means, is securely fastened to adjacent post 1 of the crib. After the motor 20 has been started, the wing nut 32 may be threaded downwardly 25 r.p.m. A smooth and the proper amount to assure that the motor can safely lift the load on the frame 9 which includes the weight of the mattress 6 and the child within the crib. Since the motor is not working under a load during the time when the connecting rod 28 is moving downwardly but, in fact, is being aided, the downward movement of the rod 28 is used to compress the spring 36, by means of the wing nut 32, to store energy. As the motor 20 continues its rotation and begins to move the rod 28 in an upward direction, the spring 36, which has been compressed by the downward movement, then begins to expand and its continued force with that of the motor to lift the frame 9. The advantages of this feature are twofold since the use of the spring 36 not only enables the use of a smaller and more inexpensive motor unit but also serves to smooth out the transition between upward and downward movement of the connecting rod 28 and to take up any looseness in the drive connection between the output shaft 25 and the connecting rod 28.

Although the output shaft 25 may be rotated at various speeds to obtain a slow or fast rocking motion as desired, it has been found in practice that the most desirable speed for the shaft 25 is approximately 25 r.p.m. A smooth and even rocking motion is given to the mattress frame with excellent results being obtained in quickly lulling a child to sleep. It has also been found that the moderate amount of sound resulting from the operation of the device adds to the sleep producing effect of the mattress.

From the above description of the preferred embodiment, it will be readily apparent to those skilled in the art that the present invention provides the arrangement and types of structural component utilized within this invention may be subject to numerous modifications well within the purview of this invention and applicants intend only to be limited by the specification and appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In combination with a crib structure including four upright post members, a mattress supporting frame freely movable in a vertical direction and bracket means carried by said posts for supporting said frame at the corners thereof, a rocking attachment comprising, a base housing member, means to clamp said housing to one of said posts beneath said frame, an electrical drive motor mounted in said housing, a connecting rod located within said housing and extending upwardly therefrom, means to drive a connecting rod to said motor for vertical reciprocation, a compression spring surrounding a portion of said rod and bearing at one end against said housing, a bearing plate located on top of said spring and slidably surrounding said rod, screw adjustment means carried by the upper portion of said rod for adjusting the bias of the spring 36 to compress said spring relative to said connecting rod, whereby said spring urges said rod in an upward direction and said spring is compressed upon downward movement of said rod, and an adjustable extension on the end of said rod for connecting said rod to a point on said frame adjacent the post to which it is secured.

2. The combination according to claim 1 wherein said base housing completely encloses said motor and drive connection, and said combination further includes, a flexible bellows member, said bellows being connected to said bearing plate and extending to said base housing to...
completely enclose said spring and permit flexing thereof.

3. The combination according to claim 1 wherein said means to drivingly connect said rod to said motor comprises; an output drive shaft connected to said motor, a crank disk fixed to said shaft at a point eccentric to said disk, and means to pivotally connect the lower end of said rod to said disk at a point spaced from said drive shaft.

4. The combination according to claim 1 wherein the upper portion of said rod is threaded and said adjustable extension comprises; a hollow connector member telescopically received on said threaded portion, a vertically adjustable threaded member carried by said threaded portion and bearing against said connector member, and a flexible connector element carried on the upper end of said connector member, said connector element being formed from a dielectric material for electrically insulating said rocking attachment from said mattress frame.

5. In combination with a crib structure having a mattress supporting frame freely moveable in a vertical direction, a rocking attachment comprising; a drive motor having a rotatable output shaft, a housing for said motor, means to fix said housing relative to said crib structure beneath said frame, a vertically reciprocal rod member adapted to be connected at its upper end to said frame, linkage means for connecting said shaft to reciprocate said rod, compression springs means having one end thereof bearing on said housing, and vertically adjustable pressure means carried by said rod for contacting the other end of said spring, whereby said spring urges said rod in the upward direction and downward movement of the rod compresses said spring.

6. The combination according to claim 5 wherein the upper end of said rod is connected to said frame by means of an adjustable telescoping member having a flexible connector element in engagement with said frame, said connector element being formed from a dielectric material, and a bellows member enclosing said spring and the lower portion of said rod, whereby the relative moving parts of said attachment are normally inaccessible.

7. A crib rocking attachment comprising; a base housing member, means to clamp said housing member to a crib structure beneath the mattress frame thereof, an electrical drive motor mounted in said housing, a connecting rod located within said housing and extending upwardly therefrom, means to drivingly connect said rod to said motor for vertical reciprocation, a compression spring surrounding a portion of said rod and bearing at one end against said housing, a bearing plate located on top of said spring and slidably surrounding said rod, screw adjustment means carried by the upper portion of said rod for applying pressure against said bearing plate to compress said spring relative to said connecting rod, and an adjustable extension on the end of said rod adapted to be connected to a mattress frame.

8. In combination with a crib structure having a mattress supporting frame with at least one corner thereof being freely moveable in a vertical direction, a rocking attachment comprising; vertically reciprocal connecting rod means attached to said frame adjacent said one corner thereof, enclosed motor means connected to reciprocate said rod, spring means surrounding a portion of said rod and having one end thereof seated on said motor means, vertically adjustable pressure means carried on said rod and contacting the other end of said spring for applying pressure to compress said spring relative to the rod, whereby said spring is compressed by downward movement of the rod and acts to aid said motor means in raising said rod.

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