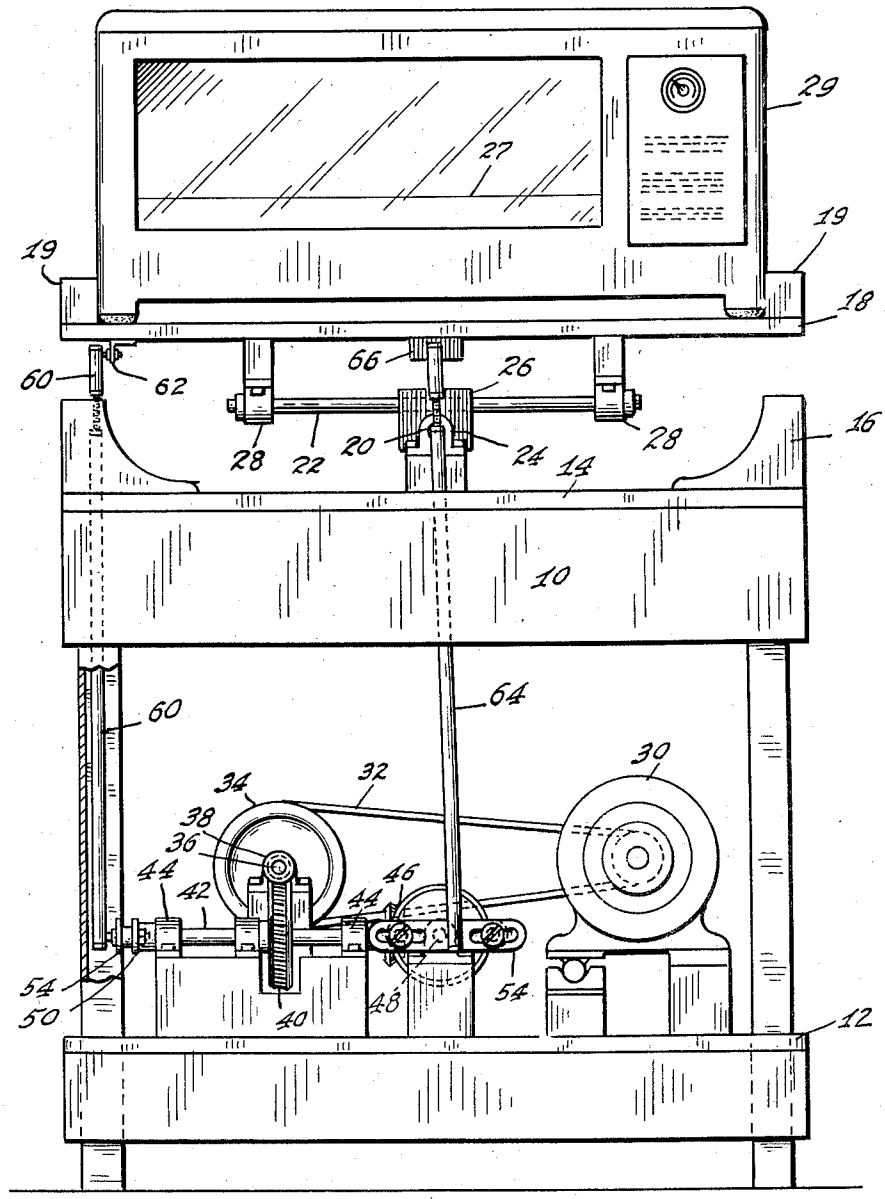
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OSCILLATING BED

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Fig. 1.



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Fig. 2.

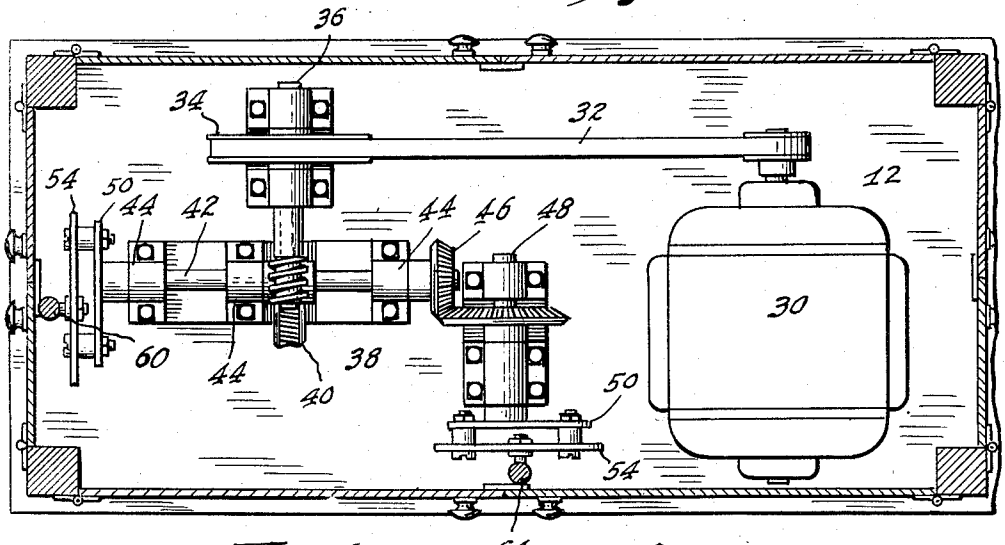


Fig. 4.

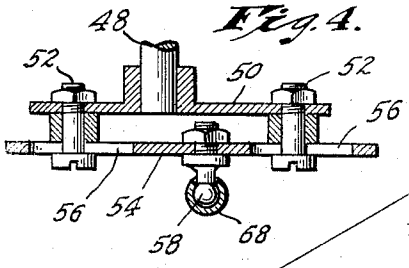


Fig. 3.

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OSCILLATING BED

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8 Claims. (Cl. 128—29)

This invention relates to a bed or bed-supporting table which oscillates or rocks in two planes, to stimulate the life processes of a patient on the bed.

It is frequently desirable, as in the treatment of circulatory ailments and in the care of premature babies, to support the patient on a bed which gently rocks or oscillates to stimulate the life processes of the patient, especially the blood circulation and respiration. The care of premature babies offers great possibilities for saving their lives and lowering the infant death rate, and such rocking treatment is of advantage in such care.

It is the object of this invention to provide a bed or a bed-support which will give an improved oscillating or rocking treatment, and produce a more effective stimulation. It is an object of the invention to provide a bed or bed-support which is rocked about a transverse axis in a motion which can be referred to as "pitch" and is also rocked about a longitudinal axis in a motion which can be referred to as "roll," and in which the pitch and roll can be at different rates and can be varied in degree, and in which the one or both movements include components of translation. It is a further object of the invention to provide such a device which is relatively simple in construction and which is thoroughly reliable.

In accordance with the invention, a bed is supported for rocking movement in two planes, desirably with each movement including a component of translation. The bed is preferably mounted on a pair of crossed axes, which permit the desired rocking movements but hold the bed against movement in other directions. The two axes are desirably spaced below the bed to provide components of translation. Independently adjustable driving means are connected to effect the two rocking movements, and both are preferably operated at different speeds from the same power source.

The accompanying drawings illustrate the invention. In such drawings:

Fig. 1 is a side elevation of apparatus embodying the invention and providing a rocking support for an infant incubator, with the front side wall of the base cabinet omitted to expose the driven mechanism;

Fig. 2 is a plan view of the driving mechanism;

Fig. 3 is an isometric view of the incubator-supporting table; and

Fig. 4 is a sectional view of the variable-throw crank used in the driving mechanisms shown in Figs. 1 and 2.

The device shown in the drawings comprises a base cabinet 10, desirably enclosed by side and end doors or walls as shown in Fig. 2. A shelf 12 within the cabinet provides a support for the driving mechanism. The top 14 of the base desirably carries posts 16 at its four corners to limit the tilting movement of the incubator-supporting table 18 mounted above it, in the event of any breakage of the driven mechanism.

The table 18 is formed to receive an incubator 29, and has rim blocks 19 at its ends to retain the incubator in place. The table 18 is supported from the base cabinet 10 by a pair of crossed shafts 20 and 22. The

shaft 20 extends transversely of the cabinet top 14 and is supported for pivotal movement in a pair of spaced pillow blocks 24. The center of the transverse shaft 20, carries a block 26 in which the shaft is fixed and which moves pivotally with the shaft. The longitudinal shaft 22 is carried by and fixed in the block 26, preferably crossing above the shaft 20, and is journalled in a pair of spaced pillow blocks 28 secured to the table 18. The table 18 is thus mounted for pitch movements about the transverse shaft 20 and for roll movements about the longitudinal shaft 22. The shafts are positioned below the level of the bed 27 of the incubator 29 carried by the table 18, and the movements of the bed as it tilts about the shaft will therefore include components of translation, with the greatest amount of translation occurring in longitudinal tilting about the lowermost shaft 20.

The driving mechanism supported on the shelf 12 comprises an electric motor 30 connected by a belt 32 to a pulley 34 carried by a worm shaft 36. The worm 38 on this shaft drives a worm wheel 40 carried by a main shaft 42 mounted in suitable bearings 44 fixed on the shelf 12. At its inner end, the shaft is connected by bevel gearing 46 to a cross shaft 48. The outer end of each of the shafts 42 and 48 carries a variable-throw crank as shown in Fig. 4. This comprises a radially extending arm 50 fixed to the shaft and carrying at its ends a pair of bolts 52. The bolts secure to the arm 50 a radially adjustable slide 54 provided with longitudinal slots 56 through which the bolts 52 pass. The center of the slide 54 carries a ball 58 for a ball-joint connection with a pitman rod. The adjustable-throw crank carried by the main driving shaft 42, which extends longitudinally of the cabinet, drives a pitman rod 60 which is connected by a ball joint to a support 62 at one end of the table 18. The adjustable-throw crank carried by the cross shaft 48 is similarly connected by a pitman rod 64 to a support 66 at one side of the table 18. Each pitman rod 60 and 64 is desirably adjustable in length, and as shown, comprises a screw 67 carried with the ball socket 68 and threaded into the main portion of the rod 60 or 64, with a lock nut 69 to lock it in adjusted position.

The two shafts 42 and 48 may be driven at any desired speeds, with the speeds of the two shafts in any desired relationship. For driving an incubator table, I desirably drive the main shaft 42 at about 8 R. P. M., so that the table 18 is given a pitch movement of 8 cycles per minute. With that speed of the main shaft, I desirably drive the cross shaft 48 at about 4 R. P. M., so that its crank will give the table a roll movement of 4 cycles per minute. The table will thus be rocked simultaneously about the two crossed axes of the shafts 20 and 22 at different rates, and will thus have a continuously varying combined movement.

The lengths of the pitman rods 60 and 64 are desirably adjusted to position the table 18 level when the cranks are in neutral position. The cranks can be adjusted to give any desired range of movements, and either crank can be adjusted to a zero-throw position so that it holds the table 18 against rocking movement in the direction which it controls.

In use, the incubator 29 is supported on the table 18, and the two cranks are adjusted to give the desired degree of rocking movements, the crank carried by the main shaft 42 being adjusted to control the pitch movements, and the crank carried by the cross shaft 48 being adjusted to vary the roll movements. The device rocks the table about the crossed axes of the shafts 20 and 22 at different rates and through the ranges of movements determined by the adjustment of the crank. Each movement includes a component of translation, and the different

rates result in a combined movement which continuously varies. The combined motion produces an especially effective stimulating action on a baby in the incubator 70.

Obviously, the device can be built in any suitable size, to take any size incubator, or to take a full size bed; and instead of providing a table to support the incubator or bed, the bed may be built as an integral part of the device.

I claim as my invention:

1. A rocking-bed device, comprising a pair of crossed tilt shafts, a fixed bearing support supporting one tilt shaft, the second tilt shaft being supported in proximate crossed relation on said one tilt shaft, means to support a bed on said second tilt shaft, a main drive shaft, a cross drive shaft, cranks on said drive shafts, and pitman rods respectively connecting said cranks to the bed-supporting means to rock the bed about the two tilt shafts, and means to drive the drive shafts.

2. A rocking-bed device as defined in claim 1 in which the drive shafts are drivingly interconnected to operate at different speeds.

3. A rocking-bed device as set forth in claim 1, in which the drive shafts are respectively connected to cause roll and pitch movements of the bed and the roll-producing shaft is driven slower than the pitch-producing shaft.

4. A rocking bed device, comprising means for supporting a bed for independent tilting movement about longitudinal and transverse axes within the projected area of the bed, a pair of cranks respectively connected to said means to rock the bed about said respective axes, and driving means to drive the cranks at different speeds.

5. A rocking bed device as set forth in claim 4 in which the two axes are spaced below the plane of the bed whereby the rocking movements include components of translation.

6. A rocking bed device as set forth in claim 4 in which the transverse axis is spaced below the plane of the bed and below the longitudinal axis, whereby the tilting movements about the transverse axis contain substantial components of translation.

7. A device for rocking an incubator of the type used for premature babies, comprising a base, means on said base to support the incubator for independent tilting movement about two crossed axes respectively extending transversely and longitudinally of the incubator, operating means operatively connected to tilt the incubator cyclically through a predetermined pitch movement about the transverse axis at one rate, operating means operatively connected to tilt the incubator cyclically through a predetermined roll movement about the longitudinal axis at a different rate, and means to drive said operating means.

8. An incubator rocking device according to claim 7 in which the axes cross within the vertically projected area of the baby-supporting bed area of the incubator and the transverse axis is below the plane of the baby-supporting bed surface of the incubator.

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