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VIBRATORY UNIT FOR BOX SPRINGS

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Fig. 1.

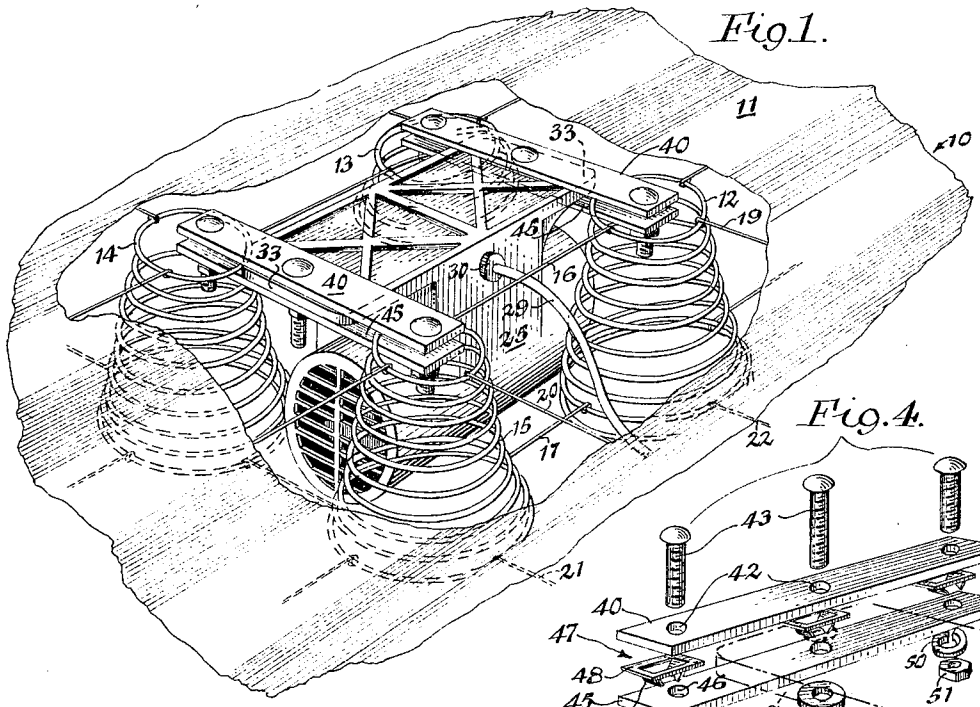


Fig. 4.

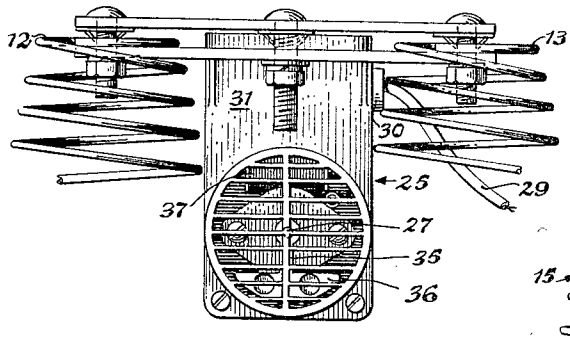
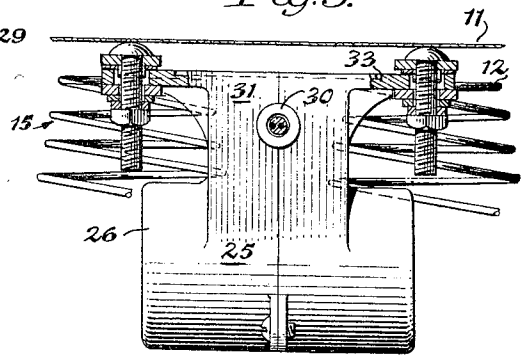


Fig. 2.

Fig. 3.



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VIBRATORY UNIT FOR BOX SPRINGS

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The present invention relates to kinesitherapy and particularly to a device which may be readily attached to a box spring in order to provide kinesitherapeutic action thereto. The soothing, mental and physical action of kinesitherapy is well known and, heretofore, mechanisms, for providing gentle vibratory massaging action have been built permanently into upholstery of furniture, couches and bedding equipment, as for instance box spring and mattresses.

It has also been proposed to provided detachable assemblies for incorporation into the usual box spring whereby a suitable vibrator may be clipped on to and assembled with guy wires of box springs. Such an attachment being relatively impermanent and not a positive one, is sometimes subject to disengagement during operation whereby the soothing effect of the assembly is interrupted.

It is an object of the present invention to provide a vibrator which possesses means for positive attachment to a usual box spring.

It is also an object of the invention to provide a vibrator which is easily and readily assembled with a usual box spring.

The device for providing kinesitherapeutic action to a box spring, for instance, is illustrated in the attached drawing, wherein

FIG. 1 shows a box spring with portions cut away to show the vibrator attached to the helical coils of a conventional box spring, and

FIG. 2 is a front view in elevation of the vibrator attached to adjacent helical coils of the box spring, and

FIG. 3 is a side view in elevation and partially in section of the device of FIG. 2, while

FIG. 4 is an exploded view of the positive attaching members for securing the vibrator with a portion of the vibrator illustrated in phantom.

Referring more particularly to the drawing, a usual box spring is shown at **10** having a top covering member of canvas or ticking **11**, said spring having contained therein the usual helical coil springs aligned longitudinally and laterally of the box spring, four of such springs of the box spring being illustrated in FIG. 1 at **12**, **13**, **14** and **15**, forming what may be called the "box" of the completed spring.

Adjacent coil springs, at the corners of the "box," as is usual, are attached to each other, both in the longitudinal series of springs and in the lateral series of springs. Thus guy wire **16** anchors adjacent coil springs **12** and **15** of the longitudinal series, for instance at the top thereof, while guy wire **17** firmly anchors the same adjacent coil springs **12** and **15** at the bottom thereof, such coil springs being affixed to the box spring body in any conventional manner. In like fashion, adjacent coil springs in the lateral series are attached as best illustrated by guy wires **19** and **20** at the top, and **21** and **22** at the bottom.

The vibrator unit **25** comprises a hollow cylindrical housing **26** open at each end of the cylinder and containing therein a rotatable shaft **27** which is coaxial with cylindrical housing **26**. The motor is energized by electric feed wire **29** connected to the motor through electric inlet plug and grommet **30** which is attached to another housing portion **31** extending from the cylindrical housing **26** and which merges into an attaching and supporting base member **33**.

As well illustrated in FIG. 3, the base member and housing are preferably die-cast, generally of nonferrous metal, or are moulded of suitable plastic, as for instance the acetal-formaldehyde copolymer sold as "Celcon."

Motor shaft **27** has a cooling fan attached to it at one end and a depending arm **35** having a weight **36** attached thereto, at the other end, so that upon rotation of shaft **27**, when motor **37** is energized, a uniform rhythmic vibration is produced throughout the member containing the eccentrically weighted device, which rhythmic vibratory action is transmitted to any member to which the device may be anchored.

For inducing the desired kinesitherapeutic action in a bed unit comprising a mattress and box spring, the device of the present invention is attached at any desired or selected position in the box spring by suspending the vibrator unit in the so-called "box," that is, between two adjacent coil springs in the longitudinal series and the two companion springs, in the lateral series as illustrated in FIG. 1.

The installation of the vibratory unit is best made by placing the box spring upon its face. In this position, the bottom of the box spring will be facing upwardly and is normally exposed or open; if not, the ticking may be readily removed to expose the springs. To support the vibratory unit, tie bar **40** would be placed over the top portion or coil of adjacent helical coils **12** and **13**. The tie bar is provided with drilled receiving apertures **42** for receiving the clamping bolts **43**. The base member **33** of the housing carrying the motor of the vibrator member is formed of a predetermined length to extend between adjacent rows of the lateral courses of the coil springs, for instance, and this base is placed upon tie bar **40** and embraced by a companion tie bar **45** drilled similarly to tie bar **40** for registry and assembly so that the securing bolt members **43** may tightly assemble the base of the vibratory unit.

It will be noted, by reference to FIGS. 2 and 3, that when assembled in this fashion, the upper helical numbers of coil springs **12** and **13** are embraced between upper and lower tie bars **40** and **45**, respectively, as is base member **33** of the vibratory unit, since the flanged ends of base are drilled to receive the central locking bolt member **43**.

Since it is desired that the vibratory unit be tightly and permanently held after assembly within the "box" of four adjacent springs, the ever present tendency of the fastening and securing bolt members to loosen must be maintained at a minimum and, to this end, means are provided for maintaining the securing bolts **43** in tightly assembled relation. Between upper and lower tie bars **40** and **45**, a spacing, frictional stop-nut member is assembled provided with a face **48** which cooperates with the tie bar **40** by resting tightly thereagainst. This member is provided with a pair of depending flanges **49** of a size to register within the bolt-receiving aperture **46** in lower tie bar **45**, such flanges pressing against the threaded shank of bolts **43** with greater force, the more tightly bolt **51** is drawn. The final tightly secured and completed assembly is perfected by attaching to the outer face at tie bar **45**, an additional securing member such as split washer ring **50**, between such bar and the nut **51**. A similar assembly is made at the other end of the tie bars. The flanges of base **33** are secured between the tie bars in similar fashion as shown in FIG. 3 except that a spacing washer is provided between the lower face of the lower tie bar and the split washer. When the whole assembly is tightened, as shown in FIGS. 2 and 3, the flanged ends of base **33** are maintained in a tightly assembled arrangement which insures that bolts **43** do not work away from the tie bars, thereby accentuating the action of the vibra-

tory member when in use, further to accentuate loosening and disengagement of the bolts.

It will be noted that during assembly, the box spring is placed with its face downwardly, but when in use the vibratory assembly is, in fact, suspended from the top of the box spring, as is clearly shown in FIG. 1.

The kinesitherapeutic action is, in general, imposed for short periods of time, on the order of a few minutes to a half hour, in most cases, although it may be employed for periods of time either of greater or lesser duration and, generally, electric cord **29**, extending from a source of current to the motor through socket and grommet **30**, will be interrupted by a conventional timing mechanism (not shown) provided with means for predetermining or preselecting the duration of the operation of the vibratory unit.

In summary, therefore, the invention comprises an assemblage readily connected to a box spring having a unit of four coil springs forming a box wherein a pair of tie rods embrace a top coil of the spring at one corner of the box, the tie rods running to and embracing a top coil of the spring at an adjacent corner of the box. A companion pair of tie rods, parallel to the first pair of tie rods, embrace a top coil of each of the springs at the remaining two corners of the box. A vibrating unit is assembled between the two pairs of tie rods and is connected thereto by means of a base having flanges at opposite ends thereof, which base extends from the first pair of tie rods to the second pair of tie rods and is secured thereto by the flanges at the opposite ends of the base.

What is claimed is:

1. In a box spring, a unit of four coil springs forming the box, a pair of tie rods embracing a top coil of the spring at one corner of the box and running to and embracing a top coil of the spring at an adjacent corner of the box, a companion pair of the tie rods parallel to said first pair of tie rods, said second pair of tie rods embracing a top coil of each of the springs at the remaining two corners of the box and a vibratory unit formed with a base having flanges at opposite ends thereof, said base extending from said first pair of tie rods to said second pair of tie rods and being secured with said flanges being received by said tie rods, and means for clamping said tie rods to said flanges and said coils.

2. The invention of claim **1** wherein means are provided between each pair of tie rods to prevent inadvertent loosening thereof when in place.

3. An assemblage adapted to be attached to the four coil springs forming the box of a box spring, comprising a vibratory unit formed with a base, a first pair of tie rods having a length to extend from a top coil of the spring at one corner of the box and run to and embrace a top coil of the spring at an adjacent corner of the box, a companion pair of tie rods adapted to be placed parallel to said first pair of tie rods, said second pair of tie rods having a length to embrace a top coil of each of the springs at the remaining two corners of the box, said base of the vibratory unit having flanges at opposite ends thereof for disposition between corresponding pairs of said tie rods, means for clamping the tie rods to said flanges and said coils, and means adapted to be placed between each pair of said tie rods to prevent inadvertent loosening of said tie rods when the latter are secured in place.

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