April 2, 1963 F. J. LENGSFELD 3,083,709

FOOT MASSAGING AND EXERCISING DEVICE

Filed June 1, 1962 2 Sheets-Sheet 1

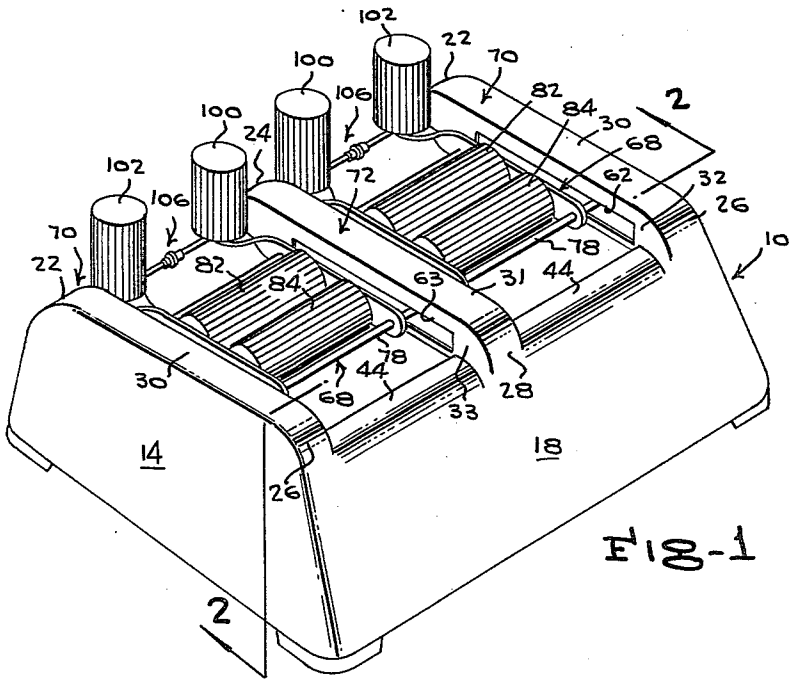
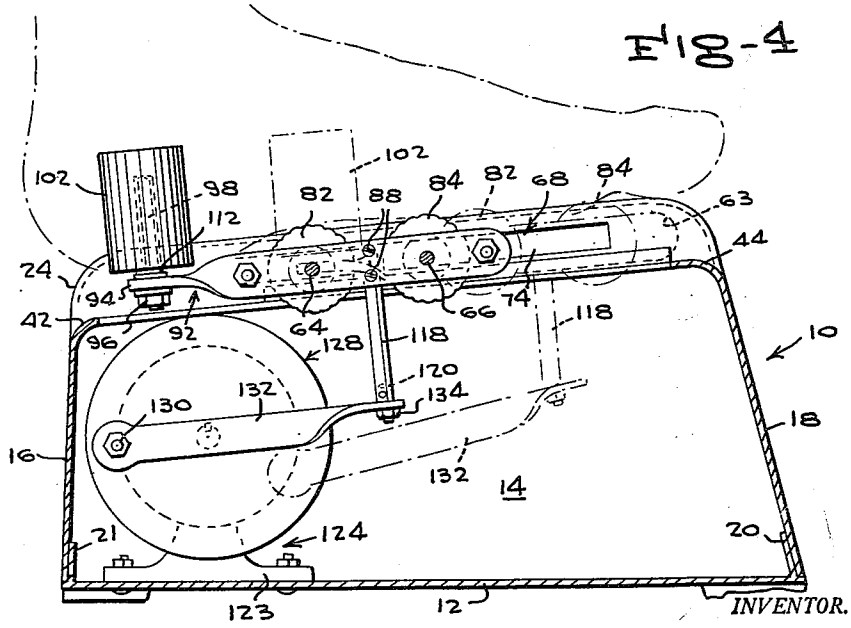


FIG-1

FIG-4



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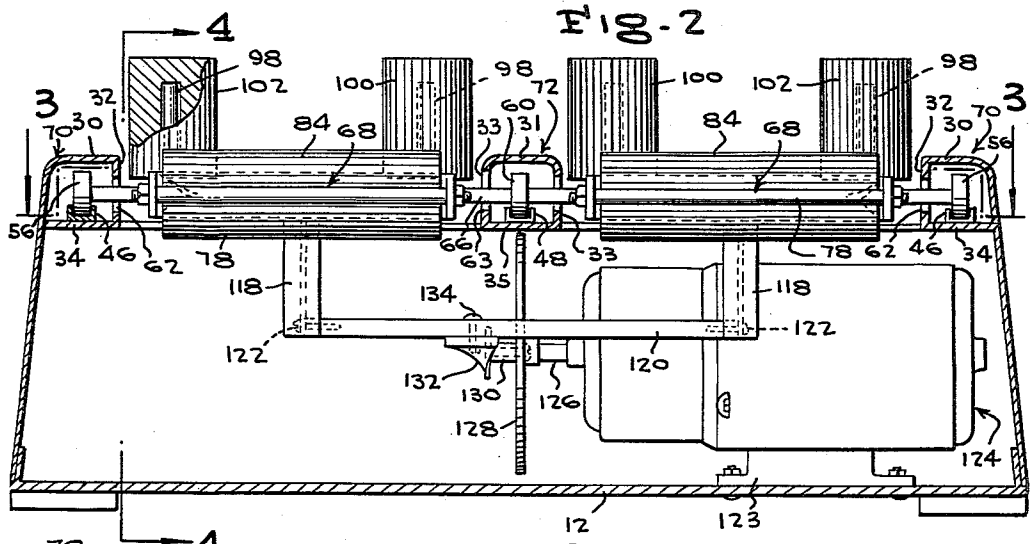
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Fig-2



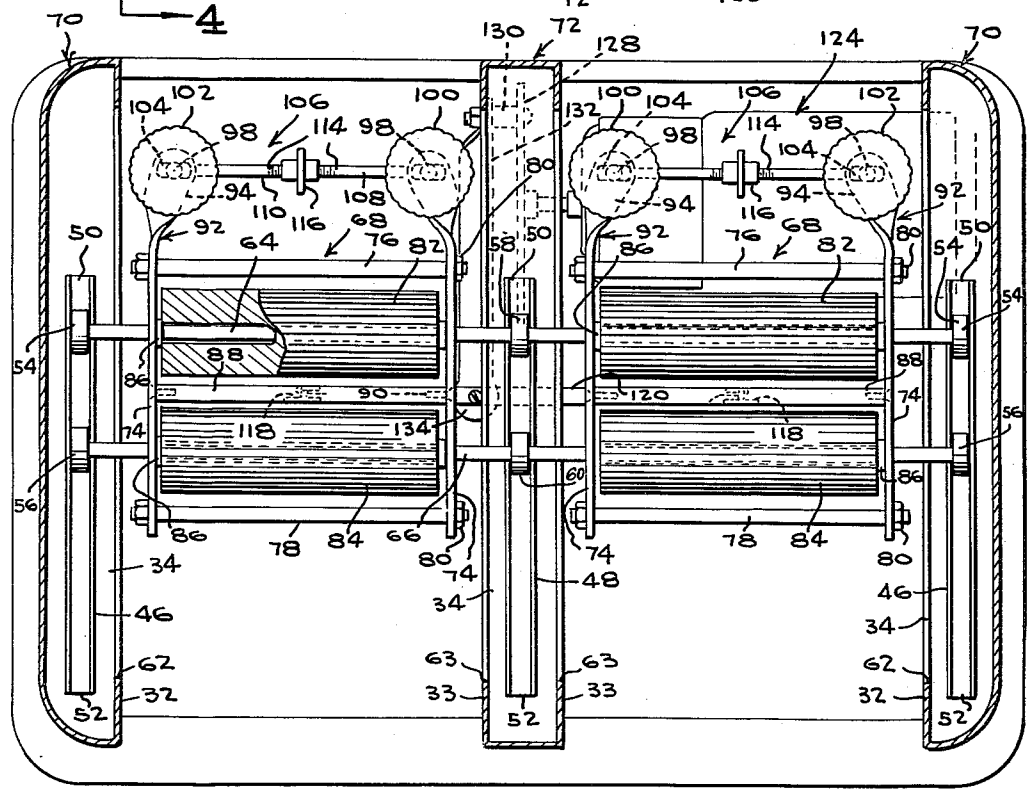


Fig-3

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United States Patent Office

3,083,709

Patented Apr. 2, 1963

3,083,709

FOOT MASSAGING AND EXERCISING DEVICE

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Filed June 1, 1962, Ser. No. 199,431

13 Claims. (Cl. 128—57)

This invention relates to a novel motor-driven foot massaging and exercising device for professional and home use.

The primary object of the invention is to provide a more effective and efficient device of the kind indicated which provides massage and exercise to the heels at the same time that massage and exercise are applied to the soles of the feet, so that more complete and thorough massage and exercise of the feet are obtained, which is effective, not only for relaxing the patient and increasing circulation of the blood, but for orthopedic rehabilitation of impaired feet, the device being capable of being used in a sitting, standing, or reclining position of the patient.

Another object of the invention is to provide a device of the character indicated above, for treating both feet at the same time, wherein free-running rollers, for massaging and exercising opposite sides of the heels of the patient are provided, which are rotated by contact of the heels therewith, as the feet are moved lengthwise by contact with power-driven sole-engaging rollers, the heel rollers being readily adjustable to accommodate heels of different widths and degrees of massage pressure on the heels.

A further object of the invention is to provide a simple, easily serviceable, mechanically sound and durable device of the character indicated above, which can be made in compact, streamlined, and easily portable forms, at relatively low cost.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is an isometric view showing the invention;

FIGURE 2 is an enlarged sectional view taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a sectional view taken along the line 3—3 of FIGURE 2; and,

FIGURE 4 is a sectional view taken along the line 4—4 of FIGURE 2.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated device comprises a closed housing 10, preferably of suitably finished metal, having an elongated generally rectangular flat form, involving a horizontal bottom wall 12 from whose edges rise similar upwardly and inwardly angled, preferably trapezoidal end walls 14, a substantially perpendicular longitudinal rear wall 16, and a rearwardly and upwardly angled longitudinal front wall 18, the front and rear walls being trapezoidal. The front wall 18 is taller than the rear wall 16, so as to give a rearward and downward angulation to the top of the housing 10. The upstanding walls can be integral with the bottom wall 12 or, as shown, telescoped over and suitably secured to upstanding inset flanges 20 and 21, located at the front and rear edges of the bottom wall 10, respectively.

As shown in FIGURE 4, the rear and front walls 16 and 18 have comfortably inwardly curved abbreviated flanges upstanding from their upper edges, which are longitudinally spaced from each other and comprise arcuate end flanges 22 and an intermediate arcuate flange 24 on the rear wall 16; and arcuate end flanges 26 and an intermediate arcuate flange 28 on the front wall 18. The end flanges and the intermediate flanges have extending therebetween straight flat top flanges 30 and 31, respectively. On the inward edges of the end top flange 30 and on the sides of the flange 31, are depending straight perpendicular flanges 32 and 33, respectively, which extend across the housing 10. Fixed bottom flanges 34 and 35 spaced downwardly and parallel to the top flanges 30 and 31 underlie the top flanges and extend between the rear and front housing walls, and are fixed thereto and to related housing end walls.

The upper edges of the rear and front housing walls merge into inwardly directed arcuate guard flanges 42 and 44, respectively, which extend between the related arcuate intermediate flanges and arcuate end flanges, for guiding the feet of the patient onto the device in the use thereof.

Suitably fixed upon and extending along the end bottom flanges 34 and the intermediate bottom flange 35, are wheel confining channels 46 and 48, respectively, which, as shown in FIGURE 3, are centered on the bottom flanges, and have rear ends 50 which are substantially spaced from the housing rear wall 16, and front or forward ends 52 which are close to the housing front wall 18. Running in the end channels 46 are spaced pairs of end wheels 54 and 56, and running in the intermediate channel 48 is a pair of spaced wheels 58 and 60. The depending flanges 32 and 33 are formed with slots 62 and 63, respectively, extending therealong which serve as shaft guideways, and which are somewhat longer than the channels 46 and 48.

Extending between the end wheels 54 is a rear roller shaft 64, which traverses the intermediate wheel 58, the end wheels 54 being fixed on the ends of the shaft 64 in a suitable removable manner, and the intermediate wheel 58 being fixedly traversed by the shaft 64. A similar front roller shaft 66 is similarly connected to the end wheels 56 and the intermediate wheel 60.

The rear and front roller shafts 64 and 66 are components of similar roller frames 68 which are severally located between and spaced from the intermediate and end wheel channel housings 70 and 72, which are defined by the intermediate and end flange assemblies. Each frame 68 comprises a pair of transversely elongated side bars 74, which are parallel to the top of the housing 10, and which are spaced and connected together by means of transversely spaced rear and front tie rods 76 and 78, respectively, such as suitably formed bolts having nuts 80 in their ends engaging the laterally outward sides of the side bars 74, the front tie rods 78 being at the front or forward ends of the side bars.

Journalled on the portions of the shafts 64 and 66 extending between the side bars 79 of the frames 68 are similar enlarged diameter corrugated rear and front rollers 82 and 84, respectively, with spacer washers or bosses 86 interposed between the side bars and related ends of the rollers. The frames 68 further comprise vertically

spaced pairs of intermediate tie bars 88, which are located spacedly between the rollers in the frames, and are suitably fixed at their ends, as indicated at 90, to the side bars 74.

The side bars 74 have longitudinal, rearwardly projecting extensions 92 thereon, which comprise flat horizontal ears 94 which are laterally inwardly and rearwardly angled relative to the side bars, and have removably fixed thereon, as indicated at 96, upstanding spindles 98, on which are journalled free-rotating vertical axis corrugated, inner and outer heel rollers 100 and 102, respectively. The lower ends of the spindles 98 are slidably and securably engaged in aligned adjustment slots 104 which extend longitudinally of the housing 10. For adjusting the heel rollers toward and away from each other, to accommodate differences in the widths of the heels of patients using the device, and/or to adjust the working pressure of the heel rollers against opposite sides of the heels, turnbuckles 106 are provided, which comprise rods 108 and 110 which are suitably fixed at their outer ends to related spindles 98 at the lower ends thereof, as indicated at 112, and have free threaded inner ends 114, on which is threaded a knurled turnbuckle nut 116.

For reciprocating the frames 68, together with their foot sole engaging rollers 82, 84 and their heel engaging rollers 100, 102, forwardly and rearwardly across the top of the housing 10 and together, fixed downwardly extending rigid angle bar arms 118 are suitably fixed at their upper ends to intermediate parts of the intermediate tie bars 88 of the frames 68. A rigid cross bar 120 extends between and is suitably fixed at its ends, as indicated at 122, to the lower ends of the arms 118.

Fixedly mounted, as indicated at 123, on the housing bottom wall 12, at one side of the intermediate wheel channel housing, and beneath a related frame 68, near the rear housing wall 16, is an electric motor 124, having a horizontal longitudinal shaft 126, on which is fixed a disc flywheel 128, which is disposed beneath and in line with the intermediate wheel channel housing 72. Eccentrically pivoted on the flywheel, as indicated at 130, is the rear end of a generally horizontal connecting rod 132, whose forward end is loosely anchored, as indicated at 134, to an intermediate part of the cross bar 120, so as to have limited pivotal connection with the cross bar 120. Operation of the motor 124 works the frames 68 back and forth across the top of the housing 10.

In use, the patient places the soles of his feet upon the horizontal rollers 82 and 84, with his heels between related heel rollers 100 and 102, so that, with the device in operation, the soles of the feet are massaged and exercised, all without requiring that the patient move the legs or the feet or undergo any exertion beyond holding the feet on the device. The rear horizontal rollers 82 are disposed to massage the arches of the patient's feet while the front horizontal rollers 84 are disposed to massage the forward or metatarsal areas of the feet, as shown in phantom lines in FIGURE 4.

While there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contempulated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A foot massaging and exercise device comprising a housing having an open top, a pair of horizontally-disposed frames arranged in longitudinal spaced relation and located adjacent the open top of said housing, means rigidly connecting the frames together for simultaneous reciprocating movement across the open top of said housing, a pair of horizontal rollers disposed longitudinally of each frame and freely journaled in said frame, and a pair of laterally-spaced vertical rollers disposed on one side of each of said pairs of horizontal rollers and freely journaled in the adjacent frame.

2. The device according to claim 1 which includes in addition means connecting each of the pairs of vertical rollers together for movement toward and away from each other.

3. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, and motor driven means mounted in the housing below the frames and operatively connected to said connecting means.

4. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, and motor driven means mounted in the housing below the frames and operatively connected to said connecting means, said horizontal rollers being of the same diameter.

5. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, and motor driven means mounted in the housing below the frames and operatively connected to said connecting means, said horizontal rollers being of the same diameter, and being corrugated plain cylinders.

6. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames,

and motor driven means mounted in the housing below the frames and operatively connected to said connecting means, said horizontal rollers being of the same diameter, and being corrugated plain cylinders, the rollers being spaced from each other in the frames so that the rear rollers serve as foot arch engaging rollers and the front rollers serve as metatarsal engaging rollers.

7. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, motor driven means mounted in the housing below the frames and operatively connected to said connecting means, and a pair of upstanding laterally spaced vertical heel side engaging rollers journalled on each frame behind the horizontal rollers thereon.

8. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, motor driven means mounted in the housing below the frames and operatively connected to said connecting means, and a pair of upstanding laterally spaced vertical heel side engaging rollers journalled on each frame behind the horizontal rollers thereon, said vertical rollers being mounted on the frames for adjustment toward and away from each other.

9. A foot massaging and exercising device comprising a housing having rear end front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitidunal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, motor driven means mounted in the housing below the frames and operatively connected to said connecting means, and a pair of upstanding laterally spaced vertical heel side engaging rollers journalled on each frame behind the horizontal rollers thereon, said vertical rollers being mounted on the frames for adjustment toward and away from each other, and turnbuckle adjusting means secured to and extending between each pair of vertical rollers.

10. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, motor driven means mounted in the housing below the frames and operatively connected to said connecting means, and end and intermediate housings extending over and severally enclosing said end and intermediate wheel channels and the wheels engaged therein.

11. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, motor driven means mounted in the housing below the frames and operatively connected to said connecting means, and end and intermediate housings extending over and severally enclosing said end and intermediate wheel channels and the wheels engaged therein, said channel housings having vertical side flanges having slots extending therealong through which said rear and front shafts work.

12. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, and motor driven means mounted in the housing below the frames and operatively connected to said connecting means, said connecting means comprising intermediate tie bars extending across the frames between the rear and front rollers thereof, rigid arms fixed to and depending from the tie bars, and a cross bar extending between and fixed to the arms at their lower ends, said motor driven means comprising a connecting rod operatively connected to said cross bar.

13. A foot massaging and exercising device comprising a housing having rear and front sides and a substantially open top, horizontal end wheel channels and an intermediate substantially horizontal wheel channel extending across the housing top, said channels being spaced from each other, horizontal frames severally positioned between the intermediate channel and the end channels, longitudinal rear and front shafts extending through both frames, end wheels on the shafts rollably confined in the end channels, intermediate wheels on the shafts rollably

confined in the intermediate channel, means rigidly connecting the frames together for simultaneous reciprocating movements across the housing between the rear and front sides of the housing, rear and front horizontal rollers journalled on the rear and front shafts within the frames, and motor driven means mounted in the housing below the frames and operatively connected to said connecting means, said connecting means comprising intermediate tie bars extending across the frames between the rear and front rollers thereof, rigid arms fixed to and depending from the tie bars, and a cross bar extending

between and fixed to the arms at their lower ends, said motor driven means comprising a connecting rod operatively connected to said cross bar, and a motor having a shaft flywheel to which said connecting rod is eccentrically pivoted.

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