May 27, 1958 A. W. INFANGER 2,836,174

FOOT MASSAGE MACHINE

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Fig. 1.

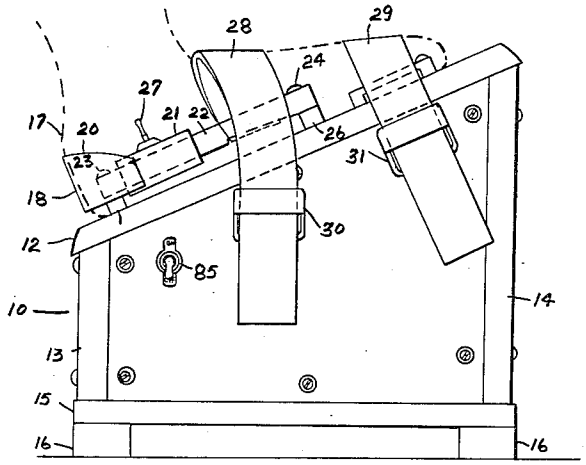

Fig. 2.

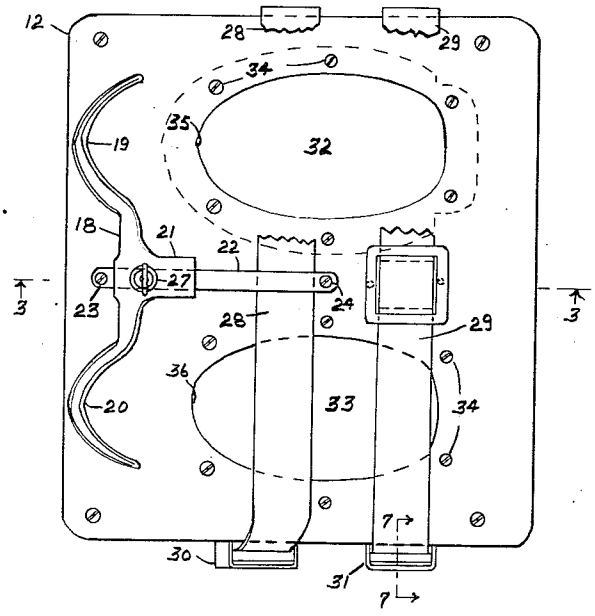

Fig. 3.

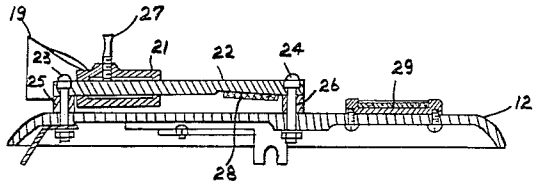

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Fig. 4.

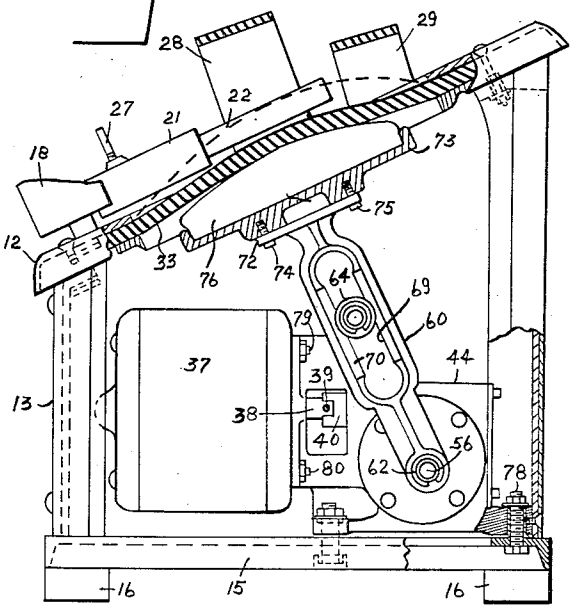


Fig. 7.

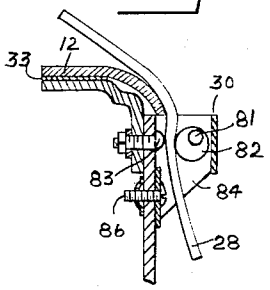
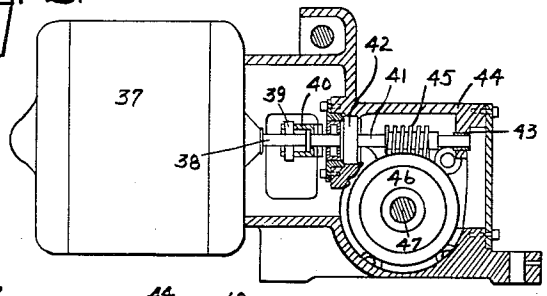


Fig. 5.



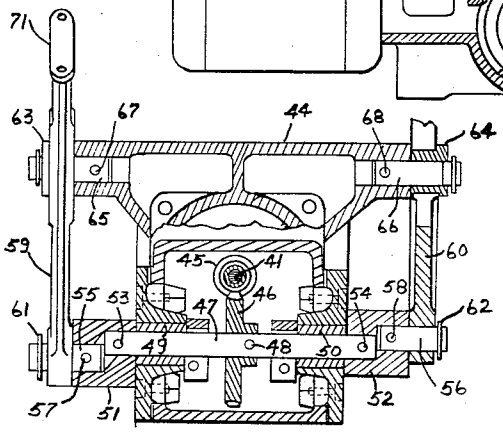


Fig. 6.

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FOOT MASSAGE MACHINE

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Application August 31, 1955, Serial No. 531,723

6 Claims. (Cl. 128—25)

This invention relates to health exercise apparatus and more particularly to a foot massage machine.

An object of this invention is to provide a new and novel foot massage machine.

Another object of this invention is to provide a new and novel foot massage device which actuates leg muscles, gently flexes the feet, and promotes circulation without the slightest physical effort or strain.

A further object of this invention is to provide a new and novel foot massage machine which soothes and relaxes tired feet and legs.

Still another object of this invention is to provide a foot massage machine which combines simplicity of construction and efficiency of operation.

A still further object of this invention is to provide a new and novel foot massage machine of sturdy and durable construction to assure uninterrupted, trouble-free operation.

Another object of this invention is to provide a new and novel motor driven means for imparting a rotating, pulsating motion to a diaphragm which is in contact with the foot of the user.

Another object of this invention is to provide a new and novel foot massage machine which has an adjustable foot positioning and securing means for accurately positioning and securing the foot of the user to the machine, in order to derive the full benefit of its operation.

These and other advantages of the invention will be more clearly understood from the following description taken in connection with the accompanying drawings and its scope will be apparent from the appended claims.

In the drawings:

Figure 1 is a side view of the foot massage machine constructed in accordance with this invention;

Figure 2 is a top view of the foot massage machine;

Figure 3 is a sectional view taken on line 3—3 of Figure 2 showing the means for positioning and securing the foot of the user to the machine;

Figure 4 is a side view of the foot massage machine partly in section showing a portion of the motor driven operating mechanism;

Figure 5 is a side view of the motor drive mechanism which is shown in section;

Figure 6 is a cross-sectional view showing the motor drive and the structure actuated thereby;

Figure 7 is a sectional view taken along line 7—7 of Figure 2.

For sake of simplicity, like elements will be designated with like reference characters.

Figure 1 shows a foot 17 in phantom cooperatively positioned in a foot massage machine generally designated by the reference numeral 10. The foot massage machine 10 is encased by a top or foot support plate 12, support members 13 and 14 and base member 15. The device 10 is supported by feet 16. A foot positioning yoke-shaped member 18 is integrally associated with a channel shaped block 21 and is adapted to be slidably

engaged about track 22 which is secured to the top plate 12 by screws 23 and 24. Spacers 25 and 26 elevate the track 22 from plate 12 to allow block 21 to slide along track 22. The sliding block 21 may be locked in any desired position by a thumb screw 27. This structure is clearly shown in Figure 3. Cup-shaped members 19 and 20 of yoke 18 are adapted to receive and position the left and right heels of the user to properly position the feet of the user in the machine. Since this positioning structure is adjustable, the machine is adapted to accommodate any shape or size foot.

The feet are secured to machine 10 and held firmly in position thereto by means of straps 28 and 29. Straps 28 and 29 each have one end fastened to a side plate of machine 10, and the other ends adjustably secured by strap-holders 30 and 31 which are mounted to the other side plate of machine 10. Figure 7 shows strap holder 31 secured to the side wall of the casing of machine 10 by screw 86. An eccentric 82 is rotatably secured to member 84 of holder 30 by pin 81. The strap 28 must pass between the bolt head 83 and eccentric 82. As will appear obvious, when strap 28 is pulled down and released, it is secured in place by the pressure exerted on the strap against bolt 83 by eccentric 82. The strap 28 may be loosened by pulling horizontally toward eccentric 82 and releasing it.

As shown in Figure 2, plate 12 has two elongated openings 35 and 36. The feet of the user, when properly positioned by cup-shaped members 19 and 20 and secured by straps 28 and 29, extend over these openings. Resilient diaphragms 32 and 33 are mounted to plate 12 by screws 34. The openings 35 and 36 allow diaphragms 32 and 33 to be exposed to and in contact with the feet of the user. Any movement of diaphragms 32 and 33 is thus imparted to the feet of the user.

A gentle, pulsating movement which extends both horizontally and vertically is applied to diaphragms 32 and 33 by the motor driven structure shown in Figures 4–6. As best shown in Figure 5, motor 37 has a shaft 38. A cross pin 39 mounted on shaft 38 cooperates with a slotted sleeve 40 which is adapted to receive pin 39. A shaft 41 which is secured to sleeve 40 is held in rotatable alignment by means of bearing 42 and bushing 43 which are both positioned in a housing 44. Worm gear 45 mounted on shaft drives worm gear 46 which is secured to shaft 47 by pin 48 (see Figures 5 and 6). Consequently, shaft 47 is driven by motor 37 through shaft 41 and gears 45 and 46.

In Figure 6, shaft 47 is provided with bushings 49 and 50, which are secured in housing 44. Two eccentrically bored couplings 51 and 52 are secured to opposite ends of shaft 47 by pins 53 and 54, respectively. Stub shafts 55 and 56 are secured to couplings 51 and 52 respectively by pins 57 and 58, respectively. These couplings eccentrically associate the crank arms with shaft 47. Rotatably engaged on stub shafts 55 and 56 are crank arms 59 and 60. Lock rings 61 and 62 are provided to hold crank arms 59 and 60 in place. Crank arms 59 and 60 driven by shaft 47 through couplings 51 and 52, and stubs shafts 55 and 56, oscillate slidably about fixed rollers 63 and 64 which are mounted on shafts 65 and 66, respectively, which, in turn, are secured to housing 44 by pins 67 and 68. With this structure, it will appear obvious that a rockable and slidable movement is imparted to the crank arms 59 and 60. Integral with crank arms 59 and 60 are mounting plates 71 (shown in Figure 6) and 72 (shown in Figure 4).

Figure 4 shows a side view of the motor driven structure, imparting movement to one diaphragm. Since the diaphragms are driven similarly, it will suffice to describe the linkage of only one crank arm to the diaphragm as

shown in Figure 4. It should be noted, however, that although crank arms **59** and **60** impart the same movement to their respective diaphragms, they do not do so at the same time. From Figure 6 it can be observed that while crank arm **59** is in its downward position, crank arm **60** is operating in its upward position. Thus, the crank arms are set to operate oppositely. This beneficial feature provides different massage movement on each foot at any given time.

In Figure 4, mounting plate **72** of crank arm **60** is secured to a cup-shaped member **73** by screws **74** and **75**. A pad **76** is positioned in cup **73** contiguous to and in contact with diaphragm **33**. The pad **76** allows the motion which is transmitted from crank arm **60** to diaphragm **33** to move the diaphragm gently and evenly. The housing **44** is bolted to base plate **15** by bolts **77** and **78**. Motor **37** is secured to housing **44** by bolts **79** and **80**. An on-off switch **85** for supplying operating power to motor **37** is located on the side of machine **10** near the strap holders (see Figure 1).

The sliding and rocking motion of crank arms **59** and **60** is applied to the feet of a user by diaphragms **32** and **33** which gently and continuously massage the feet of the user. Since the crank arms are cycled differently, as previously explained, the massaging action is different for each foot. This promotes circulation and tends to eliminate any monotonous repetition of motion which might arise if both feet were massaged with the same motion simultaneously. This gentle action improves circulation, rests and relaxes tired feet and legs, promotes flexible joints and muscles, and does so without the slightest effort or strain on the part of the user. For those who have physical disabilities which restrict physical activity, this invention provides a gentle passive exercise which will provide beneficial relief without aggravating existing conditons.

The machine is soundly constructed to assure uninterrupted, trouble-free operation. It may be easily cleaned and sterilized. Furthermore, the device is easy to use and is extremely economical.

Since other modifications and ramifications varied to fit particular operating requirements and environments will be apparent to those skilled in the art, the invention is not considered limited to the examples chosen for purposes of disclosure and covers all changes and modifications which do not constitute departures from the true spirit and scope of this invention.

I claim:

1. In combination, a motor, a shaft, means connected to said motor for rotating said shaft, a stub shaft, coupling means for coupling said stub shaft eccentrically to said first named shaft, a crank arm mounted on said stub shaft, a ring positioned on said stub shaft for locking said crank arm to said stub shaft, a fixed roller associated with said crank arm whereby said crank arm reciprocates about said fixed roller when driven by said shaft, a diaphragm associated with said shaft whereby the rotating, pulsating motion of said crank arm is transmitted to said diaphragm.

2. In combination, a motor, a first shaft, means connected to said motor for rotating said shaft, a pair of stub shafts, coupling means for coupling said stub shafts

eccentrically to said first shaft at opposite ends thereof, a pair of crank arms mounted on said stub shafts whereby rotation of said first shaft imparts a rotating, rocking motion to said crank arms, a pair of fixed rollers associated with said crank arms whereby said crank arms oscillate slidably on said rollers, a pair of diaphragms, means linking said cranks arms with said diaphragms whereby the rockable, sliding movement of said crank arms is transmitted to said diaphragms, the force of which gently flexes the diaphragms in a circular, reciprocal path.

3. The structure as defined in claim 2, having the crank arms phased in opposition whereby as one arm moves upward the other moves downward.

4. A foot massage device adapted to massage the feet of the user when positioned thereon, comprising a casing having two elongated openings in the top portion thereof, resilient diaphragms mounted in said openings, adjustable feet positioning means mounted adjacent said openings, adjustable feet securing means attached to said casing whereby said feet positioning and securing means cooperate to position the feet of the user on said diaphragms, motor driven crank arms associated with and for imparting motion to said diaphragms, means for rockably and slidably driving said crank arms whereby said diaphragms are flexed with a rotating, reciprocal motion which gently massages the feet of the user, cup-shaped members, having pads therein secured to said crank arms, said pads being contiguous to and in contact with said diaphragms.

5. A foot massage device adapted to massage the feet of the user when positioned thereon, comprising a casing having two elongated openings in the top portion thereof, resilient diaphragms mounted in said openings, adjustable feet positioning means mounted adjacent said openings, adjustable feet securing means attached to said casing whereby said feet positioning and securing means cooperate to position the feet of the user on said diaphragms, a motor driven shaft, mounted in said casing, a pair of stub shafts, coupling means for coupling said stub shafts eccentrically to said motor driven shaft at opposite ends thereof, a pair of crank arms mounted on said stub shafts whereby rotation of said first shaft imparts a rotatable, rocking motion to said crank arms, a pair of fixed rollers associated with said crank arms whereby said crank arms oscillate slidably on said rollers, means linking said crank arms with said diaphragms whereby said diaphragms are flexed with the rotating, reciprocal motion of said crank arms to gently massage the feet of the user.

6. The device defined in claim 5 characterized in having the crank arms phased in opposition whereby as one crank arm moves upward, the other crank arm moves downward, to provide different massage motion to each foot at any given time.

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