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**M. BROBERG**

2,123,765

## EXERCISING DEVICE

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Fig. 1.

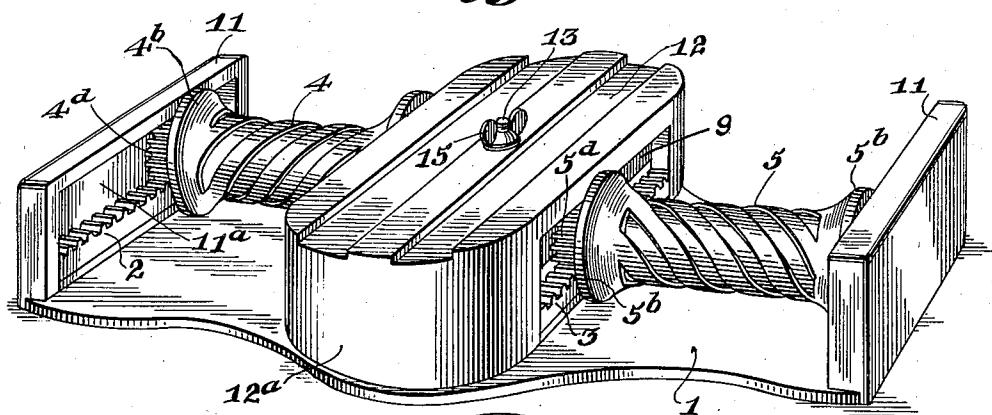


Fig. 2.

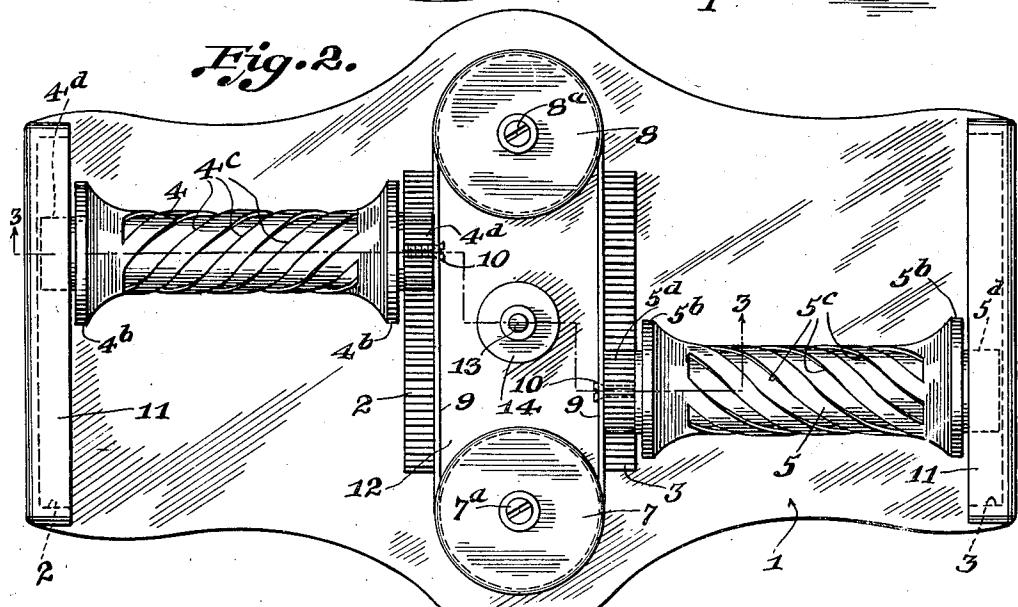
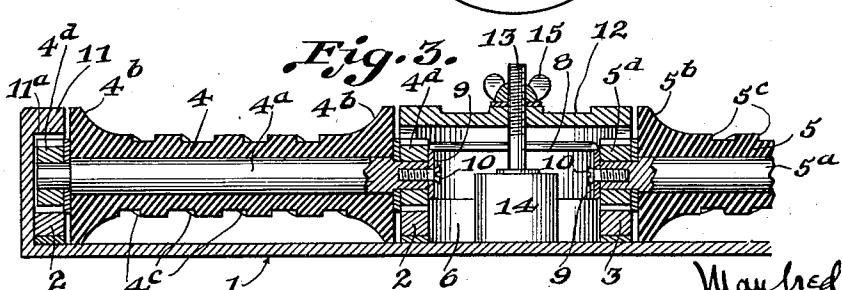


Fig. 3.



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## UNITED STATES PATENT OFFICE

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## EXERCISING DEVICE

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7 Claims. (Cl. 128—57)

This invention is a novel device for exercising and for physically treating patients; the principal object thereof being to provide a device whereby he may actively massage portions of his body, such as fallen arches, and simultaneously exercise the ligaments and muscles of his lower extremities, such as the feet and legs, to improve the blood circulation in said parts, utilizing simple active massaging movements performed by the patient himself, the motive power utilized to operate the device being supplied by the patient's legs and feet.

A further object of the invention is to provide a device of the above character comprising a pair of novel rotatable and reciprocable massaging rollers adapted to be engaged by the patient's feet and so arranged that a forward foot pressure on one roller to move said roller in one direction will automatically cause the other roller to move in the rearward direction, retracting the latter roller to starting position at the end of the device nearest to the patient, means being provided for causing simultaneous reciprocation of the rollers in opposite directions while at the same time imparting rotation to the rollers.

In my device, the use of two rollers conforms with the basic principle that alternating muscular contraction and relaxation increases the circulation of blood in the arteries, capillaries, and veins, and provides an increase in nutrition whether it be muscular, ligamentous, or bony tissue. Muscular irritability and fatigue is lessened by increase in blood circulation, and the muscles, ligaments, nerves and bones become stronger and more elastic. The alternating contraction and relaxation in my device is accomplished by pressure in the forward movement by the patient's foot on one roller, and relaxation of the patient's other foot and leg while its related roller is being retracted to its starting position.

A further object is to provide said rollers with spirally disposed ribs adapted when the rollers are rotating to facilitate removal of tissue waste from the feet and to thus increase the circulation of blood which is the main object of any massage treatment; said ribs also affording a firm contact for the feet.

A still further object of the invention is to provide an exercising device of the above character which will be simple in construction and operation.

I will explain the invention with reference to the accompanying drawing which illustrates one practical embodiment thereof to enable others to adopt and use the same; and will summarize in

the claims the novel features of construction, and novel combinations of parts, for which protection is desired.

In said drawing:

Fig. 1 is a perspective view of my exercising device.

Fig. 2 is a plan view showing the cover portion removed to expose the interconnections between the rollers which effect simultaneous reciprocation thereof in opposite directions.

Fig. 3 is a section on the line 3—3, Fig. 2.

My novel exercising device preferably comprises a base 1 of general rectangular shape having two pairs of parallel racks 2—2 and 3—3 mounted on the upper surface thereof, the pairs of racks being preferably disposed adjacent the sides respectively of the base leaving a space therebetween for the purpose hereinafter explained.

Cooperating with the pairs of racks 2—2 and 3—3 are rollers 4 and 5 respectively, of any desired size and shape, same preferably comprising molded rubber collars mounted upon metal shafts 4a, 5a, respectively, the collars having annular enlargements 4b, 5b, respectively, at their ends, and having spirally disposed ribs 4c, 5c respectively thereon whereby as the rollers are rotated, as hereinafter described, the ribs 4c, 5c, will exert a massaging action on the heels, arches or balls of the patient's feet to assist in removing waste tissue and to increase blood circulation.

Shafts 4a, 5a of the rollers carry pinions 4d, 5d respectively at their ends meshing with their related racks 2—2, 3—3, whereby when the rollers 4, 5 are reciprocated rotary motion is also imparted thereto.

Rollers 4 and 5 are interconnected whereby as one roller, such as 4, is moved forwardly on its racks 2—2, the other roller will be retracted on its racks. A pair of spaced blocks 6 (Fig. 3) are disposed longitudinally of base 1 in the area between the innermost racks 2 and 3 of the pairs, said blocks 6 carrying belt pulleys 7—8 on their upper ends journaled on pins or screws 7a, 8a respectively. Preferably the pulleys are made of wood or any other desired material, and their rims may be grooved to receive an endless flexible belt or band 9 having opposite runs disposed parallel with the innermost racks 2 and 3 respectively, and also disposed opposite the axes of the shafts 4a, 5a of the rollers, and a bolt 10 or the like secures the inner end of each shaft 4a, 5a to its related run of belt 9, as shown in Figs. 2 and 3, the pins 10 being so disposed in the runs of the belt that when one roller 4 is in fully pro-

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jected position the other roller 5 will be fully retracted; and vice versa.

In order to maintain the rollers 4 and 5 in constant engagement with their racks 2—2, 3—3 5 housing members 11 are provided at each side of the base covering the outermost racks 2 and 3 of the pairs, the housing members being recessed as at 11a in their inner faces to receive the racks and pinions, the top walls of the recesses 11a 10 closely overlying the upper peripheries of the outermost pinions 4d, 5d, and maintaining same in engagement with their respective racks 2, 3.

A cover member 12 is secured over the innermost racks 2 and 3, and over their pinions 4d, 15 5d, also over the pulleys 7, 8, and belt 9, said cover member comprising a plate having substantially semi-circular flanges 12a (Fig. 1) at its ends adapted to embrace the outer peripheries of pulleys 7—8, the plate intermediate the flanges 20 12a closely overlying the upper peripheries of the innermost pinions 4d, 5d. The distance between the ends of the semi-circular flanges 12a serves to limit the extent of reciprocatory motion 25 of the rollers 4 and 5. Cover 12 is preferably secured on the base by means of a bolt 13 mounted in a boss 14 on the base between blocks 6, the bolt having a threaded upper end extending through a perforation in the center of the cover, and having a wing-nut 15 applied thereto where 30 30 by the cover may be readily moved when desired.

The above described device provides a simple and efficient means for exercising the ligaments and muscles of the feet and legs by active massaging movements performed by the patient himself, the rubber rollers 4 and 5 being so arranged 35 that a forward foot pressure on one roller automatically rotates both rollers and causes reciprocation of both rollers in opposite directions, thereby providing a device requiring, when in 40 operation, alternating muscular contraction and relaxation of the ligaments and muscles of a patient's legs and feet increasing the flow of blood to such parts of the body, and thereby increasing the nutrition carried to the tissue, whether muscular, ligamentous or bony, the result being that 45 muscular irritation will be lessened, and bones strengthened and rendered more elastic.

I claim:—

1. In a device for actively massaging the ligaments and muscles of a patient's feet and legs; 50 a base; rollers reciprocably and rotatably mounted thereon and adapted to be engaged by the patient's feet; means connecting the rollers and base for imparting rotary motion to the rollers when reciprocated; means whereby when one roller is being moved by the patient in one direction another roller is thereby moved in another direction, comprising a member on the base having portions movable in different directions, and 55 means operatively connecting the respective rollers with different portions of the member.

2. In a device for actively massaging the ligaments and muscles of a patient's feet and legs; 60 a base; rollers reciprocably and rotatably mounted thereon and adapted to be engaged by the patient's feet; means connecting the rollers and base for imparting rotary motion to the rollers when reciprocated; means whereby when one roller is being moved by the patient in one direction another roller is thereby moved in another direc- 65

tion, comprising an endless member movably mounted on the base and having opposite runs disposed adjacent the ends of the respective rollers; and means connecting the rollers with the runs. 5

3. In a device for actively massaging the ligaments and muscles of a patient's feet and legs; a base; rollers reciprocably and rotatably mounted thereon and adapted to be engaged by the patient's feet; means connecting the rollers and base for imparting rotary motion to the rollers when reciprocated; means whereby when one roller is being moved by the patient in one direction another roller is thereby moved in another direction, comprising an endless member movably 10 mounted on the base and having opposite runs disposed adjacent the ends of the respective rollers; means connecting the rollers with the runs; and a cover over the endless member having portions limiting the reciprocating movement of the 20 rollers.

4. In a device for actively massaging the ligaments and muscles of a patient's feet and legs, a base; a pair of rollers having pinions engaging the racks respectively and adapted to be engaged by 25 the feet of a patient; means interconnecting the rollers whereby when one roller is moved by the patient across its rack in one direction, the other roller is thereby moved across its rack in another direction, comprising a member mounted on the 30 base having portions movable in different directions; and means operatively connecting the respective rollers with different portions of the member.

5. In a device for actively massaging the ligaments and muscles of a patient's feet and legs, a base; a pair of rollers having pinions engaging the racks respectively and adapted to be engaged by the feet of a patient; means interconnecting the rollers whereby when one roller is moved by 40 the patient across its rack in one direction, the other roller is thereby moved across its rack in another direction, comprising an endless member movably mounted on the base and having opposite runs disposed adjacent the ends of the rollers 45 respectively; and means connecting the rollers with the runs.

6. In a device for actively massaging the ligaments and muscles of a patient's feet and legs, a base; spaced pairs of parallel racks mounted 50 side by side on the base; rollers adapted to be engaged by the feet of a patient and having pinions engaging the pairs of racks respectively for imparting rotary motion thereto when same are reciprocated over their racks; and means interconnecting the rollers whereby when one roller is moved by the patient's foot across its rack in one direction, the other roller is thereby moved across its rack in the opposite direction. 55

7. In a device as set forth in claim 6, said interconnecting means comprising an endless belt movably mounted on the base between the pairs of racks and having opposite runs disposed adjacent the ends of the rollers respectively; means connecting the rollers with the runs; and a removable cover on the base housing the belt and maintaining the pinions in engagement with the racks. 60