

[54] **CIRCULATION-STIMULATING MACHINE**

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[52] U.S. Cl. **128/24, 272/33 B**

[51] Int. Cl. **A61h 1/00**

[58] Field of Search 272/33, 34, 49, 73; 128/24, 128/25

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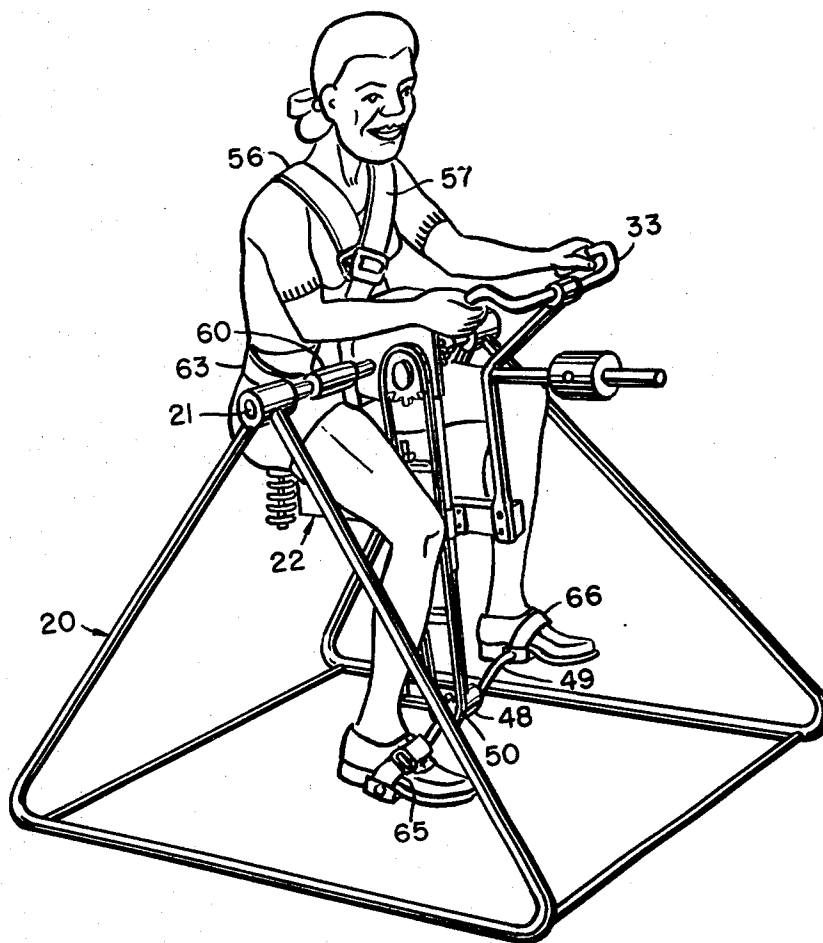
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[57] **ABSTRACT**

A machine for stimulating circulation in the upper portion of a human body by the effect of slow rotation on a horizontal axis through upright and inverted positions. A rotatable carrier includes a seat or standing support equipped with a retaining harness, and also includes a preferably pedal-operated drive system. A modified form of the invention includes a ring supported on parallel horizontal rollers. A driving belt surrounds the ring, and holds it against the rollers. The ring has an inside diameter selected to receive an occupant in crouching position.

5 Claims, 14 Drawing Figures



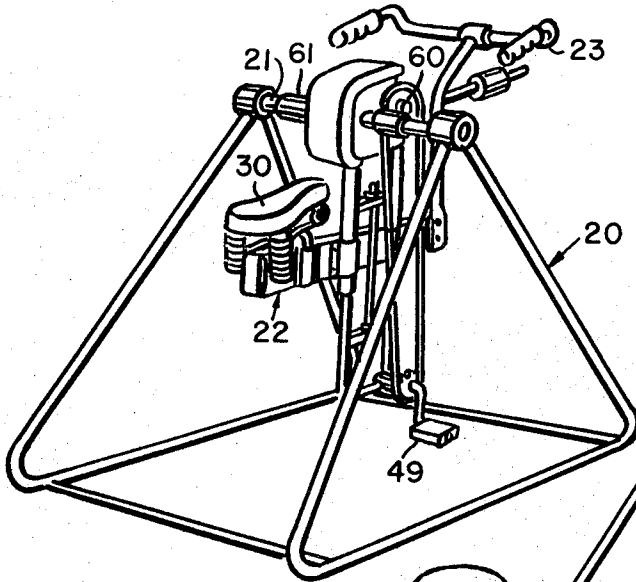


Fig. 1

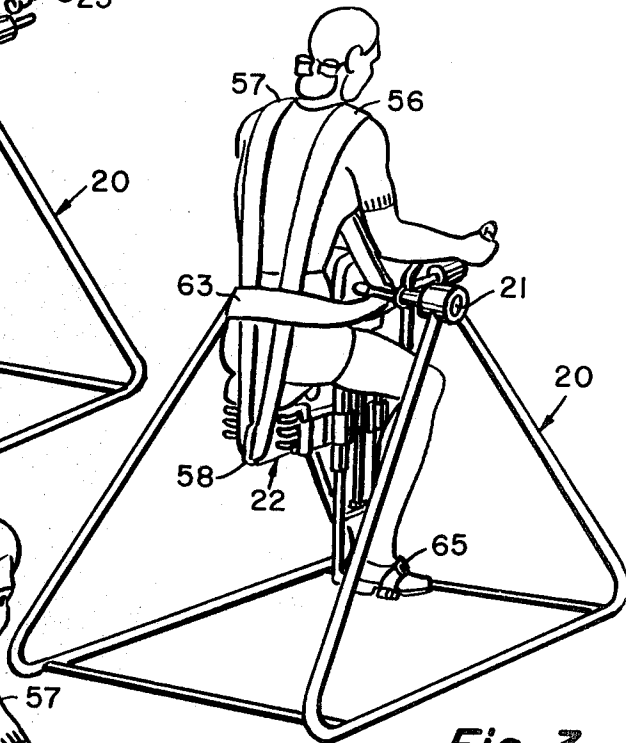


Fig. 3

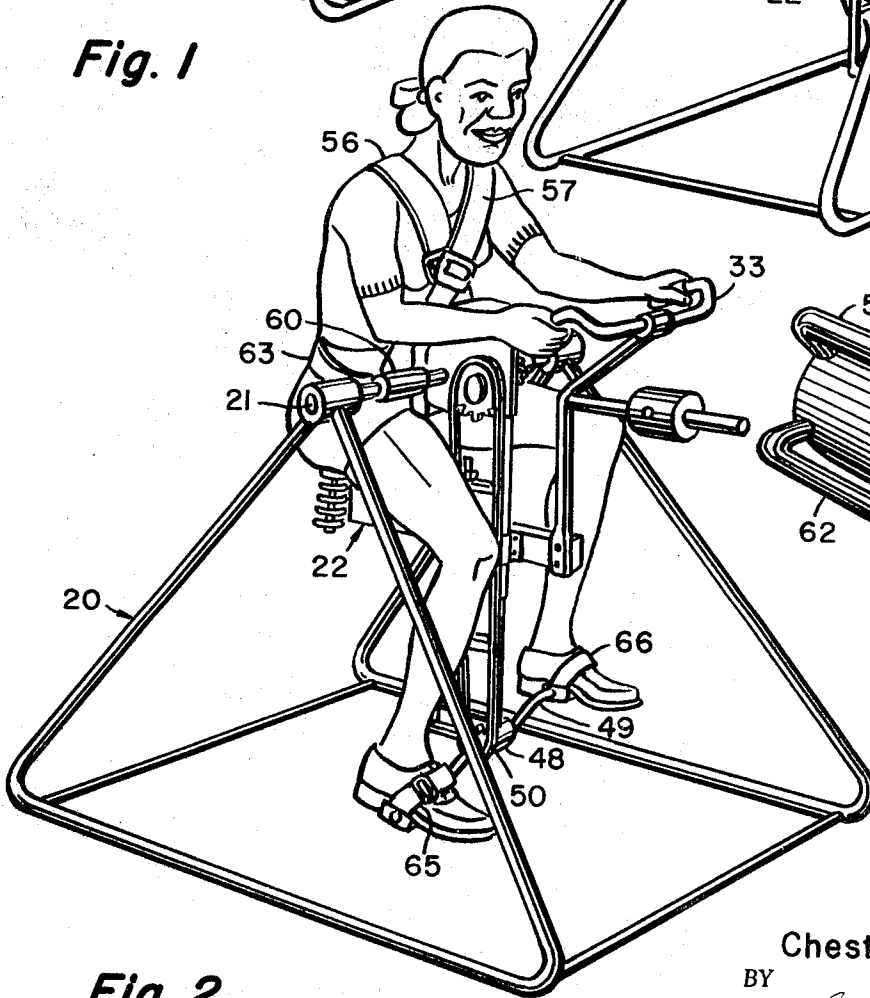


Fig. 2

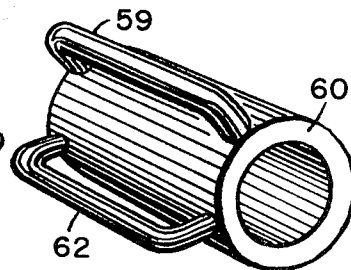


Fig. 4

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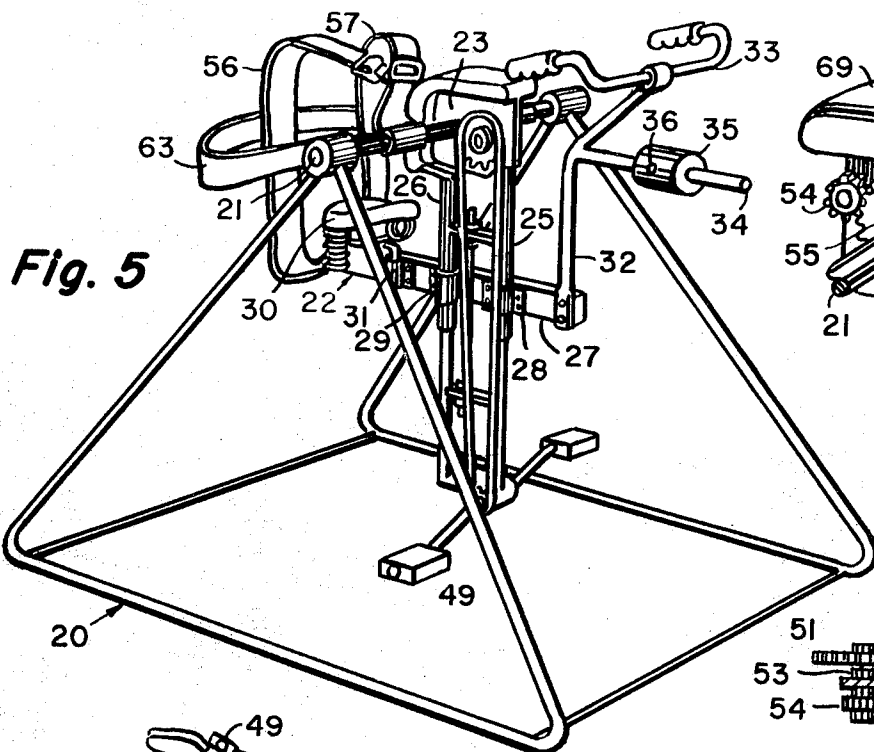


Fig. 5

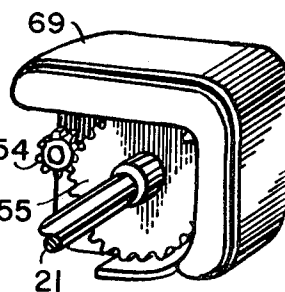


Fig. 8

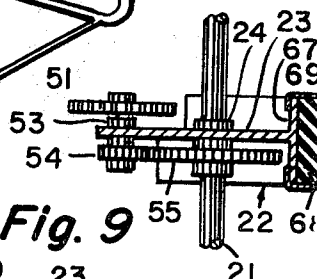


Fig. 9

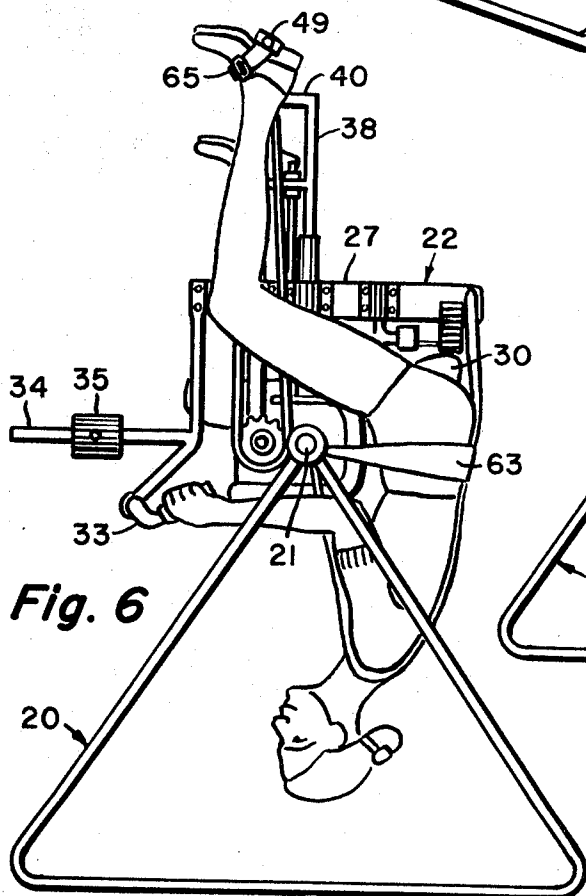


Fig. 6

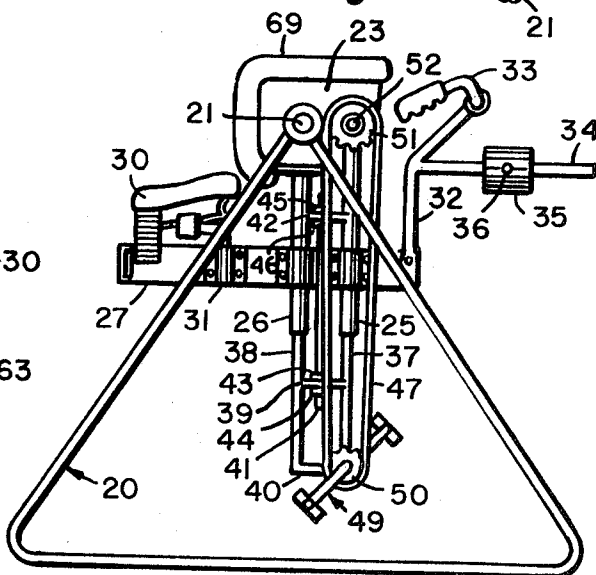


Fig. 7

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Fig. 10

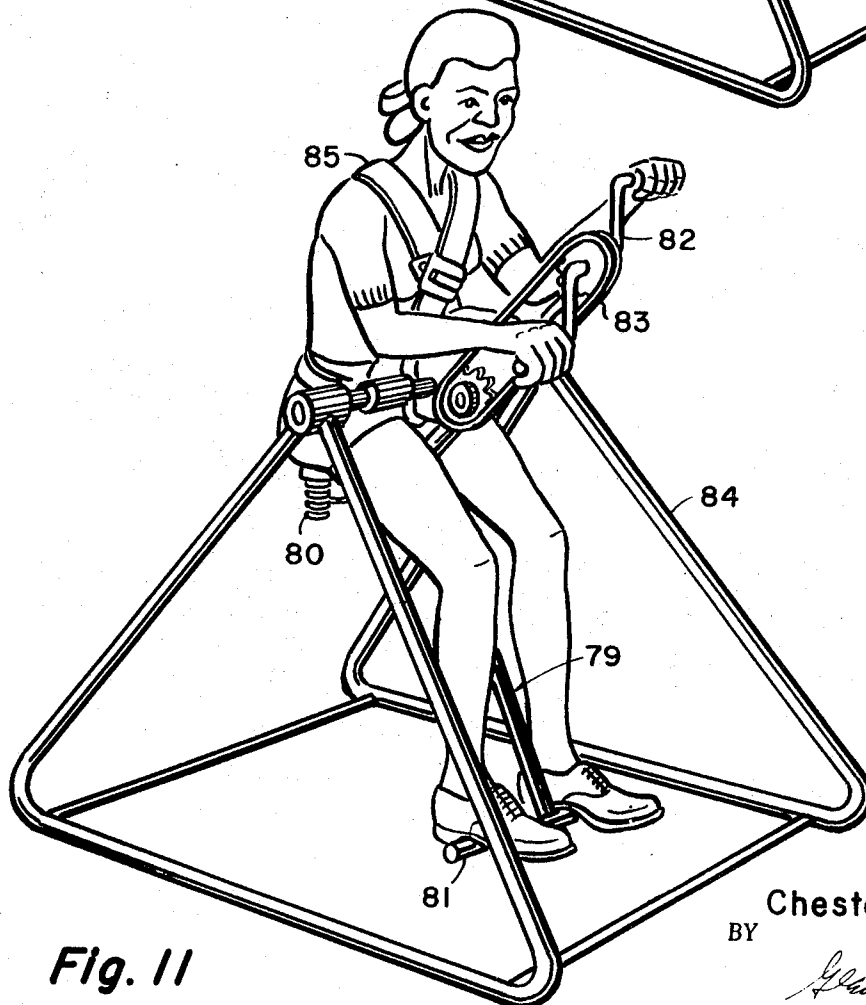
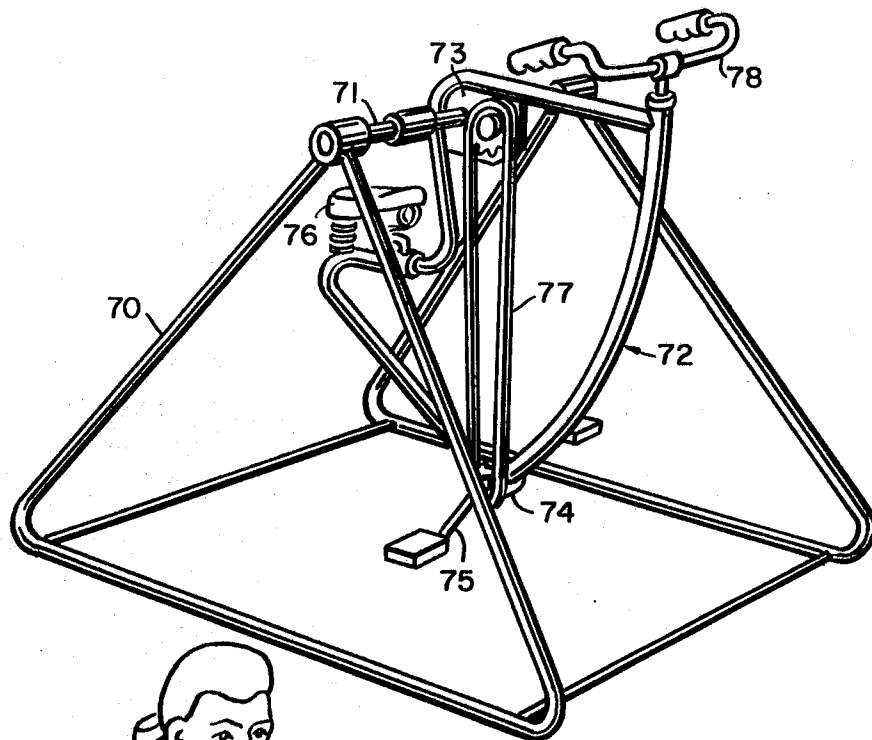


Fig. 11

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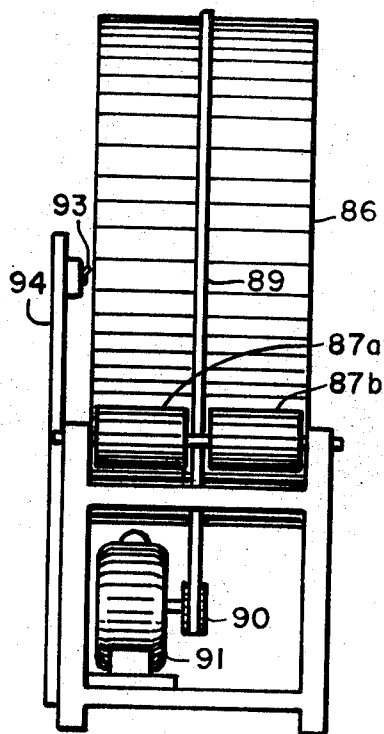


Fig. 12

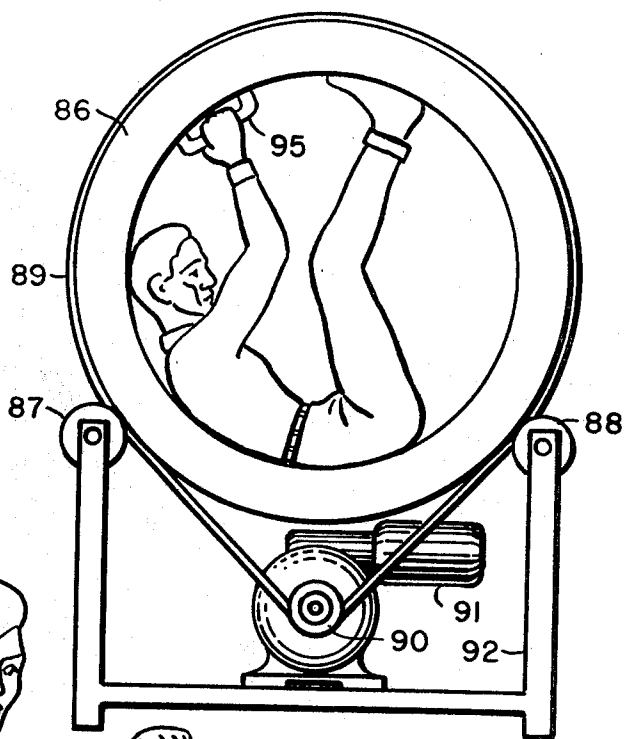


Fig. 13

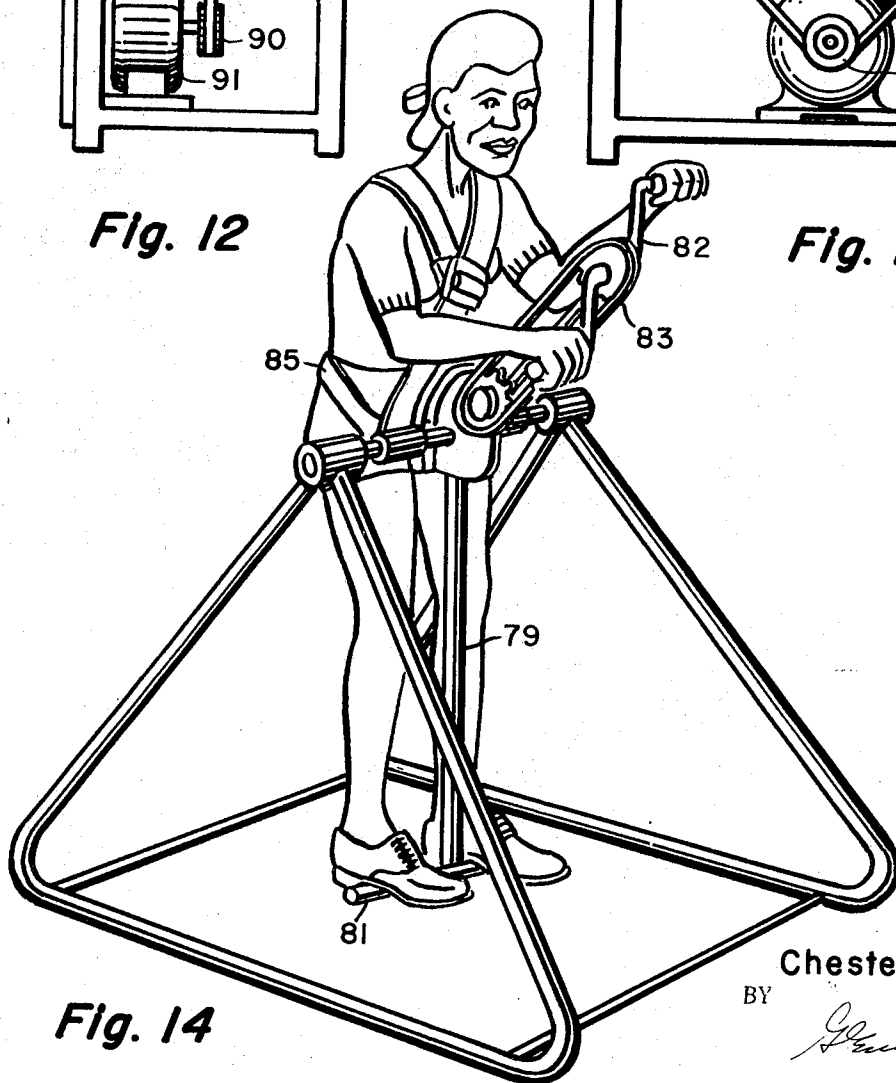


Fig. 14

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CIRCULATION-STIMULATING MACHINE

BACKGROUND OF THE INVENTION

It is generally recognized that a number of undesirable conditions in the head and neck can be corrected or improved by stimulating circulation in the affected area. Some of the many techniques developed under the general heading of physical therapy have this as a primary objective. Congestion in the nasal and sinus areas, and occasionally around the ear structure, will frequently respond to this form of treatment. The functioning of the brain itself is highly responsive to the slightest interruptions or reductions in circulation, and this becomes particularly acute in cases involving arteriosclerotic conditions. It is common experience of almost everyone that spells of dizziness or other mental mis-functioning can frequently be relieved by lying down with the head somewhat lower than the rest of the body.

Attempts have been made in the past to develop devices capable of controllably inverting the human body to reverse the usual hydraulic pressure differential between the heart and the brain. Most of these devices have required a degree of acrobatic ability to operate them, and are consequently out of the question for anyone not already in unusually good physical condition. An example of this type of device is the well-known rolling hoop, in which a person is secured inside a ring by his feet and his hands, with his arms in an upright position. By swinging his body to and fro within this confinement, he is able to alter the placement of the center of gravity of the device with respect to its plane of support on the floor, and consequently is able to roll the hoop back and forth on the floor of a gymnasium. This, and most of the other machines involving body-inversion, are primarily exercising devices. These do not satisfy the need for a machine which will controllably invert the body without the exertion of any large amount of physical effort, or requiring any substantial degree of skill. By eliminating the heavy physical effort, the circulation-stimulation benefits become available to those persons who are not physically capable of indulging in the more active and strenuous body maneuvers.

SUMMARY OF THE INVENTION

A machine embodying the preferred form of the present invention involves a carrier rotatably mounted on a horizontal axis in a convenient form of fixed frame structure. The carrier is provided with a seat or a standing support, and also a retaining harness that will hold the occupant in operating position in the machine. A pedal-operated power transfer system is arranged to induce a controllable rotation of the carrier with its occupant at a very low rate, and with minimal effort. The power transfer utilizes a chain drive extending from the pedal system to an assembly of gearing which includes a final gear in fixed position with respect to the frame. Operation of the pedals will therefore induce a movement of the carrier around this gear. The final gear is secured to the same shaft that rotatably supports the carrier. The shaft also provides a support for the harness terminal.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred form of the invention.

FIG. 2 is a perspective view of the machine illustrated in FIG. 1 on a slightly enlarged scale, and from the opposite quarter, additionally showing an occupant in place in the machine.

FIG. 3 is a rear perspective view corresponding to FIG. 2.

FIG. 4 is a view on an enlarged scale of one of the harness terminals mounted on the central shaft of the machine.

FIG. 5 is a view of the machine in the position similar to FIG. 2, but without the presence of the occupant.

FIG. 6 is a view of the machine and occupant in the inverted position, through which the occupant can operate the machine in the course of a complete revolution about the axis of the support shaft.

FIG. 7 is a side elevation of the machine illustrated in FIG. 5, with the harness equipment removed for clarity.

FIG. 8 is a perspective view on enlarged scale of the gear assembly of the power-transfer system.

FIG. 9 is a section through the gear assembly illustrated in FIG. 8.

FIG. 10 is a perspective view of a modified form of the invention, with the harness equipment removed.

FIG. 11 is a perspective view of a further modification of the invention, utilizing a hand-operated drive system.

FIG. 12 is an end view of a modified form of the invention.

FIG. 13 is a side elevation of the machine illustrated in FIG. 12.

FIG. 14 is a view of a further modification of the invention, involving a stand-up position of the operator.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The machine illustrated in FIGS. 1 through 9 has a frame 20 normally supported on a convenient floor surface. The shaft 21 is fixed both axially and rotatably with respect to the frame. A carrier 22 includes a central plate 23 (refer to FIG. 9) provided with a bearing sleeve 24 rotatably supported on the shaft 21. A pair of parallel tubular members 25 and 26 are fixed with respect to the central plate 23, and provide support for the beam 27. The beam is adjustably secured to the tubes 25 and 26 by the clamping plates 28 and 29, which may be loosened to permit shifting of the beam 27 into a desired relationship with respect to the axis of the shaft 21. The clamping plates 28 and 29 are secured to the beam 27 by any convenient form of fastening, such as bolts or screws. The seat 30 is mounted at one extremity of the beam 27 with a standard form of bracket as shown at 31, which is of the usual construction found in bicycles. At the opposite end of the beam 27, the arm 32 provides a support for the handle 33, and has a portion 34 for adjustably supporting the counterbalance weight 35. A set screw 36 can be used to lock the adjusted position of the weight 35 in a desired relationship with respect to the axis of the shaft 21. This arrangement, or any other counterbalance system, is an optional feature on the machine. The weight will normally be adjusted to accommodate the physical characteristics of the operator of the machine. Variations in these characteristics will not only include the total weight, but also the position of the center of gravity. The placement of the counterbalance can therefore be utilized to minimize the effort involved in rotating the carrier about the axis of the shaft 21.

The frame of the machine also includes the parallel rods or tubes 37 and 38 interconnected by the cross members 39 and 40. The members 37 and 38 are telescopically received within the tubes 25 and 26, and the relative axially interengagement of these members is determined by the bolt 41 which traverses the cross member 39 and also the cross member 42 interconnecting the tubes 25 and 26. A pair of nuts 43-44 is disposed on opposite sides of the cross member 39, and the nuts 45-46 are in similar relationship to the cross member 42. These nuts can be tightened on the bolt 41 to lock the telescope adjustment, and thus control the tension on the drive chain 47.

A bearing 48 secured at the junction of the cross member 40 and the rod 37 provides support for the rotating pedal assembly 49, which includes a sprocket 50 interengaged with the chain 47. This chain is also interengaged with the sprocket 51 mounted on a shaft 52 supported in the bearing 53 carried by the central plate 23. The pinion gear 54 is meshed with the fixed gear 55 secured to the shaft 21. With this arrangement, rotation of the pedal assembly 49 will move the pinion gear 54 in a planetary fashion around the fixed gear 55, causing the carrier 22 to rotate about the axis of the shaft 21. The effective mechanical advantage of the entire power-transfer system is selected so that a leisurely rate of pedaling will induce a rotation of something around 5 revolutions per minute. The arrangement is at all times under the control of the operator, who can halt his movement at any time, or limit his motion to

a partially inverted position, followed by a return to the initial upright position shown in FIGS. 2 and 3. Normally, the operator will continue pedaling so that the position will change from the FIG. 2 position, through the FIG. 6 position, and on again to the FIG. 2 position.

The occupant is held in engagement with the machine by the harness equipment including the shoulder straps 56 and 57 extending from a terminal 58 near the seat, and over the shoulders of the occupant. These straps are preferably crossed in front of the occupant, and are connected to a terminal as indicated at 59 in FIG. 4 on either of the sleeves 60 or 61. The additional terminals 62 on the sleeves receive the opposite ends, respectively, of the belt 63. The belt and straps are preferably of a material commonly used in conjunction with safety belts and safety harnesses in automobiles. It is preferable to incorporate a quick-release buckle in both the shoulder straps and the belt to facilitate mounting and dismounting from the machine. It is also preferable to incorporate pedal straps as shown at 65 and 66 in FIG. 2 to hold the feet in engagement with the pedal unit 49. Since the movement of the occupant will proceed through positions in which his weight will be brought against the member 67 secured to the central plate 23, it is also preferable to provide a padding as shown at 68. This can be of usual foam-rubber material, and is preferably covered with some convenient material as shown at 69.

Referring to FIG. 10, a modified form of the invention utilizes a frame 70 of identical construction to that previously described. The shaft 71 supports a carrier frame 72 constructed of welded sections of tubing secured to the central plate 73. The bearing 74 supports the pedal assembly 75 in a manner similar to the usual bicycle construction, and the seat 76 is mounted also according to conventional practice. The chain 77 functions to transfer power from the pedal unit 75 in the manner previously described. The handle 78 can be adjusted into any desired relationship with the seat 76.

FIG. 11 illustrates another modification of the invention in which the carrier generally indicated at 79 supports a seat 80 and a fixed foot bar 81. The power transfer, in this modification, includes a crank unit 82 mounted on the carrier 79, and transferring power to the central gearing by the chain 83. The frame 84 and the harness system 85 are similar to those previously described. FIG. 14 illustrates a modification related to FIG. 11, but supporting the occupant in standing position. In the FIG. 14 modification, the seat and its associated structure are eliminated. In all the modifications thus far described, a braking device may be installed at any convenient point in the power transfer system to generate a resistance to movement which will facilitate mounting and dismounting.

FIGS. 12 and 13 illustrate a further modification of the invention involving a ring 86 supported on the roller systems 87 and 88. The belt 89 engages the pulley 90 of the gear motor 91 mounted on the frame 92, and also extends around the ring 86 to hold it in engagement with the rollers 87 and 88. In the arrangement shown in FIG. 13, the driving belt 89 is disposed between axially spaced sections of the rollers, as shown at 87a and 87b in FIG. 12. Since this modification of the invention is power-operated, it is preferable to include a control switch as shown at 93 mounted on the arm 94 of the frame in a position fairly close to the axis of rotation of the ring 86. The inside diameter of the ring 86 is selected to receive an occupant in the crouching position shown in FIG. 13. During a full revolution of the machine, the occupant will proceed through posi-

tions in which his weight is supported either by his feet, or with the assistance of armed forces transmitted through the handles 95.

In all of these modifications, the beneficial effects of stimulated circulation in the head and neck are realized. It has been surprising to also note a tendency to improve vision, and reduce tensions and congestion in the area around the eyes. This may be due to results similar to those produced by osteopathic techniques.

I claim:

1. A machine for stimulating circulation and related body functions, said machine comprising:

a frame;

a carrier rotatably mounted in said frame on a substantially horizontal axis of rotation;

a seat mounted on said carrier, said seat being disposed eccentrically with respect to said axis, and harness means securable with respect to said carrier to retain an occupant in said seat;

handle means secured to said frame; and

drive means adapted to induce rotation of said carrier with respect to said frame, said drive means including pedal means and also power-transfer means operably associating said pedal means and a member fixed with respect to said frame, said handle means and pedal means being disposed on the opposite side of a common plane through said axis from said seat, whereby the legs and arms of an occupant of said seat tend to counterbalance the central portion of the body of said occupant.

2. A machine as defined in claim 1, wherein said frame includes a fixed shaft coaxial with said axis, and said member is a gear secured to said shaft.

3. A machine for stimulating circulation and related body functions, said machine comprising:

a frame having a horizontal shaft;

a carrier rotatably mounted on said shaft;

a seat mounted on said carrier, and harness means securable with respect to said carrier to retain an occupant in said seat, said harness means including belt-terminal sleeves mounted on said shaft on opposite sides of said frame for rotation with respect to said frame, said sleeves having at least one belt-receiving tab secured thereto; and

drive means adapted to induce rotation of said carrier with respect to said frame.

4. A machine as defined in claim 1, wherein said carrier has a section carrying said pedal means, said section being extendible and retractable with respect to the remainder of said carrier, and wherein said drive means includes an endless chain extending to and from a sprocket associated with said pedal means.

5. A machine for stimulating circulation and related body functions, said machine comprising:

a frame;

roller means mounted on said frame on parallel horizontal axes of rotation;

a ring supported on said roller means, said ring having an inside diameter selected to admit an occupant in crouching position; and

drive means for rotating said ring, said drive means including a motor mounted in said frame and also a belt extending around said ring and tending to hold said ring against said roller means.

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