United States Patent

Simjian

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[54] MASSAGING DEVICE DRIVEN BY EXERCISE APPARATUS

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[52] **U.S. Cl.** **128/64**

[51] **Int. Cl.** **A61h 7/00**

[58] **Field of Search** 128/25, 64, 26, 24

[56] **References Cited**

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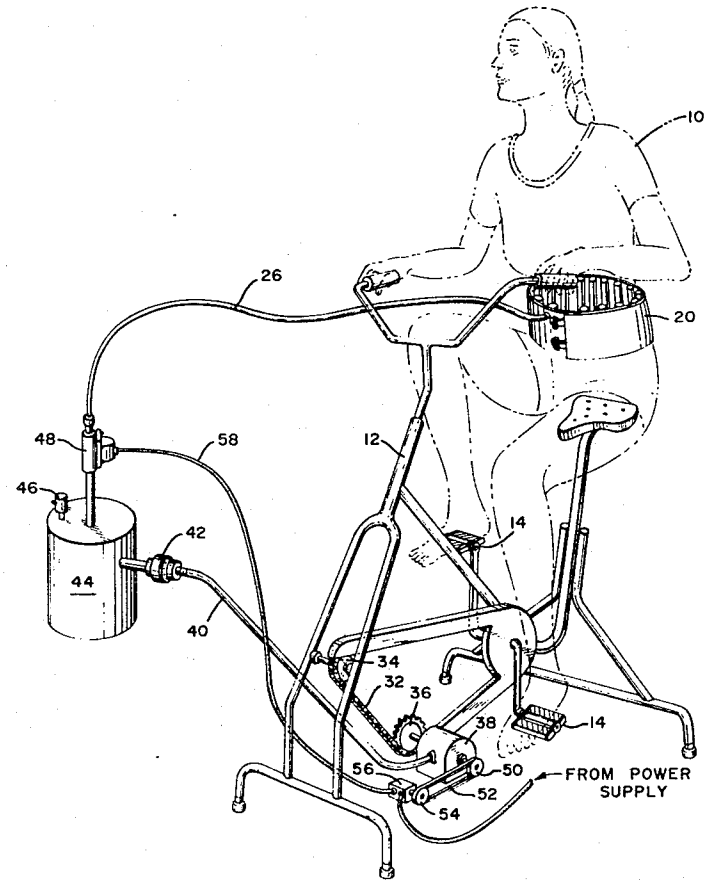
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Primary Examiner—L. W. Trapp
Attorney—Ervin B. Steinberg

[57] **ABSTRACT**

An inflatable massaging device, such as a belt, is cyclically inflated and deflated in coordinated action with the operation of an exercise apparatus requiring the expenditure of muscle power.

10 Claims, 8 Drawing Figures



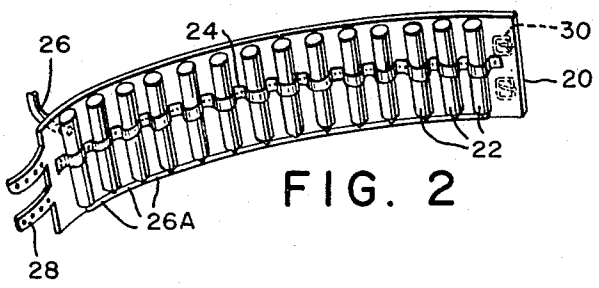


FIG. 2

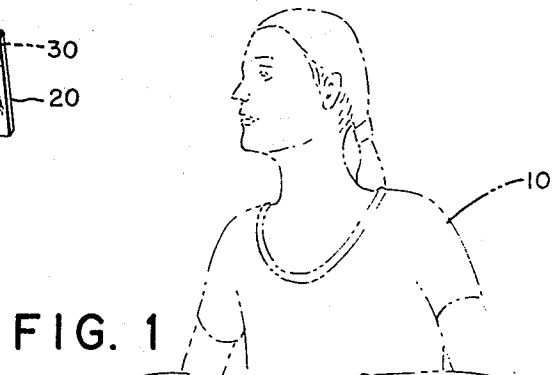
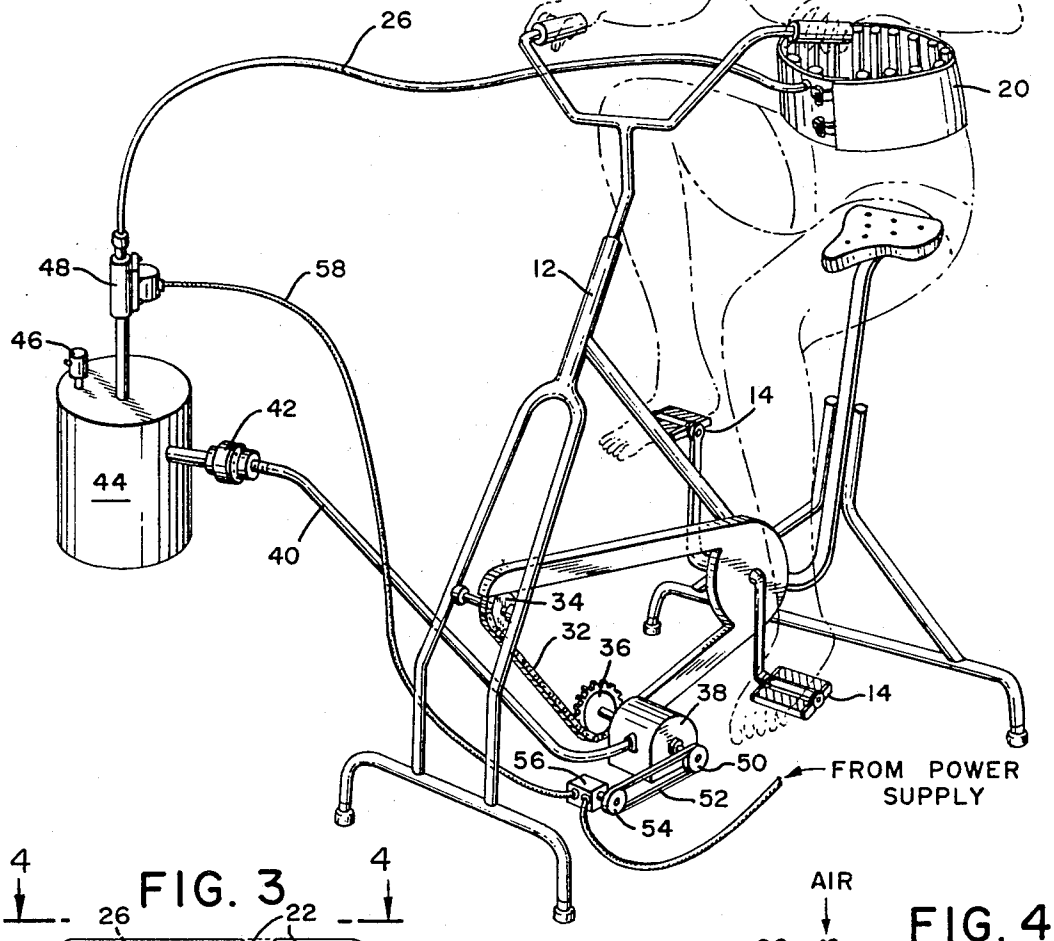


FIG. 1



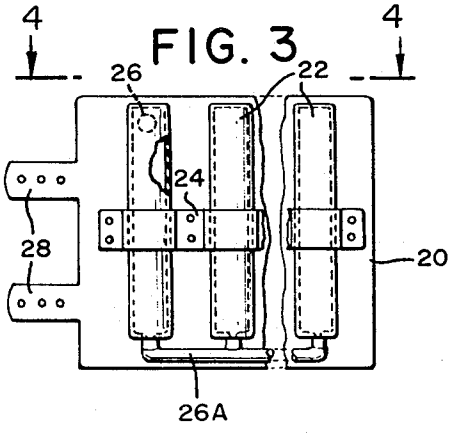


FIG. 3

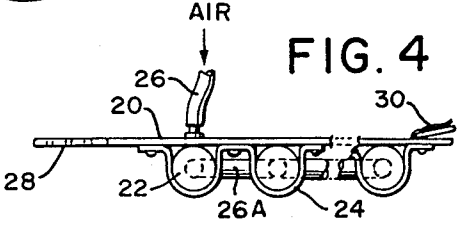


FIG. 4

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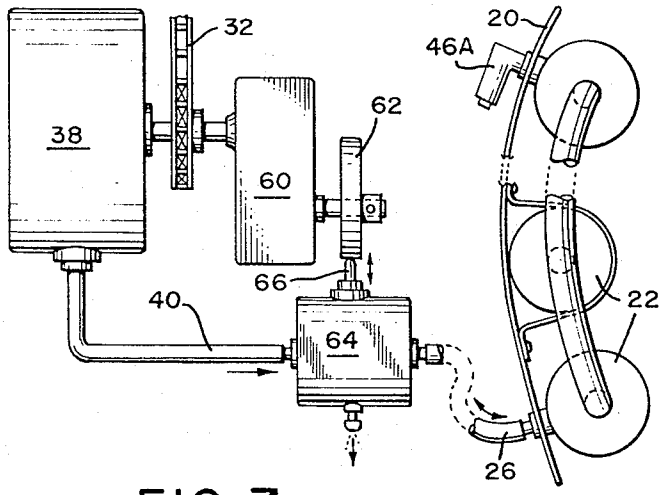


FIG. 5

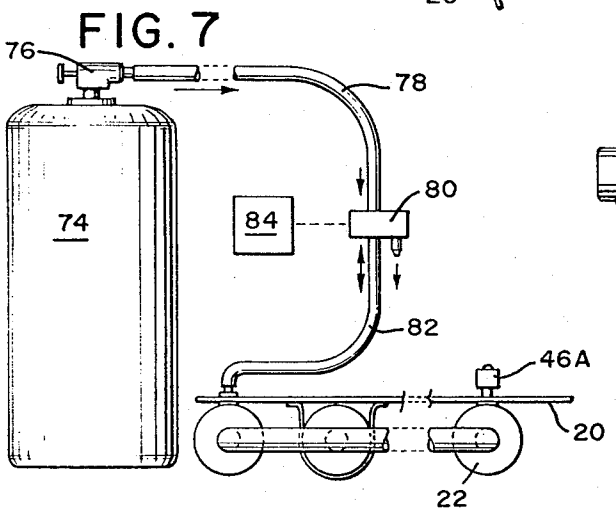


FIG. 7

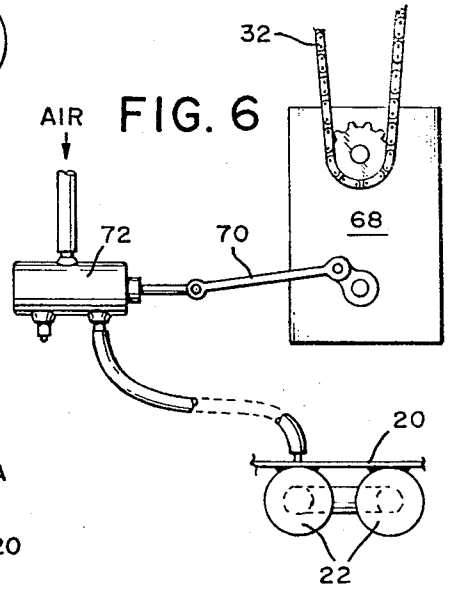
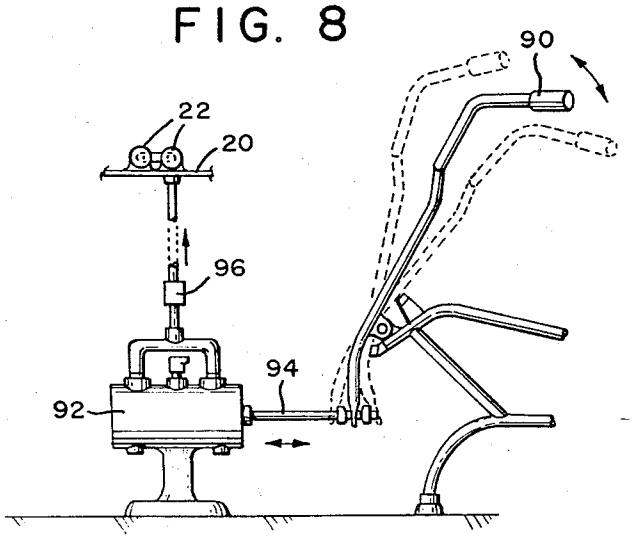


FIG. 6

FIG. 8



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MASSAGING DEVICE DRIVEN BY EXERCISE APPARATUS

This invention broadly refers to a massaging device and more specifically concerns a massaging device which is controlled responsive to the expenditure of muscle power. Quite specifically, this invention concerns an inflatable massaging device, such as a belt, adapted to be strapped to portions of the human body and the massaging device being cyclically inflated and deflated responsive to muscle power expended by operating an exercise apparatus, such as a bicycle, a rowing apparatus, a jogging device and the like.

Exercise apparatus of the type indicated which are operated by persons for the purpose of physical fitness and for toning muscles are well known and are installed in many homes, club houses, exercise rooms, etc. Similarly, there are known belts which may be strapped to various portions of the human body and which include either weights or a vibrating mechanism, often driven by electric power, for reducing purposes or eliminating fatty tissue.

The present invention concerns an inflatable device, such as a belt, adapted to be worn when operating an exercise apparatus, and means for cyclically inflating and deflating the belt in response to the operation of the exercise apparatus, whereby the inflatable device acts as a massaging device. In this manner the person operating the exercise apparatus simultaneously can obtain a massage and thereby enhance his physical well-being. One of the important features of the invention concerns the arrangement wherein the speed of cyclic inflation and deflation of the belt or similar massaging device is controlled by the expenditure of muscle power applied for operating the exercise apparatus.

One of the principal objects of this invention is, therefore, the provision of a novel massaging device.

Another important object of this invention is the provision of a novel massaging device which is cyclically inflated and deflated.

Another salient feature of the present invention concerns the provision of an inflatable massaging device, such as a belt, which is controlled responsive to the operation of an exercise apparatus, such as a bicycle.

A further object of the instant invention concerns the provision of an inflatable massaging device which is cyclically inflated and deflated at a speed controlled responsive to the effort expended by the wearer of the massaging device while operating an exercise apparatus.

A still further object of this invention is the provision of a novel arrangement for providing coordinated massaging action and expenditure of muscle power.

Further and still other objects of this invention will be more clearly apparent from the following description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic view of a typical embodiment;

FIG. 2 is a view of an inflatable belt;

FIG. 3 is a plan view of the belt shown in FIG. 2;

FIG. 4 is a view along line 4—4 in FIG. 3;

FIG. 5 is a schematic illustration of an alternative embodiment;

FIG. 6 is a schematic illustration of a still further alternative embodiment;

FIG. 7 is a schematic view of still another embodiment, and

FIG. 8 is a schematic view of an alternative embodiment using a different type of exercising apparatus.

Referring now to the figures and FIG. 1 in particular, there is shown a person 10 who is seated on a bicycle type exercising apparatus 12 which is provided with a set of foot pedals 14. The person 10 receives exercise and expends muscle energy as the pedals 14 are rotated in a conventional manner. The person 10 also wears an inflatable belt 20 which will be described in greater detail in connection with FIGS. 2, 3 and 4. Generally, it should be understood that while the belt 20 in the present embodiment is shown as being worn around the waist of the person 10, the belt may be worn also around other portions of the human body, for instance, a portion of the leg or arm, etc. The belt 20 essentially comprises a fabric backing

which is fitted with a set of transverse flexible ribs 22 which are held in place by a strap 24. The ribs are adapted to be inflated by pneumatic pressure using for instance an air hose 26 which connects to each of the ribs 22 by a feeder line 26A. The belt is fitted also with a set of straps 28 and suitable fasteners 30 for strapping the belt around a portion of the body.

It will be understood that the belt forms a massaging device when the ribs 22 are cyclically inflated and deflated. For the sake of clarity, the ribs 22 in FIG. 2 are shown in the inflated condition, but it will be understood that without inflation the ribs are collapsed.

As shown in FIG. 1 the bicycle chain 32 is fed about a sprocket gear 34 and a sprocket gear 36. The sprocket gear 36 is coupled by a shaft to an air pump 38 which responsive to the rotation of the gear 36 supplies air under pressure via the conduit 40 and via a check valve 42 to a pressure reservoir 44. The pressure reservoir 44 is fitted with an adjustable pressure regulator valve 46 which sets the maximum pressure to which the reservoir 44 can be charged. The massaging belt 20 is connected to the reservoir 44 via the conduit 26 and a solenoid controlled flow valve 48. The rotation of the sprocket gear 36 driving the pump 38 drives also a pulley 50 which via a belt 52 drives a further pulley 54 which is connected to a mechanical timing cam means 56. A timing cam (not shown) forming a part of the timing means 56 includes an electrical switching means (not shown) which via an electrical conductor 58 controls the operation of the electrical solenoid valve 48.

Operation of the present arrangement may be visualized from the following description: As the person 10 operates the pedals 14 and expends muscle power the sprocket chain 32 is rotated to drive the pump 38 which provides air under pressure to the reservoir 44. The compressed air in the reservoir 44 via the fluid line 26 supplies pressure to the belt 20 in order to inflate the ribs 22 of the massaging device. The solenoid valve 48 is controlled by the timing means 56 in such a manner that it cyclically permits air from the reservoir 44 to reach the belt 20 for inflating the ribs 22, then shuts off this flow and vents the air contained in the massaging belt to ambient, thereby deflating the ribs 22 and then re-cycles to cause renewed inflation of the massaging device. It will be apparent therefore that the person 10 receives a massaging action, the speed of which is controlled by the speed at which the pedals 14 are operated. The amount of inflation is controllable by means of the control valve 46. It will be apparent to those skilled in the art that while the timing means 56 is shown as being responsive to the speed of operation of the exercise apparatus, the timing means may be connected directly to a source of electric or mechanical power and then be independent of the speed at which muscle power is expended.

FIG. 5 shows an alternative embodiment wherein the air pump 38 (FIG. 1) is coupled to drive a gear box 60 which is fitted at its output side with a cam 62. The cam 62 controls the operation of a flow valve 64 which is provided with a sliding control element 66 to cause either fluid flow from the pump 38 to the massaging belt 20, or the release of the pressure from the belt 20 to ambient. Furthermore, a pressure relief valve 46A is disposed on the massaging device itself in order to enable the person 10 to readily regulate the inflation pressure.

A further modification is shown in FIG. 6 wherein the sprocket 32 drives a gear box 68 which via a pitman 70 controls the operation of a slide valve 72 which, in turn, causes the cyclic inflation and deflation of the massaging device 20.

A further alternative embodiment is shown in FIG. 7 wherein a tank of compressed air 74 is provided. The tank is connected via a reducing valve 76, a conduit 78, a control valve 80 and a conduit 82 to the massaging device 20. The valve 80 is controlled by a suitable actuating mechanism 84 as described heretofore. The valve actuating mechanism 84 may be operated in response to the expenditure of muscle power as seen in FIGS. 1, 5 and 6, or it may be cycled independently by being connected, for instance, to a source of electrical energy. As before, however, the valve 80 will cause cyclic inflation

and deflation of the ribs **22** of the massaging device **20**. It may be mentioned here that while the belt **20** as depicted shows a plurality of transverse inflatable ribs, it shall be understood that the ribs may be arranged to run in the lengthwise direction or that the inflatable elements may be a multitude of localized inflatable projections. The exact nature and shape of the inflatable massaging device may depend upon individual preference and, if desired, subject to medical advice.

In FIG. **8** a further variation of the present arrangement is shown. The exercise device is one in which the handle bars **90** are operated for physical exercise. Specifically, the handle bars **90** are rocked back and forth in order to provide exercise to the arm muscles and to the chest area of the person. For this purpose a double acting air pump **92** is provided having a piston and piston rod **94** reciprocated by the action of the handle bars **90**. The air compressed by the pump **92** is provided to a check valve **96** and then used in a manner as described previously. It shall be understood that the design of the pneumatic pumps and of the control valves is well understood in the art and their specific description and design details have been omitted.

In summary then, it will be apparent that the present arrangement is one in which the person expending muscle power simultaneously receives a massaging action in order to improve his physical well-being and enhance the exercising effort. Specifically, an inflatable massaging device is coupled to an exercise apparatus in such a manner that as the person uses the exercise apparatus he produces fluid pressure which causes cyclic inflation and deflation of the massaging device. Alternatively, if the fluid pressure is provided by some other means, such as a storage tank, the operation of the control valve which causes cyclic inflation and deflation of the massaging device can be controlled responsive to the expenditure of muscle power by connecting flow controlling timing means to the motion imparted to the exercise apparatus.

What is claimed is:

1. An apparatus of the type described comprising: an exercising apparatus of the bicycle type requiring the expenditure of muscle power to provide mechanical motion; an inflatable massaging device, and means responsive to said motion coupled to said massaging device for cyclically inflating and deflating said massaging device.

2. An apparatus of the type described comprising: an exercising apparatus of the rowing type requiring the expenditure of muscle power to provide mechanical motion; an inflatable massaging device, and means responsive to said motion coupled to said massaging device for cyclically inflating and deflating said massaging device.

3. An apparatus of the type described comprising: an exercising apparatus of the bicycle type requiring the expenditure of muscle power to provide mechanical motion; an inflatable massaging device; means responsive to said motion which include a fluid pump coupled to said massaging device for cyclically inflating said massaging device; fluid pressure responsive means coupled for regulating the fluid pressure to which said massaging device can be inflated; a control valve coupled between said pump and said massaging device, and timing means for controlling said control valve to cause said massaging device to be cyclically inflated and deflated.

4. An apparatus as set forth in claim **3**, and including a fluid pressure reservoir coupled between said pump and said massaging device, and a check valve coupled between said pump and reservoir.

5. An apparatus as set forth in claim **3**, said timing means including cam driven means for controlling the operation of said valve.

6. An apparatus as set forth in claim **3**, and including means for coupling said timing means to the mechanical motion provided to said exercising apparatus.

7. An apparatus as set forth in claim **3**, said pump being driven responsive to rotation.

8. An apparatus as set forth in claim **3**, said pump being driven in a reciprocating manner.

9. An apparatus as set forth in claim **3**, said fluid pressure responsive means being mounted for reach by a person wearing said massaging device around a portion of his body.

10. An apparatus of the type described comprising: an exercising apparatus requiring the expenditure of muscle power to provide mechanical motion; an inflatable massaging device adapted to be worn by the person operating said exercising apparatus; a source of pressurized gas coupled for cyclically inflating said massaging device, and control means coupling said source of gas to said massaging device and being responsive to the operation of said exercising apparatus for causing cyclic inflation and deflation of said massaging device in coordinated action with the operation of said exercising apparatus.

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