

[54] **EXERCISERS**
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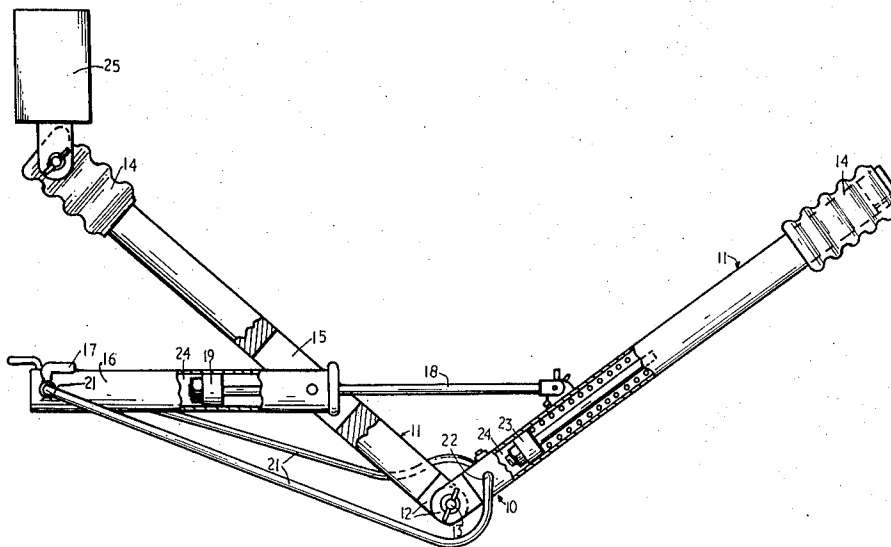
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[57] **ABSTRACT**

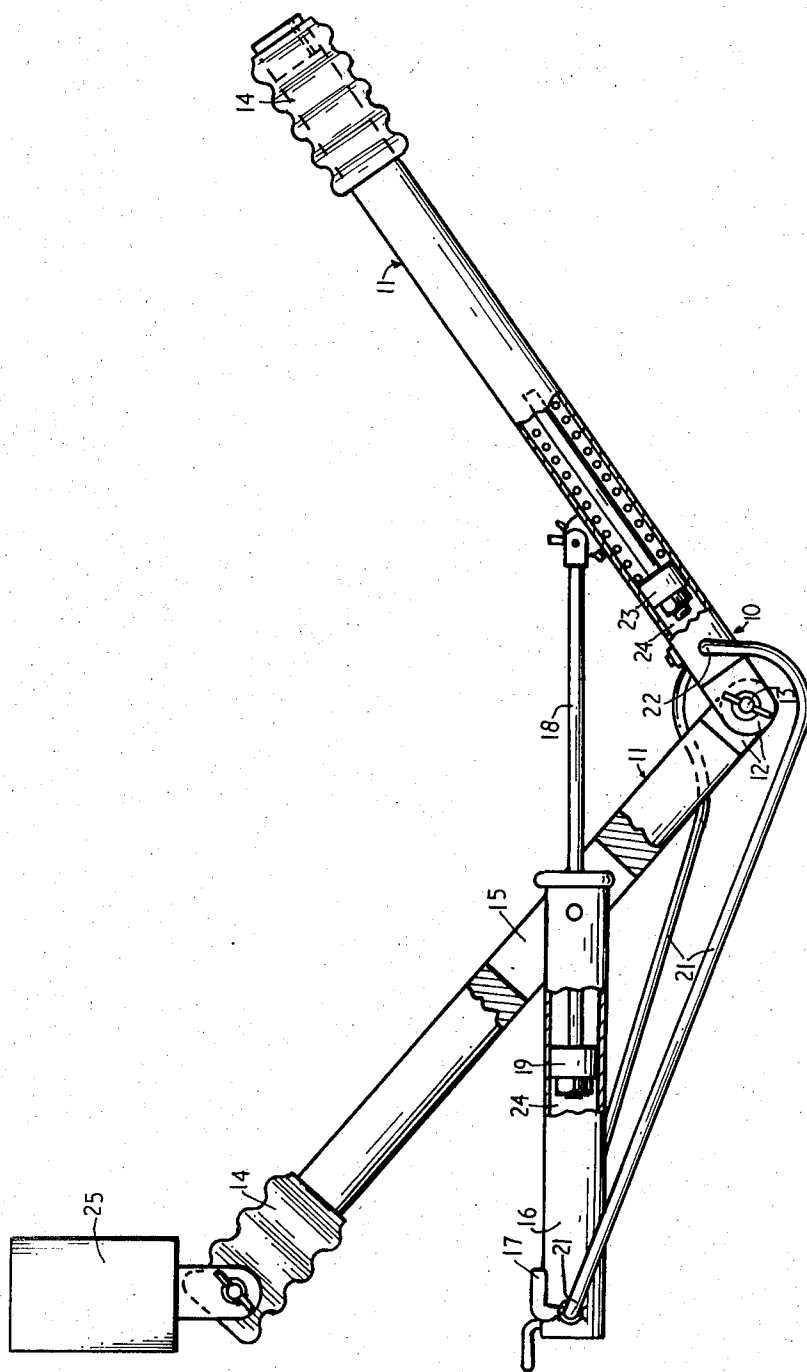
An exerciser comprising a pair of arms pivotably connected to each other and a fluid pump connected to the arms. This pump comprises a cylinder pivotably connected to one arm and a rod pivotably connected to the other arm. This rod carries a piston projecting into the aforementioned cylinder. The closed end of the piston is provided with at least one stop cock constituting an aperture of restricted cross-sectional area. The exerciser also includes a fluid reservoir located within one of the arms and communicating with the aforesaid aperture.

5 Claims, 1 Drawing Figure



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1

EXERCISERS

The present invention relates to an exerciser for use in maintaining bodily fitness or for the exercise of injured or damaged muscles.

The present invention consists in an exerciser comprising a pair of arms pivotally connected at one end, and a fluid pump connected to the arms such that relative movement between the arms will serve to pump the fluid into, or out of, a fluid reservoir through a path which includes an aperture of a restricted cross sectional area.

It is known that muscular development can be attained through muscular effort and numerous spring devices are known which are designed to provide appropriate work to stimulate muscular development. The present exerciser is designed to provide a compact device which will offer an alternative to the known spring exercisers.

The aperture of restricted cross sectional area is preferably of variable cross sectional area to enable a user to regulate the pressure which needs to be applied to the handles on the free ends of the arms to move the arms from an "open" to a "closed" position in a given time. This enables the device to be of far greater use as the force required to operate the device at a given rate can be adjusted to take account of muscular development which takes place over a period of use. The known spring exercisers have the disadvantage that the force required to operate the exerciser cannot be controlled at will over a wide range of values.

The use of a pair of pivotally connected arms as the operating members of the device allows a very wide range of exercises to be performed and the exercise can be carried out over the maximum possible distance.

In a preferred embodiment of the invention the fluid pump comprises a cylinder pivotally connected to one arm and a rod bearing at its end a piston projecting into the cylinder, the rod being pivotally connected at its other end to the other arm, the blind end of the piston is provided with at least one stop cock which connects, via a flexible tube, with a fluid reservoir. The stop cock being adjustable to vary the force which must be applied to move the arms relatively together or apart in a given time.

The fluid is preferably oil and the reservoir is conveniently positioned within one of the arms of the exerciser. There is preferably provided in the reservoir a spring loaded piston which moves in accordance with the inflow or outflow of the fluid into and out of the reservoir.

If desired one arm can be provided detachably with a stirrup for engagement with the foot of the exerciser; in this way the exerciser can be used in bending exercises in which the body is moved from a "touch toes" position to a position in which the trunk of the body is at right angles to the legs, or it can be used for knee bending exercises against the resistance of the exerciser.

Hereinafter given by way of example only is a preferred embodiment of the invention described with reference to the accompanying drawing which shows an exerciser according to the invention in side view, partly in section.

The exerciser 10 comprises a pair of arms 11 of tubular aluminium having a circular cross section. Each of the arms 11 is provided at one end with a steel boss 12,

2

the bosses being pivotally connected to one another by a bolt 13 passing through transverse holes in the overlapped bosses 12. The arms 11 are each provided with a handle 14 at their free ends.

A first of the arms 11 is provided intermediate its length with an aperture 15, the portions of the arm 11 adjacent the aperture being spaced apart sufficiently to allow a 1 inch diameter aluminium tube 16 to protect therethrough. The tube 16 is pivotally connected by pivot bolts (not shown) at one end to the first arm 11 while its other end is closed. The tube 16 is provided adjacent its closed end with a pair of stop cocks 17. A rod 18, bearing at its free end a piston 19, projects into the tube 16, the piston 19 forms a fluid tight seal with the inner wall of the tube 16. The other end of the rod 18 is pivotally connected to the other arm 11 intermediate its length in a position corresponding to the position at which the tube 16 is connected to the first arm 11.

The stop cocks 17 are each connected via flexible duct 21 with an inlet 22 to the inside of the second arm 11, the inlet being positioned adjacent the pivotally connected bosses 12. A spring loaded piston 23 is positioned within the second arm 11 and is biased towards the end of the arm adjacent the pivotally connected bosses 12.

In the use as the arms 11 are moved together from an "open" position to a "closed" position the piston 19 at the end of the rod 18 is forced down the tube 16 thereby pumping the oil 24 in the tube out through the restricted apertures of the stop cocks 17, and through the flexible ducts 21 into the fluid reservoir in the second arm 11. Similarly as the arms 11 are moved relatively apart fluid is drawn from the reservoir in arm 11 through the restricted apertures of the stop cocks into the tube 16.

The apertures of the stop cocks 17 are adjustable to vary the resistance to the relative opening and closing of the arms such that the force that must be applied to open or close the arms in a given time can be varied.

If desired a detachable stirrup 25 can be connected to the handle 14 of one of the arms 11 in order that the leg and trunk muscles of a user may be exercised as well as the arm muscles.

I claim:

1. An exerciser comprising a pair of arms pivotally connected at one end, and a fluid pump connected to the arms, said fluid pump comprising a cylinder pivotally connected to one arm and a rod bearing at its end a piston projecting into the cylinder, the rod being pivotally connected at its other end to the other of the said arms, the blind end of the piston being provided with at least one stop cock constituting an aperture of a restricted cross-sectional area, the stop cock being connected to a fluid reservoir containing fluid and positioned within one of said arms, whereby relative movement between the arms will serve to pump the fluid into, or out of said fluid reservoir through said stop cock constituting said aperture.

2. An exerciser as claimed in claim 1 in which a aperture of restricted cross sectional area is of variable cross sectional area.

3. An exerciser as claimed in claim 1 in which the arm including the reservoir is tubular and the reservoir is defined by the internal wall of the arm and a spring loaded piston movable along the longitudinal axis of the arm.

4. An exerciser as claimed in claim 1 in which the fluid is an oil.

5. A exerciser as claimed in claim 1 in which a detachable foot stirrup is provided at the free end of one of the arms.

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