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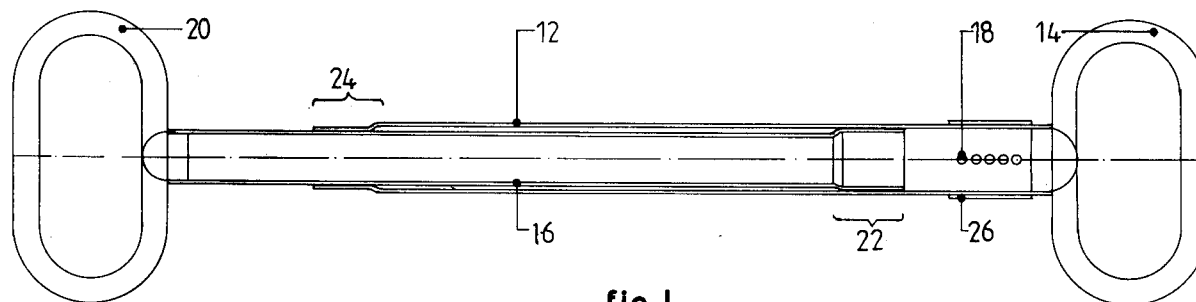
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REDDIE & GROSE 16 Theobalds Road
London WC1X 8PL(GB)(54) **An exerciser.**

(57) A tubular piston element 16 is displaceable within a tubular cylinder element 12 by gripping the respective handles 20 and 14. Apertures 18 provide for controlled displacement of water into and out of

the chamber defined between the tubular elements 12 and 16. The resistance to movement by the user is variable according to the number of apertures 18 which are closed.

**fig 1****EP 0 492 008 A1**

THIS INVENTION relates to an exerciser. More particularly, the invention relates to an exerciser for exercising under water.

According to the invention there is provided an exerciser for exercising under water, which includes

two hollow tubular elements displaceable relative to each other, the hollows of the elements defining a chamber between them, the volume of which chamber is variable by the displacement of at least one of the two elements into the other;

gripping formations for gripping the elements and facilitating displacement of the elements relative to each other; and

at least one passage for permitting controlled displacement of water into and out of the chamber, the water displaced into and out of the chamber, being water from the under water environment.

The two relatively displaceable elements may include an elongate cylinder element and an elongate piston element reciprocally displaceable within the cylinder element, the piston element projecting from one end of the cylinder element.

The gripping formations may conveniently be handle formations secured to the opposite free ends of the cylinder element and the piston element, respectively.

Both the piston element and the cylinder element may be in the form of rigid elongate pipes or tubes blocked off at the free ends thereof where the handle formations are defined, these elements being of suitable materials such as a metal material, a synthetic plastic material, or the like. Clearly, the outer diameter of the piston element may be such that it snugly fits into the cylinder element while permitting reciprocal displacement between the two elements.

The passage formation may be in the form of a vent formation and, as such, the exerciser of the invention may include control means for controlling the effective size of the vent formation and, as such, the passage of water that can pass through the vent formation, when the apparatus is in use.

The vent formation may particularly be constituted by a series of apertures defined within the wall of the cylinder element near the end thereof where the handle formation is defined. As such, the control means may include a sleeve that is slidably received on the cylinder element between positions where only selected apertures forming the vent formation are exposed to permit the flow of water into or from the chamber defined between the piston and cylinder elements.

Further features of the exerciser of the invention including the mode of use thereof is described hereinafter with reference to an example of the invention illustrated by way of drawings. The invention is now described, by way of an example, with

reference to the accompanying diagrammatic drawings, in which ;

Figure 1 shows a cross-sectional side view of an exerciser for exercising under water, in accordance with the invention ; and

Figures 2(a) and 2(b) show cross-sectional side views of a piston element (a) the cylinder element respectively, of the exerciser of Figure 1.

Referring to the drawings, and exerciser for exercising under water, in accordance with the invention, is generally indicated by the reference numeral 10. The exerciser 10 comprises an elongate rigid element 12 within which an elongate piston element 16 is reciprocally displaceable.

The cylinder element 12 and piston element 16 are of any suitable material such as a metal material, synthetic plastic material, or the like. More particularly, the elements 12 and 16 are in the form of elongate pipes closed off at the free ends thereof, a handle formation 14 being provided at the free end of the cylinder element 12 and a handle formation 20 being provided at the free end of the piston element 16. The handle formations may also be of any suitable material.

Clearly, the outer diameter of the piston element 16 is slightly less than the inner diameter of the cylinder element 12, thus enabling the piston element to be snugly received within the cylinder element while still permitting reciprocal displacement of the piston element within the cylinder element. The two handle formations, 14 and 20, can clearly be gripped in order to permit reciprocal displacement of the piston element 16 within the cylinder element 12.

Still further, a flange formation 22 is provided on the piston element 16 near the end thereof opposite to its handle formation 20, the flange formation 22 providing for sealing engagement between the piston element 16 and cylinder element 12, thus preventing the possible passage of water between these elements.

Still further, a constricted lip 24 is provided at the end of the cylinder element 12 remote from its handle formation 14, the lip 24 serving as a stop that can co-operate with the flange formation 22 in order to prevent the piston element 16 to be completely retracted from the cylinder element 12. Clearly, both the flange formation 22 and the lip 24 also provide for sealing engagement between the elements 12 and 16, preventing possible leakage of water between these elements during reciprocating displacement of these elements with respect to one another. The piston element 16 is inserted into the cylinder element 12 by shrink fitting the flange formation inside the cylinder element 12.

The exerciser 10 further includes a vent formation which is constituted by a series of apertures 18 defined in the wall of the cylinder element 12

near its closed end. A control element in the form of a sleeve 26 is provided that is slidably displaceable on the cylinder element 12 and that can provide for selective exposure of one or more of the apertures 18. As such, the effective passage size leading into the chamber defined between the cylinder element 12 and piston element 16 is thus controllable for the purpose hereinafter defined. It will be appreciated that many other suitable arrangements can be provided for controlling the passage of water into or from the chamber defined between the cylinder element 12 and piston element 16.

An exercise routine can be carried out under water using the exerciser 10 completely submerged in water with one or more of the apertures 18 of the vent exposed. This exercise is carried out by the reciprocal displacement of the piston element 16 within the cylinder element 12 which will require water to be drawn into the chamber defined between these elements through apertures 18 when displacing the handle formations away from one another, while this water must again be expelled through the apertures 18 when pushing the handle formations towards one another. Clearly, depending on the speed of displacement required, a user will have to impart predetermined forces for displacing the elements with respect to one another, thus exercising predetermined muscles of his body. Depending on the number of apertures exposed, the force required for displacing the piston element within the cylinder element can clearly be increased or decreased, thus ensuring that all individuals can effectively benefit by use of the exerciser. It is in fact believed by the Applicant that by progressively exposing fewer apertures and rhythmically reciprocating the piston element in the cylinder element at a constant rate, an isometric exercise routine can be effected with beneficial effects on the body.

It is also envisaged that one of the elements 12 or 16 can be fixed to a side wall under water, the other element thus being displaceable for the same purpose as is hereinabove defined and described. As such, the exerciser 10 can form part of an under water exercising frame attachable to the side wall of a pool, which exercising frame can permit exercising under water.

Claims

1. An exerciser for exercising under water, characterised in that it includes

two hollow tubular elements displaceable relative to each other, the hollows of the elements defining a chamber between them, the volume of which chamber is variable by the

displacement of at least one of the two elements into the other;

gripping formations for gripping the elements and facilitating displacement of the elements relative to each other; and

at least one passage for permitting controlled displacement of water into and out of the chamber, the water displaced into and out of the chamber, being water from the under water environment.

2. An exerciser as claimed in Claim 1, in which the elements are an elongate cylinder element and an elongate piston element reciprocally displaceable within the cylinder element.
3. An exerciser as claimed in Claim 2, in which the cylinder element and the piston element are cylindrical pipes blocked off at their respective free ends, the gripping formations being provided at the free ends.
4. An exerciser as claimed in Claim 1, in which the passage formation is a vent formation.
5. An exerciser as claimed in Claim 4, in which the vent formation includes control means for controlling the effective size of the vent.
6. An exerciser as claimed in Claim 4, in which the vent formation comprises a series of apertures.
7. An exerciser as claimed in Claim 3, in which the cylinder element comprises a series of aperture formations providing passages for controlled displacement of water into and out of the chamber defined between the said cylinder element and the piston element inserted therein.
8. An exerciser as described and as illustrated herein with reference to the accompanying drawings.

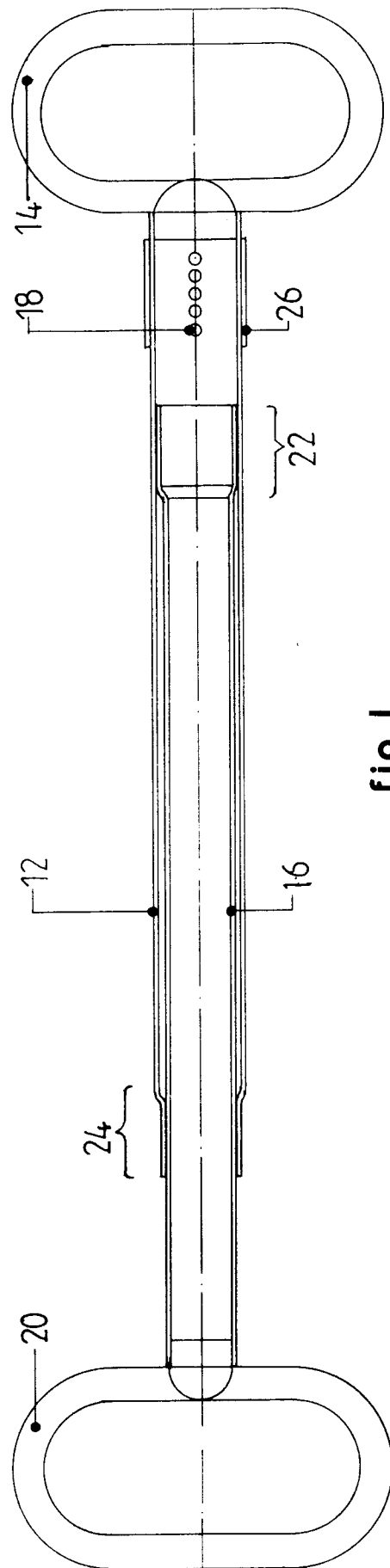


fig 1

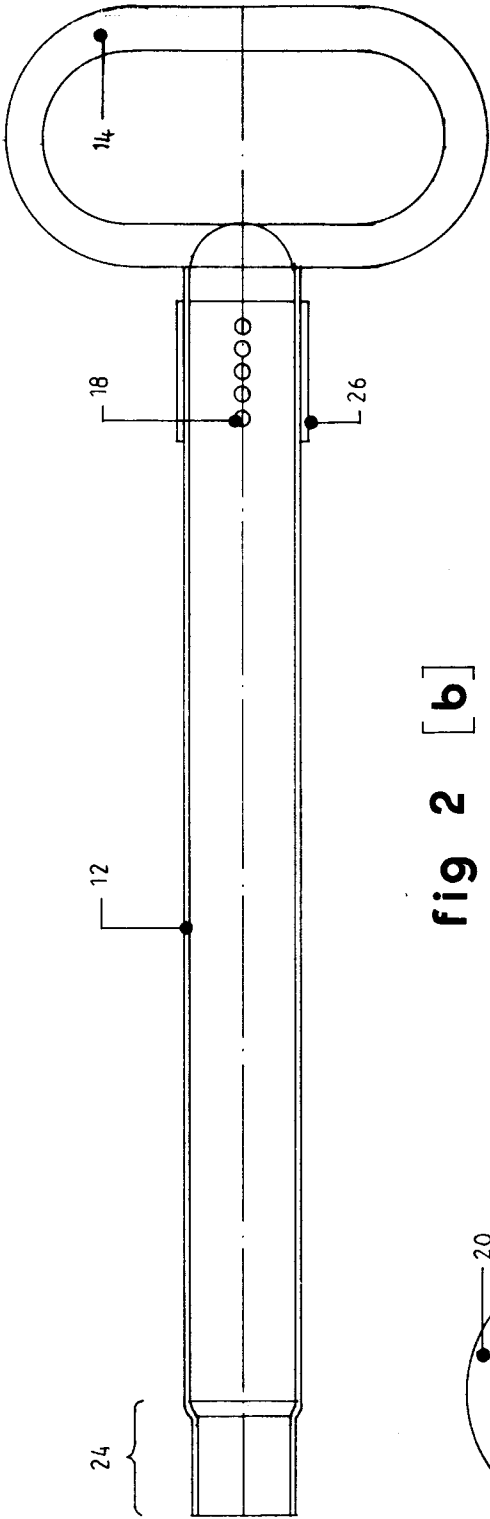


fig 2 [b]

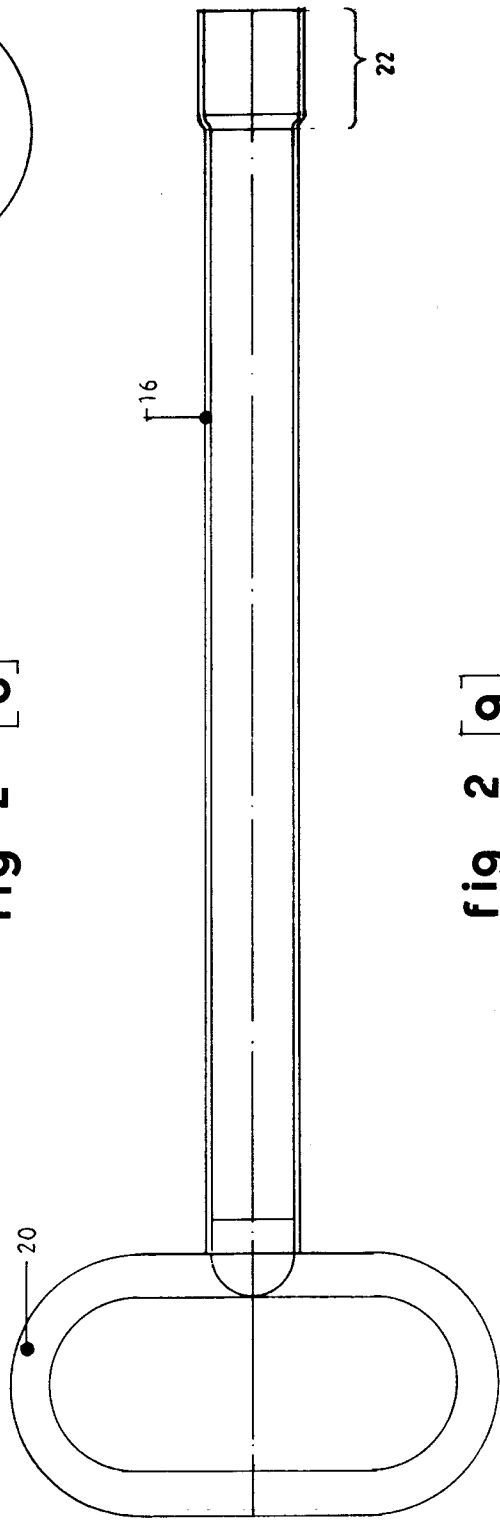


fig 2 [a]



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 90 31 4034

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-3 834 696 (SPECTOR) * column 2, line 54 - column 3, line 5; figures 3,4 *	1-3	A 63 B 21/008
A	US-A-4 416 451 (SOLLOWAY) * column 1, line 53 - column 2, line 60; column 5, line 55 - column 6, line 43; figure *	1	
A	FR-A-2 117 776 (PORNIN) * page 2, line 3 - page 3, line 4; claims 1-3; figure *	1,2,4	
A	FR-A-2 176 269 (PORNIN) * claims 1,2,4,5; figure 1 *	1,4,5	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 63 B
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 15-08-1991	Examiner MONNE E.M.B.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	