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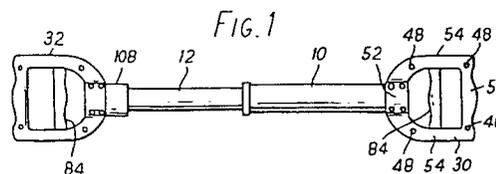
Applicant: **D.H. CULVERWELL & SON LIMITED**
Wilec House 82-88 City Road
London EC1Y 2BY(GB)

Inventor: **Rolt, Alan Frederick**
Wilec House 82-88 City Road
London EC1Y 2BY(GB)

Representative: **Brown, David Alan et al,**
MATHYS & SQUIRE 10 Fleet Street
London EC4Y 1AY(GB)

Exercising apparatus.

Exercising apparatus of the kind comprising an elongate member capable of compression and extension and having at each end a handle arranged so that a user can grip the handles one in each hand and alternately compress and extend the elongate member, the elongate member including means providing a resistance to compression and/or extension which must be overcome by the user. In the exerciser of the invention, each handle 30, 32 includes two members 56, 84 movable towards one another against resilient biasing means and capable of being gripped and moved by the user's hand thereby to exercise the muscles of the hand and fingers, so that these muscles can be exercised at the same time as those of the arms.



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This invention relates to exercising apparatus.

More particularly, the invention relates to exercising apparatus of the kind comprising an elongate member capable of compression and extension and having at each end a handle arranged so that a user can grip the handles one in each hand and alternately compress and extend the elongate member, the elongate member including means providing a resistance to compression and/or extension which must be overcome by the user. Such exercisers (hereinafter called exercisers "of the kind set forth") are used in so-called isometric or isotonic exercises.

In one form of exercising device of the kind set forth, the elongate member comprises two coaxial tubes one fitting telescopically within the other with the handles fixed to the ends of the tubes, the inner tube defining a chamber which is oil-filled and housing a piston connected by a piston rod to the end of the outer tube. The piston has bores or valves through which oil can flow as the piston moves within the chamber but which provide a restriction to the oil flow so that force is needed to move the two cylinders towards and away from one another. Examples of this form of exerciser are shown in United States patent specification 3 834 696 and United Kingdom patent specification 2 000 035A.

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It is an object to this invention to provide an improved exerciser of the kind set forth.

This invention consists in an exerciser of the kind set forth, in which each handle comprises two members movable towards one another against resilient biasing means and capable of being gripped and moved by the user's hand thereby to exercise the muscles of the hand and fingers.

The exerciser of the invention thus enables the user to exercise the muscles of the hand and fingers at the same time as those of the arms.

Suitably, each handle comprises two side members extending parallel to the axis of the elongate member, a bridging member extending transversely between the ends of the side members, and a movable member extending transversely between the side members and guided for movement towards and away from the bridging member and biased away from the bridging member by the resilient biasing means.

The biasing means may be springs acting against the movable member.

One embodiment of the invention is illustrated in the accompanying diagrammatic drawings, in which:

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Figure 1 is a side view of an exerciser in accordance with the invention,

Figure 2 is a view on a larger scale, partly in section of a handle of the exerciser,

Figure 3 is a section on line III-III of Figure 2,

Figure 4 is a section on line IV-IV of Figure 2,

Figure 5 is a section, on a larger scale, through part of the telescoping cylinders of the exerciser, and

Figure 6 is a perspective view of an anchor plate for use with the exerciser.

Referring to the drawings, the exerciser comprises an outer cylinder 10 and an inner cylinder 12 telescopically received within the outer cylinder, the inner cylinder sliding in a plastics collar 11 fixed to the end of the outer cylinder. The inner cylinder 12 is closed at both ends to form a chamber 14 (Figure 5), which is partially filled with hydraulic fluid of suitable viscosity. Slidable within chamber 14 is a piston 16 mounted on the end of a piston rod 20 which extends through a seal in one end wall 18 of the inner cylinder 12 and is fixed as described below to the end wall 24 of outer cylinder 10. As described below, the piston 16 is formed with a number of ports through which the hydraulic fluid passes as the piston moves within the chamber 14, the dimensions of the ports being

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chosen to provide a suitable range of resistances to relative movement between the outer cylinder 10 and inner cylinder 12. A handle 30 is fixed to the outer end of cylinder 10 and a similar handle 32 is fixed to the outer end of cylinder 12.

As shown in Figures 2 to 4, the handle 30 includes a main frame 42, of moulded plastics, formed in two halves 44 and 46 joined together by suitably disposed bolts 48 and 50. The main frame 42 consists of a base portion 52, two parallel side members 54 and a bridging member 56 extending transversely between the ends of the side members 54.

The base portion 52 is secured to the cylinder 10 by means of a steel locking piece 58 comprising an annular base 60 which lies against the end wall 24 of the cylinder 10 and two lugs 62 extending at right angles from the base 60. The lugs 62 fit into complementary slots 64 defined by opposed recesses in the two halves 44 and 46 of the handle, and the handle is retained in place by bolts 66 extending through bores 68 in the handle halves aligned with holes 70 in the lugs 62. The threaded end 72 of the piston rod 20 passes through a nut 74 inside cylinder 10, through the end wall 24 of the cylinder and through the centre of base 60 of the locking piece 58. A locking nut 76 engages the end of the rod 20 to hold the locking piece in position.

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Each side member 54 of the handle 30 is formed with a cylindrical bore 80 housing a compression spring 82. A movable member 84, extending transversely between side members 54, is formed with outer end portions 86 slidable within the bores 80. Each portion 86 is joined to the main part of movable member 84 through a portion 88 of reduced thickness, which extends through a slot 90 formed in the corresponding side member 54, the slots 90 allowing movement of the movable member 84 towards and away from the bridging member 56 of the handle.

The springs 82 act between the ends of the bores 80 and the portions 86 of movable member 84, to bias the movable member 84 away from the bridging member 56 to the position shown in the drawings. A spring guide in the form of a rod 91 extends through each spring and through a bore in the end portion 86 of the member 84.

Handle 32 is constructed in a similar manner to handle 30. The dimensions of the handles are 30 and 32 such that, when a user holds the exerciser with one hand holding each of the handles, the user can grip the movable member 84 of each handle with his fingers and draw it, by a gripping motion, towards the bridging member 56 against the bias of the springs 82. The user can therefore use the exerciser to exercise the muscles of the hand.

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As shown in Figure 5, the piston 16 consists of a fixed member 92 welded to the piston rod 20 and a rotatable member 94 which can rotate on the piston rod 20 whilst being held axially by nut 96. Rotatable member 94 is formed with a number of bores 98 of different diameters (only two of which are shown) spaced circumferentially around the piston rod, whilst fixed member 92 has a single bore 100 of diameter at least as great as the largest diameter bore 98 in the rotatable member. The rotatable member 94 can take up a number of angular positions relative to the fixed member 92, in each of which one of the bores 98 is aligned with the bore 100, the rotatable member being held in each position by means of a click-stop device, such as one or more ball bearings (not shown) housed in recesses in the movable member 94 and biased outwards by compression springs into engagement with shallow recesses in the fixed member 92. The movable member 94 can be rotated to a selected position by means of a locating pin 102, fixed at the end of cylinder 10, which engages in a corresponding hole (not shown) in the member 94 when the piston 16 is moved to its end position in the cylinder 10. To rotate the movable member 94 from one position to another, the handles 30 and 32 are pushed together and then rotated until the member 94 is in the selected position. The position of the

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movable member 94 is indicated by the position of a plastics sleeve 108, fixed to the inner cylinder 12 by means of a grub-screw, relative to a fixed point marked on the end of the outer cylinder 10, the sleeve 108 having a number of markings each corresponding to one position of the movable member 94.

When the handles 30 and 32 are pushed together or pulled apart, to move the piston 16 within the cylinder 12, oil in the chamber 14 flows through the bores 98 and 100 in the piston from one side of the piston to the other. The resistance thus provided to movement of the piston depends on the diameter of the bore 98, so that by setting the movable member 94 to its different positions, the force required to move the handles 30 and 32 together or apart at any given speed can be varied. To allow for the increased volume taken up in chamber 14 by the piston rod 20 as the rod moves further into the cylinder 12, the chamber 14 is not completely filled with oil, a sufficient volume of air or other compressible gas being retained in the chamber.

Figure 6 shows a metal anchor plate 110 which can be inserted through the handle 30 or 32, between the movable member 84 and the bridging portion 56. The anchor plate has a central portion 112 defining a recess so that when the exerciser is placed vertically, with one handle resting on the ground, the

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plate 110 fits over the bridging portion 56 of the handle, with the two portions of the plate on either side of the central portion 112 engaging the ground on each side of the handle. The user can then place his feet on those two portions of the plate, to hold the handle in position on the ground whilst the other handle is alternately pulled up and pushed down to extend and compress the exerciser. The anchor plate is also provided with screw holes 114, by means of which it can be attached to a wall or other vertical surface, to enable pushing and pulling exercises to be carried out with one handle fixed to the wall.

It will be appreciated that modifications could be made in the described embodiment. For example, instead of springs 82 other biasing means could be employed. The composite piston 16 could be replaced by a single piston with a bore of fixed diameter. The invention could also be applied to exercisers other than those using a piston moving in an oil-filled chamber to provide resistance against compression expansion, for example to exercisers of the kind in which the handles are moved together against the force of a compression spring housed within two telescoping tubes.

CLAIMS:

1. Exercising apparatus comprising an elongate member capable of compression and extension and having at each end a handle arranged so that a user can grip the handles one in each hand and alternately compress and extend the elongate member, the elongate member including means providing a resistance to such compression and/or extension, in which each handle comprises two members movable towards one another against resilient biasing means and capable of being gripped and moved by the user's hand thereby to exercise the muscles of the hand and fingers.
2. Exercising apparatus as claimed in claim 1, in which each handle comprises two side members extending parallel to the axis of the elongate member, a bridging member extending transversely between the ends of the side members, and a movable member extending transversely between the side members and guided for movement towards and away from the bridging member and biased away from the bridging member by the resilient biasing means.
3. Exercising apparatus as claimed in claim 2, in which the biasing means are springs acting against the movable member.

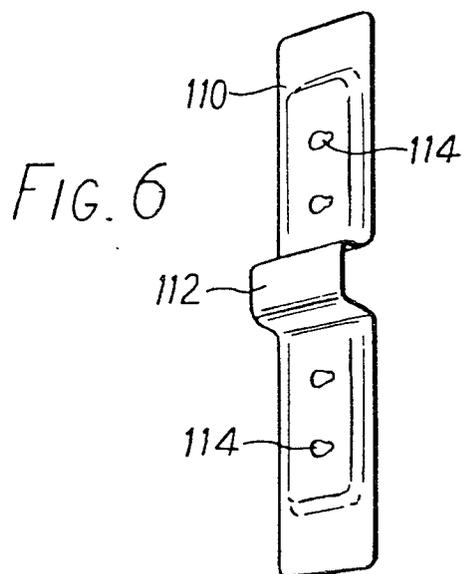
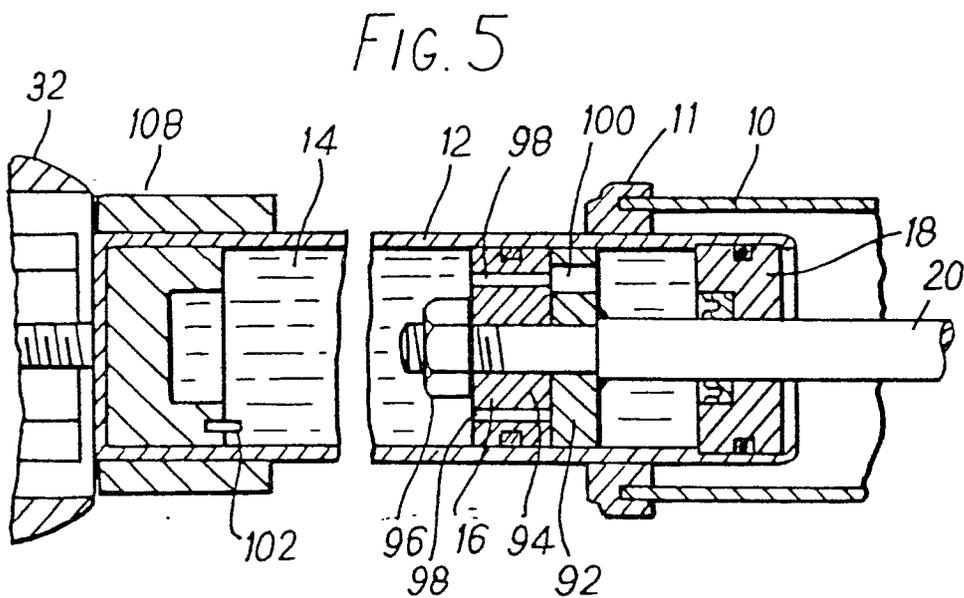
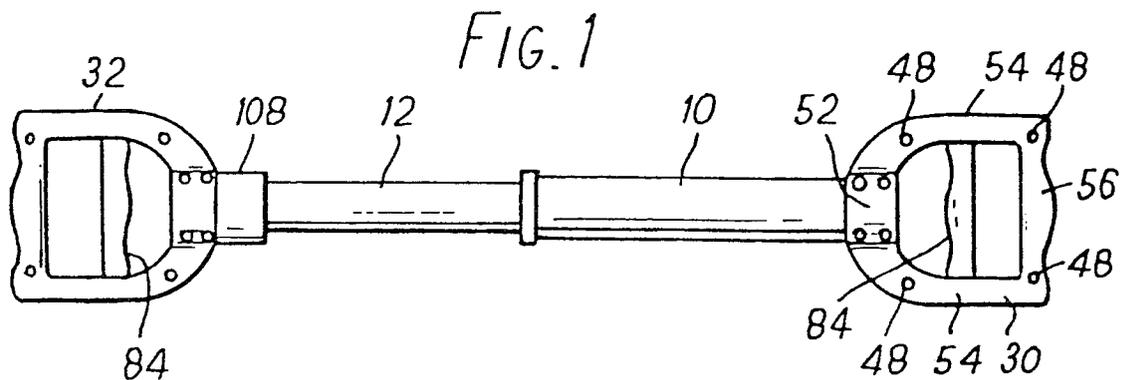
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4. Exercising apparatus as claimed in claim 3, in which each spring is housed in a bore in the associated side member of the handle and engages an end portion of the movable member, each said end portion being connected to a central portion of the movable member by a portion of reduced thickness which extends through an elongate slot in the side member of the handle.

5. Exercising apparatus as claimed in any preceding claim, in which the elongate member comprises two coaxial tubes one fitting telescopically within the other with the handles fixed to the ends of the tubes, the inner tube defining a chamber which is filled or partly filled with hydraulic fluid and which houses a piston connected by a piston rod to the outer tube, the piston having bores or valves through which oil can flow as the piston moves within the chamber but which provide a restriction to the oil flow so that force is needed to move the two cylinders towards and away from one another.

6. Exercising apparatus as claimed in claim 1, in which there is provided an anchor plate adapted to be positioned between the side members of one of the handles and having a recess shaped to receive the bridging member of the handle so that portions of the anchor plate on each side of the bridging

member can lie against a flat surface to enable the handle to be held by the anchor plate against movement away from the surface.



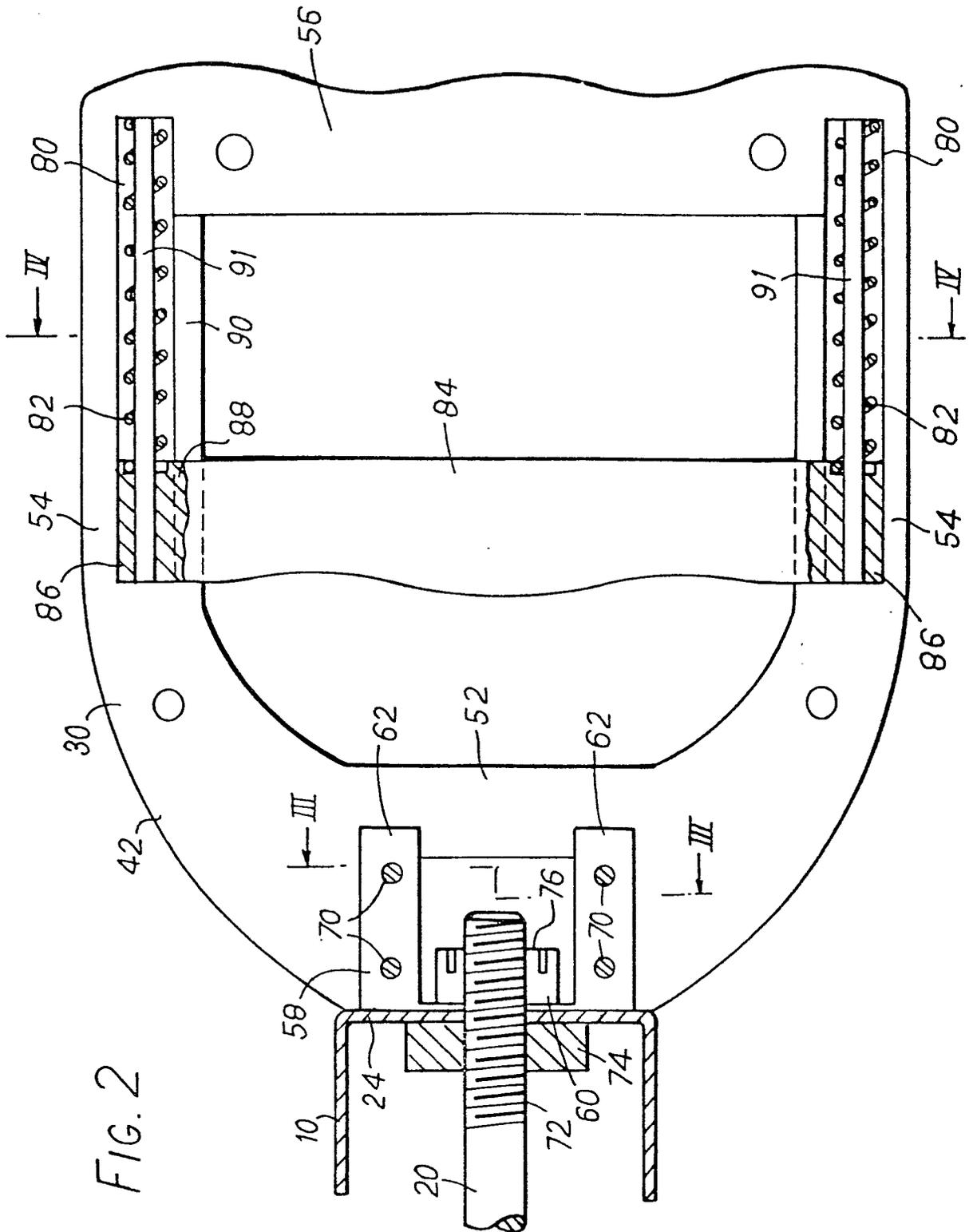


FIG. 3

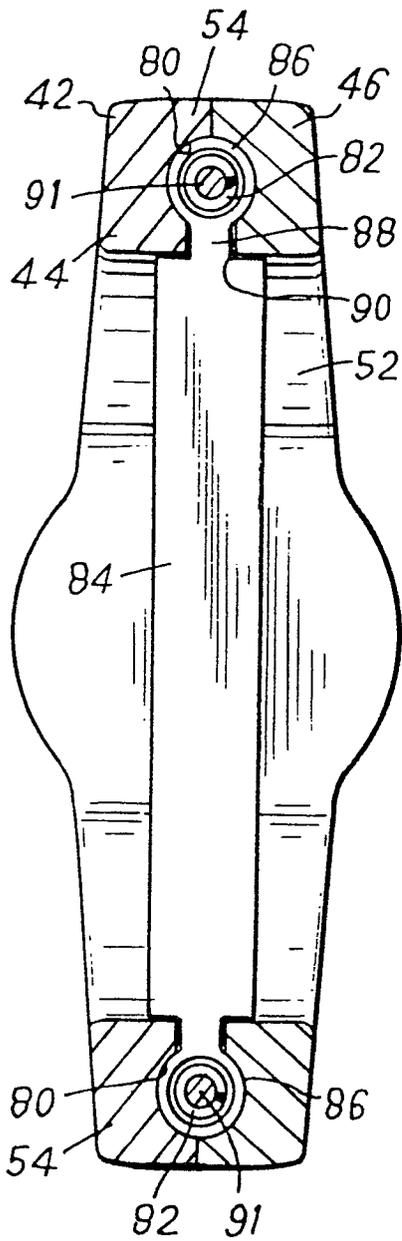
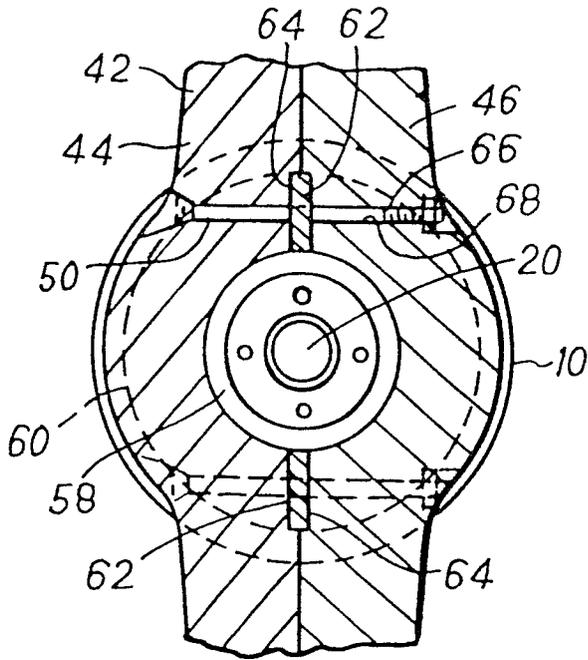


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

0030833
Application number
EP 80 30 4402

DOCUMENTS CONSIDERED TO BE RELEVANT		CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	<p><u>US - A - 1 877 218 (BLANK)</u> * Figures 1-4; page 1, lines 25-30; 60-100; page 2, lines 1-70 *</p> <p>--</p> <p><u>DE - C - 319 775 (HINKEL)</u> * Figures 1-3; page 1, lines 1-48 *</p> <p>--</p> <p><u>GB - A - 1 480 AD 1911 (CADDY)</u> * Figures 1,2,5; page 2, lines 5-21; page 3, lines 1-15 *</p> <p>--</p> <p>D <u>US - A - 3 834 696 (SPECTOR)</u> * Figures 3,4; abstract; column 4, lines 13-16 *</p> <p>-----</p>	<p>1,2</p> <p>1</p> <p>1-3</p> <p>5,6</p>
		A 63 B 21/14// 21/30 21/16
		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
		A 63 B
		CATEGORY OF CITED DOCUMENTS
		<p>X: particularly relevant</p> <p>A: technological background</p> <p>O: non-written disclosure</p> <p>P: intermediate document</p> <p>T: theory or principle underlying the invention</p> <p>E: conflicting application</p> <p>D: document cited in the application</p> <p>L: citation for other reasons</p>
<p><input checked="" type="checkbox"/> The present search report has been drawn up for all claims</p>		&: member of the same patent family, corresponding document
Place of search	Date of completion of the search	Examiner
The Hague	17-03-1981	MAROSCIA