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A6M MAX

(56) Documents Cited:
DE 020104029 A **DE 010123972 A**
JP 2002036375 A

(58) Field of Search:
UK CL (Edition X) **A6M**
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Other: **Online: EPODOC, WPI,**

(54) Abstract Title: **An exercise device**

(57) An exercise devise comprises a plate 1 attached to supports 3 by a joint 5. The foot is placed on the plate with the heel placed against a supporting ridge 2 and the plate tilted by movements of the toes and heel, enabling the user to exercise in a confined space such as seated in a plane. The device may be made from plastic material, carbon fibre or other light weight materials and may be folded for storage. The device may also be used to exercise the forearm in a similar manner.

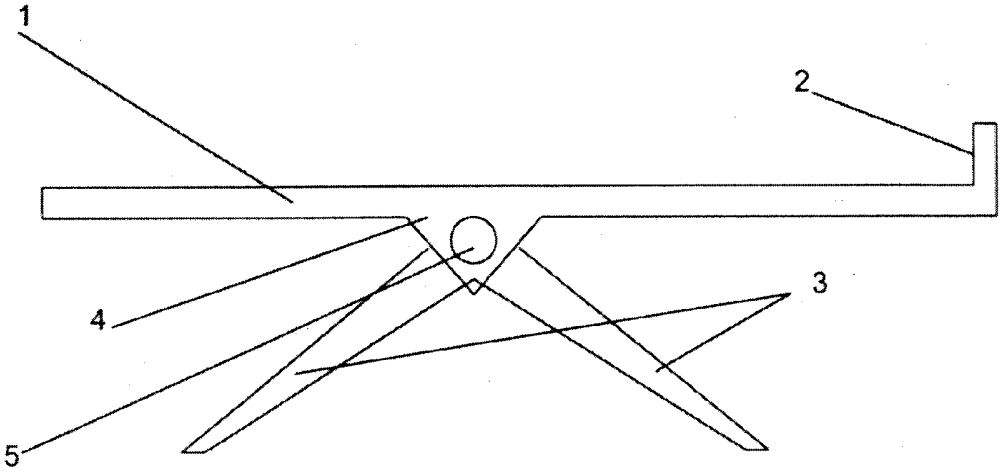

Fig. 1

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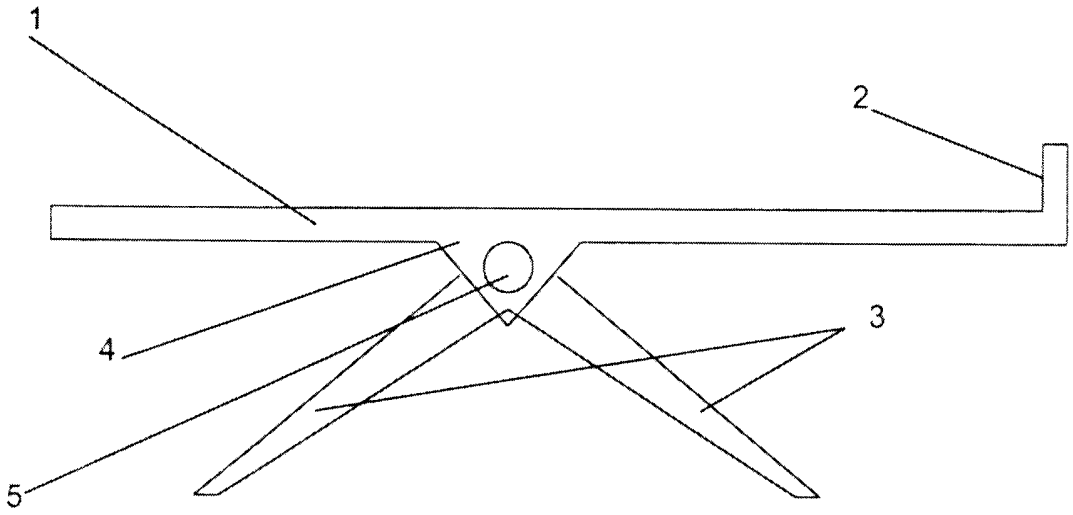

Fig. 1

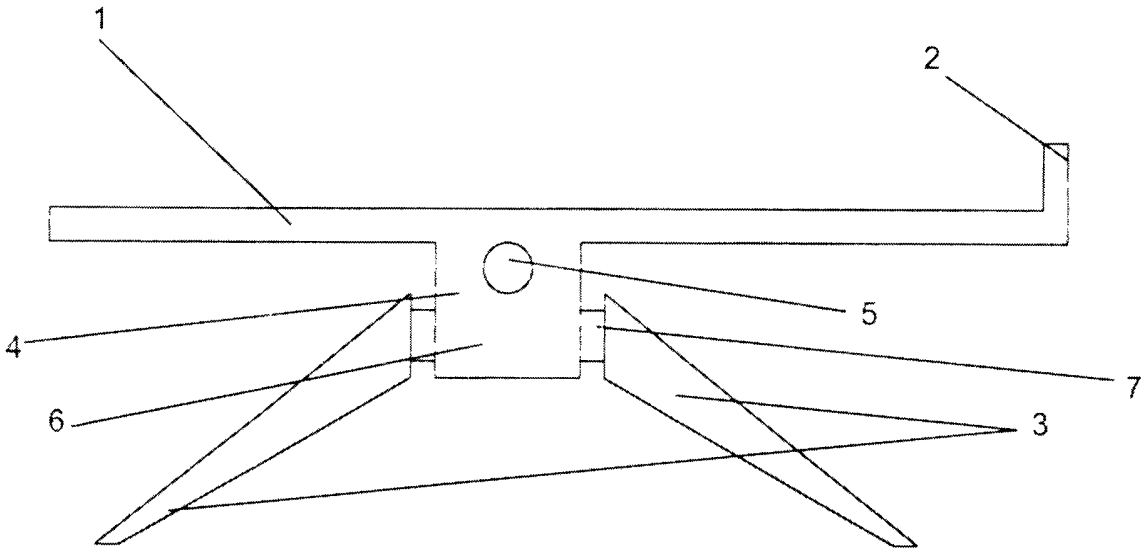

Fig.2

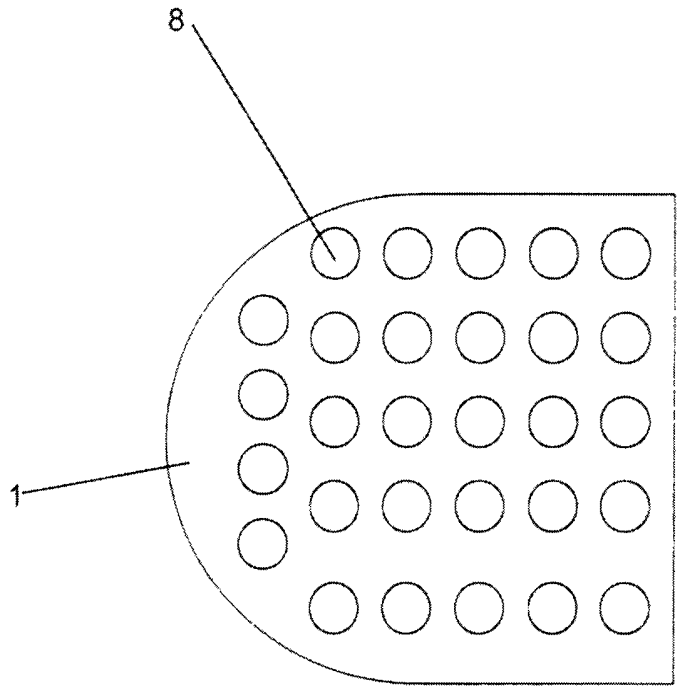

Fig. 3

Lower Limb and Forearm Exerciser

Exercise of the limbs has become more prevalent in recent years, mainly driven by an awareness of the need for healthier bodies, but also in the application of post-operative therapy.

One of the major concerns for which such exercise is used has been the increase in risk of deep vein thrombosis (DVT) due to long periods of inactivity, particularly in the lower leg and foot. When DVT occurs, a thrombus breaks free from the wall of a vein and circulates around the body with a risk of blocking a coronary or pulmonary artery, resulting in the high possibility of death to the individual.

Such periods of inactivity to the lower leg occur when sitting for long periods of time, often for several hours. This most often occurs whilst sitting on planes, trains, in vehicles and sitting at desks in an office environment.

Exercise of the lower leg and also the forearm is essential in many cases of post-operative therapy, to increase blood flow to muscle and for building up strength in these areas by exercising the joints, tendons and ligaments.

There are various ways in which such exercise is undertaken. In the case of DVT risk, there are cushions that inflate and deflate when pressure is put upon them by the foot, pedal pedestals which allow the individual to pedal, and spring loaded plates whereby pressure is applied by the foot against the pressure of springs.

In post-operative therapy, as well as the methods above, swimming, manual therapy by bending the joints, walking and weightlifting are all used to improve the condition of the limbs and joints.

To allow the exercising as described above to be undertaken successfully, a lightweight, easily portable device (the invention) is required that may be used in all environments and for all physical conditions as described herein.

The invention consists of a mainly oblong plate (Fig.1) (1) which is typically, but not limited to a length of 250-300mm. The width of such a plate may typically be, but not limited to 80-90mm and may be so shaped so as to have a waist half way along the length. On the lower side of the plate, there is a ridge (2) of around 10mm in height that follows the curvature of the lower side, so permitting the heel of the users foot to rest against and be supported by the ridge and plate. There may be lateral ridges on the upper surface of and across the width of the plate, so allowing the user a better grip with the foot, particularly when footwear is worn.

Where the user is not wearing footwear and only stockinged feet by way of socks, tights or stockings, there may be Velcro strips, rubber strips or other non slip material on the upper side of the plate, so assisting the user by way of a better grip against the plate. To reduce weight in the plate, yet not reduce its strength, the plate may have holes in, such holes to be of an aesthetic design.

The plate is supported by two pairs of legs (3) which are attached by a first hinged joint (4) The width of one pair of legs both at the top and bottom of that pair is narrower than the other pair of legs, so allowing the narrower pair to lie within the wider pair when folded against the plate for portability. The feet on each pair of legs will be fitted with rubber or similar non-slip material, so allowing the invention to remain stationery when in use.

The first hinged joint consists of a rod (5) which is fixed laterally across the width of the plate, half way along the length of and on the underside of the plate, about which the two pairs of legs rotate from a folded away position on the underside of the plate into an engaged position, ready for the user to use the invention. Which such a hinged, the user is able to place the foot on the plate and exercise the lower leg and ankle joint by rocking backwards and forwards in a vertical motion. This same exercise for the forearm and the wrist joint can be undertaken by placing the hand on the plate and rocking backwards and forwards in a vertical motion.

A further embodiment of the invention is a second hinged joint (6) (Fig.2). This hinged joint consists of a rod (7) which is fixed longitudinally along the length of the plate, whose mid point along its length is half way along the length of and half way across the width of and on the underside of the plate. This hinged joint is connected below, but does not limit the rotational movement of the first lateral joint so allowing the plate to be rocked side to side. By the use of two hinges, the user may place a foot or a hand on the plate and rotate the plate in a circular motion as well as up and down and side to side.

On the underside of the forward half of the plate, there can be a plurality of balls (8) (Fig.3) which when fixed into sockets on the underside of the plate, may rotate freely so allowing the invention to be held in the users hand and the underside of the forward half of the plate to be used as a massaging device against the users body when the two pairs of legs are folded away.

The plate and the two pairs of legs can be made from a plastic material, carbon fibre or any other strong lightweight materials such as light metal alloys.

The invention can be used singularly for one foot or hand or may be used in pairs, so allowing the user to exercise both feet or both hands at the same time.

The invention may be carried as such in a handbag, in a briefcase or any other bag, so allowing it to be transported by the user and then used on an aircraft, train, coach or anywhere else where inactivity of the limbs is prevalent.

CLAIMS

Re:- PEDEX – Application Number GB 0410536.7

A lower limb/forearm exerciser in the form of a lightweight and portable device with fold away/collapsible legs and either a solid footplate or one which folds in half by means of a hinge, pin or other device. It can be made from a plastic material, carbon fibre or other strong lightweight material such as light metal alloys.

The footplate consists of either a plain or patterned plate, or one with a plurality of rollers or balls fixed into sockets or by way of pins, on either the top or underside of the plate, allowing the rollers/balls to rotate freely. This will be beneficial for foot massage. Magnets for the benefit of the lower limb may also be included. The length of the footplate can differ between 8cms to 30cms and up to 12cms high.

The footplate is either:-

a. Connected to the legs by means of a hinge, pin or similar device located at or near to the centre of the plate. This forms a fulcrum which allows for an up and down rocking movement of both heel and toes. This allows effective exercise and increased blood flow to muscles, tendons and joints.

b. Seated on the legs by means of a connector, the plate will be affixed to the legs by a round or cross shaped snap in/push in joint, ball or pin which allows the plate to move up and down and also from side to side through 45% or less either side of the fulcrum. This is a universal type joint.

When placed on a level surface, the plate can accommodate a forearm for the purpose of exercise in the same prescribed manner for a foot or ankle.

INVESTOR IN PEOPLE

Application No: GB0410536.7 **Examiner:** Mrs Margaret Phillips

Claims searched: - **Date of search:** 6 June 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	-	JP 2002036375 A (OKA) See WPI Abstract 2003-036010 [03] and all figures
X	-	DE 20104029 A (RABE) See WPI Abstract 2001-434198 [47] and all figures
X	-	DE 10123972 A (BELLER) See WPI Abstract 2003-121966 [12]

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

A6M

Worldwide search of patent documents classified in the following areas of the IPC^{07}

A63B

The following online and other databases have been used in the preparation of this search report

Online: EPODOC, WPI,