EXERCISE PEDALING DEVICE FOR WHEELCHAIR

Applicant: Israel Polishuk, Gan Yavne (IL)
Inventor: Israel Polishuk, Gan Yavne (IL)
Appl. No.: 13/889,364
Filed: May 8, 2013

Foreign Application Priority Data
May 13, 2012 (IL) 219764

Publication Classification
Int. Cl. A63B 22/04 (2006.01)

ABSTRACT

An apparatus designed to provide a foot workout, which is attached to a wheelchair in such a way that the apparatus does not touch the floor, and which comprises a case, an attaching device used to attach the case to the wheelchair, and a pair of pedals. The attaching device comprises a rod whose top end attaches to the wheelchair and whose bottom end attaches to the case. The case contains a power source, an electric motor, a gearbox, and a relay system, such that when the patient activates the apparatus, the electric motor runs and turns the relay system to which the said pedals are attached.
Fig. 3
Fig 6
EXERCISE PEDALING DEVICE FOR WHEELCHAIR

TECHNICAL FIELD

[0001] The present invention refers to a device designed to provide a physical therapy workout for the feet that is intended for use by people in wheelchairs.

BACKGROUND ART

[0002] People with physical disabilities must often perform physical therapy for their feet. In some cases, the physical therapy is passive, i.e. the therapist grasps the patient’s foot and flexes it up and down repeatedly. This is a well-known treatment that requires a therapist who assists in the execution of the movement. Many of the people who require the aforementioned treatment have sclerosis. Such people usually use a wheelchair. The innovative apparatus, subject of the present invention, enables the patient to execute the feet workout without requiring the constant assistance of a therapist.

DESCRIPTION OF THE DRAWINGS

[0003] FIGS. 1 and 2 describe the apparatus (1) attached to a wheelchair (2).
[0004] FIG. 3 describes the attaching device (4).
[0005] FIG. 4 describes the internal components of the apparatus (1).
[0006] FIG. 5 describes the main axle (92).
[0007] FIG. 6 describes the pedal base (93).

THE INVENTION

[0008] The main objectives of the present invention are: (a) to provide an apparatus that enables people in wheelchairs to execute passive physical therapy without requiring the assistance of a therapist during the workout; (b) to provide an apparatus, as mentioned, that can be easily and efficiently attached to a wheelchair and can move around together with the wheelchair; (c) to provide an apparatus, as mentioned, that can be adjusted to standard wheelchairs according to need.
[0009] Drawings Nos. 1 and 2 present a general view of the apparatus (1), subject of the present invention, whereby it is attached to a wheelchair (2). In general, the apparatus (1) comprises a case (3), an attaching device (4) used to attach it to the wheelchair (2), and a pair of pedals (5).
[0010] The general method of operation of the apparatus (1): As depicted in Drawings Nos. 1 and 2, the apparatus (1) is attached to the bottom front part of the wheelchair in such a way that it does not touch the floor and the patient can use the apparatus (1) while moving around in the wheelchair. When the patient operates the apparatus (1), the pedals (5) move up and down. Specifically, the front of the pedal (5) moves up and down, repeatedly. Since the patient’s feet rest on the pedals (5) [they can also be strapped on according to need, using sandal-like straps], the physical therapy workout of the foot is performed automatically. Thus, the apparatus (1) can be stored aside and attached to the wheelchair (2) only when the patient wishes to perform the physical therapy workout.
[0011] Attaching the apparatus (1) to the wheelchair (2): The apparatus (1) is attached to the wheelchair (2) using an attaching device (4). The top part of the attaching device (4) attaches to the wheelchair and its bottom part attaches to the case (3) of the apparatus (1).

[0012] The attaching device (4): Drawing No. 3 presents a general view of the attaching device (4), which is used to attach the apparatus (1) [more specifically, the case (3)] to the wheelchair (2) and is designed so that it can be attached to a variety of standard wheelchairs. The attaching device (4) comprises a main vertical rod (41) that in fact is composed of two parts that are joined telescopically so that the main rod (41) may be lengthened or shortened according to need, i.e. to fit the wheelchair and the patient.
[0013] A horizontal, rectangular plate (42) with an elongated hole (43) protrudes perpendicularly from the bottom of the main rod (41). The horizontal plate (42) is attached to the case (3) using screws that tighten over the edge of the elongated hole (43) such that the position of the case (3) may be adjusted relative to the horizontal plate (42) by changing the location along the elongated hole (43) at which the screws are tightened.
[0014] Two arms protrude from the upper part of the main rod (41): a top horizontal arm (44) and a middle horizontal arm (45). The top horizontal arm (44) is horizontal [forming approximately a right angle with the main rod (41)] and has a vertical protrusion (411) at the end, which protrudes downward. The middle horizontal arm (45) is parallel to the top horizontal arm (44) and ends in a curved recess (451). The attaching device (4) is attached to the wheelchair (2) by inserting the vertical protrusion (441) into a hole in the vertical rod that constitutes part of the wheelchair (2), while the recess (451) fits onto the outside of the said rod and offers support. Thus, the attaching device (4) may be attached to the wheelchair in a simple, fast, and easy manner.
[0015] The apparatus (1) is positioned and adjusted to the wheelchair and the patient by shortening or lengthening the main rod (which is telescopic) so that the apparatus (and the pedals) are raised or lowered according to the size of the wheelchair and the patient. It is also possible to position the apparatus (and the pedals) closer to the patient by adjusting the location along the elongated hole (43) of the screws at the case (3) to the horizontal plate (42).
[0016] The case (3) is shaped like a box and it contains the internal components of the apparatus (1), which include: a power source (6), an electric motor (7), a gearbox (8), and a relay system (9). When the patient activates the apparatus (1), the electric motor (7) runs and turns the relay system (9) to which the pedals (5) are attached. Drawing No. 4 depicts the general structure within the case.
[0017] The motor (7) can be one of a wide variety of existing electric motors. The inventor recommends using a 24 volt motor, although the invention can be implemented also using other kinds of motors. The gearbox (8) is designed to decrease the rotational velocity of the motor to a speed that is reasonable for the action of the pedals (5). The final velocity of the main axle that moves the pedals can be between 6 to 10 rpm. The power source (6) can be either a direct connection to the electricity grid or batteries, preferably rechargeable batteries. The drawings attached to the present application depict a power source that comprises rechargeable batteries with a voltage that corresponds to the rating of the motor (7).
[0018] The relay system (9) depicted in Drawing No. 4 includes the following components: a cogwheel (91), the main axle (92), and the pedal base (93). When the motor (7) of the apparatus (1) is running, the cogwheel (91) turns the main axle (92) which, due to the nature of its connection to the pedal base (93), causes the pedal base to move such that the front of the pedal (931) rises while the back of the pedal (932)
descends (although not in direct proportion), and vice versa. Note: The relay system (9) moves both pedals (5) in an identical manner, as is evident from the drawings as well, and thus, to avoid redundancy, the explanation will be given only with respect to a single pedal.

[0019] The main axle (92), which is depicted in Drawing No. 5, is a long rod with a short arm (921) that protrudes from its end at an approximate 90 degree angle, and from whose other end protrudes another short arm (922), also at a 90 degree angle. The main axle (92) is attached to the floor of the case (3) by means of two legs (923). The bottom of each leg (923) is attached to the floor of the case and the main axle (92) is inserted through a horizontal hole at the other end of the leg.

[0020] The pedal base (93) is depicted in Drawing No. 6. The pedal base (93) comprises a base plate (933) with two perpendicular side arms (934). All three parts of the pedal base, i.e. the base plate (933) and the two arms (934), constitute one integral piece. The base plate (933) has an elongated hole (935). The short arm (922) is inserted into the elongated hole (935) such that when the main axle (92) turns, the short arm (922) turns as well, causing the pedal base (93) to move such that its front part (931) rises while its rear part (932) descends, and vice versa repeatedly. The pedal base (93) is attached to the floor of the case (3) by means of a support rod (936) that is connected to the pedal base through an axial connection at the corner between the base plate (933) and the rear side arm (934).

[0021] The apparatus (1) offers many advantages: (a) The apparatus enables the patient to perform the workout without requiring constant assistance of a therapist; (b) The apparatus enables the patient to control the apparatus’ action [the apparatus (1) has operation switches that are located near the patient’s hands and are connected to the case either by wire or wireless connection]; (c) The apparatus has a universal attaching method and thus can be attached to a wide variety of wheelchairs; (d) Attaching the apparatus to the wheelchair does not interfere with the patient’s ability to move around freely with the wheelchair.

[0022] While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

What is claimed is:

1. An apparatus that provides a foot workout, which is attached to a wheelchair in such a way that it does not touch the floor, and which comprises a case, an attaching device used to attach the case to the wheelchair, and a pair of pedals; whereby the said attaching device comprises a rod whose top end attaches to the wheelchair and whose bottom end attaches to the case of the apparatus; whereby the said case contains a power source, an electric motor, a gearbox, and a relay system, such that when the patient activates the apparatus, the electric motor runs and turns the relay system to which the said pedals are attached.

* * * * *