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(54) **INVERCYCLE DEVICE AND METHOD FOR EXERCISE**

(76) Inventor: **Mary Eloise Nelson**, Boulder, CO (US)

Correspondence Address:
MARY ELOISE NELSON
735 MORGAN DRIVE
BOULDER, CO 80303 (US)

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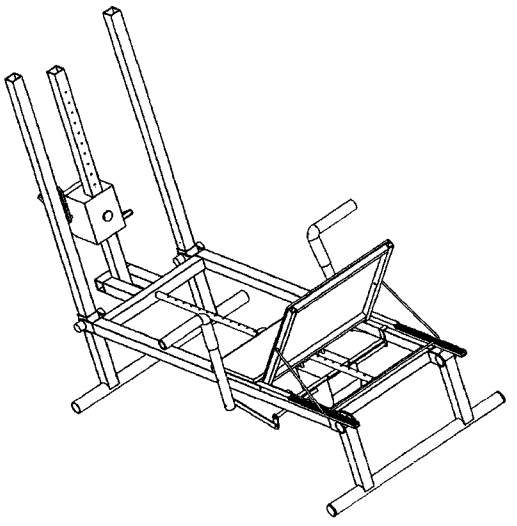
(57) **ABSTRACT**

The Invercycle is an exercise device with inversion options. The InverCycle comprises a bicycle/pedal assembly, an adjustable flat bench with a seat back that can be raised and lowered and moveable arm handles fastened to the sides of the bench/seat. The bicycle/pedal assembly is located at one end of the bench and may be raised and lowered, independently from the bench/seat, to allow the body position of feet above the head while pedaling the bicycle (either sitting up in recumbent position or lying down). The bicycle assembly allows a means for adjusting tension on the rotary motion of the pedals via a pressure knob (when rotated will apply force on the fly wheel, creating resistance). The front legs have pull pins, which allow for an adjustable inclination of the bench/seat and seat back. The seat/bench can be moved forward and backward as a means for adjusting the individual height requirement of each exerciser. The ability to adjust the angles of the bench/seat and the height of the pedal assembly provides the exerciser with various options for isolating specific muscle groups, including the buttocks, inner and outer thighs, hamstrings, quadriceps and abdominal muscles. Performing exercises while in an inverted posture will increase systemic blood circulation, massage internal organs and feed the heart and brain fresh blood. The moveable arm handles on the side of the bench provide resistance exercise. This type of motion will isolate bicep, tricep, shoulder and back muscles and can be performed while in an inverted posture or lying down in a vertical position with the feet above the head. The exerciser may simultaneously use the resistance handles while pedaling the bicycle. The seat back may be elevated, which allows the exerciser to be in a recumbent position. People who are overweight or a novice may benefit from the InverCycle as the vertical position of the bench allows the exerciser to begin by lying down and putting their legs and feet up. The adjustable pedal height and tension knob allows the exerciser to chose what level they wish to work at. When they are tired they can simply stop and rest. Any slight incline of the legs or entire body will provide the exerciser with the benefit of an increase in systemic blood circulation. The Invercycle may be appropriate for people who have a leg or back injury, as the bench provides full back support while isolating and strengthening muscles, increasing blood circulation and aerobic endurance. Intermediate and advanced exercisers may use the InverCycle for specific muscle isolation, aerobic conditioning and increasing blood circulation. No one should engage in exercise or inverted exercise without consulting a medical practitioner if there are concerns about any condition for which this is contraindicated.

FRONT PAGE VIEW



FRONT PAGE VIEW

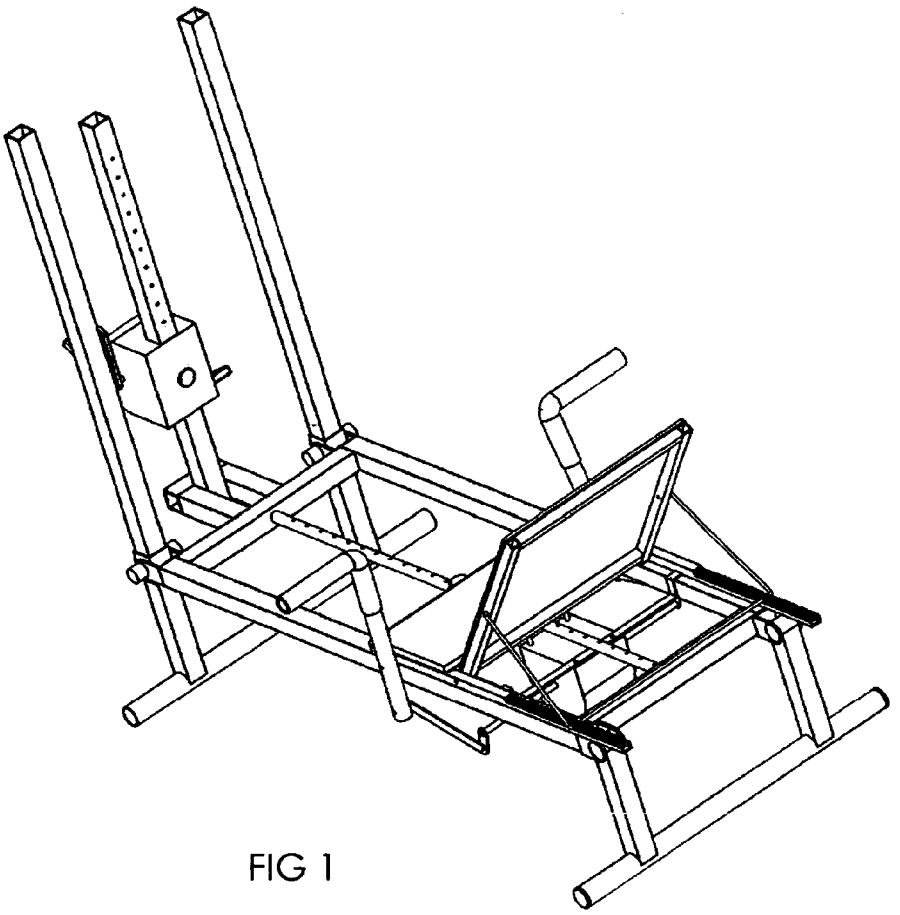


FIG 1

BENCH AND LEGS

SEE DRAWING PAGE 3 FOR ALTERNATE CONFIGUREATIONS

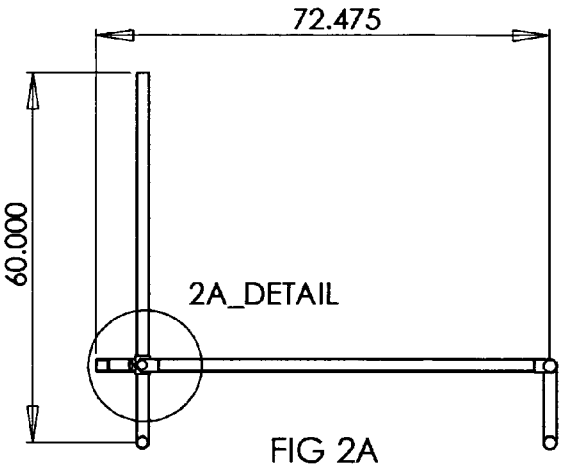


FIG 2A

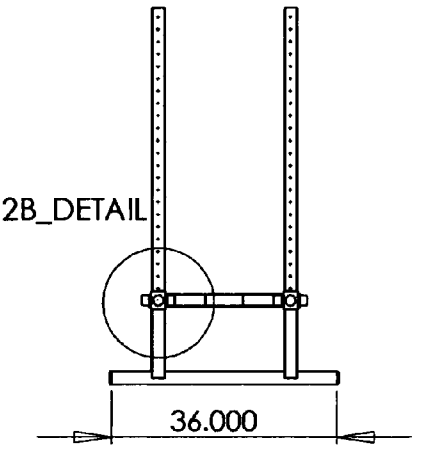


FIG 2B

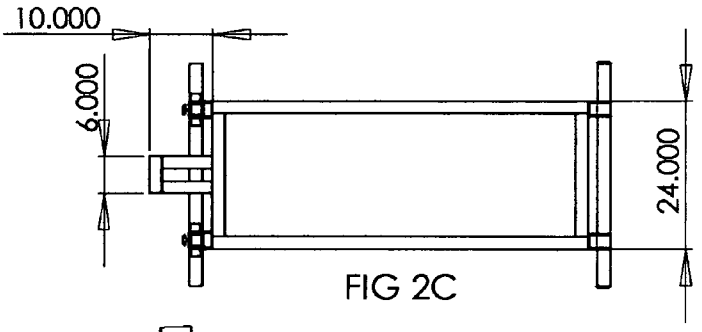
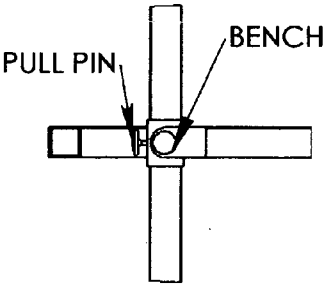
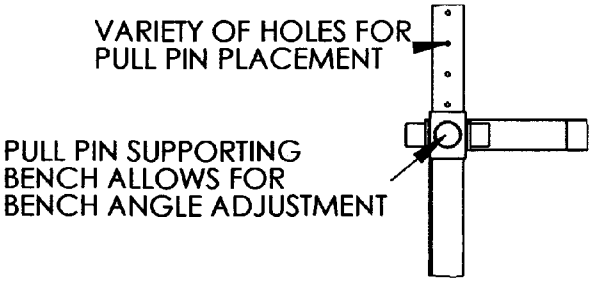


FIG 2C



2A_DETAIL
SCALE 1 : 10



2B_DETAIL
SCALE 1 : 10

ALTERNATE BENCH ANGLES

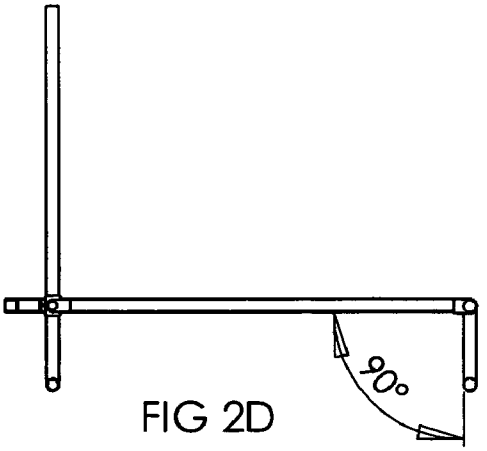


FIG 2D

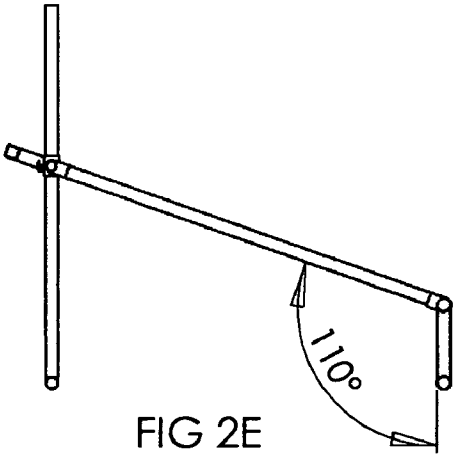


FIG 2E

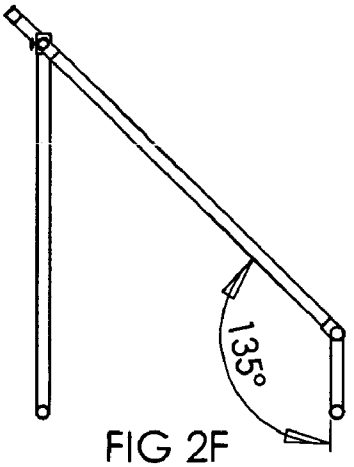


FIG 2F

SEAT - OVERALL VIEWS

SEE DRAWINGS PAGE 5 FOR ALTERNATE SEAT POSITIONS

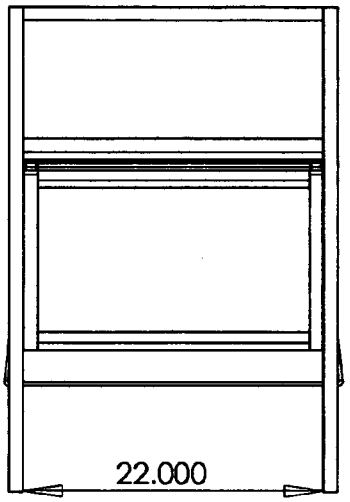


FIG 3A

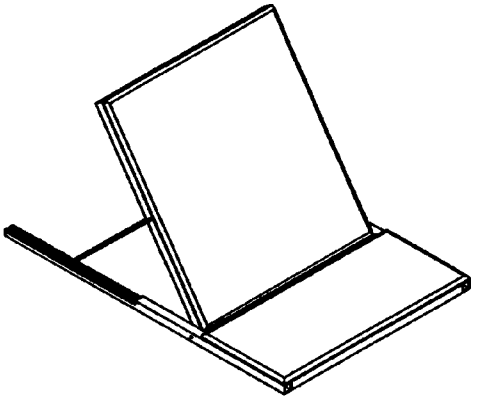


FIG 3B

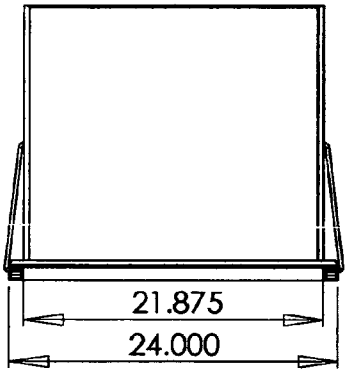


FIG 3C

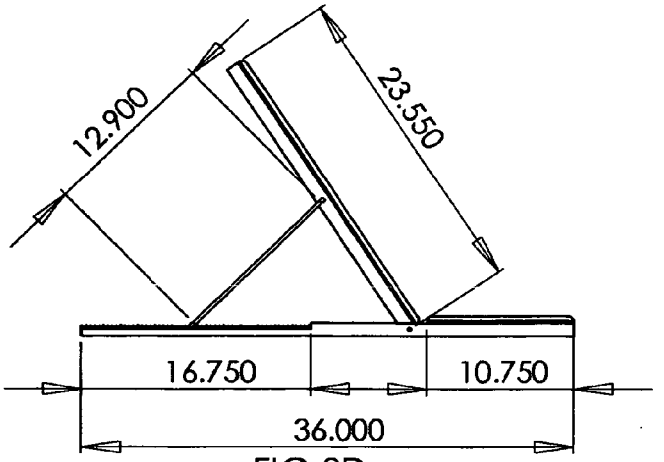


FIG 3D

ALTERNATIVE SEAT ANGLES

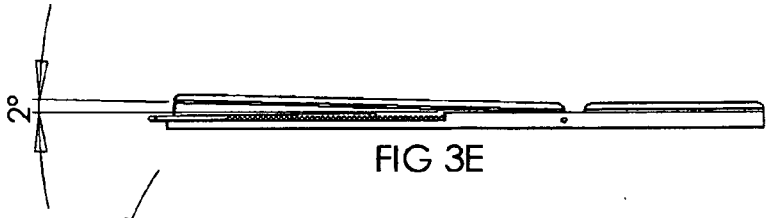


FIG 3E

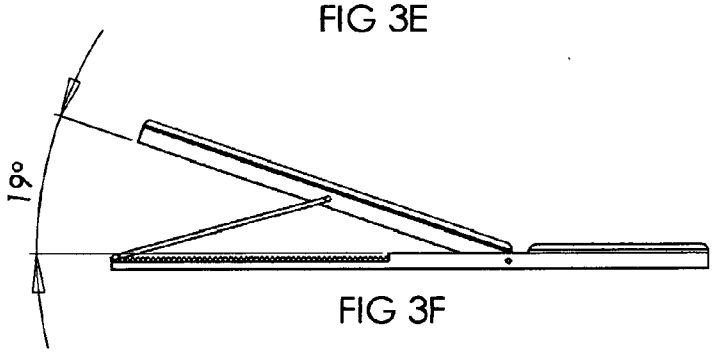


FIG 3F

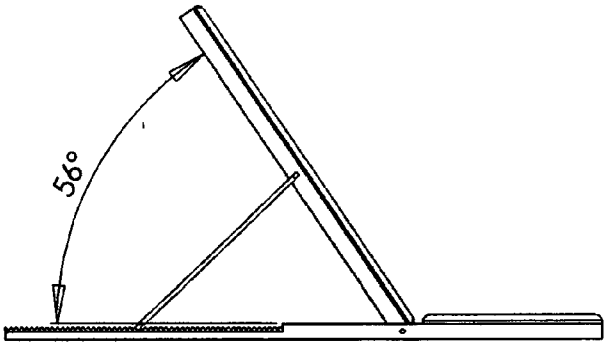


FIG 3G

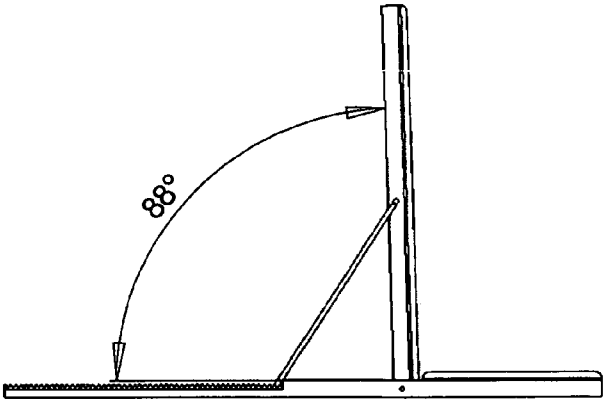


FIG 3H

PEDAL ASSEMBLY

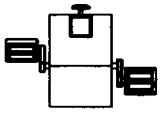


FIG 4A

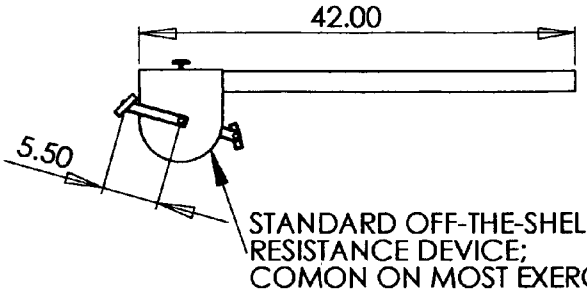


FIG 4B

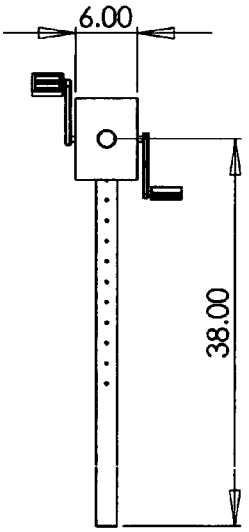


FIG 4C

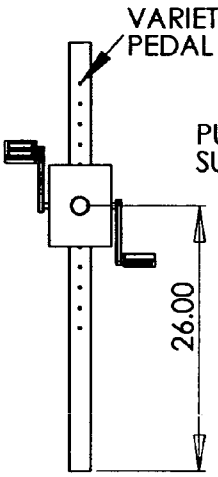


FIG 4D

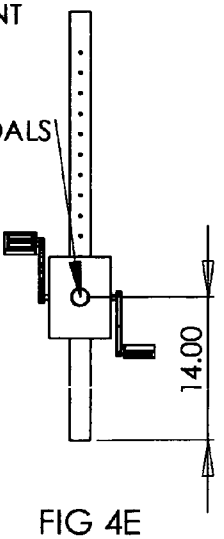


FIG 4E

VARIOUS PEDAL HEIGHT CONFIGURATIONS

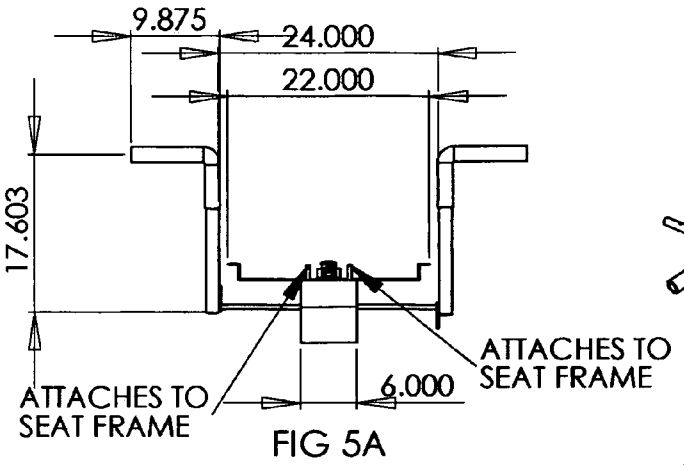
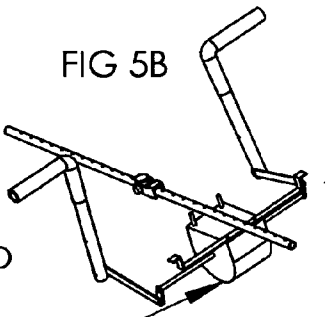


FIG 5A

HANDLE DETAILS AND SEAT ADJUSTMENT

FIG 5B



STANDARD OFF-THE-SHELF CIRCULAR RESISTANCE DEVICE; SIMILAR TO DEVICE FOR PEDALS

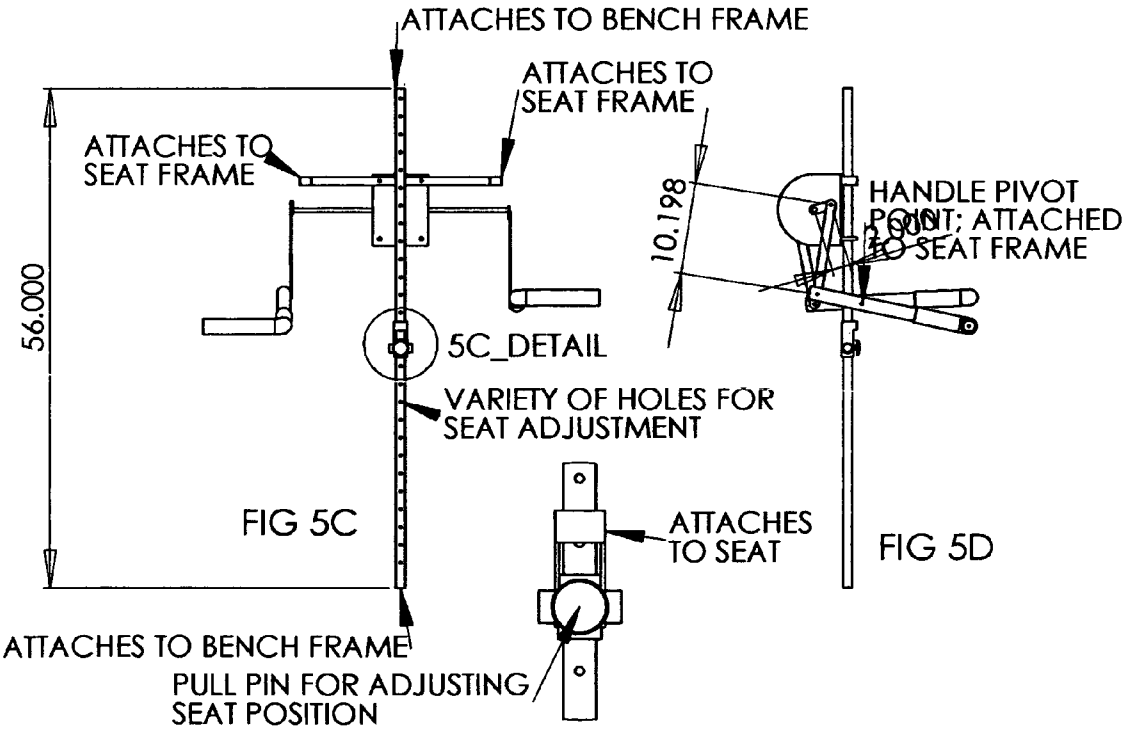


FIG 5C

FIG 5D

5C_DETAIL
SCALE 1 : 5

EXPLODED FINAL MODEL

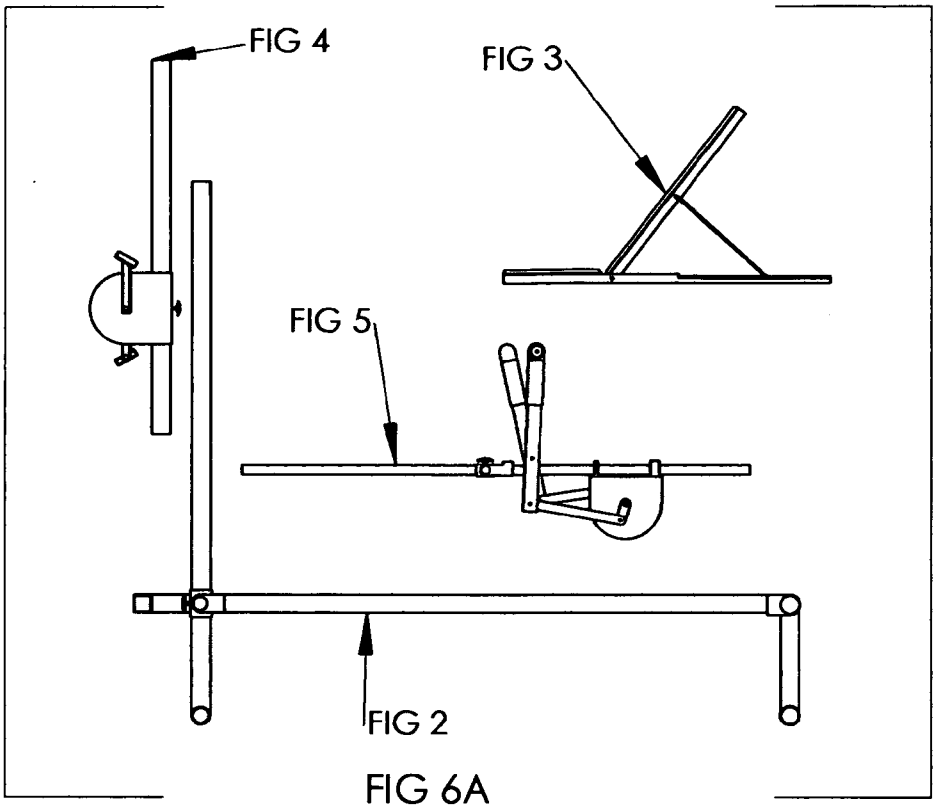


FIG 6A

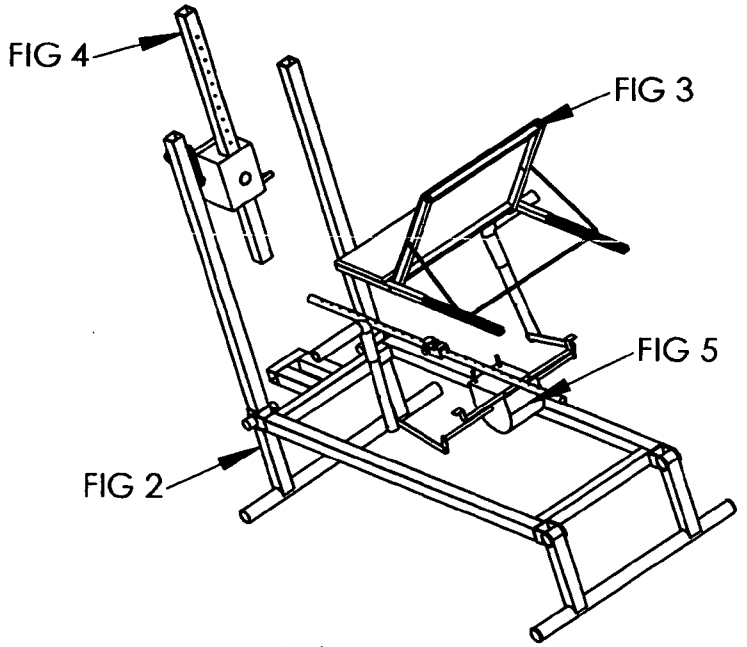


FIG 6B

FINAL MODEL

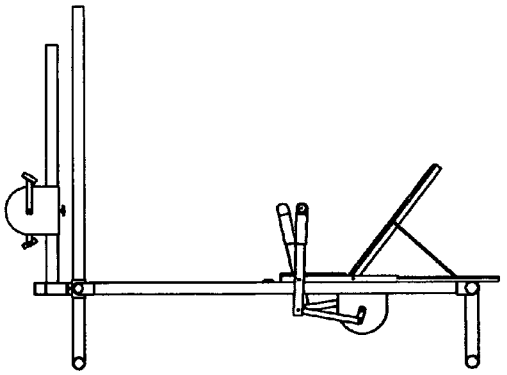


FIG 7A

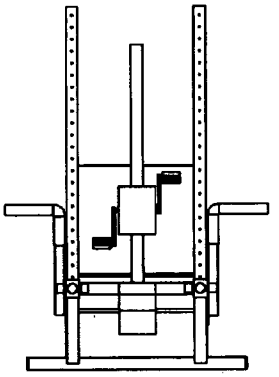


FIG 7B

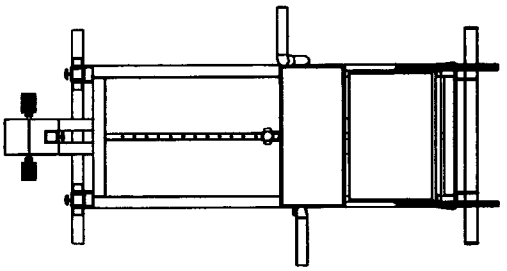


FIG 7C

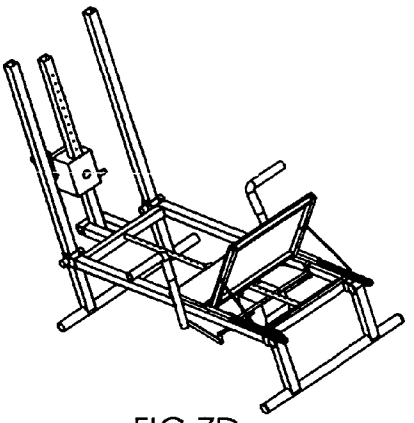


FIG 7D

VARIOUS CONFIGURATIONS
OF THE INVERCYCLE

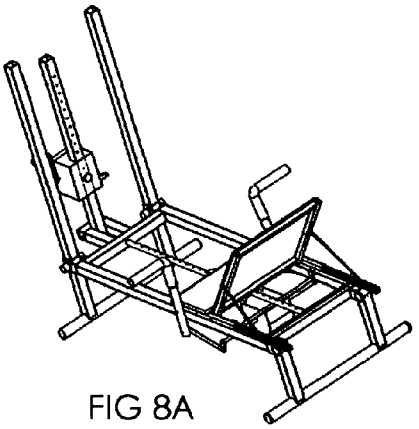


FIG 8A

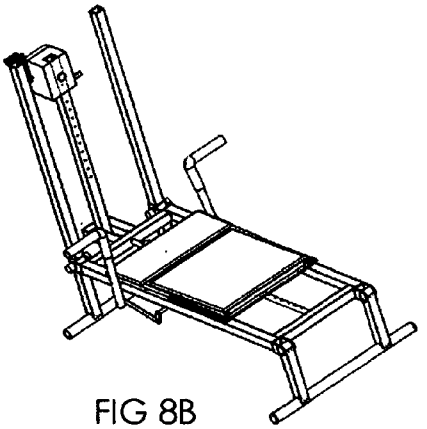


FIG 8B

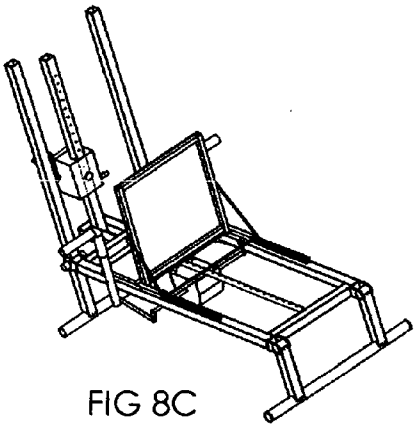


FIG 8C

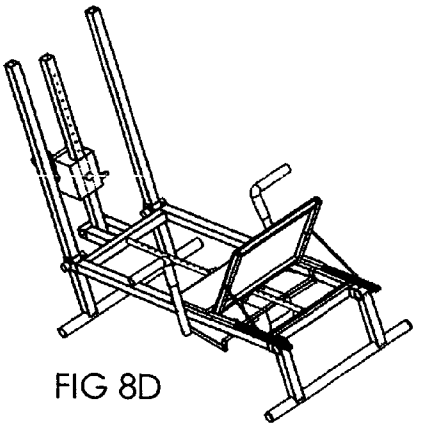


FIG 8D

INVERCYCLE DEVICE AND METHOD FOR EXERCISE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention pertains to the field of exercise. This device is designed to allow the user to engage in a plethora of diverse physical activities and exercises including but not limited to bicycling while the user adjusts her position relative to the plane of gravity, such that the user can be inclined while performing exercise or the user can be lying down on their back or sitting up with the legs elevated while exercising. Arm handles attached to the side of the bench are provided for upper body muscle isolation.

[0003] People who are overweight, have a physical handicap or injury may benefit from lying down (releasing the pressure of gravity and the heaviness of their physical weight) while performing various exercises. Anyone who chooses to use the InverCycle may elevate their feet and legs (at varying degrees) for increased muscle isolation of the abdominal muscles, buttocks, hamstrings and quadriceps. The bench/seat can be elevated and manipulated for additional varied muscle group isolation and an increase in blood circulation to the upper extremities.

[0004] 2. Description of Related Art

[0005] There exists, exercise bicycles in almost any hotel or gymnasium. Most exercise bicycles are either upright or recumbent with the legs stretched parallel to the floor, but in both cases the body is upright.

[0006] In the panoply of exercise and therapeutic exercise equipment, the exerciser may perform exercises while lying on the back, for example bench presses, or at an inclined angle with the head above the torso. In some instances certain exercises such as sit-ups are performed on a bench with the feet above the head. Slant boards exist and inversion equipment is used to increase the blood supply to the upper extremities and for spinal alignment, however this type of inversion is a passive or resting form of inversion.

[0007] Health benefits from inverted posture include increased blood supply to the brain, internal organs, eyes, ears, neck, shoulders, facial and other hair on the head, which may have a stimulating and regenerating effect. Inverted postures have long been known and used by various health regimes including yoga. It is believed that the inverted postures combined with various forms of exercise there from increases circulation which flushes tissues generating a rejuvenate effect on the body.

[0008] The InverCycle allows the exerciser to lie down or sit up using adjustable seat angles while elevating the legs at varying degrees. Inclining the vertical angle of the exercise device herein (seat/bench), shifts body weight and the force of gravity. An increase in the tension on the flywheel/pedals isolates and tones the leg muscles, buttocks and abdominal muscles. Utilizing the resistance arm handles, located on the side of the bench/seat will isolate muscle groups located in the arms, shoulders and back. The cardio-vascular system is stimulated, calories are burned and an increase in well-being is experienced.

BRIEF SUMMARY OR THE INVENTION

[0009] The invention herein described answers the need to provide exercise so that the user may adjust her body's position so the feet are level with or above the head while bicycle pedaling, in either direction of choice, backward or forward (utilizing resistance training by increasing tension on the fly wheel), using adjustable arm resistance levers (located on both sides of the bench) or resting in an inverted position (for spinal alignment and increased circulation). Simultaneously, the entire bench/seat may be inverted to varying degrees while exercising, which increases blood circulation to the internal organs and upper extremities, while isolating, strengthening and toning abdominal, buttock and leg muscles. This invention allows the user to work different muscle groups than those worked in a standing, sitting or recumbent position by dint of the need of the body to resist the force of gravity and for some people, the force of their own physical weight. People with injuries or the inability to physically maneuver their body into an inverted posture may also benefit from an increase in blood circulation, spinal support, strengthening and conditioning while utilizing the combination of inversion and resistance training, provided by the Invercycle. This invention allows people at all levels of fitness to benefit from increased blood circulation, muscle isolation and toning, spinal alignment and aerobic conditioning, which strengthen the heart muscle. In essence, the Invercycle machine provides a full body aerobic and strength, training workout with the addition of the innumerable benefits of inversion. A standard, off the shelf electronic monitory system may be incorporated to the invention. This technology would provide the user with an opportunity to program various workouts into the machine, including bench adjustment, pedal height and resistance exercise (including the arm handles).

[0010] For the purposes of rehabilitation or in the case of obesity and/or muscle weakness a standard off the shelf electric motor will be attached to the pedal assembly. The function of this motor is to provide a warm up or jump start movement. The exerciser could lie down on the bench, put their legs up, with their feet on the pedals and receive physical movement with out exerting any effort. In this event, someone could benefit from passive movement, which would stimulate the lymph system and an increase in blood circulation. Utilizing the InverCycle in this way would help an individual build muscle strength until they are capable of performing the exercises using their own physical strength. These people could also benefit from the inversion aspect and the arm resistance handles.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0011] 1. Page one **FIG. 1** is an isometric view of the InverCycle in one specific configuration.

[0012] 2. Page two are various views of the frame structure including side (**2**A), front (**2**B) and top (**2**C). In addition there are detailed views of the bench pivot point and bench angle adjustment. The bench is held in place by the pull pin shown in **2**B_DETAIL, mating into one of an array of holes along the leg.

[0013] 3. Side views of the frame structure at various angles. **FIG. 2D** flat angle. **FIG. 2 E** mid-range angle. **FIG. 2F** high range angle.

[0014] 4. Various views of the InverCycle seat, top (**3**A), isometric (**3**B), back (**3**C) and side (**3**D). The seat back is held into place with a ribbed structure on the frame and an adjustable bent rod.

[0015] 5. **FIG. 3E, 3F**, 3G, 3H show a side view of the seat at various angles. The angle is adjusted by placing the bent rod into various locations on the ribbed structure mentioned above.

[0016] 6. Various views and positions of the pedal assembly. Three different configurations of the front view are shown in **FIGS. 4C, 4D** and 4E. similar to the frame in Drawing **1**, the pedals are held in place with a pull pin mating to one of an array of holes in the post.

[0017] 7. Various views of the handle and seat adjustment assembly. **5**A shows a front, top view of the arm resistance handles and seat frame, **5**B an isometric view of the resistance handles and seat adjustment, **5**C shows a top view of the adjustable seat frame along with an overhead view of the resistance handles. Detail **5**C shows another pull pin that mates to this array of holes and holds the seat (not shown) in place. There are also mounting points to hold the handle assembly to the seat. **5**D shows a side view of the resistance handles and where they are attached to the bench/seat frame.

[0018] 8. **6**A (side) and **6**B (isometric) pictures show an exploded view of the entire assembly displaying how the various assemblies depicted in previous drawings mate together.

[0019] 9. Various views of the entire assembly. **7**A (side), **7**B (back), **7**C (top) and **7**D (isometric).

[0020] 10. Various configurations of the entire assembly in an isometric view displaying the various degrees of freedom on the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Existing exercise bicycles are designed so that the body is in an upright position. There are exercise bicycles with a typical bicycle seat (the buttocks are only supported along with the hands on the handle bars) and the feet are placed on the pedals below. In this case the rider is either sitting and pedaling or standing and pedaling.

[0022] There are bicycles known as recumbent machines. This type of bicycle provides a seat, which looks very much like a chair. The chair type seat supports the exerciser's back and buttocks. The legs are extended out so the feet can reach the pedals, keeping the legs parallel to the floor.

[0023] Both of these types of bicycles keep the body in an upright position. The force of gravity is in effect and often times the only muscles isolated are the quadriceps and hamstring muscles.

[0024] There are various slant boards and inversion machines that allow the exerciser to invert the body, however these type of devices provide only passive inversion exercise, or resting for the sake of increasing circulation. Some exercises may be preformed at an inclined position, such as while using a bench press in a weight room or doing sit-ups on an inclined bench, with the feet above the head.

[0025] The InverCycle allows the exerciser to choose between various inclined positions for both the bench/seat and the pedal assembly. The exerciser may lie down on the bench or lift the seat back up, for a seated position (which can be raised at various angles or left parallel to the ground). All exercise positions provide support for the spine and back muscles. The pedal assembly can be independently adjusted (separate from the bench), at various heights, so the exerciser can choose the desired leg elevation, in relation to the upper body. Once the exerciser begins to pedal the resistance level can be achieved by adjusting the tension knob, located on the flywheel. The pedal assembly is capable of going in both directions.

[0026] A slight incline positioning of the bench while simultaneously elevating the feet and legs will immediately increase blood circulation to the upper extremities, vital organs and head. Reversing the force of gravity while exercising, in an inverted position provides the opportunity for an exerciser to isolate various muscle groups (buttocks, hamstrings, quadriceps and abdominal). The muscles isolated will depend on the chosen angles and positions of the bench/seat and/or the height/resistance level of the pedal assembly.

[0027] There are resistance handles, which are attached to the side of the bench, so the user's arms may be exercised while pedaling simultaneously. In addition to multiple muscle group isolation (triceps, biceps, deltoid, pectoralis major, teres major, trapezius, rhomboid and scapula) the exerciser may take advantage of an aerobic workout (created by performing resistance pedaling and utilizing the arm levers), for strengthening endurance and burning calories.

[0028] The first step for making the InverCycle is to acquire all the parts for the frame. The frame consists of simple extruded steel stock, some with arrays of holes. The frame is then assembled by welding all of the joints together, making sure that the seat rod is not attached. The various frame structures now created are the frame for the bench including the pedal post, the back legs, the front legs, the seat bottom and the seat back.

[0029] The next step is to attach the wheels to the rear legs and the rear legs to the frame. The wheels on the rear legs allow the bench to slide easily on the floor when the bench angle changes. Attach the front legs by inserting the front legs into the sleeve on the bench frame. Hold the legs in place with two pull pins.

[0030] Assemble the seat by attaching the seat cushions to the seat back and seat bottom. Attach the ribbed seat support holder to both sides of the seat bottom frame. Insert the bent rod into both holes of the seat back frame. Next, attach the seat back to the seat bottom using the hinge rod.

[0031] Insert the seat sleeve onto the seat rod and weld the seat rod to the bench frame. Now attach the seat assemble to the seat sleeve by welding it into place. Next, construct the handle assembly by attaching the resistance device for the handles to the seat frame via screws and welding the resistance device support to the seat frame. Attach the axle to the handle wheel and attach the crankshafts to either side of the handle wheel. Connect a handle to both crankshafts and attach the handle to the small axle mounted on the seat bottom frame. Hold the seat assembly in place using a pull pin through the seat sleeve and into the seat rod.

[0032] Attach padding to both handles. The final step is to create the pedal assembly. Attach pedals to both crankshafts and the crankshafts to the pedal wheel. Finally, insert the pedal wheel onto the pedal post and hold it in place using another pull pin. (An off the shelf pedal assembly will be used for the fly wheel, along with a standard pressure knob

used to apply force on the fly wheel creating resistance, which increases and decreases pedaling difficulty.) The pedal assembly will have the capability of spinning in both directions, using adjustable resistance.

[0033] An off the shelf electronic programming device will be provided on some Invercycle machines, which will allow the exerciser to choose a desired resistance level and continuous exercise program. With this added device, the pedal assembly and the bench incline will raise and lower automatically, depending on the program chosen.

[0034] An additional option for the InverCycle is a standard off the shelf electronic motor, hooked to the pedal assembly unit. This option wouid provide a warm up or jumpstart motion for someone who could benefit from passive motion, used for the purposes of rehabilitation in the case of injury or for muscle weakness resulting from obesity.

What I claim as my invention is:

1. A wholly unique exercise device with multiple inversion angles for reversed gravity muscle isolation that promotes enhanced blood circulation, muscle definition and aerobic exercise for systemic oxygenation, caloric expenditure and a feeling of well-being. The InverCycle comprises a bicycle/pedal assembly, an adjustable flat bench with a seat back that can be raised and lowered and moveable arm handles fastened to the sides of the bench/seat. The bicycle/pedal assembly is located at one end of the bench and may be raised and lowered, independently from the bench/seat, to allow the body position of feet above the head while pedaling the bicycle (sitting up in recumbent position or lying down). The bicycle assembly allows a means for adjusting tension on the rotary motion of the pedals via a pressure knob (rotation in a clockwise direction, will increase pressure on fly wheel increasing resistance and counter clock wise rotation will decrease resistance). The front legs have pull pins, which allow for the adjustable inclination of the bench/seat and seat back. The seat/bench can be moved forward and backward as a means for adjusting the individual height requirement of each exerciser.

2. The ability to adjust the angles of the bench/seat and the height of the pedal assembly, as mentioned in claim one, provides the exerciser with various options for isolating specific muscle groups, including the buttocks, inner and outer thighs, hamstrings, quadriceps and abdominal muscles. No other exercise bike in the market can match or provide this type of isolation workout. Performing exercises while in an inverted posture will increase systemic blood circulation, massage internal organs and feed the heart and brain fresh blood.

3. The moveable arm handles on the side of the bench, mentioned in claim one, provide resistance exercise to the arms, shoulders and back while increasing aerobic activity. The back and forth resistance motion will isolate bicep, tricep, shoulder and back muscles. The resistance arm handles can be performed in various inverted postures (lying down or sitting up) while pedaling the bike with the feet above the head or with the feet and legs parallel to the ground. Only the Invercycle offers this type of muscle isolation coupled with gravity reversal which enhances the circulatory system and rejuvenates the body.

4. People who are overweight or a novice may benefit from the InverCycle as the vertical position of the bench allows the exerciser to begin by lying down and putting their legs and feet up. The adjustable pedal height and tension knob allows the exerciser to choose what level they wish to work at. When they are tired they can simply stop and rest. Any slight incline of the legs or entire body will provide the exerciser with the benefit of an increase in systemic blood circulation, flushing out tissues and nourishing cells with fresh nutrients. The combination of resistance pedaling while using the arm handles will expend calories initiating weight reduction and building muscle mass. An increase in muscle mass increases metabolic activity, as muscle burns fat for energy.

5. The Invercycle may be appropriate for people who have an injury, a disability or muscle weakness. The exerciser can begin by lying down, which removes the pressure of gravity and their body weight. The entire back is completely supported and the elevation of the bench angle is optional. The pedal assembly height may be adjusted to fit the individual's need along with the desired resistance level from the pedal assembly and arm handles.

6. Intermediate and advanced exercisers may use the InverCycle to increase physical aerobic endurance, isolate and increase muscle strength, burn calories and stimulate blood circulation systemically.

7. All inverted angles and positions, provided by the Invercyle, offer full spine and back support while reversing the pressure of gravity and physical body weight, isolating and strengthening muscles, increasing vital blood circulation, building aerobic endurance, expending calories and increasing an overall sense of well-being. The benefits provided by the InverCycle are accomplished in a way that no other exercise bike or machine has previously offered.

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