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Attorney for Plaintiffs,
HOIST FITNESS SYSTEMS, INC.

UNITED STATES DISTRICT COURT

FOR THE SOUTHERN DISTRICT OF CALIFORNIA

HOIST FITNESS SYSTEMS, INC.,

Plaintiff,

v.

THE SPORTS AUTHORITY, INC.

Defendant.

Case No. '08 CV 2216 JM JMA

COMPLAINT FOR PATENT INFRINGEMENT

DEMAND FOR JURY TRIAL

THE COMPLAINT

Plaintiff, HOIST FITNESS SYSTEMS, INC. ("HOIST") for their complaint against Defendant THE SPORTS AUTHORITY, INC. ("SPORTS AUTHORITY") alleges as follows:

THE PARTIES

1. Hoist is a corporation organized under, and existing by virtue of, the laws of the state of California, with its principal place of business located at 9990 Empire Street, Suite 130, San Diego, California, 92126.

2. On information and belief, Hoist alleges that Defendant Sports Authority is a corporation organized under, and existing by virtue of, the laws of the state of Colorado, with a principal place of business 1050 West Hampden Avenue, Englewood, Colorado, 80110.

JURISDICTION AND VENUE

3. This is an action for pecuniary and injunctive relief for patent infringement arising under the patent laws of the United States, Title 35, United States Code.

4. This Court has jurisdiction over the subject matter of the patent claims as provided in 28 U.S.C. § 1338.

5. Personal jurisdiction by this Court over Defendant Sports Authority is proper because Sports Authority has in the past and continues to transact and/or solicit business throughout the United States, including in this district, and their infringing activities have occurred and continue to occur throughout the United States and in this district.

6. According to Sports Authority's website, Sports Authority maintains a sales force and retail outlets in California for the purpose of serving customers in the state and in this district.

7. On information and belief, Sports Authority has furnished and continues furnishes fitness equipment within the Southern District of California based on orders placed with Sports Authority through their local retail stores.

8. By furnishing fitness equipment within the Southern District of California, Sports Authority has purposely availed itself of the privilege of doing business within the state and in this district.

9. Venue properly lies in this district under the provisions of 28 U.S.C. §§ 1391 and 1400 because Sports Authority resides in the district for venue purposes, having purposely and repeatedly availed themselves of the privilege of doing business within the district and because a substantial part of the events giving rise to the claim occurred in this district.

FACTUAL ALLEGATIONS

A. PATENTS-IN-SUIT.

10. Plaintiff Hoist is the owner of four patents-in-suit: United States Letters Patent Nos. 7,322,911 (the "911 Patent") issued January 29, 2008; 7,335,145 (the "145 Patent") issued February 26, 2008; D519,585 (the "585 Patent") issued April 25, 2006; and D541,357 (the "357 Patent") issued April 24, 2007 (collectively "the Patents").

11. Hoist's rights in and to the Patents include the right to sue for past infringements. A copy of the '911 Patent is attached hereto as Exhibit A; a copy of the '145 Patent is attached hereto as Exhibit B; a copy of the '585 Patent is attached hereto as Exhibit C; and a copy of the '357 Patent is attached hereto as Exhibit D, and each is incorporated herein by reference.

A. BACKGROUND.

12. On information and belief, Hoist alleges that between approximately August 2006 and May 2008, Defendant Sports Authority purchased millions of dollars worth of fitness equipment from Hoist including certain exercise benches.

13. On information and belief, Hoist alleges since approximately May 2008 Hoist has not received any further orders for the exercise benches from the Sports Authority.

14. On information and belief, Hoist alleges that Sports Authority is offering for sale exercise benches at its retail stores, without license from Hoist, which are nearly identical to those the Sports Authority previously purchased from Hoist.

15. On information and belief, Sports Authority, without Hoist's authorization, has been and is currently infringing, and/or inducing infringement of, one or more claims of each of the Patents, directly and/or indirectly, pursuant to 35 U.S.C. § 271, in connection with Sports Authority's sale of exercise products that infringe the Patents. Those products include, but are not limited to, the "Ab-Back

Folding Bench" SKU No.: 23246207 and the "7-Position Folding Back" SKU No.: 23246197 ("the Accused Products.")

16. On information and belief, Sports Authority was informed of, and had knowledge of, the existence of the Patents, prior to Sports Authority offering the Accused Products for sale.

CLAIM FOR RELIEF

(Patent Infringement)

17. Hoist hereby realleges and incorporates by this reference paragraphs 1 through 16 above as though fully set forth herein.

18. The Patents are directed to folding exercise benches.

19. The Patents were duly and validly issued by the United States Patent Trademark Office after having been examined according to law.

20. Defendant Sports Authority has imported into the United States and/or has made and/or sold and/or offered to sell products falling within the scope of the claims of the Patents without license in violation of 35 U.S.C. § 271(a), (b), and/or (c).

21. Defendant Sports Authority has infringed and continues to infringe one or more of the claims of the Patents by making, using, selling and offering to sell, and by inducing and contributing to others' infringement through their sales, offers for sale, and use of certain exercise benches, all without authorization or license from Hoist.

22. On information and belief, Hoist alleges Sports Authority has had and continues to have notice of the existence of the Patents and despite such notice continues to willfully engage in acts of infringement.

23. As a result of Defendant's infringement, Hoist has, and will suffer, monetary damages and irreparable injury. Hoist's monetary damages include, without limitation, lost profits, or at a minimum, the right to recover a reasonable royalty. Furthermore, unless Defendant is enjoined by this Court from continuing

their infringement of the Patents, Hoist has, and will suffer, additional irreparable damages and impairment of the value of its patent rights. Thus, an injunction against further infringement is appropriate.

REQUEST FOR RELIEF

WHEREFORE, Plaintiff prays for judgment against Defendant as follows:

1. That judgment be entered against Defendant Sports Authority, concluding that it has infringed, and is willfully infringing, the '911 Patent, the '145 Patent, the '585 Patent, and the '357 Patent;

2. That Defendant Sports Authority, its agents, servants, employees, successors and assignors, and all those acting under the authority of, or in privity or concert with Sports Authority, be permanently enjoined from directly or indirectly infringing the '911 Patent, the '145 Patent, the '585 Patent, and the '357 Patent;

3. That judgment be entered for damages to compensate Plaintiff for Defendant's infringement of the '911 Patent, the '145 Patent, the '585 Patent, and the '357 Patent, including treble damages and all other categories of damages allowed by 35 U.S.C. §284;

4. That judgment be entered that this case is an exceptional case within the meaning of 35 U.S.C. §285, and for an award of reasonable attorneys' fees to Plaintiff;

5. That judgment be entered for costs to be awarded to Plaintiff; and

6. For such other and further relief as the Court may deem proper under the circumstances.

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DEMAND FOR JURY TRIAL

Plaintiff respectfully requests a jury trial on all issues triable to a jury.

DATED: December 1, 2008

PROCOPIO, CORY, HARGREAVES & SAVITCH LLP

By: _____

Richard E. Campbell
Anthony J. Dain
Eunice Y. Lau
Attorneys for Plaintiff,
HOIST FITNESS SYSTEMS, INC.

EXHIBIT A

EXHIBIT A

US007322911B2

(12) **United States Patent**
Webber

(10) **Patent No.: US 7,322,911 B2**
(45) **Date of Patent: Jan. 29, 2008**

(54) **EXERCISE BENCH**

(76) Inventor: **Randall T. Webber**, 1265 Park Row, La Jolla, CA (US) 92037

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/249,987**

(22) Filed: **Oct. 12, 2005**

(65) **Prior Publication Data**

US 2006/0217249 A1 Sep. 28, 2006

Related U.S. Application Data

(60) Provisional application No. 60/664,454, filed on Mar. 22, 2005.

(51) **Int. Cl.**
A63B 26/00 (2006.01)

(52) **U.S. Cl.** **482/142**; 482/142

(58) **Field of Classification Search** 482/142
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

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Sit-up Bench, Speedent Corp. brochure, 1997.
Kamparts EZ-Life brochure, date unknown.
Zheigang Machinery & Equipment Corporation brochure, Abdominal Benches, ZE32020-12; -13; -14 and ZE32020-16, date unknown.

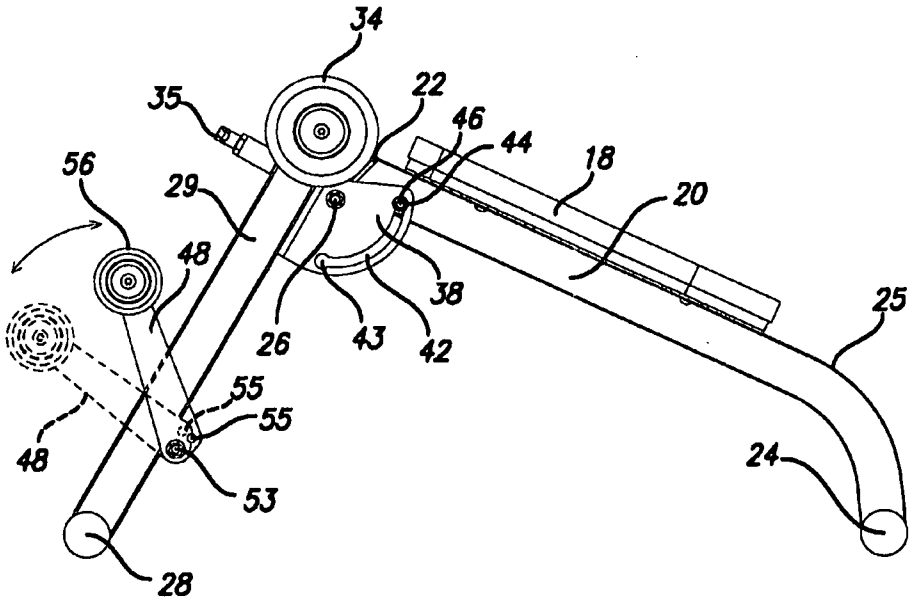
(Continued)

Primary Examiner—Lori Amerson
(74) *Attorney, Agent, or Firm*—Procopio, Cory, Hargreaves & Savitch LLP

(57) **ABSTRACT**

An exercise bench has a main support frame with a floor engaging member at one end and a folding front leg assembly at the other end which can be locked in a deployed position or a folded position. A user engaging foot stabilizer is pivotally associated with the front leg, and a thigh support is adjustably mounted on the front leg assembly or main support frame for engaging the thighs of a user when performing exercises while supported on the bench. The thigh support may be separate from or form part of a seat pad mounted on the frame. The bench is adjustable between positions for performing abdominal crunch or lower back exercises and is adjustable in both positions to allow different users to perform exercises effectively.

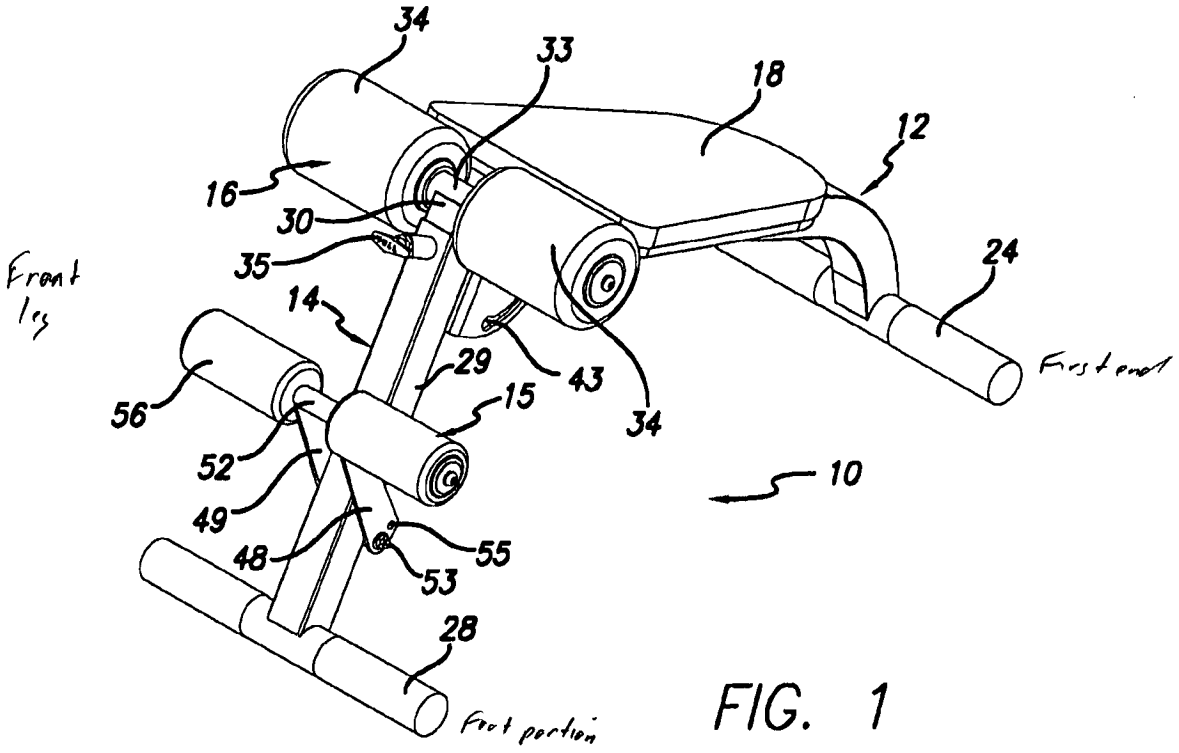
24 Claims, 36 Drawing Sheets



OTHER PUBLICATIONS

Hoist Fitness Brochure 2000 CF2162 Super Adjustable Decline Bench.
Kays Fitness Brochure, 2003, Various abdominal and low back exercise benches.
Nautilus Fitness Brochure, 2001, Various abdominal and low back benches.
KW 105m Abdominal bench, Galaxy·Star brochure, date unknown.

* cited by examiner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Foot portion

FIG. 1

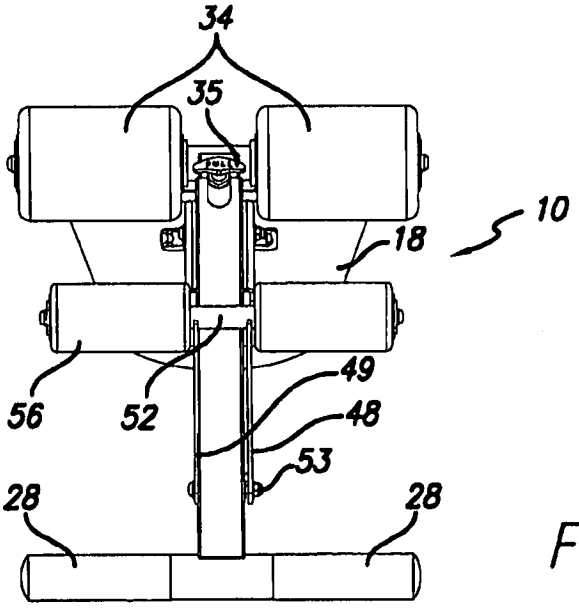
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FIG. 2

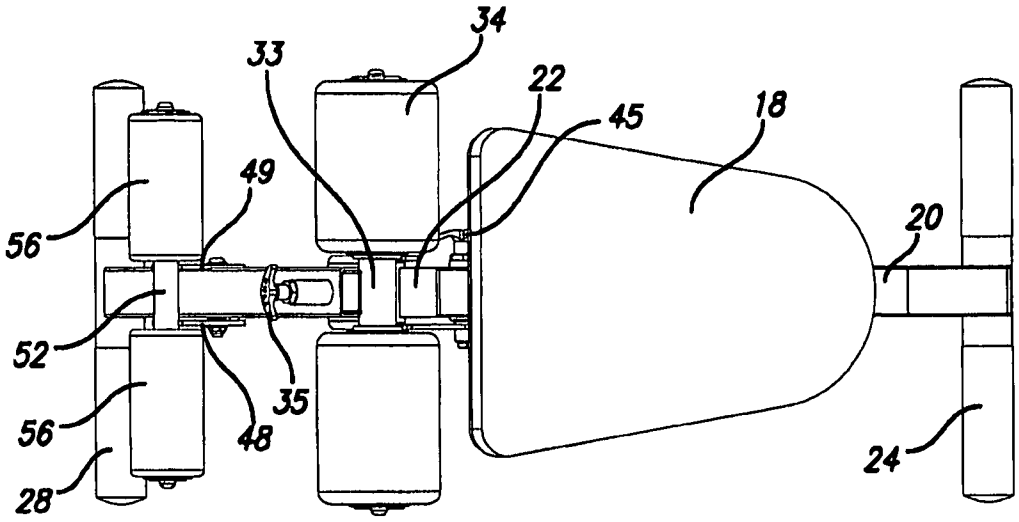
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FIG. 3

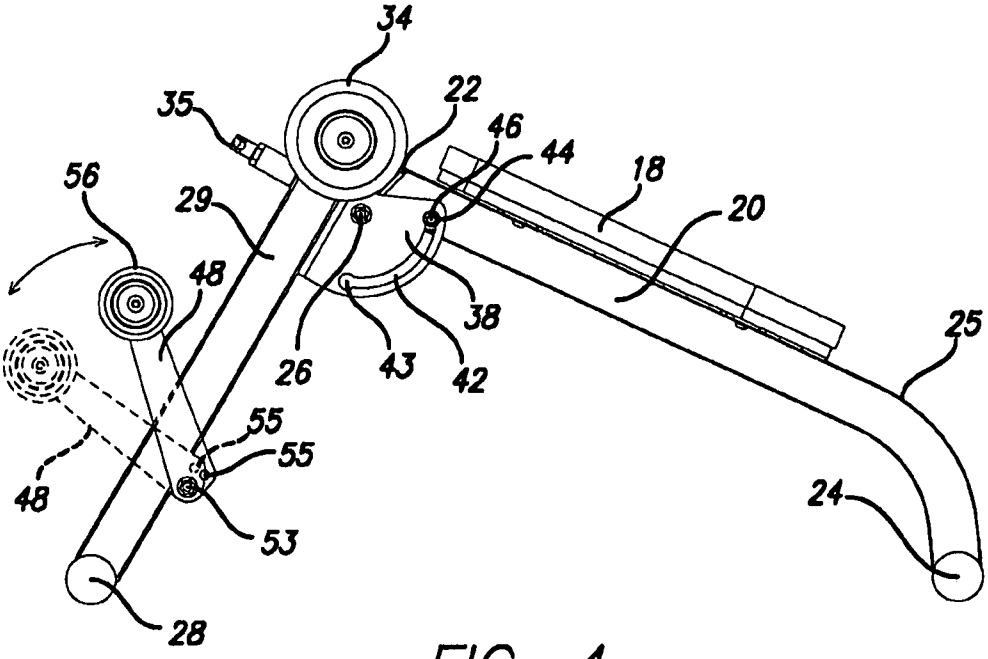
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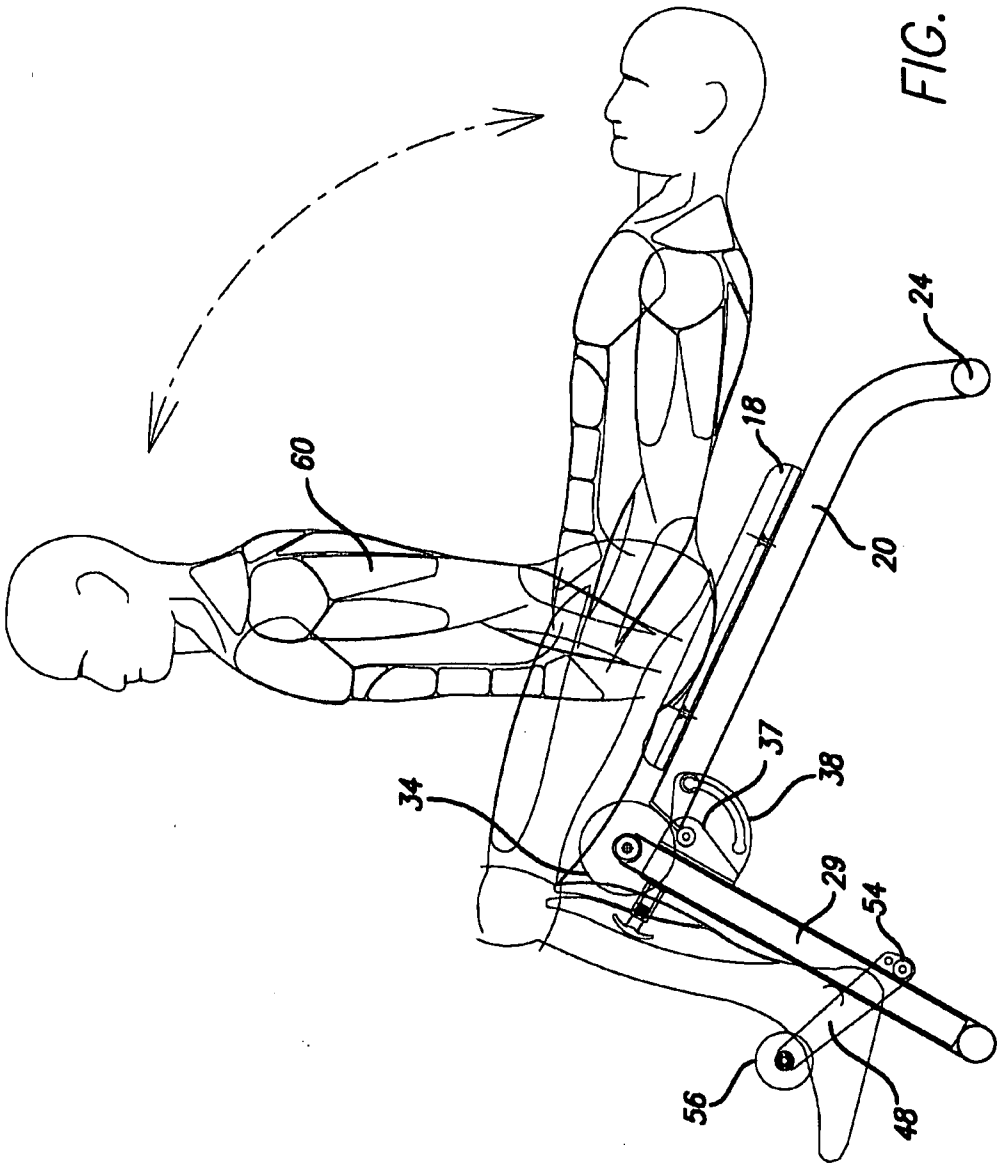
FIG. 4

FIG. 5



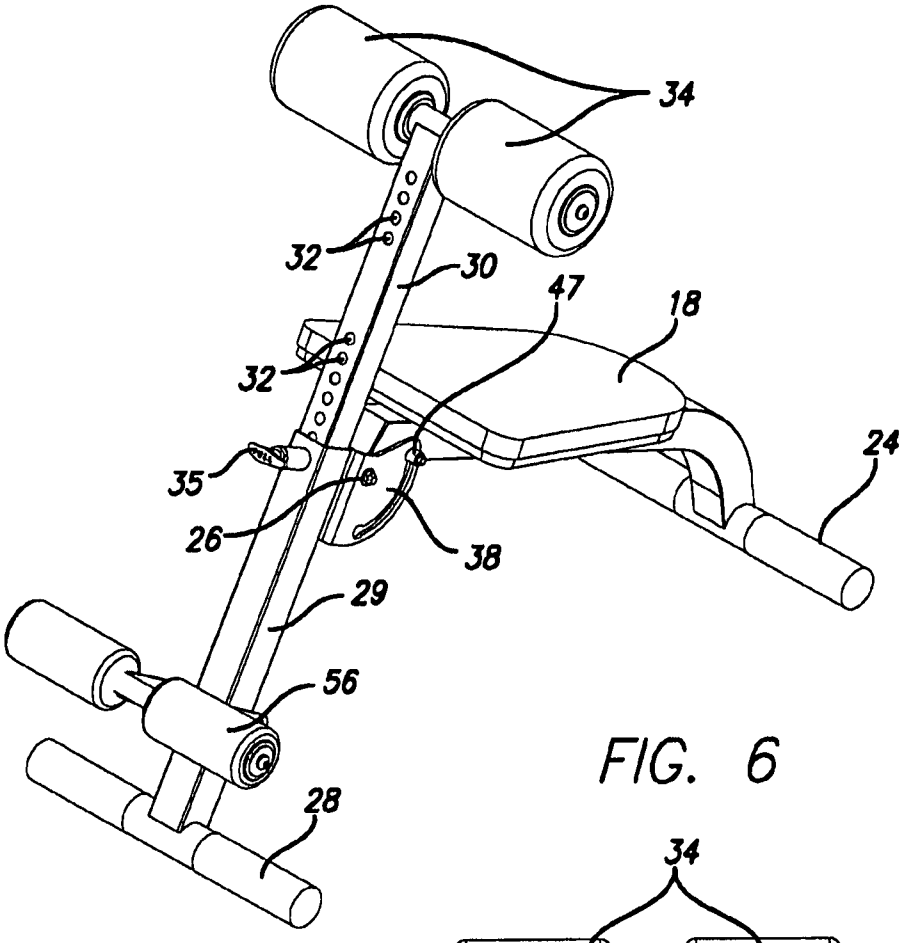


FIG. 6

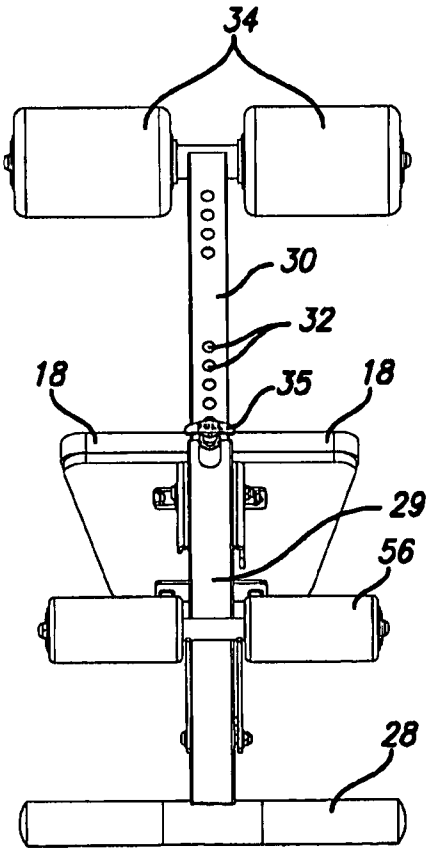


FIG. 7

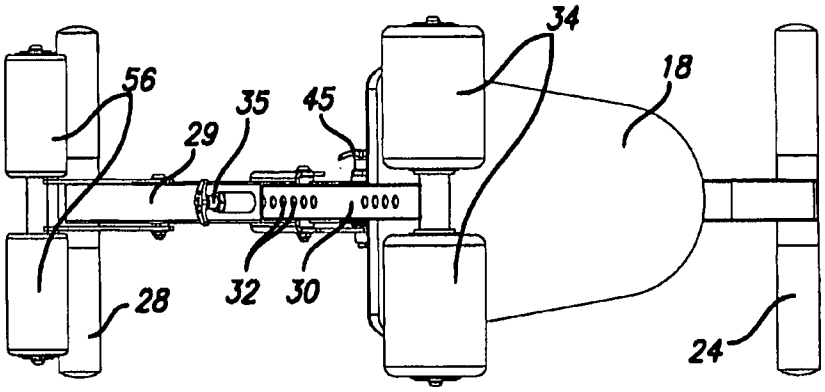


FIG. 8

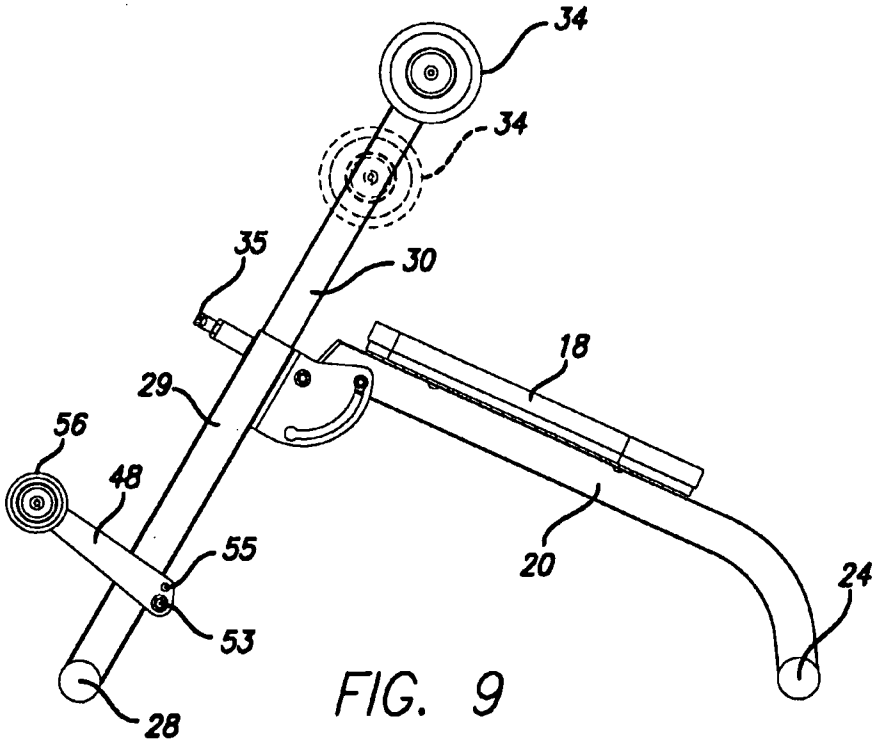


FIG. 9

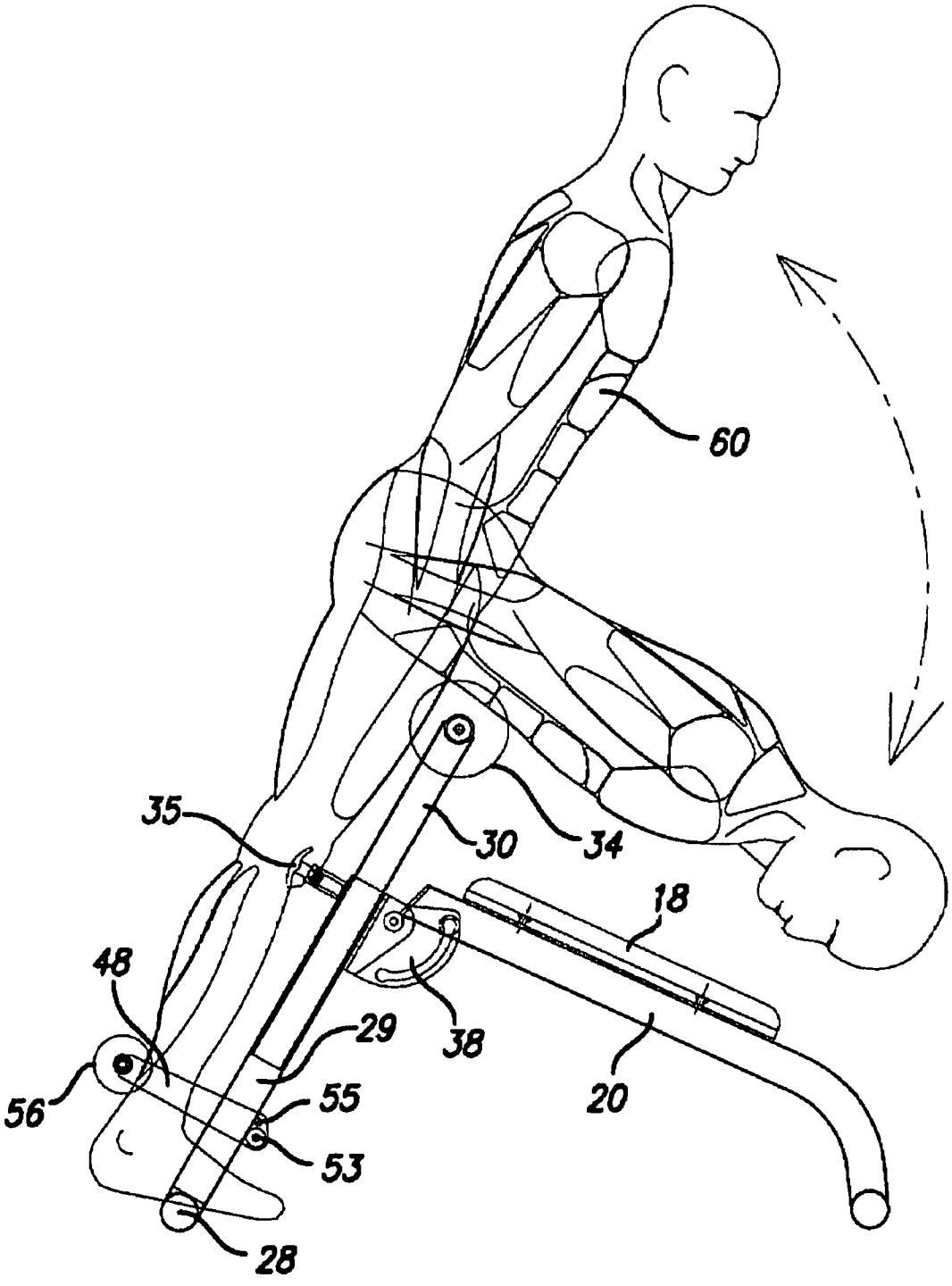


FIG. 10

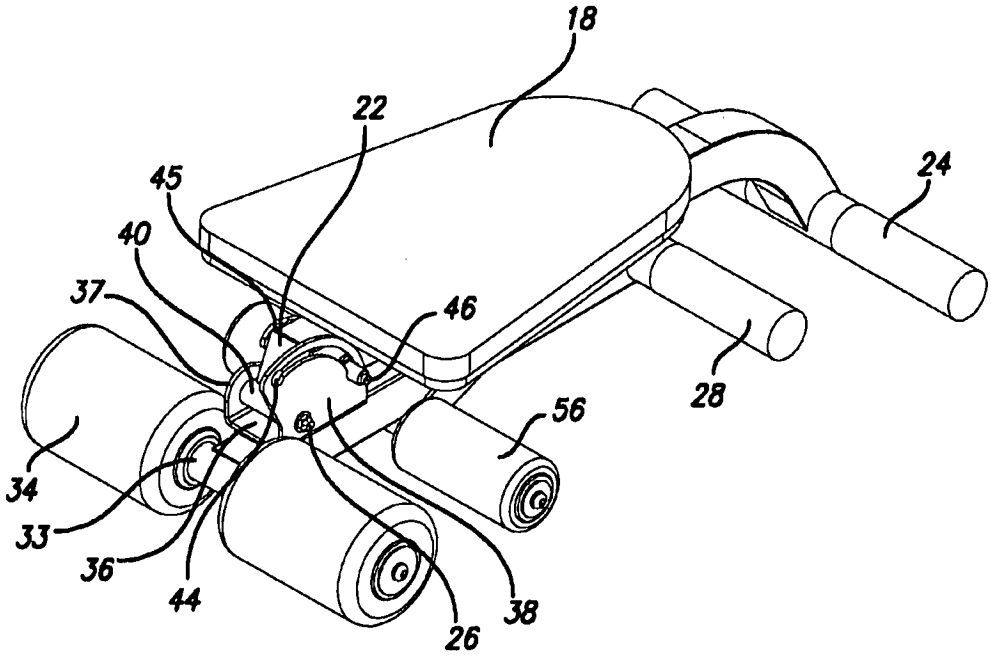


FIG. 11

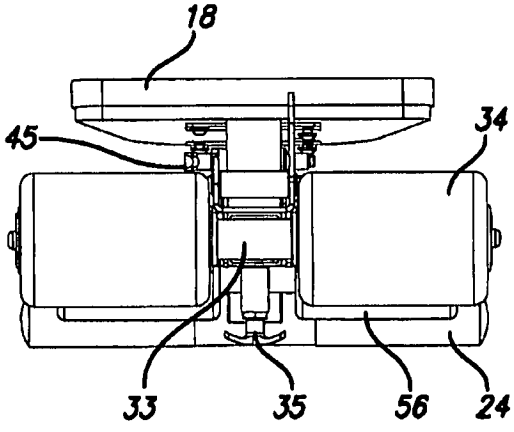


FIG. 12

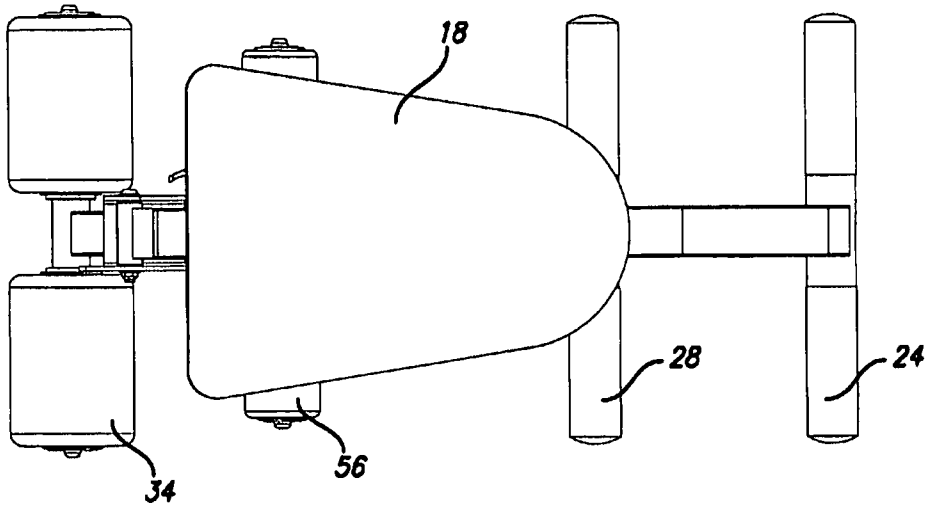


FIG. 13

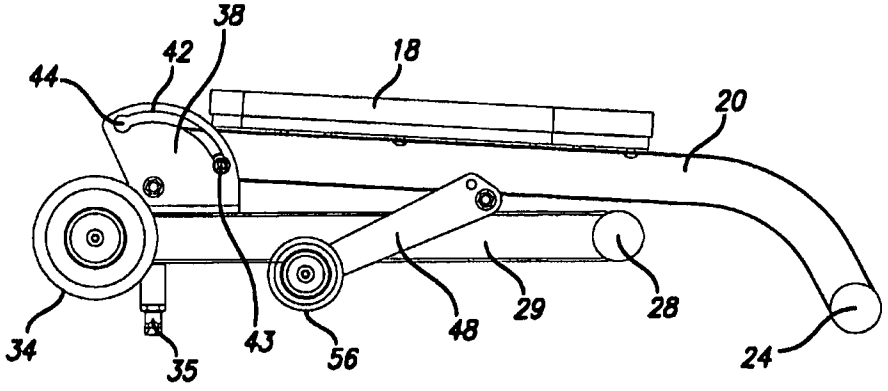


FIG. 14

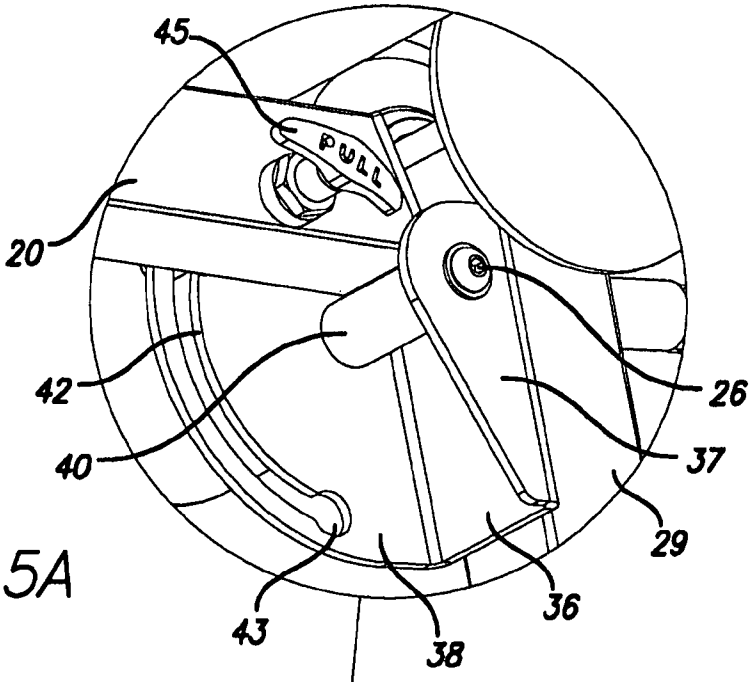


FIG. 15A

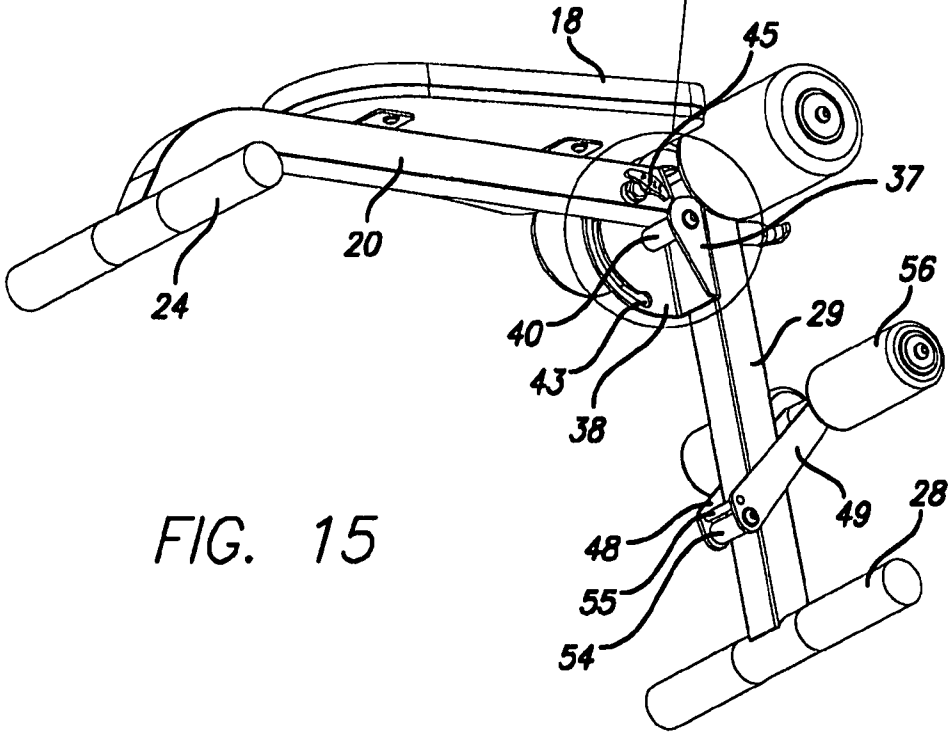


FIG. 15

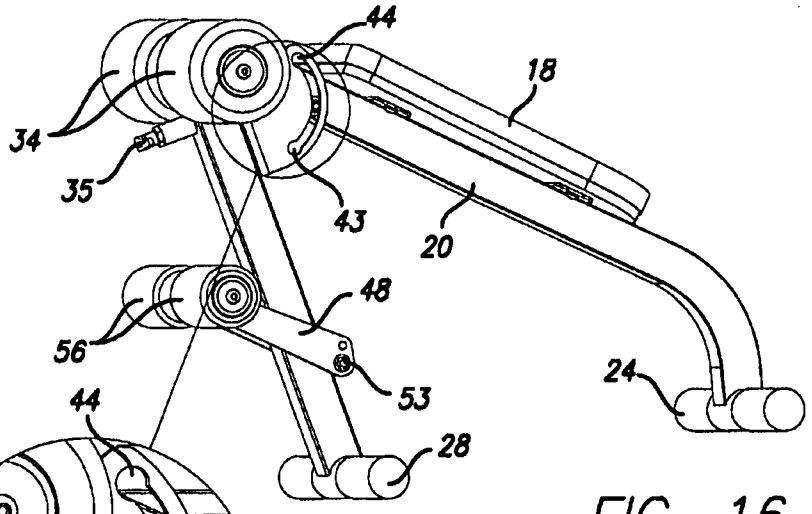


FIG. 16

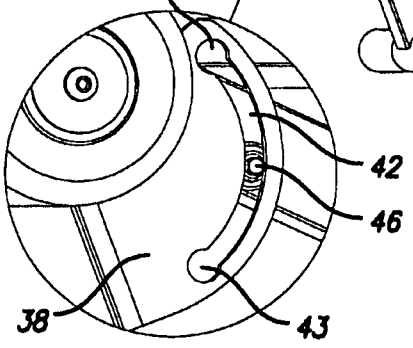


FIG. 16A

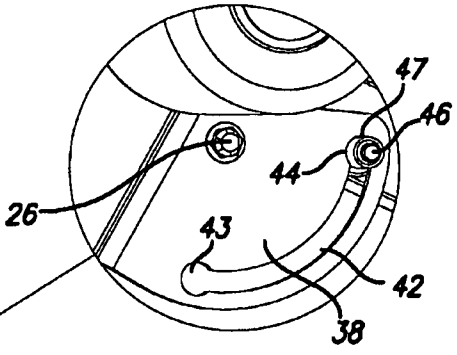
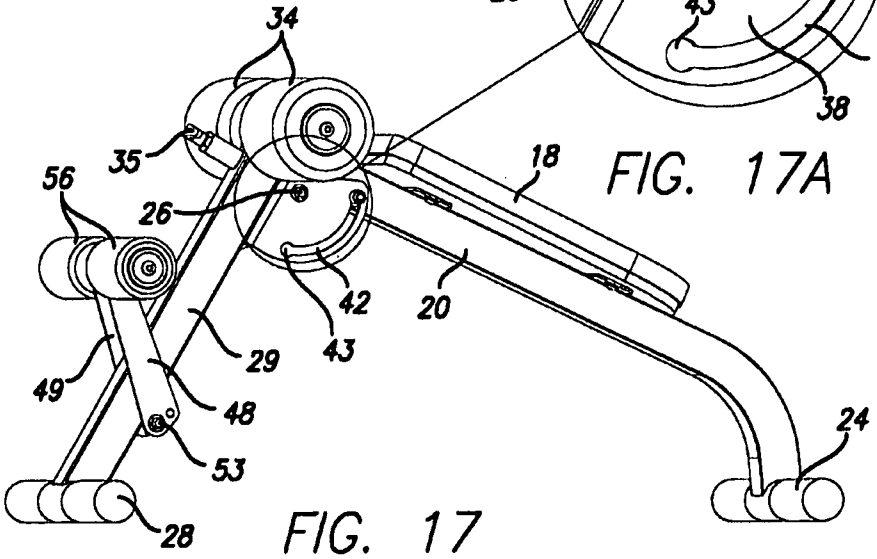


FIG. 17A



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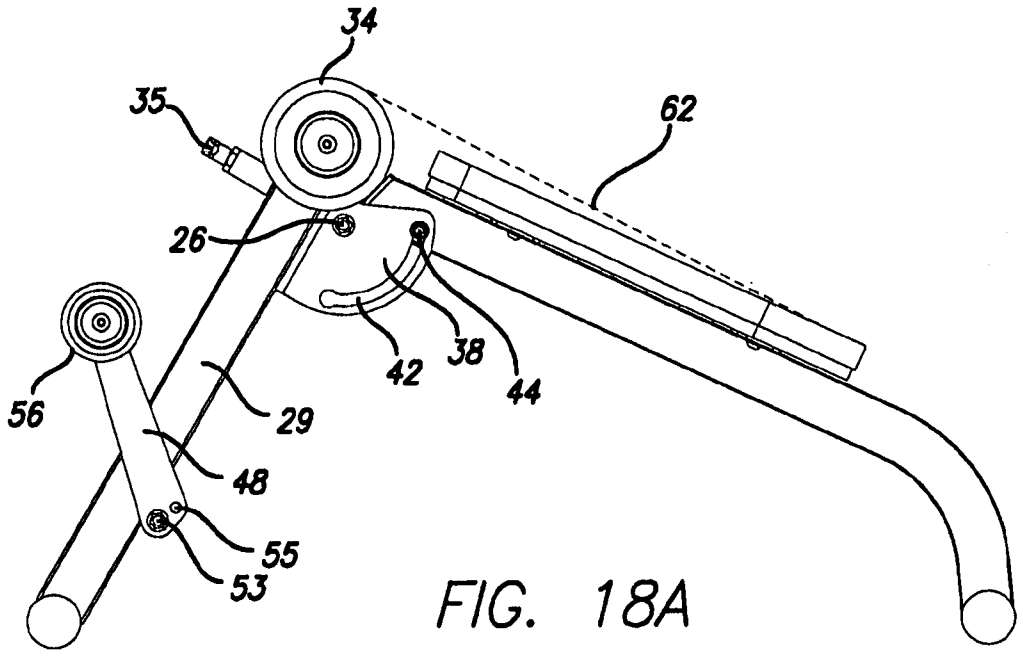

FIG. 18A

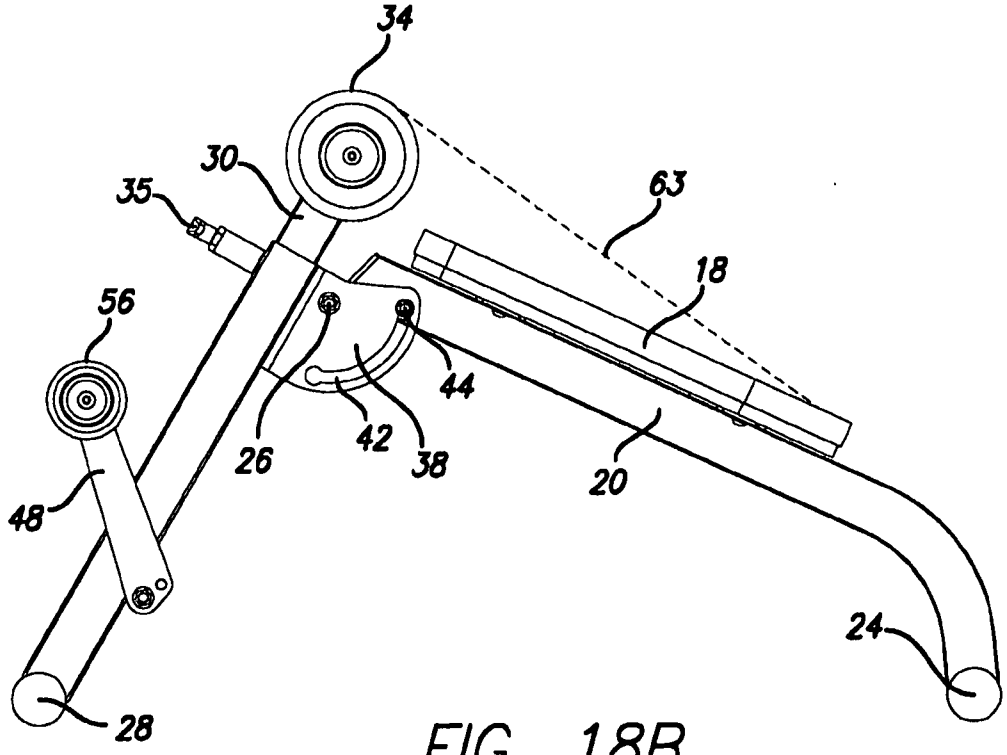

FIG. 18B

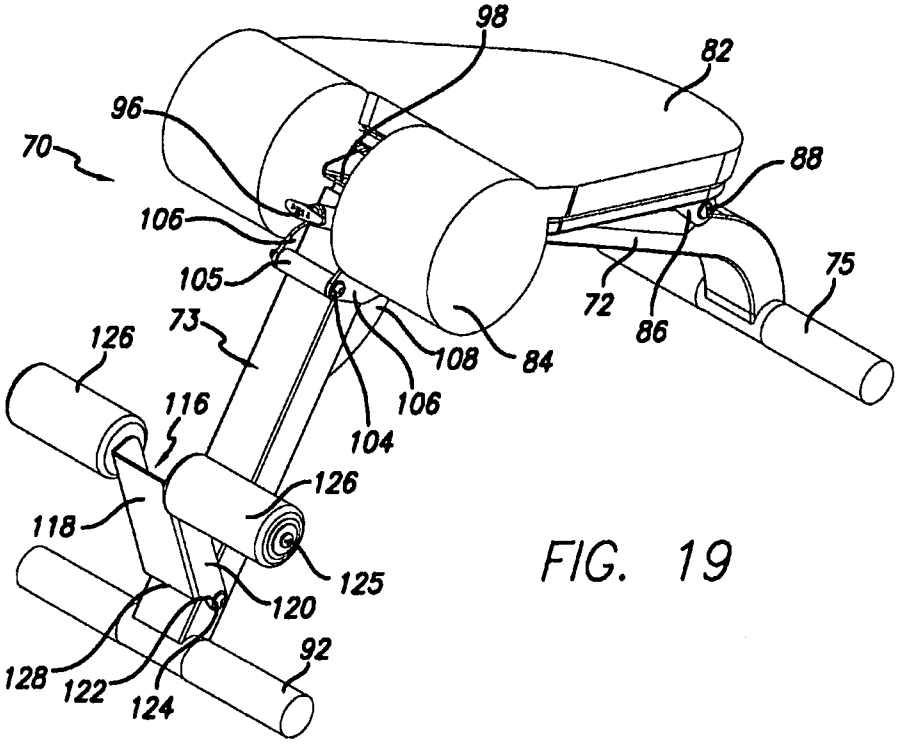
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FIG. 19

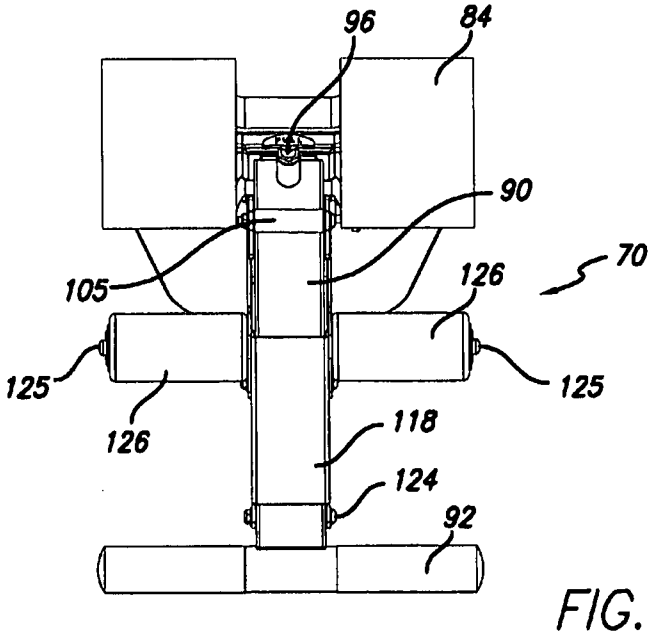
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FIG. 20

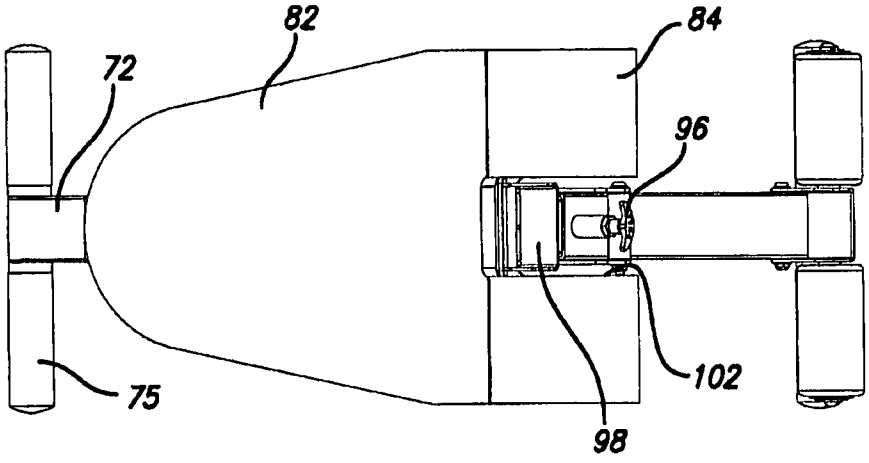
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FIG. 21

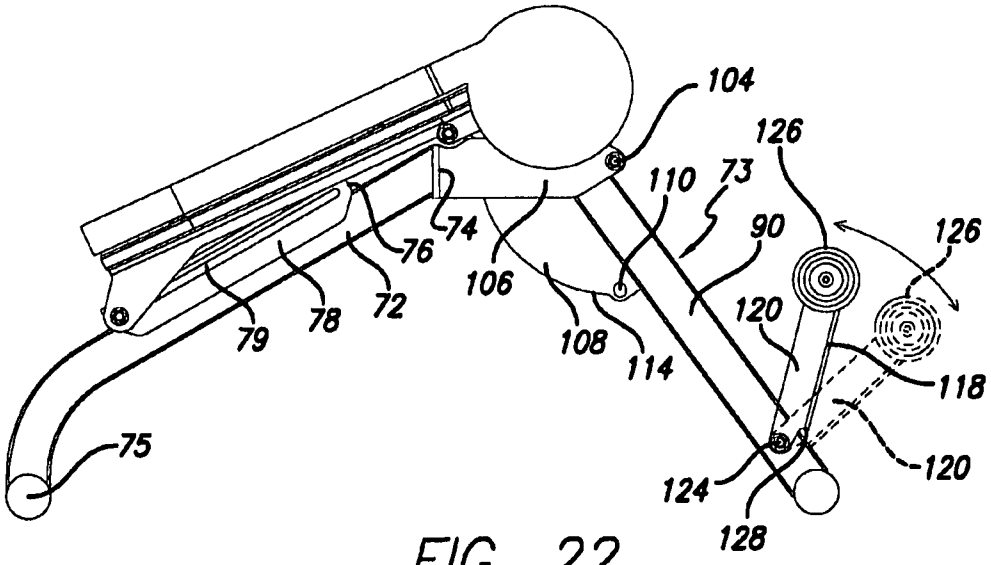
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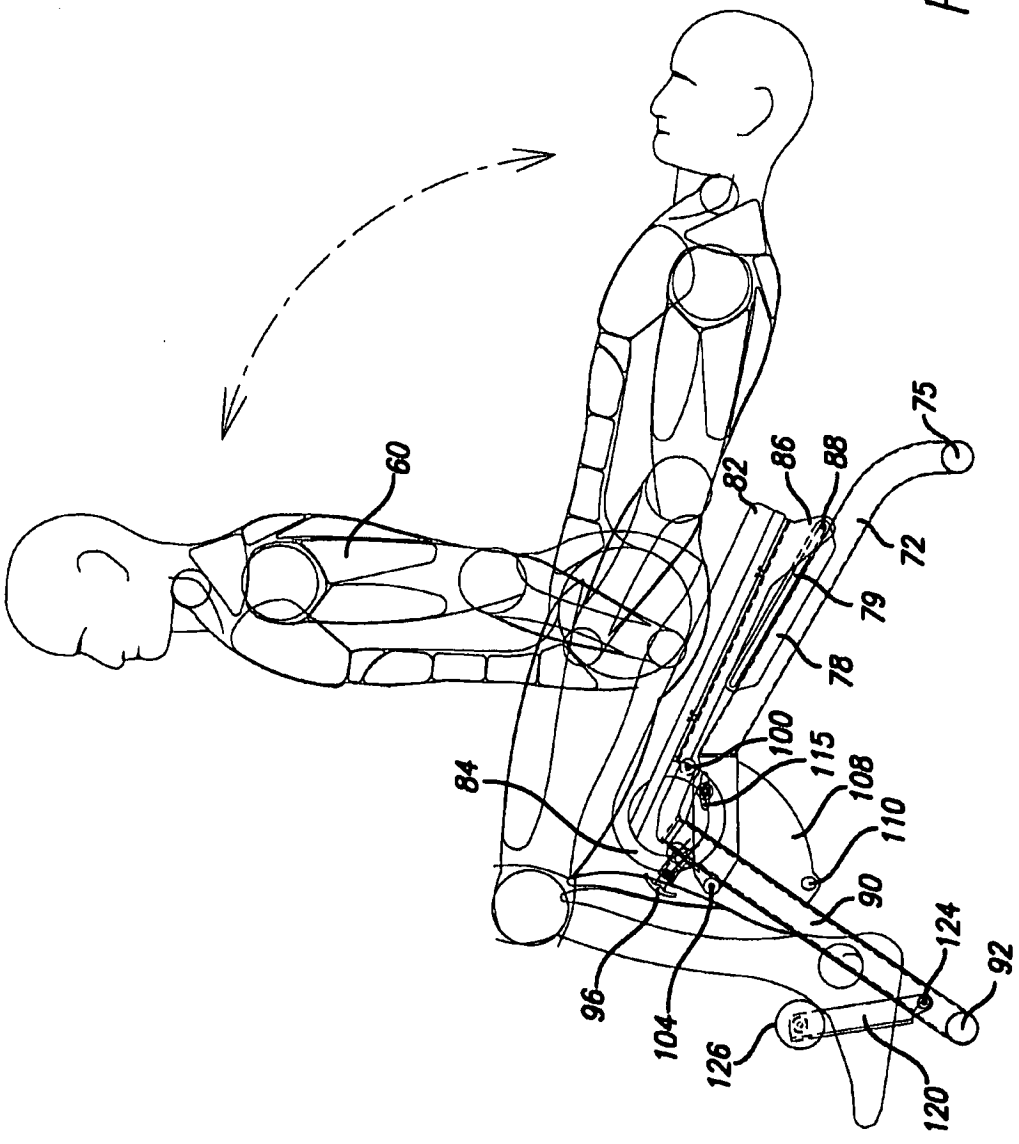
FIG. 22

FIG. 23



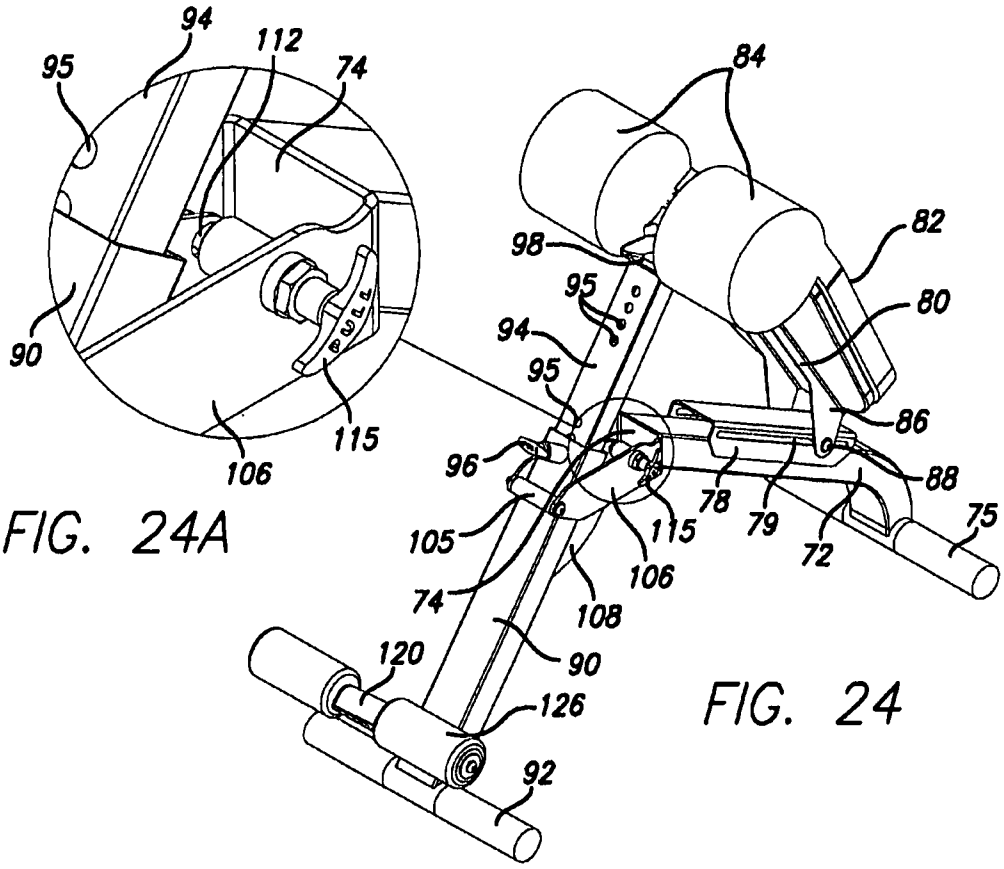


FIG. 24A

FIG. 24

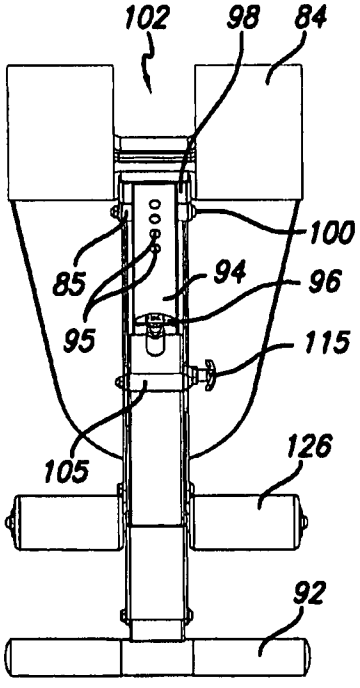


FIG. 25

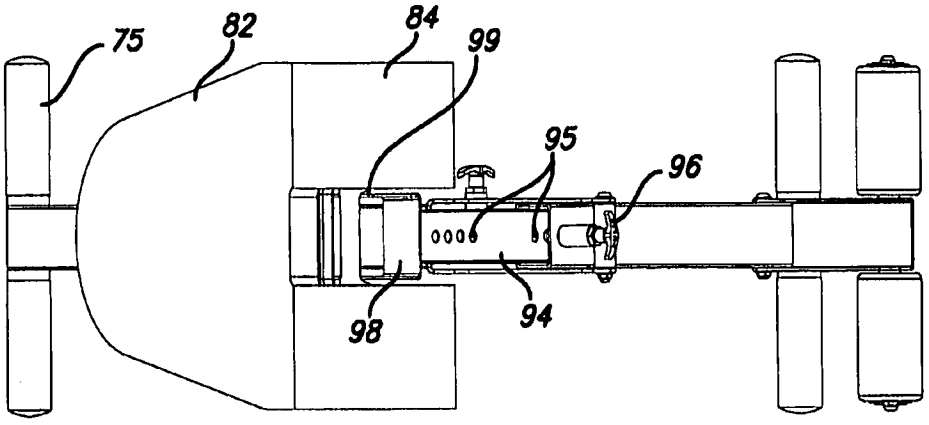

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FIG. 26

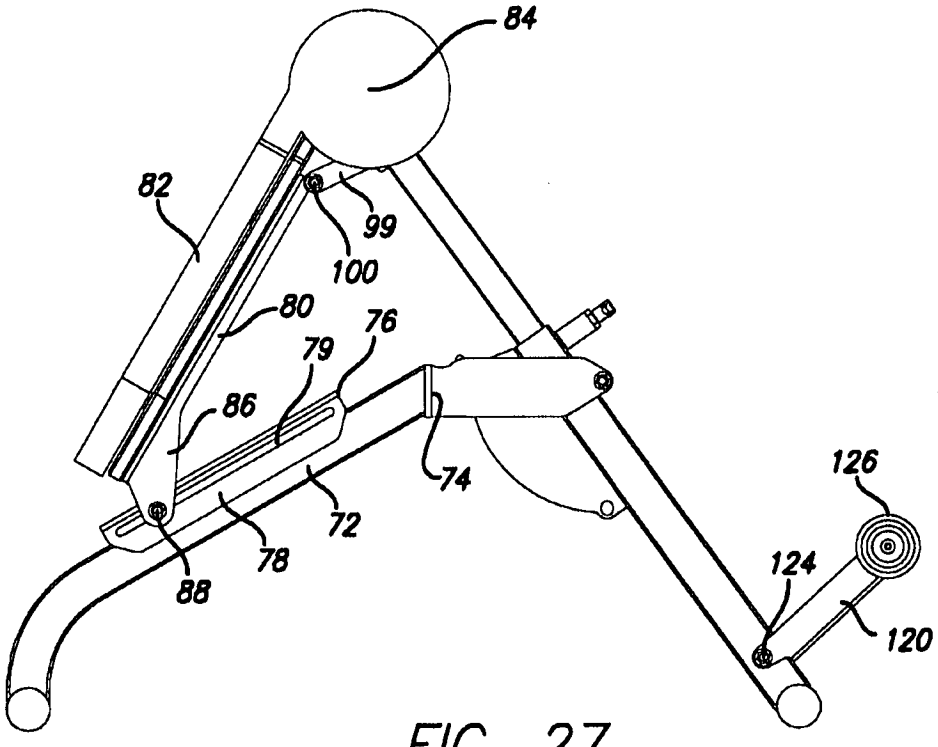
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FIG. 27

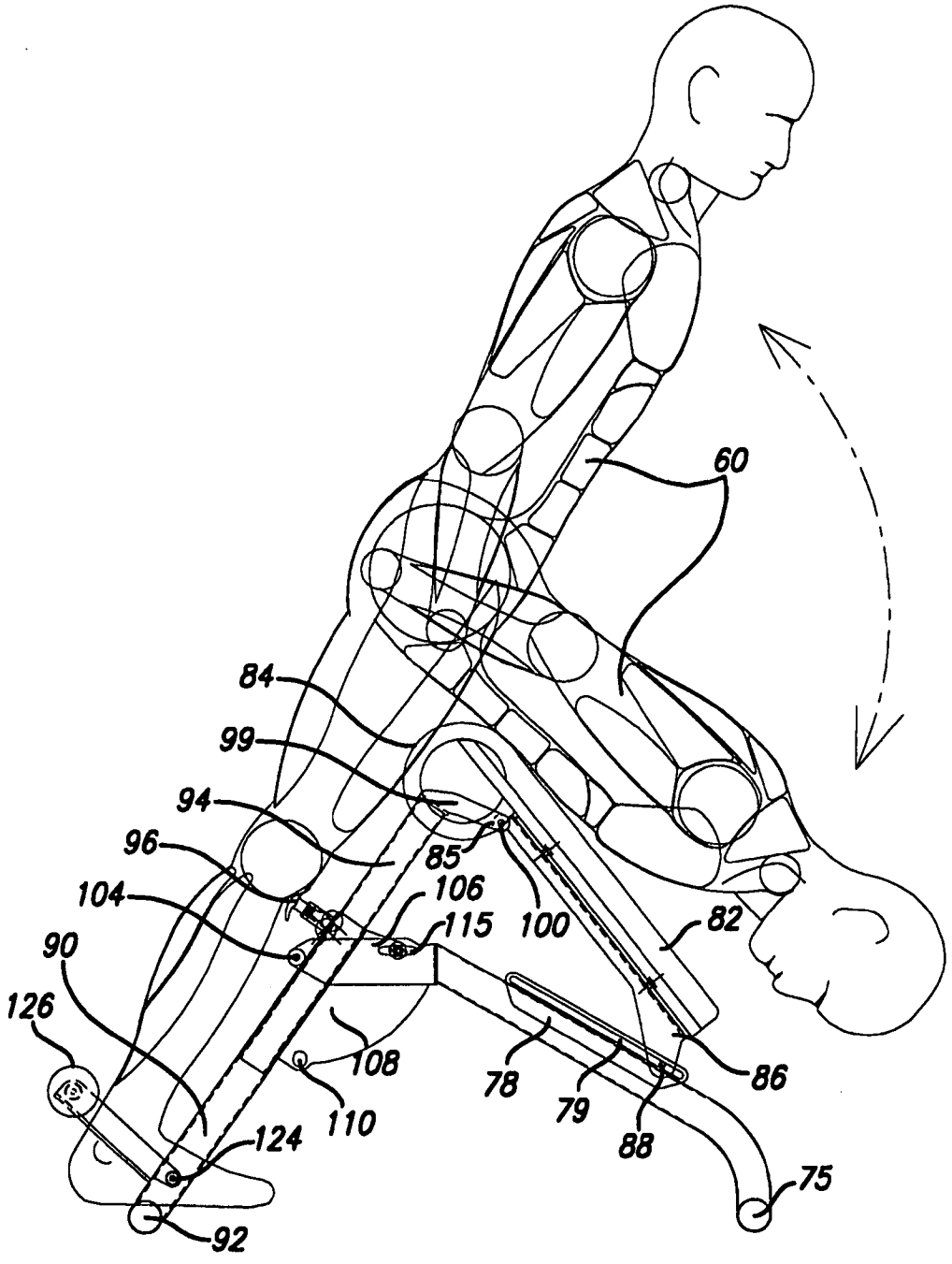
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FIG. 28

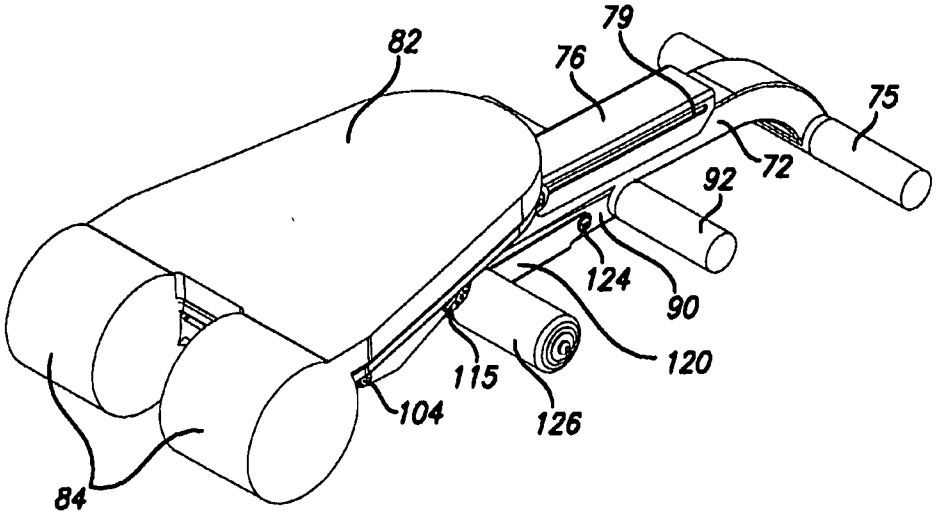

FIG. 29

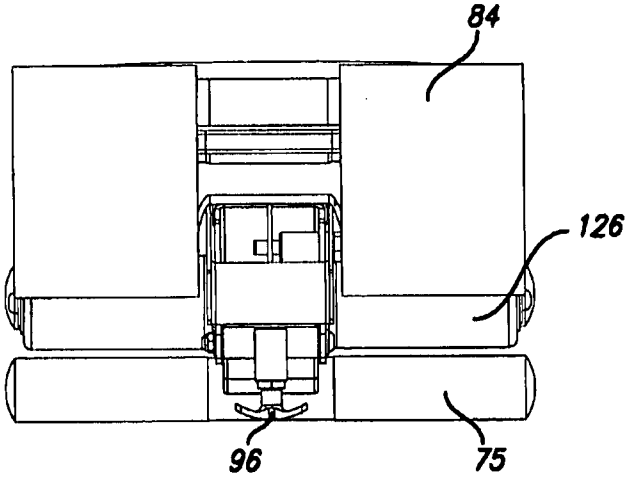

FIG. 30

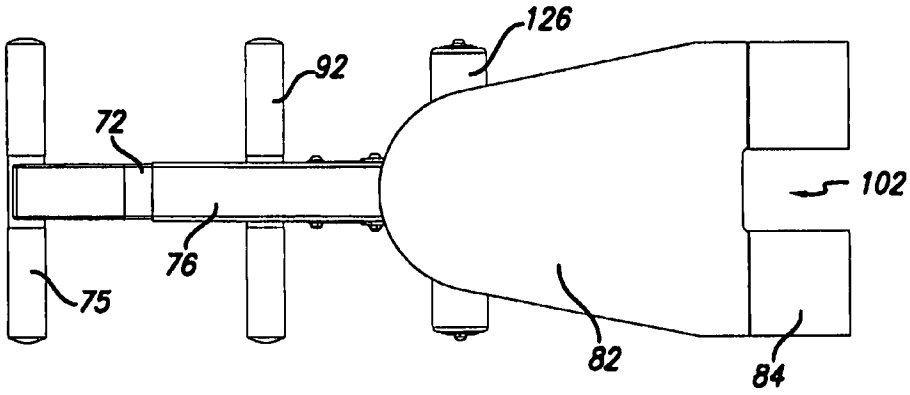

FIG. 31

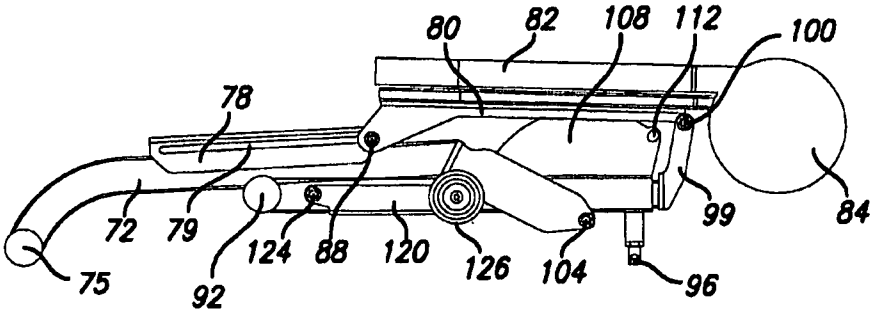

FIG. 32

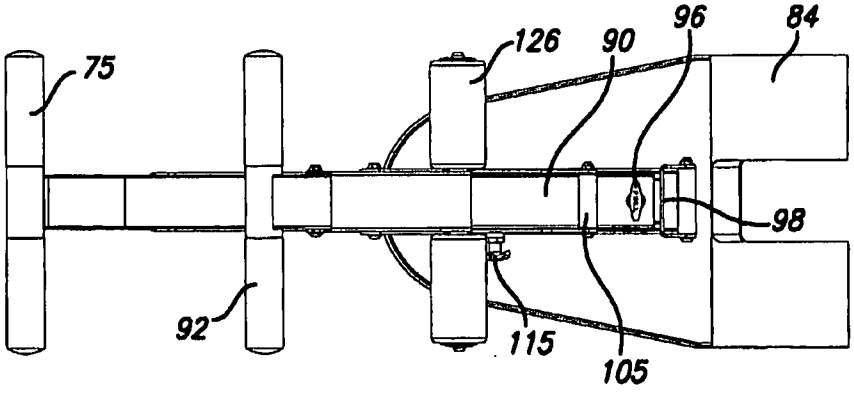

FIG. 33

FIG. 34A

FIG. 34B

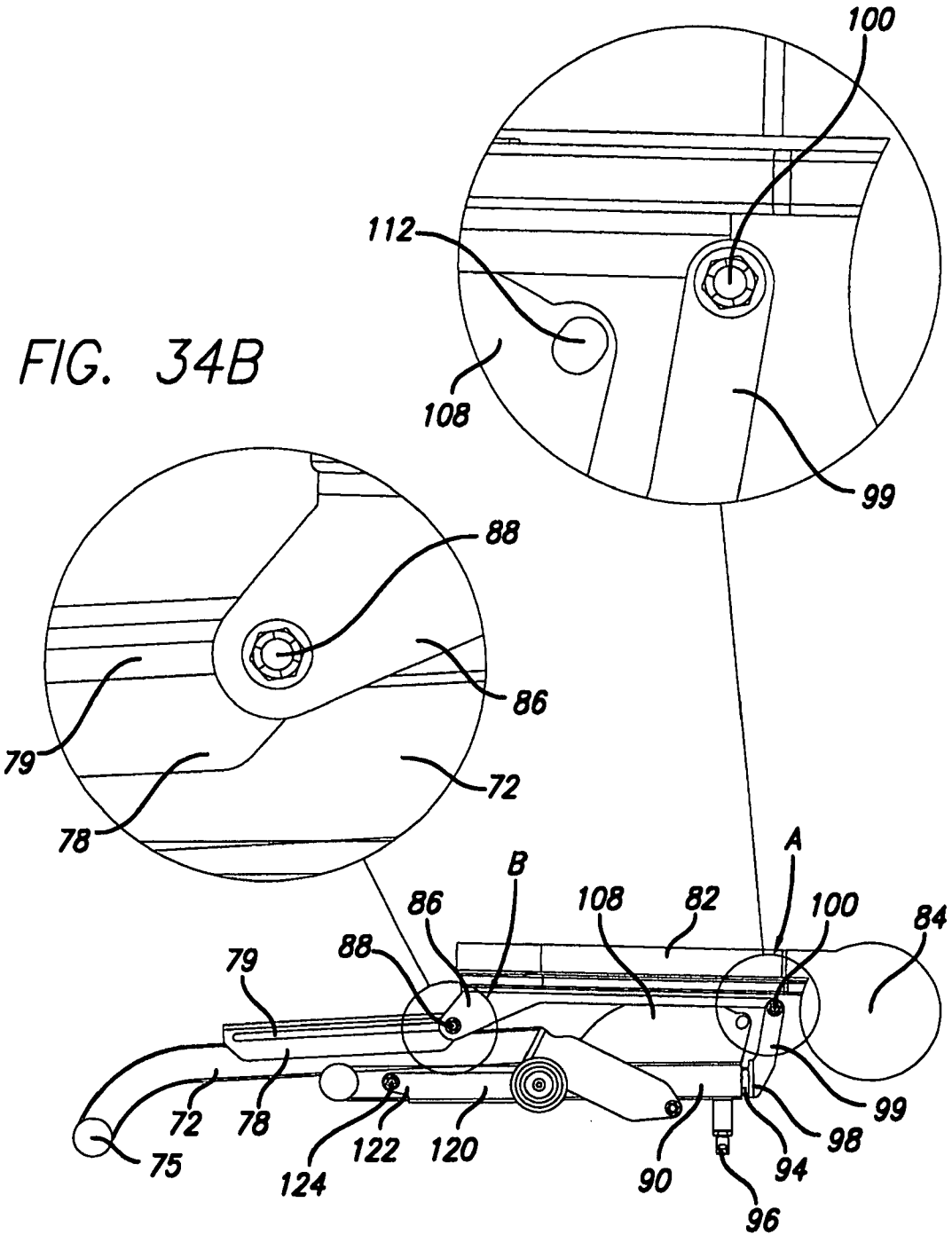

FIG. 34

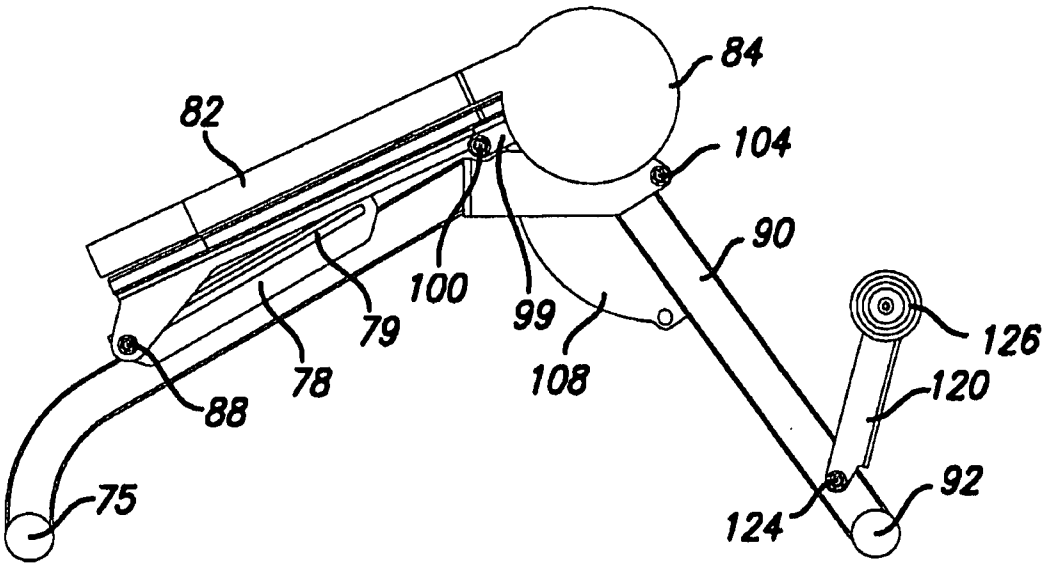
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FIG. 35

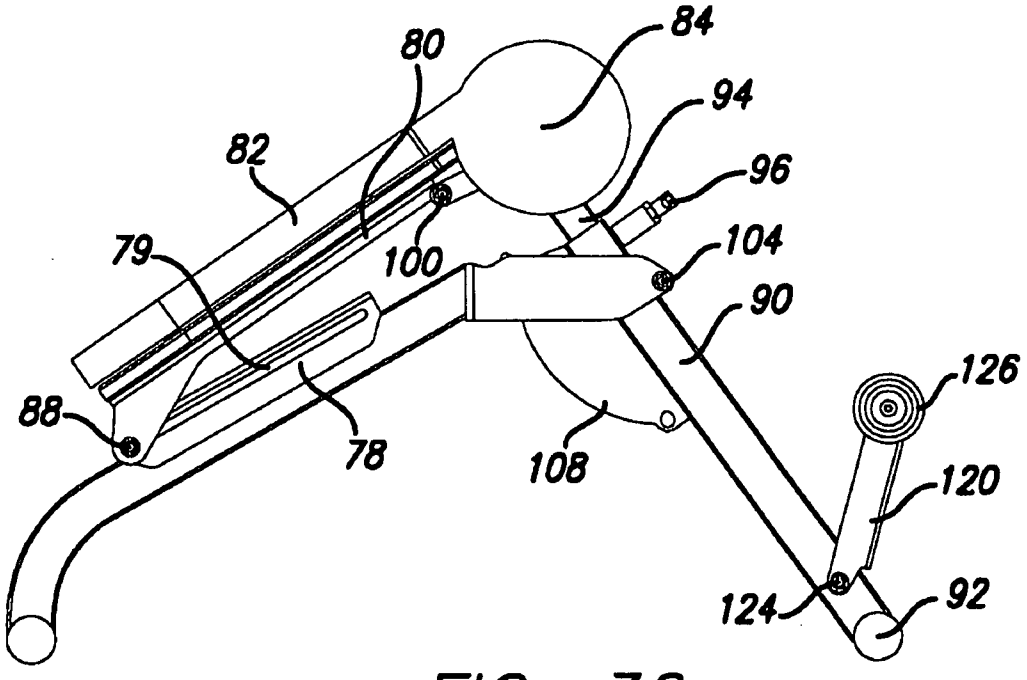
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FIG. 36

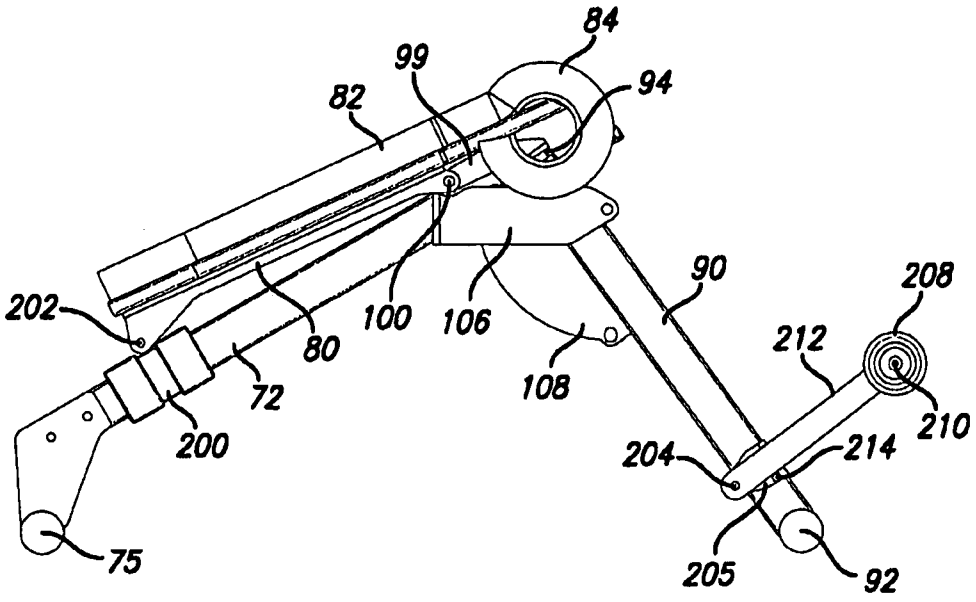

FIG. 36A

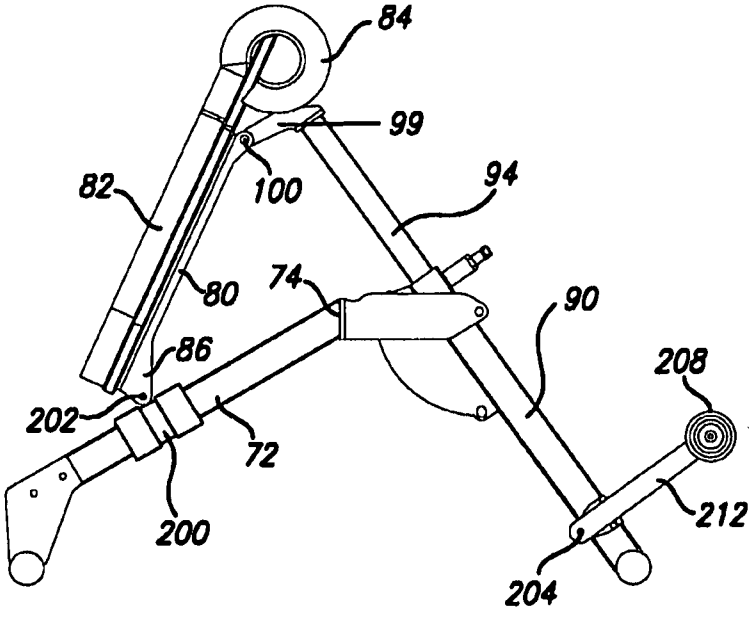

FIG. 36B

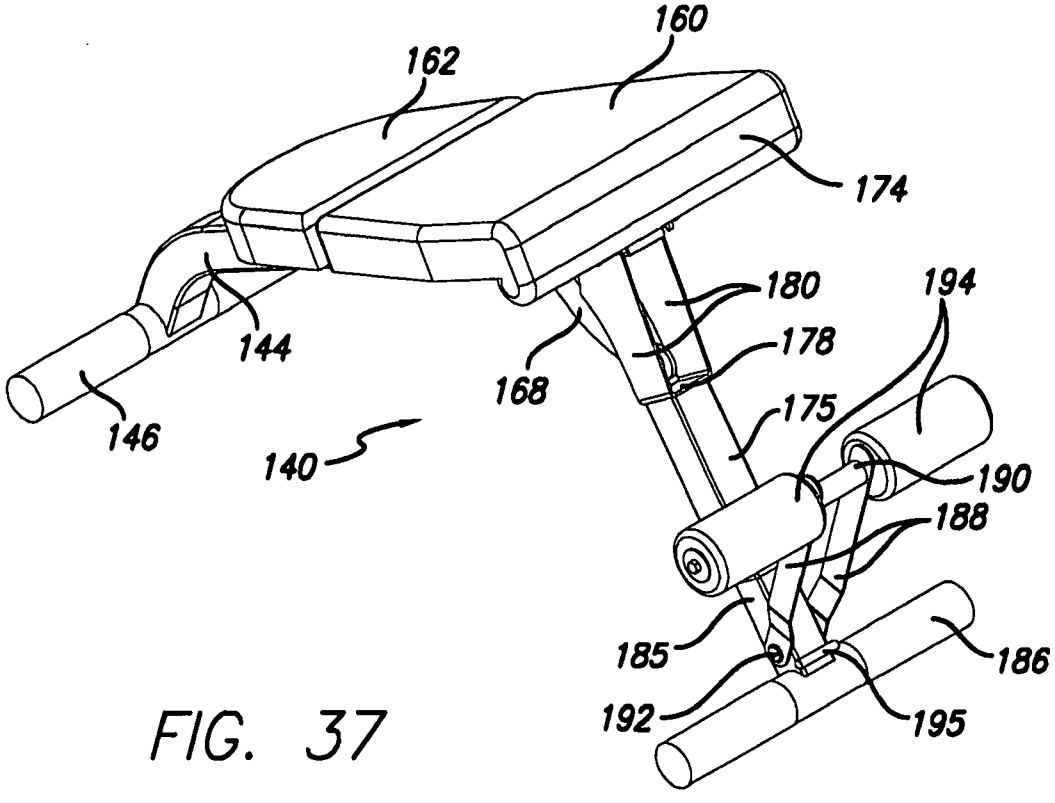
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FIG. 37

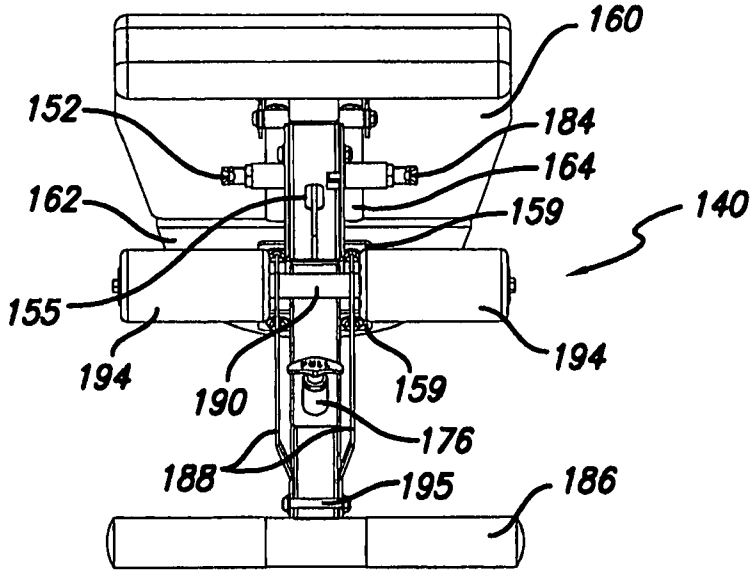
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FIG. 38

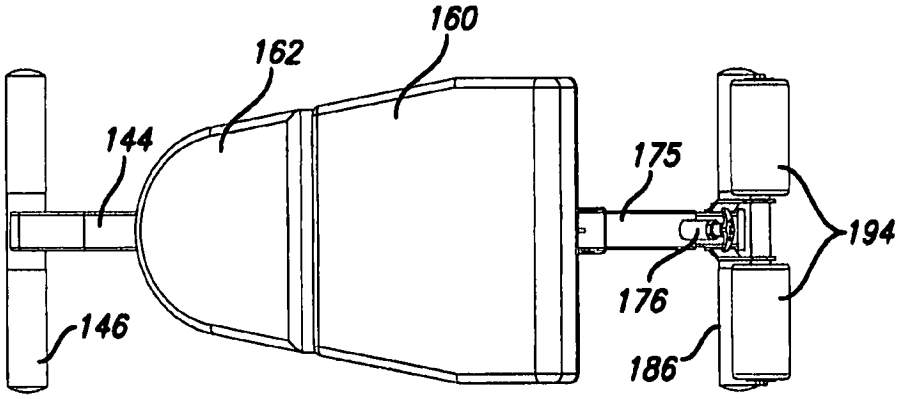
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FIG. 39

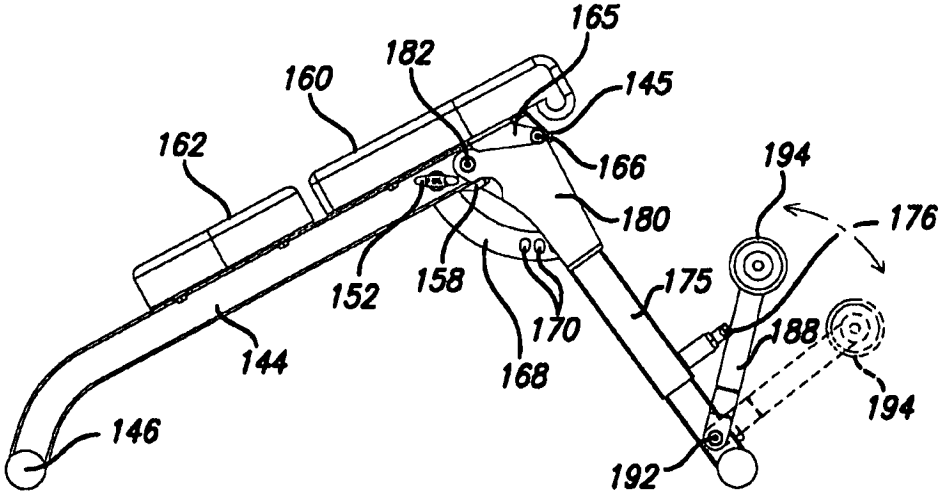
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FIG. 40

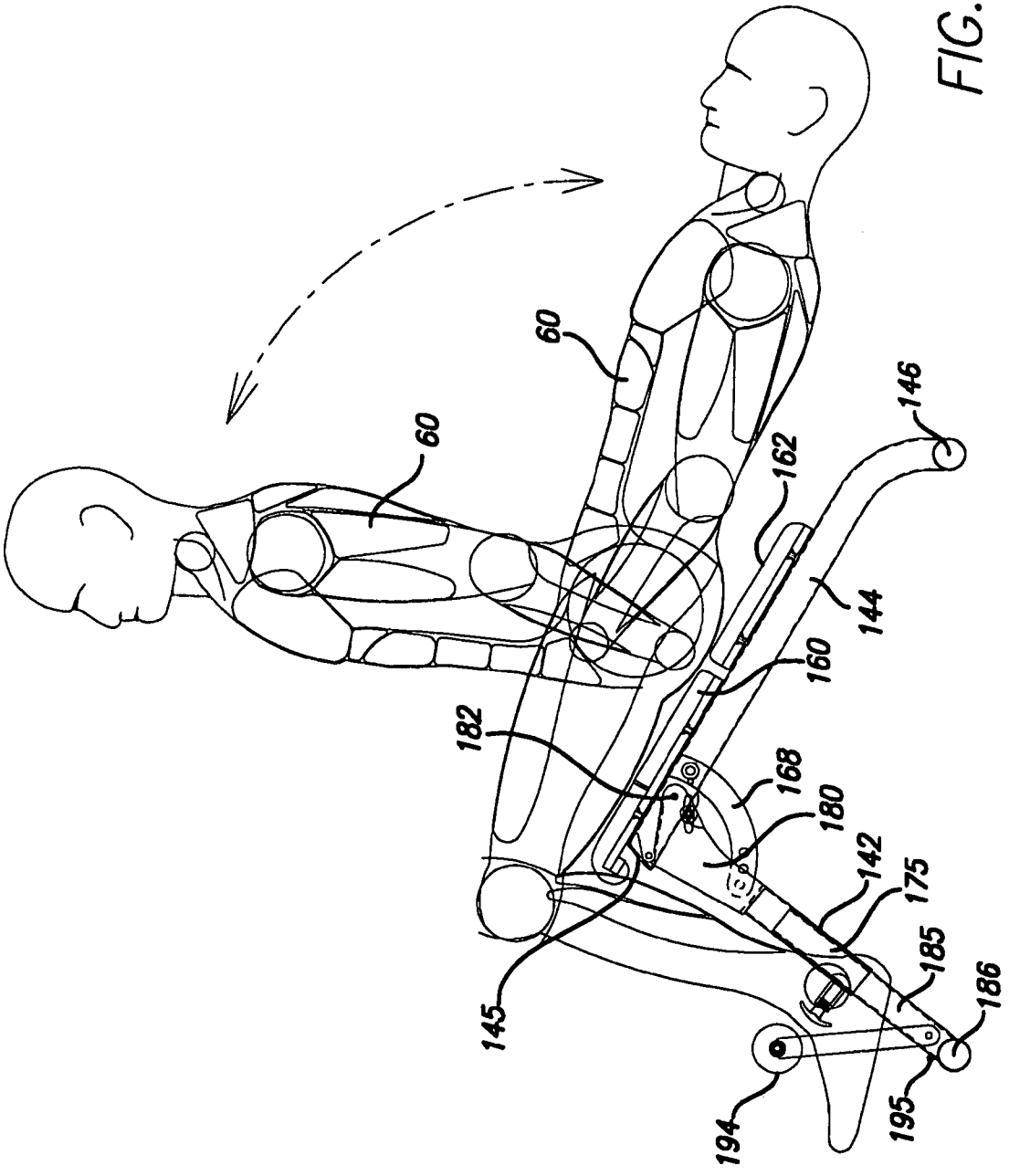

FIG. 41

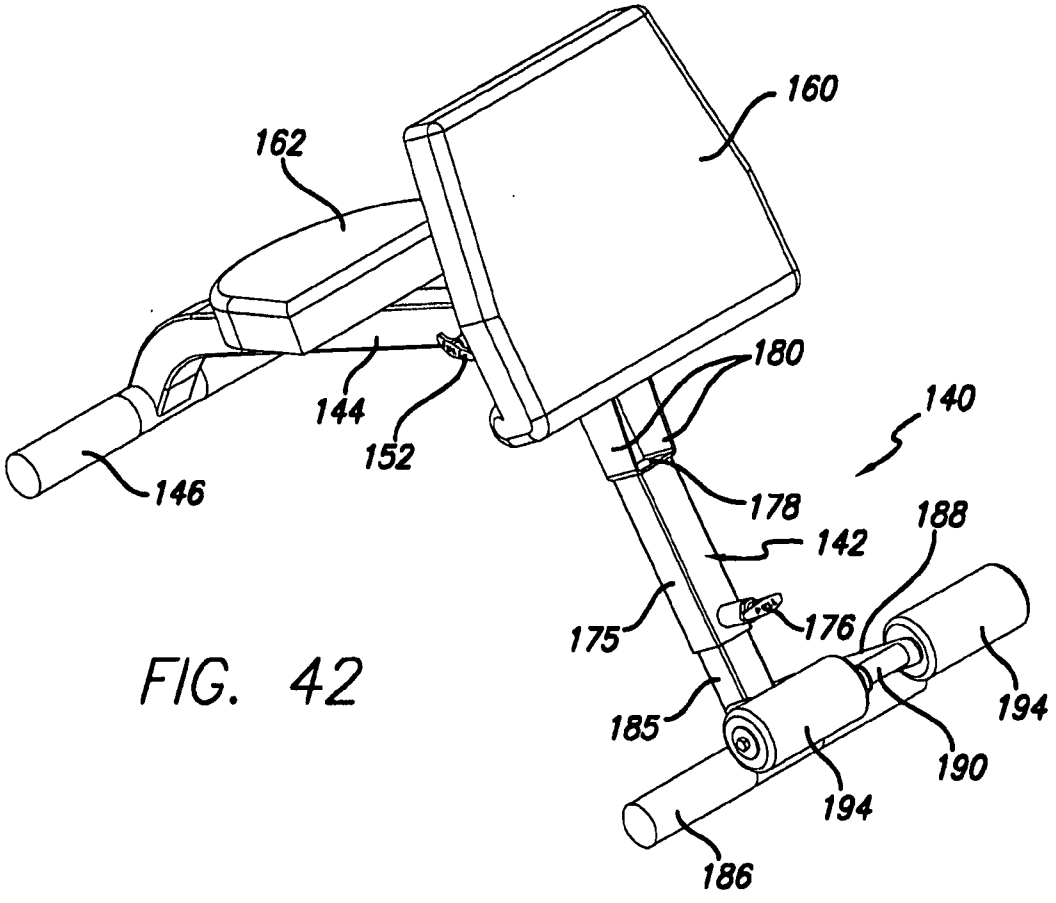
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FIG. 42

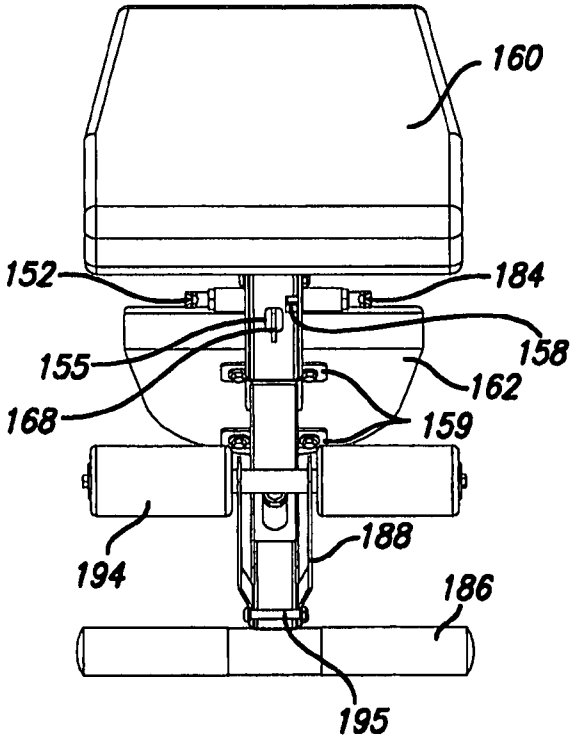
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FIG. 43

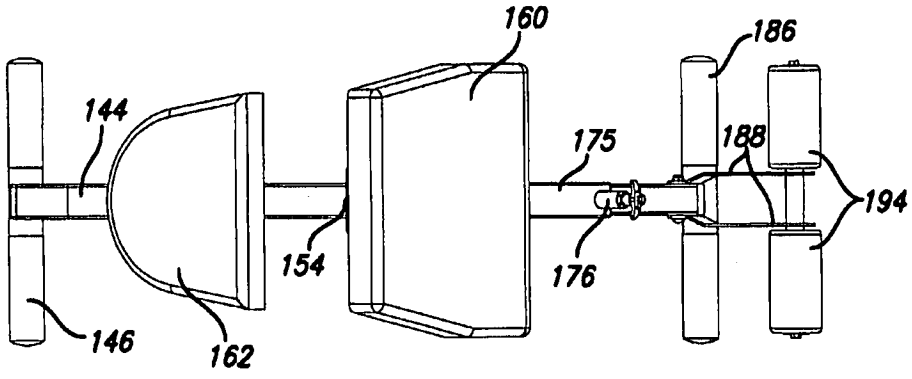
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FIG. 44

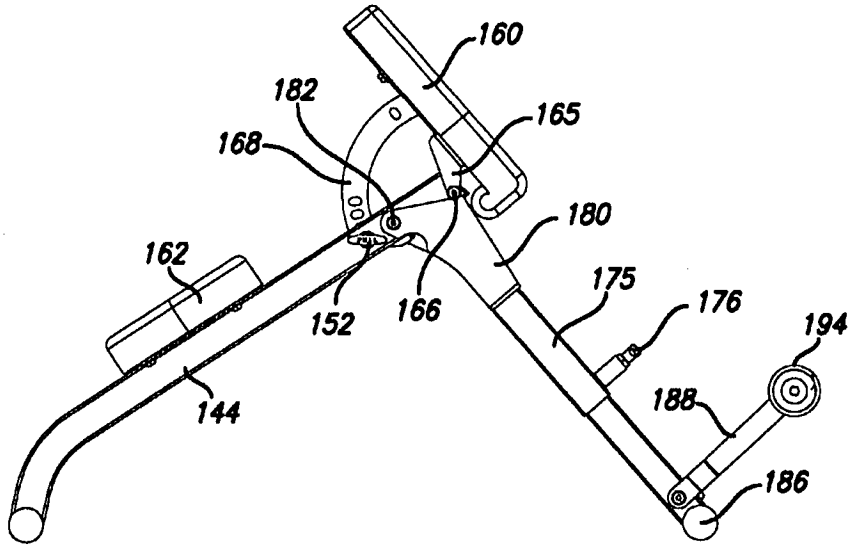
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FIG. 45

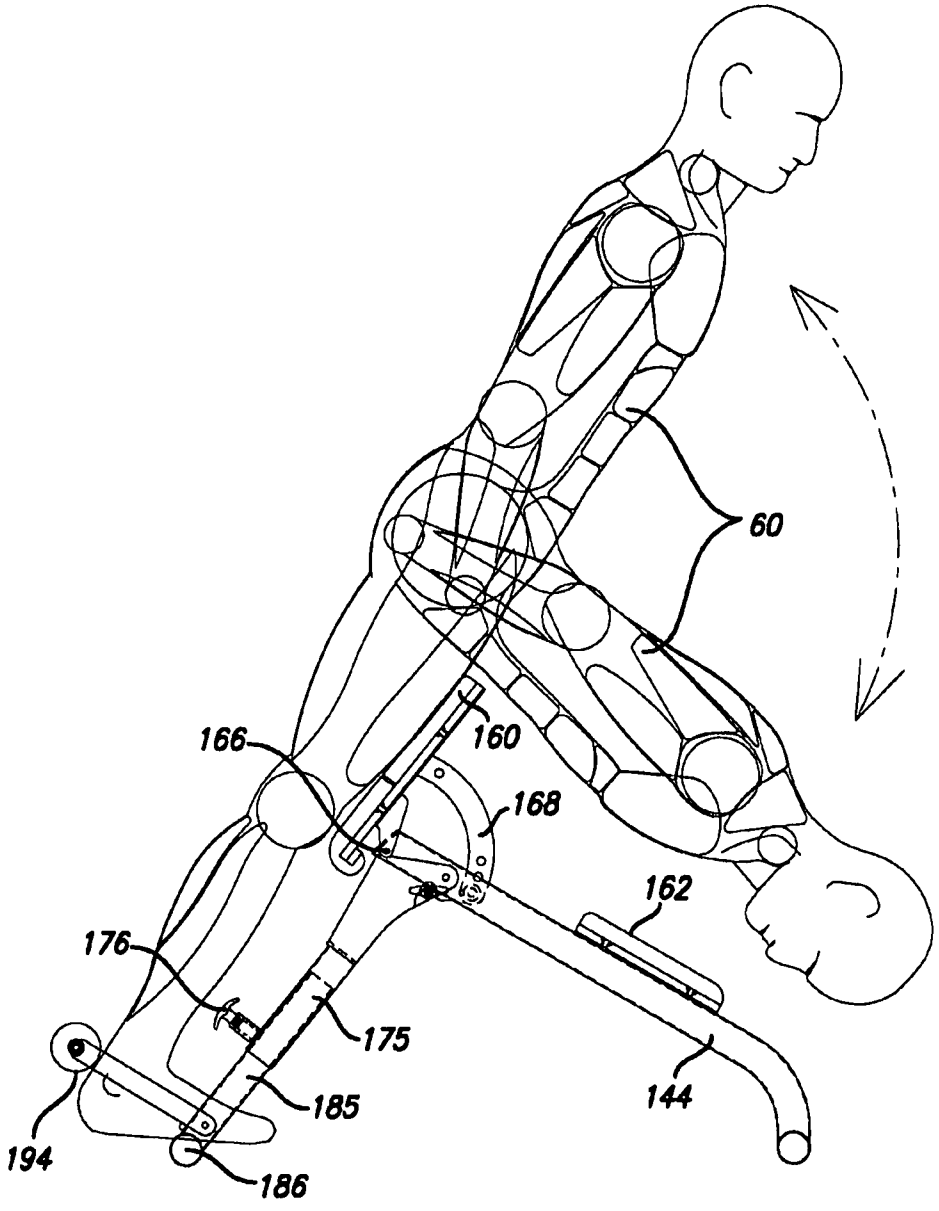

FIG. 46

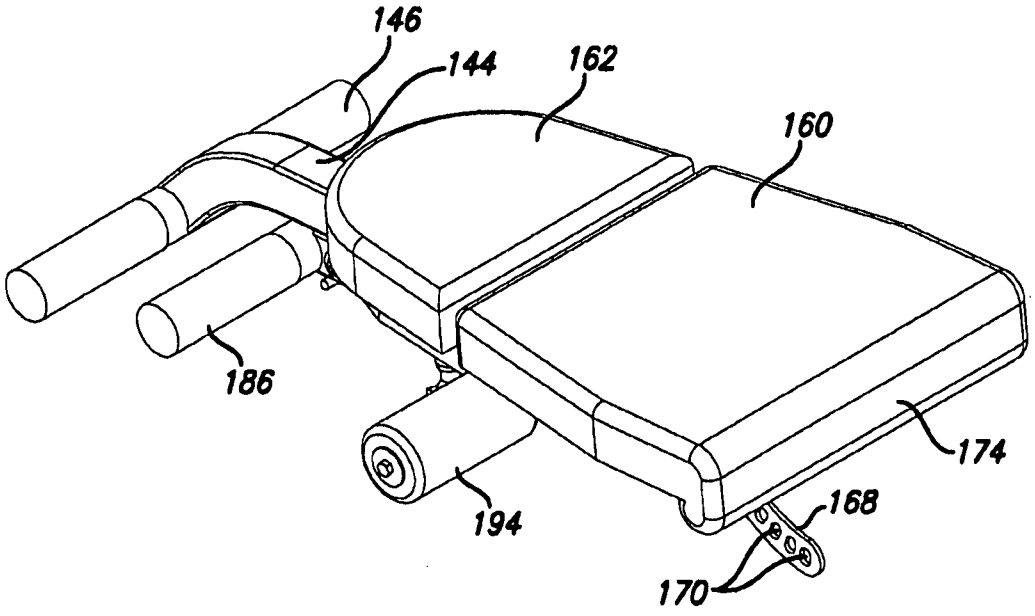

FIG. 47

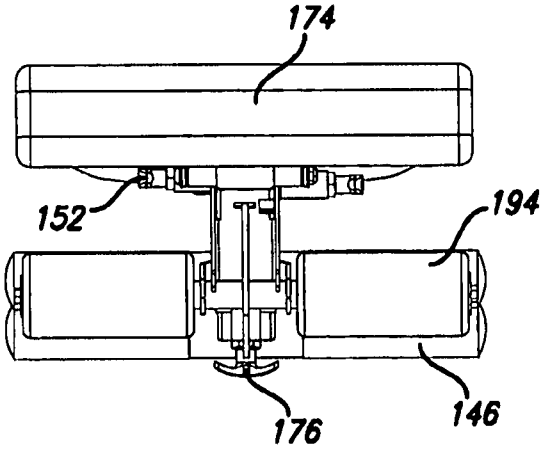

FIG. 48

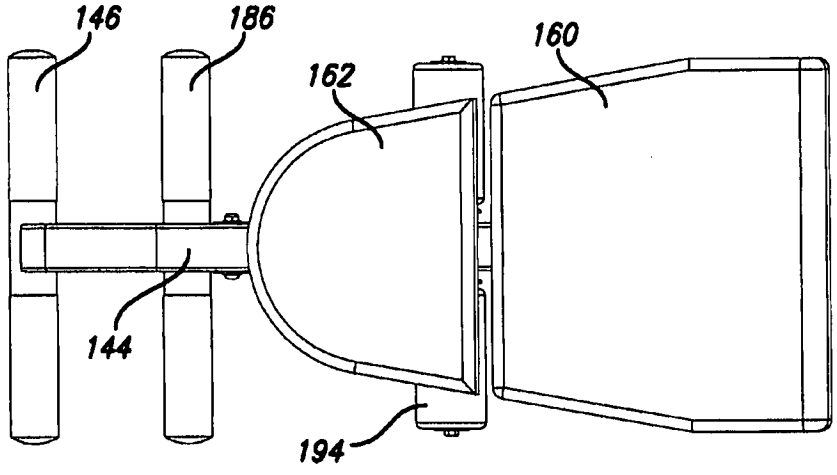
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FIG. 49

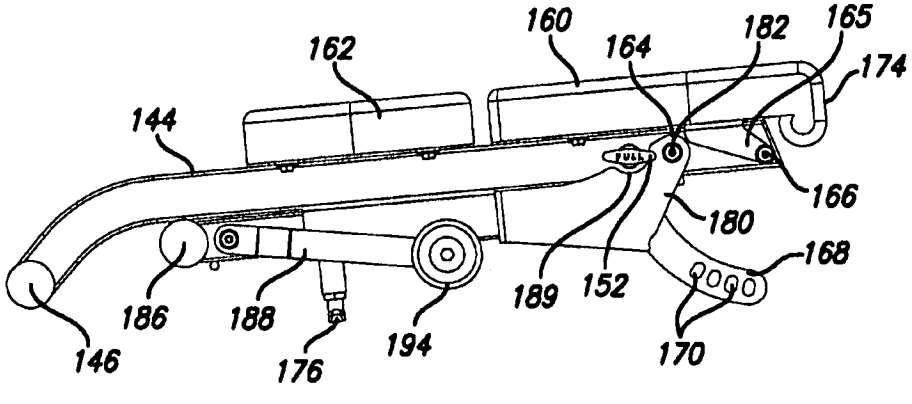
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FIG. 50

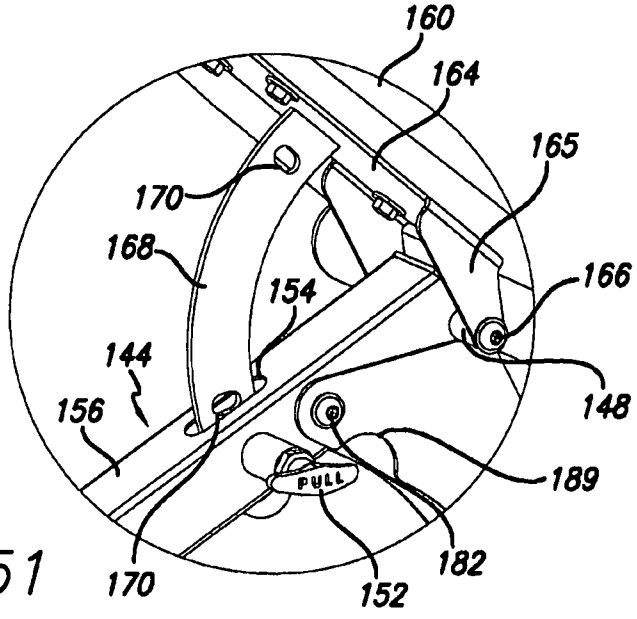
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FIG. 51

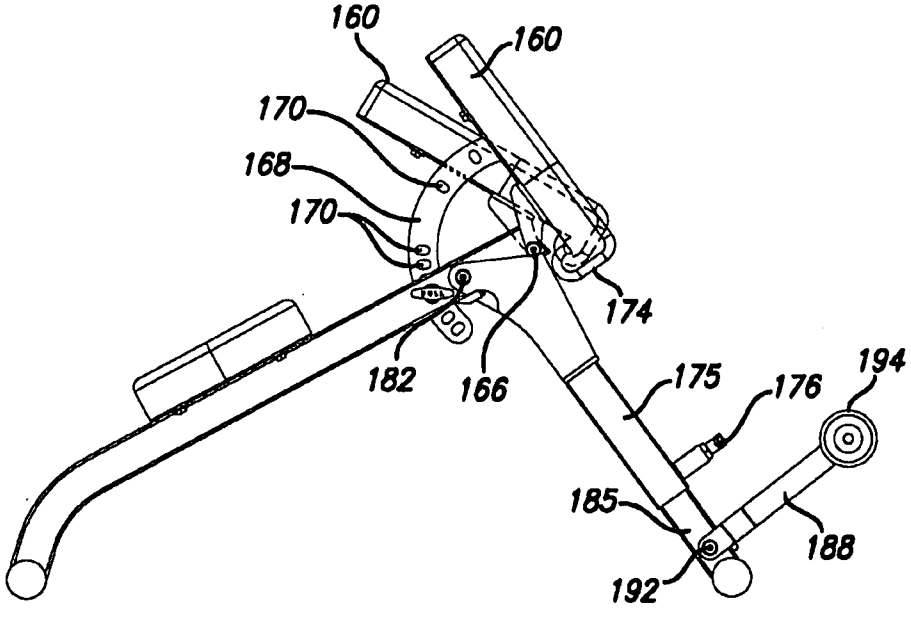
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FIG. 52

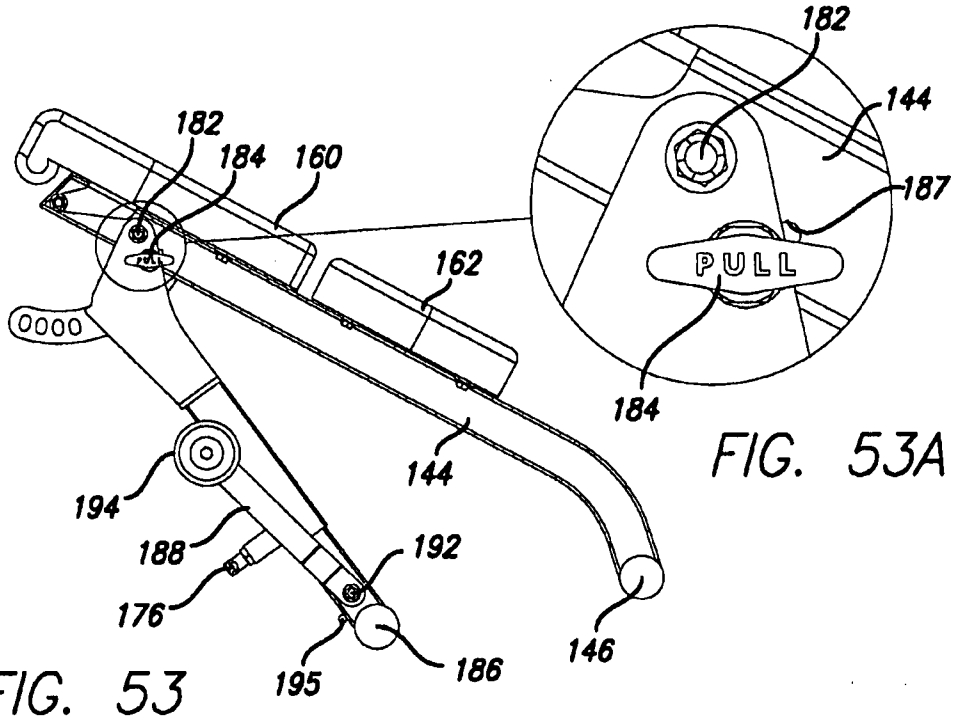

FIG. 53A

FIG. 53

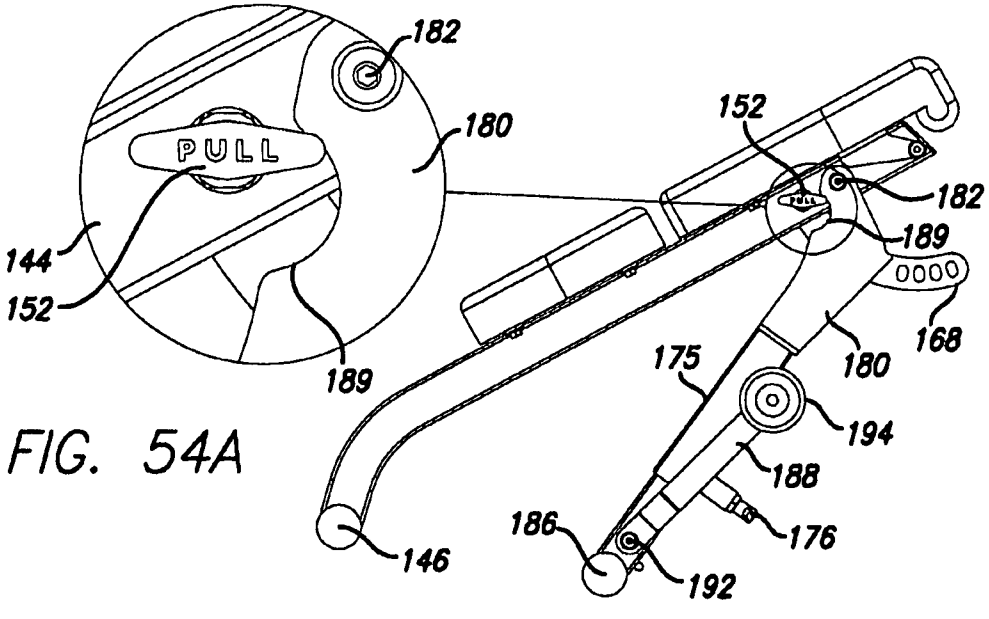

FIG. 54A

FIG. 54

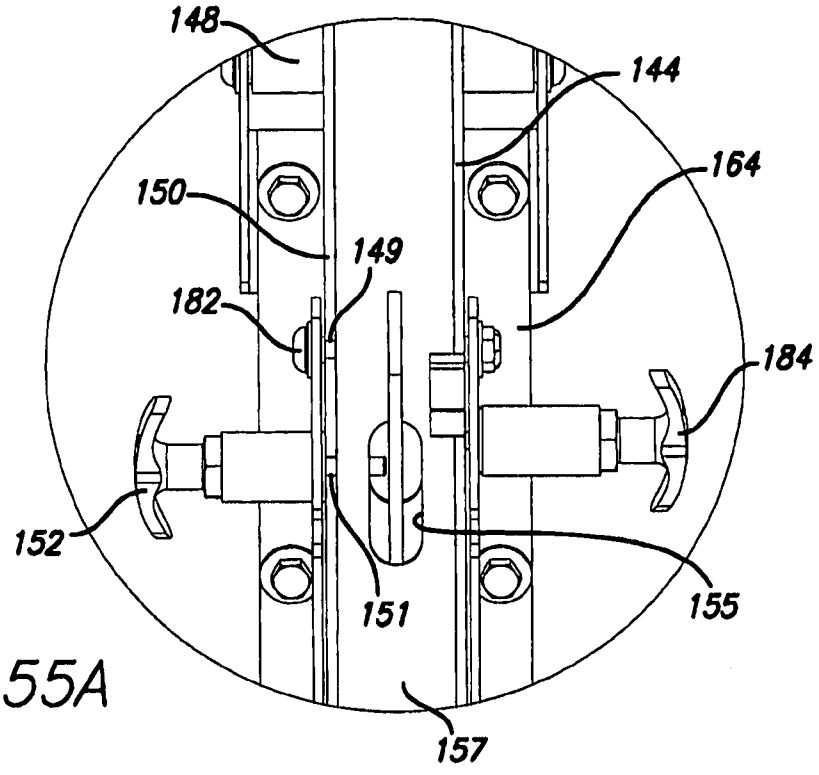

FIG. 55A

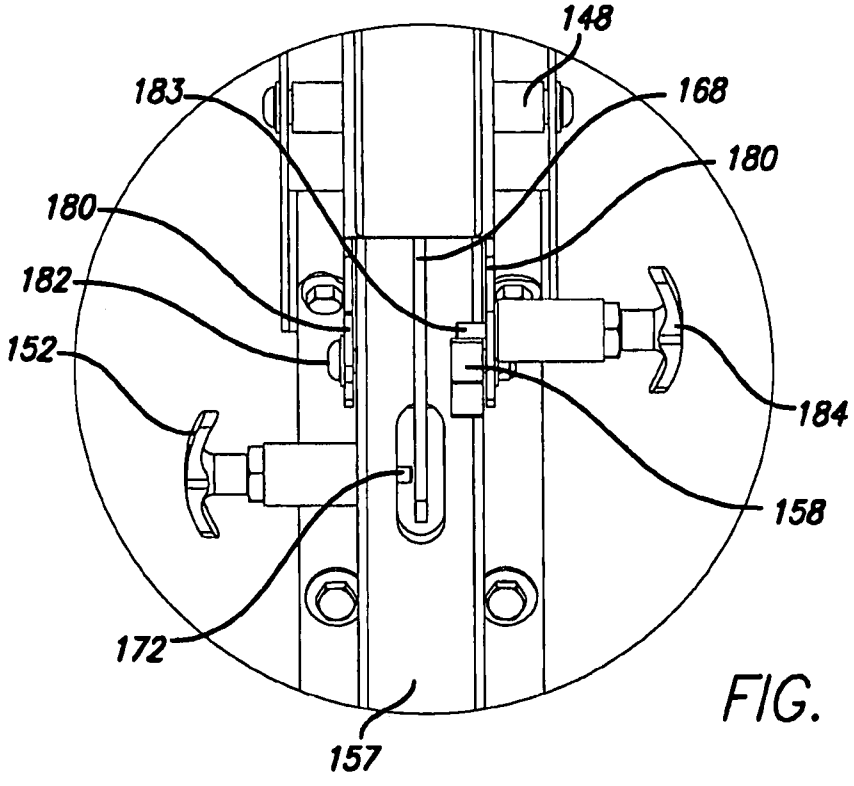

FIG. 55B

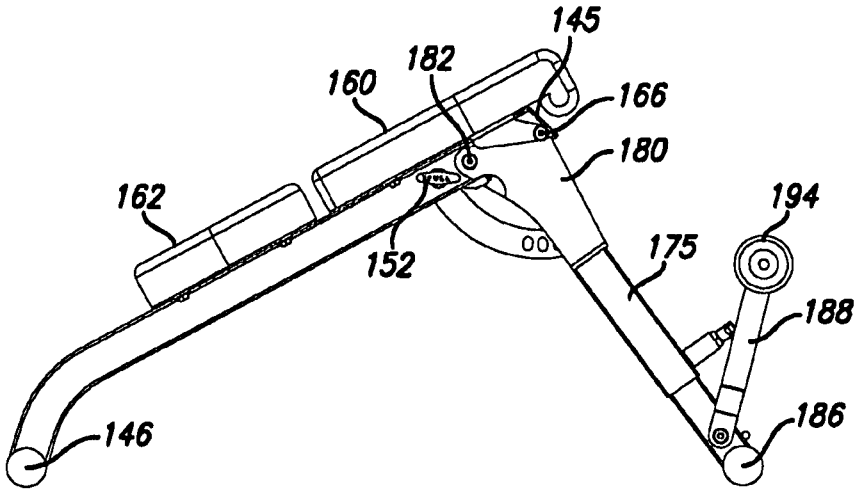
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FIG. 56

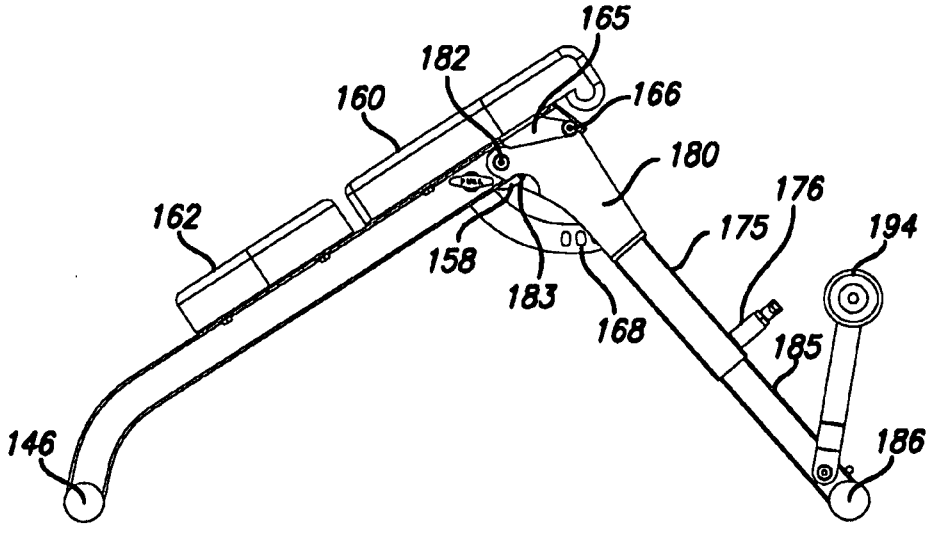
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FIG. 57

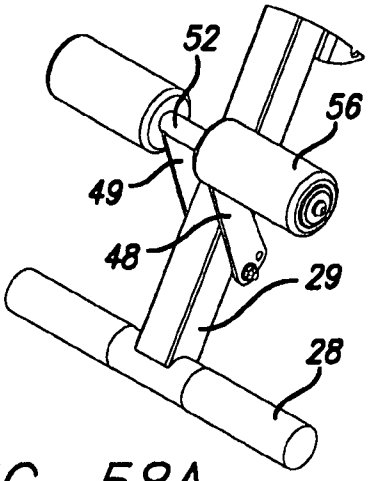

FIG. 58A

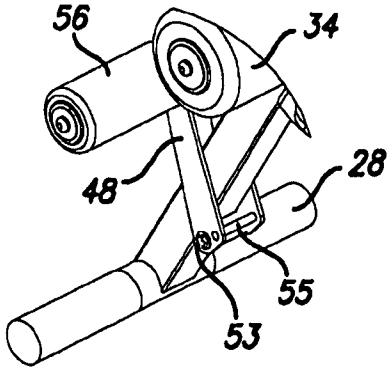

FIG. 58B

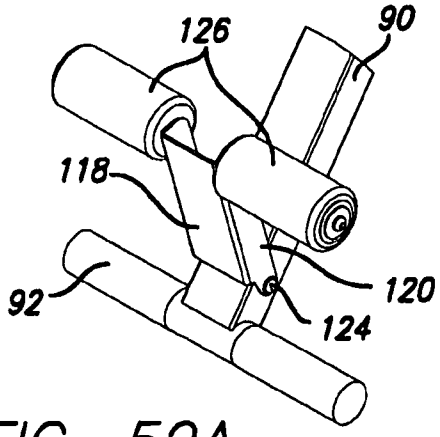

FIG. 59A

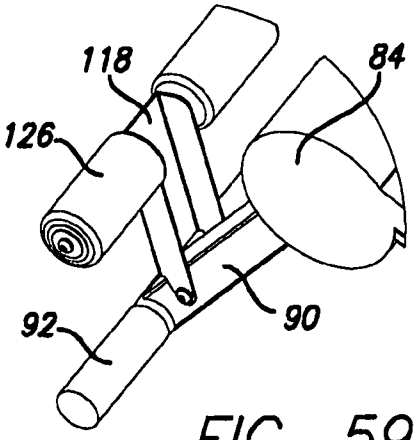

FIG. 59B

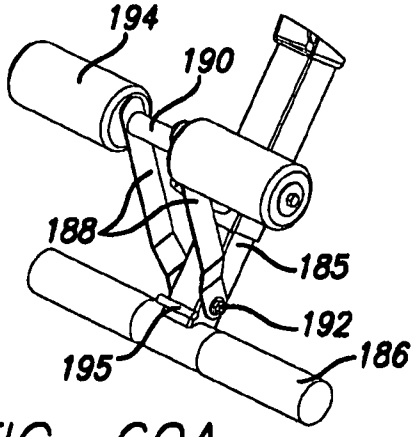

FIG. 60A

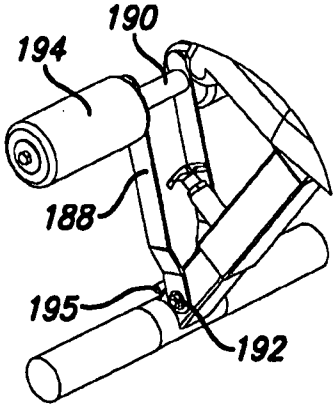

FIG. 60B

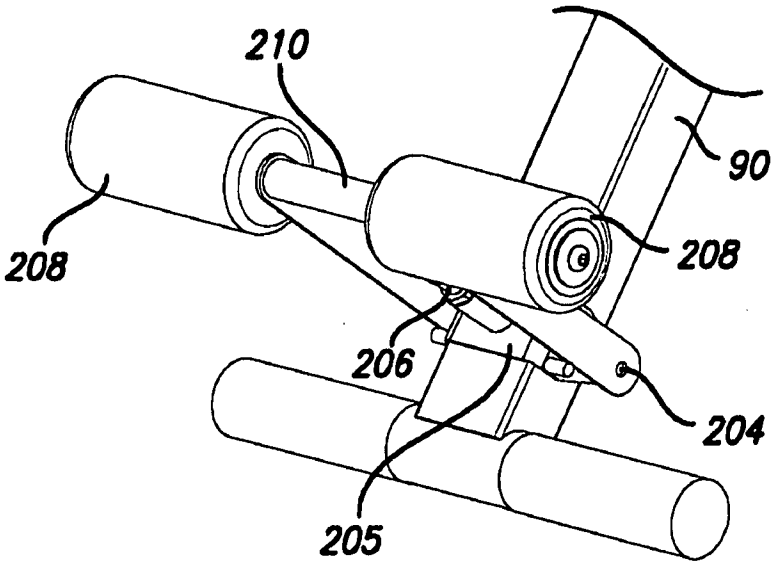

FIG. 61A

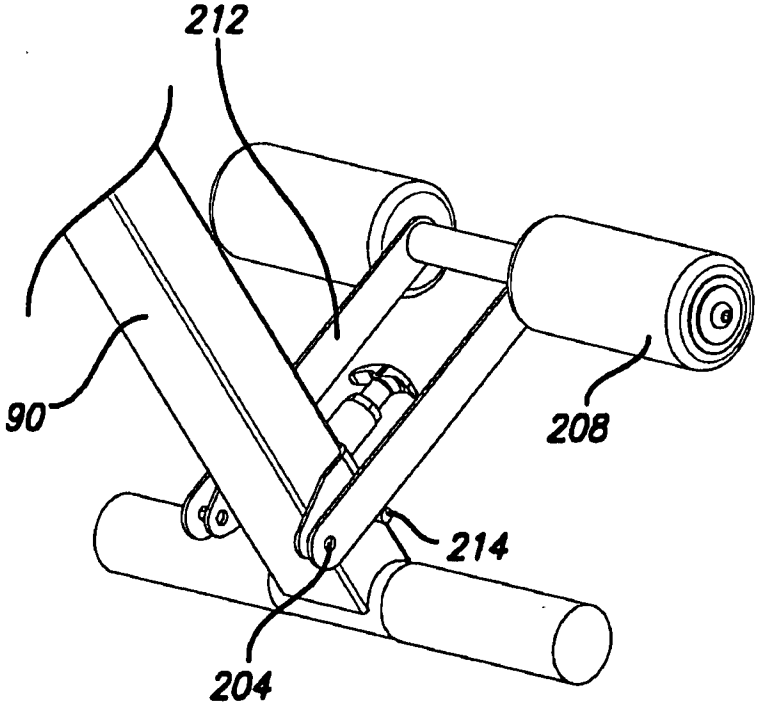

FIG. 61B

EXERCISE BENCH

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of priority of U.S. provisional application Ser. No. 60/664,454, filed Mar. 22, 2005, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

The present invention relates to exercise benches for supporting a user while performing exercise, and is particularly concerned with an exercise bench for performing both abdominal and low back exercises.

Exercise benches designed for performing abdominal or sit up exercises as well as lower back exercises such as hyper-extensions are known in the field. A simple inclined bench may be used to perform sit up exercises. Devices for performing hyper-extensions typically support the user leaning forwardly against a thigh support pad engaging the front of the user's thighs with their feet held in place by foot and ankle pads. The user then bends their upper body forward and downward at the waist, and then bends back up and rearward into alignment with the lower half of their body. This exercises the user's lower back muscles.

Some exercise benches are adaptable for both abdominal and lower back exercises. For example, U.S. Pat. No. 5,190,513 of Habing et al. describes a dual station exercise bench having a generally A shaped frame, with a back pad pivotally secured to one leg of the frame, and a secondary tube welded to the front face of the second leg of the frame and housing an adjustable slide member with thigh support pads mounted on its upper end. A second set of roller pads are pivotally mounted on the adjustable slide member below the thigh pads, for engaging a user's ankles when performing sit up or abdominal crunch exercises. A third set of roller pads are located at the lower end of the second leg, along with angled foot pads. The user stands on the foot pads with the third roller pads engaging behind their ankles while performing lower back exercises. This exercise bench has a large number of parts and is relatively heavy. It is also not foldable for storage or shipping.

Some exercise benches which can be used for lower back or abdominal exercises can be folded, but generally require removal of some parts to allow folding of the remainder of the bench. For example, U.S. Pat. No. 6,206,809 of Habing requires removal of an actuator arm carrying the thigh pad before it can be folded. U.S. Pat. No. 6,258,016 of Kuo requires the seat to be removed prior to folding the remainder of the frame. This makes movement of the bench between the folded and deployed positions inconvenient and does not allow for safe storage of the separated component.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new and improved exercise bench for performing abdominal and lower back exercises.

According to one aspect of the present invention, an exercise bench is provided which comprises a frame assembly having a first frame portion having floor engaging end and a second end, at least a forward part of the first frame portion being inclined upwardly towards the second end of the frame in an exercise position of the bench, and a second frame portion comprising a front leg secured to the first

frame portion and having a foot portion for engaging the ground, a user engaging foot stabilizer pivotally associated with the front leg, and a thigh support adjustably mounted on the frame assembly for engaging the thighs of a user when performing exercises while supported on the bench, whereby the spacing between the user engaging foot stabilizer and the thigh support is adjustable.

The thigh support, which provides support for the user's upper thigh during a back hyper-extension exercise, may be associated with either the first frame portion or main support frame, or with the second frame portion or front support leg. The adjustable spacing between the thigh support or thigh pad and the foot stabilizer allows for adjustment of the bench for users of different heights and also for different body orientations. The exercise bench may be designed for performing only abdominal exercises or for only lower back exercises, but in the exemplary embodiment it is a combination bench which can be used for both abdominal and lower back exercises. When performing an abdominal exercise, the user will sit on a seat pad located on a downwardly inclined part of the first frame portion facing forward, and hook their feet under the self-aligning foot stabilizer with the back of their lower thighs resting on the thigh support. They then bend rearward, pivoting at the waist to put their abdominal muscles under tension, and subsequently pivot back up into a sitting position. In order to perform a lower back exercise, the thigh support is adjusted to contact the upper thigh region of the user, and the user then stands facing the rear of the bench with their feet on the foot portion of the front leg and the foot stabilizer engaging behind their ankles, with their body in a forward lean so their upper thighs engage the thigh support. They then bend forward at the waist until their lower back muscles are under tension, subsequently returning to the start position.

In an exemplary embodiment of the invention, the user engaging foot stabilizer is pivotally mounted on the front leg so as to extend in front of the leg, and a stop device is provided for limiting the pivotal range of motion of the foot stabilizer in at least one direction. The stop device may be designed to prevent the foot stabilizer from pivoting to a position in which it is at a lower elevation than the pivot connection point to the front leg. This will keep the foot stabilizer within range of a user's feet when positioning themselves for either a seated abdominal exercise or a standing low back exercise. The foot stabilizer is designed to keep the user secured and properly positioned when performing exercises. It is designed to rest on top of the user's feet during an abdominal crunch exercise, keeping their feet securely on the bench by preventing the feet from sliding forward and preventing them from tipping over when they lean rearward. The foot stabilizer rests above the user's heels during a back hyper-extension exercise, keeping their feet securely on the bench by preventing them from sliding rearward.

The front leg may be pivotally secured to the second end of the first frame portion so that it can be folded up for storage, and may be tucked up within the framework of the first frame portion when folded to provide a compact storage position. The foot stabilizer may be foldable into a storage position in which at least part of the foot stabilizer swings past the front wall of the front leg to provide a more compact folded profile, and also keeps the foot stabilizer, which may comprise foot engaging roller pads, protected within the framework of the support frame. The front leg may be lockable in both the folded storage position against the underside of the first frame portion and the deployed or exercise position in which it is inclined forwardly from the

first frame portion. The foot portion or cross member at the lower end of the front leg also acts as a foot support or rest for the user to stand on when they are exercising their lower back muscles. This allows the user's weight to bear down on the floor engaging member or support in order to prevent the bench from tipping or sliding as the user performs lower back exercises.

The exercise bench of this invention can be folded into a storage position without first having to remove any component of the bench. Exercises performed on the bench are gravity resisted and un-assisted by any supplemental weights or exercise resistance, although supplemental weights or exercise resistance may be added if desired.

In an exemplary embodiment of the invention, the front leg has a first tube and an adjuster member or tube telescopically associated with the first tube and releasably lockable in a series of different extended positions relative to the first tube. In one embodiment, the first tube has an upper end secured to the forward end of the first frame portion and the adjuster member is slidably mounted in an upper end of the first tube with the thigh support secured to the upper end of the adjuster member. The thigh support may be a pair of thigh pads or rollers projecting in opposite directions from the upper end of the adjuster member. In an alternative arrangement, the thigh support is an enlarged portion of a forward end of a seat pad which has a rear end pivotally associated with the first frame portion, so that extension of the adjuster member will increase the angle of the seat pad while also raising the height of the thigh support.

In another embodiment of the invention, a pad pivotally associated with a forward part of the first frame portion can be secured in a first or down position seated on the first frame portion to act as a seat pad for a user performing abdominal exercises, or in a second, raised position to act as a thigh support for a user performing lower back exercises. The angle of the pad in the raised position can also be varied to adjust exercise difficulty. In this embodiment, the upper end of the adjuster member is secured to the forward end of the first frame portion, so that adjustment of the extension of the adjuster member will also adjust the height of the pad in the second, raised position and the inclination of the pad when acting as a seat in the down position.

According to another aspect of the present invention, a combination bench for exercising the abdominals and low back of a user is provided, the bench having a main frame and a folding assembly that can fold up for storage without the removal of any component or fastener. The bench can be locked in both the exercise and storage position, with the folding assembly tucked up within the frame work of the non-folding or main frame part in the storage position. A user engaging foot stabilizer is pivotally attached to the folding assembly with an arrangement that allows at least a portion of the user engaging section of the foot stabilizer to swing past the front wall or edge of the folding assembly in the folded or storage position, producing a more compact storage condition.

In another embodiment of the invention, a combination bench for exercising the abdominals and low back of a user is provided, the bench having a frame and a foot stabilizing device pivotally attached to the frame for providing stabilization and proper positioning of the user's feet during both exercises, the foot stabilizing device pivoting so as to self-align to the feet of the user in each exercise position, and having a limit or stop member to restrict its range of motion in at least one direction. The foot stabilizing device may comprise a cross member extending transversely across a front portion of the frame, oppositely directed pads secured to opposite ends of the cross member, and a pivot bracket assembly pivotally securing the cross member to the frame. The cross member engages the front portion of the frame to restrict pivoting motion of the foot stabilizing device in a first direction. A stop member may be mounted on the frame to restrict pivoting motion in a second direction such that the foot stabilizer can always be reached readily by the user's feet.

A bench for exercising the low back of a user according to another aspect of the invention has a main frame and a folding assembly that can fold up for storage without the removal of any component or fastener, the folding assembly being lockable in at least one of an exercise position and a storage position, and tucking up within the frame in the storage position. The folding assembly has a user engaging foot stabilizer, pivotally associated with the folding assembly in a manner that allows at least a portion of the user engaging section of said foot stabilizer to swing past the front wall or edge of said folding assembly in the storage position to allow for a more compact storage condition.

According to another aspect of the present invention, an exercise bench is provided which comprises a main frame having a first end for engaging the ground and a second end raised above the ground in an exercise position, and a front leg secured to the main frame and having a foot portion for engaging the ground in the exercise position to hold the second end of the main frame in the raised position, a support pad for supporting part of the user's body being mounted on either the front leg or the main frame, the front leg being adjustable in length to adjust the height of the support pad, and a user engaging foot stabilizer pivotally associated with the front leg with the pivot mounting at a fixed position relative to the foot portion, whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mounting and the support pad so as to accommodate user's having different length legs.

In an exemplary embodiment of the invention, a seat pad has a forward end secured to an upper end of the front leg and a rear end pivotally associated with a member slidably mounted on the main frame, whereby adjustment of the length of the front leg will cause the forward end of the seat pad to pivot upwardly and the rear end to slide forwardly along the main frame.

The exercise bench of this invention allows a user to perform either abdominal or lower back exercises, and has a folding front leg assembly so that it can fold up flat for easier storage The bench is readily adjustable to allow various size exercisers to perform both exercises effectively, and also to adjust the exercise difficulty. A thigh pad of adjustable height is provided either on the main frame or front leg assembly, and self-aligning, ankle engaging foot stabilizer pads are pivotally mounted on a part of the front leg assembly, so that the thigh pad can be adjusted independent of the ankle engaging pads.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood from the following detailed description of some exemplary embodiments of the invention, taken in conjunction with the accompanying drawings in which like reference numerals refer to like parts and in which:

FIG. **1** is a perspective view of an exercise bench according to a first embodiment of the invention, with the bench configured for performing abdominal crunch exercises;

FIG. **2** is a front view of the bench of FIG. **1**;

FIG. **3** is a top plan view of the bench of FIG. **1**;

FIG. **4** is a side view of the bench of FIG. **1**;

FIG. **5** is a side elevation view of the bench similar to FIG. **4**, illustrating a user performing a seated abdominal exercise;

FIG. **6** is a perspective view similar to FIG. **1** but illustrating the bench configured for performing a back hyper-extension exercise;

FIG. **7** is front view of the bench in the configuration of FIG. **6**;

FIG. **8** is a top plan view of the bench configured as in FIG. **6** for lower back exercises;

FIG. **9** is a side elevation view of the bench in the back exercise configuration of FIGS. **6** to **8**;

FIG. **10** is a side elevation view similar to FIG. **9**, illustrating a user performing a low back exercise;

FIG. **11** is a perspective view of the bench of FIGS. **1** to **10** in a folded, storage position;

FIG. **12** is a front view of the bench in the storage position;

FIG. **13** is a top plan view of the bench in the storage position of FIGS. **11** and **12**;

FIG. **14** is a side elevation view of the bench in the storage position of FIGS. **11** to **13**;

FIG. **15** is a rear perspective view from underneath the bench in the deployed position of FIG. **1**, illustrating the pivotal connection between the frame and the folding front leg assembly;

FIG. **15**A is an exploded view of the pivotal connection circled in FIG. **15**;

FIG. **16** is a perspective view of the exercise bench of FIGS. **1** to **15** at an intermediate position as the front leg assembly is being unfolded from a storage position to a deployed position;

FIG. **16**A is an enlarged view of the circled portion of FIG. **16**, illustrating the range of motion plate;

FIG. **17** is a perspective view of the exercise bench with the front leg assembly in the deployed, exercise position;

FIG. **17**A is an enlarged view of the circled portion of FIG. **17**, illustrating the range of motion plate;

FIG. **18**A is a side elevation view of the exercise bench of FIGS. **1** to **17** with the bench in position for performing abdominal exercises and the adjustable thigh support rollers in their lowest position;

FIG. **18**B is a side elevation view similar to FIG. **18**A showing the adjustable thigh support rollers in a raised position;

FIG. **19** is a perspective view of an exercise bench according to a second embodiment of the invention, with the bench in a first exercise position for performing abdominal crunch exercises;

FIG. **20** is a front elevation view of the bench in the position of FIG. **19**;

FIG. **21** is a top plan view of the bench of FIGS. **19** and **20**;

FIG. **22** is a side elevation view of the bench in the position of FIGS. **19** to **21**;

FIG. **23** is a side elevation view similar to FIG. **22** illustrating a user performing a seated abdominal exercise;

FIG. **24** is a front perspective view of the bench of FIGS. **19** to **23** in a second exercise configuration for performing back hyper-extension exercises;

FIG. **24**A is an enlarged view of the circled portion of FIG. **24** to illustrate the locking arrangement between the frame and the folding front leg assembly in the exercise position;

FIG. **25** is a front elevational view of the bench in the exercise position of FIG. **24**;

FIG. **26** is a top plan view of the bench positioned as in FIG. **24**;

FIG. **27** is a side elevation view of the bench positioned as in FIG. **24**;

FIG. **28** is a side elevation view similar to FIG. **27** illustrating a user performing a low back exercise;

FIG. **29** is a perspective view illustrating the bench of FIGS. **19** to **28** in a folded or storage position;

FIG. **30** is a front view of the folded bench of FIG. **29**;

FIG. **31** is a top plan view of the folded bench of FIG. **29**;

FIG. **32** is a side elevation view of the folded bench of FIGS. **29** to **31**;

FIG. **33** is a bottom plan view of the folded bench of FIGS. **29** to **32**;

FIG. **34** is a side elevation view similar to FIG. **32** illustrating the bench in the folded position;

FIG. **34**A is an expanded view of the circled region A of FIG. **34**;

FIG. **34**B is an expanded view of the circled region B of FIG. **34**;

FIG. **35** is a side elevation view of the exercise bench of FIGS. **19** to **34** with the adjustable seat assembly in its lowest position;

FIG. **36** is a side elevation view similar to FIG. **35** illustrating the seat assembly in a raised position;

FIG. **36**A is a side elevation view similar to FIG. **35** showing a modified pivot mounting for the adjustable seat assembly, with the upholstery cut away to show the front pivotal attachment;

FIG. **36**B is a side elevation view similar to FIG. **27** but showing the modified exercise bench of FIG. **36**A, again with the upholstery cut away to show the front pivotal attachment;

FIG. **37** is a perspective view of an exercise bench according to a third embodiment of the invention in a first exercise position for performing abdominal crunch exercises;

FIG. **38** is a front elevational view of the bench in the position of FIG. **37**;

FIG. **39** is a top plan view of the bench of FIGS. **37** and **38**;

FIG. **40** is a side elevation view of the bench in the position of FIGS. **37** to **39**;

FIG. **41** is a side elevation view similar to FIG. **40** illustrating a user performing a seated abdominal exercise;

FIG. **42** is a perspective view of the third embodiment of the exercise bench in a second exercise position for performing back hyper-extension exercises;

FIG. **43** is a front elevation view of the bench in the position of FIG. **42**;

FIG. **44** is a top plan view of the bench in the position of FIG. **42**;

FIG. **45** is a side elevation view of the bench in the position of FIG. **42**;

FIG. **46** is a side elevation view similar to FIG. **45** illustrating a user performing a lower back exercise;

FIG. **47** is a perspective view of the bench of FIGS. **37** to **46** in a folded or storage position;

FIG. **48** is a front elevation view of the bench in the folded position of FIG. **47**;

FIG. **49** is a top plan view of the bench in the folded position of FIG. **47**;

FIG. **50** is a side elevation view of the bench in the folded position of FIG. **47**;

FIG. **51** is an expanded perspective view of the adjustable seat bracket from underneath the front pad, illustrating how the curved adjuster plate passes through the main frame;

FIG. **52** is a side elevation view of the exercise bench illustrating different adjusted positions of the front pad in the second exercise position for performing lower back exercises;

FIG. **53** is a side elevation view of the bench of FIGS. **37** to **52** illustrating the front leg assembly being folded about its pivotal connection to the main frame towards the folded position;

FIG. **53**A is an expanded view of the circled region of FIG. **53** illustrating the locking pin and pinning hole for locking the folded leg assembly in the folded position;

FIG. **54** is a side elevation view similar to FIG. **53** but from the opposite direction to FIG. **53**;

FIG. **54**A is an expanded view of the circled region of FIG. **54** illustrating the notch in the leg assembly bracket for fitting around the seat pad adjusting pull pin;

FIG. **55**A is a bottom plan view of part of the underside of the bench with the front support leg in the folded position;

FIG. **55**B is a bottom plan view similar to FIG. **55**A but illustrating the front support leg in the exercise position;

FIG. **56** is a side elevation view of the bench of the third embodiment in the exercise position for performing abdominal exercises, with the adjustable seat assembly in its lowest position;

FIG. **57** is a side elevation view similar to FIG. **56** illustrating the adjustable seat assembly in a raised position;

FIG. **58**A is a front perspective view of the self-aligning foot stabilizer of the first embodiment of the exercise bench;

FIG. **58**B is a rear perspective view of the foot stabilizer of FIG. **58**A;

FIG. **59**A is a front perspective view of the self-aligning foot stabilizer of the second embodiment of the exercise bench;

FIG. **59**B is a side perspective view of the foot stabilizer of FIG. **59**A;

FIG. **60**A is a front perspective view of the self-aligning foot stabilizer of the third embodiment of the exercise bench; and

FIG. **60**B is a rear perspective view of the foot stabilizer of FIG. **60**A.

FIG. **61**A is a front perspective view of an alternative self-aligning foot stabilizer; and

FIG. **61**B is a rear perspective view of the foot stabilizer of FIG. **61**A.

DETAILED DESCRIPTION OF THE DRAWINGS

FIGS. **1** to **18** illustrate a foldable exercise bench **10** according to a first embodiment of the invention for performing abdominal crunch exercises or lower back exercises. The bench consists of 5 main elements: A main support frame **12**, a folding front leg assembly **14**, a foot stabilizer **15**, a thigh support **16** and a seat pad **18**, as indicated in FIG. **1**.

FIGS. **1** to **5** illustrate the bench **10** in a first exercise position for performing abdominal crunch exercises, while FIGS. **6** to **10** illustrate the bench **10** in a second exercise position for performing back hyper-extension exercises. FIGS. **11** to **14** illustrate the bench in a folded or storage position, and FIGS. **15** to **18** illustrate various details of the bench components.

The main support frame **12** comprises a main tube **20** which has a floor engaging cross support **24** connected at a first end and a support plate **22** (FIGS. **3** and **4**) connected to a second end. The main tube angles downward and rearward from its second end and has a downward bend **25** approximate its first end. The seat pad **18** is engaged with the main tube **20** with a forward end of the seat pad adjacent the second end of the tube. The seat pad is tapered, as best seen in FIG. **3**, with the widest end at the front closest to the second end of the main tube.

The folding front leg assembly **14** is pivotally connected to the main support frame by pivot pin **26** located adjacent its upper end and has a floor engaging cross support **28** associated with its second or lower end. The front leg assembly holds the main tube **20** in the raised position when in the deployed, exercise positions of FIGS. **1** to **10**, as best illustrated in FIGS. **1**, **4**, **6** and **9**. The lower cross support **28** also acts as a foot rest or support for the user to stand on when they are performing back exercises. This allows the user's weight to bear down on the floor engaging section to prevent the bench from tipping or sliding as the user is exercising their low back muscles.

The folding front leg assembly comprises a tubular front support leg **29** with an open upper end and the floor engaging cross support **28** is transversely attached at the lower end. An adjuster tube **30** with multiple adjustment openings **32** (see FIGS. **6** and **7**) is inserted into the open first end of the front support leg for telescopic adjustment with the support leg. One end of the adjuster tube protrudes past the open end of the support leg and has a round pad support rod **33** transversely mounted at its upper end. Roller pads **34** are mounted over the ends of the pad support rod **33**. The roller pads **34** comprise the thigh support **16** for engaging the user's thighs when the adjuster tube is elevated for low back exercises, as in FIGS. **6** to **10**. The pads **34** also provide support behind a seated user's knees during abdominal exercises. A pull pin **35** extends through the front wall of the front support leg **29** adjacent its open upper end and into a selected aligned opening **32** in the adjuster tube so as to lock the adjustment tube at a selected extension.

A "U" shaped mounting bracket **36** is attached by its web to the rear wall of the front leg **29**, opposite the pull pin **35**. The mounting bracket has a first rearward protruding leg **37** and second rearward protruding leg **38** which is longer and larger in dimensions than the first leg, as best illustrated in FIGS. **5**, **11** and **15**. The pivot pin **26** extends through a first opening in the first leg **37**, a round tube **40** welded to the front plate **22** of the main tube, and through a second, aligned opening in the second leg **38** so as to pivotally connect the front support leg **29** to the main frame, as best illustrated in FIGS. **11** and **15**A. This pivotal connection allows the front support leg to fold rearward, up against the underside of the main support frame. The second leg has an arcuate slot **42** approximate its rearward edge with opposite bulbous ends **43**, **44**, as best illustrated in FIG. **4**. A pull pin **45** is mounted on one side wall of the main support frame's main tube. The pull pin **45** has a larger diameter body **47** with a smaller diameter tip **46** which engages in the arcuate slot **42** of bracket **36** secured to the front support leg **29**, as illustrated in FIGS. **15** to **17**. The bulbous ends **43**, **44** of the arcuate slot provide locking positions for the storage position (see FIG. **11**) and the exercise positions (see FIGS. **4** and **6**). When the leg is pivoted about pivot pin **26**, the end or tip **46** of the pull pin will travel along slot **42**. The stepped design of the pull pin plunger ensures that the pull pin will always engage with the slot, for added safety. When the pull pin is aligned with one of the enlarged, bulbous ends of the slot, the larger diameter portion **47** of the pull pin will extend into the enlarged end of the slot, locking the pin in position and thus locking the leg **29** in its end position (either folded or deployed).

The foot stabilizer **15** is generally T-shaped and is pivotally connected to the front support leg **29** at a location

intermediate the leg's two ends. The stabilizer comprises two, spaced plates **48**,**49** on opposite sides of the front leg **29** with a pair of holes located towards the first end of each plate, and a user engaging cross bar **52** transversely connected to each plate at their respective second ends. The plates are spaced to allow them to pass around the sides of the support leg and pivotally mount the stabilizer to a round tube **54** welded on the support leg's rear wall, as best illustrated in FIG. **15**. This allows the foot stabilizer to pivot about a pivot axis **53** extending through the first pair of aligned plate holes. A bolt or pin **55**, also illustrated in FIG. **15**, is transversely connected through the second of the pair of plate holes in plates **48** and **49**, and acts as a stop means to limit the range of motion of the foot stabilizer about its pivotal connection to the front support leg. Roller pads **56** are mounted to the ends of the user engaging cross bar for added comfort and to create a larger contact surface. Upward rotation of the stabilizer about pivot **53** (FIG. **4**) is limited by the engagement of the cross bar **52** with the front side of the leg **29**. Downward rotation of the stabilizer is limited by engagement of the stop pin **55** with the rear face of the leg **29**. Because of the stop means which limits rotation of the stabilizer in the forward direction, the stabilizers or foot and ankle engaging pads will never pivot out of the exercise ready position and are always readily accessible to the user.

As noted above, FIGS. **1** to **5** illustrate the exercise bench in a first deployed position for performing abdominal crunch exercises. In the position of FIGS. **1** to **5**, the upper pads **34** are in a lower position adjacent the front edge of seat pad **18**, and the front support leg **29** is rotated into the deployed, forwardly inclined position with the floor engaging cross support **28** engaging the ground and the pull pin **45** extending through the bulbous end **44** of slot **42** to lock the leg **29** in the illustrated position. FIG. **4** illustrates the self-aligning capabilities of the foot stabilizer, since it can pivot freely about pivot **53** between two end positions. FIG. **4** illustrates two possible positions of the foot stabilizer in solid and dotted outline, respectively.

FIG. **5** illustrates a user **60** performing a seated abdominal exercise. In FIG. **5**, hidden lines have been revealed to better show the various components. In this case, the user is seated on seat pad **18** facing forwardly, with their legs extending over thigh pads **34**, which engage behind the user's knees. The legs are then bent downwardly with the feet engaging behind or hooking under the foot stabilizer pads **56** so that the feet are anchored. It will be understood that the user's legs will be located on opposite sides of the front support leg **29**. The upright position of FIG. **5** represents both the start position and the finish position for the exercise, with the arrows indicating the exercise motion. The reclined position is the intermediate position when the abdominal muscles are under tension. The user will bend backwardly about their waist from the upright start position until they are in the rearwardly reclined position, and will then bend back upwardly into the upright position. Because the seat pad is inclined, the user must use their stomach muscles to pull their body up hill, against the force of gravity. The greater the angle of the seat pad (or the elevation between their knees and hips), the greater the effort required to return the body to the starting, upright position. Because of its pivotal attachment to the front support leg **29**, the foot stabilizer **15** automatically pivots to adjust to the leg length of the user.

FIGS. **18**A and **18**B illustrate how the angle of the user's body for performing abdominal crunch exercises can be adjusted. In FIG. **18**A, the adjustable rollers **34** are in their lowest position while FIG. **18**B shows the rollers **34** in a slightly elevated position. The rollers are adjusted by pulling the pull pin **35** outwardly and lifting the adjustment rod **30** until the rollers **34** are at the desired height, and then releasing the pull pin **35** to extend through the aligned opening **32** in the front wall of rod or tube **30**. Raising the rollers **34** increases the amount the user's knees are raised above their hips. The dotted lines **62**, **63** in FIGS. **18**A and **18**B represent the line of the user's upper leg when they are seated on the bench as depicted in FIG. **5**. By slightly raising the adjuster tube, the roller pads will change the user's seated angle from 27 to 36 degrees while the roller height is changed from 21.5 inches to 24.25 inches. The steeper the seated angle of the user, the greater the gravitational influence of their body weight on the exercise.

A similar adjustment is also used to vary the height of the roller pads **34** so as to provide thigh support when performing back exercises, as illustrated in FIGS. **6** to **10**. It can be seen from FIGS. **6** and **7** that the adjuster tube **30** has two sets of openings **32**, with the upper set engaging the pull pin **35** to adjust the height of pads **34** when the user is performing seated abdominal exercises, as described above. The lower set of openings **32** is used to adjust the height of thigh pads **34** when performing lower back exercises. With the front support leg **29** in its deployed position, the user pulls out the pull pin **35** and raises the pads **34** to the desired height so that they will engage the front of the user's thighs as in FIG. **10**. The pad height will be dependent on the length of the user's legs, and the openings provide a wide range of adjustability for users of different heights. The pin **35** is then released to extend through the aligned opening and secure the pads **34** in the raised position.

The user **60** then stands facing the rear of the bench, as illustrated in FIG. **10** with their feet planted on the folding assembly's floor engaging cross member **28** and their heels fitted under the user engaging cross bar **52** and pads **56** of the foot stabilizer, leaning slightly forward against the thigh pads **34**. Once they are locked in place, making contact with both the thigh support and the foot stabilizer, they bend over at the waist until their low back muscles are under tension, as indicated in the forwardly bent position of the user in FIG. **10**, and then return to the starting position. Because the floor engaging section of the folding assembly is forward of the thigh support, the user is placed in a forwardly inclined starting position. This means their torso is already under the influence of gravity, which increases the minute they start the exercise by bending forward and force their low back muscles to resist the effects of gravity.

FIGS. **11** to **14** illustrate the bench **10** in the folded or storage position. In order to fold up the bench for storage, the pull pin **45** (FIG. **15**) is pulled out to release the larger portion of the pin from the bulbous end **44** of the slot **42**, and the front support leg **29** can then be folded rearwardly and upwardly about pivot **26** until it is positioned adjacent the lower surface of main tube **20**, as indicated in FIG. **14**. At this point, the end **46** of the pull pin will have traveled along the slot **42** up to the opposite bulbous end **43**, and the released lock or pull pin **45** will spring out so that the larger diameter portion **47** enters the enlarged end **43** of the slot, locking the leg **29** in the folded position. It can be seen that the folded leg **29** tucks up within the framework of the bench in the folded position, with the ground engaging member **28** at the end of the leg **29** being spaced from bent end portion of the main tube **20** and the entire folding assembly being raised above the cross support **24** at the first end of the tube. The foot stabilizer **15** is also folded up against the support leg **29** in a compact manner. Because the user engaging roller pads **56** on the foot stabilizer are at a spacing wider than the width of the support leg **29**, they can fold up past

the front wall of leg **29**, providing a more compact folded profile and keeping the pads protected within the curved framework of the main support frame.

FIGS. **19** to **36** illustrate an exercise bench **70** according to a second embodiment of the invention. This embodiment is similar to the first embodiment but has the thigh support mounted at the end of a seat pad on the main frame rather than on an adjuster tube slidably mounted in the front leg, and the seat pad in this case is pivotally mounted on the main frame and adjusted by extending the length of the front leg, as described in more detail below. The exercise bench is movable between a first exercise position as illustrated in FIGS. **19** to **23**, **35** and **36** for performing abdominal crunch exercises, a second exercise position as illustrated in FIGS. **24** to **28** for performing back hyper-extension exercises, and a folded or storage position as illustrated in FIGS. **29** to **34**.

The exercise bench **70** has a main support frame that has a downwardly angled main tube **72** with a floor engaging, round cross support **75** transversely attached to a first end and a U-shaped support bracket **74** (see FIG. **27**) secured to its second end. A folding front leg assembly **73** is pivotally attached to the second end of the main tube **72**. The main tube has a straight section and a downward curving section extending to the cross support **75**. An elongate "U" shaped channel **76** is secured to the upper surface of the straight section of the main tube, as illustrated in FIGS. **22**, **23**, **24** and **27**, with the channel's side panels **78** mounting to the side walls of the main tube. The channel **76** is raised above the upper surface of main tube **72** with the raised portions of the side panels **78** each having a longitudinal guide slot **79** aligned with the corresponding slot in the other side panel, the arrangement being such that the slotted sections are located above the upper surface of main tube **72**.

A seat assembly is pivotally mounted on the main tube **72**. The seat assembly comprises a seat bracket **80** and a tapered seat pad **82** with an enlarged, rounded front end **84** mounted to the seat bracket for supporting the user. The rounded front end **84** provides thigh support for the user when they are performing back hyper-extension exercises and support behind the user's knee when they are seated and performing abdominal crunch exercises. The seat bracket **80** has a transverse tube **85** attached to a forward end (see FIGS. **25** and **28**) and two ears **86** projecting downward and rearward at its rear end (see FIG. **24**). Attachment holes are located approximate the end of each ear. The rear ears engage over the main frame's top channel and are connected by a pivot pin **88** that runs through the hole in a first ear, pivotally and slidably engages through both slots **79** in the channel and then engages through the hole in the second ear, as best illustrated in FIGS. **34** and **34B**.

The folding front leg assembly **73** of the bench has a tubular front support leg **90** with an open first end and a floor engaging cross support **92** transversely attached at a second end. An adjuster tube **94** with multiple adjustment openings **95** (see FIG. **24**) is inserted into the open first end of the front support leg for telescopic adjustment with the support leg. A pull pin **96** is mounted on the front wall of the support leg **90** adjacent its open end and extends through an opening in the front wall for engagement in a selected one of the openings **95** to lock the adjuster tube **94** at a selected extension. As best illustrated in FIGS. **34**, **34A**, a U-shaped bracket **98** is secured to the upper end of the adjuster tube **94** and has a pair of ears **99** which project rearwardly for engagement with a pivot pin **100** which extends through the transverse tube **85** at the forward end of the seat bracket **80**. This pivotally secures the forward end of the seat assembly to the upper end of the adjuster tube **94**. A gap **102** is provided at the center of the rounded front end **84** of the seat pad **82** to provide clearance for the pivotal movement of the folding front leg assembly about pivot **100** (see FIGS. **19**, **20**, **21** and **25**, for example)

The front support leg **90** is pivotally secured to the main tube **72** via a pivot pin **104** which is pivotally engaged in a mounting tube **105** which is transversely welded to the front or forward wall of the support leg at a location between the leg's two ends. The pivot pin **104** is secured between the forwardly projecting ears or plates **106** of the front bracket **74** of the main tube, as best illustrated in FIGS. **19** and **24**, so as to pivotally connect the main support frame to the front support leg **90**. The pivotal connection between the front support leg and forward bracket of the main tube **72** allows the front support leg to fold rearward, up against the underside of the main support frame. A rearward protruding plate **108** is attached to the rear wall of the support leg at a location behind mounting tube **105** and between the ears **106**, as best illustrated in FIGS. **22** and **32**. This plate has two spaced pinning holes **110** (FIG. **22**) and **112** (FIG. **32**) at opposite ends of its curved rearward edge **114** which provide locking positions for the storage (folded) and exercise positions. A pull pin **115** is located on one ear **106** of the support bracket, engaging one of the holes located in the support leg's rear plate **108**, depending on whether the support leg is in the deployed position or the folded position. FIG. **24A** illustrates the pull pin **115** engaging the hole **112** with the support leg in the deployed or exercise position. In the folded position of FIG. **33**, the pull pin **115** will engage hole **110** to hold the support leg in the folded position.

A generally "T" shaped foot stabilizer is pivotally connected to the front support leg **90** at a location intermediate the leg's two ends. The stabilizer consists of a "U" shaped channel **116** with a central web **118** which is wider than the width of the front face of the leg **90** and which has two side legs **120**. The rear ends of the side legs **120** have rearwardly projecting ears **122** which are pivotally secured to the support leg or tube **90** via a pivot pin **124** which extends through aligned openings in the projecting ears and the side walls of the tube, as best illustrated in FIGS. **19** and **22**. Oppositely directed user engaging bars or rods **125** are transversely attached to the respective channel side leg at the second end of the channel. Roller pads **126** are mounted on each of the user engaging bars or rods of the foot stabilizer for added comfort and to create a larger contact surface. The central web **118** of the channel acts as stop means to limit the pivotal range of motion of the foot stabilizer about its connection to the front support leg. When the channel is pivoted upwardly, the inner face of the web will eventually contact the front face of the front support leg or tube **90** to limit rotation in this direction. When the channel is pivoted downwardly about pivot **124**, the end edge **128** of the channel will eventually contact the front face of the tube **90** so as to limit rotation in the anti-clockwise direction, as indicated by the dotted lines in FIG. **22**. FIGS. **24** and **27** also illustrate the stabilizer pads **126** in the lowermost stop position.

As noted above, FIGS. **19** to **33**, **35** and **36** illustrate the bench **70** in a deployed or exercise position for performing abdominal crunch exercises. In FIGS. **19** to **33** and **35**, the adjuster tube **94** and adjustable seat assembly are in the lowermost position with the tube **94** retracted as far as possible into the support leg or tube **90**. FIG. **23** shows a user **60** performing an abdominal crunch exercise with the bench in this position. In FIG. **23**, hidden lines have been revealed to better show the various components. The user will start in the upright position, seated on the seat pad **82** while facing

forwardly with the knees engaging over the enlarged rounded ends **84** of the seat pad and the feet anchored under the foot stabilizer pads **126**. Once in the proper position, the user will bend rearwardly at their waist until they reach the fully reclined position illustrated in FIG. **23**, extending rearwardly over the seat pad **82** and stretching the abdominal muscles. The user then bends back upwardly into the upright position. Because the seat pad is inclined, the user must use their stomach muscles to pull their body up hill, against the force of gravity. The greater the angle of the seat pad (or the elevation between their knees and hips), the greater the effort required to return the body to the starting, upright position. Because of its pivotal attachment to the front support leg **90**, the foot stabilizer automatically pivots to adjust to the leg length of the user.

FIGS. **35** and **36** show the ability to adjust the angle, and consequently the degree of difficulty, of the user position for an Abdominal Crunch exercise. FIG. **35** shows the adjustable seat assembly in its lowest position while FIG. **36** shows it slightly elevated, which increases the amount the user's knees are raised above their hips. By releasing the pull pin **96** and slightly raising the adjuster tube **94**, the seat assembly changes the user's seated angle from 25 to 35 degrees and the user's knee height by over three inches (since the height of the upper face of the rounded end **84** of the seat pad is increased from about 23.5 inches to about 26.75 inches). The steeper the seated angle of the user, the greater the gravitational influence of their body weight on the exercise. This adjustment is also used to vary the height of the thigh support when performing back exercises, as will be described in more detail below.

FIGS. **24** to **28** illustrate the adjuster tube **94** extended farther out from the front support leg or tube **90** and the resultant increased angle of the seat pad assembly so that the rounded front end **84** of the seat pad is at an even greater height from the floor. This position is suitable for performing a back hyper-extension exercise, since it raises the rounded front end of the pad for engagement by the user's upper thigh, and creates a steep angle to the seat which leaves room for the user's upper body when they lean forward to perform a lower back exercise. The seat pad assembly will be adjusted by the user until the rounded front end **84** of the seat pad, which in this case acts as a thigh support, is located for engagement with the upper thighs of user **60**, as indicated in FIG. **28** which illustrates a user performing a back hyper-extension exercise. The user can easily adjust the height of the front end or support pad **84** by pulling out pin **96** and lifting the pad to the desired height, then releasing the pull pin to lock in the aligned opening **95** in the adjuster tube **94**. As the adjuster tube is extended, the front end of the seat pad assembly is raised, and the rear end pivots about pivot pin **88**, with the pin also sliding forwardly along the slots **79** in the channel member **76** mounted on top of the main frame tube **72** to accommodate the pivotal movement. When the adjuster tube is retracted downwardly into tube **90**, the pin **88** will slide rearwardly along the slots **79**.

In order to perform a lower back or back hyper-extension exercise, the user **60** stands facing the rear of the bench, as illustrated in FIG. **28**, with their feet planted on the floor engaging cross member **92** of the front leg and their heels fitted in front of and under the pads **126** of the foot stabilizer, leaning slightly forward against the thigh pads **84**. Once they are locked in place, making contact with both the thigh support and the foot stabilizer, they bend over at the waist until their low back muscles are under tension, as indicated by the arrows in FIG. **28**, and then return to the starting position. Because the front support leg **90** is inclined generally rearwardly in the deployed or exercise position, the floor engaging cross member **92** is spaced forward of the thigh support pads **84**, so that the user is placed in a forwardly inclined starting position. This means their torso is already under the influence of gravity, which increases the minute they start the exercise by bending forward and force their low back muscles to resist the effects of gravity.

FIGS. **29** to **34** illustrate the bench **70** in the folded or storage position. In order to move the bench from the deployed or exercise position into the storage position, the adjuster tube **94** is first lowered into the lowermost position, if extended, and locked in the lowered position. Pull pin **115** is then pulled back to release the pin from the opening **112** in plate **108** (FIG. **24**A). The front leg assembly can then be rotated rearwardly about pivot **104** until it is positioned underneath and adjacent the main tube **72**, as best illustrated in FIG. **32**. At this point, the pull pin **115** will be aligned with the second opening **110** in the plate **108** and will be spring loaded to engage in this opening and lock the folding leg assembly in the folded position. When the front leg is folded rearward, the adjuster tube's pivotal connection **100** to the seat assembly swings forward, pulling the pin **88** attached to the rear of the seat assembly along the main frame's slotted channel **79** until it reaches the forward end of the channel, as indicated in FIG. **32**.

The folded position allows the bench to be stored out of the way, in a closet or under a bed when not in use and allows the product to be boxed fully assembled for easier shipping. Notice that the front support leg **90** fits up against the underside of the straight section of the main tube **72**, ending before the tube bends towards its first end **75**. Also notice that the user engaging roller pads **126** on the foot stabilizer are spaced wider than the front support leg to allow them to fold up past the front wall of the leg. This provides a more compact folded profile and keeps the pads protected within curved frame work of the main support frame.

In the embodiment of FIGS. **19** to **36**, the rear end of the seat is pivotally and slidably mounted in a guide slot in a slide channel which is in turn mounted on the main support frame. FIGS. **36**A and **36**B illustrate a modification of the embodiment of FIGS. **19** to **36** which is designed to reduce the potential for pinch points. Some parts of the modified embodiment of FIGS. **36**A and **36**B are identical to corresponding parts of the embodiment of FIG. **19** to **36**, and like reference numbers have been used for such parts, which are not described in detail in connection with FIGS. **36**A and **36**B. Instead, reference is made to the foregoing description of these parts in connection with FIGS. **19** to **36**.

In the modified embodiment of FIGS. **36**A and **36**B, instead of pivotally and slidably mounting the rear end of the seat in a guide slot of a slide channel on the main support frame, the rear end of the seat is instead pivotally mounted on a slide member or sliding carriage **200** via pivot **202**. The carriage **200** slides along the length of the seat supporting portion of the main frame **72** when the seat is pivoted up and down. As in the previous embodiment, the height of the enlarged support pad **84** at the forward end of the seat pad **82** can be adjusted by adjusting the extension of the adjuster tube **94** out of the upper end of front leg **90**. By extending tube **94** upwardly, the seat pad **82** is pivoted upwardly at its forward end about pivot **100** and its rearward end about pivot **202**, and the carriage **200** slides forwardly along main frame **72** to accommodate the pivoting motion. This will raise the height of the enlarged forward end or support pad **84**.

FIG. **36**A shows the lowermost position of the seat pad **82**, with the bench and seat pad in position for performing

abdominal crunch exercises. Comparison of FIG. **36**A with FIG. **35**, which shows the equivalent lowermost position of the embodiment of FIGS. **19** to **36**, shows that the pinch risk is substantially reduced in the modified embodiment of FIG. **36**A, due to the larger gap between the undersurface of seat support bracket **80** and the upper surface of the main frame **72** beneath the seat.

FIG. **36**B shows the adjuster tube **94** extended out from the front support leg **90** so as to raise the rounded front end **84** of the seat pad to a position suitable for performing back hyperextension exercises, as described above in connection with FIGS. **24** to **28**. In the modified embodiment of FIGS. **36**A and **36**B, the sliding carriage or sleeve **200** slides forwardly along main frame tube **72** as the seat is pivoted upwardly.

As in the previous embodiment, a foot stabilizer is pivotally connected to the front support leg **90** at a location intermediate the leg's two ends. Unlike the previous embodiments, in which the foot stabilizer is mounted at a fixed position on the front support leg, the foot stabilizer in FIG. **36**A is pivotally mounted via pivot pin **204** on a bracket **205** slidably mounted on the front support leg **90** and secured in a selected position by pull pin **206**. This allows the foot stabilizer to be adjusted along the length of the front support leg to accommodate users having different length legs. The foot stabilizer itself is similar to the foot stabilizer of the first embodiment, and has a pair of pads **208** mounted on opposite ends of a support rod **210**. A pair of spaced pivot mounting plates **212** extend on opposite sides of the front support leg **90** and are secured to the support rod **210** at one end, and pivotally mounted at the rear end of the sliding bracket **205** via pivot **204** with a pivot pin (not shown) extending through the aligned openings in the sliding bracket and the spaced mounting plates. Stop pins **214** on each side of bracket **205** limit the downward rotation of the foot stabilizer by engaging the lower edges of the plates **212**.

The bench of FIGS. **36**A and **36**B is adjustable between the different exercise positions and the folded position in the same way as described above in connection with FIGS. **19** to **36**, with the exception of the difference in the pivotal mounting of the rear end of the seat pad. As in FIGS. **19** to **36**, the modified bench of FIG. **36**A is movable into a folded position which allows the bench to be stored out of the way, in a closet or under a bed when not in use and allows the product to be boxed fully assembled for easier shipping. The user engaging roller pads **208** on the foot stabilizer are spaced wider than the front support leg **90** to allow them to fold up past the front wall of the leg in the folded position, as do the roller pads **126** of the previous embodiment when the bench is folded as in FIG. **32**.

FIGS. **37** to **57** illustrate an exercise bench **140** according to another embodiment of the invention which is adjustable between deployed or exercise positions for performing abdominal crunch or back hyper-extension exercises, and a folded or storage position. As in the first two embodiments, the bench **140** has a main frame supporting a seat pad assembly and a front support leg **142** which is foldable between exercise and folded positions. Unlike the previous embodiments, the seat pad assembly in this case is a split seat with a pivoting first seat pad and a fixed second seat pad, with the forward end of the pivoting seat pad secured near the second end of the main tube, as will be described in more detail below.

FIGS. **37** to **41**, **56** and **57** illustrate the bench in a position for performing abdominal crunch exercises, while FIGS. **42** to **46** illustrate the bench positioned for performing back hyper-extension exercises, and FIGS. **47** to **50** illustrate the bench in a folded or storage position. The bench **140** has main support frame that has a downwardly angled main tube **144** with a floor engaging, round cross support **146** transversely attached at a first end and a support plate **145** secured over its open second end. The support plate **145** adds strength to the second end and keeps the main tube from collapsing under the weight of the user. The main tube has a straight section extending from the second end and a downward curving section extending up to the first end. A mounting tube **148** is transversely attached approximate the second end of the main tube, as best seen in FIGS. **51** and **55**.

Aligned pivot holes **149** and a pinning hole **151** are located in the side wall **150** of the straight section of the main tube **144**, as best illustrated in FIG. **55**, with the pivot hole positioned between the pinning hole and transverse mounting tube **148**. A pull pin or spring-loaded plunger **152** is mounted to one side wall for extension through one of the side wall pinning holes, as illustrated in FIG. **51**. Aligned elongated openings or slots **154,155** are located in the top and bottom walls **156,157** of the straight section of the main tube, as indicated in FIGS. **43**, **51** and **55**. The slots **154,155** are positioned in alignment with the pull pin **152**, as seen in FIGS. **51** and **55**. As best illustrated in FIGS. **40** and **55**, a raised block or stop member **158** is attached to the bottom wall **157** of the main tube at a location between the slot **155** and the second end of the main tube. A pair of upholstery mounting-plates **159** are attached to the top wall of the first section between the slot **154** and the curved section of the main tube.

As noted above, the bench has a split-seat system comprising a pivoting first seat pad **160** and a fixed second seat pad **162**. The first seat pad **160** is mounted on a seat bracket **164** with downward projecting ears **165** at its forward end. Attachment holes are located approximate the end of each ear **165** for pivotal attachment to the mounting tube **148** via pivot pin **166**. A curved adjuster plate **168** with multiple adjustment holes **170** is welded to underside of the bracket **164**, and projects downwardly through the aligned slots **154,155** in the upper and lower faces **156,157** of the main tube **144**, as best illustrated in FIGS. **51** and **52**. The pull pin **152** has a projecting plunger **172** (FIG. **55**) which will extend through a selected aligned hole **170** in the adjuster plate **168** when released. The first seat pad **160** has tapered sides and a rounded front edge **174** which provides support behind the user's knee when they are seated and performing abdominal crunch exercises. The second, fixed seat pad **162** is a smaller tapered pad that is fixedly mounted to the upholstery mounting plates **159** located atop the main tube.

The folding front leg assembly has a tubular front support leg **175** with an open lower end and a second end. A pull pin **176** is attached to the front wall of the leg approximate its open lower end. A generally "U" shaped bracket **178** is attached by its web to the second end of the support leg. The opposite legs **180** of bracket **178** extend upwardly and rearwardly to engage over opposite sides of the main frame tube **144**, and have mounting holes (not visible in the drawings) located near their outermost edges which are aligned with the pivot holes **149** in the side walls of tube **144**. The legs are pivotally secured to the main tube via pivot pin **182** which extends through the aligned mounting holes and pivot holes. One leg **180** has a pull pin **184** mounted to it at a location between the mounting hole and the bracket's connection to the support leg, as best illustrated in FIGS. **53**, **53**A, **55**A and **55**B. When the main support frame and folding front assembly are joined, the pull pin **184** acts to lock the folding front leg assembly in either the deployed

exercise position or the folded position. As illustrated in FIG. **55**A, the pull pin plunger **183** engages a second pinning hole **187** (visible in FIG. **53**A) on the main support frame in the folded position. The plunger **183** is extended to wedge against the raised block **158** and the bottom wall of the main tube in the exercise position, as illustrated in FIGS. **53**A and **55**B. This way the front support leg assembly can be locked in either position. As best illustrated in FIGS. **50** and **51**, the other leg **180** of the bracket **178** has a notch **189** in its rear edge for engaging around the pull pin **152** when the bench is in the folded position.

A generally "T" shaped adjuster tube **185** with multiple adjustment openings is inserted into the open first end of the front support leg for telescopic adjustment with the support leg. The cross bar **186** at the lower end of tube **185** is for engagement with the floor. The pull pin **176** extends through the front wall of the support leg or tube **175** and into an aligned adjustment opening in tube **185** to lock the tube **185** at a selected extension relative to the tube **175**. A generally "T" shaped foot stabilizer is pivotally connected to the adjuster tube **185**. The stabilizer consists of two, spaced plates **188** with a mounting hole located towards the first end of each plate, and a user engaging cross bar **190** transversely connected at the second end of each plate. The plates are spaced apart to allow pivotal mounting to the side walls of the adjuster tube via a pivot pin **192** extending through the mounting holes at the first ends of the plates and corresponding pivot holes in the side walls of adjuster tube **185**. Roller pads **194** are mounted to the ends of the user engaging cross bar for added comfort and to create a larger contact surface. A stop pin **195** is transversely attached to the front wall of the adjuster tube, between the mounting holes and the floor engaging cross bar, so that the ends of the pin protrude past the side walls of the adjuster tube, as best illustrated in FIG. **37**. Once attached, the foot stabilizer's pivotal connection to the adjuster tube is limited in one direction by contact of plates **188** with the transverse pin **195** and in the other direction by contact of cross bar **190** with the front face of the front leg support tube **175** (see FIG. **38**).

The bench **140** will now be described in the position illustrated in FIGS. **37** to **41** and **56** for use in performing abdominal crunch exercises. In this position, as noted above, the plunger **183** of pull pin **184** will be stopped against the stop block **158** on the underside of the main frame tube **144**. In these drawings, the pivoting seat pad **160** is in its lowermost position seated on top of the main frame tube **144** with the plunger of pull pin **152** extending through an aligned opening in curved adjuster plate **168** to lock the seat pad in position. In the down position, the two seat pads **160** and **162** provide support for a seated exerciser performing abdominal exercises. The adjuster tube **185** which is telescopically engaged in the lower end of the front support leg or tube **175** may also be in a retracted position, with pull pin **176** engaging through an adjustment hole in the front face of tube **185** to lock it in position, but may be adjusted to vary exercise difficulty or for user's with different leg lengths, as discussed below.

FIG. **41** shows a user **60** performing a seated abdominal exercise. In FIG. **41**, hidden lines have been revealed to better show the various components. The user first sits upright on the front pad **160**, facing forwards, and hooks their feet under the foot stabilizer pads **194**. FIG. **40** illustrates the self-aligning capabilities of the pivoting foot stabilizer. They then lean their torso rearward, pivoting at the waist until their abdominal muscles are under tension, as illustrated in the reclined user position of FIG. **41**. The user then returns to the upright position. The upright position in FIG. **41** represents both the start and finish of the exercise, while the reclined position shows the intermediate position when the abdominal muscles are under tension.

Because the seat pads **160,162** are inclined, the user must use their stomach muscles to pull their body up hill, against the force of gravity. The greater the angle of the seat pad, or the greater the elevation between the user's knees and hips, the greater the effort that will be required to return to the upright position. The effort required for performing an abdominal crunch exercise in this case may be adjusted by increasing the length of the support leg assembly **142**, i.e. by extending the length of adjuster tube **185** extending out of the support leg or tube **175**, as indicated in FIG. **57**. By slightly raising the support leg, the forward end of the seat assembly is raised to change the user's seated angle from 28 to 33 degrees, and simultaneously increases the amount the user's knees are raised above their hips. The height at the top of the forward end **174** of the seat is 22.75 inches in FIG. **56** and 25 inches in the raised position of FIG. **57**. The steeper the seated angle of the user, the greater the gravitational influence of their body weight on the exercise. This adjustment is also used to vary the height of the thigh support when performing back exercises.

In FIGS. **42** to **46**, the position of the bench has been modified to allow a back hyper-extension exercise to be performed. In this position, the front seat pad **160** is raised so that it faces generally forwardly to act as a thigh support for a user. This is done by releasing pull pin **152** from the adjuster plate **168**, and then rotating the rear end of the seat pad **160** upwardly so that the seat pad pivots about pivot pin **166** into the raised position, as best illustrated in FIG. **45**. FIGS. **51** and **52** also illustrate the pad **160** being pivoted into a raised position. FIG. **51** illustrates how the adjustable seat bracket with its curved adjuster plate **168** passes through the slot in the main tube as the first seat pad is adjusted from one exercise position to the next. The angle of seat pad **160** in the upright or raised position can be varied to a less steep or steeper angle to increase or decrease the level of exercise difficulty. FIG. **52** highlights the multiple angular positions available for performing Back Hyper-Extension exercises. By adjusting the angle of the user engaging thigh support **160**, as indicated in FIG. **52**, the gravitational effect of the user's body weight is adjusted. The steeper or closer the pad is to vertical the less impact gravity has on the user and the easier the exercise. When the seat pad **160** is in the desired orientation, the pull pin **152** is released and engages an aligned opening **170** in plate **168** to lock the seat pad in position.

FIG. **46** shows a user **60** performing a low back exercise. Before performing this exercise, the user can adjust the height of the thigh support or raised pad **160** to an appropriate position for engaging the front of their upper thigh as indicated in FIG. **46**. This is done by adjusting the overall length of the folding front leg assembly by extending adjuster tube **185** until the pad **160** is at the desired height, and then releasing pull pin **176** to lock the tube in the adjusted position. The upright position of the user in FIG. **46** represents both the start and finish of the exercise, while the bent position shows the intermediate position. The user **60** stands on the foot rest **186** with the foot stabilizer pads **194** engaging behind their ankles and over their heels, and leans against the pad **160**. Once the user is locked in place in this way, they can bend forward at the waist until their low back muscles are under tension, as indicated by the forwardly bent position in FIG. **46**, and then return to the starting position. The relative positions of the foot rest **186** and thigh engaging pad **160** are such that the user is placed in a

forwardly inclined starting position, putting their torso under the influence of gravity, and this force increases as soon as they start the exercise, forcing their back muscles to resist the force of gravity.

FIGS. **47** to **50** illustrate the bench **140** in a folded or storage position, while FIGS. **53** and **54** illustrate the folding front support assembly in the process of being folded between the exercise and storage position or vice versa. With the front seat pad **160** returned to the lowermost position seated on top of main tube **144**, the front support leg **175** is rotated rearwardly about pivot **182**. The pull pin **184** is pulled outwardly so that the plunger can clear the side wall of the tube **144** and then enter the opening **187** to lock the folding front assembly in the folded position. At the same time, the notch **189** in the opposite leg **180** (see FIGS. **50**, **54** and **54**A) will fit around the pad adjusting pull pin **152**.

The folded position of FIGS. **47** to **50** allows the bench to be stored out of the way, in a closet or under a bed when not in use and allows the product to be boxed fully assembled for easier shipping. In this position, the front support leg fits up against the underside of the straight section of the main tube, ending before the tube bends towards its first end. At the same time, the user engaging roller pads **194** on the foot stabilizer are spaced wider than the front support leg to allow them to fold up past the leg's front wall. This provides a more compact folded profile and keeps the pads protected within curved frame work of the main support frame.

FIGS. **58** to **61** show several alternative embodiments of the self-aligning foot stabilizer as described above in connection with the embodiments of the bench illustrated in FIGS. **1** to **57**. It will be understood that the stabilizers of FIGS. **58** to **61** are interchangeable and any one of these stabilizers may be used in any of the above embodiments. In FIGS. **58**A and **58**B, the stabilizer pivots off the rear wall of the front support leg and utilizes a bolt **55** contacting the rear wall of the support leg **29** as stop means to limit the forward motion of the stabilizer. Rearward motion of the foot stabilizer is limited by the center section **52** of the cross bar which connects to the second end of the spaced plates **48**, **49**. In FIGS. **59**A and **59**B, the stabilizer pivots on the side walls of the support leg and uses the end of the web **118** and the inner surface of the stabilizer channel as stop means to limit the stabilizer's forward and rearward motion. In FIGS. **60**A and **60**B, the stabilizer pivots on the side walls of the support leg, similar to the design in FIGS. **59**A and **59**B, but has spaced plates **188** instead of a U-shaped channel. The forward edges of the twin plates contact a pin **195** transversely attached to the front wall of the adjuster tube to limit the forward motion of the foot stabilizer. The rearward motion is limited by the center section **190** of the cross bar, similar to the arrangement in FIGS. **58**A and **58**B.

In FIGS. **61**A and **61**B, the foot stabilizer is pivotally mounted on a bracket **205** which is adjustably secured to a front support leg **90** of an exercise bench as described above in connection with FIG. **36**A. A pull pin **206** extends through an opening in a front wall of the bracket **205** and a selected opening in the front wall of the support leg **90**. This allows the foot stabilizer to be adjusted along the length of the front support leg to accommodate users having different leg lengths. The foot stabilizer itself is similar to the embodiment of FIG. **58**, and has a pair of pads **208** mounted on opposite ends of support rod **210**. A pair of spaced pivot mounting plates **212** extend on opposite sides of the front support leg and are secured to support rod **210** at one end, and pivotally mounted on the rear end of mounting bracket **205** at their opposite ends via pivot pins **204**. Stop pin **214** on the opposite sides of bracket **205** restricts downward pivoting movement of the foot stabilizer and hold the stabilizer in an exercise-ready position.

In all four versions of the foot stabilizer, the foot stabilizer pads self-align to the user and provide support/positioning for the user's feet during the performance of both abdominal and low back exercises. The ability of the foot or ankle engaging pads to swivel allows the foot stabilizer to fold up tight against the front of the support leg when the bench is in the storage position as well as to self-align to the user. Because of the stop means used to limit the pivotal range of motion of the foot stabilizer pads, the stabilizers will never pivot out of their exercise ready position and are always easily accessible for either type of exercise. It should also be noted that other components or features in the above embodiments of the exercise bench, such as locking pull pins, pinning hole vs. slots, stop means, exercise angle adjustment means, pivoting vs. sliding pad adjusters, or single vs. dual seat pads, may be interchanged between the embodiments and not alter the scope of the invention.

The folding exercise bench of this invention is designed to allow the user to perform both abdominal and lower back exercises, and is easy to switch between the positions for the different types of exercise. The bench is readily adjustable for various size exercisers to perform both types of exercise effectively, and is also adjustable for different levels of exercise difficulty. While resistance for both exercises is supplied by the user's body weight, this could be augmented by hand held weights, elastic bands, or other forms of resistance known in the art, if desired. The bench also has the ability to fold up and lock into a relatively flat, compact storage position without having to first remove any components from the bench. The storage position allows the bench to be readily stored out of the way, in a closet or under a bed, when not in use. It also allows the product to be boxed when fully assembled for easier shipping, and requiring no assembly by a purchaser. In the folded position, the entire front leg assembly is folded up against or close to a straight portion of the main frame, and tucked up within a curved end portion of the main frame.

The user engaging foot stabilizer in each of the above embodiments is pivoted to the front support leg assembly at a location which does not adjust with the seat. This means that the distance between the seat pad and the foot stabilizer can be varied to accommodate users of different heights with different leg lengths. At least a portion of the foot engaging pads of the foot stabilizer can swing past the front wall or edge of the front support leg in the folded condition to allow the foot stabilizer to fold up tight against the front support leg for more compact storage and also to protect the pads against damage when stored. The end stops which limit pivotal movement of the foot stabilizer ensure that it is always readily accessible to the user in an exercise ready position. The foot stabilizer is also designed to self-align to the user during each exercise.

Although some exemplary embodiments of the invention have been described above by way of example only, it will be understood by those skilled in the field that modifications may be made to the disclosed embodiments without departing from the scope of the invention.

I claim:

1. An exercise bench, comprising:

a main frame having a first end which engages the ground, an opposite, second end, and a support portion between the first and second ends, the main frame engaging the ground only at the first end and the support portion and second end raised above the ground in an exercise position;

a front leg secured to the main frame and having a foot portion which engages the ground in the exercise position to hold the second end of the main frame in the raised position;

a support pad which supports part of the user's body mounted on one of said front leg and said main frame;

the front leg being adjustable in length to adjust the height of the support pad;

a user engaging foot stabilizer; and

a pivot mount pivotally associating the foot stabilizer with the front leg whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mount and the support pad.

2. The exercise bench as claimed in claim **1**, wherein the foot stabilizer is adjustably mounted on the front leg so as to accommodate users having different length legs.

3. The exercise bench as claimed in claim **1**, further comprising a carriage member slidably associated with the main frame, the support pad having a rear end pivotally secured to the carriage member and a forward end secured to an upper end of the front leg, whereby adjustment of the length of the front leg will cause the forward end of the support pad to pivot upwardly and the rear end to slide forwardly along the main frame.

4. The exercise bench as claimed in claim **3**, wherein the support pad comprises a seat pad for supporting a seated user in a first abdominal exercise position, and the forward end of the support pad is enlarged and comprises means for engaging behind the knees of the seated user in a first, abdominal exercise position and means for engaging the thighs of a standing user in a second, lower back exercise position.

5. The exercise bench as claimed in claim **1**, wherein the front leg has first and second telescopically engaged portions for adjusting the length of the front leg, and a locking device for releasably locking the portions in a selected adjusted position, the first portion having a lower end comprising said foot portion, and the foot stabilizer being associated with said first portion.

6. The exercise bench as claimed in claim **5**, wherein the first portion of the front leg is pivotally secured at or adjacent the second end of the main frame, the front leg being foldable between a deployed, exercise position supporting the second end of the main frame in the raised position and a storage position folded against the main frame.

7. The exercise bench as claimed in claim **6**, wherein the second portion of the front leg has an upper end and the support pad is secured to the upper end of said second portion.

8. The exercise bench as claimed in claim **7**, further comprising a seat pad having a rear end pivotally and slidably associated with the main frame and an enlarged forward end comprising said support pad.

9. An exercise bench, comprising:

a main frame having a first end which engages the ground and a second end raised above the ground in an exercise position;

a front leg secured to the main frame and having a foot portion which engages the ground in the exercise position to hold the second end of the main frame in the raised position;

a support pad which supports part of the user's body mounted on one of said front leg and said main frame;

the front leg being adjustable in length to adjust the height of the support pad;

a user engaging foot stabilizer;

a pivot mount pivotally associating the foot stabilizer with the front leg whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mount and the support pad;

the support pad being adjustable in height between positions for engaging behind a user's knees when seated on the main frame in a first, forwardly facing abdominal exercise position and different height positions for engaging in front of a user's thighs when standing in a second, rearwardly facing lower back exercise position, the foot stabilizer comprising means for engaging over a user's feet in the first exercise position and behind a user's ankles in the second exercise position.

10. The bench as claimed in claim **9**, wherein the support pad is mounted on an upper end of said front leg, whereby adjustment of the length of said front leg adjusts the height of the support pad.

11. The bench as claimed in claim **9**, wherein the support pad is mounted on the main frame, and the front leg has an upper end pivotally associated with the forward end of the main frame, whereby adjustment of the length of said front leg will adjust the height of the forward end of the main frame and thereby adjust the height of said support pad.

12. The bench as claimed in claim **9**, further comprising a seat pad having a rear end pivotally associated with the main frame and a forward end comprising said support pad, the front leg having an upper end associated with the forward end of said seat pad, whereby adjustment of the length of said front leg will pivot the forward end of said seat pad upwardly, thereby adjusting the height of said support pad.

13. The exercise bench as claimed in claim **9**, wherein the foot portion comprises a cross bar forming a foot support for a user's feet when standing in the second exercise position.

14. An exercise bench, comprising:

a main frame having a first end which engages the ground and a second end raised above the ground in an exercise position;

a front leg secured to the main frame and having a foot portion which engages the ground in the exercise position to hold the second end of the main frame in the raised position;

a support pad which supports part of the user's body mounted on one of said front leg and said main frame;

the front leg being adjustable in length to adjust the height of the support pad;

a user engaging foot stabilizer;

a pivot mount pivotally associating the foot stabilizer with the front leg whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mount and the support pad;and

a stop member for limiting the range of motion of said foot stabilizer relative to its pivot mount.

15. The exercise bench as claimed in claim **14**, wherein the foot stabilizer has a first end secured to said pivot mount and a second, foot engaging end, the stop member preventing downward movement of the foot stabilizer to a location where the foot engaging end is below the level of said pivot mount.

16. The exercise bench as claimed in claim **14**, wherein the front leg has a front wall, and the foot stabilizer comprises a cross member extending transversely across the front wall of the frame, oppositely directed pads secured to opposite ends of the cross member, and a pivot bracket assembly extending rearwardly from the cross member and pivotally securing the cross member on said pivot mount, the

cross member comprising means for restricting pivoting motion of the foot stabilizer in a first direction.

17. The exercise bench as claimed in claim **16**, wherein the front leg has a rear wall, the pivot mount is located on the rear wall, and the pivot bracket assembly comprises a pair of plates extending on opposite sides of said front leg to engage said pivot mount, the stop member comprising a stop pin secured between said plates at a location rear of said rear wall, whereby the stop pin engages the rear wall of the front leg to restrict pivoting motion of the foot stabilizer in a second direction.

18. The exercise bench as claimed in claim **16**, wherein the pivot bracket assembly comprises a pair of plates extending from said pivot mount on opposite sides of said front leg up to said cross member, and the stop member comprises a slop pin secured across the front face of said front leg below said pivot mount for engaging the plates to restrict pivoting motion of the foot stabilizer in a second direction.

19. The exercise bench as claimed in claim **14**, wherein the foot stabilizer comprises a channel member having a first end engaging said pivot mount and a second end, and oppositely directed foot engaging pads secured to the second end of the channel member, the channel member having an inner face facing the front leg, the first end of the channel member comprising a first stop member for engaging the front wall of the front leg to restrict pivoting motion of the foot stabilizer in a first direction and the inner face of the channel member comprising a second stop member for engaging the front wall of the front leg to restrict pivoting motion of the foot stabilizer in a second direction.

20. An exercise bench, comprising:

a main frame having a first end which engages the ground and a second end raised above the ground in an exercise position;

a front leg secured to the main frame and having a foot portion which engages the ground in the exercise position to hold the second end of the main frame in the raised position;

a support pad which supports part of the user's body mounted on one of said front leg and said main frame;

the front leg being adjustable in length to adjust the height of the support pad;

a user engaging foot stabilizer;

a pivot mount pivotally associating the foot stabilizer with the front leg whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mount and the support pad;and

the front leg is pivotally associated with the second end of the main frame, the front leg being foldable between a deployed, exercise position supporting the second end of the main frame in the raised position and a storage position folded against the main frame.

21. The exercise bench as claimed in claim **20**, wherein the foot stabilizer has a first end secured to the pivot mount and a second end, and a foot engaging portion at the second end of the stabilizer, the front leg having a front wall, and the foot stabilizer being pivotal into a folded, storage position when the front leg is in the storage position, at least part of the foot engaging portion extending past the front wall in the storage position, whereby the amount of said foot stabilizer protruding from said front wall in the storage position is reduced.

22. The exercise bench as claimed in claim **20**, including a locking device for locking the front leg in the deployed and storage positions.

23. An exercise bench, comprising;

a main frame having a first end which engages the ground and a second end raised above the ground in an exercise position;

a front leg secured to the main frame and having a foot portion which engages the ground in the exercise position to hold the second end of the main frame in the raised position;

a support pad which supports part of the user's body mounted on one of said front leg and said main frame;

the front leg being adjustable in length to adjust the height of the support pad;

a user engaging foot stabilizer;

a pivot mount pivotally associating the foot stabilizer with the front leg whereby adjustment of the length of the front leg adjusts the distance between the foot stabilizer pivot mount and the support pad; and

a seat pad mounted on the main frame, the seat pad being split into a front portion pivotally mounted on the frame and a rear, fixed portion.

24. The exercise bench as claimed in claim **23**, wherein the front portion of the seat pad comprises said support pad and has a front end pivotally mounted adjacent the second end of the main frame for movement of the front portion between a lowered position aligned with the rear portion for providing a seat pad for performing abdominal exercises and a raised, forwardly facing position for engaging the thighs of a user when performing lower back exercises, the main frame further comprising a locking device for locking the front portion of the seat pad in the lowered and raised positions.

* * * * *

EXHIBIT B

EXHIBIT B

US007335145B2

(12) United States Patent
Webber

(10) Patent No.: US 7,335,145 B2
(45) Date of Patent: Feb. 26, 2008

(54) **FOLDABLE EXERCISE BENCH**

(76) Inventor: **Randall T. Webber**, 1265 Park Row, La Jolla, CA (US) 92037

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 312 days.

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(22) Filed: **Dec. 3, 2004**

(65) **Prior Publication Data**

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(51) **Int. Cl.**
A63B 26/00 (2006.01)

(52) **U.S. Cl.** **482/142**; 482/104

(58) **Field of Classification Search** 482/142; D21/676, 686, 690, 95–100
See application file for complete search history.

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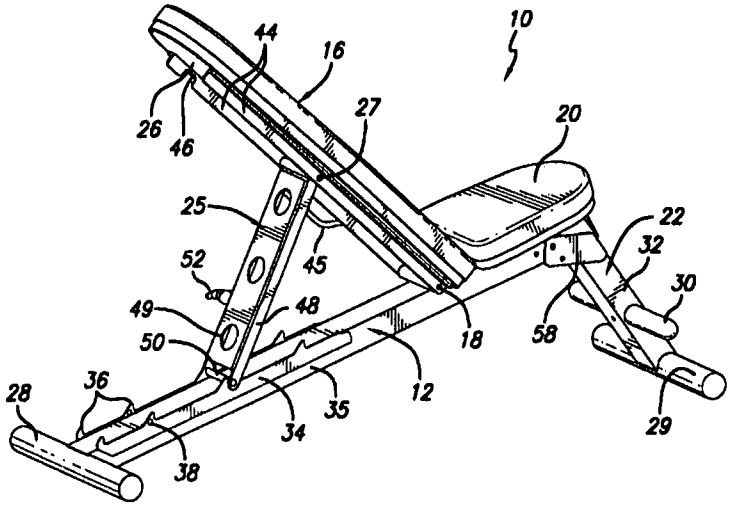
Primary Examiner—Lori Amerson
(74) *Attorney, Agent, or Firm*—Procopio, Cory, Hargreaves and Savitch LLP

(57) **ABSTRACT**

A foldable exercise bench has a base which engages the ground at one end and a back support pivotally mounted on the base for movement between a folded position flat against the support base and a plurality of different inclined exercise positions. A front leg pivoted to the support base engages the ground in a deployed position to support the forward end of the base in a position raised above the ground and is folded flat against the support base for storage. A support link pivoted to the back support has an end for engaging a selected one of a series of spaced retaining formations on the support base to hold the back support at a selected inclined orientation. The back support, support link and retaining formations are designed to nest together in the folded position to provide a compact storage arrangement.

34 Claims, 9 Drawing Sheets



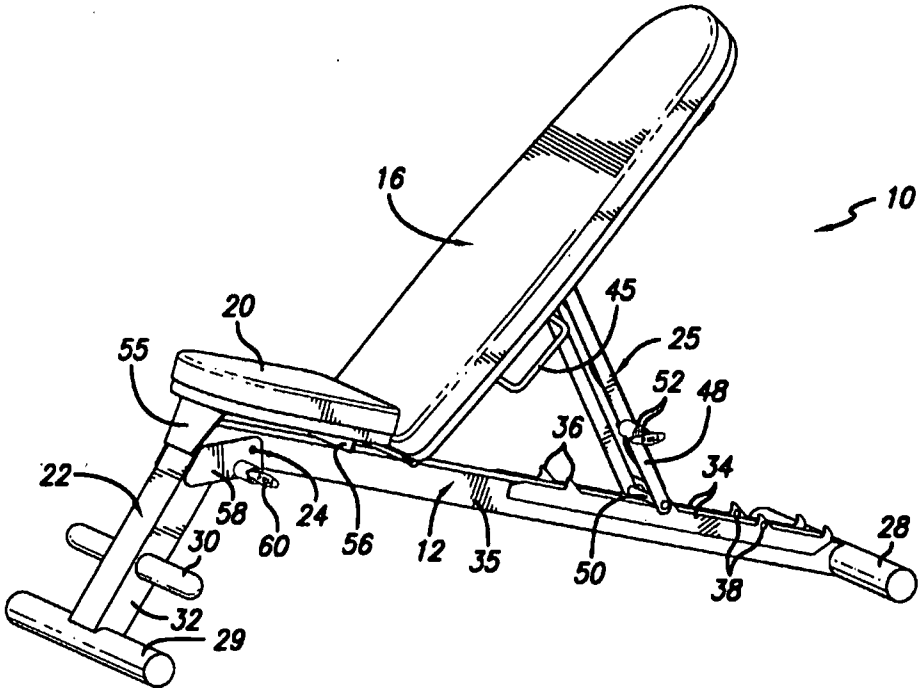

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FIG. 1

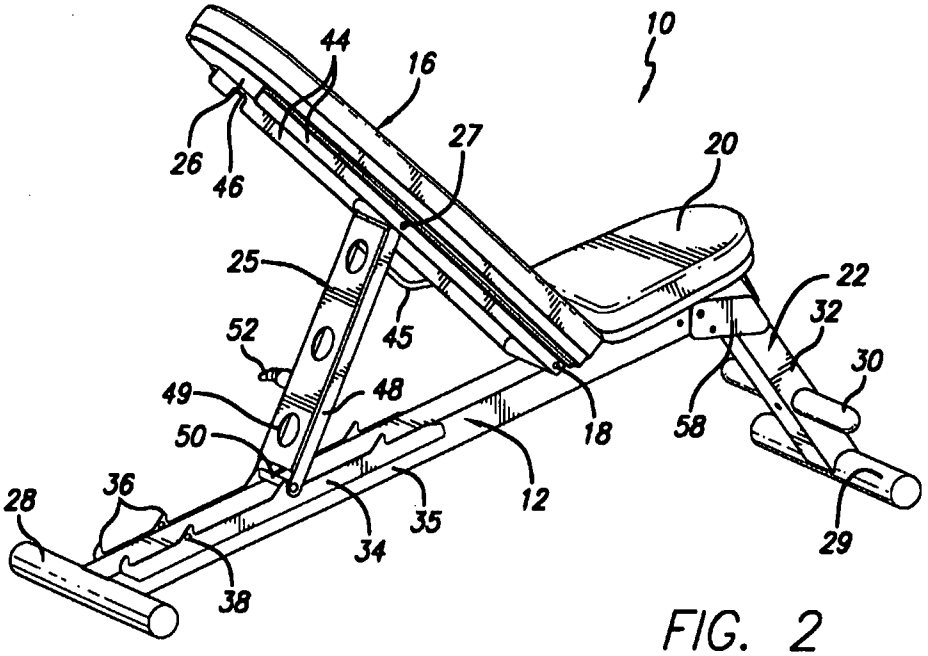
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FIG. 2

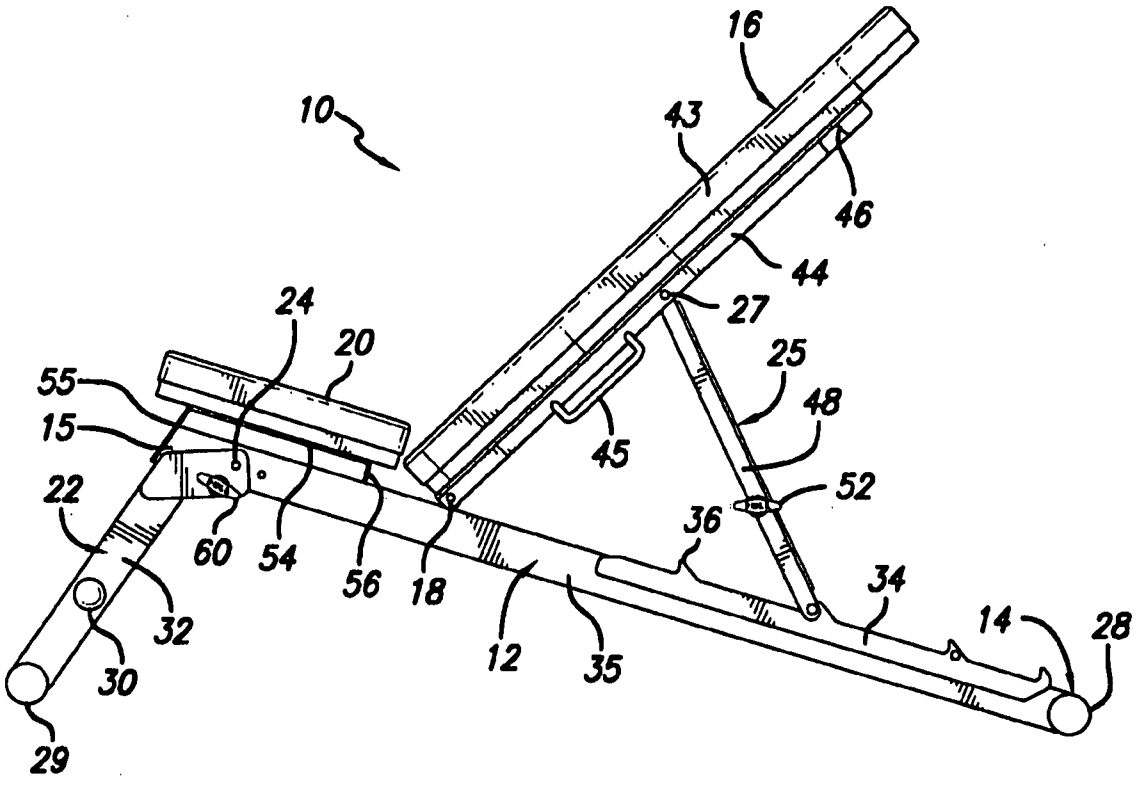
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FIG. 3

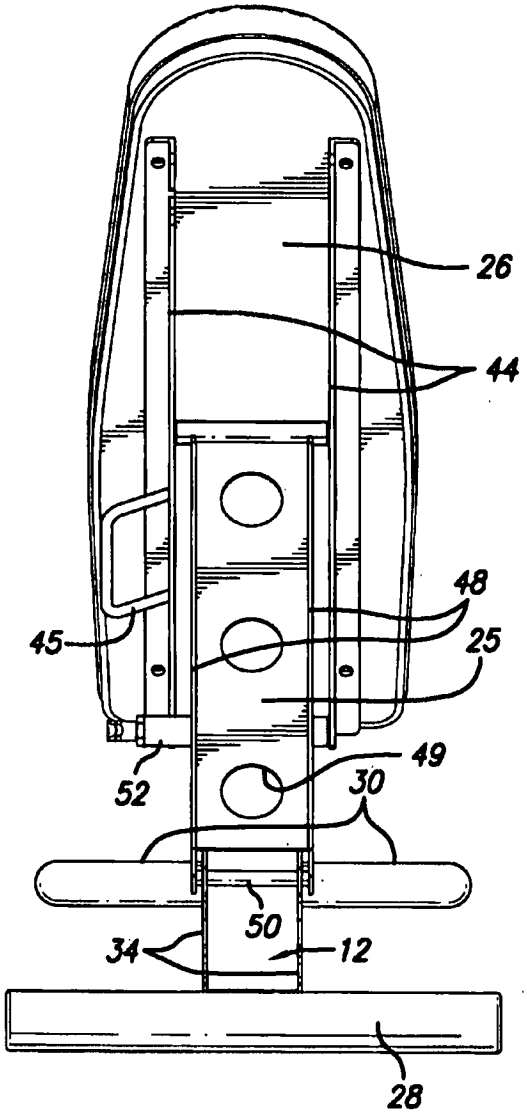


FIG. 4

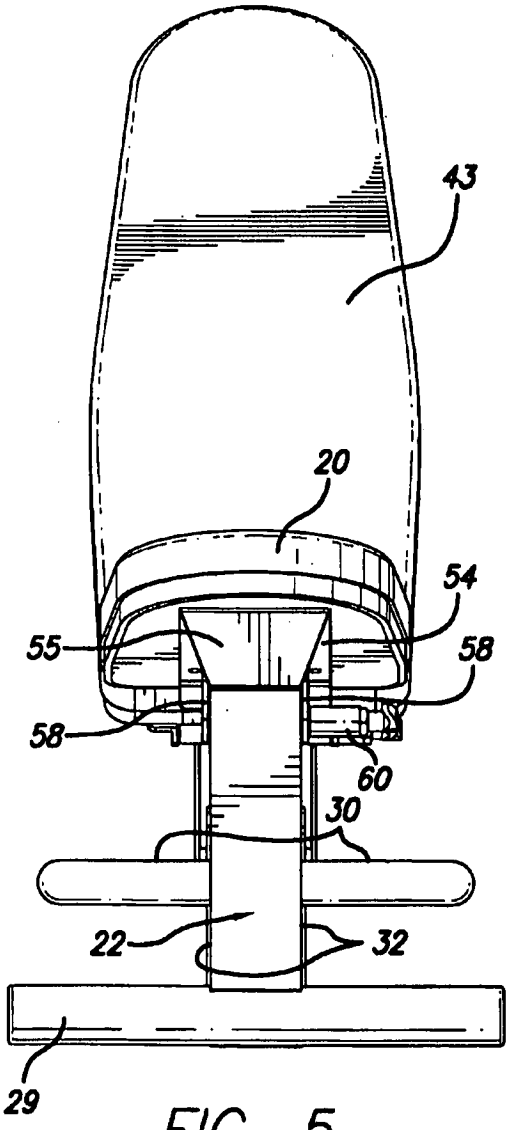
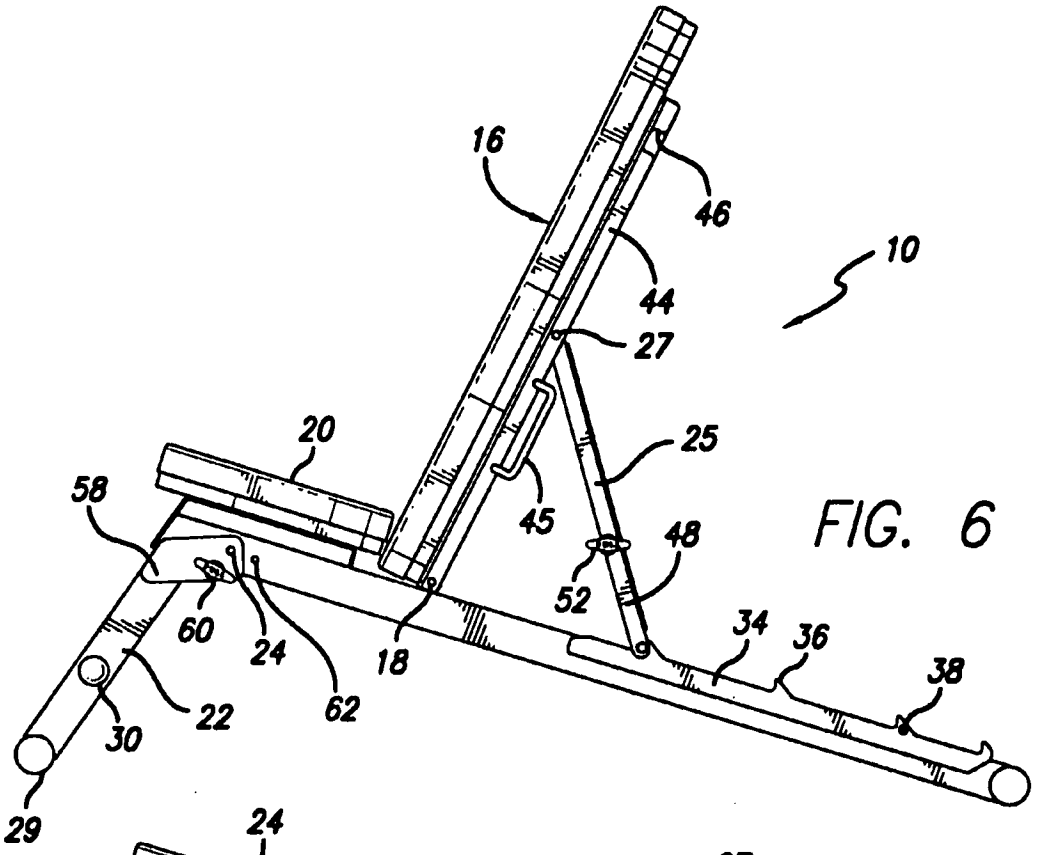


FIG. 5



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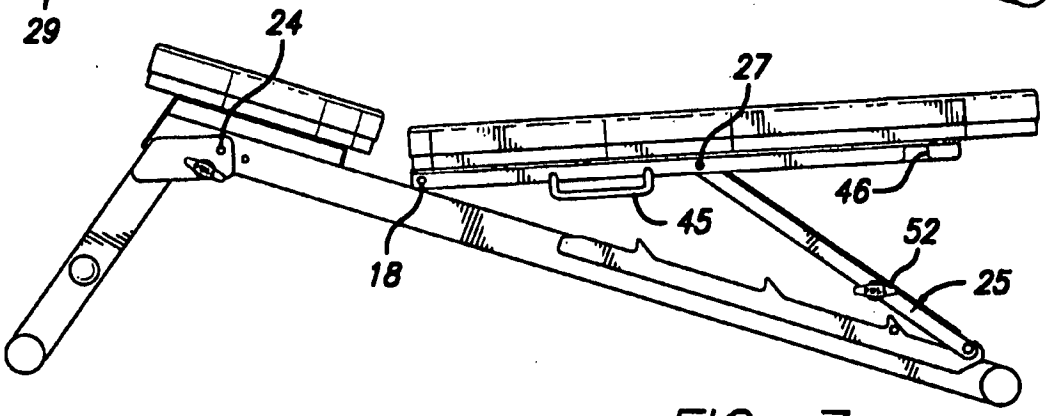
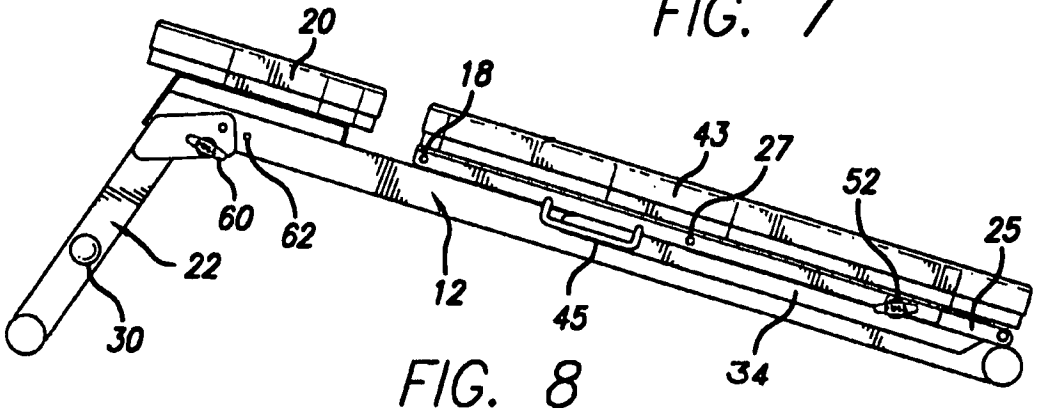


FIG. 7



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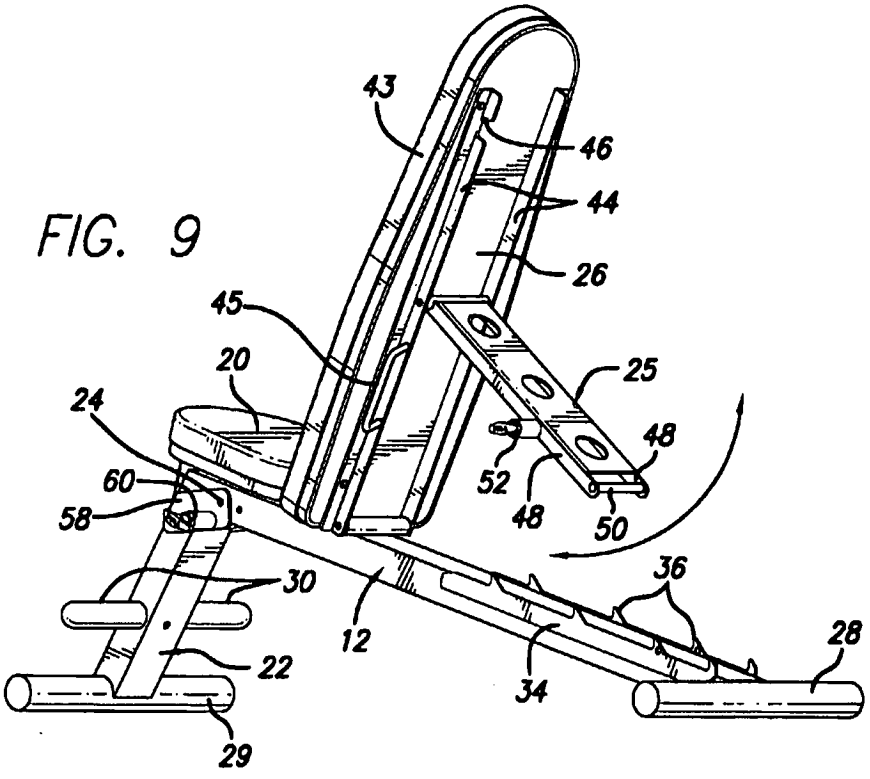
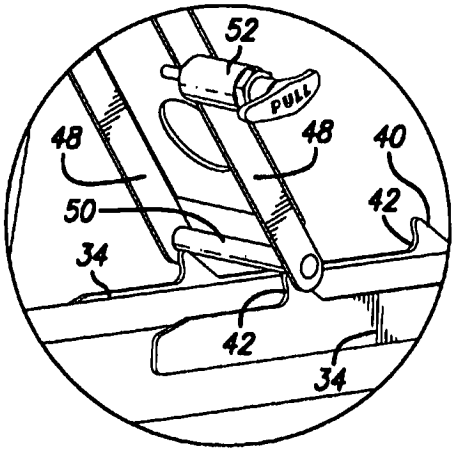


FIG. 9



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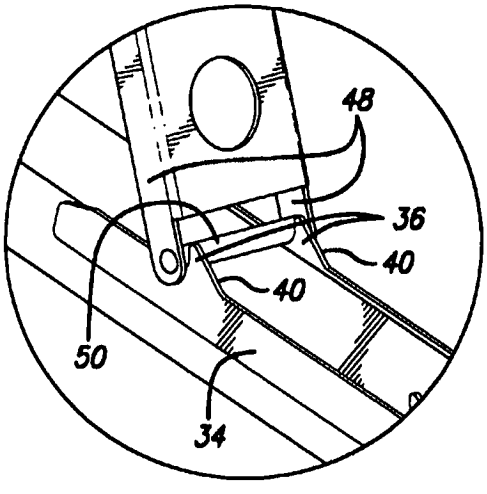

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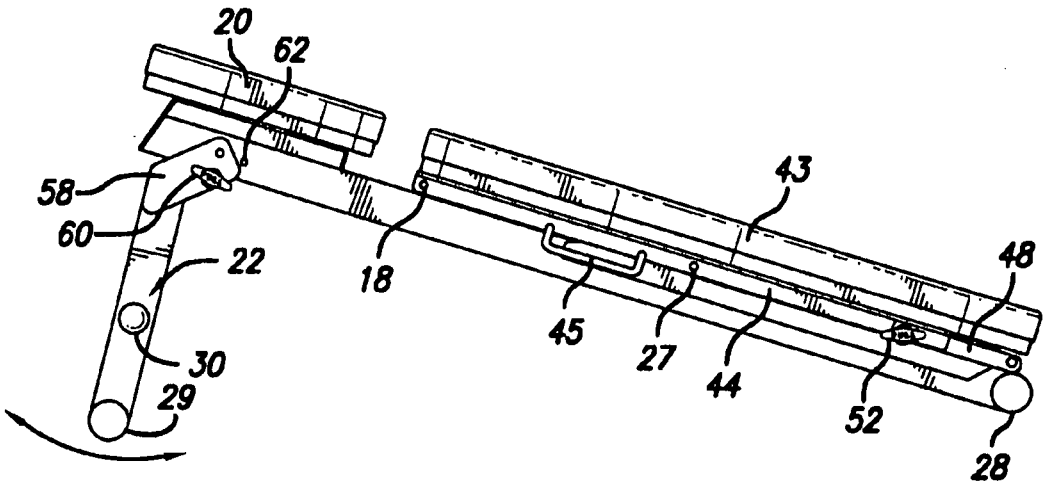
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FIG. 12

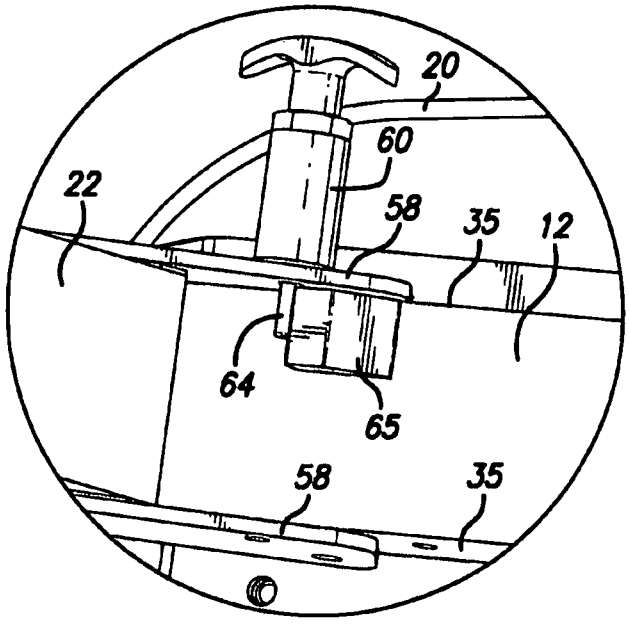
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FIG. 13

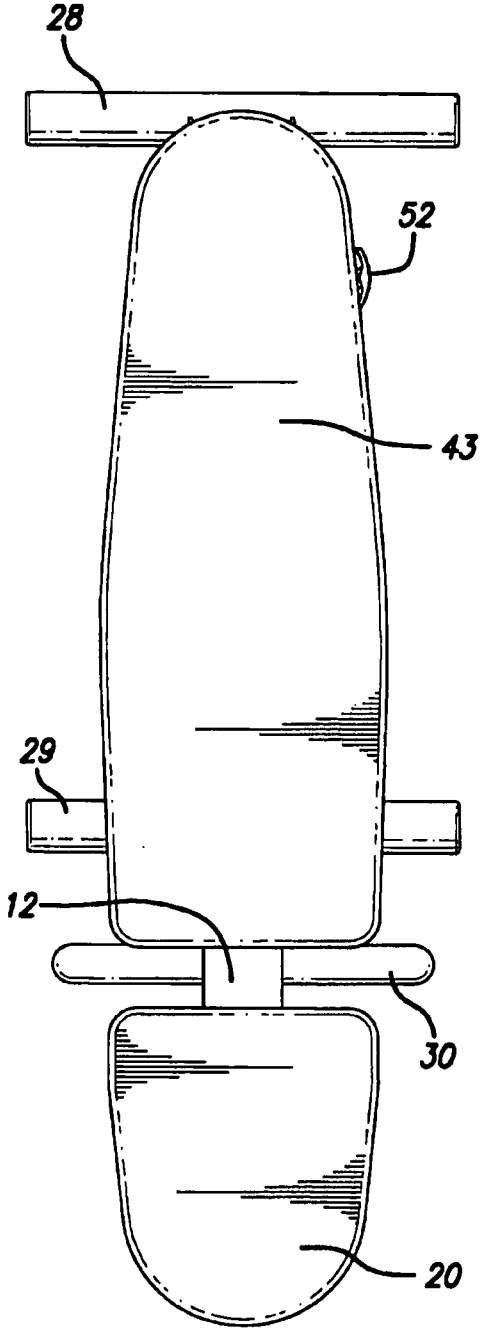
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FIG. 14

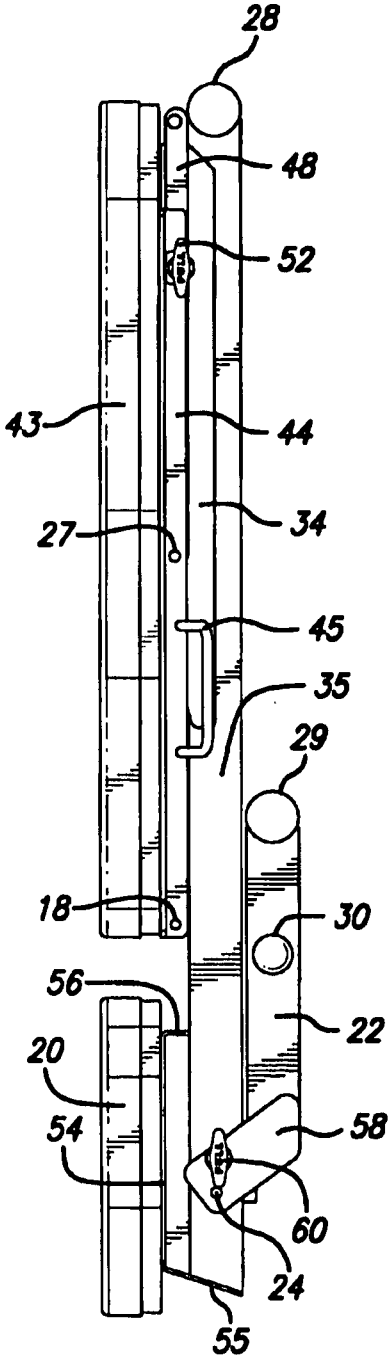
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FIG. 15

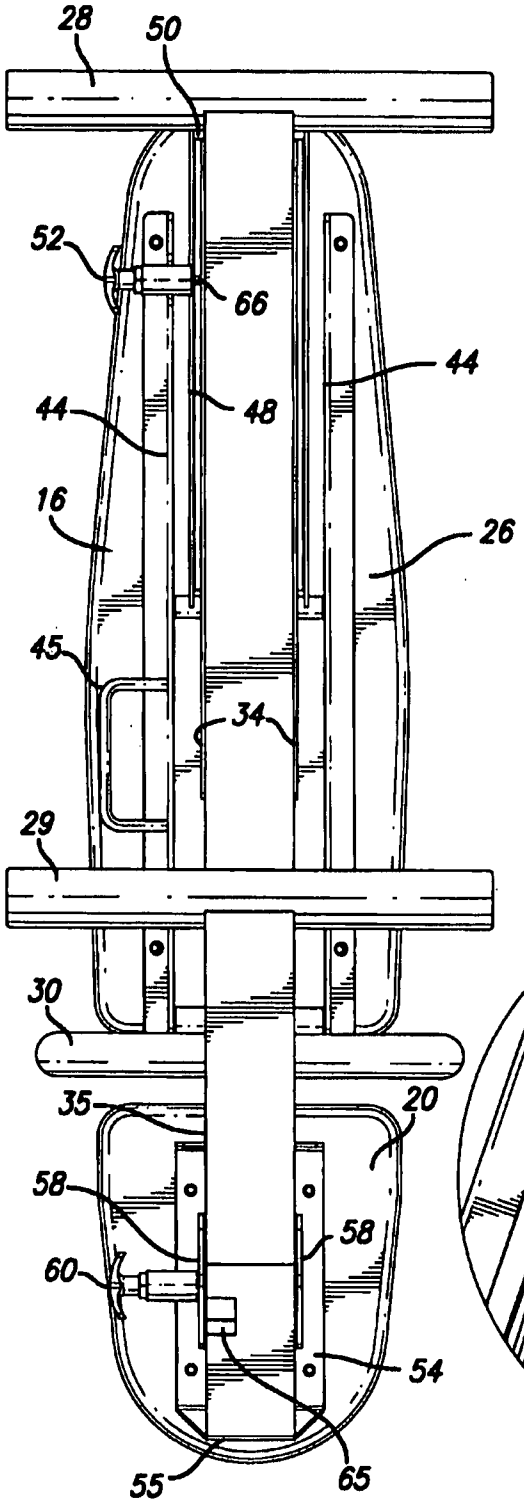
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FIG. 16

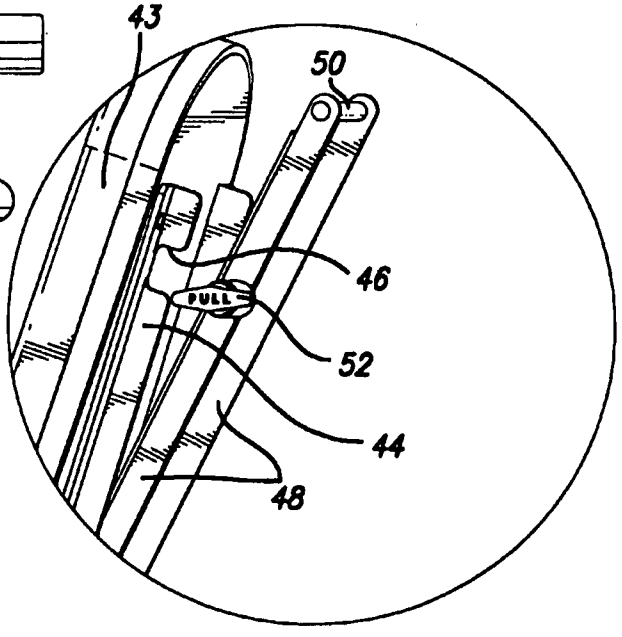
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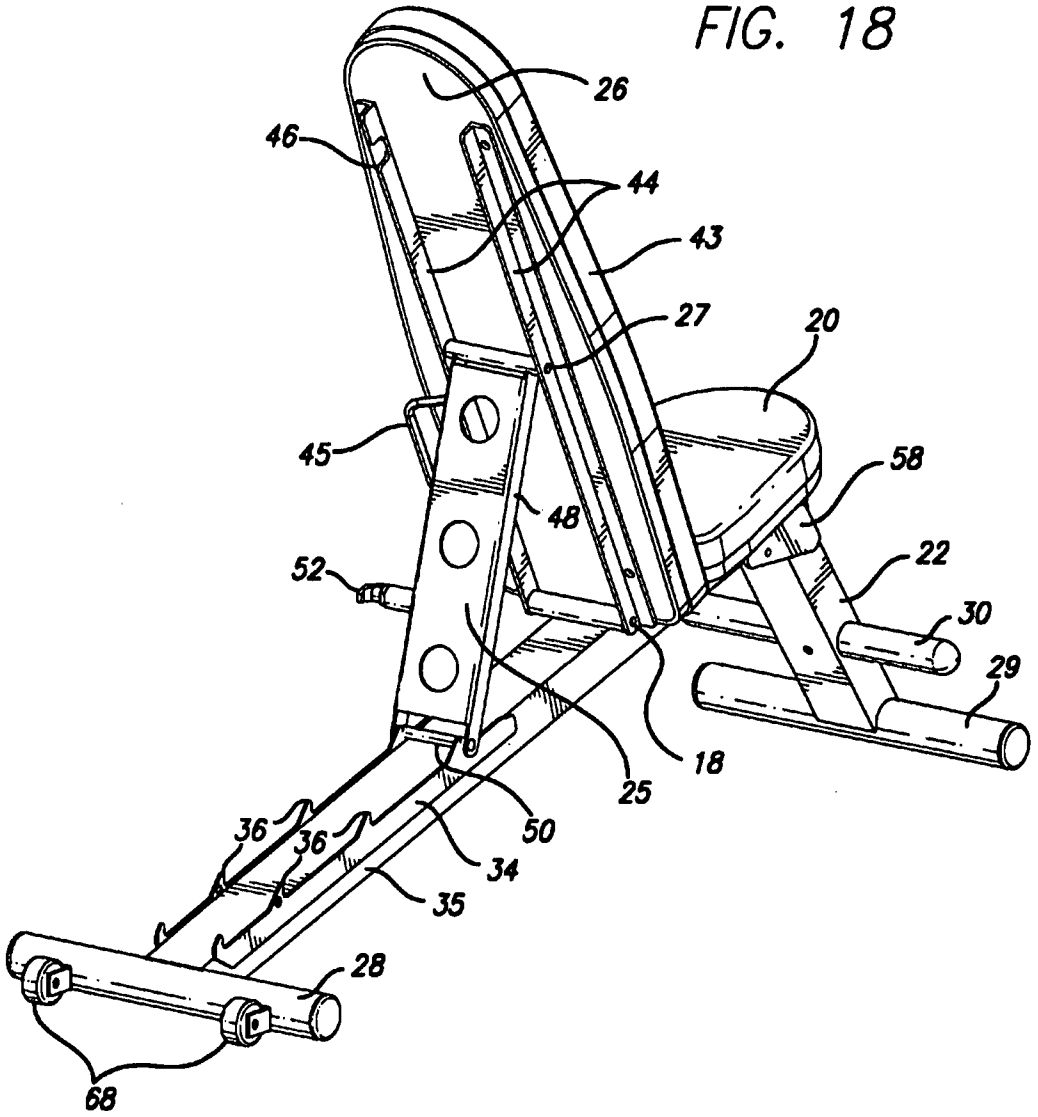
FIG. 17

FIG. 18



FOLDABLE EXERCISE BENCH

BACKGROUND OF THE INVENTION

The present invention relates generally to exercise benches used for support when performing weightlifting or other resistance-type exercises, and is particularly concerned with a foldable, multi-position exercise bench which can be folded up for storage or for carrying from one location to another.

Multiple position exercise benches are commonly known in the field as FID benches (flat-incline-decline), referring to the different possible bench positions. The FID bench has been a staple in the fitness industry for many years. Some FID benches may be folded for storage purposes while others do not have the ability to fold. U.S. Pat. No. 6,645,130 of Webber describes an adjustable exercise bench which can be folded into an upright orientation for storage. Some foldable benches are still fairly bulky and difficult to carry when folded, and have parts which protrude in the folded position, requiring more storage space.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new and improved foldable, multi-position exercise bench.

According to one aspect of the present invention, a foldable exercise bench is provided which comprises a support base having a first end for engaging the ground and a second end, a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base, a seat pad mounted on the support base in front of the back support, and a front support leg having a first end pivotally secured to the support base and a second end for engaging the ground in a deployed position to support the second end of the support base in a position raised above the ground, the front support leg being movable between a deployed position engaging the ground and a folded position folded flat against the support base, the front support leg having a front face and a rear face, and an integrated foot rest on the support leg located in line with the support leg and not protruding forwardly or rearwardly from the front or rear face of the support leg.

Since the foldable front support leg is equipped with an integrated, non-protruding foot rest, it can be folded completely flat against the support base with no space required between the support base and support leg, and nothing protruding outwardly from the support leg, requiring less storage space.

The back support is also designed to fold flat against the upper side of the support base in the folded position. In an exemplary embodiment of the invention, the back support has a rear face and a back supporting link is pivoted at an upper end to the rear face of the back support. The support base has a series of spaced, upwardly directed teeth or retaining formations defining a series of adjusted positions of the back support, and the back supporting link has a lower end comprising a formation for releasable engagement with any selected teeth to hold the back support at a selected orientation relative to the seat pad. The link is releasable from the retaining formations to allow both the back support and supporting link to be folded flat against the support base in the folded, storage position.

A first locking device may be provided for releasably locking the front leg to the support base in the folded position. A second locking device may be provided for releasably locking the supporting link to the support base in the folded position. In an exemplary embodiment, the rear face of the back support, the supporting link, and the retaining formations on the support base are designed to nest together in the folded position for more compact storage. The rear face of the back support may have a pair of projecting rails or runners between which the supporting link and retaining formations are nested in the folded position, and the supporting link may have spaced, parallel side walls between which the retaining formations engage. This nesting arrangement has the advantage of allowing a flatter storage condition and also avoids or reduces the risk of any damage to the underside of the upholstered back pad.

According to another aspect of the present invention, an adjustable foldable bench is provided which comprises an elongate base having a rear end for engaging the ground and a forward end, a front leg secured to the base adjacent the forward end for supporting the forward end of the base in a raised position, a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base, a support link having a first end pivoted to a rear face of the back support and a second end, the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base with the back support in the folded position, and a releasable locking device for releasably locking the support link to the raised rack-out in the folded position.

The arrangement of locking the support link directly to the raised rack-out on the support base avoids the need for providing any separate brackets or the like for engagement with the locking device or lock pin, reducing the number of parts and making the assembly more compact. The retaining formations may comprise a series of spaced, upwardly projecting teeth which may have a curved front side for retaining the end of the support link when engaged with respective teeth and an angled back side. One tooth may have an opening for receiving a lock pin extending from an aligned position on the support link when the support link is in the folded position.

In an exemplary embodiment of the invention, the rear face of the back support has a pair of spaced, parallel L-shaped runners or brackets between which the support link is nested in the folded position, and the retaining formations on the support base comprise first and second sets of spaced, upwardly projecting teeth, each tooth in a respective set aligned with a corresponding tooth in the other set. The support link is of generally U-shaped cross-section and has spaced longitudinal sides which are at a spacing greater than the spacing between the two sets of teeth, so that the support link is nested over at least some of the teeth in the folded position, while the runners on the back support nest over both the support link and the two sets of teeth. This provides a very compact, flat folded condition for the bench, so that it may be stored in a relatively narrow storage space such as under a bed or in a closet.

A carrying handle may be provided on one side of the back rest. This allows the bench to be easily transported when in the folded, locked condition.

The foldable, adjustable exercise bench of this invention is easy to use and is easy and inexpensive to manufacture. It has a simple, strong, and safe design, and can be folded flat

into a very compact state. It is generally easier to carry than most prior art exercise benches, due to its compactness when folded flat, as well as the convenient, integral carrying handle. Once the front leg is deployed and the back rest is raised, it is quite easy to adjust the orientation of the back rest in order to perform decline, flat, incline and shoulder press exercises.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood from the following detailed description of an exemplary embodiment of the invention, taken in conjunction with the accompanying drawings in which like reference numerals refer to like parts and in which:

FIG. **1** is a front perspective view of an exercise bench according to an exemplary embodiment of the invention in a selected exercise position;

FIG. **2** is a rear perspective view of the bench in the position of FIG. **1**;

FIG. **3** is a side elevation view of the exercise bench in the inclined position of FIGS. **1** and **2**;

FIG. **4** is a rear elevation view of the exercise bench in the position of FIGS. **1** to **3**;

FIG. **5** is a front elevation view of the exercise bench in the position of FIGS. **1** to **4**;

FIG. **6** is a side elevation view illustrating the exercise bench in a first exercise position with the back pad in a full upright position;

FIG. **7** is a side elevation view illustrating the exercise bench in one of two intermediate exercise positions;

FIG. **8** is a side elevation view illustrating the exercise bench in another exercise position in which the back pad is in a full recline position;

FIG. **9** is a rear perspective view of the exercise bench showing the back pad support link in a released position to illustrate the free swinging ability of the support link;

FIG. **10** is an enlarged view of part of the exercise bench illustrating the ramping of the lower end of the support link over the teeth on the retaining rack;

FIG. **11** is an enlarged view similar to FIG. **10** illustrating the locking position of the support link in front of one pair of retaining or locking teeth;

FIG. **12** is a side elevation view of the exercise bench similar to that of FIG. **8** but illustrating rearward pivoting motion of the front leg;

FIG. **13** is a bottom plan view of the front end of the exercise bench illustrating the stop position of the front leg;

FIG. **14** is a top plan view of the exercise bench in the fully folded, storage position;

FIG. **15** is a side elevation view of the exercise bench in the position of FIG. **14**;

FIG. **16** is a bottom plan view of the exercise bench in the position of FIGS. **14** and **15**;

FIG. **17** is a side view of part of the back pad and support link illustrating their positions immediately prior to folding into the flat or storage position; and

FIG. **18** is a rear elevation view of a modified exercise bench in the full upright position.

DETAILED DESCRIPTION OF THE DRAWINGS

FIGS. **1** to **16** illustrate a foldable exercise bench **10** according to an exemplary embodiment of the present invention. The exercise bench is a so-called FID or flat-incline-decline bench which is adjustable between various different back rest orientations for performing different types of exercise. It is also collapsible into a relatively flat, fully folded condition as illustrated in FIGS. **14** to **16** for storage or transportation purposes.

The bench **10** basically comprises an elongate support base or strut **12** having a rear end **14** for engaging the ground and a forward end **15**, a back rest **16** having a first end pivoted to the support base at pivot **18** at a location between the ends of the support base, a seat pad **20** mounted on the support base in front of the back rest **16** for forming a seat, and a front leg **22** pivoted at one end to the support base at a location adjacent its forward end, via pivot **24**. A support link or lever **25** is pivoted at one end to the back rest via pivot **27**, and engages the support base at its lower end to hold the back rest at a selected orientation, as described in more detail below.

The support base or strut **12** is a single elongate metal rod or tube with a cross member **28** attached to its rear end to act as a rear support foot. The front leg **22** is a similar bar or strut with a cross member **29** at its lower end acting as the front support foot, giving the front leg a general T-shape. A foot rest bar **30** is mounted to extend transverse to the front leg at a location spaced above the front support foot **29**, with opposite portions of the foot rest bar projecting from opposite side faces **32** of the front leg.

A retaining or locking rack is mounted on the support base. The retaining rack comprises a pair of identical, elongate plates **34** which are secured to opposite side faces **35** of the support base or strut **12** at a location spaced rearwardly from the back pad. The plates **34** extend up to a location close to the rear support foot **28**. Each plate **34** has a series of spaced, upwardly projecting teeth **36**, with each tooth on one plate aligned with a respective tooth on the other plate, as best illustrated in FIGS. **2** and **9**. The upper straight edges of the plates project up above the top face of the support base **12**, along with the teeth **36**. The two plates together form a retaining or locking rack for the support link **25**.

In the illustrated embodiment, a series of four spaced teeth **36** are provided, but a greater or lesser number may be provided if desired, dependent on the number of different back rest orientations required. A pinning hole **38** is located in one of the teeth **36** at a location below the top edge of the tooth and above the top face of the support base. Each tooth has an angled back side **40** and a curved front side **42**, as best illustrated in FIGS. **10** and **11**.

The back rest **16** comprises a back pad **43** for supporting the back of an exerciser, and a pair of spaced, parallel L-shaped runners or brackets **44** which are attached directly to the rear face **26** of the back pad. A carrying handle **45** is welded to one of the brackets **44** so as to project outwardly to one side of the bracket, as best illustrated in FIGS. **1**, **3** and **4**. The same bracket **44** also has notch **46** adjacent its upper end, as illustrated in FIGS. **2**, **9**, **16** and **17**.

The support link or lever **25** for the back rest is pivoted at its upper end between the brackets **44** via pivot pin **27**, as illustrated in FIG. **2**. Link **25** comprises an elongate plate or web having a pair of downwardly directed side rims **48** forming a generally U-shaped cross section, as best illustrated in FIGS. **1**, **2** and **10**. This one-piece connecting link has greater rigidity than some prior art arrangements and is easy and inexpensive to produce. The plate or web may have a series of holes **49** for reducing weight. A positioning member or pin **50** of circular cross-section is secured between the lower ends of the side rims **48**, and is designed to engage the projecting teeth **36** of the retaining rack on the base support, as indicated in the drawings. As illustrated in FIGS. **1**, **2** and **11**, the round pin **50** is a close fit in the

rounded or curved front side **42** of a selected pair of teeth when engaged with the retaining or locking rack.

A spring-loaded pull pin **52** is mounted at an intermediate position on one of the side rims **48** of the support link **25**. Pull pin **52** acts as a handle to aid in adjusting the back pad, as well as a locking device for securing the support link in the collapsed or folded condition, as will be described in more detail in connection with FIG. **16**.

The seat pad **20** is mounted on the support base or strut **12** via seat mounting bracket **54** which is generally U-shaped, as illustrated in the side view of FIG. **3**. Bracket **54** has a flat upper portion or web on which the seat pad **20** is secured, and a front leg **55** which is longer than the rear leg **56** and which is angled slightly outward. The front leg **55** caps off the open front end of the tubular support base or strut **12**, as best illustrated in FIGS. **1** and **3**, increasing the structural integrity of the front end of the base. The second or rear leg **56** of the seat mounting bracket attaches to the top side of the support base **12**, positioning the upper portion or web slightly above the upper face of the support base to allow attachment of the seat pad.

The front leg **22** of the exercise bench has a pair of mounting plates **58** welded to its opposite side faces **32** adjacent its upper end so as to project rearwardly at an angle to the front leg and over the opposite side faces **35** of the support base, as best illustrated in FIGS. **2**, **3**, **13** and **16**. A pair of holes are provided in each side face **35** of the support base beneath the seat pad and adjacent the front end of the support base, and corresponding holes are provided in each mounting plate **58**. One of the holes in the mounting plate **58** and the corresponding hole in the side face of the support base are for receiving pivot pin **24** for the front leg **22**. A pull pin **60** is attached to one of the mounting plates **58** over the second hole in that plate, as illustrated in FIGS. **1**, **3** and **13**. The second hole **62** in the side face **35** of the support base comprises a pinning hole and is positioned to receive the spring-loaded plunger **64** of the pull pin **60** when the front leg is in the folded, storage position, as will be described in more detail below. When the front leg is in the exercise or deployed position of FIGS. **1** to **3**, the plunger **64** will extend beneath the support base **12** as illustrated in FIG. **13**, and will engage a stop member **65** located on the underside of the support base to lock the front leg in the exercise or support position.

In the exercise position, the front leg **22** is designed to wedge up against the underside of the support base **12** for support, as illustrated in FIGS. **5** and **13**. The capped forward end **15** of the support base provides added strength and helps to prevent the tubular strut forming the support base from collapsing. In each of the various possible exercise positions of the bench, the foot rest bar **30** can be used as a foot rest by placing the feet on top of the bar, or as an anchor to hold the user in place by hooking the feet under the bar. The foot rest bar is narrower in width than the side faces **32** of the front leg, so that it does not protrude outwardly beyond the front or rear face of the front leg.

FIGS. **1** to **5** of the drawings illustrate one of four possible exercise positions of the exercise bench, in which the positioning pin **50** at the lower end of the support link **25** is engaged in front of the second teeth **36** of the retaining or locking rack. In this position, the back rest **16** is in an intermediate, rearwardly inclined orientation for use in performing various types of upper and lower body exercises.

If the user wishes to raise the back rest, they pivot the back rest up and the self-ramping feature of the connecting link and teeth of the receiving rack allow pin **50** to ramp up and over the teeth into a new selected bracket position. If the exerciser wishes to lower the back rest of the bench, they simply have to disengage the positioning pin **50** from the teeth **36**, using the pull pin **52** as a handle. At this point, the support link **25** is free swinging about pivot **27**, and can be moved to engage any selected pair of teeth **36**. As indicated in FIG. **10**, the positioning pin **50** engages and ramps over the angled rear face of the selected teeth, and then locks into the curved front faces of the selected teeth as indicated in FIG. **11**. The raised straight edges of the plates **34** prevent the positioning pin **50** from dragging across the top face of the support base as the support link is adjusted from one position to another. Instead, the pin **50** will drag across the upper edges of the plates **34**, avoiding marring of the painted top surface of the support base. The angled back edges **40** of the locking teeth **36** allow the positioning pin or rod to ramp up easily over the tooth to automatically find the next adjustment position.

FIGS. **6** to **8** illustrate three other possible exercise positions of the bench **10**. FIG. **6** illustrates the positioning pin **50** engaging the front pair of teeth **36** to place the back pad in the full upright position, which would be selected when performing shoulder press or biceps curl exercises. FIG. **7** illustrates the positioning pin engaging the rear pair of teeth **36** and the back pad in a more rearwardly inclined orientation for performing various upper and lower body exercises. Another possible rearwardly inclined orientation (not illustrated) is provided by engaging pin **50** in the third set of teeth.

FIG. **8** illustrates the back pad in the full recline position which would be selected for performing decline press or abdominal crunch exercises. In order to place the back pad in this position, the positioning pin **50** is released from the retaining or locking teeth and is then swung outwardly beyond the rear ends of the retaining plates **34**, while the back pad is folded downwardly about pivot **18** until it rests on top of the support base. At this point, the pull pin **52** will engage in the notch **46** in one runner or bracket **44** of the back support, as indicated in FIGS. **8** and **17**, and the support link **25** will be nested between the brackets **44**, while the opposite side rims of the support link will nest over the raised teeth **36** of the plates **35**. In this position, the pull pin **52** is aligned with the hole **38** in the respective third tooth **36**, and can be retracted and released to extend through the hole and lock the support link to the support base.

The foldable bench therefore has five different possible exercise positions with the back pad at various orientations. It will be understood that a greater number of different positions may be provided if desired, simply by providing additional pairs of teeth on the respective plates **34**. Similarly, a reduced number of teeth may be provided if a lesser number of exercise positions are required.

FIGS. **14** to **16** illustrate the bench **10** in the folded, storage position. In order to collapse the bench into a storage position, the user first collapses the back pad in the manner described above in connection with FIG. **8**. The user lifts the support link, using the pull pin **52** as a handle, so that it is released from the retaining teeth **36**, as indicated in FIG. **9**. The back pad is then folded all the way down, together with the support link, and the extending plunger **66** of the pull pin is engaged in the pinning hole **38** in the aligned tooth **36**. The pull pin housing engages in the notch **46** in one of the runners or brackets **44** at the rear of the back pad, with FIG. **17** illustrating the movement of the notch **46** over the pull pin **52** as the parts are collapsed and folded together.

The user next disengages the pull pin **60** on the front leg from the stop member **65**, allowing the front leg **22** to be folded rearward about pivot **24** into the storage position of

FIG. **15**. At this point, the pull pin **60** is aligned with the pinning hole **62** on the adjacent side face **35** of the base support, and the plunger **64** is released to extend through the aligned hole in plate **58** and the hole **62** to lock the leg in the storage position. When the leg **22** is folded, it provides a flat, resting surface because nothing protrudes beyond the flat front face (or lower face when the leg is folded as in FIG. **15**).

The folded, storage position of the exercise bench **10** has a very compact, thin profile due to the compact design of the front leg **22** with no protruding parts, as well as the nested foldable arrangement of the back pad, support link, and retaining teeth. The association between the adjustable back support, support link, and support base is such that, when folded into the storage position, the upwardly projecting teeth **36** on the plates **34** fit between the downwardly directed side rims **48** of the support link, and the support link fits in between the two runners **44** of the back support, as best illustrated in FIG. **16**, with the pull pin **52** fitting into the notch **46** in the adjacent runner **44**. This nesting ability allows the back pad to fold up as tight as possible against the base support. It also protects the upholstery of the back pad, since the projecting teeth fit inside the U-shaped support link, while the flat face of the support link rests against the rear surface of the back pad and protects it from damage. This arrangement not only protects the upholstery, but also prevents damage to the teeth.

The thin profile storage position of the bench allows it to easily fit in a relatively small storage space such as under a bed or in a closet. The integral handle **45** and flat storage position allow the folded bench to be carried relatively easily.

FIG. **18** illustrates a modification of the exercise bench **10** to provide wheels **68** on the rear foot **28** of the support base **12**. The exercise bench is otherwise identical to the previous embodiment, and like reference numerals have been used for like parts as appropriate. Wheels **68** aid in positioning the bench in an exercise environment.

The foldable exercise bench of this invention is easy to manufacture, with a reduced number of parts, and is also easy to use, and compact. It is a simple, strong, inexpensive and reliable design. The folded bench is relatively flat and compact, and is easy to carry from place to place due to the integral handle. In the upright position, the back pad orientation can be adjusted quickly and easily, and with little effort.

The nesting arrangement between the back pad, support link, and upper edges and teeth of the retaining plates or racks is compact and protects both the teeth and the rear face of the back pad upholstery from damage. The support link adjusts and locks in the same raised rack-out or teeth, and also locks to one of the teeth in the folded condition, reducing the number of parts. The positioning pin or rod is locked in the curved front edge of the respective tooth in the exercise positions, and no secondary pinning device is required for this purpose, further reducing the number of parts.

Although an exemplary embodiment of the invention has been described above by way of example only, it will be understood by those skilled in the field that modifications may be made to the disclosed embodiment without departing from the scope of the invention, which is defined by the appended claims.

I claim:

1. An adjustable foldable bench, comprising:

an elongate support base having a rear end for engaging the ground and a forward end;

a front leg secured to the base adjacent the forward end for supporting the forward end of the base in a raised position;

a back support pivotally mounted on the support base at a location between the ends of the base for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

a releasable locking device which locks the support link to the raised rack-out in one position only of the back support, the one position comprising the folded position; and

a pair of parallel, spaced projecting runners on the rear face of the back support, the runners being at a predetermined spacing greater than the width of the support link, whereby the support link is nested between the runners in the folded position.

2. An adjustable foldable bench, comprising:

an elongate support base having a rear end for engaging the ground and a forward end;

a front leg secured to the base adjacent the forward end for supporting the forward end of the base in a raised position;

a back support pivotally mounted on the support base at a location between the ends of the base for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

a releasable locking device for releasably locking the support link to the raised rack-out in the folded position;

the raised rack-out comprising spaced first and second plates each having an upper edge and a plurality of spaced teeth projecting upwardly from the upper edge of each plate, each tooth on one plate being aligned with a respective tooth on the other plate; and

the support link comprising a flat web of predetermined width having opposite, downwardly directed side rims, and the plates being at a predetermined spacing less than the width of the web, whereby at least the upper edges and teeth of the plates are nested between the side rims of the support link in the folded position.

3. The bench as claimed in claim **2**, wherein the support base has a flat top surface and opposite sides, the first plate being secured to one side of the support base and the second plate being secured to the other side of the support base, the upper edge and teeth of each plate being spaced above the top surface of the support base.

4. The bench as claimed in claim 2, wherein one tooth of a respective plate has a pinning hole, and a pull pin is mounted at a predetermined position on the corresponding side rim of the support link for alignment with the pinning hole in the folded position, the pull pin and pinning hole comprising said releasable locking device.

5. The bench as claimed in claim 2, further comprising a pair of spaced, parallel runners on the rear face of the back support, the runners being at a predetermined spacing greater than the width of the support link web, whereby the support link and upper edges and teeth of the plates are nested between said runners in the folded position.

6. The bench as claimed in claim 5, wherein one of said runners has a notch for engaging over said locking device in the folded position.

7. The bench as claimed in claim 5, further comprising a handle secured to one of said runners and projecting out to one side of the back support for use in carrying the bench when in the folded position.

8. An adjustable foldable bench, comprising:

an elongate support base having a rear end for engaging the ground and a forward end;

a front leg secured to the base adjacent the forward end for supporting the forward end of the base in a raised position;

a back support pivotally mounted on the support base at a location between the ends of the base for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

a releasable locking device for releasably locking the support link to the raised rack-out in the folded position; and

a seat pad and a mounting bracket securing the seat pad to the support base in front of the back support, the mounting bracket being substantially U-shaped and having a flat web secured to the seat pad with a front end adjacent the front end of the seat pad and a rear end, a first leg projecting downwardly from the front end of the web and a second leg projecting downwardly from the rear end of the web, the legs being secured to the support base.

9. The bench as claimed in claim 8, further comprising a foot rest secured to the front leg at a location between the first and second ends, the front leg having a front face and opposite side faces, the side faces being of predetermined width, and the foot rest comprising first and second foot rest portions projecting from the opposite side faces for engagement by a user's right and left feet, the width of the foot rest being no greater than the width of the side faces, whereby the foot rest does not project outwardly beyond the front face of the front leg in either the deployed or folded position.

10. The bench as claimed in claim 8, wherein the support base comprises a tubular member having an open forward end, the first leg of the mounting bracket being longer than the second leg and extending downwardly over the open forward end of the tubular member to form an end cap.

11. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support; and

a front support leg having a first end pivotally secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground, the front support leg being movable between a deployed position engaging the ground and a folded position folded flat against the support base; the front support leg having a front face and a rear face;

an integrated foot rest on the support leg located in line with the support leg and not protruding forwardly or rearwardly from the front or rear face of the support leg; and

a support link having a first end pivoted to a rear face of the back support and a second end, the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position, and a releasable locking device for releasably locking the support link to the raised rack-out in the folded position.

12. The bench as claimed in claim 11, wherein the retaining formations comprise teeth, one of the teeth having a pinning hole, the locking device comprising a pull pin on the support link for alignment with the pinning hole in the folded position, the pull pin having a plunger for engaging through the pinning hole to lock the support link in the folded position.

13. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support; and

a front support leg having a first end pivotally secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground, the front support leg being movable between a deployed position engaging the ground and a folded position folded flat against the support base; the front support leg having a front face and a rear face;

an integrated foot rest on the support leg located in line with the support leg and not protruding forwardly or rearwardly from the front or rear face of the support leg; and

a locking device for releasably locking the leg to the support base in the folded position.

14. The bench as claimed in claim 13, including a carrying handle for transporting the bench in the folded position.

15. The bench as claimed in claim 13, wherein the locking device comprises a spring loaded plunger mounted on the

leg, the support base having a pinning hole for receiving the plunger in the folded position of the leg.

16. The bench as claimed in claim **15**, further comprising a stop member on the support base for engaging the plunger in the deployed position of the front support leg to hold the front leg in the deployed position.

17. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end pivotally secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground, the front support leg being movable between a deployed position engaging the ground and a folded position folded flat against the support base: the front support leg having a front face and a rear face;

an integrated foot rest on the support leg located in line with the support leg and not protruding forwardly or rearwardly from the front or rear face of the support leg; and

a mounting bracket securing the seat to the support base in front of the back support, the seat comprising a pad, the mounting bracket being substantially U-shaped and having a flat web secured to a lower surface of the seat pad with a front end adjacent the front end of the seat pad and a rear end, a first leg projecting downwardly from the front end of the web and a second leg projecting downwardly from the rear end of the web, the legs being secured to the support base.

18. The bench as claimed in claim **17**, wherein the support base comprises a tubular member having an open forward end, the first leg of the mounting bracket being longer than the second leg and extending downwardly over the open forward end of the tubular member to form an end cap.

19. The bench as claimed in claim **17**, wherein the seat pad is spaced above the support base by the legs of the mounting bracket.

20. A foldable exercise bench, comprising:

a support base having a rear end which engages the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends which moves between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end which engages the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations which releasably engage the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the support link having a generally U-shaped cross-section and comprising a flat web and spaced side rims, the side rims being at a predetermined spacing for nesting over the raised rack-out in the folded position with the flat web between the raised rack-out and the rear face of the back support; and

a pair of spaced, parallel runners projecting outwardly from the rear face of the back pad, the spacing between the runners being greater than the spacing between the side rims of the support link, whereby the support link is nested between the runners in the folded position.

21. The bench as claimed in claim **20**, wherein the raised rack-out has a pinning hole and a locking device is mounted on one side rim of the support link for engaging the pinning hole in the folded position.

22. The bench as claimed in claim **21**, wherein the raised rack-out comprises a plurality of spaced teeth and the pinning hole is located in one of the teeth.

23. The bench as claimed in claim **21**, wherein one of said runners has a notch for engaging over said locking device in the folded, nested position.

24. A foldable exercise bench, comprising:

a support base having a rear end which engages the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends which moves between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end which engages the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations which releasably engage the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the support link having a generally U-shaped cross-section and comprising a flat web and spaced side rims, the side rims being at a predetermined spacing for nesting over the raised rack-out in the folded position with the flat web between the raised rack-out and the rear face of the back support; and

the raised rack-out having an upper edge spaced above the upper face of the support base and a plurality of teeth projecting upwardly from said upper edge and comprising said retaining formations.

25. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the rear face of the back support having a first nesting formation for nesting over the support link in the folded position and the support link having a second nesting formation for nesting over the raised rack-out in the folded position, whereby both the raised rack-out and the support link are nested within the first nesting formation in the folded position; and

the first nesting formation comprising a pair of spaced parallel brackets on the rear face of the back support.

26. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the rear face of the back support having a first nesting formation for nesting over the support link in the folded position and the support link having a second nesting formation for nesting over the raised rack-out in the folded position, whereby both the raised rack-out and the support link are nested within the first nesting formation in the folded position; and

the second nesting formation comprising a pair of downwardly directed opposite side rims on the support link.

27. The bench as claimed in claim **26**, further comprising a locking device for locking one side rim of the support link to the raised rack-out in the folded position.

28. The bench as claimed in claim **27**, wherein the first nesting formation has a notch for engaging over the locking device in the folded position.

29. The bench as claimed in claim **26**, wherein the support link has a flat upper web for extending over the raised rack-out in the folded position to prevent contact between the raised rack-out and rear face of the back pad.

30. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the rear face of the back support having a first nesting formation for nesting over the support link in the folded position and the support link having a second nesting formation for nesting over the raised rack-out in the folded position, whereby both the raised rack-out and the support link are nested within the first nesting formation in the folded position; and

the raised rack-out having an upper edge spaced above the upper face of the support base and a plurality of teeth projecting upwardly from said upper edge and comprising said retaining formations.

31. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the rear face of the back support having a first nesting formation for nesting over the support link in the folded position and the support link having a second nesting formation for nesting over the raised rack-out in the folded position, whereby both the raised rack-out and the support link are nested within the first nesting formation in the folded position; and

the front support leg being pivotally secured to the support base for movement between the deployed position engaging the ground and a folded position folded flat against the support base.

32. The bench as claimed in claim **31**, further comprising a locking device for locking the support leg to the support base in the folded position.

33. The bench as claimed in claim **31**, further including a foot rest on the front support leg spaced above the second end of the front support leg, the front leg having a front face, a rear face and opposite side faces, the foot rest having first and second foot engaging portions projecting outwardly from the opposite side faces of the front leg and not

protruding forwardly or rearwardly from the front or rear face in either the deployed or folded position.

34. A foldable exercise bench, comprising:

a support base having a rear end for engaging the ground and a forward end;

a back support pivotally mounted on the support base at a location between the ends for movement between a folded position flat against the support base and a plurality of adjusted, inclined positions relative to the support base;

a seat on the support base in front of the back support;

a front support leg having a first end secured to the support base and a second end for engaging the ground in a deployed position to support the forward end of the support base in a position raised above the ground;

a support link having a first end pivoted to the back support and a second end;

the support base having a raised rack-out comprising a series of spaced retaining formations for releasably engaging the second end of the support link to hold the back support at a series of selected orientations relative to the support base, the support link being foldable flat against the support base together with the back support in the folded position;

the rear face of the back support having a first nesting formation for nesting over the support link in the folded position and the support link having a second nesting formation for nesting over the raised rack-out in the folded position, whereby both the raised rack-out and the support link are nested within the first nesting formation in the folded position; and

at least one wheel secured to the rear end of the support base.

* * * * *

EXHIBIT C

EXHIBIT C

US00D519585S

(12) United States Design Patent

Webber

(10) Patent No.: US D519,585 S
(45) Date of Patent: ** Apr. 25, 2006

(54) **FOLDING EXERCISE BENCH**

(76) Inventor: **Randall T. Webber**, 1265 Park Row, La Jolla, CA (US) 92037

(**) Term: **14 Years**

(21) Appl. No.: **29/218,522**

(22) Filed: **Dec. 3, 2004**

(51) **LOC (8) Cl.** **21-02**
(52) **U.S. Cl.** **D21/690**; D21/676
(58) **Field of Classification Search** D21/662, D21/676, 686, 690; 482/104, 133, 140, 142
See application file for complete search history.

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Primary Examiner—Philip S. Hyder
Assistant Examiner—RoseLynne Ulm
(74) *Attorney, Agent, or Firm*—Gordon & Rees LLP

(57) **CLAIM**

The ornamental design for a folding exercise bench, as shown.

DESCRIPTION

FIG. **1** is a front perspective view of a folding exercise bench in an upright position, showing my new design;

FIG. **2** is a rear perspective view thereof;

FIG. **3** is a side elevational view thereof;

FIG. **4** is a rear elevational view thereof;

FIG. **5** is a front elevational view thereof;

FIG. **6** is a side elevational view of the bench showing the back rest in a different position;

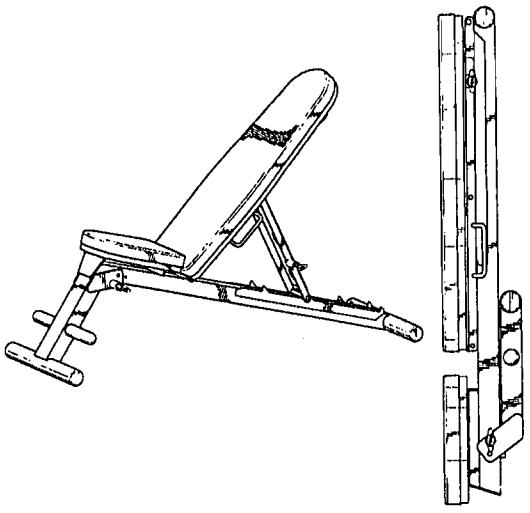
FIG. **7** is a side elevational view of the bench showing the back rest in a fully reclined position;

FIG. **8** is a top plan view with the bench in a fully folded position;

FIG. **9** is a side elevational view of the bench in the fully folded position; and,

FIG. **10** is a bottom plan view of the bench in the fully folded position.

1 Claim, 6 Drawing Sheets



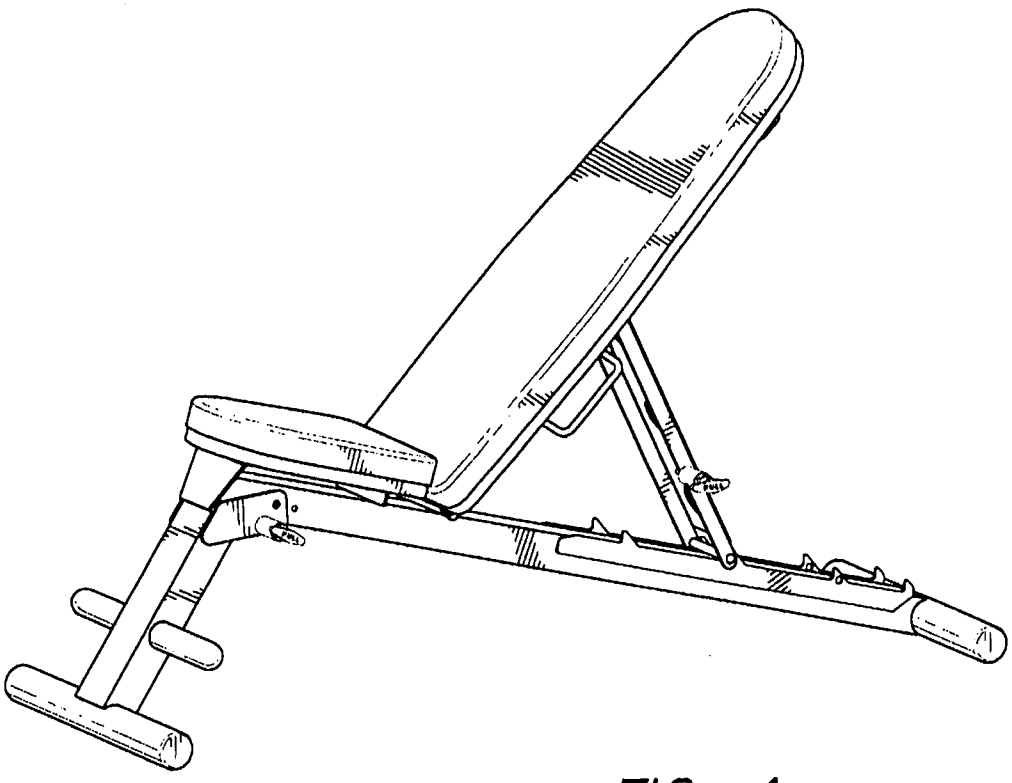


FIG. 1

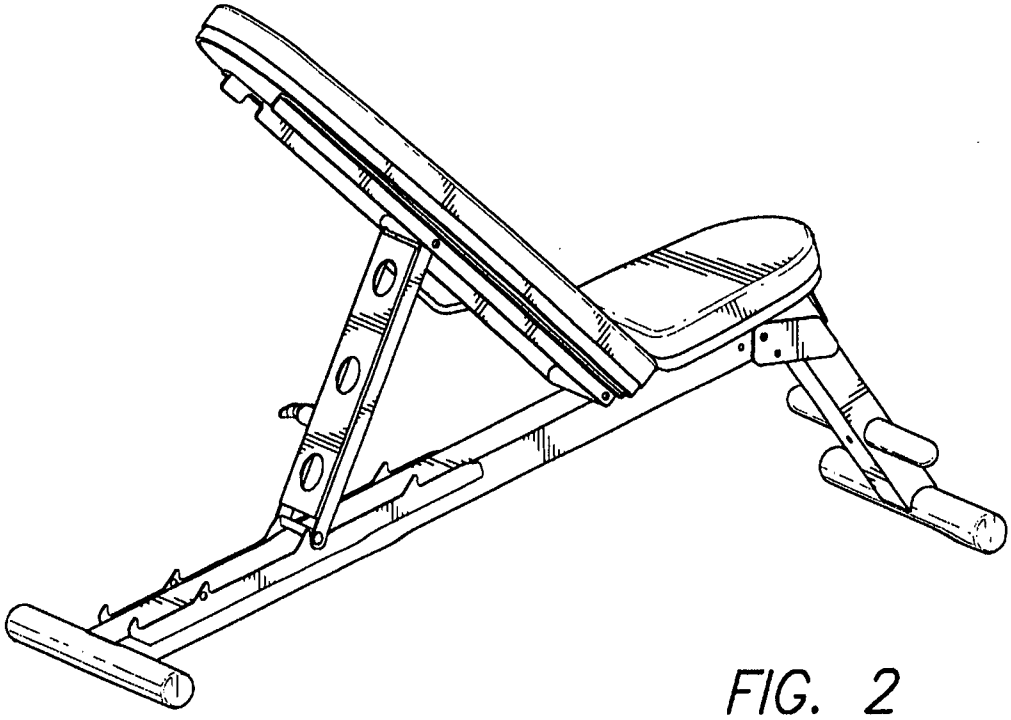


FIG. 2

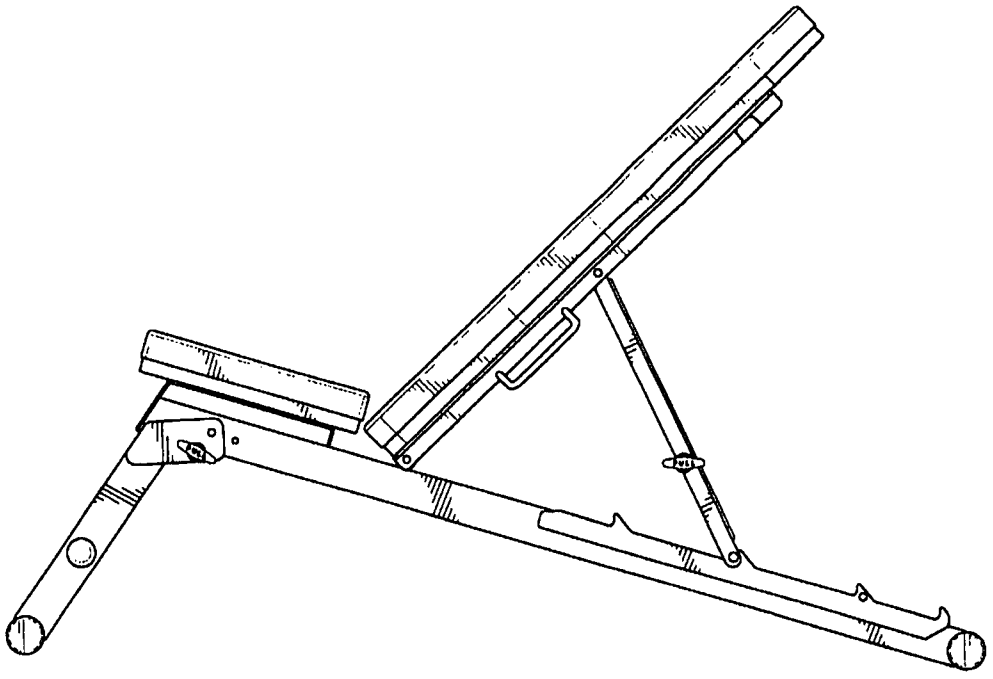


FIG. 3

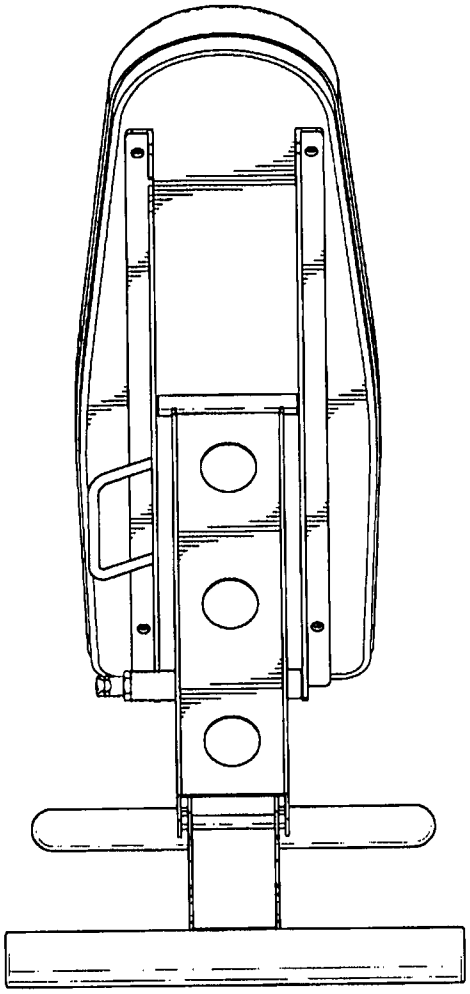


FIG. 4

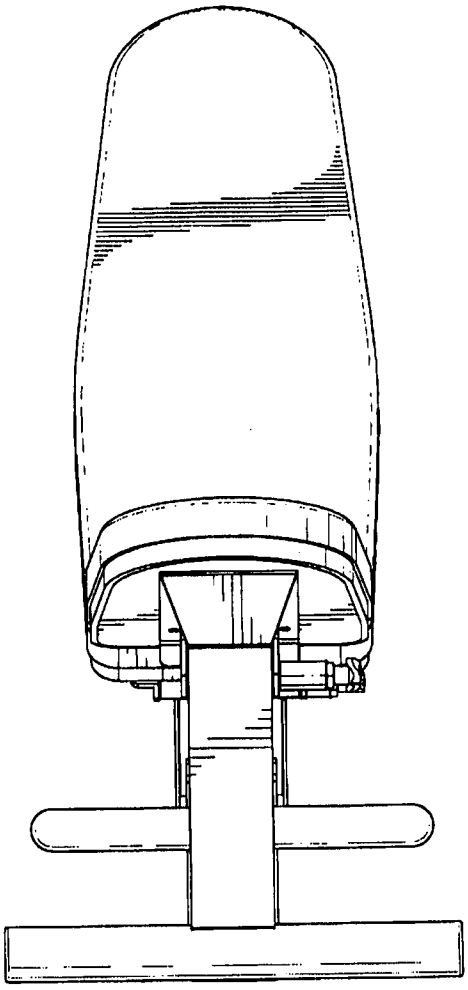


FIG. 5

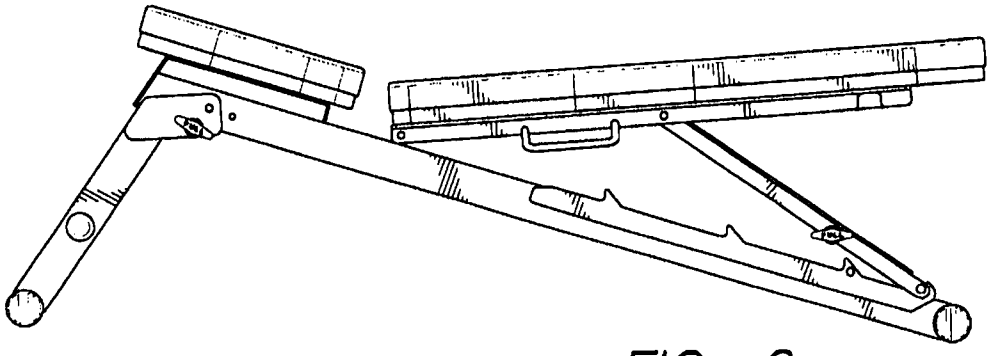


FIG. 6

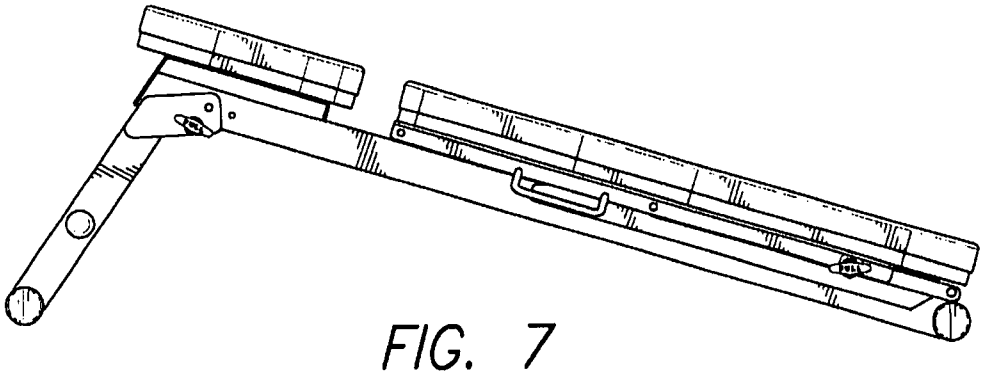


FIG. 7

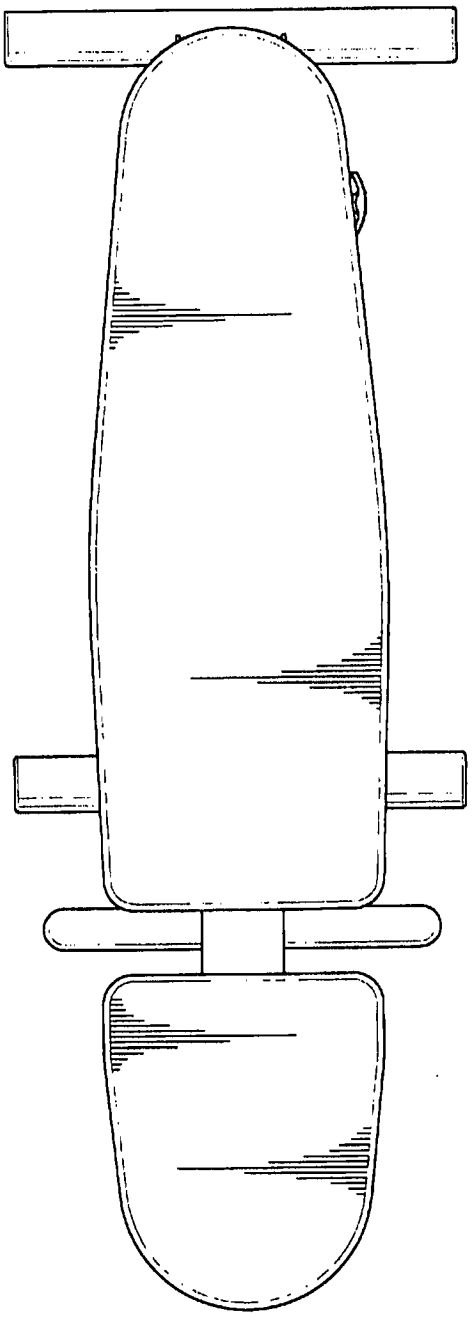


FIG. 8

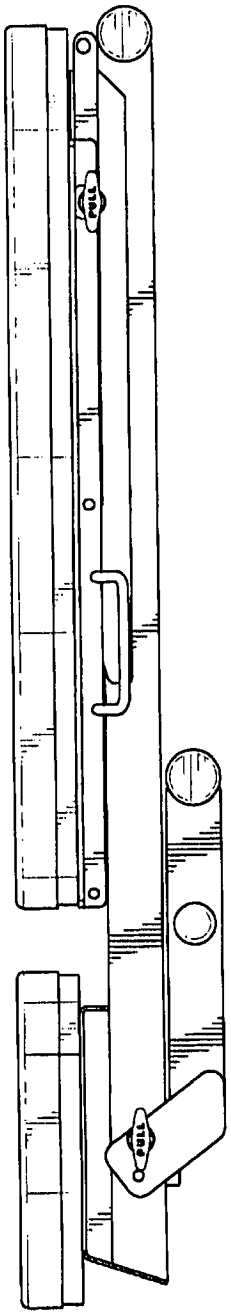


FIG. 9

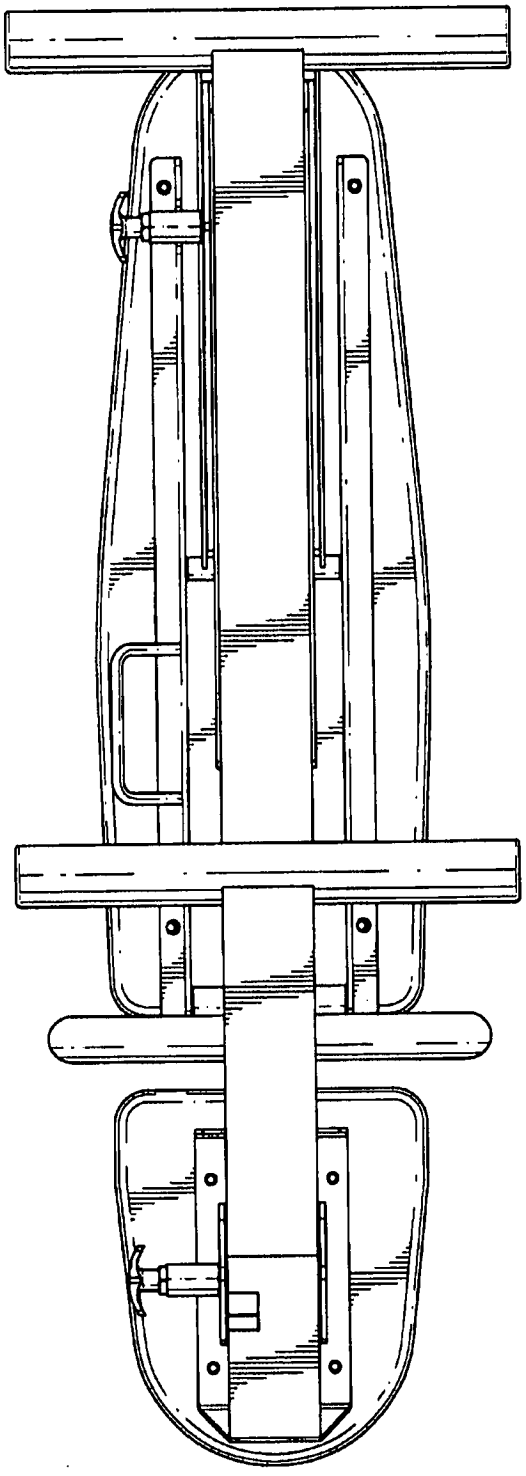


FIG. 10

EXHIBIT D

US00D541357S

(12) United States Design Patent

Webber

(10) Patent No.: US D541,357 S
(45) Date of Patent: ** Apr. 24, 2007

(54) **FOLDING EXERCISE BENCH**

(76) Inventor: **Randall T. Webber**, 1265 Park Row, La Jolla, CA (US) 92037

(**) Term: **14 Years**

(21) Appl. No.: **29/243,777**

(22) Filed: **Nov. 30, 2005**

(51) **LOC (8) Cl.** **21-02**
(52) **U.S. Cl.** **D21/690**
(58) **Field of Classification Search** D21/662, D21/676, 686, 690; 482/104, 133, 140, 142, 482/96; D24/183
See application file for complete search history.

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Primary Examiner—Philip S. Hyder
(74) *Attorney, Agent, or Firm*—Procopio Cory Hargraves & Savitch

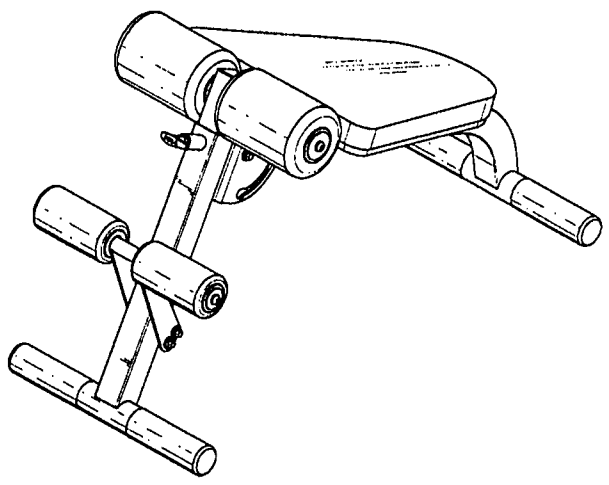
(57) **CLAIM**

The ornamental design for a folding exercise bench, as shown.

DESCRIPTION

FIG. **1** is a front perspective view of a folding exercise bench in a first exercise position, showing my new design;
FIG. **2** is a front elevational view thereof;
FIG. **3** is a right side elevational view thereof;
FIG. **4** is a left side elevational view thereof;
FIG. **5** is a top plan view thereof;
FIG. **6** is a rear elevational view thereof;
FIG. **7** is a bottom plan view thereof;
FIG. **8** is a front perspective view of the folding exercise bench of FIG. **1**, showing the bench in a second exercise position;
FIG. **9** is a right side elevational view of the bench in the position of FIG. **8**, the left side of the upper extended post being identical to the right side;
FIG. **10** is a rear perspective view of the bench in the position of FIG. **8**;
FIG. **11** is a front perspective view of the folding exercise bench in a lowered, folded position; and,
FIG. **12** is a right side elevational view of the bench in the position of FIG. **11**.

1 Claim, 12 Drawing Sheets



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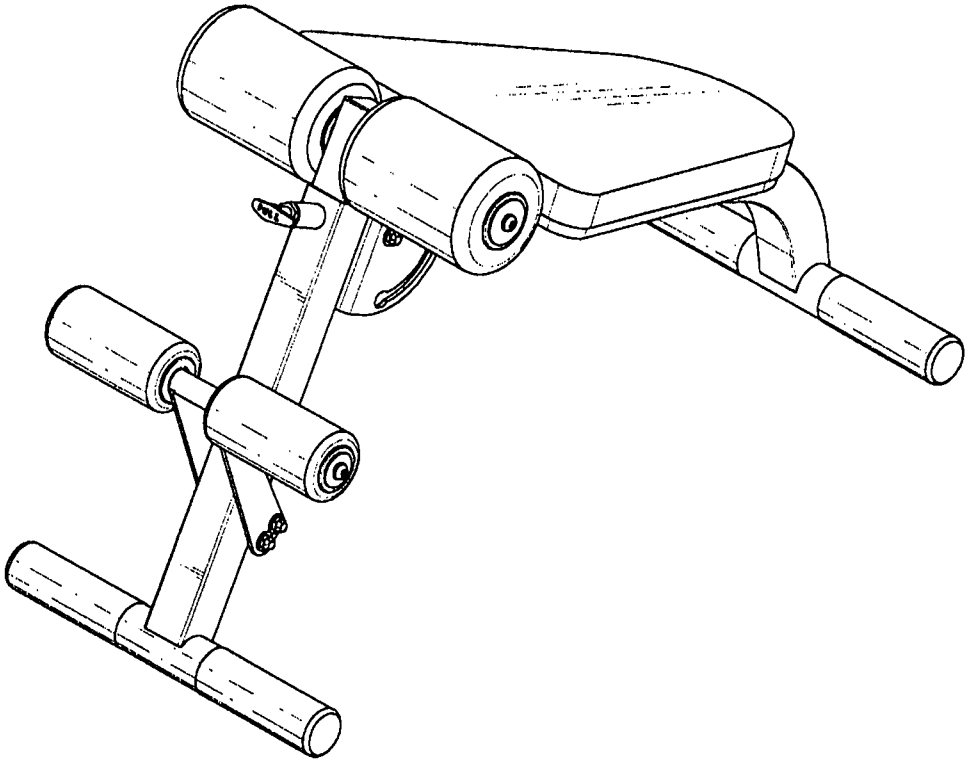


FIG. 1

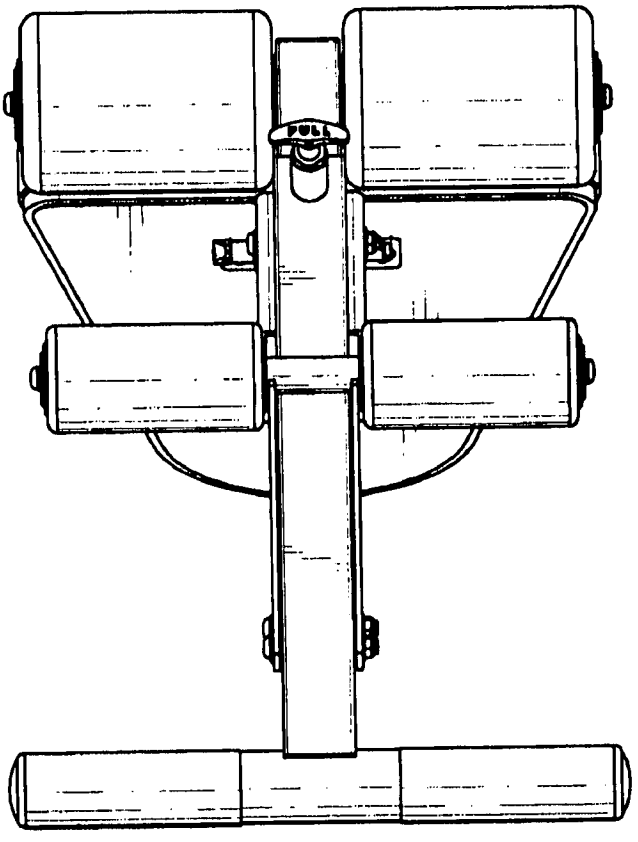


FIG. 2

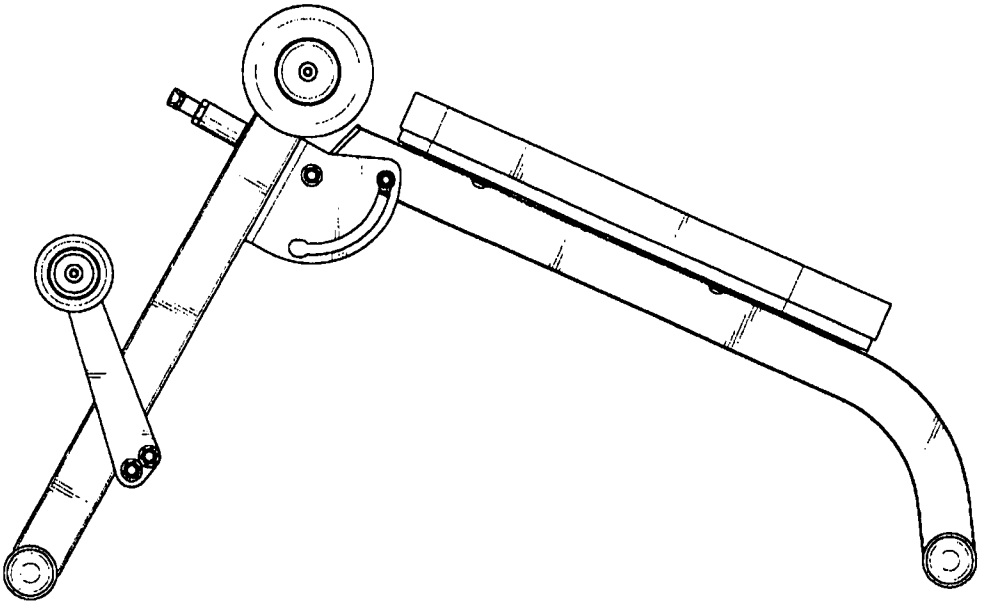
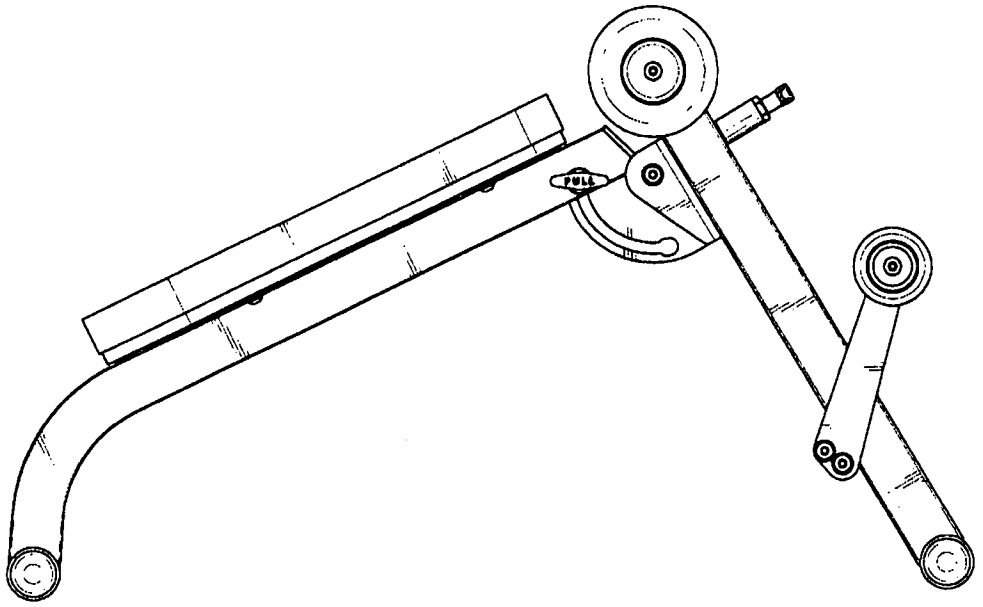


FIG. 3



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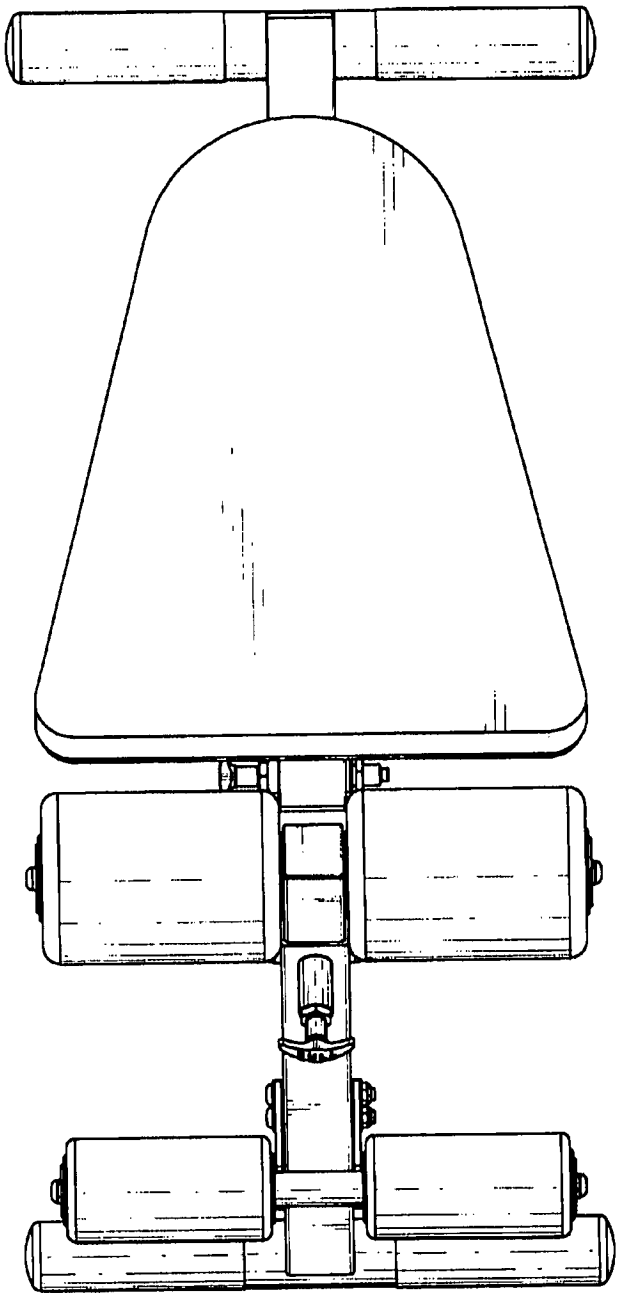

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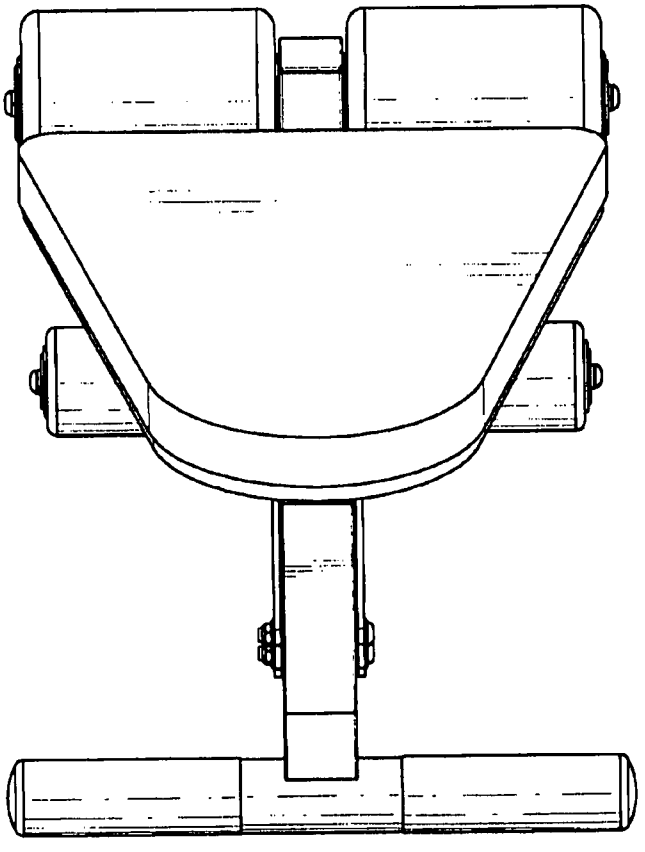

FIG. 6

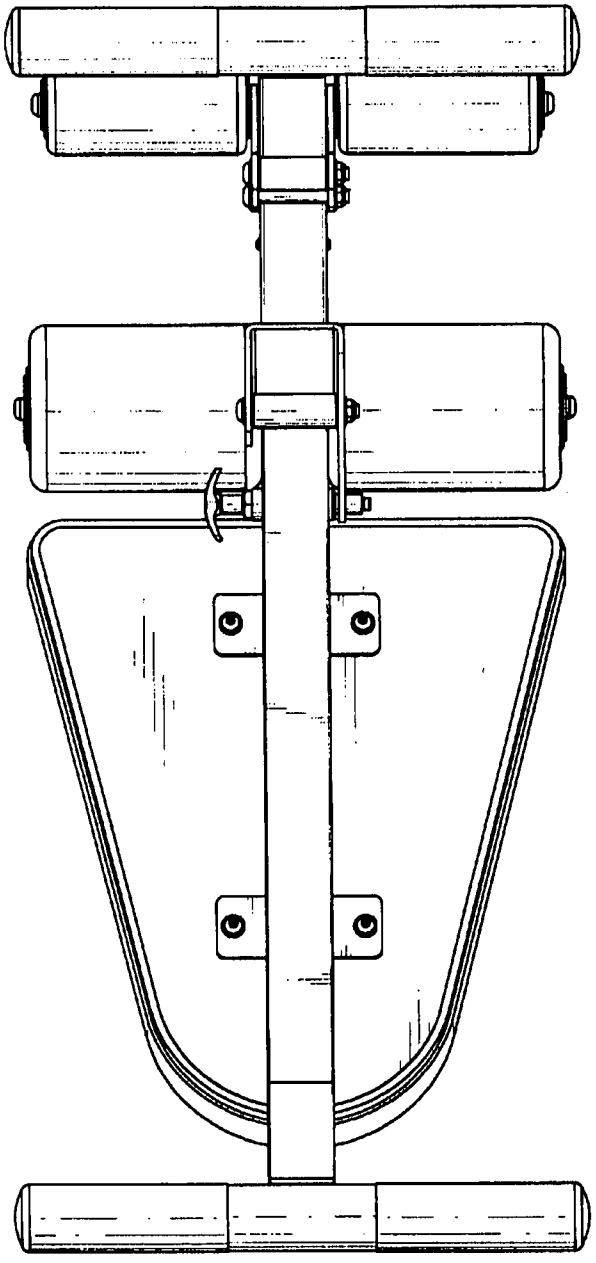

FIG. 7

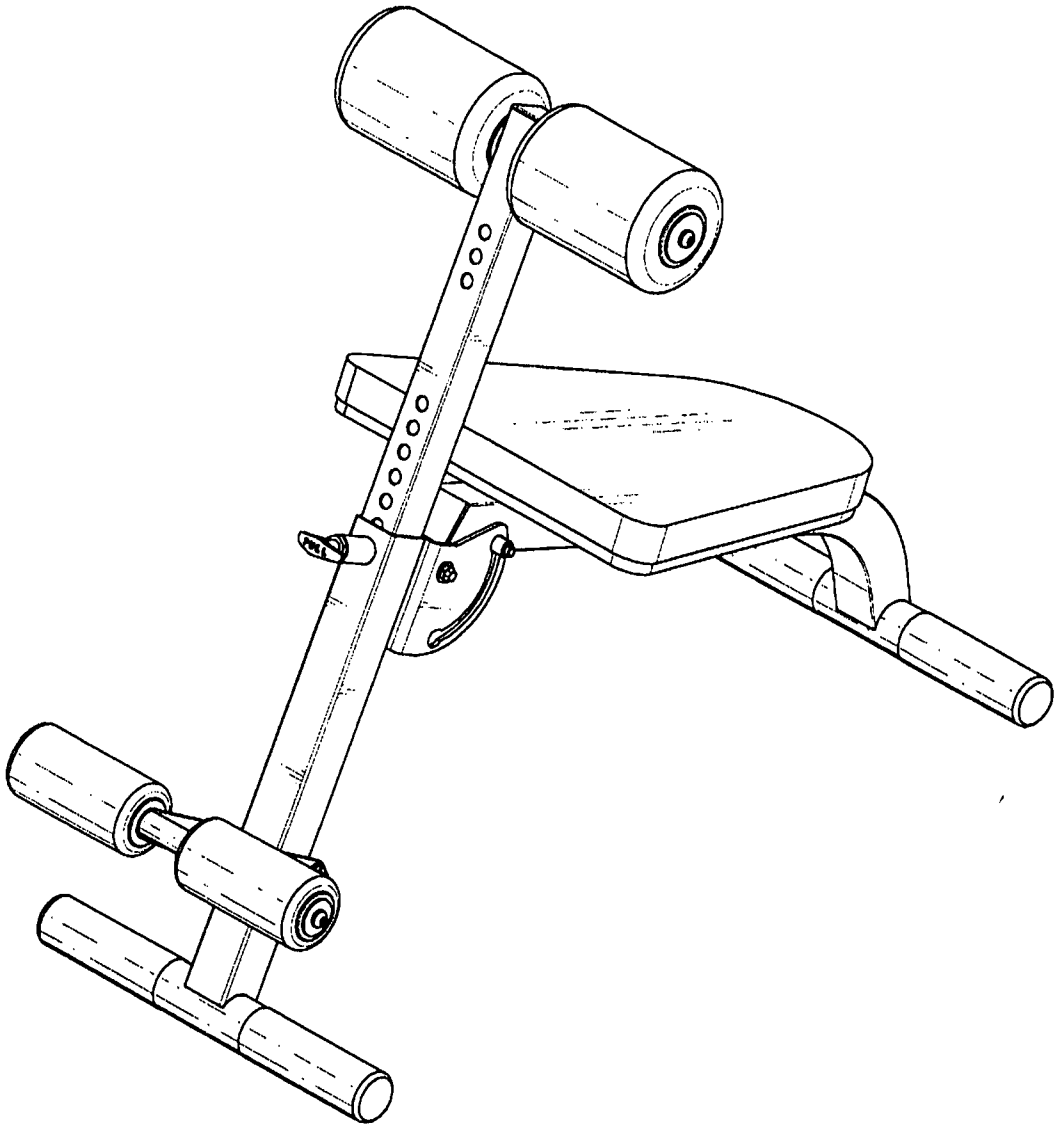

FIG. 8

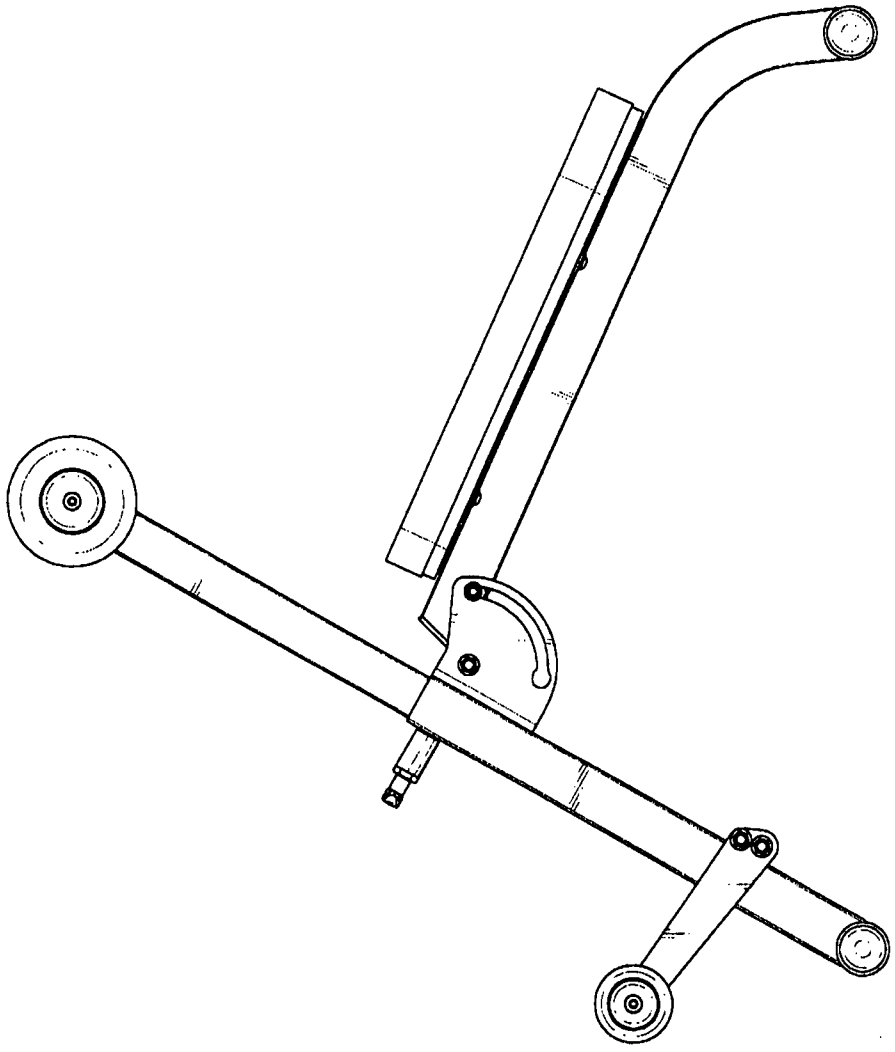

FIG. 9

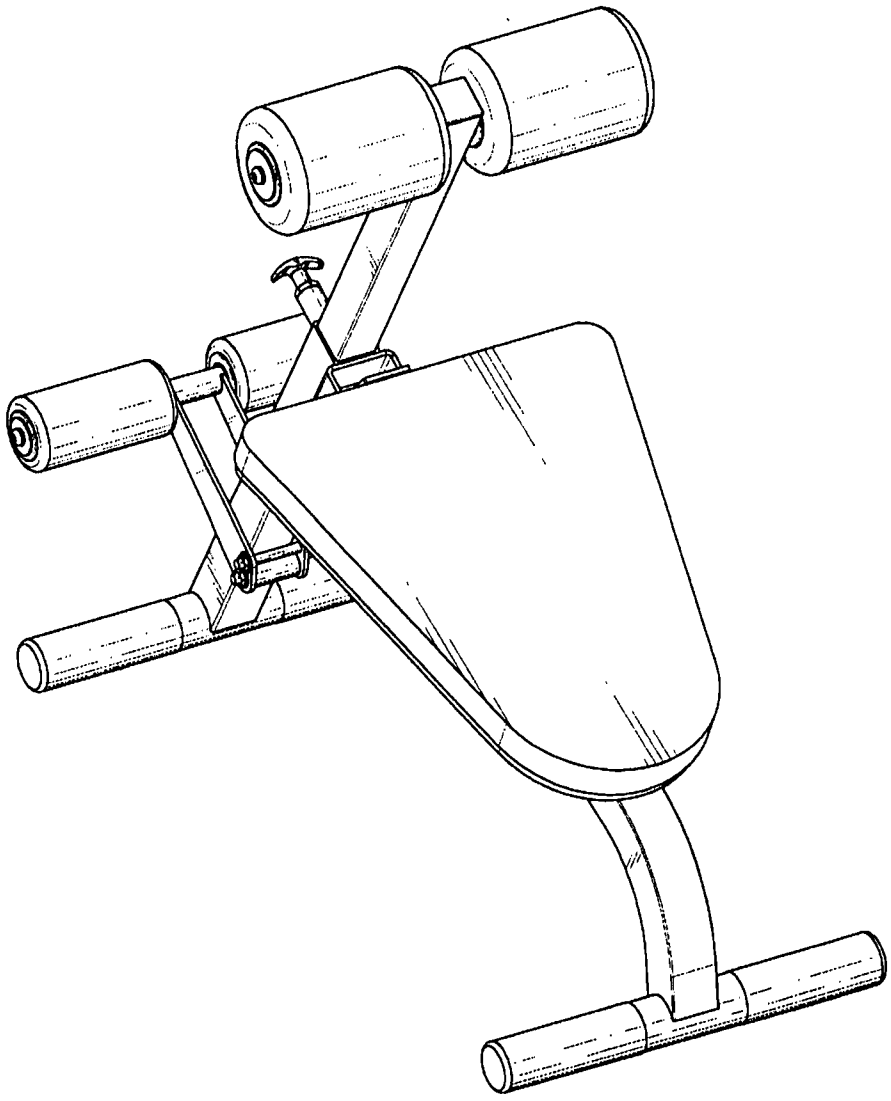

FIG. 10

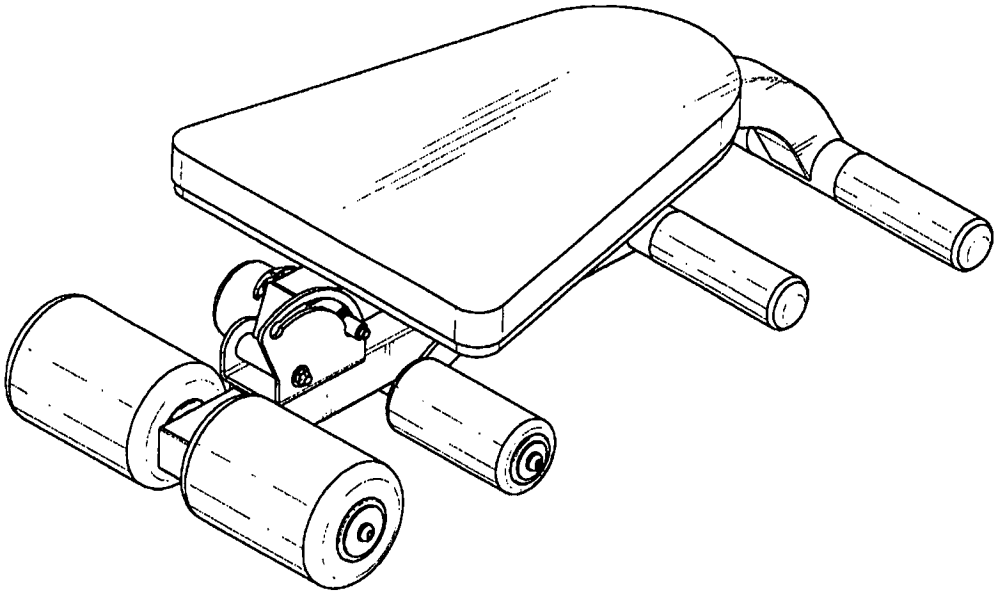

FIG. 11

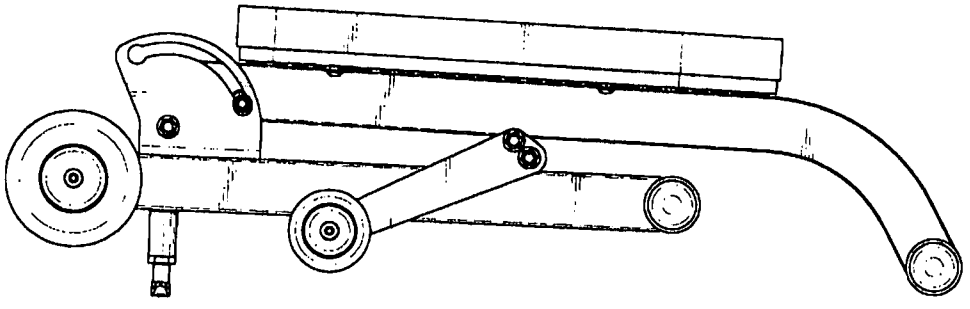

FIG. 12

JS 44 (Rev. 12/07)

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

I. (a) PLAINTIFFS
HOIST FITNESS SYSTEMS, INC.

DEFENDANTS
THE SPORTS AUTHORITY, INC.

FILED
08 DEC -1 PM 1:28
CLERK, U.S. DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
BY: DEPUTY

(b) County of Residence of First Listed Plaintiff San Diego
(EXCEPT IN U.S. PLAINTIFF CASES)

County of Residence of First Listed Defendant Arapahoe, Colorado
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED.

(c) Attorney's (Firm Name, Address, and Telephone Number)
Anthony J. Dain
Richard E. Campbell
Procopio, Cory, Hargreaves & Savitch LLP
530 B Street, Suite 2100
San Diego CA 92101 - (619) 238-1900

Attorneys (If Known)

'08 CV 2216 JM JMA

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

	PTF	DEF		PTF	DEF
Citizen of This State	☒ 1	☐ 1	Incorporated *or* Principal Place of Business In This State	☒ 4	☐ 4
Citizen of Another State	☒ 2	☐ 2	Incorporated *and* Principal Place of Business In Another State	☒ 5	☐ 5
Citizen or Subject of a Foreign Country	☐ 3	☐ 3	Foreign Nation	☐ 6	☐ 6

IV. NATURE OF SUIT (Place an "X" in One Box Only)

CONTRACT
- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans)
- ☐ 153 Recovery of Overpayment of Veteran's Benefits
- ☐ 160 Stockholders' Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability
- ☐ 196 Franchise

REAL PROPERTY
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

TORTS

PERSONAL INJURY
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers' Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury

PERSONAL INJURY
- ☐ 362 Personal Injury—Med. Malpractice
- ☐ 365 Personal Injury — Product Liability
- ☐ 368 Asbestos Personal Injury Product Liability

PERSONAL PROPERTY
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

CIVIL RIGHTS
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/ Accommodations
- ☐ 444 Welfare
- ☐ 445 Amer. w/Disabilities - Employment
- ☐ 446 Amer. w/Disabilities – Other
- ☐ 440 Other Civil Rights

PRISONER PETITIONS
- ☐ 510 Motions to Vacate Sentence

Habeas Corpus:
- ☐ 530 General
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

FORFEITURE/PENALTY
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 R.R. & Truck
- ☐ 650 Airline Regs.
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

LABOR
- ☐ 710 Fair Labor Standards Act
- ☐ 720 Labor/Mgmt. Relations
- ☐ 730 Labor/Mgmt.Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Empl. Ret. Inc. Security Act

IMMIGRATION
- ☐ 462 Naturalization Application
- ☐ 463 Habeas Corpus – Alien Detainee
- ☐ 465 Other Immigration Actions

BANKRUPTCY
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

PROPERTY RIGHTS
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

SOCIAL SECURITY
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

FEDERAL TAX SUITS
- ☐ 870 Taxes (U.S. Plaintiff or Defendant)
- ☐ 871 IRS—Third Party 26 USC 7609

OTHER STATUTES
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 480 Consumer Credit
- ☐ 490 Cable/Sat TV
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 USC 3410
- ☐ 890 Other Statutory Actions
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes

V. ORIGIN (Place an "X" in One Box Only)
☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

VI. CAUSE OF ACTION
Cite the U.S. Civil Statute under which you are filing **(Do not cite jurisdictional statutes unless diversity):**
35 U.S.C. Sections 101 et seq.
Brief description of cause:
Patent Infringement

VII. REQUESTED IN COMPLAINT: ☐ CHECK IF THIS IS A **CLASS ACTION** UNDER F.R.C.P. 23 **DEMAND $**
CHECK YES only if demanded in complaint: **JURY DEMAND:** ☒ Yes ☐ No

VIII. RELATED CASE(S) IF ANY (See instructions): JUDGE _____ DOCKET NUMBER _____

DATE 12/1/08
SIGNATURE OF ATTORNEY OF RECORD

FOR OFFICE USE ONLY
RECEIPT # 157490 AMOUNT $350 APPLYING IFP _____ JUDGE _____ MAG. JUDGE _____
MB 12/01/08

UNITED STATES
DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
SAN DIEGO DIVISION

 # 157490 - MB

December 01, 2008
16:30:49

Civ Fil Non-Pris
USAO #.: 08CV2216 CIVIL FILING
Judge..: JEFFREY T MILLER
Amount.: $350.00 CK
Check#.: 879

Photocopies
USAO #.: COPIES
Qty....: 6 @ $0.50
Amount.: $3.00 CK
Check#.: 879

Total-> $353.00

FROM: HOIST FITNESS SYSTEMS INC VS
THE SPORTS AUTHORITY INC