This invention is an exercise apparatus that relates to the field of exercise. The apparatus is easily attached to an exercise bench and eliminates the need to have an exercise partner present when attempting to maximize the resistance of medicine ball crunches on a declined exercise bench. The apparatus contains a circular frame with a flexible, resilient mat in the center that is being held in place with helically wound coil springs. Such frame is connected to an exterior frame with two arms, left and right that extend outward and then smoothly curve downward towards a mutual base. Each arm on the external frame has a rotation point and the right arm contains an angle adjustment device. The apparatus contains three adjustable height levels as well as an impact support bracket.
BENCH ATTACHMENT INTENDED TO ELIMINATE THE NEED FOR A PARTNER WHILE PERFORMING MEDICINE BALL CRUNCHES ON A DECLINED EXERCISE BENCH

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The current invention relates to the field of exercise. It is an apparatus in which the exerciser securely fastens it to a declined exercise bench to perform medicine (weighted) ball crunches without a partner. The invention uses a flexible, resilient mat and coil springs similar to those used in trampolines. Together the mat and springs create a rebound, thus, returning the medicine ball to the exerciser when tossed into the mat. The invention eliminates the need for an exercise partner when attempting to maximize the resistance of a given medicine ball while performing medicine ball crunches on a declined exercise bench. It provides the maximum amount of resistance in the lower portion of the rectus abdominis during each repetition performed. Exercising the lower portion of the abdominal muscles is the primary application of this invention.

[0003] 2. Description of Related Art

[0004] There are currently no other inventions that have implemented the use of a flexible, resilient mat and springs similar to those found in trampolines to create a bench attachment geared towards exercising the abdominal region. Further, there are currently no inventions that connect to an exercise bench and assist the exerciser with additional resistance while working with a medicine ball. Traditionally, an exerciser who wishes to maximize the resistance of the medicine ball being used while performing declined crunches, thus targeting the lower region of the rectus abdominis optimally, would do so with a workout partner.

[0005] The exerciser would start in a seated upright position, perform the crunch with the selected medicine ball and return to the original seated upright position as one repetition. However, the exerciser would throw the medicine ball to the partner who is standing at the exerciser’s feet. The partner then quickly returns the ball to the exerciser with a throw, serving as a rebounder. The initial throwing of the ball to the partner allows the exerciser to reach the original starting position where the next repetition will begin. The throwing of the ball to the exerciser creates additional resistance rather than simply returning to a supine position midway with the ball.

[0006] Stearns (U.S. Pat. No. 5,094,449) discusses the different types of abdominal exercises. In his application, Stearns reports three distinct types of abdominal movement. Most notably the “crunch,” which consists of a back and forth motion of the upper torso while the user is seated in an upright position; the “sway,” which consists of the user lifting a selected weight while moving the upper torso from side to side, either in a seated upright or standing position; and the “twist,” which requires the user to twist the torso in order to lift the weights and exercise the outer abdominal region.

[0007] Each method described by Stearns targets a specific region of the abdominals. The crunch method is used when targeting the upper, inner and outer regions of the rectus abdominis, thus, the lower portion of the abdominal region is targeted minimally. However, when performed on a declined bench the crunch method effectively exercises the lower portion of the rectus abdominis.

[0008] Durfee (U.S. Pat. No. 6,896,643 B2) discusses the trend within the United States and the dollar amount spent on the desire to obtain a toned midsection. Durfee claims that the U.S. alone spends hundreds of millions of dollars on home exercise equipment, and that number is much larger when including commercial health and fitness club equipment.

[0009] VanDerHoeven (U.S. Pat. No. 4,848,740) discusses the issues with regular sit-ups. Discussed are the countless number of hours and repetitions required to successfully obtain a toned abdominal musculature from simply performing sit-ups alone. VanDerHoeven claims they are ineffectual when used alone because they only exercise a portion of the abdominal region and it requires a lot of time and dedication to obtain results.

[0010] James (U.S. patent application Ser. No. 10/822,531) discusses the resilient type of mat that is used in the apparatus, similar to those found in trampolines. The primary purpose of such mats is to create a bounce when a given object with a given force comes into contact with the mat. Traditionally the mats used in trampolines are used to jump during athletic training. James notes that the mats that are used in trampolines are “usually constructed as a single piece.” Further, the “mats are constructed from polypropylene” due to its strength, all the while remaining lightweight. Such mats are connected to a frame using a plurality of coil springs.

[0011] McNeil (U.S. Pat. No. 3,948,515) delves into the proper shape of such mats in order to properly balance the tension throughout. A rectangular shaped trampoline mat, according to McNeil, creates an unequal distribution of tension due to the mat’s periphery. Such mats should be round in shape.

[0012] According to Eriksson (U.S. Pat. No. 3,767,192) trampolines are comprised of a mat that is attached “resiliently to a horizontal frame.” The aforementioned mats are made of canvas, rubberized fabric, plastic cloth or some other type of resilient material that may provide the needed bounce effect. Further, Eriksson notes that circular frames are optimal for an equal distribution of weight upon the mat. With circular frames the usable mat space is increased with the same amount of material that would have been used in a rectangular frame.

[0013] According to Hslng (U.S. Pat. No. 5,545,110) there are two different ways of connecting mats, or jumping beds as Hslng refers to them, to their frames. The first way is one in which the mat is connected to the frame using a series of springs, similar to the way described by James (U.S. patent application Ser. No. 10/822,531). The second way consists of using an elastic cord to securely fasten the mat, or jumping bed, to the frame. Such devices include a number of channels along the periphery of the mat, or bed, in which the springs are connected to the frame, using a series of holes along the frame of the trampoline.

[0014] Schulze, Jr. (U.S. Pat. No. 4,452,444) claimed exercisers in which the primary goal is to obtain a rebound are generally constructed of a mat that is made of “flexible, resilient webbing, which is secured by a tubular frame by a means of a plurality of coil springs.” Such springs are similar to those discussed by James (U.S. patent application Ser. No. 10/822,531) and Hslng (U.S. Pat. No. 5,545,110).

[0015] Shulze, Jr.’s invention in U.S. Pat. No. 4,452,444 implements the use of a wear bushing. Such implementation proves useful when looking to securely fasten the aforementioned coil springs to the frame and mat without significantly reducing either the frame or mat’s life span. The wear bush-
ings serve as protective devices. Thus, they increase the durability and prolong the integrity of both the frame and mat where the coil springs are connected. Wear bushings are cylindrical in shape and are inserted through apertures that are created in the frame or otherwise.

[0016] Nissen et al. (U.S. Pat. No. 4,162,063) discussed the type of springs that are used in trampolines, or flexible, resilient mats consisting of webbing as noted by Schultz, Jr. (U.S. Pat. No. 4,452,444). Each contain “extensible metal springs having integrally formed hooks at their ends.” Each one is uniform when in an unused state and contains “helically wound” coils that are stacked upon one another. This type of coil spring is most commonly used in such devices.

[0017] The abdominal muscles as a whole are essential to an individual’s core strength and one’s overall health. Athletes and non-athletes alike must build a strong core in order to endure rigorous workouts involving weight training or to simply maintain good health. The current invention promotes weight loss, thus, improving the user’s overall health and well-being.

[0018] Sebastian (U.S. Pat. No. 8,118,720) discusses the importance of strong abdominals and their direct affect on an individual’s “core.” Furthermore, he dissect the term “abdominals” and concludes the term references many different muscle groups including the obliques internus, transversus abdominis, the rectus abdominis, and the pyramidalis muscle. This invention focuses on targeting the lower regions of the rectus abdominis, although the upper regions, the pyramidalis muscle and the obliques internus are worked secondarily.

[0019] The current invention’s novelty is brought about by the nature of the apparatus: a flexible, resilient mat suspended to a vertical frame using a plurality of coiled springs that is easily fastened to an exercise bench, containing an angle adjustment device and 3 height levels to exercise the abdominal muscles.

**BRIEF SUMMARY OF THE INVENTION**

[0020] The current invention allows an exerciser to take full advantage of performing medicine ball crunches on a declined exercise bench while maximizing the ball’s resistance without having an exercise partner present. The invention is a flexible, resilient mat suspended to a vertical frame using a plurality of coiled springs. The height of the mat may be adjusted to one of three levels with the use of pins. The angle at which the mat is facing may be adjusted to one of three levels via an angle adjustment device on the apparatus’ frame. The invention is easily fastened to an exercise bench with grooved hand screws.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING**

[0021] FIG. 1 shows a prior art image of a cylindrical hollow frame connected to mat with coil springs.

[0022] FIG. 2 shows a prior art image of the coil spring and wear bushing.

[0023] FIG. 3 shows a front view of the entire apparatus.

[0024] FIG. 4 shows a front view of the apparatus with height levels in an extended position.

[0025] FIG. 5 shows a front view of the height levels in a recessed position.

[0026] FIG. 6 shows a front view of the left arm of the exterior mat frame with rotation point.

[0027] FIG. 7 shows a front view of the right arm of the exterior mat frame with angle adjustment device and rotation point.

[0028] FIG. 8 shows the hand screw used to secure the apparatus to the exercise bench.

[0029] FIG. 9 shows a front view where the apparatus gets securely fastened to the exercise bench at its base.

[0030] FIG. 10 shows the height level adjustment pin used to securely lock each adjusted height level.

[0031] FIG. 11 shows a right side view the apparatus with the impact support and stability bracket on the base.

[0032] FIG. 12 shows a front and side view of the flat bracket and its connector to securely attach from the interior frame to the exterior frame arm.

**DETAILED DESCRIPTION OF THE INVENTION**

[0033] The current invention is composed of a circular frame with a flexible, resilient mat in the center that is held in place with helically wound coil springs. Such frame is connected to an exterior frame with two arms, one on each side, left and right, that extend outward and then smoothly curve downward towards a mutual base. The left arm of the exterior frame contains a rotation point before it begins to curve downward towards the base. The right arm has a rotation point but it also contains the apparatus’ angle adjustment device.

[0034] The angle adjustment device is an angled, spring-loaded tab with a pin that is lifted and dropped when pressed and un-pressed, respectively. Said pin enters strategically placed holes on the exterior frame’s right arm, just beyond the rotation point, thus, securely locking the apparatus at the desired angle chosen by the exerciser. The rotation points are made of ball bearings that are placed within the exterior frame’s arms.

[0035] The exterior frame is permanently attached to the third and highest of a series of three adjustable height levels. The third level, when recessed, recesses into the second level. The second level follows this pattern and recesses into the first level. The first level is the base of the apparatus, which is not to be confused with the base of the aforementioned exterior frame base. The first height level contains a storage unit for a second height adjustment pin on the right side. Each height level is securely locked into place using a height adjustment pin.

[0036] Below the first and lowest height level there are two downward facing flat sheets of metal, one on either side, left and right, with two grooved holes. Said grooved holes are alongside one another and have enough space in between one another to fit the tip of one hand screw at the head of the other without getting in the way of one another. Said sheets are placed around the location of an exercise bench in which the user intends to securely fasten the apparatus. Hand screws with the bottom ⅛ are grooved and used to tighten the apparatus around said bench.

[0037] The rear of the first height adjustment level contains a permanently attached impact support and stability bracket to assist the apparatus in withstanding the impact of the given medicine ball being used by the exerciser. The support bracket protrudes outward and downward, simultaneously, connecting to two more sheets, which are fastened around the bench in the same manner as the first two for the base but using only one grooved hand screw.

[0038] The apparatus can handle up to a 6 lb medicine ball. Any ball with a weight above 6 lbs risks compromising the
integrity of the apparatus. Further, the mat is to be sized to accommodate up to a 6 lb medicine ball.

Composition/Manufacture

The current invention features a hollow, circular steel frame (FIG. 3, “1”) with a plurality of holes throughout the rear side of the frame. Such channels are for the secure placement of helically wound coil springs (FIG. 2), which are in turn connected to a flexible, resilient mat (FIG. 3, “3”). The helically wound coil springs may be seen in FIG. 2 (and FIG. 3, “2”), a prior art figure, taken from Schulze, Jr., U.S. Pat. No. 4,452,444. Inside each hole on the rear side of the frame is a wear bushing, also found in FIG. 2 and adapted from Schulze, Jr. U.S. Pat. No. 4,452,444. Said bushings are used to help protect and maintain the integrity of the frame, thus, increasing its durability and the longevity of its usage.

The aforementioned mat has a thin round rod that circles the outer portion and said mat is wrapped around the given rod and rod visibility points are strategically placed throughout, aligned with the plurality of holes on the rear side of the frame. Said rod with mat wrapped around it with holes may be seen in FIG. 1, a prior art figure, taken from James, U.S. patent application Ser. No. 10/822,531. The rod is circular and made out of a durable metal that is strong enough to maintain its integrity and allows the mat to achieve the necessary curvature when presented with a given force in order to reciprocate that force and create the rebound effect required by the apparatus.

Outside of the interior circular mat frame is the exterior frame (FIG. 3, “4”). On each side of the exterior frame where the interior frame meets the left and right arms (FIG. 3, “11”) of the exterior frame there is a bracket (FIG. 7, “10”). Said brackets are made of steel and are secured to both frames via weldment. The bracket on the left side of the apparatus simply serves as a bracket to connect the inner frame to the exterior frame. The bracket on the right side serves this purpose as well as houses the apparatus’ angle adjustment device.

Each bracket turns round at the end connecting to the exterior frame in order to successfully connect to said frame. FIG. 12 shows the brackets, both of which are the same. Each bracket is flat where it connects to the interior frame (FIG. 12, “10”) and is permanently connected to and in the center of a rounded cap (FIG. 12, “39”) that is connected to the arm (FIG. 12, “35”), one on each side, of the exterior frame.

The apparatus’ angle adjustment device is composed of a heavy-duty, high impact tab (FIG. 7, “6”), a coil spring (FIG. 7, “9”), a pin (FIG. 7, “7”) and strategically placed holes (FIG. 7, “8”) on the right arm of the exterior frame just beyond the rotation point (FIG. 7, “5”). The coil spring that is used in the angle adjustment device is permanently attached to the bracket housing the device. The tab, which is permanently connected to the pin, is permanently attached to the spring at its base. When in an extended position the spring pushes the tab up at an angle, thus, pushing the pin down and securely locking in the angle chosen by the exerciser (FIG. 7). The pin is up and out of the angle adjustment hole and ready to be adjusted by the exerciser when the tab is pushed down and the spring is in a recessed position (FIG. 7).

On each arm of the exterior frame there is a rotation point. The aforementioned rotation points may be found in FIG. 6, “5” & FIG. 7, “5” on the left and right arms, respectively. Each rotation point is made of a ball bearing that is connected to the inner portion of the exterior frame arm (FIG. 6, “35” ; FIG. 7, “35”) that connects to the inner frame bracket and the outer portion of the exterior frame arm, leading to a mutual base. The rotation point on the right arm (FIG. 7, “5”) is closer to the inner frame bracket (FIG. 7, “10”) than are the angle adjustment device’s strategically placed pinholes (FIG. 7, “8”) on the arm (FIG. 7, “11”) of the exterior frame. Such placement of the rotation point and the angle adjustment pinholes allows the angle chosen by the exerciser to be securely locked into place. The exterior frame is composed of a hollow steel tube that is curved to meet the aforementioned design.

The mutual base that each exterior frame arm curves downward and eventually meets is centrally located and also serves as the third and highest adjustable height level (FIG. 4, “15”). The base of each arm is permanently attached (FIG. 4, “12”) to the third adjustable height level via weldment. Each height adjustment level is composed of a hollow steel box, with each level sized to recess into the preceding level when not in use.

FIG. 4 depicts the aforementioned adjustable height levels in an extended position. Each level is hollow and square and is made of steel. Inside height levels 1 (FIG. 4, “13”) and 2 (FIG. 4, “14”) are inner brackets that serve as stoppers to the following levels, 2 and 3, respectively. FIG. 5 depicts these inner brackets (34) preventing the following height levels from recessing too far into the preceding level in which the stoppers are housed. Around the top edge of each steel height level is a heavy-duty, high-impact plastic guard (FIG. 5, “37”) to guard the exerciser from exposed cut steel. The pinholes (FIG. 5, “17”) on each adjustable height level are exactly the same size and are perfectly aligned when recessed into a previous height level.

Permanently connected to the right side of first height level is the second adjustable height level selector pin holder (FIG. 4, “16”). Said holder has a hole the same size as the those found on each adjustable height level and is used to house the second pin when only the first or second height levels are being used. The pins (FIG. 10) used are identical and are composed of several parts.

Each pin (FIG. 10) has a heavy-duty, high impact plastic handle (FIG. 10, “27”). The stem of each pin is smooth (FIG. 10, “28”) and has a raised bump (FIG. 10, “29”) on complementary sides near the tip. The raised bumps near the tip are to ensure the pin is secure while in an adjustable height level chosen by the exerciser by locking it into the rear.

Connected to the first height level and the functioning base of the apparatus are the apparatus’ bench attachment sheets (FIG. 11, “19”). On each side, left and right, of the base is one sheet that protrudes downward leaving a center space for the bench (FIG. 11, “36”) to rest. Each sheet has two holes (FIG. 11, “20”) on a horizontal axis. Each sheet contains one hole that is smooth and one that is grooved. Each grooved hole is on the complimentary side of each smooth hole. Therefore, one hand screw is inserted into the smooth hole and is screwed into the grooved hole. Each screw tightens the sheets around the portion of the bench they are slipped around, thus, securing the apparatus to the exercise bench. Each sheet is made out of steel and are lined with rubber on the inner sides to provide the apparatus with traction when being secured to an exercise bench. The bottom of the first height level and the base of the apparatus are also lined with rubber to provide the apparatus with traction when secured to an exercise bench.
Protruding in an outward fashion before sloping downward with two more sheets (FIG. 11, “31”) from the rear of the first height level and base (FIG. 11, “33”) of the apparatus is the arm (FIG. 11, “30”) of the impact support and stability brace. The impact support and stability brace sheets (FIG. 11, “31”) consists of one on each side, similar to the base sheets. However, said sheets only contain one hole each. One sheet has a grooved hole and the other a smooth hole. The sheets are lined with rubber to add traction while securing it to the bench in the same fashion as the base sheets.

Each hand screw (FIG. 8, “22”) is composed of a heavy-duty, high impact plastic handle (FIG. 8, “23”), a heavy-duty, high impact plastic spacer (FIG. 8, “38”) located just beneath and connected to the handle, and a stem that is smooth (FIG. 8, “24”) towards the handle and grooved (FIG. 8, “25”) toward the tip. The hand screws are to be used to secure the apparatus to an exercise bench via the aforementioned attachment securement sheets on both the base (FIG. 11, “19”) of the apparatus as well as those on the impact support and stability bracket (FIG. 11, “31”).

Usage

Setting up the apparatus is very simple and using it is even simpler. It is very user-friendly in that there are not too many steps to take before it may be used in a safe and proper manner. Upon taking the apparatus out of its packaging, the exerciser will be presented with the apparatus, which contains the mat and frame connected by coil springs, which is connected to the exterior frame, subsequently connected to the three adjustable height levels and the impact support and stability bracket, all of which are one solid piece and requires no effort from the exerciser.

The exerciser will further be presented with 2 height adjustment pins and 3 grooved hand screws. Next the exerciser needs to take the hand screws and securely fasten the apparatus to the exercise bench. This is achieved by slipping the apparatus’ fastening sheets located on the base and on the impact support and stability bracket over and around the part of the bench it is to be fastened around. The user will then screw 2 hand screws into the base sheets, 1 from the left and 1 from the right, and 1 into the impact support and stability bracket.

One height adjustment pin is to be used if the exerciser desires the height to be at level 1 or 2 and both are to be used if the exerciser would like the height to be at level 3. If the exerciser chooses to put the height at level 2, the second pin will be inserted into the second height adjustment pin holder on the right side of the first height level. If the exerciser chooses to use the first height level, the pin will simply be placed into the first and lowest pinhole.

Lastly, the exerciser will need to adjust the angle of the mat, if need be. This is accomplished by simply pressing down on a tab on the right exterior frame arm and pushing the interior frame forward or backward till the pin connected to the pressed tab on the angle adjustment device reaches another angle adjustment hole. There are a total of 3 possible angles to choose from.

The exerciser is now able to safely exercise using the apparatus.

Distinguished from Other Inventions

The current invention is different than all others simply because it uses a nontraditional means to achieve an end goal: the use of a flexible, resilient mat to maximize the resistance one feels while performing medicine ball crunches on a declined exercise bench. All other inventions in which a flexible, resilient mat is incorporated and are in the field of exercise are used for jumping, such as trampolines.

1 claim:

1) An exercise apparatus that is comprised of:
   a. a circular frame containing a plurality of holes;
   b. a series of helically wound coil springs with hooked ends;
   c. a flexible, resilient mat;
   d. an exterior frame with two arms that curves outward and downward towards a mutual base;
   e. an angle adjustment device comprising a spring-loaded push tab and a pin;
   f. a ball bearing rotation point on each exterior frame arm;
   g. 3 adjustable height levels, 2 of which are adjustable and lockable via pin insertion as well as recess into previous levels;
   h. 2 height selection pins;
   i. 2 bench securement sheets protruding from the base of the apparatus;
   j. an impact support and stability bracket containing 2 extra bench securement sheets;
   k. 3 hand screws;

2) an exercise apparatus used to target the lower abdominal region when performing medicine ball crunches on a declined exercise bench;

3) An exercise apparatus used to eliminate the need for an exercise partner when performing medicine ball crunches on a declined exercise bench;

4) an exercise apparatus in which an circular interior frame is connected to an exterior frame and, subsequently, connected to a mutual base, thus, connecting it to an impact support and stability bracket.