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Jackson

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[54] **VARIABLE WEIGHT RESISTANCE FOOTBALL TRAINING DEVICE**

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[52] **U.S. Cl.** ..... **273/55 R,** 272/81

[51] **Int. Cl.** **A63b 67/00**

[58] **Field of Search** ..... 273/55 R, 55 A; 272/79, 272/81, 82, 83 R, 80

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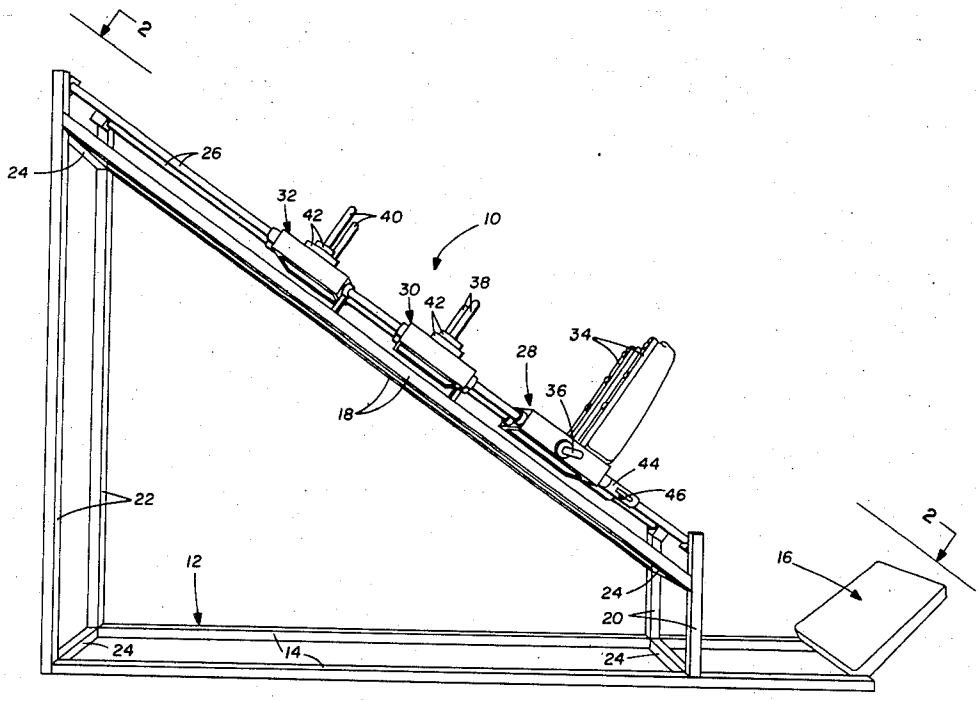
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[57] **ABSTRACT**

An exercise device comprises an inclined guide, a weight member supported for upward movement on the guide, structure responsive to upward movement of the weight member on the guide from a first position to a second position for abruptly increasing the load on the weight member, and structure responsive to movement of the weight member from the second position to a third position for abruptly further increasing the load on the weight member. In accordance with one embodiment of the invention, the load increasing structures comprise additional weight members slidably supported on the guide at the second and third positions. In accordance with another embodiment, the load increasing structures comprise preloaded springs mounted for engagement with the weight member at the second and third positions.

7 Claims, 4 Drawing Figures



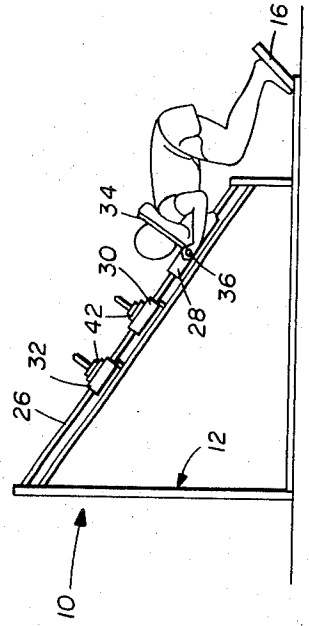
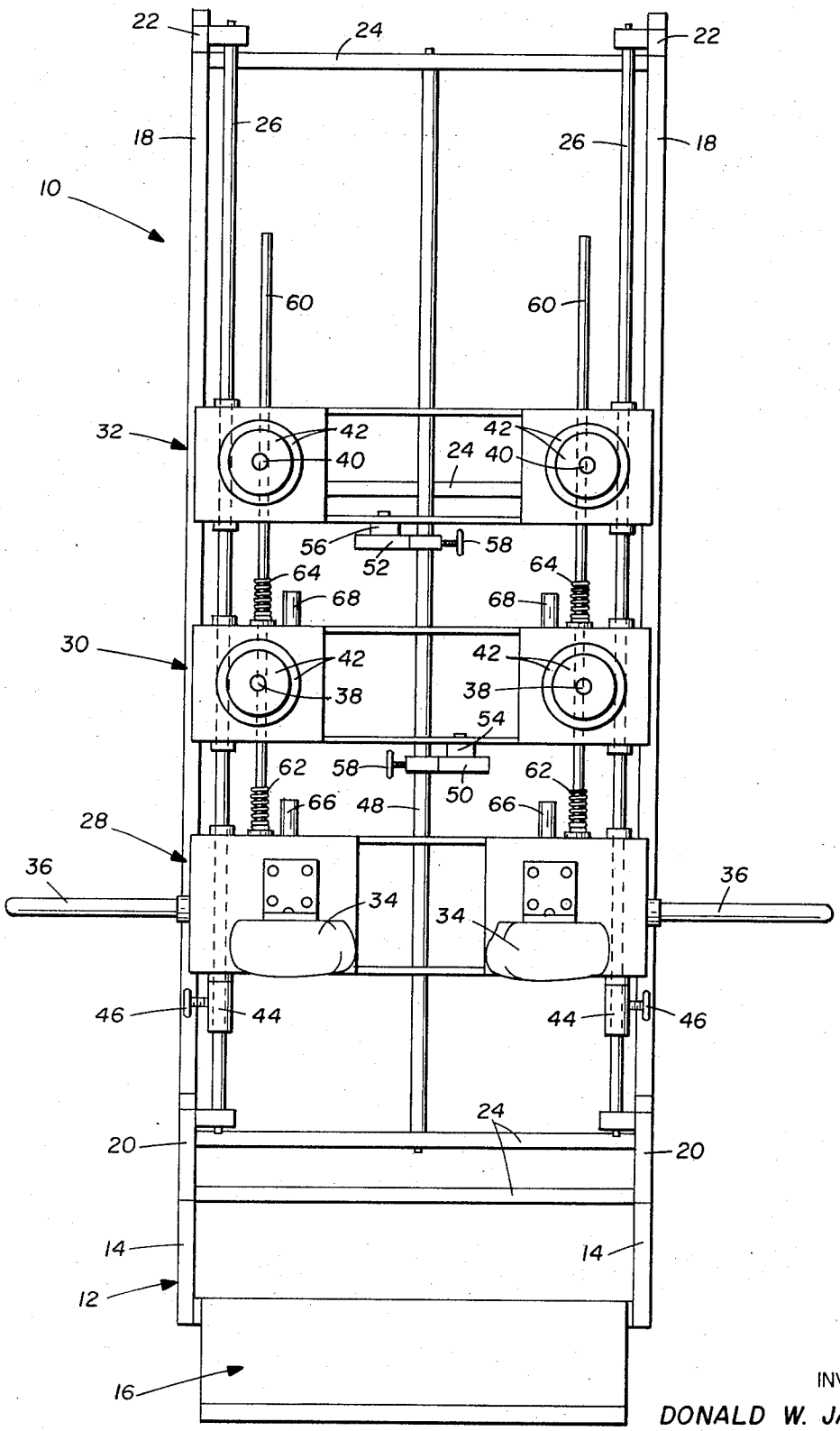


FIG. 3

FIG. 1

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FIG. 2

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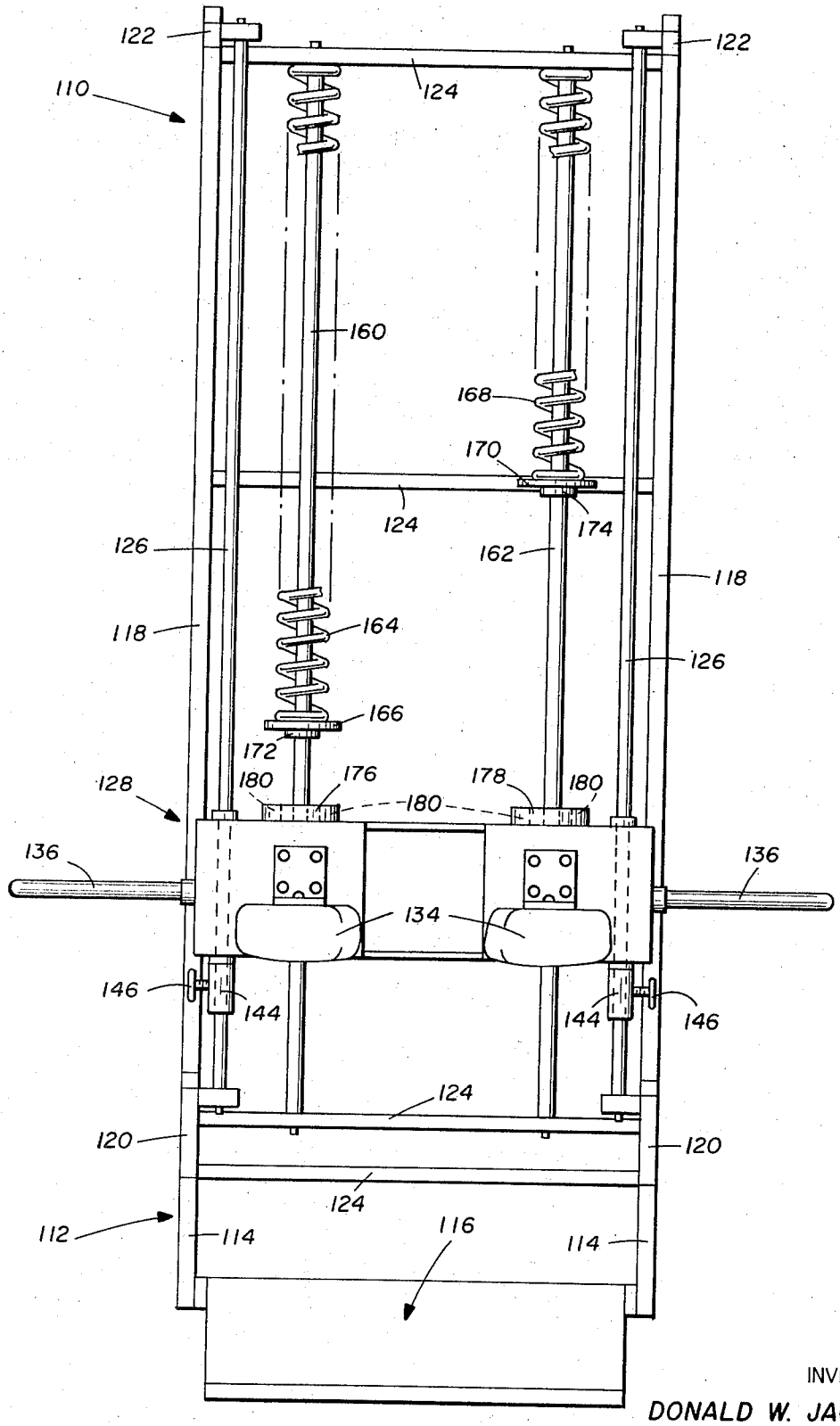


FIG. 4

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VARIABLE WEIGHT RESISTANCE FOOTBALL TRAINING DEVICE

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to an exercise device, and more particularly to an exercise device for teaching and developing the specific physical attributes that are required of offensive linemen in football.

To be successful in the game of football, an athlete must develop the strengths necessary to play his position, confidence in his ability to play his position, sufficient flexibility to permit him to move quickly, and endurance or stamina. In this connection, one of the most difficult positions to teach and learn is that of offensive lineman. This is because the strengths and movements that must be developed in order to properly block an opponent are almost completely foreign to an athlete. Heretofore, blocking skills have been taught with the aid of a variety of devices, including blocking sleds, fixed and movable dummies, and conventional weight lifting apparatus. For various reasons, each of these devices is less than wholly satisfactory insofar as the development of the strength and skills needed by an offensive lineman are concerned.

For example, blocking sleds and dummies are not conveniently used indoors, and are not readily adjusted to the physical limitations of a particular athlete. Furthermore, various athletic conferences, etc., prohibit the use of blocking sleds and dummies before and after spring training. Ordinary weight lifting devices are capable of developing specific muscles but cannot be used to teach the lunging motion that is necessary in blocking. Also, most conventional weight lifting exercises are limited by the relatively weak muscles in the wrists and ankles of an athlete, and therefore do not function to adequately develop the large muscles of the back and thighs which are the principal muscles used in blocking.

The present invention comprises an exercise device which overcomes the foregoing and other disadvantages that are characteristic of the prior art. In accordance with the preferred embodiment of the invention, a weight member is mounted for upward movement on an inclined grade. An athlete assumes a crouching position and then pushes the weight member up the inclined guide with his shoulders. When the weight member has been moved upwardly on the guide a predetermined distance, the resistance to further upward movement of the weight member is abruptly increased. By this means, the athlete develops all of the strengths and skills necessary in properly blocking an opponent.

DESCRIPTION OF THE DRAWINGS

A more complete understanding of the invention may be had by referring to the following Detailed Description when taken in conjunction with the accompanying Drawings, wherein:

FIG. 1 is a perspective view of an exercise device comprising the preferred embodiment of the invention;

FIG. 2 is a top view of the device shown in FIG. 1 taken generally along the line 2—2 of FIG. 1 in the direction of the arrows;

FIG. 3 is an illustration of the use of the invention; and

FIG. 4 is a view similar to FIG. 2 showing an exercise device comprising an alternative embodiment of the invention.

DETAILED DESCRIPTION

Referring now to the Drawings, and particularly to FIG. 1, there is shown an exercise device **10** incorporating the present invention. The exercise device **10** comprises a frame **12** including a pair of bottom rails **14** which support an inclined footrest **16.** A pair of inclined top rails **18** are supported on the bottom rails **14** by a pair of relatively short front rails **20** and a pair of relatively long rear rails **22.** A plurality of cross braces **24** extend horizontally between the various rails comprising the frame **12.**

The frame **12** supports a pair of spaced, parallel guides **26.** Three weight members **28, 30,** and **32** are in turn slidably supported on the guides **26** for upward movement against the action of gravity. The weight member **28** is provided with a pair of padded shoulder contacts **34** and a pair of handholds **36.** The weight members **30** and **32,** on the other hand, are equipped with pairs of posts **38** and **40,** respectively, which receive annular weights **42** of the type commonly used with barbells, and the like.

Referring now to FIG. **2,** the weight member **28** is normally positioned as shown by a pair of stops **44** mounted on the guides **26.** The stops **44** are provided with thumb screws **46,** whereby the normal position of the weight member **28** may be adjusted relative to the frame **12.** A rail **48** extends between the upper cross braces **24** parallel to the upper rails **18,** and is provided with upper and lower laterally projecting stops **50** and **52.** The stops **50** and **52** engage downwardly projecting fingers **54** and **56** on the weight members **30** and **32,** respectively, to limit downward movement of the members **30** and **32** on the guides **26.** Like the stops **44,** the stops **50** and **52** are provided with thumb screws **58** whereby the normal positions of the members **30** and **32** may be adjusted. It will be noted that the finger **54** of the weight member **30** is positioned on the opposite side of the rail **48** from the finger **56** of the weight member **32.** By this means, upward movement of the weight member **30** beyond the stop **52** is permitted.

A pair of rods **60** are secured to the weight member **28** and extend therefrom through the weight members **30** and **32.** A pair of coil springs **62** are mounted on the rods **60** between the weight member **28** and the weight member **30,** and a pair of coil springs **64** are mounted on the rods **60** between the weight members **30** and **32.** Similarly, a pair of bumpers **66** are mounted on the weight member **28** and are positioned between the weight member **28** and the weight member **30,** and a pair of bumpers **68** are mounted on the weight member **30** and are positioned between the weight members **30** and **32.** Thus, when the weight member **28** is moved upwardly the rods **60** slide through the weight members **30** and **32** until the bumpers **66** on the weight member **28** engage the weight member **30,** whereupon the bumpers **64** and the springs **62** cooperate to maintain a predetermined spacing between the weight member **28** and the weight member **30.** Likewise, when the weight members **28** and **30** are thereafter moved upwardly on the guides **26,** the rods **60** slide through the weight member **32** until the bumpers **68** on the weight member **30** engage the weight member **32,** whereupon the bumpers **68** and the springs **64** cooperate to maintain a pre-

determined spacing between the weight member **30** and the weight member **32.**

The use of the exercise device **10** is illustrated in FIG. **3.** An athlete A positions himself in the exercise device **10** by placing his feet on the inclined footrest **16,** placing his shoulders in engagement with the padded shoulder contacts **34,** and gripping the handholds **36** with his hands. Due to the positioning of the footrest **16** on a line with but substantially beneath the lower ends of the guides **26,** the athlete A is necessarily in a crouched position when his feet, shoulders and hands are so arranged.

The athlete A uses the exercise device **10** by pushing the weight member **28** upwardly on the guides **26** with his shoulders. During the initial movement of the weight member **28,** the only force resisting upward movement of the weight member **28** on the guides **26** is the weight of the member **28.** However, as soon as the weight member **28** engages the weight member **30,** the force resisting the upward movement of the weight member **28** on the guides **26** is abruptly increased in that the weight of the member **30** and the annular weights **42** thereon is suddenly added to the weight of the member **28.** Similarly, when the weight member **30** subsequently engages the weight member **32,** the force resisting upward movement of the weight member **28** is again abruptly increased in that the weight of the member **32** and the annular weights **42** thereon is suddenly added to the weight of the member **30,** the weights **42** thereon and the weight of the member **28.** Thus, in moving the weight member **28** upwardly on the guides **26,** the athlete A experiences three distinct loading conditions, i.e., the load imposed by the weight of the member **28** alone, the load imposed by the weight of the member **28** plus the weight of the member **30** and the weights **42** thereon, and the load imposed by the weight of the member **28** plus the weight of the weight member **30** and the weights **42** thereon plus the weight of the member **32** and the weights **42** thereon.

One of the most important features of the present invention comprises the spatial relationship between the various component parts of the exercise device **10.** As has been indicated, the footrest **16,** the padded shoulder contacts **34** and the handholds **36** are so arranged that an athlete using the exercise device **10** is initially in a crouching position, i.e. the position of a football lineman at the start of his charge. Because of this arrangement and the inclination of the guides **26,** movement of the weight member **28** upwardly along the parallel guides **26** requires the same lunging motion that a lineman employs in blocking an opponent. The weight member **30** is positioned on the parallel guides **26** at a point corresponding to the point of contact between a lineman and an opponent. Thus, the use of the exercise device **10** develops exactly the same movements and strengths that are required in playing the position of lineman in the game of football.

As opposed to the position of the weight member **30,** the position of the weight member **32** on the guides **26** does not correspond to a point of contact. Instead, the weight member **32** is employed to teach an athlete to make a complete follow through when blocking an opponent. Thus, in using the exercise device **10,** an athlete first moves the weight member **28** into engagement with the weight member **30,** and then moves the weight members **28** and **30** into engagement with the weight member **32.** By this means, the concept of blocking through an opponent is instilled in the athlete.

It will be appreciated that the use of the exercise device **10** is not limited by the strength of the relatively weak muscles of the ankles and wrists of an athlete, but instead depends almost entirely on the strength of the relatively large muscles in the back and thighs of the athlete. It is well established that the strength available from the back and thigh muscles is minimum when an athlete is in a crouching position and that the strength available from these muscles increases progressively as the athlete moves from a crouching position to a fully extended position. This fact establishes a second basic reason for the progressive loading characteristics of the exercise device **10,** i.e., as the strength available from the large muscles in the back and thighs increases, the load imposed on an athlete using the exercise device **10** is correspondingly increased so that the strengths necessary in blocking an opponent are fully developed.

Those skilled in the art will realize that the exercise device **10** can be loaded in different ways in accordance with the needs of particular athletes. Experience has shown that excellent overall training for football linemen is achieved when the weight members **28, 30,** and **32** of the exercise device **10** are arranged to apply loads of ten pounds, thirty pounds, and ten pounds, respectively. On the other hand, either maximum quickness or maximum strength can be developed by arranging the weight members **28, 30,** and **32** to apply lesser or greater loads.

Referring now to FIG. **4,** there is shown an exercise device **110** comprising a second embodiment of the invention. The exercise device **110** includes a frame **112** which is constructed substantially identically to the frame **12** of the exercise device **10** shown in FIGS. **1** and **2.** In particular, the frame **112** includes a pair of bottom rails **114** which support an inclined footrest **116,** and a plurality of cross braces **124,** only two of which are shown.

The frame **112** of the exercise device **110** supports a pair of inclined guides **126** which extend at substantially the same angle as the guides **26** of the frame **10.** A weight member **128** is slidably supported on the inclined guides **126,** and is provided with a pair of padded shoulder contacts **134** and a pair of handholds **136.** The weight member **128** is normally positioned as shown in FIG. **4** by a pair of adjustable stops **144.** Stops **144** are provided with thumb screws **146,** whereby the normal position of the weighted member **128** may be adjusted relative to the frame **112.** A pair of rails **160** and **162** are supported by the uppermost cross braces **124** of the frame **112** and extend substantially parallel to the guides **126.** The rail **160** supports a coil spring **164** which terminates in a plate **166,** and the rail **162** supports a coil spring **168** which terminates in a plate **170.** The springs **164** and **168** are normally preloaded against a pair of stops **172** and **174** mounted on the rails **160** and **162,** respectively. A pair of spring engaging fingers **176** and **178** project downwardly from the weight member **128** and are provided with downwardly projecting bifurcations **180** having sufficient spacing to clear the stops **172** and **174.**

The exercise device **110** shown in FIG. **4** is used similarly to the exercise device shown in FIGS. **1, 2,** and **3.** An athlete places his feet on the inclined footrest **116,** places his shoulders against the padded shoulder contacts **134,** and grips the handholds **136** with his

hands. Thereafter the athlete pushes the weight member **128** upwardly on the guides **126** with his shoulders.

Initially, the only force resisting upward movement of the weight member **28** comprises the weight of the member **128.** However, as soon as the finger **176** on the weight member **128** engages the plate **166** on the spring **164,** the force resisting upward movement of the weight member **128** on the guides **126** is abruptly increased in that the preloaded force of the spring **164** is suddenly added to the weight of the member **128.** Similarly, when the finger **176** subsequently engages the plate **170** on the spring **168,** the force resisting upward movement of the weight member **128** on the guides **126** is once again abruptly increased in that the preloaded force of the spring **168** is suddenly added to the force of the spring **164** and the weight of the member **128.** Thus, an athlete using the exercise device **110** experiences three distinct loading conditions in moving the weight member **128** up the guides **126,** i.e., the load imposed by the weight of the member **128** alone, the load imposed by the weight of the member **128** plus the force due to the spring **164** and the load imposed by the weight of the member **128** plus the force due to the spring **164** plus the force due to the spring **168.** By this means, the exercise device **110** operates substantially identically to the exercise device **10** to develop the specific strengths and skills needed by a football lineman.

From the foregoing, it will be understood that the present invention comprises an exercise device which is easily constructed from readily available materials and which functions to improve the specific strengths and skills that are required of an offensive lineman. More particularly, the present invention is particularly advantageous in developing the large muscles of the back and thighs that are used by linemen to block an opponent, in developing the lunging motion that is employed by a lineman, and in teaching the complete follow through that is necessary in blocking. The use of the invention is further advantageous in that the development of the large muscles in the back and thighs is not limited by the strength of the muscles in the wrists and ankles, in that an exercise device incorporating the invention is conveniently used indoors, and in that the use of exercise devices incorporating the invention is not prohibited by the rules of any athletic conference.

Although particular embodiments of the invention have been illustrated in the Drawings and described in the foregoing specification, it will be understood that the present invention is not limited to the embodiments disclosed, but is capable of rearrangement, modification and substitution of parts and elements without departing from the spirit of the invention.

What is claimed is:

1. An exercise device comprising:

a base member having a guide, said guide being upwardly inclined relative to said base member;

a first member slidably supported on the guide for movement from a normal position upwardly along a predetermined path under direct muscular action of a user and against the action of gravity, said member presenting sufficient resistance to sliding movement to tax the muscles of the user;

means responsive to movement of the first member through first and second predetermined distances upwardly along the path for abruptly applying additional forces to the member which further oppose movement of the member upwardly along the path, said additional force applying means comprising:

a second member supported on the guide in the path of the first member for engagement by the first member upon movement thereof through the first predetermined distance and thereafter for movement with the first member upwardly along the guide; and

a third member supported on the guide for engagement by the second member only after movement of the first and second members through the second predetermined distance and thereafter for movement with the first and second members upwardly along the guide.

2. An exercise device comprising:

a frame including an upwardly inclined guide;

a first member slidably supported on the guide for upward movement from a first position;

a second member slidably supported at a second position on the guide a predetermined distance from said first member for engagement by the first member and thereafter for upward movement with the first member from the second position, whereby the resistance to upward movement of the member under direct muscular action of a user on the guide is abruptly increased, presenting sufficient resistance to sliding movement to tax the muscles of the user a predetermined distance from said first and second members; and

a third member slidably supported a predetermined distance from said first and second members on the guide for engagement by the second member only after movement of the first and second members from the second position to a third position, and thereafter for upward movement on the guide with the first and second members, whereby the resistance to upward movement of the member on the guide is again abruptly increased.

3. The exercise device according to claim **2** wherein the first member includes padded shoulder contacts and handholds, and wherein the second and third members include weight receiving means whereby the resistance to the upward movement of the first member on the guide may be varied.

4. The exercise device according to claim **3** wherein the frame further includes an inclined footrest positioned beneath and substantially in alignment with the guide.

5. An exercise device comprising:

a frame including an upwardly inclined guide defining a predetermined path;

a first member having a predetermined weight and being supported for sliding movement on the guide from a first position along the predetermined path under direct muscular action of a user, said first member having sufficient resistance to sliding movement to tax the muscles of the user;

a second member having a predetermined weight and being supported for engagement by the first member only after substantial movement thereof along the predetermined path and thereafter for movement with the first member along the predetermined path whereby the force resisting movement of the first member along the path is abruptly increased;

a third member having a predetermined weight and being supported for engagement by the second member only after substantial movement thereof

along the predetermined path and thereafter for movement with the first and second members along the predetermined path whereby the force resisting movement of the first member along the path is further abruptly increased; and

said second and third members each further including means for retaining thereon additional weights.

6. The exercise device according to claim **5** wherein the first, second, and third members are urged to move downwardly on the guide by the action of gravity, and further including means for normally positioning the first member at the first position on the guide and for normally positioning the second member at a second position on the guide which is spaced from the first position and for normally positioning the third member at a third position on the guide which is spaced from the second position.

7. The exercise device according to claim **6** further including a footrest positioned beneath and substantially in alignment with the guide and wherein the first member further includes shoulder contacts and handholds.

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