

[54] JUMP MEASURING DEVICE

[76] Inventor: Edward Kropelnitski, 5409 Perry Rd., Grand Blanc, Mich. 48439

[22] Filed: June 23, 1972

[21] Appl. No.: 265,636

[52] U.S. Cl. 272/59 C, 273/1.5 A

[51] Int. Cl. A63b 69/00

[58] Field of Search 273/1.5 R, 1.5 A, 102.2 R, 273/1 E; 272/59 C, 62

[56] References Cited

UNITED STATES PATENTS

3,258,266	6/1966	Kamish	272/59 C X
3,294,400	12/1966	Goldstein	272/59 C X
3,128,037	4/1964	La Rocca	273/102.2 R
2,299,798	10/1942	Colson et al.	272/62 X
3,649,010	3/1972	Jeffrey	273/1 E
3,158,370	11/1964	Pearson, Jr.	273/1 E
3,637,204	1/1972	Dawson	272/59 C
3,302,214	2/1967	Yuritch	273/102.2 R X
799,697	9/1905	Webb et al.	273/102.2 R
2,916,287	12/1959	Davey	273/102.2 R X
2,645,491	7/1953	Volman	273/102.2 R

Primary Examiner—Anton O. Oechsle

Assistant Examiner—Paul E. Shapiro

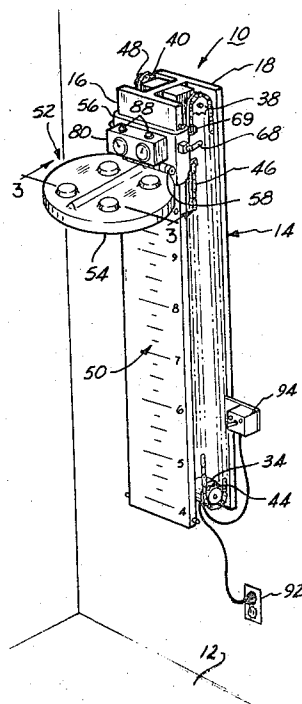
Attorney, Agent, or Firm—Weiner, Basile and Weintraub

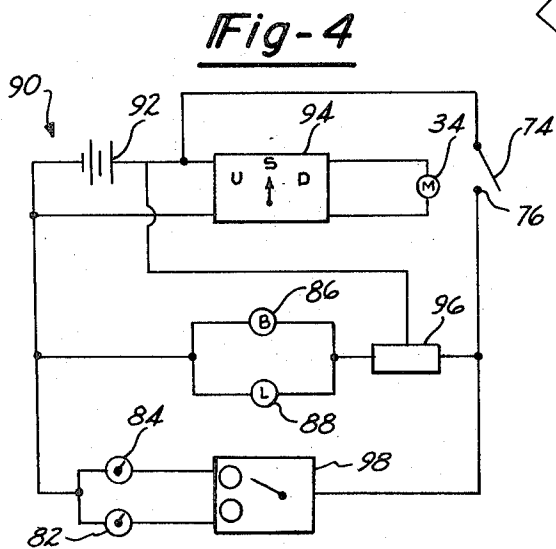
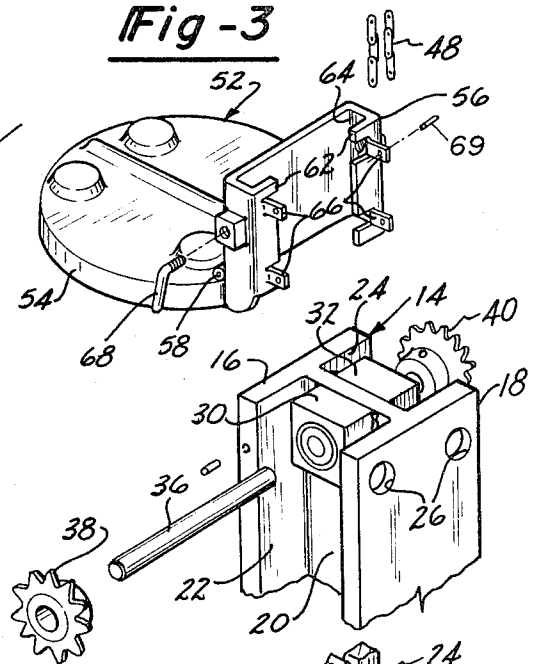
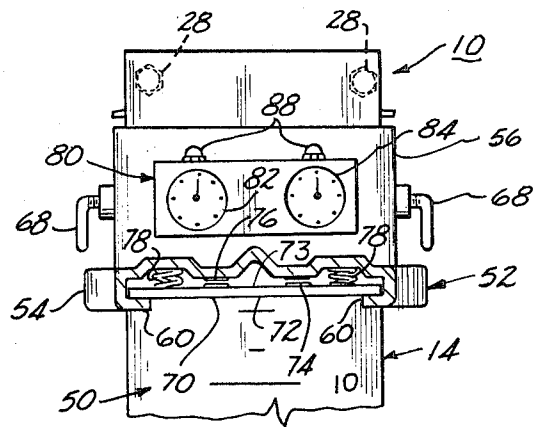
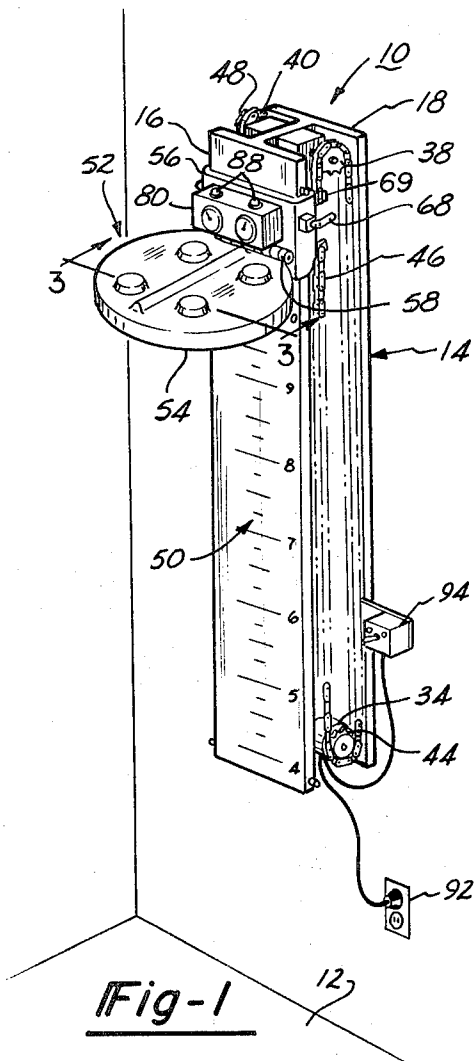
[57]

ABSTRACT

A device for measuring the vertical distance jumped by an athlete and having means, such as a buzzer and lights, for indicating that the athlete has jumped a pre-selected vertical distance. In one embodiment of the invention a wall mounted support carries a horizontally disposed target vertically movable with respect to the support by an electro-mechanical drive. In a second embodiment the target support is telescopically carried by a floor standard. The horizontally disposed target is pivotally attached to a vertical support in such a manner that the target is pivoted upwardly if the target is contacted by an athlete with more force than is necessary to actuate the indicating means. The target will return to its initial horizontal position after contact by the athlete.

10 Claims, 6 Drawing Figures





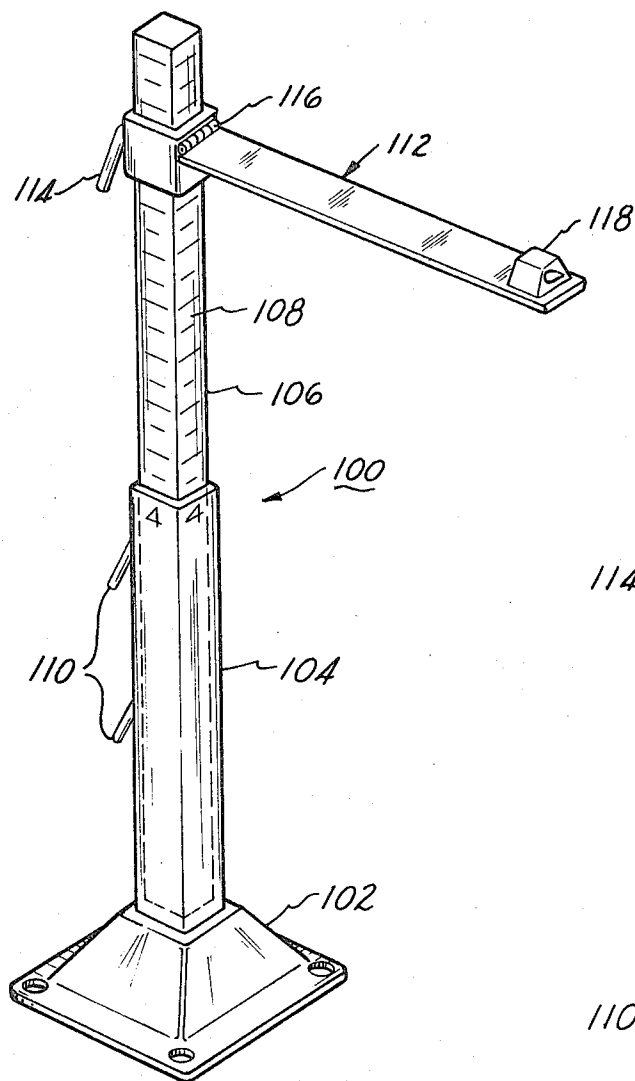


Fig-5

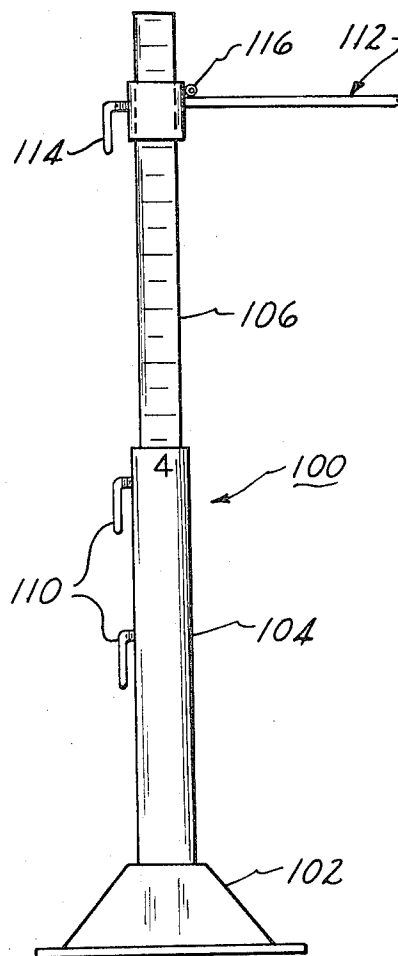


Fig-6

JUMP MEASURING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a device for measuring the vertical distance jumped by an athlete and, in particular, the present invention relates to jump measuring devices having audio and visual means for indicating that the athlete has jumped a pre-selected vertical distance.

2. Description of the Prior Art

Heretofore, it has been suggested that the ability of an athlete to jump vertically from either a running or standing position can be improved by practice and by periodically measuring and recording the individual athlete's jumping ability, he can be stimulated to practice and thus improve his jumping skill. An apparatus and method of measuring the vertical distance jumped by an athlete is disclosed in U. S. Pat. No. 3,258,266 and such an apparatus and method is designed specifically to improve the jumping skill of an athlete. Although the apparatus disclosed in the aforementioned Letters Patent functions to accomplish the desired result of improving the athlete's jumping skill, the apparatus is deficient in several aspects which are now provided by the present invention.

SUMMARY OF THE INVENTION

The present invention, which will be subsequently described in greater detail hereinafter, comprises a device for measuring the vertical distance jumped by an athlete including means carried by the device for giving an audible and visual indication that the athlete has jumped a pre-selected vertical distance above the floor.

It is therefore an object of the present invention to provide a new and improved jump measuring device.

It is also an object of the present invention to provide a jump measuring device and a means for quickly and accurately adjusting the distance that the athlete is to jump, and one which is so designed as not to cause injury to the fingers of the jumping athlete or result in damage to the device as a result of being contacted by the athlete.

Other objects, advantages, and applications of the present invention will become apparent to those skilled in the art of jump measuring devices when the accompanying description of several modes of the present invention is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like components throughout the several views, and in which:

FIG. 1 is a perspective view of one example of a jump measuring device incorporating the principles of the present invention;

FIG. 2 is a fragmentary, exploded perspective view of the jump measuring device illustrated in FIG. 1;

FIG. 3 is a fragmentary front elevational view of the jump measuring device illustrated in FIG. 1;

FIG. 4 is an example in schematic form of a preferred electrical circuit incorporating the principles of the present invention and embodiment in the jump measuring device illustrated in FIG. 1;

FIG. 5 is a perspective view of another example of a jump measuring device incorporating the principles of the present invention; and

FIG. 6 is a side elevational view of the jump measuring device illustrated in FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, and, in particular, to FIGS. 1, 2 and 3 wherein there is illustrated one embodiment of the invention in the form of a jump measuring device 10 adapted to indicate whether an athlete can jump a pre-selected vertical distance above a floor 12. The jump measuring device 10 comprises an I-shaped vertical support 14 consisting of an outer wall 16 and an inner wall 18 connected by a central partition 20 which divides the opposite sides of the support 14 into U-shaped channels 22 and 24. The inner wall 18 has a plurality of bores 26 (FIG. 2) through which mounting screws 28 (FIG. 3) extend for attachment of the jump measuring device 10 to a wall such that the support 14 is disposed in a vertical position as illustrated in FIG. 1. Bearing blocks 30 and 32 are respectively fixedly attached to the opposite sides of the partition 20 at the upper extremity of the support 14 by any suitable means, such as by welding, while reversible electric motors 34 (only one is illustrated) are fixedly attached to the opposite sides of the partition 20 at the lower extremity of the support 14. The bearings 30 and 32 rotatably support a common shaft 36 which extends through partition 20 and mounts at its opposite ends driven sprockets 38 and 40 by any suitable means, not shown. Similarly, each motor 34 has a drive shaft 42 which supports a drive sprocket 44 (only one of which is illustrated in FIG. 1). Endless chains 46 and 48 (FIG. 1) are respectively supported in channels 22 and 24 between the drive and driven sprocket and as the electric motors 34 are selectively reversed in direction as will be explained hereinafter, the chains 46 and 48 will be rotated in opposite directions within their respective channels 22 and 24. The exposed face of the outer wall 16 has indicia markings 50 illustrated as foot and inch markings of a vertical ruler having a range from 4 feet to 11 feet with the support 14 being mounted to the wall such that the indicia markings 50 provide a visual indication of the vertical distance from the floor 12 for a purpose to be explained hereinafter.

The jump measuring device further comprises a target 52 consisting of an L-shaped upper member having a round horizontal leg 54 rotatably attached to a vertical leg 56 by a hinge 58 which normally maintains the leg 54 in a horizontal position but permits the same to rotate upwardly in the event the athlete should jump too high and thus functions to prevent both injury to the athlete's finger and damage to the device 10. As can best be seen in FIGS. 2 and 3, the legs 54 and 56 of the target 52 each have a U-shaped cross section with the sides of the legs 54 and 56 being bent inwardly to form, respectively, guide flanges 60 and 62. The guide flanges 62 of the vertical leg 56 form a clearance space 64 which closely fits the thickness of the outer wall 16 of the vertical support 14 such that the target 54 is slidably movable up and down the full length of the support 14. The guide flanges of the flanges 62 of the vertical leg 56 are further formed with outwardly extending tabs 66 which are attached by pins 68 to the ends of the drive chains 46 and 48 and it is thus seen

that when the drive motors 34 are actuated to rotate in a clockwise direction (as viewed in FIG. 2) the drive chains 46 and 48 will raise the target 52, whereas when the drive motors 34 are rotated in an opposite direction, that is, counterclockwise, the drive chains 46 and 48 will lower the target 52. The side walls of the vertical leg 56 are provided with clamping screws 68 which extend therethrough to engage the outer wall 16 of the support 14 to clamp the target at any desired position.

The round guide flange 60 associated with the round horizontal leg 54 support a lower target member 70, the exposed or bottom surface 72 of which is adapted to be struck by the jumping athlete and which lower target member is vertically raised as a result of being struck. As can best be seen in FIG. 3, the upper surface of the lower target member 70 is provided with a plurality of aligned electrical contacts 74 which are adapted to engage vertically aligned electrical contacts 76 carried on the inner surface of the horizontal leg 54 to complete an electrical circuit, all of which will be described hereinafter in greater detail. Disposed between the inner surface of the leg 54 and the upper surface of the lower target member 70 is a plurality of springs 78 which normally biases the lower target member 70 downwardly and prevent any contact between the electrical contacts 74 and 76. It should be noted that the springs 78 are very light compression springs and offer a minimum resistance to the jumping athlete. In addition, the clearance space between the contacts 74 and 76 is extremely small such that an electrical connection will be made by the slightest contact with the lower target member 70 by the jumping athlete. The entire target 52 is preferably fabricated from a non-conduction material, for example plastic, such that the athlete is fully protected against the possibility of an electric shock.

As can best be seen in FIGS. 1 and 3, the vertical leg 56 of the target 52 supports a visual scoring indicator 80 having a pair of dials 82 and 84, each of which is adapted to indicate the number of times an athlete contacts the target 52 when selectively connected to a power source. For example, when the dial 82 is activated, the same will register the number of times each member of a team strikes the target 52 while the other dial 84 can be activated to register the number of times each member of a second team strikes the target 52. The indicator 80 further carries a buzzer 86 (FIG. 4) and a pair of lights 88, both of which are activated to give a visual and audible indication that the athlete has jumped the selected distance and made contact with the target 52.

Referring now to FIG. 4, wherein there is illustrated one example of a preferred electrical circuit 90, particularly adapted for use with the present invention jump measuring device 10. The circuit 90 comprises a power source 92 connected in a parallel arrangement with the drive motor 34, the buzzer 86 and the lights 88, and the pair of indicating dials 82 and 84. The drive motor 34 is controlled by a switching mechanism 94 adapted to selectively stop and reverse the direction of rotation of the motor 34 to raise and lower the target 52 in the manner aforementioned. The buzzer 86 and lights 88 are connected to the power source 92 by means of a series connection with the target contacts 74 and 76 such that the lights and buzzer are activated each time an athlete strikes the target 52. A time delay mechanism 96 connected directly to the power source 92 maintains

an electrical connection therewith for a short period of time, say 2 seconds, after the target contacts 74 and 76 separate such that the buzzer and lights will be clearly heard and seen after the athlete makes contact with the target 52. The target contacts 74 and 76 also connect the power source to the indicator dials 82 and 84 while a switching mechanism 98 permits a selective use of one dial or the other for the purpose of keeping score as hereinbefore mentioned.

Referring now to FIGS. 5 and 6, there is illustrated a second embodiment of the present invention in the form of a manually operated jump measuring device 100 comprising a standard 102 adapted to be attached directly to the floor or, if desired, to a dolly or the like, to permit the jump measuring device 100 to be mobile. The standard 102 includes an upright tubular member 104 which telescopically receives a target support 106 having a ruler 108 formed thereon for indicating the vertical distance from the floor. The target support 106, which is slidably movable up and down with respect to the tubular member, may be locked at any desired position by any suitable means such as clamps 110. The support 106 slidably mounts a target 112 which is locked into position by a clamp 114 and includes a hinge 116 which functions in the same manner as the hinge 58 described hereinbefore. At the forward end of the target there is mounted a buzzer and light arrangement 118 which is activated by contact of the lower surface for the target 112 by an athlete and may include the same structural and functional aspects as the target 52 disclosed in FIGS. 1-4.

Although only two embodiments of the present invention have been disclosed, it will be apparent to those skilled in the art of jump measuring devices that other forms may be had all coming within the spirit of the present invention and scope of the appended claims.

What is claimed is as follows:

1. A device for measuring the vertical distance jumped by an athlete, said device comprising:
 - a vertical support;
 - a horizontally disposed target carried by said vertical support and vertically movable with respect to said support;
 - said target being vertically spaced from a floor beneath said target member;
 - means carried by said vertical support for indicating the vertical distance between said floor and the bottom side of said target;
 - means carried by said device for audibly indicating when said athlete makes contact with said bottom side of said target; and means connecting said target to said vertical support in such a manner that said target is vertically displaced when said athlete contacts said target with a force greater than necessary to actuate said audibly indicating means, said target returning to its initial position after said contact by said athlete.
2. The device defined in claim 1, wherein:
 - said target comprises an upper member carried by and vertically movable with respect to said support;
 - a lower member carried by said upper member and vertically movable with respect thereto;
 - said lower member being adapted to form an electrical connection with said upper member when said lower member is moved vertically upwardly when contacted by said athlete; and

5

means normally separating said members for breaking said electrical connection, one of said members being connected to said audible means and the other of said members being connectable to a source of electrical energy.

3. The device defined in claim 2, wherein said audible means is a buzzer.

4. The device defined in claim 2, wherein said lower member is separated from said upper member after contact by said athlete to break said electrical connection; and further comprising time delay means operable after said initial contact for maintaining an electrical connection between said audible means and said power source for a predetermined time after said first mentioned contact is broken.

5. The device defined in claim 1, further comprising visual indication means carried by said device and responsive to a contact with said lower side of said target for giving a visual indication that the contact has been made.

6. The device defined in claim 1, further comprising electro-mechanical means for vertically moving said target with respect to said support and for selectively positioning said target at selected distances from said floor.

7. The device defined in claim 1, further comprising means carried by said device for giving a visual count of the number of times an athlete makes contact with said lower side of said target, said last mentioned means being responsive to a contact with the lower side of said target by said athlete.

8. The device defined in claim 1, wherein said target is manually moved relative to said support for changing said vertical distance.

9. The device defined in claim 1, further comprising

6

means carried by said device for restraining said target against movement relative to said support.

10. A device for measuring the vertical distance jumped by an athlete, said device comprising:

a vertical support;

a horizontally disposed target carried by said vertical support and vertically movable with respect to said support;

said target being vertically spaced from a floor beneath said target member;

means carried by said vertical support for indicating the vertical distance between said floor and the bottom side of said target;

means carried by said device for audibly indicating when said athlete makes contact with said bottom side of said target;

said target comprising an upper member carried by and vertically movable with respect to said support;

a lower member carried by said upper member and vertically movable with respect thereto;

said lower member being adapted to form an electrical connection with said upper member when said lower member is moved vertically upwardly when contacted by said athlete; and

means normally separating said members for breaking said electrical connection, one of said members being connected to said audible means and the other of said members being connectable to a source of electrical energy; said members being hinged to said support such that upon contact of said lower member with said upper member, both said upper and lower members are rotated about said hinged point and raised vertically upwardly.

* * * * *

40

45

50

55

60

65