

United States Patent

Green

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[54] **TRAMPOLINE**

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[51] Int. Cl. **A63b 5/00**

[58] Field of Search 182/137, 138, 139, 140; 5/111;
272/65

[56] **References Cited**

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[57] **ABSTRACT**

A trampoline having a frame formed of tubular material, generally rectangular in shape and supported on legs constructed to yieldingly resist downward movement of the frame bodily and to allow downward yielding movement of a portion of the frame in response to the exertion of a downward impact thereon. The invention includes yieldingly supported pad means on the frame of the trampoline positioned to cushion the impact of the user on the frame.

7 Claims, 10 Drawing Figures

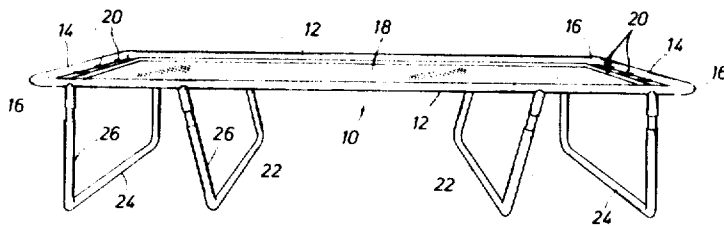


FIG. 1

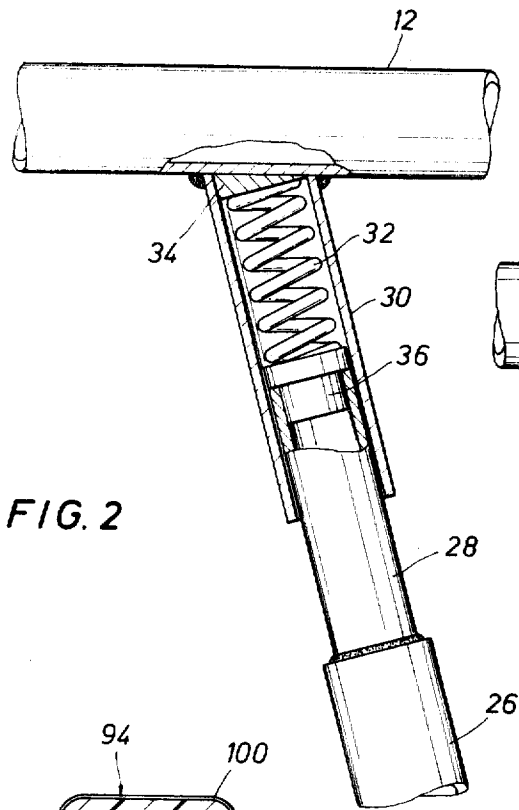
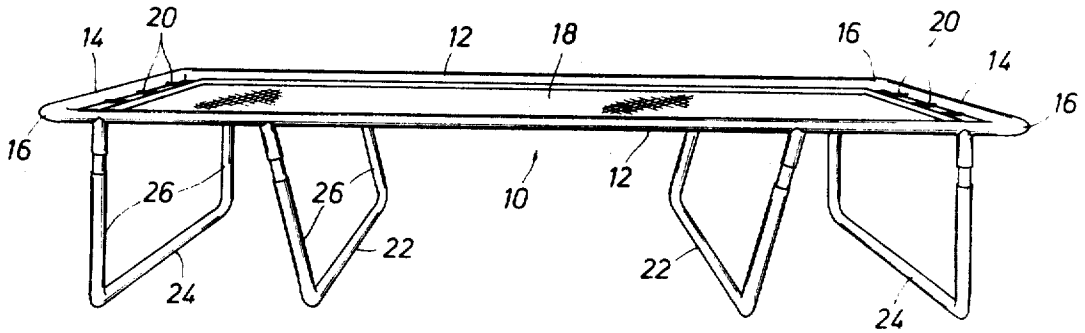


FIG. 2

FIG. 3

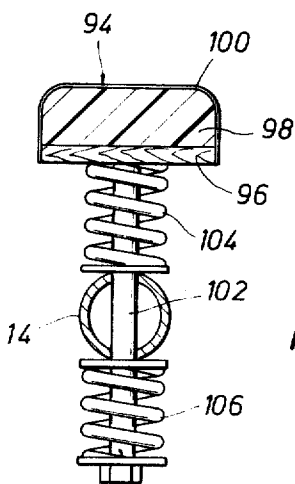
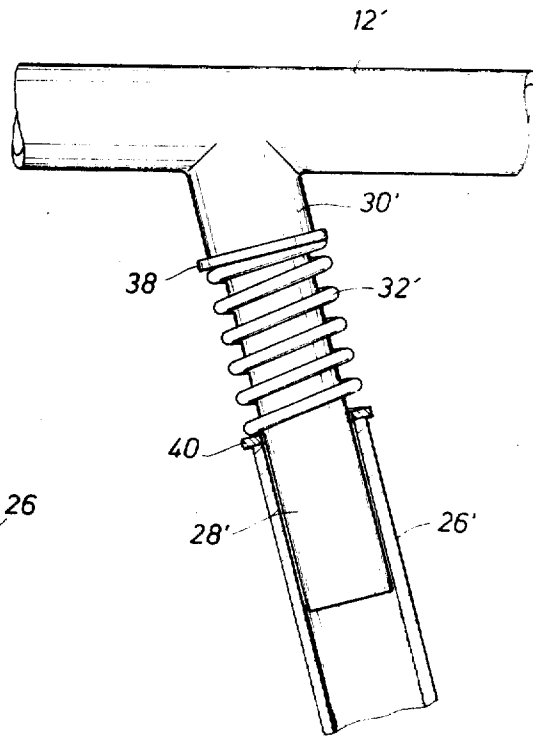


FIG. 4

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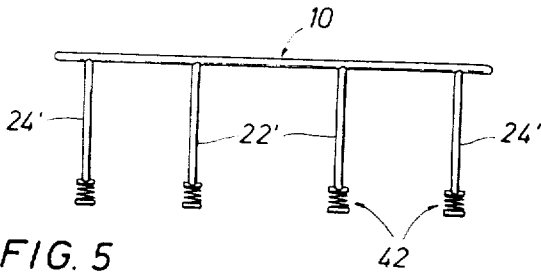


FIG. 5

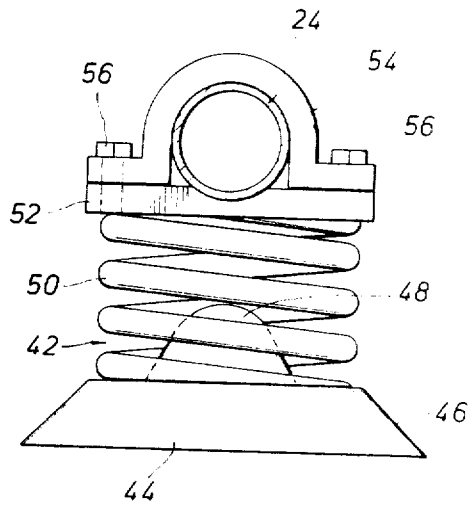


FIG. 6

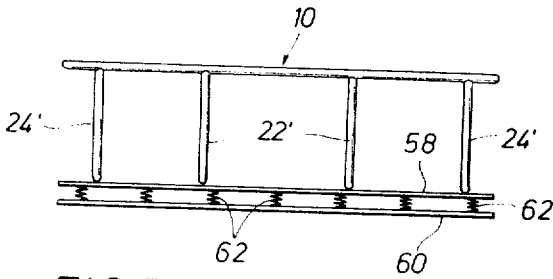


FIG. 7

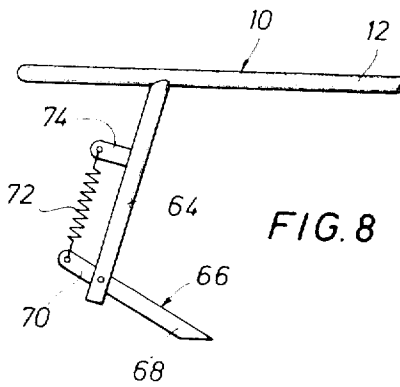


FIG. 8

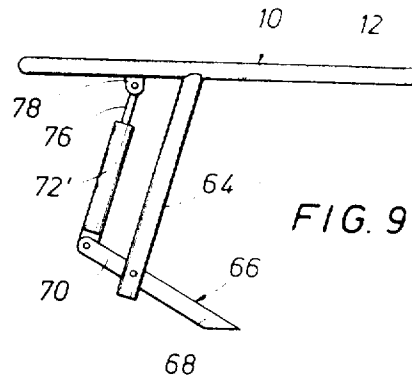


FIG. 9

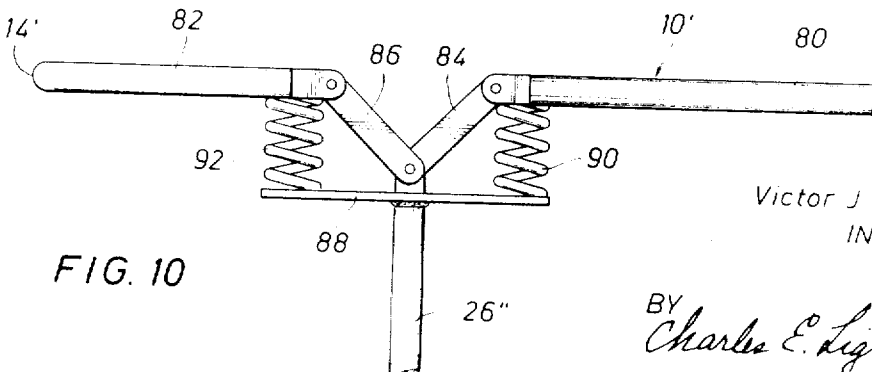


FIG. 10

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TRAMPOLINE

BACKGROUND OF THE INVENTION

As heretofore commonly constructed, trampolines are provided with relatively heavy rigid frames supported on stiff rigid legs for maximum strength and durability. Such frames are of rectangular shape, usually formed of tubular material, such as steel tubing and formed with rounded corners. A flexible bed of rectangular shape, formed of strong fabric and of smaller dimensions than the frame is supported thereon in a tightly stretched condition by means of numerous coil springs, to render the bed resilient to the downward force exerted thereon by the user and to cause the bed to rebound to move the user's body upwardly.

In performing on a trampoline constructed in this manner, the user often lands on the bed at a location away from the center of the bed and on rebounding therefrom may be thrown toward the frame and at times completely off of the trampoline. Inexperienced users and particularly beginners who have not yet learned how to control their movements, may at times be thrown onto the surrounding frame, resulting in serious injury.

SUMMARY OF THE INVENTION

Briefly described, the trampoline of the present invention comprises a generally rectangular frame formed of tubular material, within which a flexible bed formed of fabric is resiliently supported in a tightly stretched condition by numerous coil springs, and provided with legs constructed to yieldingly support the frame at an elevation above the ground to allow the frame as a whole, or a portion thereof, to move downwardly in response to the exertion of a downward impact on the frame, thereby cushioning the impact of the user's body on the frame in the event that the user should descend on the frame. The trampoline is further provided with yieldingly supported pads on the frame positioned to be engaged by the user to cushion the impact of the user's body on the frame.

By suitably regulating the resiliency of the supporting means of the frame as well as the resiliency of the pads, the danger to the user due to striking the frame with his head or other part of the body or falling bodily on the frame is greatly reduced.

BRIEF DESCRIPTION OF THE VIEWS OF THE DRAWINGS

FIG. 1 is a perspective view of a preferred embodiment of the trampoline of the invention;

FIG. 2 is a fragmentary, side elevational view, partly broken away and partly in cross-section, and on an enlarged scale, shows details of structure of the yieldable connection between the frame and legs of the trampoline;

FIG. 3 is a view similar to that of FIG. 2 illustrating a modified form of the leg connection of the trampoline;

FIG. 4 is a vertical, cross-sectional view, on an enlarged scale, of a side portion of the trampoline frame, showing details of construction of the yieldably supported frame pads of the invention;

FIG. 5 is a side elevational view, on a reduced scale, illustrating a modified form of the spring mounting of the trampoline of the invention;

FIG. 6 is a side elevational view, partly in cross-section, and on a greatly enlarged scale, showing one of the base or foot members of the trampoline mounting of FIG. 5;

FIG. 7 is a view, similar to that of FIG. 5 illustrating a further modified form of the spring mounting of the trampoline of the invention;

FIG. 8 is a fragmentary side elevational view illustrating a modified form of the yieldable support means for the trampoline frame;

FIG. 9 is a view similar to that of FIG. 8 illustrating a further modification of the yieldable support means for the trampoline frame;

FIG. 10 is a fragmentary side elevational view illustrating a still further modification of the yieldable support means of the invention.

DETAILED DESCRIPTION OF A PARTICULAR EMBODIMENT OF THE INVENTION

As illustrated in FIG. 1, the trampoline of the invention is constructed with a generally rectangular frame 10 formed with tubular side and end members 12 and 14 which are assembled to provide rounded corners 16.

Within the frame 10 a rectangular bed 18 is provided, formed of suitable flexible sheet material, such as woven fabric or plastic and attached to the frame by means of coil springs 20 along all sides to yieldingly hold the bed in a tightly stretched condition.

The frame of the trampoline is preferably supported on inner and outer legs 22 and 24. The legs are preferably of generally U-shaped, formed of tubular material, each formed with upwardly bent end portions 26, each of which has at its upper end a longitudinally extending tubular extension 28 (male portion) of smaller diameter than the portion 26 adapted to be slidably extended into the female portion lower end of a tubular socket element 30, whose upper end is attached to the side member 12 of the frame as by means of welding and extending downwardly therefrom. The extension 28 is telescopically slidable in the socket 30, within which a coil spring 32 is positioned for engagement at its upper end with a seat element 34 within the upper end of the socket, and at its lower end with a plug 36 closing the upper end of the extension 28, to yieldingly hold the frame 10 against downward movement, as shown in FIG. 2.

By this arrangement the frame of the trampoline is yieldingly held in a horizontal position for downward movement in response to the impact of an acrobat who may fall against the frame while jumping on the bed of the trampoline, thus cushioning the impact of the acrobat against the frame. Thus the side or end of the frame against which the user of the trampoline may fall by accident is allowed to move downwardly or sag against the yielding resistance of the springs 32 to cushion the impact of the user against the frame and serving to alleviate injury to the user.

A somewhat different form of the cushioning means is illustrated in FIG. 3, wherein the socket element 30' is formed as the vertical leg of a T-shaped portion of the trampoline frame, which is provided with an extension 28' or male portion slidably fitted into the female portion or upper end of the up-turned portion 26' of the supporting leg. A coil spring 32' surrounds the extension 28' between an upper washer 38 on the lower end of the socket 30' and a lower washer 40 on the upper end of the tubular portion 26' to yieldingly hold the extension 28' against downward sliding movement in the portion 26'.

In the form of the invention illustrated in FIG. 5, the legs 22' and 24' of the trampoline are of similar shape to the legs 22 and 24 and similarly located, but are rigidly connected at their upper ends to the frame and provided with yieldable foot or base devices, generally designated 42, each constructed as shown in FIG. 6 to yieldingly support the frame for downward movement.

Each of the yieldable foot or base devices 42 comprises a base portion 44, which may be of annular shape with an upwardly tapering periphery 46 and formed with a central, upwardly extending, rounded projection 48. A coil spring 50 is seated at its lower end on the base portion 44 surrounding the projection 48 and attached at its upper end to a spring plate 52 to which an inverted U-shaped clip 54 is attached, as by means of screws 56 to clampingly engage the bottom tubular portion of one of the legs 22 or 24 between the spring plate and clip. By attaching two or more of the foot or base devices 42 to the bottom portion of each of the trampoline legs the frame will be yielding support for downward movement in response to the impact of the user in the event that the user should fall against the frame while jumping on the bed of the trampoline.

In the form of the invention illustrated in FIG. 7, the legs 22' and 24' of the trampoline have their bottom portions attached to the upper plate 58 of a platform like structure having a lower plate 60 and a plurality of coil springs 62 disposed

between the plates to yieldingly resist downward movement of the plate 58 toward the lower plate 60. By this arrangement the plate 58 may tilt in response to downward impact of the user against one side or end of the frame to cushion such impact.

Further modifications of the yieldable supporting means of the invention are illustrated in FIGS. 8 and 9, wherein the legs of the trampoline are each made up of a downwardly extending tubular member 64 attached at its upper end to a side 12 of the frame and a lever element 66 pivotally connected mediate its ends to the lower end portion of the member 64 and having one arm 68 thereof engageable at its outer end with the floor and whose other arm 70 is connected at its outer end to a yieldable element 72, which as seen in FIG. 8 may take the form of a coil spring 72 attached at one end to the arm 70 and at its other end to a lug 74 on the member 64 spaced above its lower end. Upon the occurrence of a downward impact on the trampoline frame the lever 66 will be actuated to exert a pull on the spring 72 to yieldingly cushion the impact.

The yieldable element 72' shown in FIG. 9 takes the form of a pressure cylinder connected at one end to the arm 70 and whose piston is connected by a rod 76 to a lug 78 on the side 12 of the trampoline frame. In this arrangement a downward impact on the frame actuates the lever 66 to exert a compressive force on a compressible fluid in the pressure cylinder to cushion the impact.

A further modification of the yieldable frame supporting means of the invention is illustrated in FIG. 10, wherein the side of the frame is made in several parts, such as those shown at 80 and 82, which are linked together by a pair of links 84 and 86 pivotally connected at one end to the adjacent ends of the frame parts and at their other ends pivotally connected to the upper end of the upright portion 26'' of a frame leg.

The leg portion 26'' carries near its upper end a horizontal bar 88 upon which coil springs 90 and 92 are seated at their lower ends, the upper end of the spring 90 being engaged with the part 80 and the upper end of the spring 92 being engaged with the part 82. By this arrangement a downward impact exerted on either of the parts 80 or 82 will be yieldingly cushioned by the spring 90 or 92 respectively.

For the purpose of further cushioning the user against injury due to falling on the frame of the trampoline the sides and ends of the frame may be provided with yieldingly mounted pads, such as that indicated at 94 in FIG. 4. The pads may be formed in a number of separate lengths or sections along each side and end of the frame, each section have a base board 96 upon which padding 98 is placed and covered with a fabric covering 100. Each pad is suitably supported on spaced apart upright rods, such as that shown at 102 which are slidably extended through the tubular side or end member and about which upper and lower coil spring 104 and 106 are positioned, the upper spring being in engagement at its upper end with the base 96 and at its lower end with a spring plate 108 and the lower spring being in engagement at its ends with spring plates 110 and 112 to yieldingly hold the pad against downward movement due to a downward impact on the pad.

It will be apparent that a user falling on the frame of the

trampoline while jumping on the bed of the same will be cushioned against injury by the pad 94 while the pad may move downwardly to further yieldingly resist the impact, and should the downward force exceed the yielding capacity of the yieldably mounted pads the frame will be effective to further cushion the impact.

It will thus be seen that the invention provides a trampoline of rugged construction having means for effectively cushioning downward impact of a person coming in contact with the frame of the trampoline while jumping on the bed of the trampoline.

Having thus clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patent is:

- 1. A trampoline which consists essentially of:
 - a generally rectangular frame,
 - a trampoline bed within and connected to the sides and ends of said frame,
 - a plurality of spaced resilient connectors consisting of coil springs, each coil spring under tension to yieldingly hold said bed in a tightly stretched condition,
 - legs extending downward from said frame at longitudinally spaced locations along opposite sides of said frame, and coil springs which are the sole structure for allowing downward yielding movement of said frame in response to a downward force exerted on said frame and each spring being of free action, at least one of said springs associated with each of said legs.
- 2. A trampoline according to claim 1 wherein each leg has a male portion and a female portion and said coil spring is yieldingly engaged between said portions.
- 3. A trampoline according to claim 1 wherein said coil spring yieldingly engaged said frame.
- 4. A trampoline according to claim 1 which further includes pad means movable mounted on said frame for vertical movement relative thereto, said pad means being above and covering said frame, and yieldable means positioned for coaction with said frame and said pad means to yieldingly resist downward movement of said pad means relative to said frame.
- 5. A trampoline according to claim 4, wherein said pad means are supported on an upright rod which extends through said frame.
- 6. A trampoline which comprises a generally rectangular frame, a trampoline bed within and connected to the sides and ends of said frame by a plurality of spaced resilient connectors each under tension to yieldingly hold said bed in a tightly stretched condition, pad means movably mounted on said frame for vertical movement relative thereto, said pad means being above and covering said frame, and yieldable means positioned for coaction with said frame and said pad means to yieldingly resist downward movement of said pad means relative to said frame.
- 7. A trampoline according to claim 6, wherein said pad means are supported on an upright rod which extends through said frame.

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