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TRAMPOLINE LEVELLING APPARATUS

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ABSTRACT

Trampoline levelling apparatus for levelling a trampoline including a frame and a plurality of legs that are adapted to both engage a foundation and space said frame above the foundation, said trampoline levelling apparatus including: a threaded rod, a longitudinal axis extending through the threaded rod, an upper end and a lower end; a head on the upper end of the threaded rod adapted for engagement with a driver for rotation of the threaded rod about the longitudinal axis; a knob on the lower end of the threaded rod; a foot having a base plate and a receptacle in which the knob is received and captured; a threaded sleeve for engagement with the threaded rod; and a clamp assembly mounted to the threaded sleeve; the parts being so formed and arranged that the threaded rod may be turned about its axis whilst captured in the receptacle of the foot by its knob.

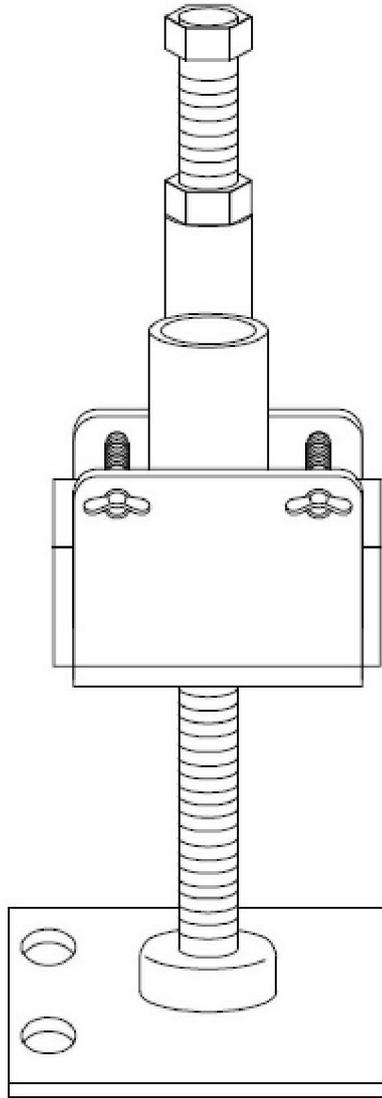


Figure 8

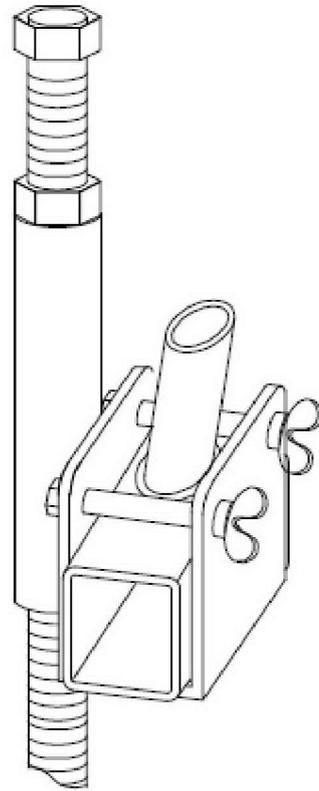


Figure 9

TRAMPOLINE LEVELLING APPARATUS

This invention relates to trampoline levelling apparatus.

This invention has particular application to trampoline levelling apparatus for levelling an assembled trampoline of the type having a base assembly that is adapted to rest on a suitable foundation, said base assembly being adapted to provide support for a jumping mat that is spaced above the foundation, and wherein reference will be made to same. However, it will be appreciated that the invention may be suitable for levelling other trampolines, and possibly other articles.

Most trampolines, because of their size, are used outdoors.

Further, because assembling a trampoline can be rather time consuming, most owners prefer to store their trampoline in an assembled state in their backyard.

There may be locations where the foundation for supporting the trampoline is not level, and it is important that the jumping mat be substantially horizontal. Some trampolines can have sufficient weight to make lifting them difficult, and can possibly place considerable strain on a person's back muscles.

Consequently persons need to be careful when lifting and a trampoline in order to make it level, such as by placing objects under its feet. Moreover, there is a risk that the feet may move off such objects.

It is therefore an aim of the present invention to provide trampoline levelling apparatus for levelling a trampoline which will be reliable and efficient in use and which will alleviate at least some of the aforementioned problems associated with lifting and levelling

a trampoline. It is another aim of the invention to provide a trampoline improved by the operative association with trampoline levelling apparatus.

With the foregoing and other objects in view, this invention in one aspect resides broadly in trampoline levelling apparatus for levelling a trampoline of the type that includes a flexible mat and a base assembly having a frame and a plurality of legs that are adapted to both engage a foundation and space said frame above said foundation, the flexible mat being connected to the frame by a plurality of spring members, said trampoline levelling apparatus including:

a threaded rod having a rod diameter, a longitudinal axis extending axially through the threaded rod, an upper end and a lower end opposite the upper end;

a head on the upper end of the threaded rod adapted for engagement with a tool or driver for rotation of the threaded rod about the longitudinal axis;

a knob on the lower end of the threaded rod, the knob protruding radially to a knob diameter larger than the rod diameter of the threaded rod;

a foot having a base plate and a receptacle in which the knob on the threaded rod is received and captured;

a threaded sleeve having a threaded bore sized for threaded engagement with the threaded rod; and a clamp assembly mounted to the threaded sleeve for clamping to the frame;

the parts being so formed and arranged that the threaded rod may be turned about its axis whilst captured in the receptacle of the foot, the threaded rod being permitted to swivel up to a predetermined angle from normal to the base plate.

Preferably the trampoline levelling apparatus further includes a trampoline foot docking component engageable with the clamp assembly and having docking means for docking with the foot of the trampoline.

In another aspect, this invention relates to a method of levelling a trampoline of the type that includes a flexible mat and a base assembly having a frame and a plurality of legs that are adapted to both engage a foundation and space the frame above the foundation, the flexible mat being connected to the frame by a plurality of spring members, said method including: providing trampoline levelling apparatus including as hereinbefore described; mounting the frame to the clamp assembly; and rotating the threaded bar about its axis to move the threaded sleeve therealong whereby the height of the threaded sleeve, and thereby the foot of the trampoline, may be adjusted for levelling the trampoline.

Preferably head attached to the threaded bar is a hexagonal head akin to the head of a bolt or screw. It is also preferred that the knob be of identical form and size to that of the head and the receptacle is sized to receive the head loosely, but capture the head therein. Such an arrangement enables the threaded bar to be provided with identical ends for ease of manufacture, the orientation of the threaded bar in the receptacle of the foot being eliminated as a potential source of assembly error.

In order that embodiments of this invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention:

Fig. 1 is a photographic view of a prototype of trampoline levelling apparatus according to an embodiment of the invention in position supporting a leg of a trampoline;

Fig. 2 is another photographic view of the trampoline levelling apparatus of Fig. 1;

Fig. 3 is a photographic view of a foot docking component ;

Fig. 4 is a pictorial view of trampoline levelling apparatus;

Fig. 5 is a detail view of the trampoline levelling apparatus of Fig. 4;

Fig. 6 is a pictorial view of the trampoline levelling apparatus of Fig. 4 with the foot docking component in position;

Fig. 7 is a more detailed pictorial view of the trampoline levelling apparatus of Fig. 6;

Fig. 8 is a diagrammaticpictorial view of the trampoline levelling apparatus; and

Fig. 9 is a diagrammaticpictorial view of the trampoline levelling apparatus.

The trampoline levelling apparatus 10 shown with slight variations in Figs. 1 to 9, wherein like reference numerals refer to like elements in each illustration or photograph.

However, in order to avoid clutter in the drawings, such elements will not be necessarily be indicated by the allocated reference numeral in every drawing. The trampoline levelling apparatus includes a threaded bar 11 having a hexagonal head 12 attached to the upper end. The threaded bar passes through a sleeve 13 having a clearance bore extending therethrough to accommodate the threaded bar and a nut 14 welded to the top of the sleeve for threaded engagement with the threaded bar.

A knob (not visible), , is attached to the lower end of the threaded bar and, for convenience of manufacture, is also in the same form as the hexagonal head. The threaded bar is secured to a foot 16 by capturing the knob in a receptacle formed by a housing 17 attached to a foot plate 18, the housing and foot plate together forming the foot. The

receptacle is deep enough and large enough to permit the knob and threaded bar to rotate, swivel and/or nutate therein, the housing having an aperture of sufficient diameter to permit the threaded bar to pass loosely therethrough, but too small for the knob, so that the threaded bar is retained by the knob to which it is attached being captured by the housing. This arrangement allows the levelling apparatus of the present invention to be supported on an uneven surface or a surface which is at an angle to horizontal.

A clamp assembly 20 is mounted to the sleeve and includes a channel member 21 arranged with its channel transverse to the axis of the sleeve and open in the upward direction to receive and support a frame member of a trampoline to be supported and levelled by the levelling apparatus. In this respect, the channel member has two wing bolts 22 arranged to penetrate both side webs of the channel member, one near each the ends and also near the upper edges to pass across the opening of the channel transverse to the axis of the channel. A nut 23 is fixed to the outside of the channel nearer the sleeve for threaded engagement with each wing bolt. Engagement of the wing bolts with the nuts and tightening thereof urges the sides of the flanges together to clamp the frame of the trampoline in the channel. A piece of shim may also be provided for interposition between the frame member of a trampoline and the inside faces of the channel.

The foot docking component 30 shown in Fig. 3 has a frame stub portion 31 in the form of a rectangular hollow section and a spigot portion 32 extending at right angles to the axis of the stub portion, but at a skewed angle such that, when supported by the channel member, the stub portion extends upward at an acute angle to the side walls of the channel and thus diverges in the upward direction from the sleeve and threaded bar. The stub

portion is also of an oval or ovoid section commensurate with the section of the support poles or feet of the trampoline.

The threaded bar is provided with a right hand thread so that rotating the hex head and threaded bar therewith in the clockwise direction, as viewed from above, with respect to the sleeve produces a relative downward axial displacement of the threaded bar in relation to the sleeve, whereby that portion of the trampoline mounted or supported thereon is raised commensurately. Rotation of the threaded bar in the opposite direction conversely lowers that portion of the trampoline. By providing one or more such levelling apparatus in operative association with the trampoline at one or more selected locations about the frame permits the trampoline to be levelled are required.

It will of course be realised that while the foregoing description has been given by way of example of the invention, all other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as hereinbefore described.

CLAIMS

1. Trampoline levelling apparatus for levelling a trampoline of the type that has a flexible mat and a base assembly having a frame and a plurality of legs that are adapted to both engage a foundation and space said frame above the foundation, the flexible mat being connected to the frame by a plurality of spring members, said trampoline levelling apparatus including:

a threaded rod having a rod diameter, a longitudinal axis extending axially through the threaded rod, an upper end and a lower end opposite the upper end;

a head on the upper end of the threaded rod adapted for engagement with a tool or driver for rotation of the threaded rod about the longitudinal axis;

a knob on the lower end of the threaded rod, the knob protruding radially to a knob diameter larger than the rod diameter of the threaded rod;

a foot having a base plate and a receptacle in which the knob on the threaded rod is received and captured;

a threaded sleeve having a threaded bore sized for threaded engagement with the threaded rod; and a clamp assembly mounted to the threaded sleeve;

the parts being so formed and arranged that the threaded rod may be turned about its axis whilst captured in the receptacle of the foot by its knob, the knob being permitted to swivel up to a predetermined angle from normal to the base plate.

2. The trampoline levelling apparatus according to claim 1, and including a trampoline foot docking component engageable with the clamp assembly and having docking means for

docking with the foot of the trampoline.

3. The trampoline levelling apparatus according to claim 1 or claim 2, wherein the head attached to the threaded bar is a hexagonal head akin to the head of a bolt or screw and the knob is of identical form and size to that of the head and the receptacle is sized to receive the head loosely, but capture the knob therein.

4. A method of levelling a trampoline of the type that has a flexible mat and a base assembly having a frame and a plurality of legs that are adapted to both engage a foundation and space said frame above said foundation, the flexible mat being connected to the frame by a plurality of spring members, said method including:

providing trampoline levelling apparatus according to claim 1 or claim 2 or claim 3; mounting the frame to the clamp assembly; and rotating the threaded bar about its axis to move the threaded sleeve therealong whereby the height of the threaded sleeve may be adjusted for levelling the trampoline.

EDITORIAL NOTE

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Page number 1/5 is repeated resulting in the following 5 pages of figures being numbered 1/5, 1/5, 3/5, 4/5 and 5/5.

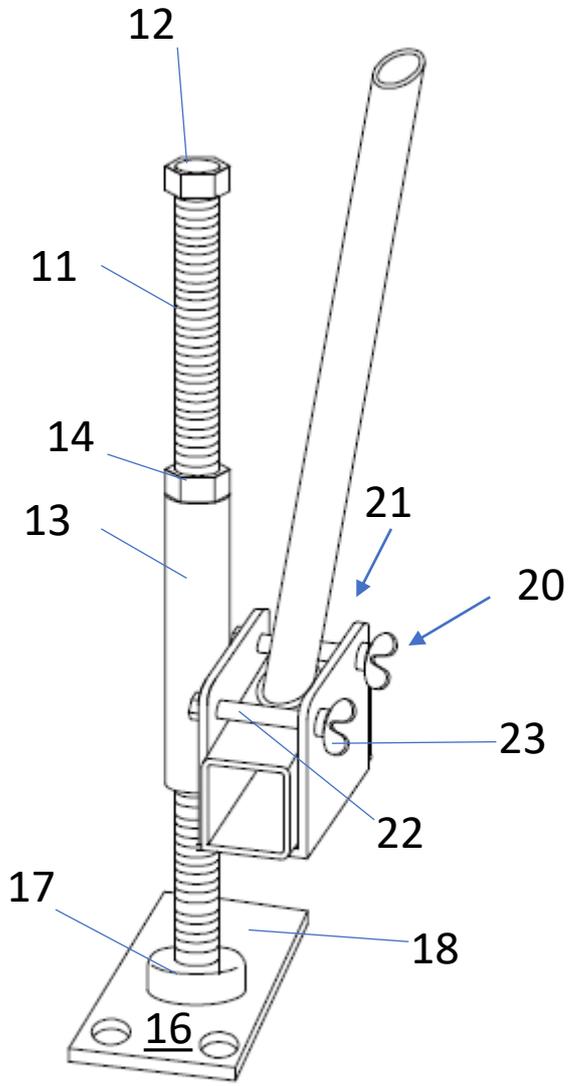


FIGURE 1

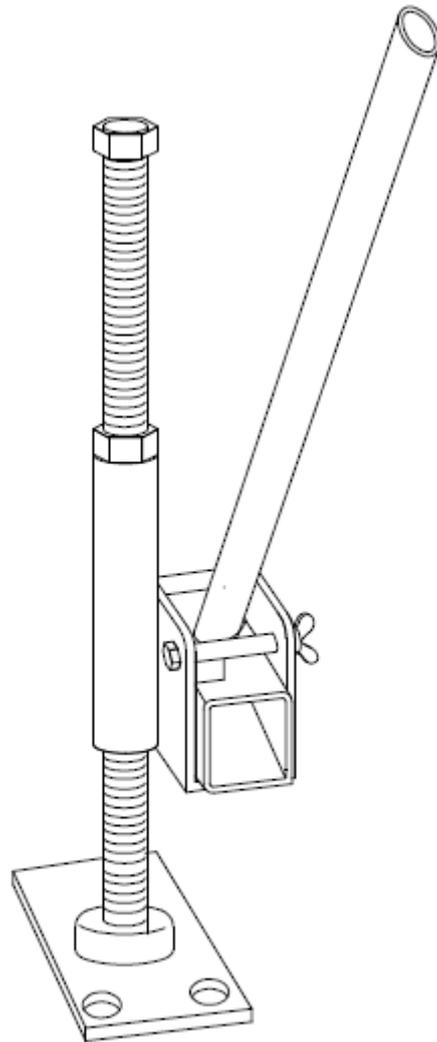


FIGURE 2

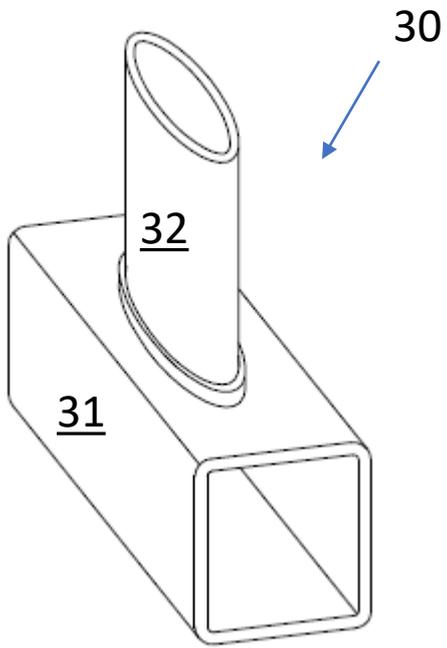


Figure 3

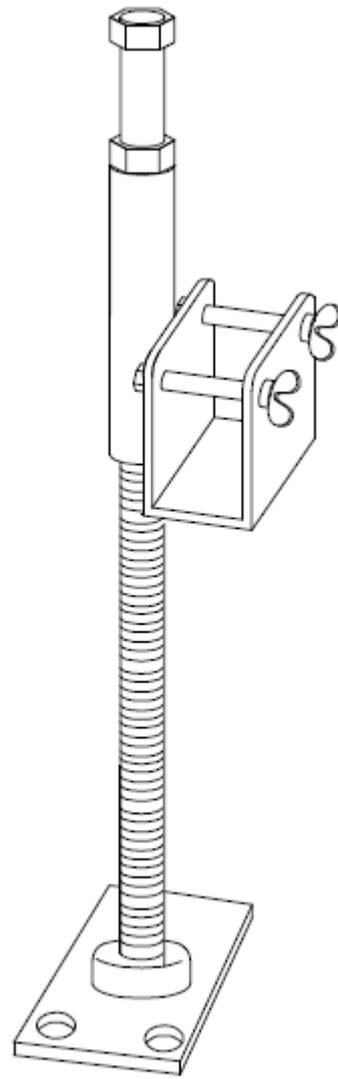


Figure 4

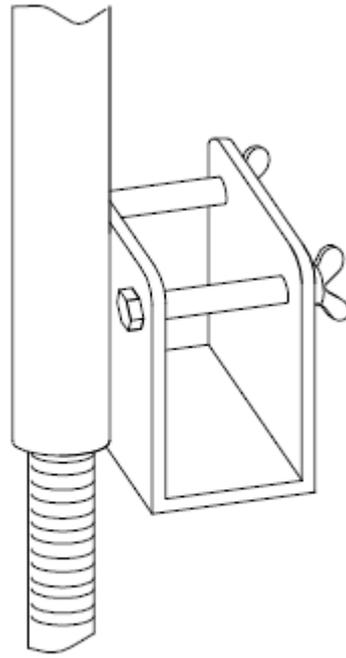


Figure 5

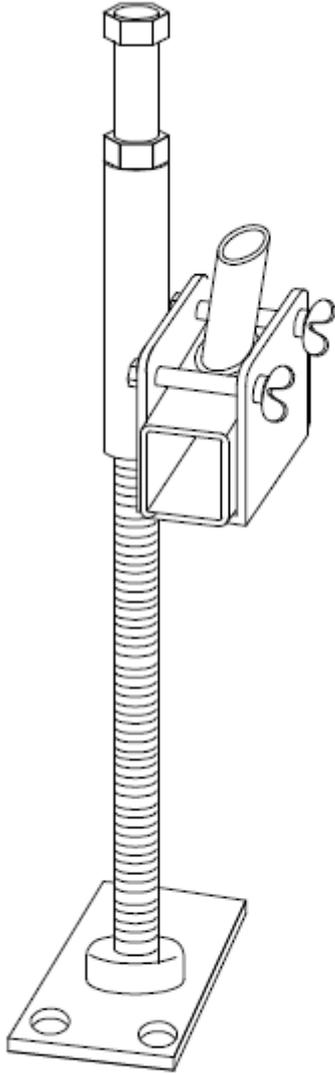


Figure 6

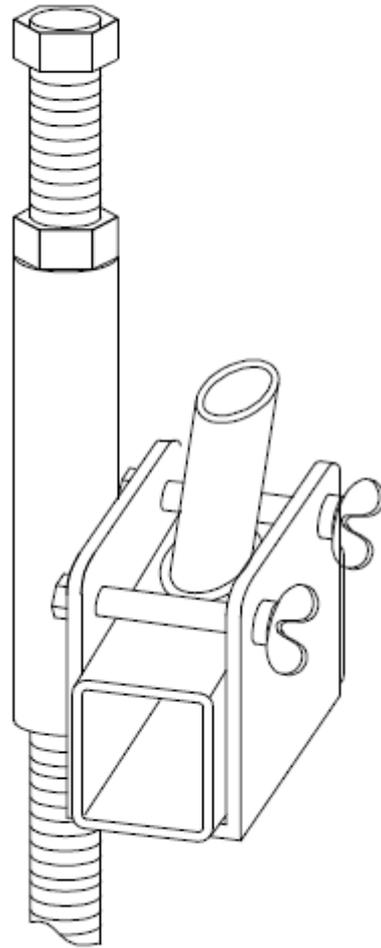


Figure 7

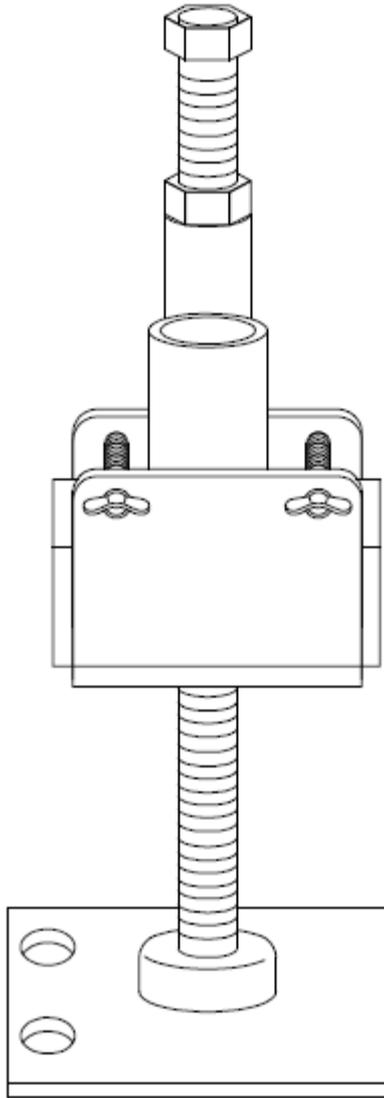


Figure 8

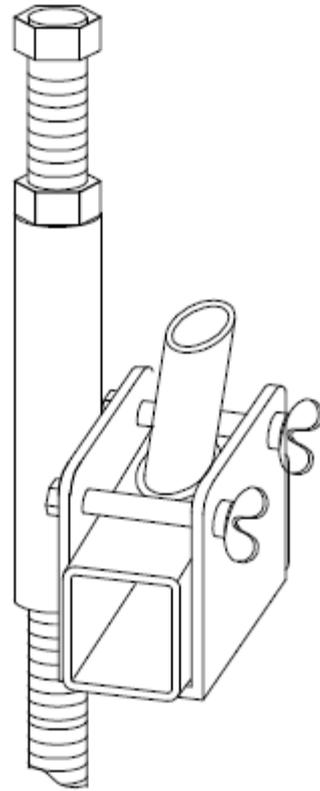


Figure 9