United States Patent [19]

Sidlinger

[11] **3,891,208**

[45] **June 24, 1975**

[54] **CONCEALED SPRING ANCHORING MEANS FOR TRAMPOLINES AND METHOD OF PRODUCING SAME**

[76] Inventor: **Bruce C. Sidlinger,** 208-214 International Rd., Garland, Tex. 75040

[22] Filed: **June 18, 1973**

[21] Appl. No.: **370,681**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 201,376, Nov. 23, 1971, Pat. No. 3,767,009.

[52] **U.S. Cl.** **272/65;** 5/187

[51] **Int. Cl.**[2] **A63B 5/18**

[58] **Field of Search** ..... 272/65; 182/139; 5/82, 5/187; 297/452; 160/378; 29/91.1, 91.2; 28/77; 26/54 A; 38/102.1

[56] **References Cited**

UNITED STATES PATENTS

1,347,413	7/1920	Schaefer	5/187
1,549,934	8/1925	Vanek et al.	5/187
1,583,300	5/1926	McTernen	5/187
2,370,990	3/1945	Nissen	182/139 X

FOREIGN PATENTS OR APPLICATIONS

724,244	2/1955	United Kingdom	272/65

Primary Examiner—Richard J. Apley
Assistant Examiner—Joseph R. Taylor

[57] **ABSTRACT**

The anchor bars which connect the springs with the flexible bed of a trampoline are attached to the margin of the bed by a series of short tapes which extend perpendicular to the margin and these short tapes are first attached to a second elongated tape which runs parallel with the margins of the bed and thereafter both tapes are secured to the bed so that if one of the short tapes becomes detached from the bed it will still remain attached to the elongated tape and prevent the spring from flying away. The tapes are also positioned to place the ends of the springs and the anchors under the bed and out of possible contact by an acrobat. The side frames of the trampoline frame are also strengthened to support a pad over the outer ends of the springs to prevent injury to an acrobat.

18 Claims, 9 Drawing Figures

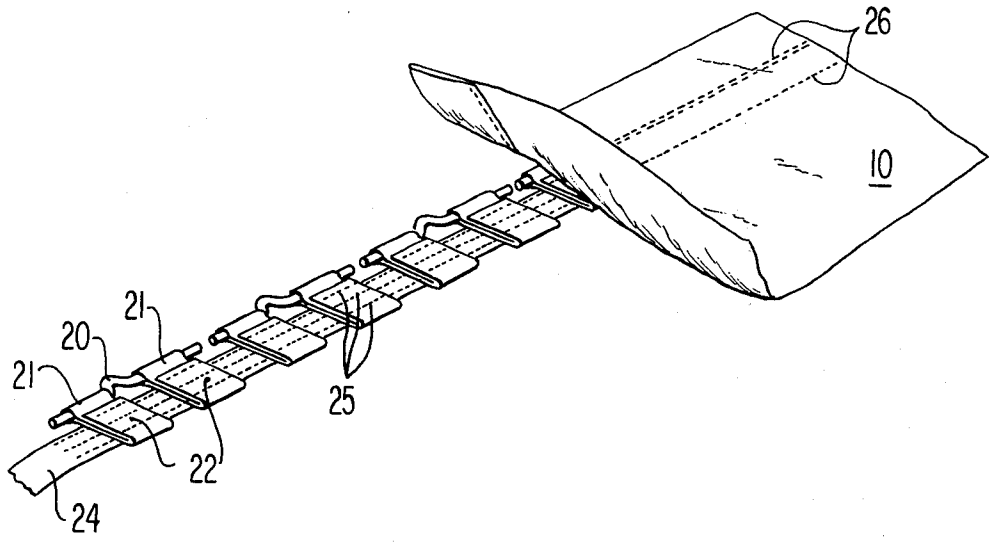


FIG. 1

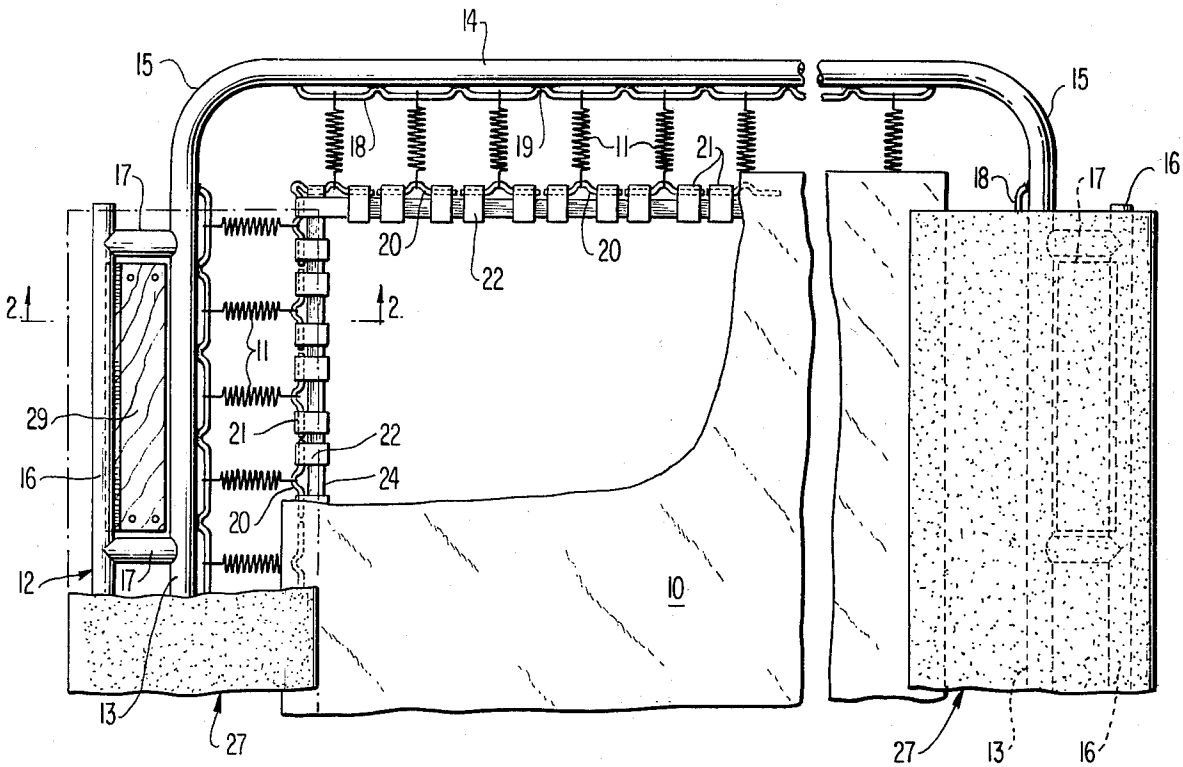


FIG. 2

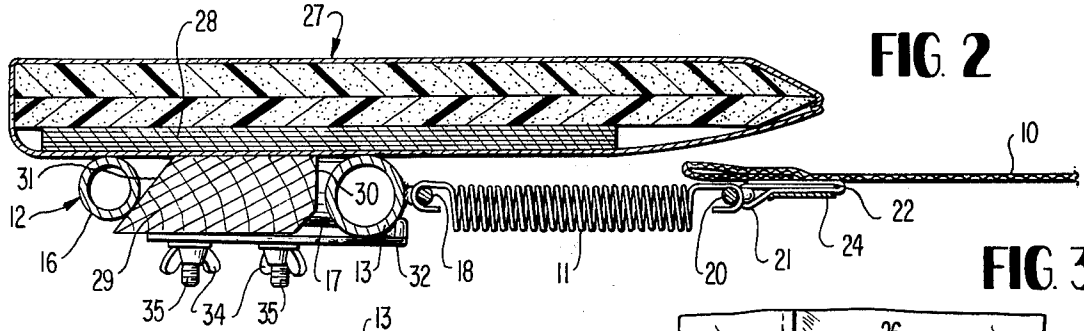


FIG. 3

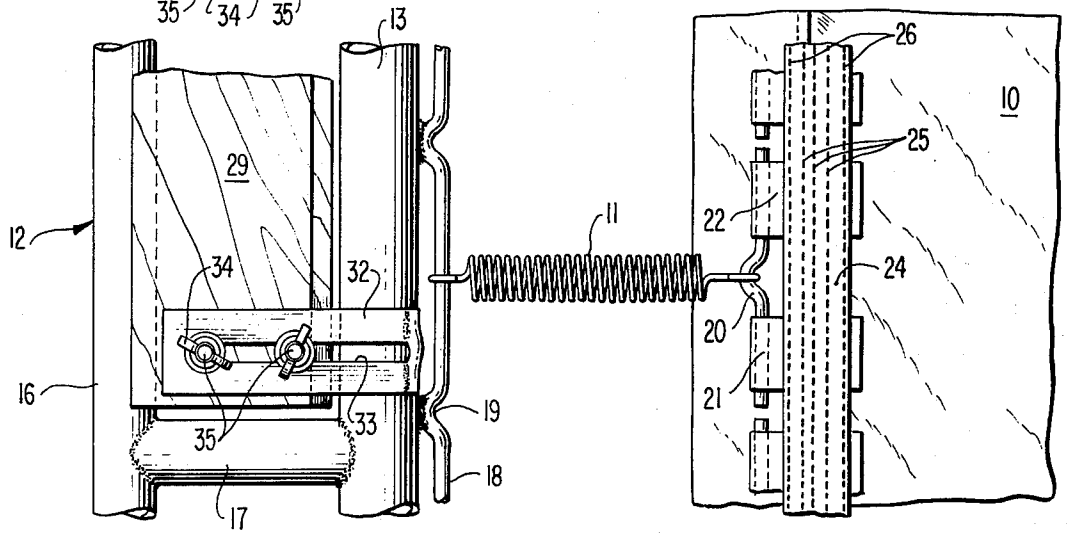


FIG. 4

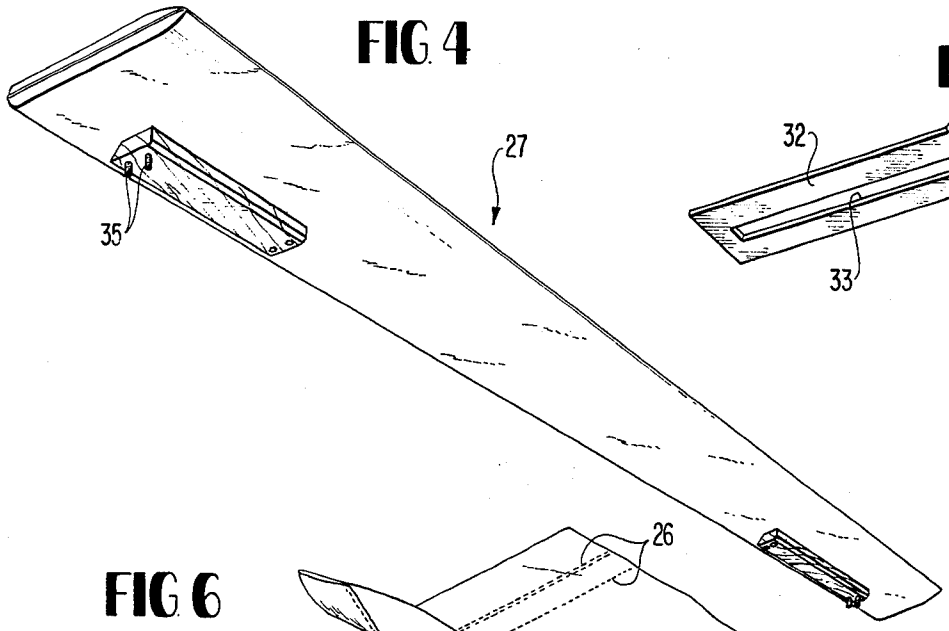


FIG. 5

FIG. 6

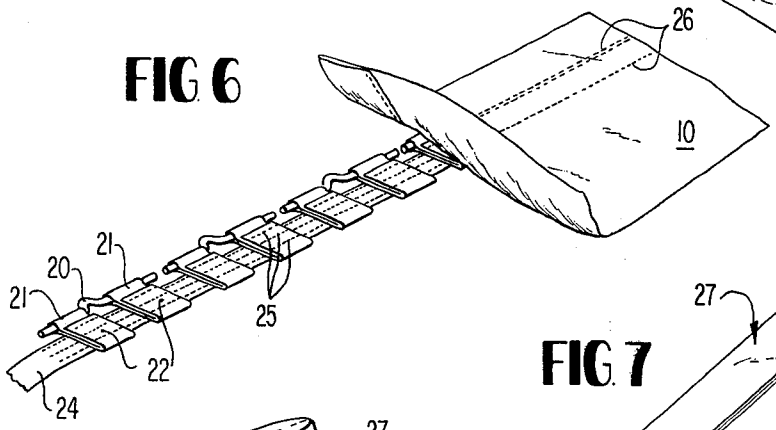
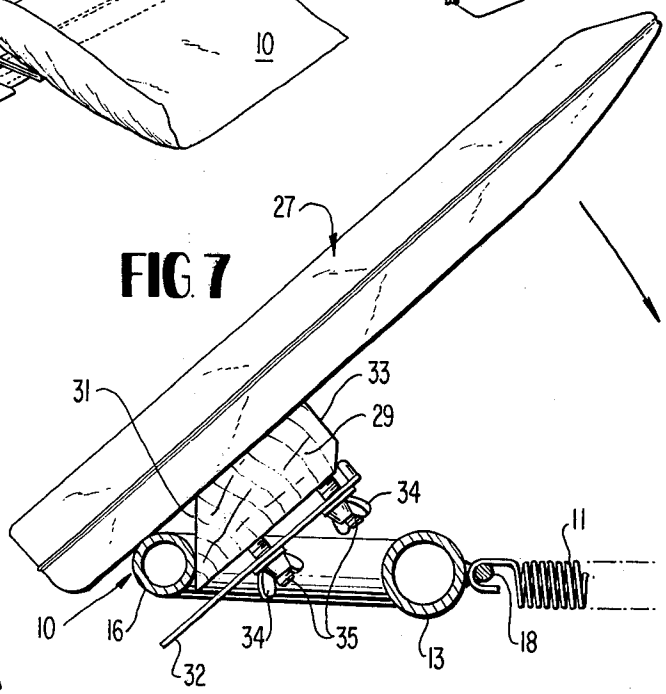


FIG. 7



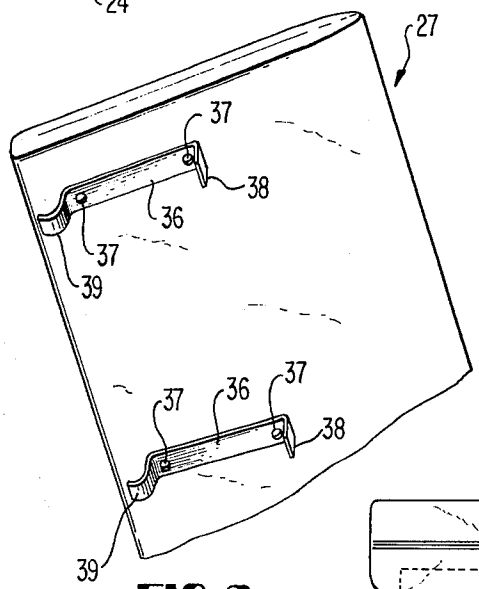
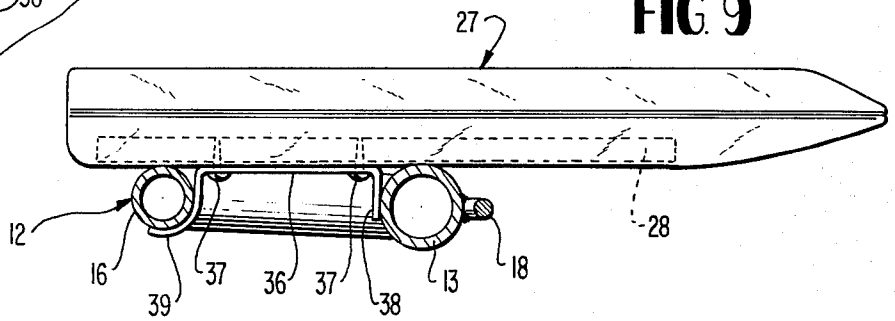


FIG. 8

FIG. 9



CONCEALED SPRING ANCHORING MEANS FOR TRAMPOLINES AND METHOD OF PRODUCING SAME

This application is a continuation-in-part of my co-pending application Ser. No. 201,376, now U.S. Pat. No. 3,767,009, filed Nov. 23, 1971, entitled TRAMPOLINE SUPPORT AND CUSHIONING MEANS.

The invention relates to recreational equipment and more particularly to trampolines of the type in which a flexible sheet of material is suspended horizontally by a series of coil springs connected between the margins of the sheet of material and an encircling supporting frame.

In the normal course of use by an acrobat who is not attempting to perform a feat which is beyond the scope of his proficiency, there is little danger of accident so long as the materials of the trampoline have not become worn or deteriorated and so long as the acrobat takes care to land with both feet on the bed.

As a practical matter, there are only two common ways in which a person can be injured by the springs which support the bed. Normally these springs are at least partially covered by a pad, but even when the coils of the springs are not completely covered the usual type of injuries caused by the springs result from a situation in which one end of a spring pulls away from the bed. In that case, a person's leg may become pinched between adjacent turns of a coil when it is released; normally no pinching will take place because the coils remain spread as long as they are hooked up between the frame and the bed. Another possible cause of injuries results when a spring completely pulls away and goes flying into the air, in which case the spectators may also be injured.

The problem of a spring pulling away from a bed is especially acute in the case of outdoor trampolines because the ultraviolet rays of the sun deteriorate the nylon thread usually used to sew the tapes for the spring anchors to the flexible bed which itself is usually composed of woven polypropylene fibers which are much more resistent to the effects of the sun. The problem is accentuated because of the fact that polypropylene thread cannot be used in sewing the tapes to be bed because it does not have the strength of nylon although it is more resistant to the sun. Nylon can be made resistant to ultraviolet rays if it is coated with an appropriate material, but the material used for the coating is soluble in contact with the oil which must be used with the large needles required to sew trampoline beds. The machines which perform this sewing are usually equipped with an oil reservoir into which the needles are continually dipped to keep them lubricated.

Accordingly, it is an object of this invention to provide an arrangement for attaching the spring anchor tapes to the bed in such a way that the effect of the sun's rays on the thread is minimized.

Another object of the invention is to attach the spring anchor tapes to the bed indirectly by means of an intermediate tape which extends along the marginal area of the bed in an arrangement such that if an anchor tape and a portion of the intermediate tape pulls away from the bed the remaining tape attached to the bed absorbs the force and holds the weakened portion for a sufficient time to prevent injury to the acrobat.

Another object of the invention is to minimize the possibility of injuries by arranging the anchor tapes inwardly of the edges of the bed so that the spring anchors and the open ends of the springs connected thereto are covered by the marginal areas of the bed itself.

A further object of the invention is to provide a sturdier support for the resilient pads which are used to cover the trampoline frame and the springs connected thereto.

Other objects and advantages will become apparent from the following detailed description of the invention, taken in conjunction with the accompanying drawings, in which:

FIG. **1** is a fragmentary partially broken-away plan view of an improved trampoline according to the present invention;

FIG. **2** is an enlarged elevational view partly in section which is taken on the line **2—2** of FIG. **1** and illustrating a pad which is positioned over the springs which are secured to the frame;

FIG. **3** is a bottom view, facing upwardly, of the showing of FIG. **2**;

FIG. **4** is a perspective of one of the pads before it has been placed in position over the springs;

FIG. **5** is a perspective illustrating a clamping member which is used with the pads;

FIG. **6** is a perspective detail view illustrating the manner in which the anchor tapes are stitched to the intermediate tape which is then stitched to the bed;

FIG. **7** is an enlarged fragmentary elevational view illustrating a pad positioned over the springs which are secured to the frame, with the pad in elevated position;

FIG. **8** is a fragmentary perspective of the underside of one end of the pads and illustrating a pair of frame-holding brackets which may be used in substitution of or in addition to the pad holding device which is illustrated in FIGS. **4** and **5**; and

FIG. **9** is an elevational view of one of the pads with the brackets shown in FIG. **8** after it has been attached to the frame.

In the drawings the numeral **10** indicates a trampoline bed of conventional manufacture which may comprise a rectangular sheet of flexible sheet material, for example, fabric such as heavy cotton or canvas or a closely woven fabric composed of synthetic fibers such as polypropylene, or other substantially non-stretching fibrous material. As is customary, the bed is supported in a horizontal plane by a plurality of resilient members, such as coiled springs **11,** spaced at intervals around the margins of the bed and connected at their outer ends to the trampoline frame, indicated generally by numeral **12.**

This frame encircles the bed and comprises an inner section formed from heavy metal tubing to form side sections **13** and end sections **14** (only one of which is shown in the drawings) which may consist of a single tube bent to form rounded corners **15,** or the frame may be constructed in sections connected to be telescopically fitted together or the sections may be hinged to allow the trampoline to be dismantled for storage or travelling, as is well known in the art.

Along each side there is provided a second metal tubular member **16,** spaced outwardly from the tubing **13** and connected to it by cross members **17** at spaced intervals. While the outer member could be extended around the entire periphery of the frame, it is not essential because in the case of an elongated bed the heaviest forces in the springs **11** are exerted generally in the

central area of the bed against the side members of the frame.

As disclosed and claimed in my parent application Ser. No. 201,376, the inner members **13** and **14** are provided with rods **18,** formed at intervals with loops **19** which can be welded to the frame to space the remainder of the rod away from the frame to provide anchorages for the outer ends of the springs **11** which allows each spring to individually slide along the rod until it finds a position to maintain it at right angles to the margins of the bed. The rod therefore, not only stengthens the frame to some extend but, by allowing for individual positioning of each spring, eliminates a serious safety hazard known to trampoline acrobats as "bed dance". Briefly stated, this is a phenomenon which produces in the acrobat's mind the illusion that the bed is horizontally unstable.

The inner end of each of the coil springs is connected to a metal anchor rod **20,** the respective ends of which are received in the looped ends **21** of pairs of doubled over fabric tapes **22,** as is conventional practice. It has also been the practice, in the past, to sew the doubled over ends of these tapes directly to the hem **23** of the bed in such a position that the looped ends **21,** as well as the anchors and the spring ends, project outwardly beyond the edges of the bed, as shown in the abovementioned application Ser. No. 201,376.

The present invention differs from that disclosed in said prior application in that the tapes **22** are indirectly secured to the trampoline bed and their locations have been changes so that the anchors **20,** with the attached ends of the springs **11,** are concealed underneath the marginal area of the bed. Thus, the possibility of injury to an acrobat who lands with one foot beyond the edge of the bed is substantially eliminated.

As can be clearly seen in FIG. **6,** the short lengths of tapes **22** are first doubled over at least once to form looped ends **19,** after which they are laid transversely upon one face of a second, longer, length of tape **24** with their looped portions in alignment along one side at intervals sufficient to allow pairs of tapes **22** to receive the respective ends of the metal anchors **20** and then the tapes **22** are sewed to the elongated tape **24** by means of one or more rows of stitches **25.** The anchors need not necessarily be inserted in the loops at that time, nor do they need to be inserted until the bed is to be connected to the springs.

When this preliminary sewing is completed, the tape **24** is placed on the lower face of the bed **10,** adjacent the inwardly turned hem **23** and again one or more rows of stitches **26** are used to secure the tape **24** to the bed. While the hem **23** may be sewed prior to the application of the tape, this need not necessarily be done as a separate operation and, while the stitches used to secure the transverse tapes to the long tape are shown as being spaced apart from the stitches used to apply tape **24** to the bed at uniform distances, this pattern need not necessarily be followed and it should be obvious that no particular pattern stitching need be followed; it could be a zigzag or other irregular pattern. Also, while it is preferable to attach the tape **24** to the bed at a distance inwardly from the edge of the bed to cover the anchors and spring ends, it should be understood that the indirect attachment of the short tapes to the bed contributes an advantage to the invention which is independent of their locations.

The fact that the short tapes are attached to the main tape **24** prior to the latter's attachment to the bed, added to the fact that the assembly of tapes themselves lie on the under surface of the bed, means that whatever securing means, such as the stitching **25,** is employed to attach the anchor-holding tapes to the main tape, it will be unaffected either by sunlight or by the ordinary wear and tear produced by the contact of acrobats on the upper surface of the bed. In short, while the stitching **26** which holds the main tape **24** to the bed may deteriorate over a period of time, a failure of this stitching will not result in the immediate release of any of the springs **11.** While a portion of the long tape **24** will pull away at the specific point where there is a failure of the stitching **26,** the adjacent portions of the long tape will still hold in place and, since the stitching **25** will be completely unaffected by the failure of stitching **26,** the separate anchor-holding tapes **22** will not separate from the main tape **24.** While, admittedly, the separation of the main tape from the bed at any given point will allow a spring **11** at that point to pull the anchor tapes **22** outwardly from their normal positions there will not be a complete failure of support. This action can be compared to that of a line of mountain climbers connected together by a safety rope; if one slips, he will be prevented from falling more than a few feet by the safety rope.

In the prior application Ser. No. 201,376 an arrangement is disclosed and claimed for holding several elongated resilient safety pads, indicated generally by numeral **27,** in place over the frame **12** and springs which utilizes devices which engage with the rods **18** and the tubular frame member only, and such an arrangement is satisfactory for covering the ends of the trampoline although in the drawings the end pad has been omitted.

In the present application a sturdier arrangement is proposed for supporting the pads along the sides of the trampoline, and for this purpose the underside of the pads **27,** which may comprise a rigid base such as a sheet of plywood **28,** may have an elongated block **29,** attached thereto the width of which is such as to loosely fit between the inner and outer members **13** and **16** and whose length is such as to fit between a pair of cross members **17.** The thickness of the block should be sufficient to permit the surface **30** of one side to project downwardly at right angles to the base **28** and to abut against the outer periphery of tubular member **13** and for the opposite surface **31** to project angularly and outwardly downward below the horizontal mid plane of tubular member **16** and to abut against this member at a location below this mid plane, as shown in FIG. **2.** Such an arrangement will permit the pad to be put in position by placing the surface **31** in contact with the outer tube while the pad is held in a tilted condition, as shown in FIG. **7.** The pad is then lowered into the position shown in FIG. **2.** Further downward movement, in a clockwise direction, is prevented because the base **28** now rests on tube **13** and angled surface **31** of the block is wedged into contact with the lower portion of tube **16.**

As a precaution against accidental lifting of the pad, a metal plate **32,** having an elongated central slot **33** can be attached to the underside of the block **29,** as by means of a pair of wing nuts **34,** secured to bolts **35** which pass through the slot **33** and are anchored in the block. When the wing nuts are loosened, the plate can be slid back, as in FIG. **7,** to remove the pad.

Longitudinal movement of the pad along the frame can be prevented by making the block **29** long enough to loosely fit between the cross members **17** or, as shown in FIG. **4**, two short blocks can be used, each of which engages at one end with a separate cross member.

An alternate means for securing a pad is shown in FIGS. **8** and **9**, wherein a pair of heavy metal brackets **36** are attached by screws **37** to the base **28.** One end **38** of each bracket extends downwardly at right angles to abut against frame member **13**, while the other end **39** is curved to partially enclose the lower surface of frame member **16.** Insertion and removal of the pad is accomplished in the same manner as previously described.

I claim:

1. In a trampoline of the type comprising a flexible bed supported in horizontally stressed taut condition by a plurality of coil springs connected between an encircling metal frame means and the margins of the flexible bed by means of anchors whose respective ends are received in the loops of spaced pairs of tapes attached to the bed adjacent the margins thereof, the improvement which comprises said pairs of tapes being attached to the underside of said bed at locations spaced inwardly of the adjacent margin to position said anchors and the connected ends of the coil springs below the material comprising the bed and also inwardly of said margin, a distance sufficient for the margin of the bed to cover said anchors and the inner ends of said coils springs while exposing the remaining portions of the spring.

2. The invention according to claim **1** wherein said pairs of tapes are sewed to another elongated tape extending parallel with the marginal area of the bed, and said another tape is sewed to said bed.

3. The invention according to claim **2**, wherein said pairs of tapes are also sewed to said bed.

4. In a trampoline of the type wherein a flexible bed is supported by an encircling frame by means of a series of coil spring means connected in stressed condition between a series of short tapes secured at spaced intervals along the marginal areas of the bed and said frame, the improvement which consists of a plurality of first securing means respectively connecting each of said short tapes only to an elongated second tape extending along a margin of the bed, and second securing means to attach the second tape extending along the marginal area of the trampoline bed on the underside thereof and thereby to cover and protect said first securing means from exposure to forces acting from above said trampoline bed whereby a failure of the second securing means at a given location will not result in the complete loss of spring support at that location.

5. The invention according to claim **4**, wherein said second tape is sewed to said second tape and said second tape is sewed to said bed.

6. The invention according to claim **5**, wherein said first tapes are comparatively short in length, the first tape being doubled over at least once to form a closed loop at one end, the first tapes being disposed at right angles to the second tape.

7. The invention according to claim **6**, wherein said first tapes are also sewed to said bed.

8. The invention according to claim **7**, wherein said first tapes are secured between the second tape and said bed.

9. Method of attaching spring anchors to the margin of a trampoline bed comprising the steps of preparing a length of flexible tape to receive a plurality of metal anchors at spaced locations along the length of the tape, and securing said prepared tape to said trampoline bed adjacent a margin thereof.

10. The method according to claim **9** which includes the step of sewing said prepared tape to the bed.

11. The method according to claim **10** in which said preparing step includes the step of sewing a hem in the margin of the bed simultaneously with sewing said prepared tape to the bed.

12. The method according to claim **9** in which said preparing step includes the step of attaching a series of short lengths of doubled over tapes of said first tape at longitudinally spaced intervals thereof.

13. The method according to claim **12** in which said preparing step includes the step of sewing the short lengths of tape to the first tape.

14. The method according to claim **13** in which said preparing step includes the step of sewing the first tape to the bed after the short lengths have been sewed to the first tape.

15. The method according to claim **9** which includes the step of positioning said prepared tape inwardly from the edge of said adjacent margin a distance sufficient to allow the marginal area of the bed to cover said anchors and the ends of springs connected therewith.

16. The method according to claim **15** in which said preparing step includes the step of sewing short lengths of tape to the first tape at longitudinally spaced intervals to receive said anchors.

17. The method according to claim **16** in which said preparing step includes the steps of doubling over the short lengths of tape to form loops for the receipt of said anchors, and sewing said first tape to the bed.

18. The method according to claim **17** in which said preparing step includes the step of arranging pairs of said short lengths of tape to receive the respective ends of substantially straight anchors parallel to the length of the first tape.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,891,208
DATED : June 24, 1975
INVENTOR(S) : Bruce C. Sidlinger

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In column 6, lines 21-22, change "in which said preparing step" to --which--.

Signed and Sealed this

twenty-eight Day of *October 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks