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(54) **SECURITY SYSTEM**

SICHERHEITSSYSTEM

SYSTÈME DE SÉCURITÉ

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EP 3 568 545 B1

Description

TECHNICAL FIELD

[0001] The present invention relates to security a system according to claim 1; in particular, to security systems that impede intrusion to a particular restricted area.

[0002] The security system according to the invention has been devised to prevent movement and access to a particular area and in particular to modular security systems.

BACKGROUND ART

[0003] The following discussion of the background art is intended to facilitate an understanding of the present invention only. The discussion is not an acknowledgement or admission that any of the material referred to is or was part of the common general knowledge as at the priority date of the application.

[0004] Impeding access into restricted areas as well as crowd control is becoming not only popular but a necessity due to security concerns in places where it is expected that a relative large crowd will be gathering to enjoy outdoors a particular entertainment activity (such as a concert) or political rallies. These security systems are typically defined by fencing systems adapted to be assembled for their use at a particular event and disassembled once the event has finished. Fencing systems provide a single layer of defense permitting people to climb the fence or ram against the fence so as to push the fence over due to the little or no strength of these types of fencing systems. Thus, a fence system is no longer an effective security systems for providing security to a multitude of people assembled in a particular area.

[0005] Further, particular security systems have been installed in the cities due to the ongoing security threat of terrorist attacks that may be conducted in public places such as footpaths or pedestrian malls of cities using, for example, vehicles as weapons by driving the vehicles on footpaths or pedestrian malls and into the crowd. However, these current security systems not necessarily have the ability to stop these type of attacks.

[0006] For example, currently, security systems have been installed in cities intended to provide security in the public places of the cities. These security systems are based on locating concrete bollards, planter boxes and/or monuments at the points of entry and exit of the footpaths and pedestrian malls to impede access of cars or trucks into these areas that typically are occupied with people. However, these concrete bollards, planter boxes and monuments are arranged in a spaced apart relationship and thus they only impede access of vehicles of a particular size such as cars and trucks; however, access into the restricted areas via relative small cars or motorcycles is still possible.

[0007] Moreover, installation of a barrier using concrete bollards, planter boxes and/or monuments is expensive due to being relative heavy objects difficult to handle; thus, transportation to the particular public places requires large trucks; and once at site, heavy lifting equipment such as cranes is required for arranging the concrete bollards, planter boxes and monuments in the spaced apart arrangement to avoid intrusion of vehicles such as car or vehicles into public places bursting with pedestrians.

[0008] The CA2801810A1 discloses a barrier dispersal system embodying a fatiguing maze to separate prey from their animal predators. The system contains one or more continuous barriers encircling the enclosure grounds to restrict movement of prey and predators. The system contains maze layers of barrier elements/pieces positioned around the enclosed region and is included to cause physical fatigue by confusing and misleading predators as they attempt to navigate through the presented spatial learning task. Optional additional barrier pieces may be placed on either side of each opening within the concentric maze layers to convey egress directionality from the maze and to further prevent the involved organisms from encountering one another. The present invention dilutes breach rates by creating a maze diversion to decrease the chance of successful breaches through the solid barrier or barriers, consequently increasing the protection of prey.

[0009] The US2005284080A1 discloses a bastion including one or more free-standing structures for use in, for example, military applications and for force protection. The free-standing structures are made up of a plurality of pivotally interconnected fire resistant mesh covered wire panels and are filled with, for example, sand, crushed rock or granular materials.

[0010] US2003183814A1 discloses components, a system, and method of implementing the system, for controlling access and egress. In a preferred embodiment, the user's requirements are considered in providing a properly scaled barrier for such varied uses as security, safety, order, privacy, and discipline. In one embodiment, premanufactured panels and connectors are delivered to a site that has been properly prepared for installation of the system. Local materials may be used for the panels in some cases. The panels and connectors may be assembled quickly by unskilled labor and, in some embodiments, the barrier just as quickly dismantled or repaired as necessary. One embodiment may be used as a temporary or emergency solution to access control. Another embodiment may be used in a residential setting, providing storage in some installations. In all embodiments, accessories for enhancing effectiveness may be installed on or within the barrier.

[0011] US2006255326A1 discloses a fence module is adapted for installation without required anchoring buy providing a base frame and a plurality of upright supporting posts extending from the base frame. At least three fence sections extend between the supporting posts. A first fence section at a first extreme end of the fence module, a second fence section at a second extreme end of

the fence module, and a third fence section angularly positioned between the first and second fence sections. A pair of vibration sensing modules are used to detect intruders, one applied to the first fence section and a second applied to the third fence section, with the first fence section positioned on the secure end of the protected zone.

[0012] The EP3006650A1 discloses a netting device for producing a fence without posts intended to be erected on a support surface, along the longitudinal axis of the fence, said device comprising a set of panels in mesh made from rigid wires metallic or not, woven or welded, connecting elements for connecting said panels to each other and anchoring means allowing the fixing of the fence on the support surface. It is against this background that the present invention has been developed.

SUMMARY OF INVENTION

[0013] According to the invention there is provided a multi-layered security system according to claim 1, having an attack side, having an attack side adapted to receive a first attack from an intruder, the system comprising a plurality of layers of defense, the layers of defense being adapted for receiving the first attack and subsequent second attacks from the intruder, the plurality of layers being defined by at least one pair of barriers, wherein the pair of barriers are arranged in a spaced apart relationship with respect to each other, defining a second barrier comprising a passage located between the pair of first barriers.

[0014] The pair of barriers comprises a first barrier and third barrier located opposite with respect to each other defining the second barrier comprising the passage.

[0015] In particular arrangements, the spike barrier may be located adjacent any one of first, second, and third barriers.

[0016] Preferably, the first barrier defines the attack side of the security system.

[0017] Preferably, there is provided a spike barrier adjacent the first barrier such that a vehicle impacting the security system drives over the spike barrier prior impacting the first barrier.

[0018] The first barrier comprises a plurality of first panels arranged side by side.

[0019] Preferably, each first panel comprises a frame member comprising posts and noggins attached to each other and having at least one face covered with anti-climb mesh.

[0020] Preferably, each first panel comprises an outer face defining the attack side of the security system, and an inner face facing the second barrier.

[0021] Preferably, the outer face of each first panel is covered with anti-climb mesh.

[0022] The third barrier comprises a plurality of second panels arranged side by side.

[0023] Preferably, each second panel comprises an inner face facing the first barrier.

[0024] Preferably, each second panel comprises a frame member comprising posts and noggins attached to each other having at least one face covered with a mesh.

[0025] Preferably, the mesh comprises an anti-climb mesh.

[0026] Preferably, the inner face of each first panel facing each second panel is covered with a mesh.

[0027] Preferably, the mesh comprises an anti-climb mesh.

[0028] The security system further comprises first means for joining together adjacent first panels of the first barrier and second means for joining together adjacent second panels of the third barrier.

[0029] The security system further comprises third means for attaching in a spaced apart relationship the first and third barriers.

[0030] The security system further comprises a link bar comprising first means for joining together adjacent first panels, second means for joining together adjacent second panels and third means for attaching in a spaced apart relationship the first and third barriers.

[0031] Preferably, the link bar comprises first and second ends, and a bar joining together the first and second ends to define the third means for attaching in a spaced apart relationship the first and third barriers.

[0032] Preferably, the first end of the link bar comprises the first means for joining together adjacent first panels.

[0033] Preferably, the second end of the link bar comprises the second means for joining together adjacent second panels.

[0034] Preferably, the first means for joining together adjacent first panels comprise spigots extending from the first end of the link bar.

[0035] Preferably, the spigots are adapted to releasably receive the lower ends of posts of the adjacent first panels.

[0036] Preferably, the second means for joining together adjacent second panels comprise spigots extending from the second end of the link bar.

[0037] Preferably, the spigots are adapted to releasably receive the lower ends of posts of adjacent second panels.

[0038] Preferably, the upper end of the posts of the adjacent first panels are releasably joined together via first joiners.

[0039] Preferably, the upper end of the posts of the adjacent second panels are releasably joined together via second joiners.

[0040] Preferably, the first end of the link bar pivotally attaches the lower ends of adjacent first panels.

[0041] Preferably, the second end of the link bar pivotally attaches the lower ends of the posts of the adjacent second panels.

[0042] Preferably, the first joiners pivotally attach the upper ends of the posts of adjacent first panels.

[0043] Preferably, the second joiners pivotally attach the upper ends of the posts of adjacent second panels.

[0044] Preferably, each end of the link bar comprises an opening for receiving a stake to secure the link bar to the ground.

[0045] Preferably, the bar comprises W bars comprising flexible steel.

[0046] In a particular arrangement, the bar of the link bar is located at an elevated position defining a clearance between the surface on which the link bar rests and the bar.

[0047] Preferably, the link bar comprises a mat resting over the bar of the link bar.

[0048] Preferably, the security system comprises a plurality of link bars arranged in a spaced apart relationship with respect to each other for joining together pairs of first and second panels arranged opposite to each other for defining the security system.

[0049] In an arrangement, the link bar is adapted to provide support to a pair of either neighboring first panels or neighboring second panels.

[0050] Preferably, the first barrier comprises brace members, each brace member extending from a particular location of the posts of the first panels to the bar of a link bar.

[0051] Preferably, each link bar is adapted to attach the lower end of the brace member at different locations along the bar of the link bar for varying the inclination of the brace member.

[0052] Preferably, the upper end of each brace member is pivotally attached to a post of the panel.

[0053] Preferably, the security system is adapted to upgrade or downgrade the security level that the security system provides.

[0054] Preferably, at least the first panels are adapted to releasably receive security devices to upgrade or downgrade the security level that the security system provides.

[0055] Preferably, at least the first panels are adapted to releasably receive security devices to impede intruders from climbing over at least the first barrier.

[0056] Preferably, the security devices may comprise a razor blade wire assembly attached to support members attached to the upper end of the at least first panels.

[0057] Preferably, the security devices may comprise means to impede intruders from gaining support of parts of the security system during climbing of the at least one one first barrier.

[0058] Preferably, the means to impede intruders from gaining support comprises free-rolling rollers.

[0059] Preferably, each of the at least first panels comprises a pair of rollers.

[0060] Preferably, the rollers are rotatably attached to support members attached to the upper end of the at least first panels.

[0061] Preferably, there is provided a gap defined by the spacing between the upper end of at least the first panels and the rollers, the gap having a specific width to impede intruders from gaining support at the spacing between the roller and upper end during climbing of the barrier.

[0062] In an arrangement, there is provided a mesh portion over which the rollers will be located.

[0063] Preferably, the security devices may comprise vehicles barriers located adjacent the attack side of the first barrier.

[0064] Preferably, the vehicle barriers comprise modular vehicle barriers releasably attached adjacent the attack side of the barrier to upgrade or downgrade the security level that the barrier provides.

[0065] In another arrangement, there is provided an upper beam joining upper ends of first and second panels.

[0066] Preferably, there are provided a plurality of upper beams arranged in a spaced apart relationship with respect to each other along the security system.

[0067] In yet another arrangement, there is provided a roof structure mounted on the plurality of upper beams covering the passage.

[0068] Preferably, the roof structure comprises at least one spike barrier.

[0069] In a particular arrangement, the first barrier is be tilted forward a particular angle.

[0070] Preferably, the security system further comprises arches located at the upper end of the first and/or second panels.

[0071] In an alternative arrangement, the security system further comprises an assembly of wires extending between posts of first and/or second panels with each wire having a pulley at one of the post; wherein each pulley comprises portions of the wire wound around the axis of the pulley.

[0072] According to a second aspect which does not form part of the invention there is provided a link bar comprising first means for joining together adjacent first panels, second means for joining together adjacent second panels, and third means for attaching in a spaced apart relationship the first and third barriers for defining the security system in accordance with the first aspect of the invention.

[0073] Preferably, the link bar comprises first and second ends, and a bar joining together the first and second ends to define the third means for attaching in a spaced apart relationship the first and third barriers.

[0074] Preferably, the first end of the link bar comprises the first means for joining together adjacent first panels.

[0075] Preferably, the second end of the link bar comprises the second means for joining together adjacent second panels.

[0076] Preferably, the first means for joining together adjacent first panels comprise spigots extending from the first end of the link bar.

[0077] Preferably, the spigots are adapted to releasably receive the lower ends of posts of the adjacent first panels.

[0078] Preferably, the second means for joining together adjacent second panels comprise spigots extending from the second end of the link bar.

[0079] Preferably, the spigots are adapted to releasably receive the lower ends of posts of adjacent second panels.

[0080] Preferably, the upper end of the posts of the adjacent first panels are releasably joined together via first joiners.

[0081] Preferably, the upper end of the posts of the adjacent second panels are releasably joined together via second joiners.

[0082] Preferably, the first end of the link bar pivotally attaches the lower ends of adjacent first panels.

[0083] Preferably, the second end of the link bar pivotally attaches the lower ends of the posts of the adjacent second panels.

[0084] Preferably, the first joiners pivotally attach the upper ends of the posts of adjacent first panels.

[0085] Preferably, the second joiners pivotally attach the upper ends of the posts of adjacent second panels.

[0086] Preferably, each end of the link bar comprises at least one opening for receiving a stake to secure the link bar to the ground.

[0087] Preferably, the bar comprises W bars comprising flexible steel.

[0088] In a particular arrangement, the bar of the link bar is located at an elevated position defining a clearance between the surface on which the link bar rests and the bar.

[0089] Preferably, the link bar comprises a mat resting over the bar of the link bar.

[0090] According to a third aspect which does not form part of the invention there is provided a barrier for installation on a surface and having an attack side, the barrier comprising at least one panel and a plurality of link bars for maintaining the panel in an erected condition, wherein the link bar comprises first and second ends adapted to secure the link bar to the ground and a bar joining together the first and second ends, the first end of each link bar comprising the means for attaching the panel and maintain the panel in erected condition and the second end of each link bar being spaced apart from the first end.

[0091] Preferably, each of the first and second ends of each link bar comprises means to secure the link bar to the ground.

[0092] Preferably, each means to secure the link bar to the ground comprise at least one opening for receiving a stake to secure the link bar to the ground.

[0093] Preferably, each panel comprises a frame member comprising posts and noggins attached to each other having at least one face covered with anti-climb mesh.

[0094] Preferably, each panel comprises an outer face defining the attack side of the barrier.

[0095] Preferably, the outer face of each first panel is covered with anti-climb mesh.

[0096] According to a fourth aspect which does not form part of the invention there is provided a barrier for installation on a surface and having an attack side, the barrier comprising a plurality of panels arranged side by side and means for joining together adjacent panels, wherein the means for joining together adjacent panels comprise a plurality of link bars, each link bar comprising first and second ends adapted to secure the link bar to the ground, and a bar joining together the first and second ends, the first end of each link bar comprising means for joining together adjacent panels and the second end being spaced apart from the first end.

[0097] Preferably, each of the first and second ends comprises means to secure the link bar to the ground.

[0098] Preferably, each means to secure the link bar to the ground comprise at least one opening for receiving stakes to secure the link bar to the ground.

[0099] Preferably, the first end of the link bar comprises the first means for joining together adjacent panels.

[0100] Preferably, the first means for joining together adjacent panels comprise spigots extending from the first end of the link bar.

[0101] Preferably, the spigots are adapted to releasably receive the lower ends of posts of adjacent panels.

[0102] Preferably, the upper end of the posts of the adjacent panels are releasably joined together via joiners.

[0103] Preferably, the first end of the link bar pivotally attaches the lower ends of adjacent panels.

[0104] Preferably, the joiners pivotally attach the upper ends of the posts of adjacent panels.

[0105] Preferably, each panel comprises a frame member having at least one face covered with anti-climb mesh.

[0106] Preferably, each panel comprises an outer face defining the attack side of the barrier.

[0107] Preferably, the outer face of each first panel is covered with anti-climb mesh.

[0108] Preferably, the bar comprises W bars comprising flexible steel.

[0109] In a particular arrangement, the bar of the link bar is located at an elevated position defining a clearance between the surface on which the link bar rests and the bar.

[0110] Preferably, the link bar comprises a mat resting over the bar of the link bar.

[0111] Preferably, the barrier comprises brace members, each brace member extending from a particular location of the posts of the first panels to the bar of a link bar.

[0112] Preferably, each link bar is adapted to attach the lower end of the brace member at different locations along the bar of the link bar for varying the inclination of the brace member.

[0113] Preferably, the upper end of each brace member is pivotally attached to a post of the panel.

[0114] Preferably, the barrier is adapted to upgrade or downgrade the security level that the barrier provides.

[0115] Preferably, the barrier is adapted to releasably receive security devices to upgrade or downgrade the security level that the barrier provides.

[0116] Preferably, the barrier is adapted to releasably

receive security devices to impede intruders from climbing over the barrier.

[0117] Preferably, the security devices may comprise a razor blade wire assembly attached to support members attached to the upper end of the panels.

[0118] Preferably, the security devices may comprise means to impede intruders from gaining support of parts of the security system during trying to overcome the plurality of barriers.

[0119] Preferably, the means to impede intruders from gaining support comprises free-rolling rollers.

[0120] Preferably, each panel comprises a pair of rollers.

[0121] Preferably, the rollers are rotatably attached to support members attached to the upper end of the panels.

[0122] Preferably, there is provided a gap defined by the spacing between the upper end of the panels and the rollers, the gap having a specific width to impede intruders from gaining support at the spacing between the roller and upper end during climbing of the barrier.

[0123] In an arrangement, there is provided a mesh portion over which the rollers will be located.

[0124] Preferably, the security devices may comprise vehicles barriers located adjacent the attack side of the barrier.

[0125] Preferably, the vehicle barriers comprise modular vehicle barriers releasably attached adjacent the attack side of the barrier to upgrade or downgrade the security level that the barrier provides.

BRIEF DESCRIPTION OF THE DRAWINGS

[0126] Further features are more fully described in the following description of several non-limiting embodiments thereof. This description is included solely for the purposes of exemplifying the present invention. It should not be understood as a restriction on the broad summary, disclosure or description of the invention as defined by the appended claims. The description will be made with reference to the accompanying drawings in which:

Figure 1 is a top view of a particular arrangement of a security system in accordance with the invention;
Figure 2 is a front view of a first panel of the security system shown in figure 1;
Figure 3 is a side view of the first panel of the security system shown in figure 1;
Figure 4 is a front view of a second panel of the security system shown in figure 1;
Figure 5 is a side view of the second panel of the security system shown in figure 1;
Figure 6 is a front view of a link bar of the security system shown in figure 5;
Figure 7 is a top view of the link bar of the security system shown in figure 1;
Figure 8 is a side view of the link bar of the security system shown in figure 1;
Figure 8a is a side view of a stake for securing the link bar to the ground;
Figure 9 is a cross-sectional view of the security system along line 9-9' shown in figure 1;
Figure 10 is a front view of a section of the security system shown in figure 1 comprising the adjacent first panels;
Figure 11a is a front view of an upper joiner for joining adjacent panels of the first barrier of the security system shown in figure 1;
Figure 11b is a front view of an upper joiner for joining adjacent panels of the second barrier of the security system of the security system shown in figure 1;
Figure 12 is a top view of a particular section of the security system shown in figure 1 at an inflection point;
Figure 13 is a top view of one end of the link bar shown in figures 6 to 8;
Figure 14 is a cross-sectional view of another arrangement of a security system in accordance with the first embodiment of the invention;
Figures 15 is side view of an end of a link bar of the security system shown in figure 14;
Figure 16 is a detail of a side view of an alternative arrangement of the security system shown in figure 14;
Figure 17 is a side view of a brace member for reinforcing the barriers of the security system shown in figure 1;
Figure 18 is a front view of a particular panel including an entrance to provide access to the passage defined between the barriers of the security system shown in figure 1;
Figure 19 is a top view of a particular arrangement of a security system;
Figure 20 is a cross-sectional view of the security system along line 20-20' shown in figure 19; and
Figure 21 is a cross-sectional view of another arrangement of a security system.

[0127] It should be noted that the figures are schematic only and the location and disposition of the components can vary.

DESCRIPTION OF EMBODIMENT(S)

[0128] Figure 1 shows a particular arrangement of a security system 10 in accordance with the invention. Figure 19 shows a particular arrangement of a security system 10 in accordance with a second embodiment of the application.

[0129] The system 10 is adapted to impede intruders on foot from accessing a restricted area bound at least partially by the security system 10. In particular, the security system 10 comprises a multitude of barriers 12 configured to hinder any intruders on foot from overcoming the security system 10. The security system 10 is also adapted to impede any type of vehicles from access-

ing the restricted area in the event the vehicles may ram into the security system.

[0130] The system 10 permits incorporation of a plurality of security devices 58 and/or 60 (see figures 20 and 21) with the intention to adjust the level of security that the security system 10 can provide; this is particular useful in view that it is possible to, for example, upgrade or downgrade the level of security of the security system 10 depending on the particular security threat at a particular location where the security system 10 is installed.

[0131] As will be described below, the security system 10 permits attachment at particular locations of the barrier 12 of security devices 58 such as rollers 46 for impeding intruders from using the upper end of the panels 14 and 16 as support for climbing the barrier 12; alternatively, the barrier 12 may be fitted with razor blade wire assemblies at, for example, the upper end of the panels 14 and 16.

[0132] In an arrangement, the upper end of the panels 14 (and panel 16) are adapted to releasably receive the security devices 58 permitting, as mentioned before, upgrading or downgrading the level of security of the barrier 12. For example, if the security system 10 is to be used for controlling attendees of outdoor music festivals, the rollers 46 may be used for impeding the attendees to use the upper end of the panels 14 as support to climb the barrier 12 with the intention to access the festival.

[0133] Alternatively, razor blade wire assemblies may be installed onto the upper end of the panels 14 (and panel 16) in situations where greater security threats exist when compared to the security threats posted by the attendees of outdoor music festivals.

[0134] Further, the security system 12 may incorporate security devices 60 that impede, for example, vehicles from ramming against the barrier 12 of the security system 10. As will be described below, vehicles barriers such as spikes barriers or modular bollards such as bollards adapted to be selectively displaced between an operative condition and a retracted condition may be part of the security system 10.

[0135] The fact that the security system 10 comprises a multitude of barriers 12, is particularly advantageous because it permits the security system 10 to provide multiple layers of defense by using security devices 58 or 60 with the intention to gradually mitigate the attack as the intruder is overcoming each layer. In particular, as the intrusion progresses, the attacking power of the intruder is gradually reduced resulting in that the intrusion is slowed down until it is halted or turned back.

[0136] The system 10 shown in figure 1 comprises a multitude of barriers 12 located in a spaced arrangement with respect to each other. In the arrangement shown in figure 1, there is a first barrier 12a and a third barrier 12c spaced apart with respect to each other defining a second barrier 12b. The barrier 12a and 12c may be fence-like structures arranged opposite to each other defining a passage between the barriers 12a and 12c.

[0137] In alternative arrangements, there may be provided additional layers of defense. For example, vehicle barriers 60 (such as spike barriers or modular bollards) may located in front of the first barrier 12a defining the attack side of the security system 10. In the event of an attack by a vehicle, the spike barriers act as a first layer of defense puncturing the tyres of the vehicle prior or during the vehicle impacting the first barrier 12a; the modular bollards can stop the vehicles.

[0138] Further, other additional layers of defense to be incorporated in the security system 10 may be systems to impede personnel on foot to use the barriers as support for gaining access to the restricted area. As will be described later herein, the system 10 comprises layers of defense comprising anti-climb meshes as well as free-rolling rollers 46 impeding intruders on foot to climb any barriers 12 of the security system 10 by getting hold of any possible support structure being part of the security system 10. Razor blade wire assemblies may also incorporated as an additional layer of defense.

[0139] Moreover, in accordance with the invention, security systems 10 comprises a plurality of components adapted to be transported to the particular areas that require protection such as areas where entertainment activities like outdoor concerts or rallies will be held. At site, the components may be assembled relatively fast for erection of the security system 10. Once assembled, the security system 10 provides a fully interconnected single structure that may be moved or tilted only with the help of heavy lifting equipment; thus, a multitude of individuals or one or more vehicles ramping against the security system 10 will not be able to move or tilt the security system 10.

[0140] As mentioned before, the particular arrangement of security system 10 shown in the figures 1 to 18 comprises a first barrier 12a and a third barrier 12c spaced apart with respect to each other defining a second barrier 12b.

[0141] As shown in figure 1, each of the barriers 12a and 12c comprises, respectively, a plurality of panels 14 and 16. The panels 14 and 16 are arranged side by side to define, respectively, the barriers 12a and 12c.

[0142] Figure 2 shows the front of the panel 14a of the first barrier 12a. The panels 14 are typically located at the attack side of the security system 10.

[0143] Any panel 14 comprises a frame 18 defined by two spaced part posts 20 and three breams 22 extending between the posts 20 for joining the posts 20 together. The three beams 22 (also referred as noggins) are arranged in a spaced apart arrangement with respect to each other defining to neighboring voids 26a and 26b in the frame 18.

[0144] Further, the frame 18 is covered with anti-climb mesh 26 so as to define a surface adapted to hinder intruders on foot from climbing the panel 14 with the objective of overcoming the barrier 12a. (For illustration purposes figure 2 shows only particular portions of the frame 28 covered with anti-climb mesh 26; however, the mesh 26 covers the entire frame 18 of the panel 14). The mesh

26 is attached to the outer face of the panel 14 - the outer face is the face that defines the attack side of the security system 10. The attack side of the security system is the side where it is expected that the intruders will impact first.

[0145] Figure 4 shows the front side panel 16a of the third barrier 12c. The panels 16 are typically located behind a first barrier 12a. This third barrier 12c acts as an additional layer of defense. In alternative arrangements, more than two barriers 12 may be arranged in a tandem and spaced apart relationship.

[0146] The panel 16 comprises a frame 18 defined by two posts 20 spaced apart with respect to each other, and two beams 22 extending between the posts 20 for joining the post 20 together. The two beams 22 are arranged in a spaced apart arrangement with respect to each other defining one void 26 within the frame 18

[0147] Further, the frame 18 is covered with mesh 28 defining a fence-like structure impeding access to the restricted area. (For illustration purposes, figure 4 shows only particular portions of the frame 28 covered with mesh 28; however, the mesh 28 covers the entire frame 18 of the panel 16).

[0148] In a particular arrangement, the mesh 28 of the panels 16 may also comprise anti-climb mesh. The inner face (the face facing the first barrier 12a) comprises the mesh 28.

[0149] As mentioned before, the panels 14 are arranged sided by side defining the barrier 12a; and, the panels 16 are arranged side by side defining the barrier 12c. The barriers 12a and 12c are attached via link bars 30 so as to arrange the barriers 12a and 12c opposite to each other defining a second barrier 12b located between the first and third barriers 12a and 12c. The second barrier 12b defines a passage 13 that, as will be explained below, permits security officers to patrol the security systems 10.

[0150] As shown in figure 1, the link bars 30 are adapted to attach (1) pairs of panels 14 that are adjacent each other, (2) pairs of panels 16 that are adjacent each other and (3) pairs of panels 14 and 16 located opposite to each other.

[0151] Attachment of the panels 14 and 16 as described above occurs because the link bars 30 comprises two ends 32a and 32b that permit attaching the lower ends of the posts 20 of the panels 14 and 16. In particular, one end 32a of the link bar 30 attaches the lower end of posts 20 of neighboring panels 14 and another end 32b of the link bar 30 attaches the lower end of posts 20 of neighboring panels 16. The ends 32a and 32b due to being spaced apart permit arranging the panels 14 and 16 opposite to each other defining the passage 13 as is shown on figures 9 and 14.

[0152] Figures 6 to 8 show a particular arrangement of the link bar 30.

[0153] As shown in figure 6, the link bar 30 comprises the first end 32a and the second end 32b and that are spaced apart with respect to each other via a bar 34. The bar 34 permits arranging the panels 14 and 16 opposite to each other.

[0154] The link bar 30 is adapted to be secured to the terrain on which the security system 10 rests. For this, each end 32 comprises openings 31 to permit stakes 33 to traverse the ends 32 and penetrate the ground. The use of stakes 33 is particularly useful when using the security system 10 on surfaces comprising grass.

[0155] The link bar 30 also comprises a pair of plates 35 extending upwardly from the bar 34 of the link bar 30 and spaced apart with respect to each other. The plate 35 comprises openings 37 arranged in a spaced apart relationship with respect to each other. As will be described later with reference to figure 9, the plates 35 permits receiving between them the lower end of a brace member 38.

[0156] Further, in one arrangement, the bar 34 comprises one or more W bars 39 as shown in figure 8. The W bars 39 comprise flexible steel to allow adjusting the link bar 30 to any irregularities present on the ground. The W bars also remove the trip hazard when security officers are patrolling the passage 13.

[0157] Moreover, each end 32 comprises spigots 36 extending upwardly for receiving the lower ends of the post 20. Each end 32 comprises two neighboring spigots 36 that permit releasably attaching the lower ends of the posts 20 of the panels 14 adjacent to each other as well as of the panels 16 adjacent to each other to define, respectively, the barriers 12a and 12c.

[0158] The joint of the lower ends of the posts 20 with the spigots 36 is adapted to permit pivotal movement of the posts around the pin 36. As will be described later, this pivotal movement permits varying the trajectory of the security system 10 so as to for example define a security system 10 having a S-shaped configuration as shown in figure 1.

[0159] Further, the upper ends of the posts 20 of neighboring panels 14 or 16 are also releasably attached to each other; as shown in figures 10 and 11a and 11b, attachment occurs via a joiner 42 comprising neighboring spigots 44 for insertion into the upper ends of the poles 20. These joiners 42 are also adapted to permit releasable attachment and pivotal movement of the panels 14 or 16 as described above in relation to the joint of the lower end of the posts 20 and the pin 36 of the link bar 30.

[0160] Moreover, the link bars 30 may also be used as an additional defense layer. For example, as shown in figure 1, there are two link bars 30a and 30b having only one of its ends 32 attached to a panel 14 (or 16). This arrangement provides additional reinforcement to neighboring panels 14 (or 16) that are attached to each other via one of the ends 32 of the link bar 30.

[0161] Referring now to figure 9, figure 9 shows a cross section of the security system 10 along the line 9-9' shown in figure 1.

[0162] As mentioned before the barrier 12a in the particular arrangement shown in figure 1 defines the attack side of the security system 10a. The attack side is the side of the security system 10 that receives the initial

assaults. Thus, this particular barrier 12a requires reinforcement means so as to absorb as much energy as possible from the intruder's impact during the initial assault. By doing this, the intruder will be slowed down and most probably stopped at any subsequent layer of defense - for example: the passage 13 (the second layer 12b - also referred as the second barrier 12b) or the third layer 12c (also referred as the third barrier 12c).

[0163] As shown in figure 9, each panel 12 of the barrier 12a comprises a brace member 38 to provide additional reinforcement to the barrier 12a against impact. In a particular arrangement, there is a brace member 38 for each post 20 of each panel 4 of the barrier 12a.

[0164] The brace 38 as shown in figures 9 and 17 comprises a rod 40 extending diagonally from a particular location (such as an upper location) of the post 20 to a particular location at the bar 34 of the link bar 30. The angle of inclination of the rod 40 may for example depend on the particular uses that the security system 10 will be given. The angle of inclination of the brace 38 may be adjusted by attaching the lower end of the rod 40 to particular openings 37 of the plates 35. The upper end of the rod comprises a link 41 permitting attachment of the brace member 38 to the post 20 of the panel 14. The link 41 is adapted to pivotally attach the upper end of the brace member 38 so as to permit varying the angle of inclination of the brace member 38.

[0165] Moreover, it was mentioned before that the security system 10 in accordance with the invention comprise means to impede intruders from gaining support from parts of the security system 10 while trying to overcome the plurality of layers of defense.

[0166] In a particular arrangement, the security system may comprise free-rolling rollers impeding the intruders on foot to overcome the barrier 12a by getting hold of the upper end of the panels 12 in case the intruders successfully were able to climb the panel 12.

[0167] Figure 10 shows the front section of the barrier 12a comprising a roller arrangement 46 attached to the upper end of the panels 14.

[0168] The roller arrangement 46 comprises a plurality of cylinders 48 arranged side by side on the panels 14. In particular, each panel comprises a pair of rollers 48a and 48b. The rollers 48 are rotatably attached to support members attached to the upper end of the panels 14.

[0169] The rollers 48 are attached in a vertical manner on the upper end of the panels 14. There is a gap of 10 mm between each roller and the upper end of the panels 14 to remove a gripping joint. This arrangement allows for strength to the roller apparatus and additional height to the panel 14.

[0170] In a particular arrangement, there may be provided a mesh portion over which the rollers 48 will be located. This mesh portion impedes an intruder gaining access to the rollers 48 or the inner side of the panels 12 and thus, adding a further layer of defense.

[0171] Furthermore, the panels 14 are adapted to be attached to each other to follow a particular trajectory depending on the particular area that the security system 10 will provide protection to.

[0172] As shown in figure 1, the barriers 12a and 12c are arranged so as to define an S-shaped trajectory. In other arrangements, the barriers 12a and 12c may be arranged in a straight line, curved line, or a circular arrangement to fully surround a restricted area. This is accomplished via a joints adapted to pivotally attach the posts 20 of neighboring panels 14 (or 16). As mentioned before, (1) the lower end of the posts 20 of the neighboring panels 14 (or neighboring panels 16) are pivotally attached to the spigots 36 of the link bar 30, and (2) the upper ends of the post 20 of the neighboring panels 14 (or neighboring panels 16) are joined together via joiners 42 adapted to permit pivotal movement of the neighboring panels 14 (or neighboring panels 16).

[0173] The pivotal movement of the panels 12 or 16 allow for the arrangement of the barriers 12a and 12c not only to follow a straight line; but, the barriers 12a and 12c may undergo, as is shown in figure 1, 12 and 13 a change of direction by orienting the panels 14 (or 16) at angles other than 180°.

[0174] Referring now to figures 14 to 16, figures 14 to 16 show particular views of an alternative arrangement of the security system 10 according to the invention. The security system 10 according to this alternative arrangement comprises features that are similar to the security system 10 according to the first arrangement of barriers 12a and 12c shown in figures 1 to 13 and similar reference numerals are used to identify similar parts.

[0175] The security system 10 in accordance with the alternative arrangement comprises a link bar 30 adapted to account for any irregularities of the terrain on which the security system 10 is mounted; for this the link bar 30 comprises a bar 34 that is elevated when compared to the bar 34 of the link bar 30 of the first arrangement of the security system 10 described earlier and shown in figure 6.

[0176] As shown in figures 14 and 15, the ends 32 of the link bar 34 comprise plates 52 extending from the ends 32 upwardly for receiving the link bar 34. In this manner, the bar 34 of the link bar 30 is spaced apart a particular distance from the ground 37 on which the security system 10 rests defining a clearance 35 - see figure 15. This particular arrangement of link bar 30 accounts for any irregularities (such as rocks protruding upwardly from the ground 37) due to the presence clearance 35 between (a) the ground 37 on which the link bar 30 rests and (b) the bar 34. To include one or more of these particular arrangements of link bar 30 in the security system is particular useful for use when the security system 10 is installed on irregular terrain.

[0177] There may be provided a mat 54 for covering the bar 34 shown in figure 14. The mat 54 provides a flat surface with the objective of reducing the trip hazard created by the elevated bar 34 of the link bar 30 described in the earlier paragraph. Also, the mat 34, due to resting on the link bar 30, can enhance the stability of the security

system 10; this is particularly true in the particular circumstances where the mat 56 is relative heavy.

[0178] Further, as also shown in figure 14, there is provided an upper beam 54 joining the upper ends of the panels 14 and 16 of the barriers 12a and 12c. In particular arrangements there may be provided a plurality of upper beams 54 arranged in a spaced apart relationship with respect to each other along security system 10.

[0179] This particular arrangement of upper beams 54 keeps together the barriers 12a and 12c.

[0180] Further, in a particular arrangement of the previously described security systems 10, the first barrier 12a may be tilted forward a particular angle as is shown in figure 16 in connection with the alternative arrangement of the security system 10. Tilting the panel 14 of the barrier 12a increases the difficulty for an intruder to climb the barrier 12.

[0181] Further, other alternative arrangements of the security system 10 may comprise arches located at the upper end of, for example, the panels 14. The arches are arranged in such a manner that one side of the arch (the haunch of the arch) is attached to the upper end of the panels 14 or 16 and the other side of the arch is suspended spaced apart from the upper end of the panel 14 or 16. In this manner the concave surface of the arch is facing towards the surface on which the security system 10 is mounted. The presence of the arch increases the difficulty for an intruder to climb the barriers 12 due to having to overcome the arch one reaching the upper end of the panels 14 or 16.

[0182] Further, other alternative arrangements of the security system 10 may include, instead or in conjunction with the anti-climb meshes 26, an assembly of wires extending between the posts 20 of the panels 14 or 16 with a pulley at one post for each wire.

[0183] The pulley comprises portions of the wire wound around the axis of the pulley. This arrangement impedes the intruders from gaining support when trying to start climbing the panels 14 or 16 by grabbing the wires; this is because when a pulling force is applied to the wire, the pulley will be actioned resulting in that the wire will extend and thus not providing a viable support for climbing the panel 14 or 16.

[0184] In operation, once the security system 10 has been installed, the security system 10 impedes intruders on foot or in vehicles to enter the restricted areas bound by the security system 10.

[0185] As mentioned before, the system 10 comprises a multitude of layers of defense with the intention that each attack is gradually mitigated as the intruders overcome each of the defense layers; and, as the intrusion progresses, the resources of the intruders are reduced and consumed; this results in that intrusion is slowed down until it is halted or turned back.

[0186] In particular, the security system 10 shown in figure 1 comprises a plurality of barriers 12 that provide layers of defense for gradually reducing the action of intruders trying to gain access to the restricted area bound by the security system 12. For example, the security system 10 shown in figures comprises a first barrier 12a defining one or more layers of defense with intention to mitigate as much as possible the action of the intruders. In the circumstances where the intruder is able to overcome the first barrier 12a by for example successfully climbing the panels 14, the intruder enters into the passage 13. The passage 13 acts as another layer of defense allowing the security officers to patrol the security system 10 by walking along the passage 13. This allows controlling any intruder that has overcome the first barrier 12a. Authorised access to the passage 13 is accomplished by the use of secured entrances such as doors 50 (see figure 18) placed at regular intervals for permitting entrance of security officers into the passage 13 as well for removing any intruder that may have been able to enter the passage 13.

[0187] The third barrier 12c is adapted to impede the intruder from exiting the passage 13 by climbing the barrier 12c defined by the panels 16 - for example, the barrier 12c may also comprise layers of defense such as anti-climb mesh or arches.

[0188] Thus, the security system 10 in accordance with the invention provides a multi-layered barrier to impede access of intruders on foot or using motorised vehicles into restricted areas bounded by the security system 10.

[0189] Figures 19 to 21 show a particular arrangement of a security system 10 according to a second embodiment of the application. The security system 10 according to the second embodiment is similar to the security system 10 according to the first embodiment and similar reference numerals are used to identify similar parts.

[0190] The system 10 in accordance with the second embodiment of the application comprises a barrier 12 configured to hinder any intruders on foot from overcoming the security system 10. The security system 10 is also adapted to impede any type of vehicles from accessing the restricted area in the event the vehicles may ram into the security system.

[0191] The security system 10 according to a second embodiment of the application comprises one or more panels 14 to define the barrier 12.

[0192] In the particular arrangement shown in figures 19 to 21, each panel 14 comprises a panel 14 as described with reference to the invention comprising a frame 18 covered with anti-climb mesh 26 for impeding intruders from climbing the panels 14 to try to overcome the barrier 12.

[0193] In the present arrangement, the panels 14 are attached to each other to define the barrier 12. In particular, adjacent panels 14 (such as panels 14a and 14b shown in figure 19) are releasably and pivotally attached to each other via one of the ends 32b of the link bars 30. The other ends 32a, located at the other end of the bars 34 of the link bars 30, are spaced apart from the ends 32b.

[0194] As was described with reference to the invention, each link bar 30 is adapted to be secured to the terrain on which the security system 10 rests. For this,

each end 32 of the link bar 30 comprises openings 31 to permit stakes 33 to traverse the ends 32 and penetrate the ground - see figures 20 and 21. The use of stakes 33 is particularly useful when using the security system 10 on surfaces comprising grass.

[0195] In alternative arrangements, the link bars 30 may be attached to the ground by bracing them with concrete weighted footings.

[0196] Further, the link bars 30 rest on the ground on which the barrier is installed. The fact that each link bar 30 comprises a bar 34 extending away from the barrier 12 provides support to the barrier 12 impeding tilting of the barrier 12 by intruders pushing against the panels 14 defining the attack side of the barrier 12. The fact that each link bar 30 is attached to ground (for example, via stakes 33) aids in impeding intruders from moving and tilting the barrier 12. Spike barriers 60 may be located on the roof structure.

[0197] The particular arrangement of barrier 12 shown in figure 19 comprises the first arrangement of link bar 30 described with reference to figure 9 related to the first embodiment of the invention. Alternative arrangements of the barrier 12 according to a second embodiment of the invention may comprise the second arrangement of link bar 30 described with reference to figure 14 related to the invention.

[0198] Modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention as defined by the appended claims.

[0199] For example, in alternative arrangement, the security system 10 may comprise a roof type structure for protecting the second barrier 12b (the passage 13). The roof structure may be supported on the beams 54 that join the upper end of barriers 12a and 12b.

[0200] Throughout this specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

Claims

1. A multi-layered security system having an attack side adapted to receive a first attack from an intruder, the system comprising a plurality of layers of defense, the layers of defense being adapted for receiving the first attack and subsequent second attacks from the intruder, the plurality of layers being defined by a multitude of barriers (12) having at least first and third barriers, wherein the first barrier (12a) and third barrier (12c) are arranged in a spaced apart relationship with respect to each other defining a second barrier (12b) comprising a passage (13) located between the first and third barriers (12a and 12c), the first barrier (12a) comprises a plurality of first panels (14) arranged side by side and the third barrier (12c) comprises a plurality of second panels (16) arranged side by side, wherein the security system further comprises a link bar (30) comprising first means for joining together adjacent first panels (14) for defining the first barrier (12a), second means for joining together adjacent second panels (16) for defining the third barrier (12c), and third means for attaching the first and third barriers (12a and 12c) in a spaced apart relationship opposite to each other, **characterized in that** the passage allows a person to walk along the passage.

2. The multi-layered security system according to claim 1, wherein each of the first and/or second panels (14 and/or 16) comprises a frame (18) defining at least one face covered with anti-climb mesh, the frame (18) comprising posts (20) having lower ends and upper ends, and noggins (22), the posts (20) and noggins (22) being attached to each other.

3. The multi-layered security system according to claim 1 or 2, wherein the link bar (30) comprises first and second ends (32a and 32b), and a bar joining together the first and second ends (32a and 32b) defining the third means for attaching in a spaced apart relationship the first and third barriers (12a and 12c), the first end (32a) of the link bar (30) comprises the first means for joining together adjacent first panels (14) and the second end (32b) of the link bar (30) comprises the second means for joining together adjacent second panels (16).

4. The multi-layered security system according to claim 3, wherein the first and second means for joining together adjacent first and second panels (14 and 16) comprise spigots (36) extending from the first end (32a) and from the second end (32b) of the link bar (30) wherein the spigots (36) are adapted to releasably receive the lower ends of posts (20) of the adjacent first and second panels (14 and 16) and to pivotally attach the lower ends of posts (20) of the adjacent first and second panels (14 and 16) to the first and second ends (32a and 32b) of the link bar (30).

5. The multi-layered security system according to any one of claims 2 to 4, wherein the upper end of the posts (20) of the adjacent first panels (14) are releasably joined together via first joiners (42), and the upper end of the posts of the adjacent second panels are releasably joined together via second joiners (42).

6. The multi-layered security system according to any one of claims 3 to 5 wherein each first and second end (32a and 32b) of the link bar (30) comprises at least one opening for receiving a stake (33) to secure

the link bar (30) to the ground.

7. The multi-layered security system according to any one of claims 1 to 6, wherein the security system comprises a plurality of link bars (30) arranged in a spaced apart relationship with respect to each other for joining together pairs of first and second panels (14 and 16) defining the first and third barriers arranged (12a and 12c) opposite to each other.

8. The multi-layered security system according to any one of claims 1 to 6 wherein the link bar (30) is adapted to provide support to adjacent first panels (14) and/or to adjacent second panels (16).

9. The multi-layered security system according to any one of claims 2 to 8, wherein the first barrier (12a) comprises a plurality of brace members (38), the brace members (38) extending from a particular location of the posts (20) of the first panels (14) for attachment to the link bars (30) joining together adjacent first panels (14) defining the first barrier (12a), wherein the attachment may occur at different locations along the bar (34) of the link bar (30) for varying the inclination of the brace member (38).

10. The multi-layered security system according to any one of the preceding claims, wherein the security system is adapted to upgrade or downgrade the security level that the security system provides by at least one of the barriers (12a and 12c) being adapted to releasably receive security devices to upgrade or downgrade the security level that the barrier (12a or 12c) provides.

11. The multi-layered security system according to claim 10, wherein the security devices comprise free-rolling rollers to impede intruders from gaining support of parts of the security system during climbing of the at least one first barrier (14).

12. The multi-layered security system according to claim 11, wherein there is provided a gap defined by the spacing between the upper end of the at least one barrier and the rollers, the gap having a specific width to impede intruders from gaining support at the spacing between the rollers and the upper end of the first panel during climbing of the first barrier.

Patentansprüche

1. Mehrschichtiges Sicherheitssystem mit einer Angriffsseite, die zum Abfangen eines ersten Angriffs von einem Eindringling ausgebildet ist, wobei das System eine Vielzahl von Abwehrschichten aufweist, wobei die Abwehrschichten zum Abfangen des ersten Angriffs und darauffolgenden zweiten Angriffen von dem Eindringling ausgebildet sind, wobei die Vielzahl von Schichten durch eine Vielzahl von Barrieren (12) mit mindestens einer ersten und einer dritten Barrieren definiert werden, wobei die erste Barriere (12a) und die dritte Barriere (12c) in einer beabstandeten Beziehung zueinander angeordnet sind, wodurch eine zweite Barriere (12b) definiert wird, die einen sich zwischen der ersten und der dritten Barriere (12a und 12c) befindlichen Durchgang (13) aufweist, wobei die erste Barriere (12a) eine Vielzahl von ersten Platten (14) aufweist, die nebeneinander angeordnet sind, und die dritte Barriere (12c) eine Vielzahl von zweiten Platten (16) aufweist, die nebeneinander angeordnet sind,
wobei das Sicherheitssystem ferner eine Verbindungsstange (30) aufweist, die eine erste Einrichtung zum Zusammenfügen benachbarter erster Platten (14) zur Definition der ersten Barriere (12a), eine zweite Einrichtung zum Zusammenfügen benachbarter zweiter Platten (16) zur Definition der dritten Barriere (12c), und eine dritte Einrichtung aufweist zum Anbringen der ersten und der dritten Barriere (12a und 12c) gegenüberliegend in einer voneinander beabstandeten Beziehung, **dadurch gekennzeichnet, dass** der Durchgang einer Person ermöglicht, entlang des Durchgangs zu gehen.

2. Mehrschichtiges Sicherheitssystem nach Anspruch 1, wobei die erste und/oder die zweite Platte (14 und/oder 16) jeweils einen Rahmen (18) aufweist, der mindestens eine Fläche definiert, die mit Anti-Kletter-Netz bedeckt ist, wobei der Rahmen (18) Säulen (20) mit unteren Enden und oberen Enden und Riegel (22) aufweist, wobei die Säulen (20) und Riegel (22) aneinander befestigt sind.

3. Mehrschichtiges Sicherheitssystem nach Anspruch 1 oder 2, wobei die Verbindungsstange (30) ein erstes und ein zweites Ende (32a und 32b) und eine Stange aufweist, die das erste und das zweite Ende (32a und 32b) miteinander verbindet, wodurch die dritte Einrichtung definiert wird, um die erste und die dritte Barriere (12a und 12c) in einer voneinander beabstandeten Beziehung anzubringen, wobei das erste Ende (32a) der Verbindungsstange (30) die erste Einrichtung zum Zusammenfügen benachbarter erster Platten (14) aufweist und das zweite Ende (32b) der Verbindungsstange (30) die zweite Einrichtung zum Zusammenfügen benachbarter zweiter Platten (16) aufweist.

4. Mehrschichtiges Sicherheitssystem nach Anspruch 3, wobei die erste und die zweite Einrichtung zum Zusammenfügen benachbarter erster und zweiter Platten (14 und 16) Steckzapfen (36) aufweisen, die sich von dem ersten Ende (32a) und von dem zweiten Ende (32b) der Verbindungsstange (30) aus erstrecken, wobei die Steckzapfen (36) dazu ausge-

bildet sind, die unteren Enden der Säulen (20) der benachbarten erste und zweiten Platten (14 und 16) lösbar aufzunehmen und die unteren Enden der Säulen (20) der benachbarten ersten und zweiten Platten (14 und 16) schwenkbar an dem ersten und zweiten Ende (32a und 32b) der Verbindungsstange (30) anzubringen.

5. Mehrschichtiges Sicherheitssystem nach einem der Ansprüche 2 bis 4, wobei die oberen Enden der Säulen (20) der benachbarten ersten Platten (14) über erste Verbinder (42) lösbar zusammengefügt sind, und die oberen Ende der Säulen der benachbarten zweiten Platten über zweite Verbinder (42) lösbar zusammengefügt sind.

6. Mehrschichtiges Sicherheitssystem nach einem der Ansprüche 3 bis 5, wobei das erste und das zweite Ende (32a und 32b) der Verbindungsstange (30) jeweils mindestens eine Öffnung zur Aufnahme eines Pfahls (33) aufweisen, um die Verbindungsstange (30) am Boden zu befestigen.

7. Mehrschichtiges Sicherheitssystem nach einem der Ansprüche 1 bis 6, wobei das Sicherheitssystem eine Vielzahl von Verbindungsstange (30) aufweist, die in einer beabstandeten Beziehung zueinander angeordnet sind, um Paare von ersten und zweiten Platten (14 und 16) zusammenzufügen, welche die erste und die dritte Barriere (12a und 12c) definieren, die gegenüberliegend zueinander angeordnet sind.

8. Mehrschichtiges Sicherheitssystem nach einem der Ansprüche 1 bis 6, wobei die Verbindungsstange (30) dazu ausgebildet ist, benachbarten ersten Platten (14) und/oder benachbarten zweiten Platten (16) Halt zu bieten.

9. Mehrschichtiges Sicherheitssystem nach einem der Ansprüche 2 bis 8, wobei die erste Barriere (12a) eine Vielzahl von Stützbalkenelementen (38) aufweist, wobei sich die Stützbalkenelemente (38) von einer bestimmten Stelle der Säulen (20) der ersten Platte (14) aus erstrecken, um an den Verbindungsstangen (30) angebracht zu werden, die benachbarte erste Platten (14) zusammenfügen, wodurch die erste Barriere (12a) definiert wird, wobei die Anbringung an verschiedenen Stellen entlang der Stange (34) der Verbindungsstange (30) erfolgen kann, um die Neigung des Stützbalkenelements (38) zu variieren.

10. Mehrschichtiges Sicherheitssystem nach einem der vorstehenden Ansprüche, wobei das Sicherheitssystem dazu ausgebildet ist, die Sicherheitsstufe zu erhöhen oder zu verringern, die das Sicherheitssystem bietet, indem mindestens eine der Barrieren (12a und 12c) dazu ausgebildet ist, die Sicherheitsvorrichtungen lösbar aufzunehmen, um die von der Barriere (12a oder 12c) gebotene Sicherheitsstufe zu erhöhen oder zu verringern.

11. Mehrschichtiges Sicherheitssystem nach Anspruch 10, wobei die Sicherheitsvorrichtungen freirollende Rollen aufweist, um zu verhindern, das sich Eindringlinge beim Klettern über die mindestens einen ersten Barriere (14) an Teilen des Sicherheitssystems abstützen können.

12. Mehrschichtiges Sicherheitssystem nach Anspruch 11, wobei ein Spalt vorgesehen ist, der durch den Abstand zwischen dem oberen Ende und der mindestens einen Barriere und den Rollen definiert wird, wobei der Spalt eine bestimmte Breite aufweist, um zu verhindern, dass sich Eindringlinge beim Klettern über die erste Barriere am Abstand zwischen den Rollen und dem oberen Ende der ersten Platte abstützen können.

Revendications

1. Système de sécurité multicouche ayant un côté d'attaque conçu pour recevoir une première attaque d'un intrus, le système comprenant une pluralité de couches de défense, les couches de défense étant conçues pour recevoir la première attaque et les secondes attaques ultérieures de l'intrus, la pluralité de couches étant définies par une multitude de barrières (12) ayant au moins des première et troisième barrières, dans lequel la première barrière (12a) et la troisième barrière (12c) sont disposées dans une relation espacée l'une par rapport à l'autre, définissant une deuxième barrière (12b) comprenant un passage (13) situé entre les première et troisième barrières (12a et 12c), la première barrière (12a) comprend une pluralité de premiers panneaux (14) disposés côte à côte et la troisième barrière (12c) comprend une pluralité de seconds panneaux (16) disposés côte à côte,
dans lequel le système de sécurité comprend en outre une barre de liaison (30) comprenant un premier moyen destiné à joindre ensemble de premiers panneaux (14) adjacents afin de définir la première barrière (12a), un deuxième moyen destiné à joindre ensemble de seconds panneaux (16) adjacents afin de définir la troisième barrière (12c), et un troisième moyen destiné à fixer les première et troisième barrières (12a et 12c) dans une relation espacée opposée l'une à l'autre, **caractérisé en ce que** le passage permet à une personne de marcher le long du passage.

2. Système de sécurité multicouche selon la revendication 1, dans lequel chacun des premiers et/ou seconds panneaux (14 et/ou 16) comprend un cadre

(18) définissant au moins une face recouverte d'un treillis anti-montée, le cadre (18) comprenant des poteaux (20) ayant des extrémités inférieures et des extrémités supérieures, et des caboches (22), les poteaux (20) et les caboches (22) étant fixés l'un à l'autre.

3. Système de sécurité multicouche selon la revendication 1 ou 2, dans lequel la barre de liaison (30) comprend des première et seconde extrémités (32a et 32b), et une barre joignant ensemble les première et seconde extrémités (32a et 32b) définissant le troisième moyen destiné à fixer dans une relation espacée les première et troisième barrières (12a et 12c), la première extrémité (32a) de la barre de liaison (30) comprend le premier moyen destiné à joindre ensemble de premiers panneaux (14) adjacents et la seconde extrémité (32b) de la barre de liaison (30) comprend le deuxième moyen destiné à joindre ensemble de seconds panneaux (16) adjacents.

4. Système de sécurité multicouche selon la revendication 3, dans lequel les premier et deuxième moyens destinés à joindre ensemble de premiers et seconds panneaux (14 et 16) adjacents comprennent des ergots (36) s'étendant à partir de la première extrémité (32a) et de la seconde extrémité (32b) de la barre de liaison (30), dans lequel les ergots (36) sont conçus pour recevoir de manière libérable les extrémités inférieures des poteaux (20) des premiers et seconds panneaux (14 et 16) adjacents et pour fixer de manière pivotante les extrémités inférieures des poteaux (20) des premiers et seconds panneaux (14 et 16) adjacents aux première et seconde extrémités (32a et 32b) de la barre de liaison (30).

5. Système de sécurité multicouche selon l'une quelconque des revendications 2 à 4, dans lequel l'extrémité supérieure des poteaux (20) des premiers panneaux (14) adjacents est jointe ensemble de manière libérable par l'intermédiaire de premiers éléments de jonction (42), et l'extrémité supérieure des poteaux des seconds panneaux adjacents est jointe ensemble de manière libérable par l'intermédiaire de seconds éléments de jonction (42).

6. Système de sécurité multicouche selon l'une quelconque des revendications 3 à 5 dans lequel chaque première et seconde extrémité (32a et 32b) de la barre de liaison (30) comprend au moins une ouverture destinée à recevoir un piquet (33) afin de fixer la barre de liaison (30) au sol.

7. Système de sécurité multicouche selon l'une quelconque des revendications 1 à 6, dans lequel le système de sécurité comprend une pluralité de barres de liaison (30) disposées dans une relation espacée l'une par rapport à l'autre destinées à joindre ensemble des paires de premiers et seconds panneaux (14 et 16) définissant les première et troisième barrières (12a et 12c) disposées à l'opposé l'une de l'autre.

8. Système de sécurité multicouche selon l'une quelconque des revendications 1 à 6, dans lequel la barre de liaison (30) est conçue pour fournir un support aux premiers panneaux (14) adjacents et/ou aux seconds panneaux (16) adjacents.

9. Système de sécurité multicouche selon l'une quelconque des revendications 2 à 8, dans lequel la première barrière (12a) comprend une pluralité d'éléments de renfort (38), les éléments de renfort (38) s'étendant à partir d'un emplacement particulier des poteaux (20) des premiers panneaux (14) pour la fixation aux barres de liaison (30) joignant ensemble les premiers panneaux (14) adjacents définissant la première barrière (12a), dans lequel la fixation peut se produire au niveau de différents emplacements le long de la barre (34) de la barre de liaison (30) pour faire varier l'inclinaison de l'élément de renfort (38).

10. Système de sécurité multicouche selon l'une quelconque des revendications précédentes, dans lequel le système de sécurité est conçu pour augmenter ou diminuer le niveau de sécurité que le système de sécurité fournit par au moins l'une des barrières (12a et 12c) conçues pour recevoir de manière libérable des dispositifs de sécurité afin d'augmenter ou diminuer le niveau de sécurité que la barrière (12a ou 12c) fournit.

11. Système de sécurité multicouche selon la revendication 10, dans lequel les dispositifs de sécurité comprennent des rouleaux à roulement libre pour empêcher des intrus de prendre appui sur des parties du système de sécurité pendant la montée de l'au moins une première barrière (14).

12. Système de sécurité multicouche selon la revendication 11, dans lequel il est prévu un espace défini par l'espacement entre l'extrémité supérieure de l'au moins une barrière et les rouleaux, l'espace ayant une largeur spécifique pour empêcher des intrus de prendre appui sur l'espacement entre les rouleaux et l'extrémité supérieure du premier panneau pendant la montée de la première barrière.

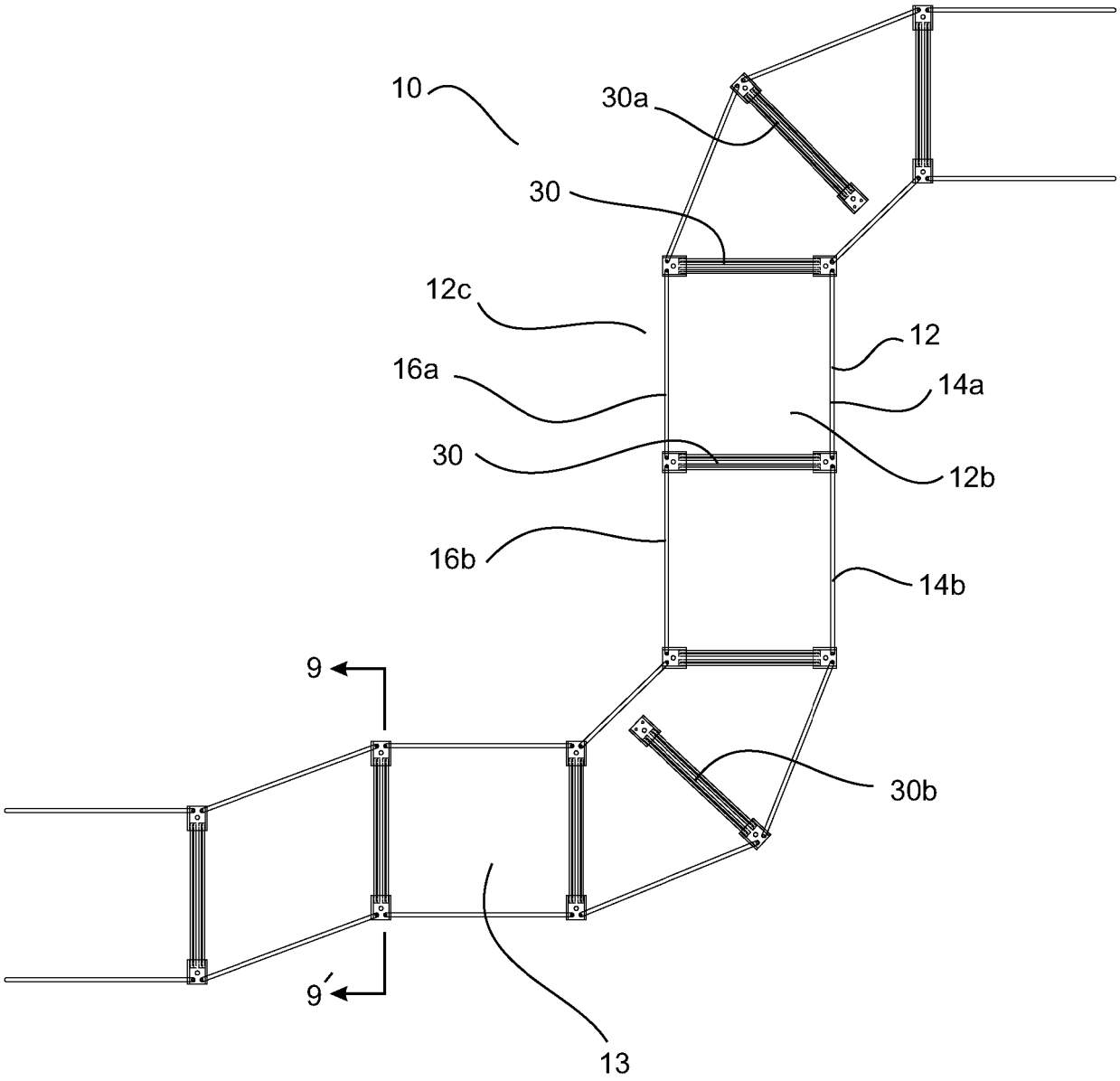

Fig. 1

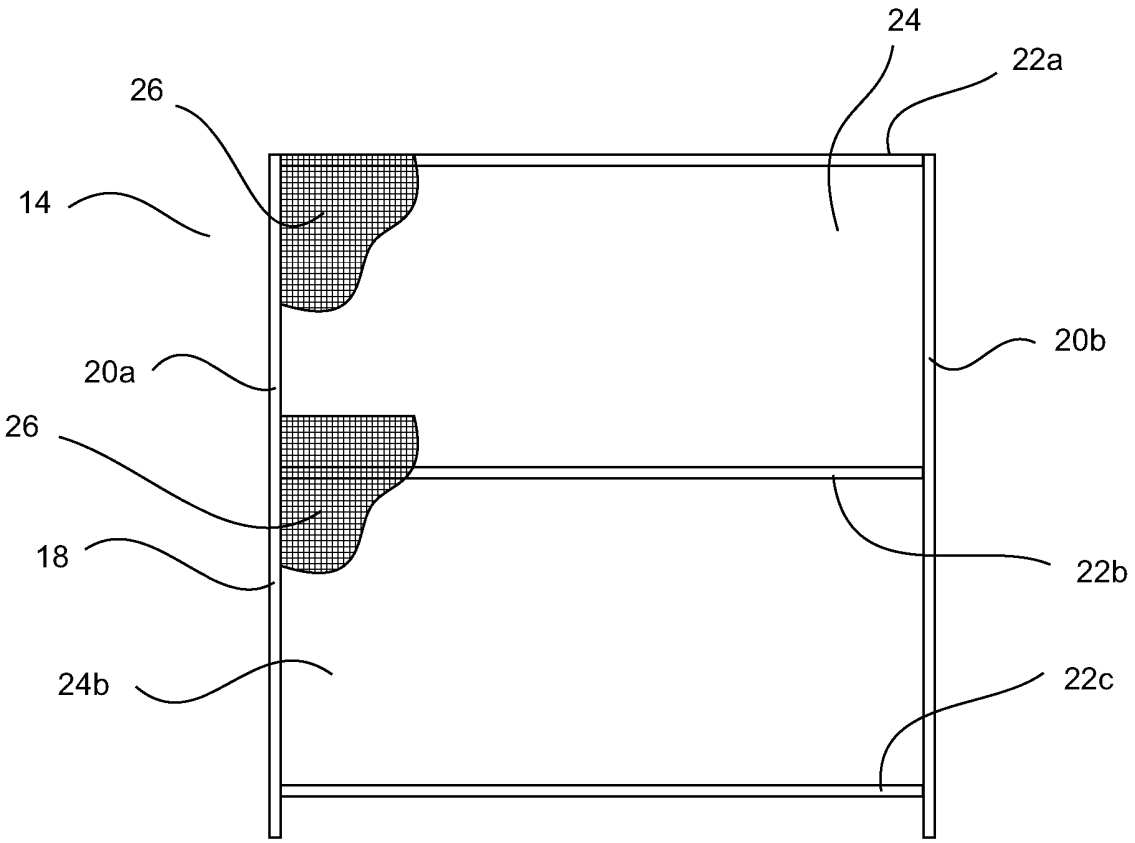

Fig. 2

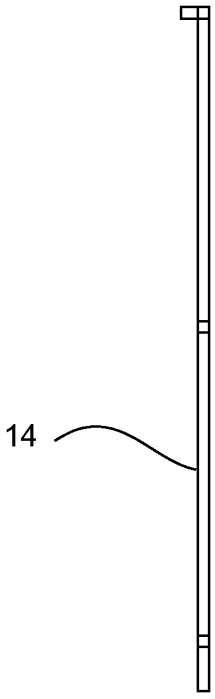

Fig. 3

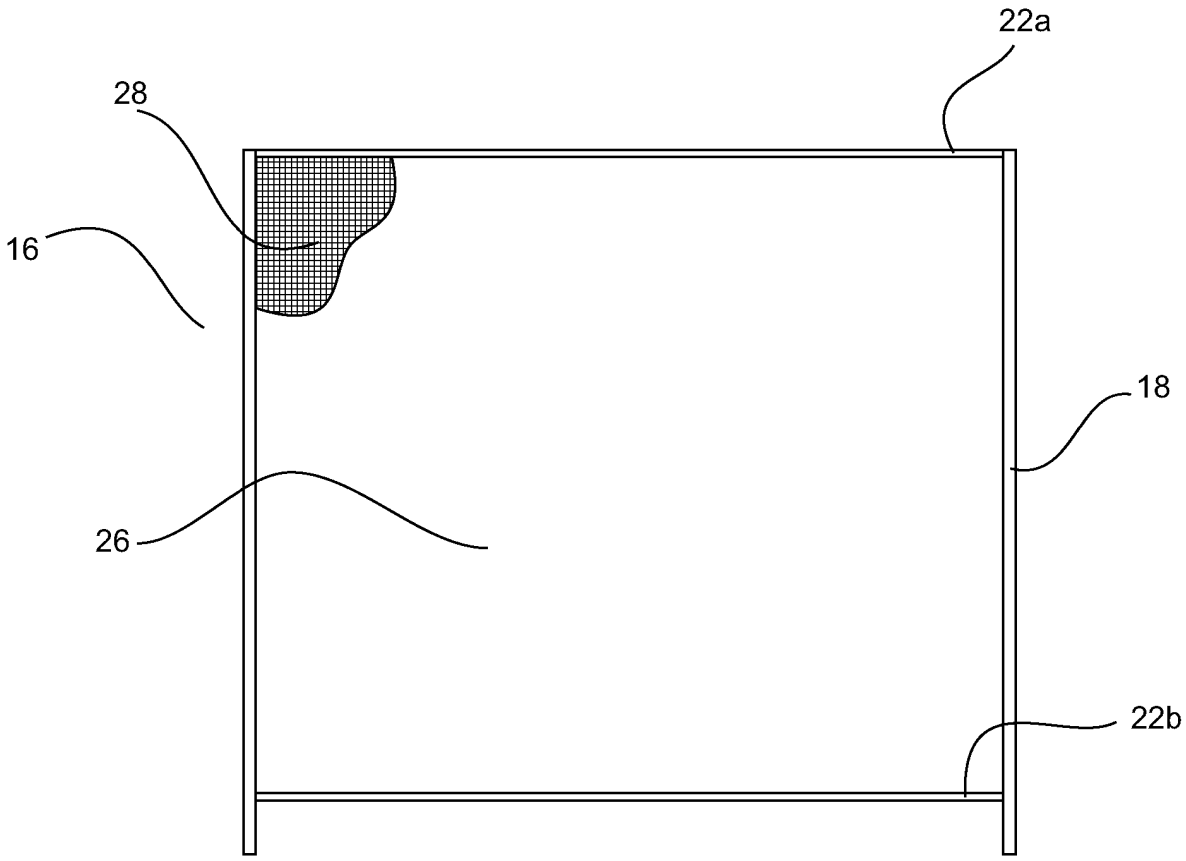

Fig. 4

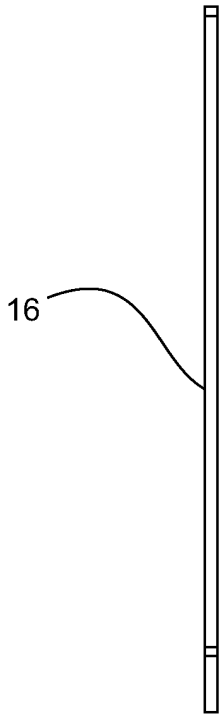

Fig. 5

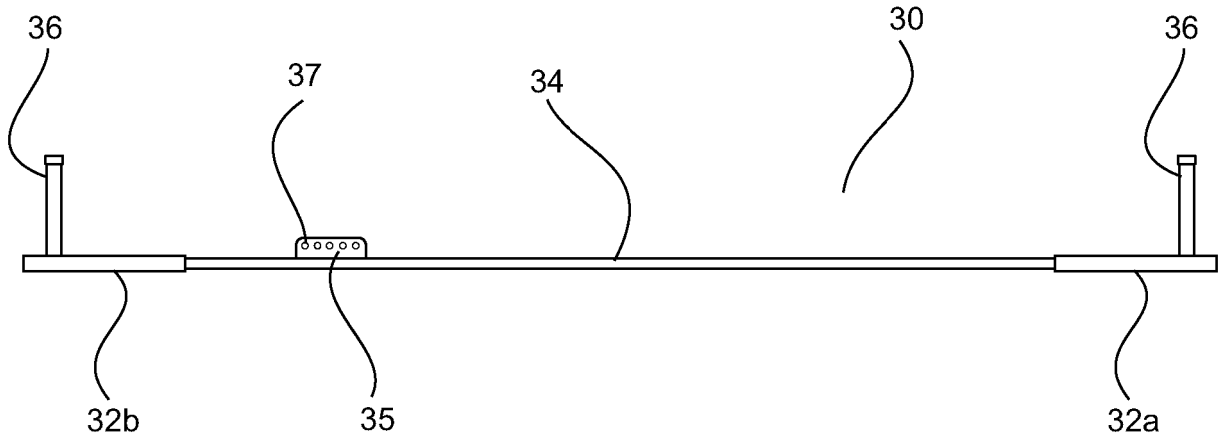

Fig. 6

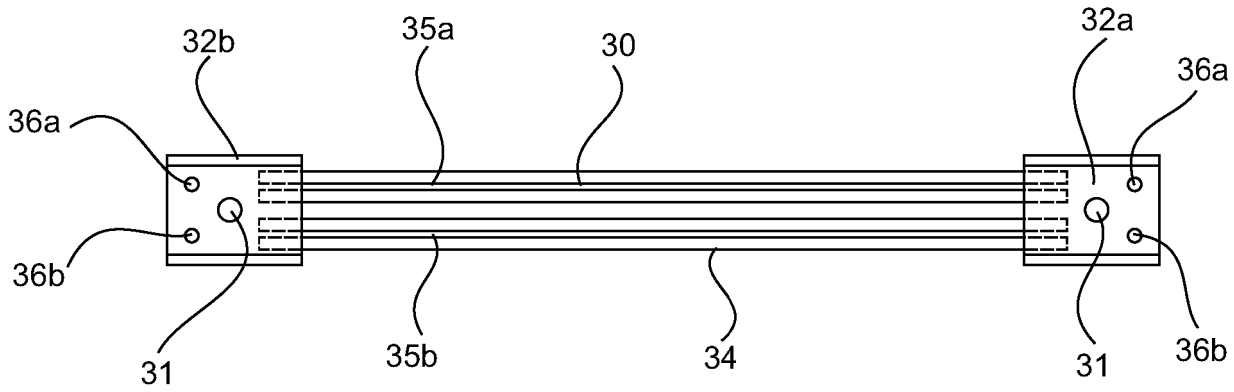

Fig. 7

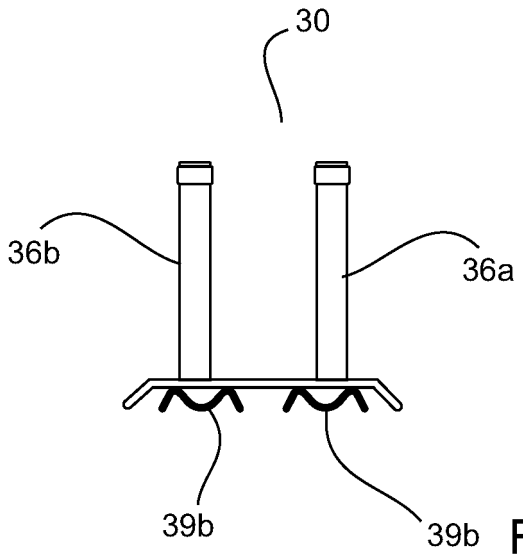

Fig. 8

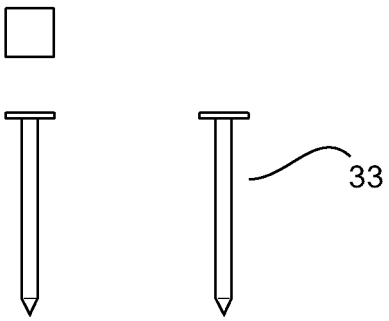

Fig. 8a

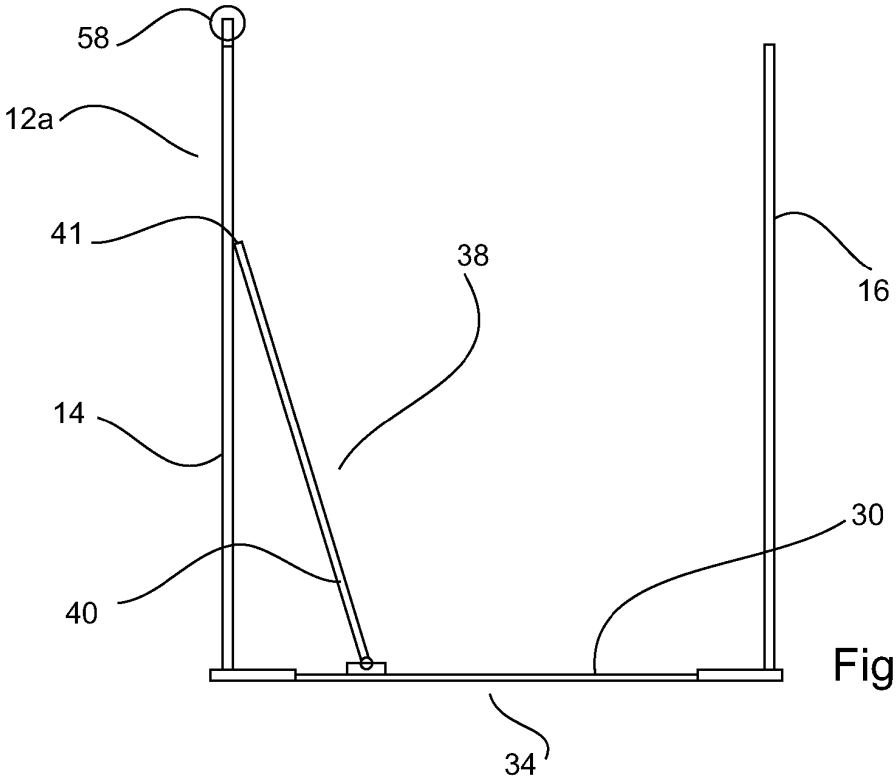

Fig. 9

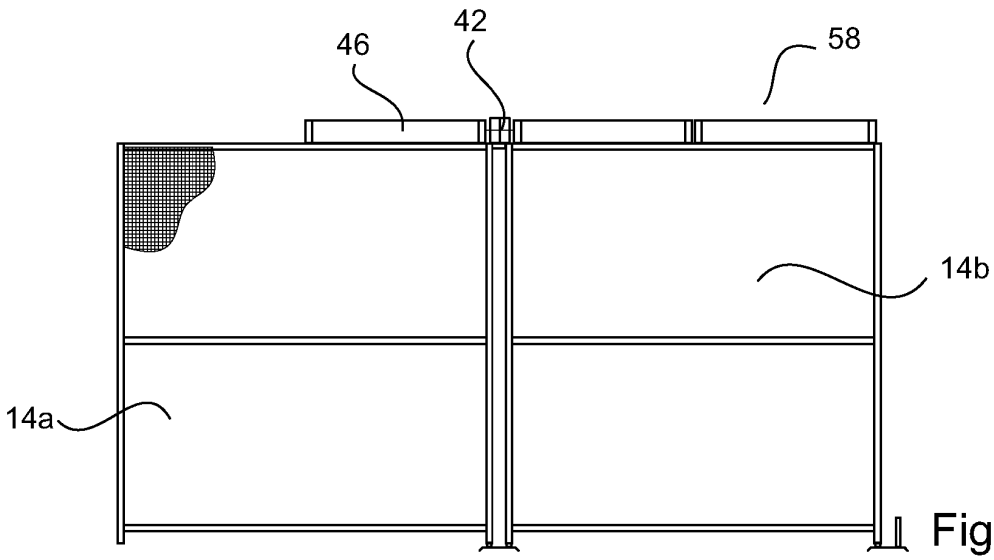

Fig. 10

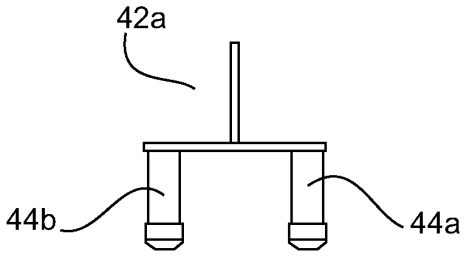

Fig. 11a

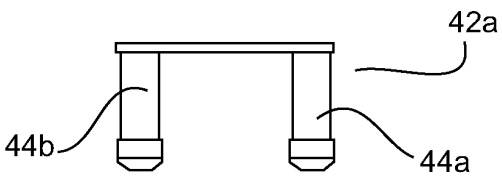

Fig. 11b

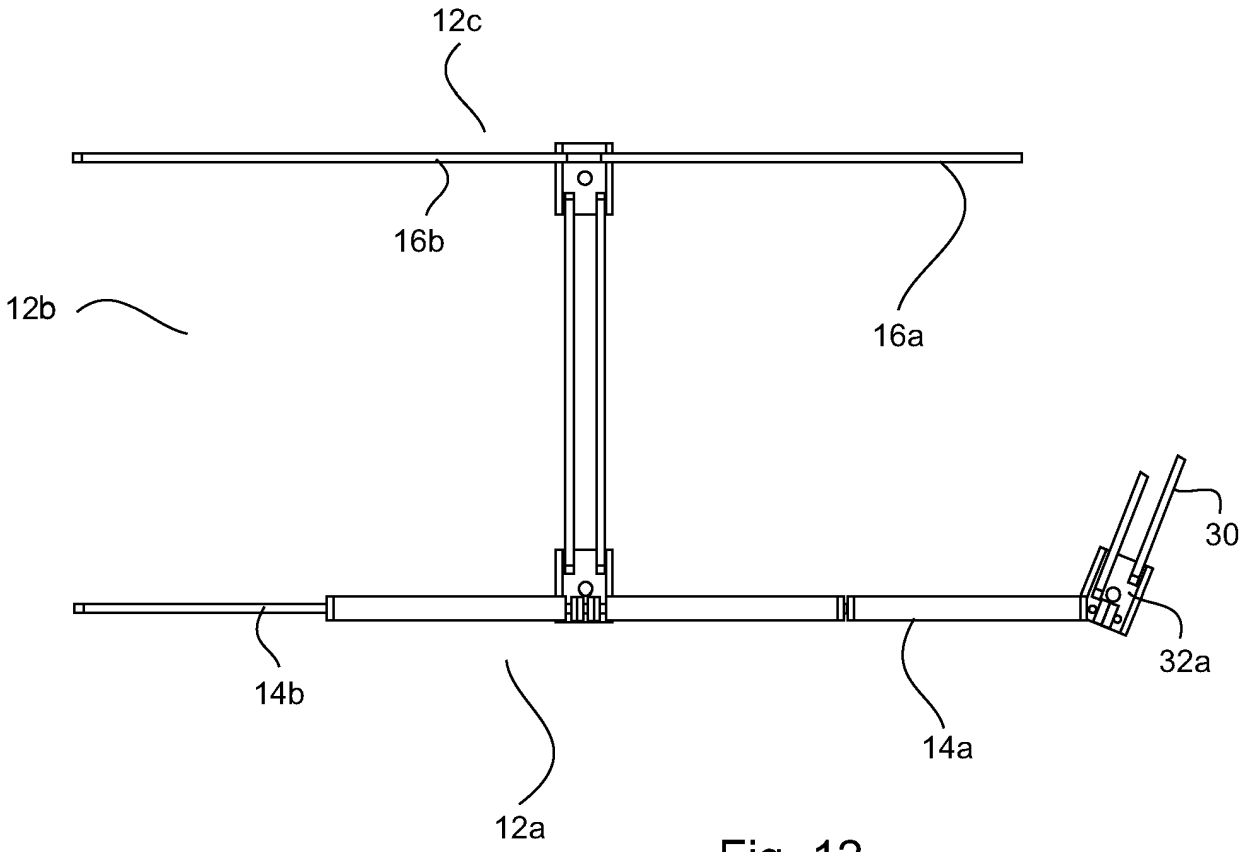

Fig. 12

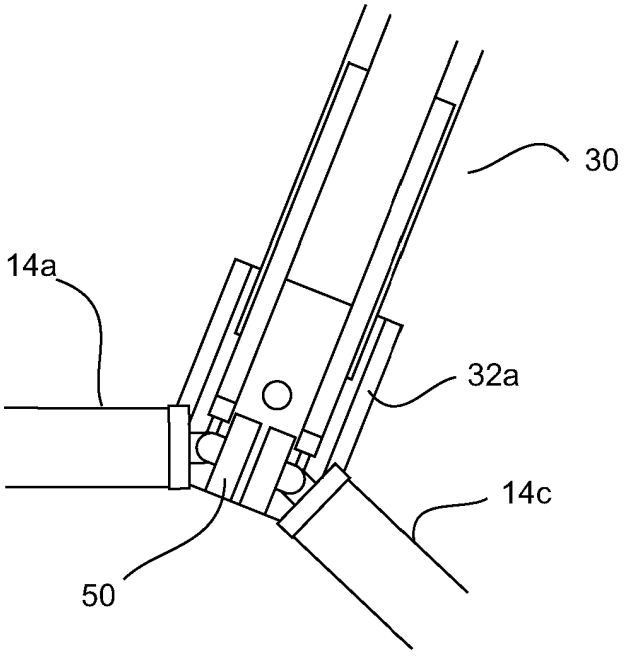

Fig. 13

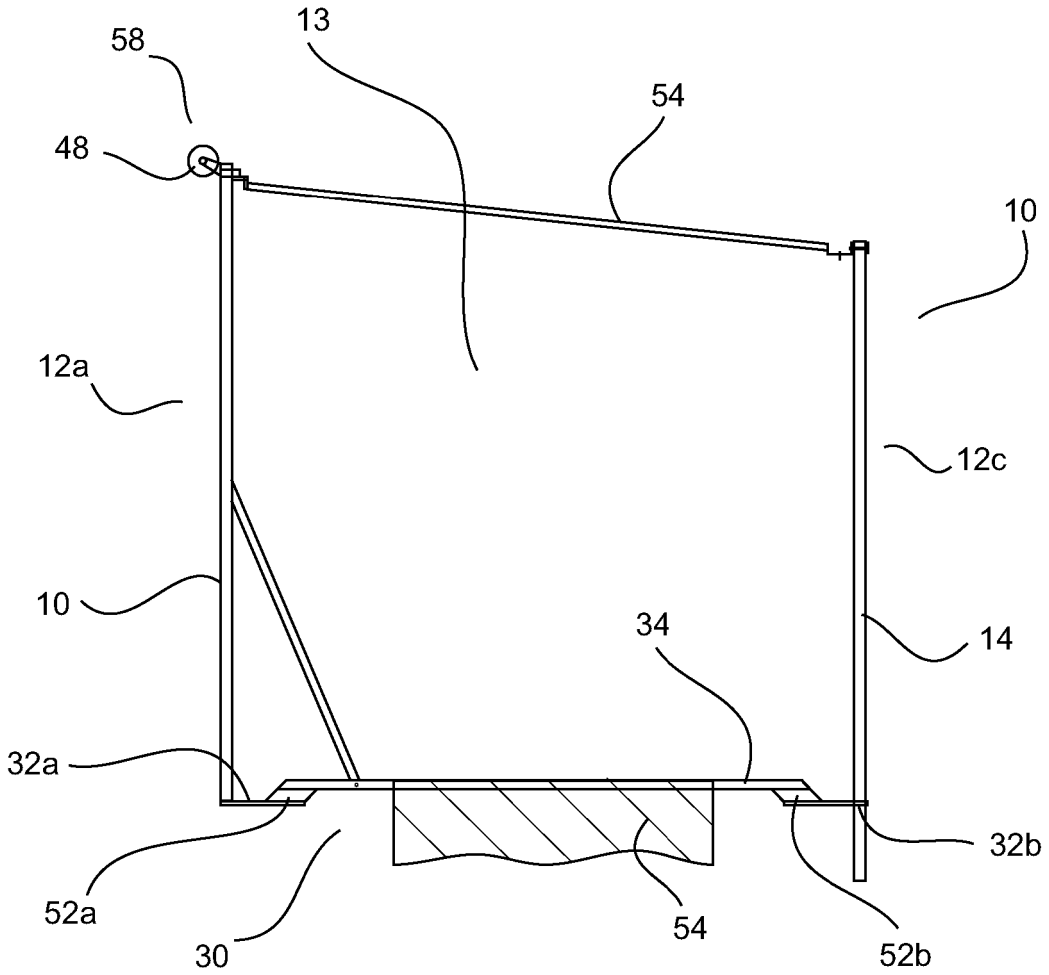
58
13
54
48
10
12a
12c
10
34
14
32a
32b
52a
54
30
52b

Fig. 14

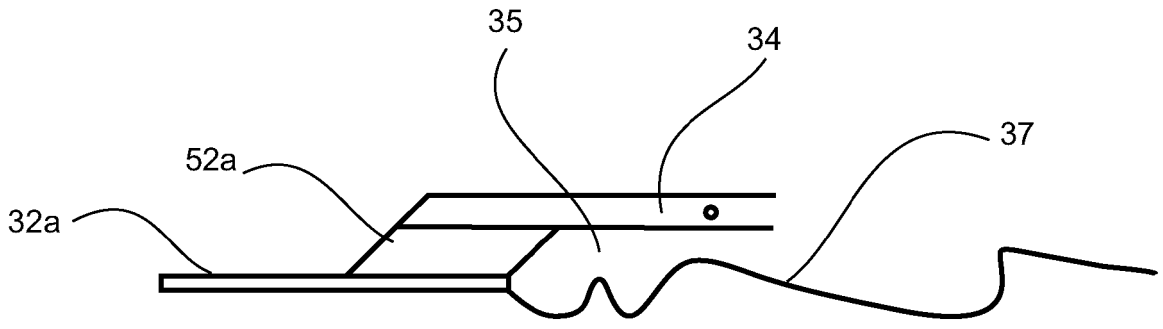
35
34
37
52a
32a

Fig. 15

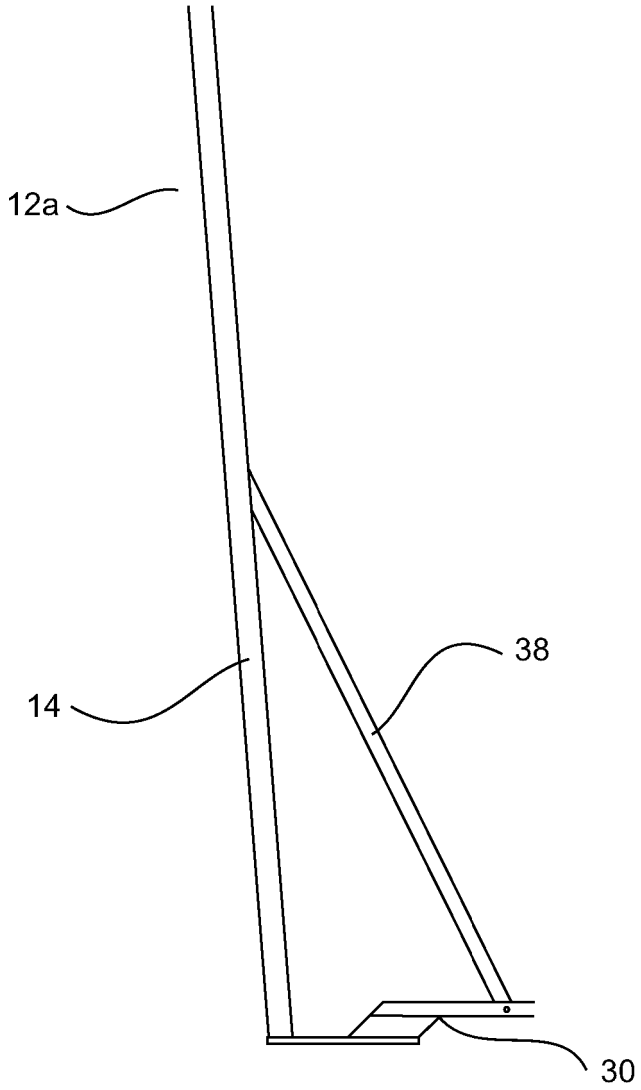

Fig. 16

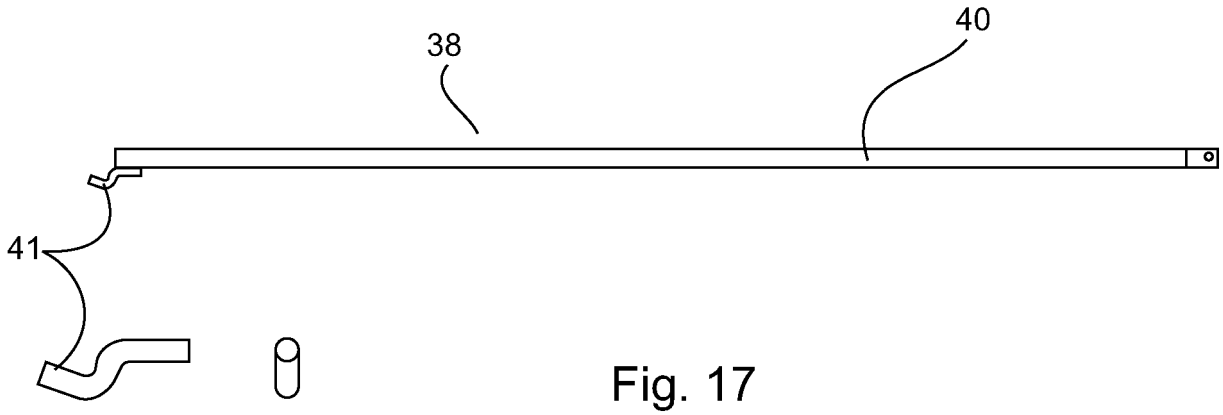

Fig. 17

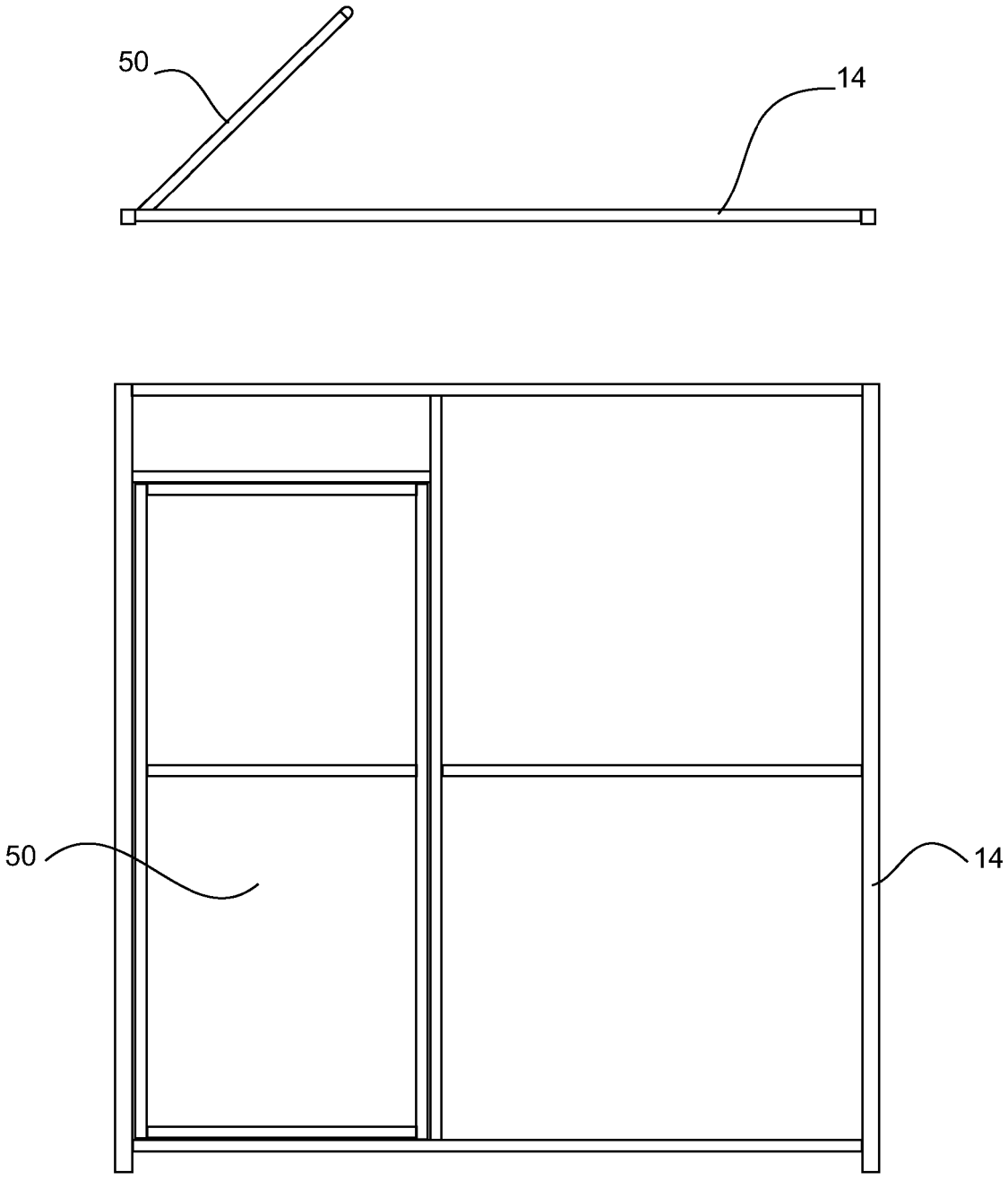

Fig. 18

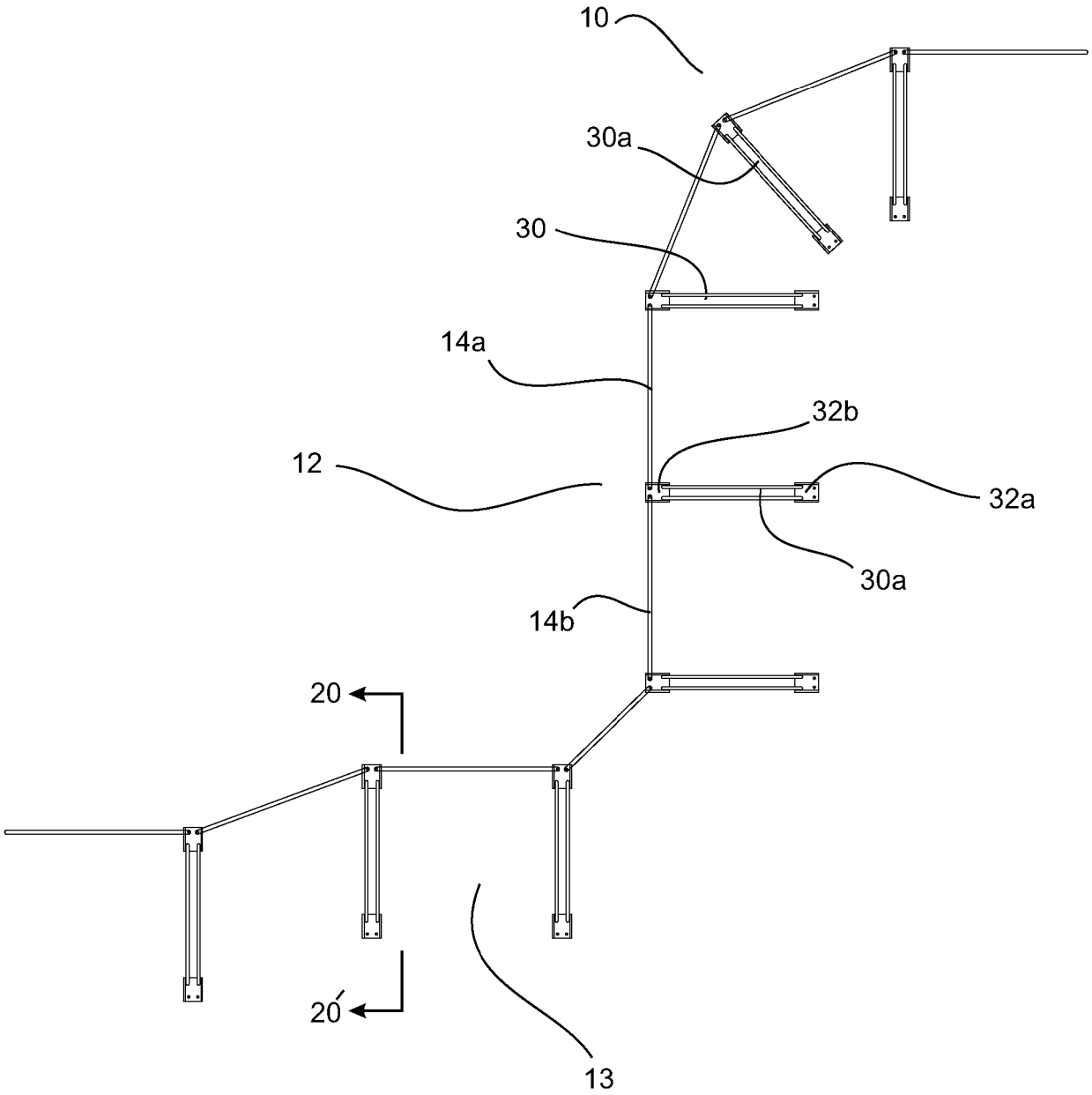

Fig. 19

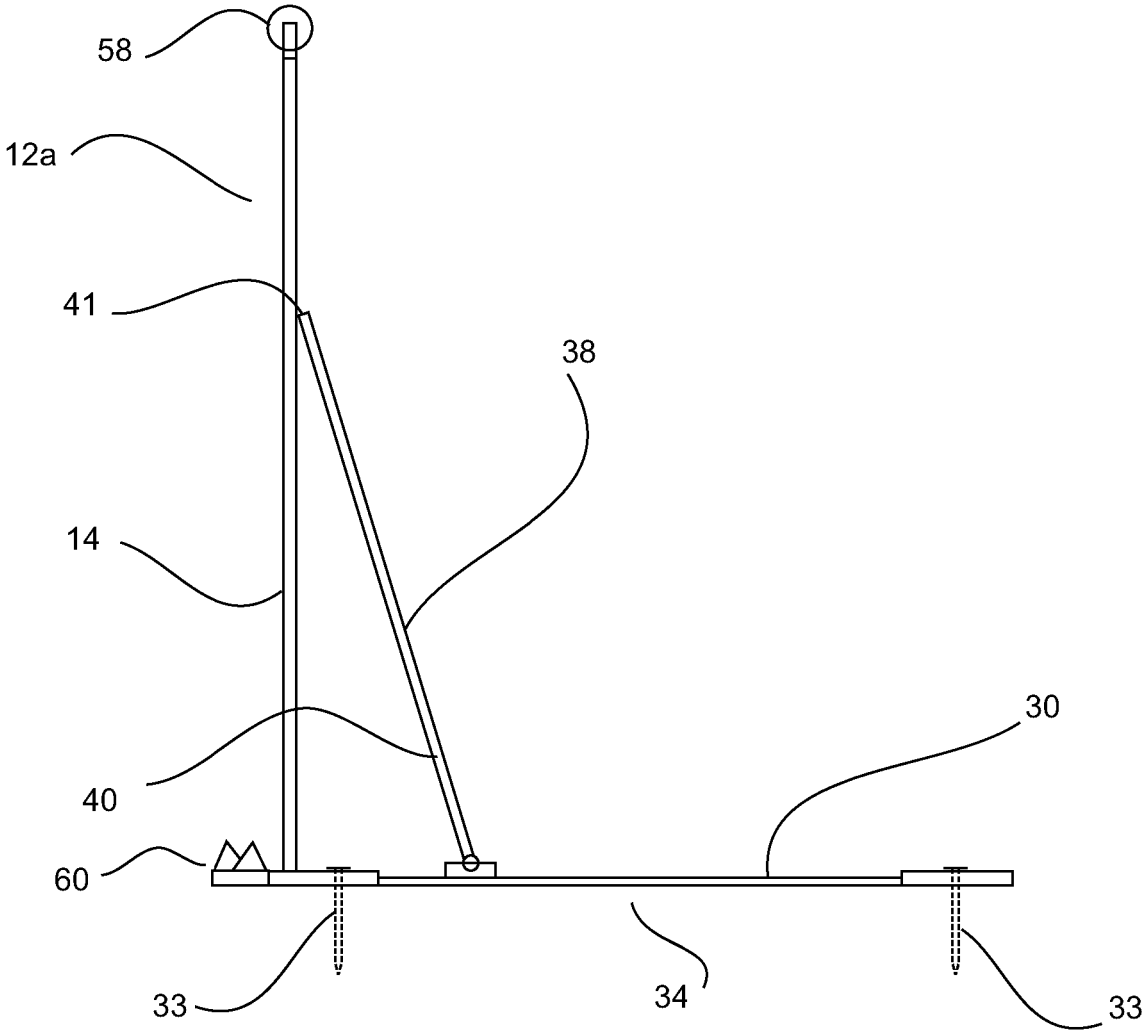

Fig. 20

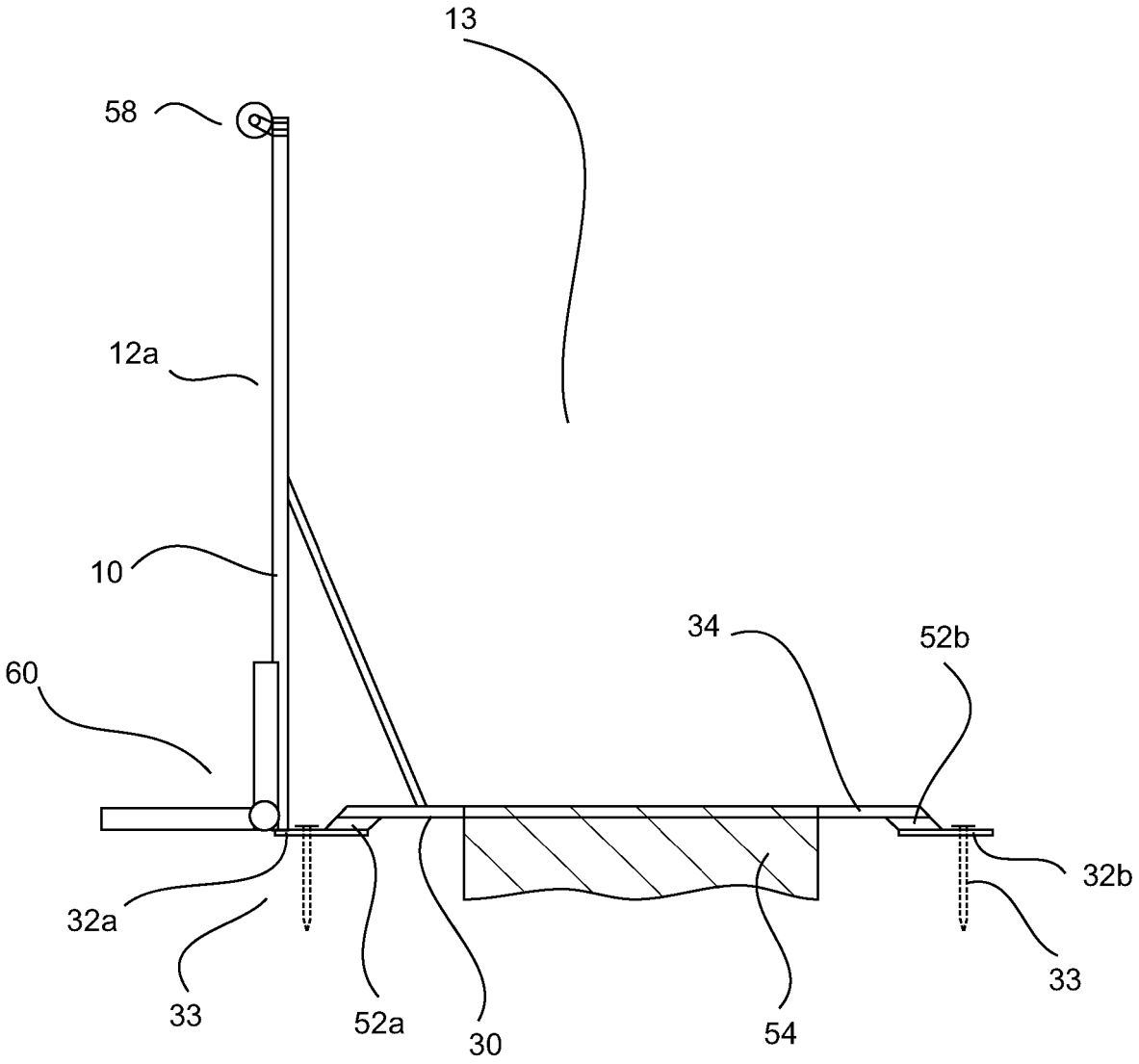

Fig. 21

REFERENCES CITED IN THE DESCRIPTION

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