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(54) **Title:** A STRUCTURE

(57) **Abstract:** A structure for retaining a locking pin is disclosed. The structure comprises a wall, a first elongate component and a second elongate component. The first elongate component comprises a length of sheet material having a first bend directly connecting a first panel of the first elongate component to a second panel of the first elongate component. The second elongate component comprises a sheet material having a planar part and one or more limbs extending from the planar part. Each of the one or more limbs includes a respective bend at a location along the length of the limb, and the planar part being absent of any bend. A face of the planar part of the second elongate component is secured against a face of the second panel of the first elongate component. Ends of each of the one or more limbs furthest from the planar part of the second component are secured against the wall, and an edge of the first panel that is opposite to the first bend is secured against the wall at a location separated from the one or more limbs.



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A Structure

Field

The present invention relates to a structure for retaining a locking pin, in particular, but not exclusively, the structure relates to a bomb-resistant bin.

Background

Refuse bins are typically provided in public places in town and city centres. However, security concerns have resulted in the removal of refuse bins from some public areas causing inconvenience to the public and an increase in cost for those charged with litter clearance.

Bomb resistant bins with the ability to contain explosions are known. The design of such bins is challenging because of the usually conflicting requirements of effectiveness of blast-resistance and cost of manufacture, ease of emptying, ease of use by the public, ease of installation and later removal.

Summary

According to the present invention, there is provided a structure for retaining a locking pin, the structure comprising a wall, a first elongate component and a second elongate component, wherein the first elongate component comprises a length of sheet material having a first bend directly connecting a first panel of the first elongate component to a second panel of the first elongate component, wherein the second elongate component comprises a sheet material having a planar part and one or more limbs extending from the planar part, each of the one or more limbs including a respective bend at a location along the length of the limb, and the planar part being absent of any bend, and wherein a face of the planar part of the second elongate component is secured against a face of the second panel of the first elongate component, ends of each of the one or more limbs furthest from the planar part of the second component are secured against

the wall, and an edge of the first panel that is opposite to the first bend is secured against the wall at a location separated from the one or more limbs.

5 Through these features, the second elongate component can be constructed of a material having a thickness that is too great to bend reliably and/or using readily available manufacturing tools along the length of the elongate component. Through these features, the structure can be provided with high strength yet be relatively simple and
10 inexpensive to manufacture through processes of cutting and bending sheet material. Furthermore, the first elongate component can provide support to the second elongate component whilst being of relatively simple construction and relatively easy to manufacture. The features allow locking pins to be introduced into the gaps between adjacent limbs before
15 translation behind the limbs. When locking pins are in place behind the limbs, the parts of the limbs between the wall and the bends provide resistance to movement of the locking pins in a direction away from the first panel of the first elongate component. When locking pins are in place behind the limbs, the parts of the second elongate component that are
20 between the bends on the limbs and the junction between the planar part of the second elongate component provide resistance to movement of the locking pins in a direction away from the wall. The securing of the planar part of the second elongate component to the second panel of the first elongate component and the securing of the first panel against the wall,
25 even if this is secured indirectly, assists in providing resistance to movement of the locking pins in a direction away from the wall. Where dimensions of the internal cross-section of the channel formed by the first and second elongate components (and also possibly the wall) approximately equal dimensions of the external cross-section of the
30 locking pin, the securing of the planar part of the second elongate component to the second panel of the first elongate component and the securing of the first panel to the wall, even if this is secured indirectly, also

assists in providing resistance to movement of the locking pins in a direction away from the first panel of the first elongate component. These effects are particularly important where the structure is included within a vessel in which an explosion may originate.

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Preferably, the length of the sheet material of the first elongate component comprises a second bend connecting the second panel to a third panel, axes of the second and third bends being generally parallel to one another.

10 Conveniently, an end of the third panel opposite to the second bend of the first elongate component is secured to the wall at a location separated from the first panel and the limbs. This provides further strength to the structure, in particular further resisting forces applied by the locking pin to the second elongate component in a direction away from the first panel
15 of the first elongate component.

The edge of the third panel opposite to the second bend may be provided with a tab that extends through a hole in the wall and that is secured to a face of the wall that is opposite to the second panel of the first elongate
20 component. The third panel being secured to the wall increases the strength of the locking pin retention part, in particular as the end of the third panel is on an opposite side of the channel relative to the end of the limbs.

25 The bends in the limbs may have axes that are generally parallel to the axes of the first and second bends.

Preferably, the structure comprises a reinforcing component for each limb of the second elongate component, each reinforcing component a) being
30 secured to the first elongate component at or adjacent the first bend, b) being located against the limb for its length and c) being secured to the wall adjacent the end of the corresponding limb. The features of the first

and second elongate components allow such reinforcing components to be included, and the reinforcing components provide improved strength to the structure, particularly against forces in the key directions described above.

5

In one embodiment, an end of each of the one or more limbs is provided with a tab that extends through a hole in the wall and that is secured to a face of the wall that is opposite to the planar part of the second elongate component. This can increase the resistance to forces on the second
10 elongate component in the direction generally away from the wall. The use of such a tab and associated arrangement allows relatively high structural integrity for the second elongate component because it allows the tab to be cut from the sheet of material integrally with the other parts of the second elongate component.

15

Conveniently, an end of each of the one or more limbs is provided with two tabs that extend through respective holes in the wall and that are secured to the face of the wall that is opposite to the planar part of the second elongate component.

20

Each reinforcing component may be provided with a tab that extends through a hole in the wall and is secured to the face of the wall that is opposite to the planar part of the second elongate component. This can further increase the resistance to forces on the second elongate component
25 in the direction generally away from the wall.

Preferably, the tab of the reinforcing component is offset compared to a tab of the associated limb.

30

In one embodiment, the second elongate component comprises two or more limbs extending from the planar part, each of the two or more limbs including a respective bend at a location along the length of the limb.

The first elongate component may comprise a third bend directly connecting the first panel and a fourth panel, the first and fourth panels extending in opposite sense with respect to the second panel, axes of the first and second bends being generally parallel to one another, the fourth panel being secured against the wall thereby to secure the second panel against the wall.

Preferably, the planes of the fourth and second panels of the first elongate component are generally parallel.

Conveniently, the first and second bends of the first elongate component are generally right angle bends. They may alternatively have angles other than right angles.

15

Brief Description of the Drawings

Embodiments of the present invention will now be described by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a blast resistant container embodying the present invention;

Figure 2 shows a perspective view of an inner side of a door of the container;

Figure 3 shows a perspective view of an inner side of the door of the container without a cover;

Figure 4 shows a perspective view of an upper locking plate with locking hooks;

Figure 5 shows a perspective view of a lower locking plate with locking hooks;

Figure 6 shows a perspective view of the container without the door;

Figure 7 shows a perspective view of a locking channel fitted to the inside of the container;

Figure 8 shows a first elongate part of the locking channel shown in Figure 7;

Figure 9 shows a second elongate part of the locking channel shown in Figure 8; and

Figure 10 shows a limb with a reinforcing component of the second elongate part.

Detailed Description

5 Referring now to the drawings, there is shown in Figure 1 a blast resistant container 1 configured to absorb and upwardly direct forces of an explosion originating inside the container 1.

10 The container 1 comprises a door 2, a rear wall 3, a left and a right side wall 4, 5 and a base 6 (shown in Figure 6) defining a space for holding refuse. The rear wall 3, the left and the right side walls 4, 5 are integrally formed, for example, it may be formed of a metal sheet. The door 2 is removably attachable to edges formed at the front of the two side walls 4, 5 so as to provide access to the space provided within the container 1. The door 2 is hinged so that it can be swung
15 open and closed. The hinge axis is vertical, and there is no vertical change in the centre of gravity of the door as it hinges.

The base 6 is formed with a plurality of holes (not shown) for receiving fastening means such as bolts so that the container 1 can be secured to the ground upon
20 which it stands. At an opposite end to the base 6, an aperture 8 is formed for directing or channelling a blast from an explosion in a direction away from the base 6 and generally vertically. The longitudinal axis of the container 1 is generally vertical in use.

25 Referring now to Figures 1 to 3, the door 2 comprises a front panel 20 preferably made out of a metal sheet. The door 2 of the container is provided with a refuse aperture 9 through which a user disposes of their waste so that the waste is received and contained in the space of the container 1.

30 The door 2 is removably attached to the container 1 by cooperating means. The cooperating means of the door 2 includes locking hooks 28 attached to locking plates 25, 26 which are movable in a direction parallel to the longitudinal axis of

the container 1. The locking hooks 28 may also be termed locking pins. The locking plates 25, 26 may also be termed locking pin mechanisms. The locking hooks 28 engage with corresponding cooperating elements, which can be termed locking channels, which are described in more detail below. The cooperating means enable the door 2 to be secured to the left and right side walls 4, 5 of the container 1 such that it is retained in its position in the event of an explosion within the container. Additionally, the cooperating means allow for the door 2 to be opened such as to allow access to the interior of the container 1, in particular when the container is used for refuse and needs emptying or cleaning.

The locking plates 25, 26 comprise an upper 25 locking plate and a lower locking plate 26 which are shown in Figures 4 and 5, respectively, and in situ in Figure 3. Both plates 25, 26 have a rectangular profile and are formed of a respective metal sheet. Centrally positioned apertures 27 of the plates 25, 26 have been cut out. This reduces the weight of the plates 25, 26 as well as the quantity of material required without significantly reducing strength where high strength is most needed. At approximately each corner of each of the plates 25, 26, the locking hooks 28 are formed. The locking hooks 28 each have a longitudinal axis that extends perpendicular to a line connecting opposite locking hooks. The axes of the locking hooks is vertical in use.

An end of an arm 29 is attached to the lower locking plate 26. At an opposite end of the arm 29, a rack 30 having teeth 31 is formed. The arm 29 and the rack 30 extend parallel to the locking hooks 28, so vertically in use. The upper locking plate 25 is also formed with a rack 30 having teeth 31. When the upper and lower locking plates 25, 26 are in the position shown in Figure 3, the rack 30 on the arm 29 extending from the lower locking plate 26 is parallel to the rack 30 formed on the upper locking plate 25. Furthermore, the teeth 31 of the racks 30 are opposing one another. A pinion 32 is located between the racks 30 and is rotatable about a central axis. The pinion 32 engages with the teeth 31 of the racks 30 such that rotation of the pinion causes the racks 30 to move up and

down respectively. This causes the plates 25, 26 to be moved in a direction parallel to the longitudinal axis of the container 1. The plates 25, 26 have generally the same configuration, and approximately the same weight. The rack and pinion arrangement results in the plate 25 moving upwards by the same
5 amount as the other plate 26 is moved downwards. Because the plates 25, 26 have about the same weight, the force required to move the plates 25, 26 to activate locking or unlocking is relatively low. Moreover the force required is approximately the same for both the locking and unlocking movements.

10 The pinion 30 is further formed with holes (not shown) for receiving a corresponding key (not shown) so that the pinion can be rotated so as to lock and unlock the door 2. As shown in Figure 1, a hole 80 is formed in the door 2 exposing the holes in the pinion such that they can be accessed with a corresponding key 81.

15 The locking hooks 28 of each locking plate 25, 26 face the same direction and lie in the plane of the locking plates 25, 26. However, the locking hooks 28 of the upper locking plate 25 face the opposite direction to the locking hooks 28 of the lower locking plate 26, as is best seen in Figure 3. When the locking hooks 28 engage with the cooperating elements of the container 1 such that the door 2 is
20 secured to said container 1, movement of the door in a bilateral direction parallel to the longitudinal axis of the container is restricted. This increases the blast resistance of the door 2 in contrast to a container wherein the hooks are configured to face the same direction. If the hooks were to face the same direction, movement of a door due to an explosion might only be restricted in a
25 unilateral direction parallel to the longitudinal axis of the container.

The cooperating means of the door 2, the locking plates 25, 26, and the associated locking hooks 28, are held in their position against the inner surface
30 of the front panel 20 by the racks engaging with the pinion 32 secured to the front panel 20. A cover 40 is fitted to the inside of the front panel 20, as is best seen in Figure 2.

The door is also provided with hinges 37 which are received in corresponding holders 38 of the container, thereby enabling a user as they have unlocked the cooperating means to swing open the door 2 to access the space within the container 1.

5

Referring now to Figures 6 to 10, the cooperating means on the container 1 comprises two locking channel structures 50 which are fixedly attached to the inside of the container 1 adjacent to the free edges of the left and right side walls 4, 5. Each locking channel structure 50 is defined in part by one of first and
10 second elongate components 51, 52 and defines respective locking channels for receiving locking pins 28.

The first elongate component 51 as illustrated in Figure 8 is formed of a sheet of material which is bent such that it comprises four panels 53, 54, 55, 56. The
15 first and the third panel 53, 55 extend in opposite directions away from the second panel 54. The first and the third panel 53, 55 are generally perpendicular to the second panel 54. The first and the third panel 53, 55 may alternatively extend from the second panel 54 at an angle greater or a smaller than 90°, as long as they extend in the general opposite direction. The fourth panel 56
20 extends from the third panel at approximately 90° and in a plane parallel to the plane of the second panel 54. The fourth panel 56 may extend from third panel at an angle greater or a smaller than 90°. The first elongate component essentially comprises a generally rectangular metal sheet that includes three bends in the direction of the longest side of the rectangle. The length of the
25 rectangular sheet defines the length of the elongate components. Approximately half of the width of the metal sheet forms the first and second panels, that ultimately define the locking channel structures 50.

The free edge of the first panel 53 is formed with recesses 58 so as to receive
30 limbs 61 of the second elongate component 52. The third panel 55 is formed with holes 70 that allow so as to be welded to the second elongate component 52. Furthermore, the bend connecting the second and third panels 54, 55 are

formed with holes 59 for receiving tabs 57d of the second elongate component 52. As best seen in Figure 8, the fourth panel 56 is formed with tabs 57a for securing the first elongate component 51 channel structure 50 to a planar component such as the outer wall 4.

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The second elongate component 52 as illustrated in Figure 9 comprises a first planar part 60 provided with four limbs 61 that are spaced apart from one another and that extend perpendicularly from a longitudinal edge of the first planar part 60. The limbs 61 are bent about an axis parallel to the longitudinal axis of the first planar part 60. The limbs are bent at 90°. The limbs 61 are provided with tabs 57b at an edge parallel to the longitudinal axis of the first planar part 60. The aspects of the second elongate component so far described are formed from a single sheet of metal that is first cut into shape before the limbs are bent. The sheet of metal that constitutes the second elongate component 52 is thicker than the sheet that constitutes the first elongate component 51. It will be appreciated that the bends in the second elongate component 52 are shorter than the bends in the first elongate component.

The second elongate component 52 is further provided with reinforcing components 64 that are aligned with each limb 61. The reinforcing components 64 are of similar shape to the limbs 61 and they are bent about an axis parallel to the longitudinal axis of the second elongate component 52. The reinforcing components 64 are formed of sheet metal of the same thickness as the sheet forming the first planar part 60 and the limbs 61. The reinforcing components 64 extend from the edge of each limb 61 that is provided with tabs 57b to the junction of the limbs 61 with the first planar part 60 of the second elongate component 52. At each of the ends, the reinforcing components 64 are provided with at least one tab 57c, 57d. The end of each reinforcing component 64 that is aligned with the edge of the limbs 61 provided with tabs 57b, is formed with one tab 57c that is off-set relative to said tabs 57b of the limbs 61. The tab 57c of each reinforcing component is off-set in a direction parallel to the longitudinal axis of the second elongate component 52. A gap is provided in the longitudinal

direction of the first planar part 60 between the tab 57c and each of the tabs 57a, 57b. The end of each reinforcing component 64 that terminates adjacent the first planar part 60 is provided with two tabs 57d which lie in a plane parallel to that of the first planar part 60. Each reinforcing component 64 is formed with
5 holes 65 and the reinforcing components 64 are secured to their respective limbs 61 by fillet welds where the edges of the holes 65 meet the adjacent surface of said limbs 61. Each reinforcing component 64 may additionally or alternatively be welded to its respective limb 61 along at least some of the outer junctions where the reinforcing component 64 and the limb meet, although not
10 at the two ends of the reinforcing component that are provided with tabs 57c, 57d.

The first and second elongate components 51, 52 are attached to one another such that the edges of each limb 61 provided with tabs 57b and respective
15 reinforcing component 64 locate in the recesses 58 of the first elongate component 51. The tabs 57d of the reinforcing component 64 that are provided at the end adjacent the first planar part 60 are received in the corresponding holes 59 formed in the bend of the second and third panels 54, 55 in the first elongate part 51 of the locking channel. The tabs 57d are welded to the bend
20 connecting the second and third panels 54, 55 of the first reinforcing component 51 so as to secure the first and second elongate components 51, 52. Furthermore, as the tabs 57d of the reinforcing components 64 are received in the holes 59 of the bend between the second and third panels 54, 55, the first planar part 60 locates against a surface of the third panel 55 that faces away from the second
25 and fourth panels 54, 55. The first planar part 60 is welded to the surface of the third panel 55 where the edges of the holes 70 formed in the third panel 55 contact the first planar part. The first planar part 60 may additionally or alternatively be welded along at least part of its length.

30 The limbs 61 and respective reinforcing components 64 together with the first and the second panels 53, 54 form channels 66 for receiving the locking hooks 28. As the channels 66 are partially defined by structures provided by the limbs

61 and the reinforcing components 64, which structures are spaced apart from one another, gaps 67 are formed between the channels 66. When the door 2 is unlocked, the locking hooks 28 are positioned in the gaps 67 such that the door 2 can be removed from the container 1. When the door is moved into its locked position, the locking hooks 28 are moved in an upward or downward direction parallel to the longitudinal axis of the first and second elongate 51, 52 components such that the locking hooks 28 locate within the channels 66.

The first and second elongate components 51, 52 and the reinforcing components 64 channel structures 50 are secured to the inner sides of the left and right side walls 4, 5 of the container 1 by the 'slot and tab' welding system described above. In particular, the tabs 57a formed on the fourth panel 56, the tabs 57b provided on the limbs 61 and the adjacent tab 57c on the reinforcing component 64 are all provided by arrangement in the same plane and locate in corresponding holes 68 provided on the left and right side walls 4, 5 of the container 1, as best seen in Figure 6. As the locking channel structures 50 are positioned on the inside of the left and right side walls 4, 5 the tabs extend from the inside of the container to an outer surface of each side wall 4, 5. The tabs protrude by approximately 1 millimetre past the outer surfaces of each side wall 4, 5. This enables the tabs to be welded to and levelled with the outer surfaces.

The locking channel structures 50 are located on the inside of the container 1 such that the first panel 53 of each first elongate component 51 lies against a respective inner surface of the left and right side walls 4, 5 parallel to the free longitudinal edges of said side walls 4, 5. Thereby, the gaps 67 of each locking channel structure 50 formed between the bent limbs 61 and respective reinforcing component 64 face the opposite locking channel structure 50 as well as the door 2.

The first planar part 60 and the limbs 61 of each locking channel structure 50 are formed of a single sheet of material, such as a metal sheet. In these embodiments, the thickness of the sheet of material is 6 millimetres which

provides strength to the second elongate component however still allows for the component to be bent in small sections such as the bends of the extending limbs 61 using relatively inexpensive manufacturing tools. The sheet of material of the first elongate component 51 is 3 millimetres in thickness, which allows for the
5 sheet of material to be easily bent along a greater length in comparison to a metal sheet of greater thickness. Through these features, the locking channel structure 50 can be provided with high strength yet be relatively simple and inexpensive to manufacture through processes of cutting and bending sheet material.

10

As explained above, the first and second panels 53, 54 form the channels 66 together with the limbs 61 and respective reinforcing component 64, and the tabs 57b and 57c of the limbs 61 and the respective reinforcing component 64 secure the locking channels to the container by the tabs being welded to the side
15 wall 4, 5. The first panel 53 provides additional strength to the first elongate component 51, however it should be understood that it is not essential so as to form a locking channel as the free longitudinal edge of the second panel can be directly secured to either side wall 4, 5 of the container 1 such that the relevant side wall 4, 5 forms a channel together with the second panel 54 and the bent
20 limbs 61 and respective reinforcing component 34. The second panel 54 of the first elongate component 51 engages with the locking pins 28 such that as the door is in a locked position it is prevented from falling inwards to the centre of the container 1. The second panel 54 extends between relevant side wall 4, 5 of the container 1 or the first panel 53 and the third panel 55 of the second
25 elongate component 52. The second panel 54 therefore provides strength to the container in that it resists forces generated from an explosion within the container in a direction perpendicular to the side walls 4, 5. The third panel 55 attached to the first planar part 60 of the second component 52 counteracts forces acting perpendicular to the door 2 from inside of the container 1. When
30 the door is in a locked position, the locking pins 28 located in the channels 66 add additional structural integrity to the locking channels as they prevent the channels from collapsing by the second wall being forced to a position parallel

to the side walls 4, 5 of the container. The fourth panel 56 provides additional strength and structural integrity to the locking channel structures 50 as the tabs 57a of the fourth panel secures the locking channel structures 50 to the side walls of the container 1 in addition to the tabs 57b, 57c of the limbs 61 and
5 respective reinforcing component 64. The fourth panel 56 and the securing of the panel to the walls 4, 5 serves to resist movement of the second elongate component 52 in the presence of blast forces.

It should be understood to a person skilled in the art that the number of limbs
10 61 forming the channels 66 and the corresponding locking hooks 28 is not restricted to the amount described above. The container of the present invention may be configured to have more or fewer channels 66 and locking hooks 28.

15 Operation of the container 1 will now be described with reference to the Figures. The container 1 is useable as a refuse bin. The container is secured to the ground upon which it stands by fastening means extending through holes in the base 6 and secured to the ground. When the container 1 is used as a bin, the door 2 is closed in that the locking hooks 28 of the locking plates 25, 26 are located in the
20 channels 66 of the locking channel structures 50. The door 2 is thereby secured to the container 1 as the locking hooks 28 engage with the locking channel structures 50 restricting any movement of the door relative to the container 1. In particular, as the locking hooks 28 of each locking plate 25, 26 face opposite directions the door is restricted from moving in a bilateral direction parallel to
25 the longitudinal axis of the container 1.

The door 2 is unlocked by inserting a key 81 into a hole 80 located approximately in the centre of the door 2 and then into corresponding hole(s) (not shown) formed in the pinion 32. By turning the key, the pinion 32 is
30 rotated by the user and the racks 30 move in opposite directions such that the locking plates 25, 26 are moved in a direction parallel to the longitudinal axis of the container towards one another, in other terms towards the centre of the

door 2. As the locking plates 25, 26 move towards the centre of the door, the locking hooks 28 move out of the channels 66 such that they locate in the gaps 67 between the limbs 61 of the locking channel structures 50. Once the key 81 is turned such that the door 2 is in an opened position, the key 81 is retained in the door and cannot be removed until the key 81 is rotated back to its original position.

To lock the door 2, the key is turned in the opposite direction thereby also rotating the pinion 32 in the opposite direction compared to when unlocking the door. By doing so the racks 30 are moved such that the locking plates 25, 26 travel away from one another and away from the centre of the door. The locking hooks 28 thereby enter the channels 66 of the locking channel structures 50. The hooks 28 are self-guided into the channels 66 as a result of the features of the reinforcing members 34 of each locking plate 25, 26 extending over the tips of the locking hooks 28 and the corners 35 of the locking hooks 28 being tapered. When the door is in its locked position, the key 81 is aligned with the hole 80 in the door such that the key 81 can be removed.

The container 1 absorbs and upwardly directs forces of an explosion originating inside the container 1 by the container being structurally sound and strong due to the two side walls 4, 5 and the rear wall 3 being integrally formed and the door 2 being securely attached to the container 1. In the event of an explosion within the container, forces are exerted outwards on the three walls 3, 4, 5 and the door 2 of the container. The container 1 remains in its position as it is secured to the ground upon which it stands. The three walls 3, 4, 5 can withstand forces of great magnitude as they are formed out of a single sheet of metal. The door 2, being in a locked position, remains secured to the container 1 due the locking hooks being located in the channels 66.

In particular, the locking channel structures 50 attached to the container 1 can resist forces generated from an explosion within the container in a direction perpendicular to the side walls 4, 5 due to the second panel 54 of the first

elongate component 51 lying in a plane perpendicular to the plane of the side walls 4, 5. The locking channel structures 50 can also resist forces exerted perpendicular to the plane of the door 2 due to the third panel 55 of the first elongate component 51 being attached to the first planar part 60 of the second component 52. Advantageously, the locking pins 28 located in the channels 66
5 when the door 2 is in a locked position add additional structural integrity to the locking channels as they prevent the channels from collapsing by the second wall 54 being forced to a position parallel to the side walls 4, 5 of the container 1.

10 Although embodiments of the invention have been shown and described, it will be appreciated by those skilled in the art that variations may be made to the above exemplary embodiments that lie within the scope of the invention, as defined by the following claims.

Claims

1. A structure for retaining a locking pin, the structure comprising a wall, a first elongate component and a second elongate component,
5 wherein the first elongate component comprises a length of sheet material having a first bend directly connecting a first panel of the first elongate component to a second panel of the first elongate component, wherein the second elongate component comprises a sheet material having a planar part and one or more limbs extending from the planar part, each of the
10 one or more limbs including a respective bend at a location along the length of the limb, and the planar part being absent of any bend, and wherein a face of the planar part of the second elongate component is secured against a face of the second panel of the first elongate component, ends of each of the one or more limbs furthest from the planar part of the
15 second component are secured against the wall, and an edge of the first panel that is opposite to the first bend is secured against the wall at a location separated from the one or more limbs.
2. A structure as claimed in claim 1, wherein the length of the sheet
20 material of the first elongate component comprises a second bend connecting the second panel to a third panel, axes of the second and third bends being generally parallel to one another.
3. A structure as claimed in claim 2, wherein an end of the third panel
25 opposite to the second bend of the first elongate component is secured to the wall at a location separated from the first panel and the limbs.
4. A structure as claimed in claim 3, wherein the edge of the third
30 panel opposite to the second bend is provided with a tab that extends through a hole in the wall and that is secured to a face of the wall that is opposite to the second panel of the first elongate component.

5. A structure as claimed in any preceding claim, wherein the bends in the limbs have axes that are generally parallel to the axes of the first and second bends.
- 5 6. A structure as claimed in any preceding claim, comprising a reinforcing component for each limb of the second elongate component, each reinforcing component a) being secured to the first elongate component at or adjacent the first bend, b) being located against the limb for its length and c) being secured to the wall adjacent the end of the
10 corresponding limb.
7. A structure as claimed in any preceding claim, wherein an end of each of the one or more limbs is provided with a tab that extends through a hole in the wall and that is secured to a face of the wall that is opposite
15 to the planar part of the second elongate component.
8. A structure as claimed in claim 7, wherein an end of each of the one or more limbs is provided with two tabs that extend through respective holes in the wall and that are secured to the face of the wall that is
20 opposite to the planar part of the second elongate component.
9. A structure as claimed in claim 7 or claim 8 when dependent on claim 6, wherein each reinforcing component is provided with a tab that extends through a hole in the wall and is secured to the face of the wall
25 that is opposite to the planar part of the second elongate component.
10. A structure as claimed in claim 9, wherein the tab of the reinforcing component is offset compared to a tab of the associated limb.
- 30 11. A structure as claimed in any preceding claim, wherein the second elongate component comprises two or more limbs extending from the

planar part, each of the two or more limbs including a respective bend at a location along the length of the limb.

12. A structure as claimed in any preceding claim, wherein the first
5 elongate component comprises a third bend directly connecting the first panel and a fourth panel, the first and fourth panels extending in opposite sense with respect to the second panel, axes of the first and second bends being generally parallel to one another, the fourth panel being secured against the wall thereby to secure the second panel against the wall.

10

13. A locking pin retention part as claimed in claim 12, wherein the planes of the fourth and second panels of the first elongate component are generally parallel.

14. A locking pin retention part as claimed in claim 13, wherein the first
15 and second bends of the first elongate component are generally right angle bends.

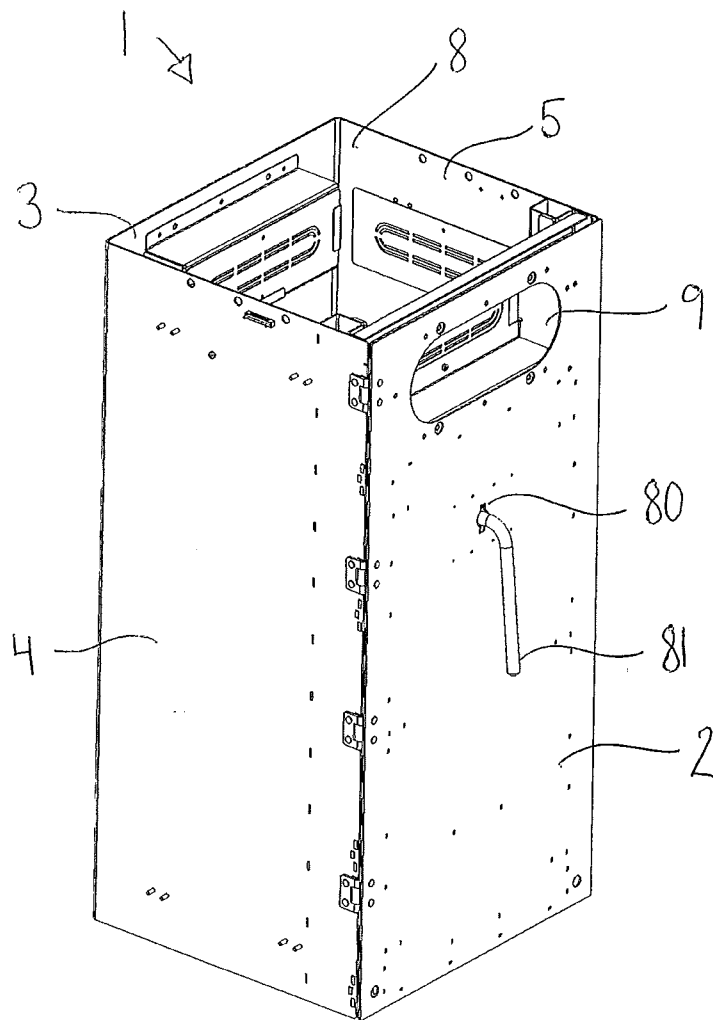


FIGURE 1

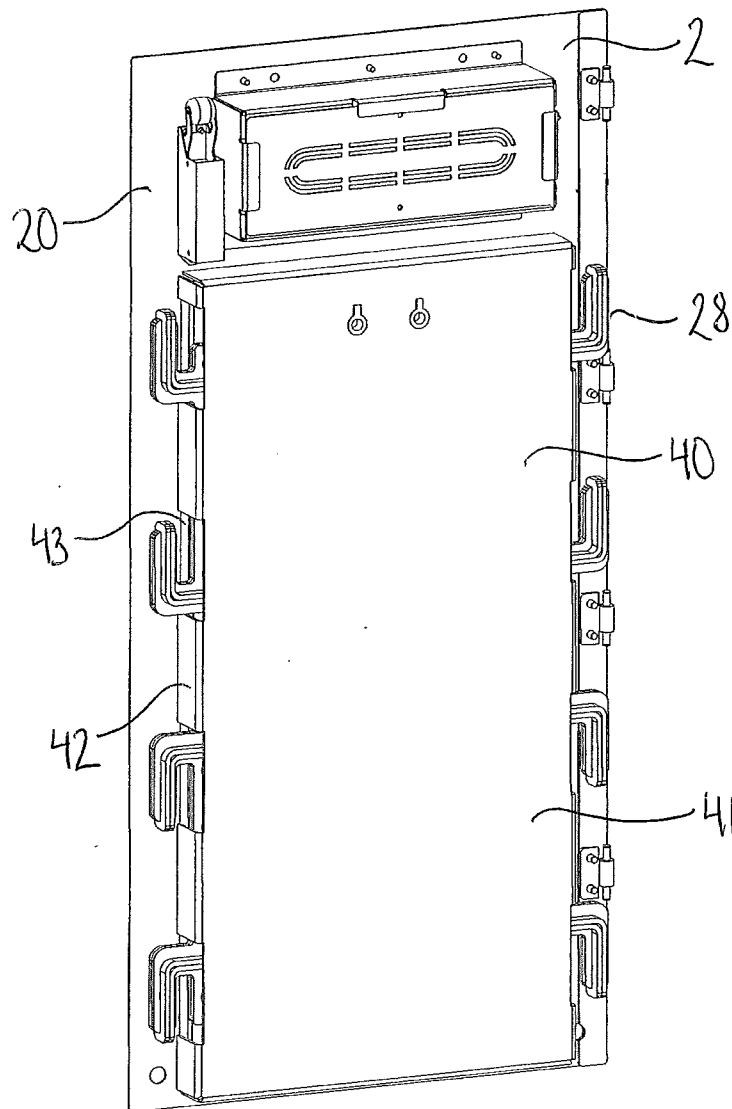


FIGURE 2

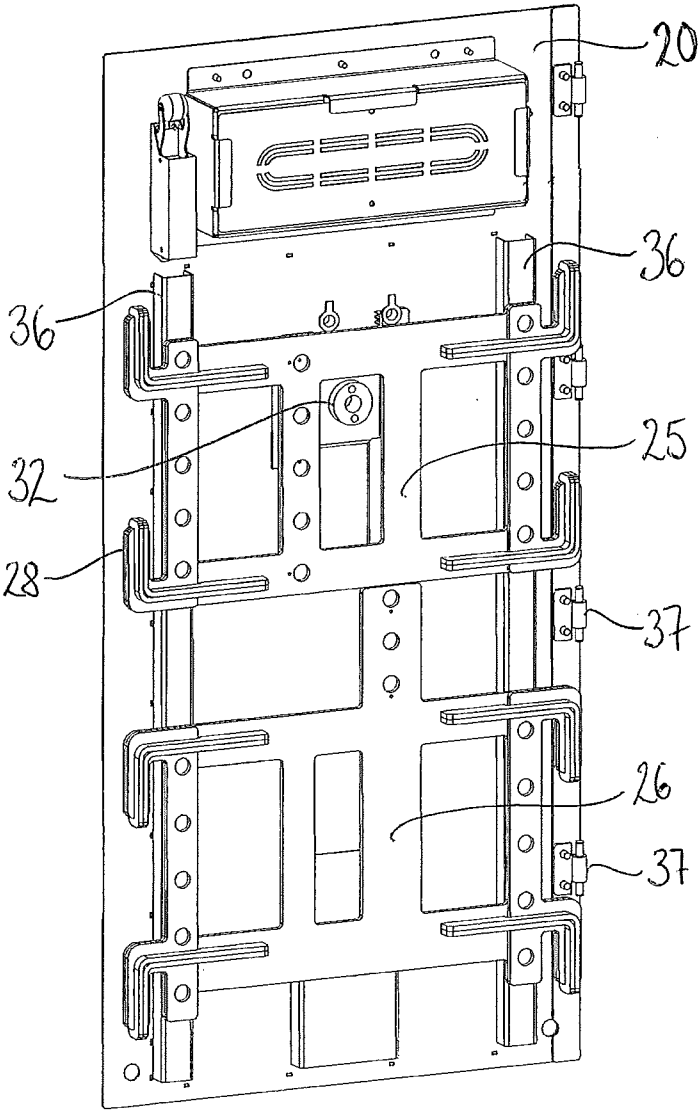


FIGURE 3

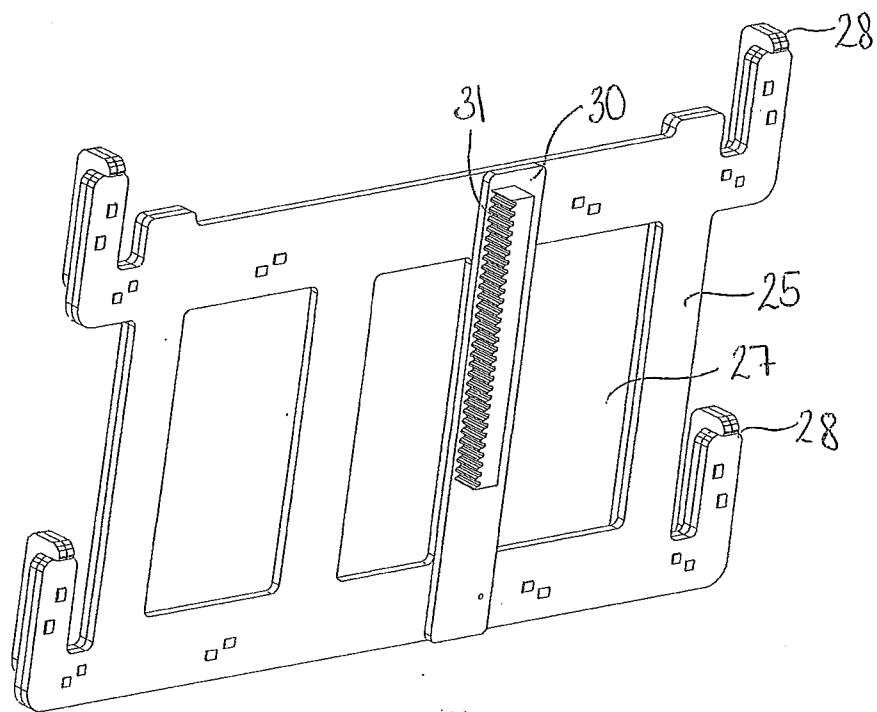


FIGURE 4

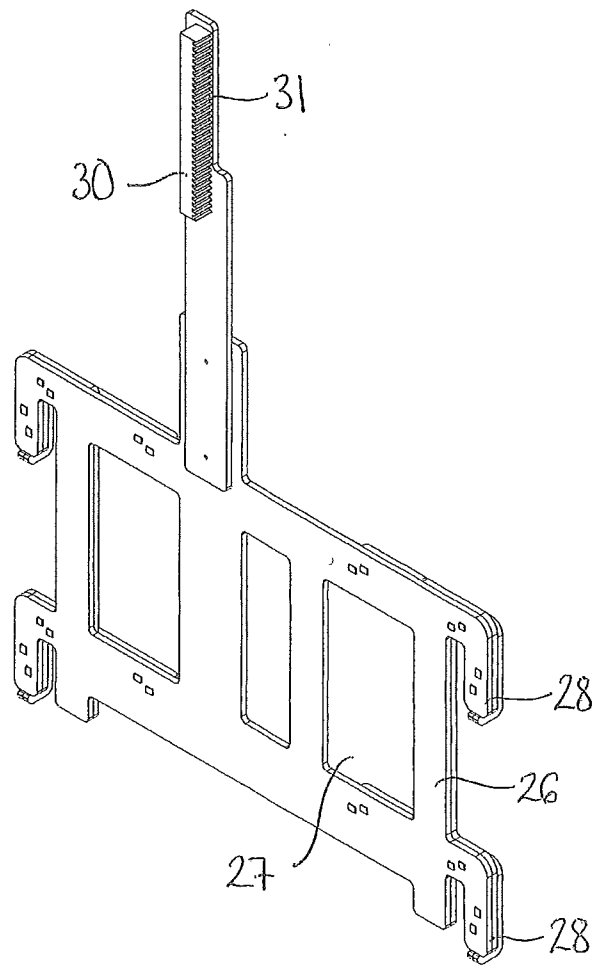


FIGURE 5

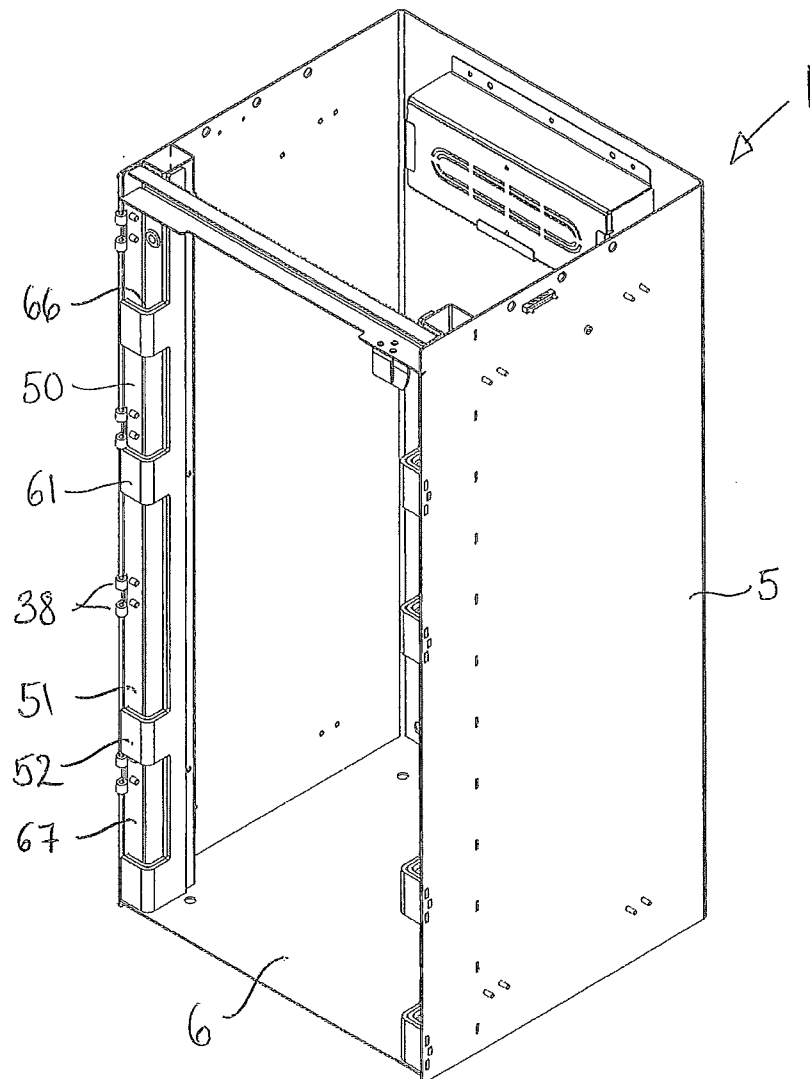


FIGURE 6

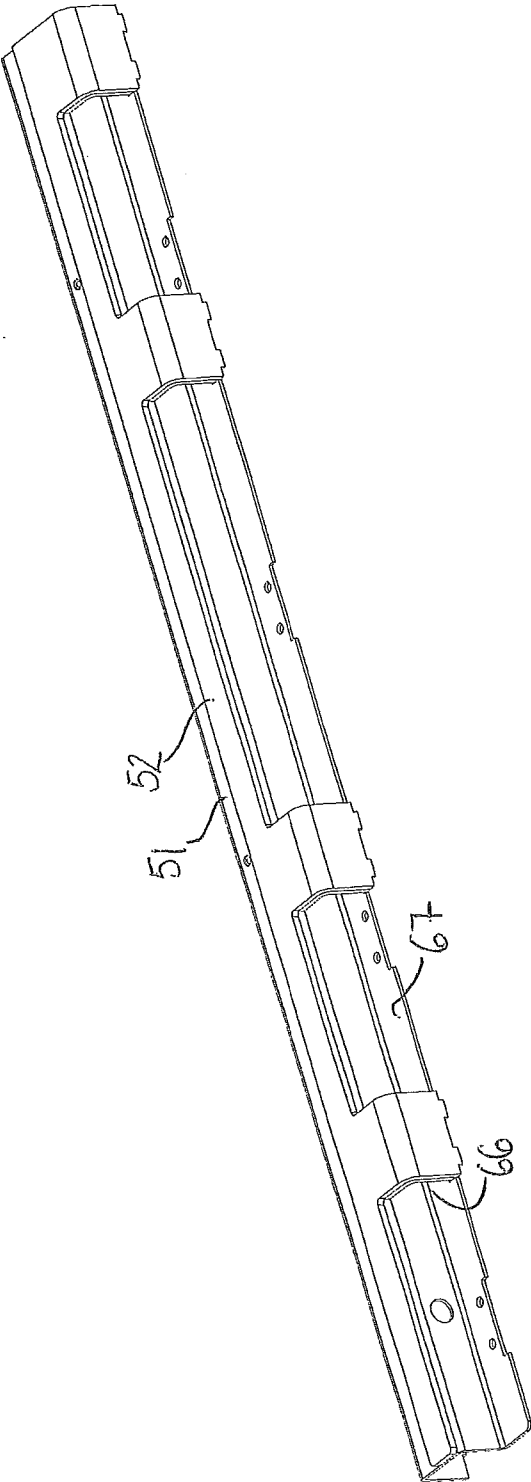
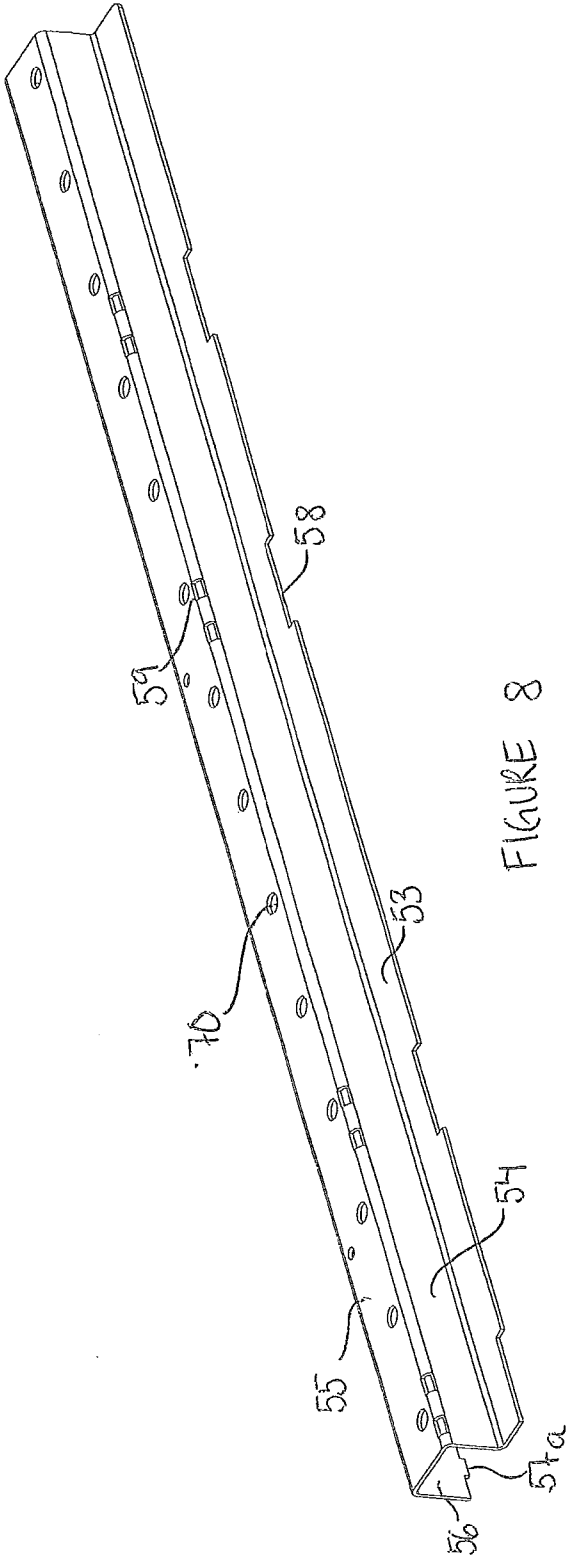


FIGURE 7



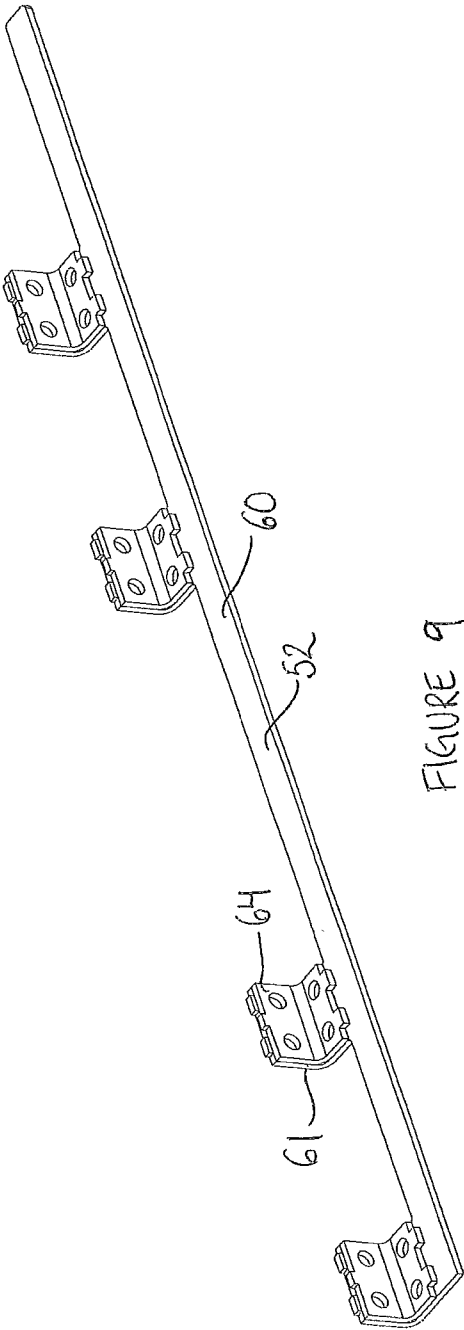


FIGURE 9

