US 20070252496A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0252496 A1**

Remondino (43) **Pub. Date: Nov. 1, 2007**

(54) **TRACK SUPPORT SYSTEM AND METHOD**

(76) Inventor: **Paul Daniel Remondino**, Spring Lake, MI (US)

Correspondence Address:
HODGSON RUSS LLP
THE GUARANTY BUILDING
140 PEARL STREET
SUITE 100
BUFFALO, NY 14202-4040 (US)

(21) Appl. No.: **11/411,592**

(22) Filed: **Apr. 26, 2006**

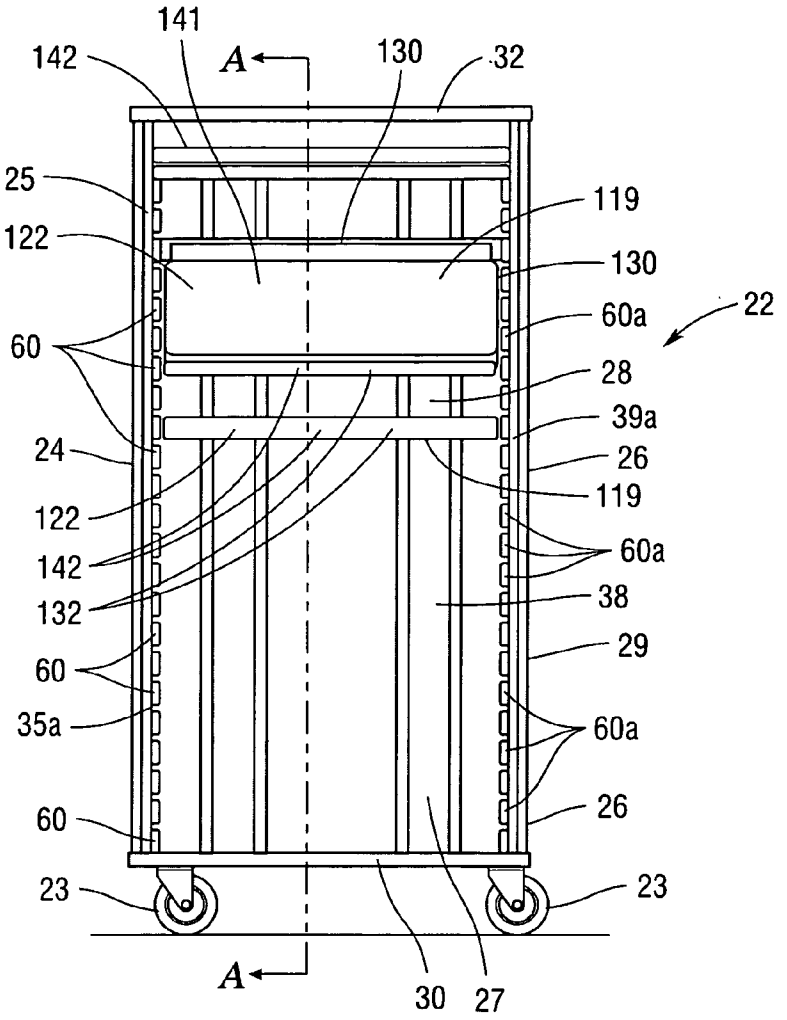
Publication Classification

(51) **Int. Cl.**
A47B 88/00 (2006.01)

(52) **U.S. Cl.** **312/351**

(57) **ABSTRACT**

A track support system for installation in a housing having opposed first and second side walls with the housing capable of receiving a storage unit therein, the track system comprising the first side wall having a first component, a second component and a third component arranged in horizontal row. The second side wall having a mirror image first component, a mirror image second component and a mirror image third component arranged in a mirror image horizontal row. The mirror image first components support weight and provide stops for horizontal and angled storage units, the mirror image second components have mirror image angled sliding surfaces for guiding the storage unit to an angled position, and provide stops when the storage unit is horizontal and partly withdrawn from the housing, and mirror image third components have curved surfaces for guiding the unit to the angled position and support weight.



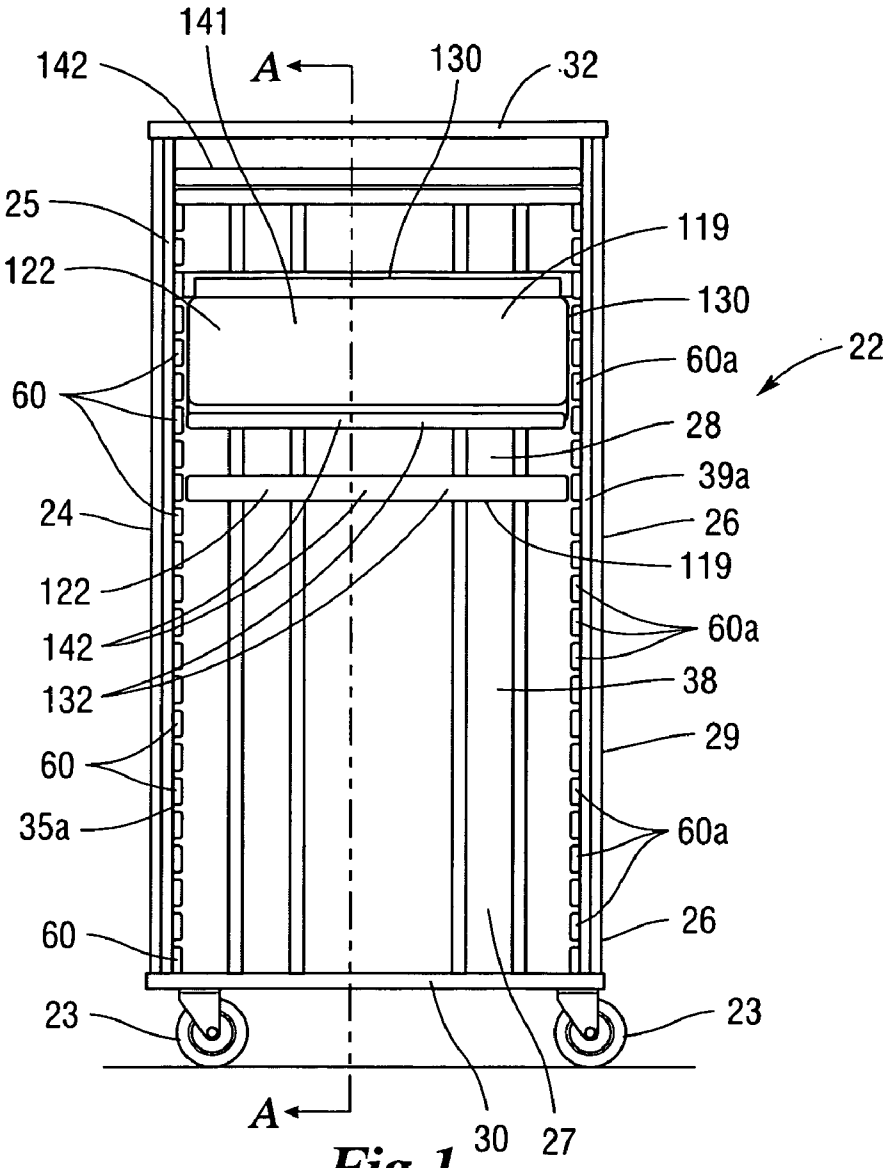

141
142
A
130
32
25
119
122
130
22
60a
60
28
39a
24
26
119
122
60a
142
132
38
29
60
35a
60a
26
60
23
23
A
30
27

Fig.1

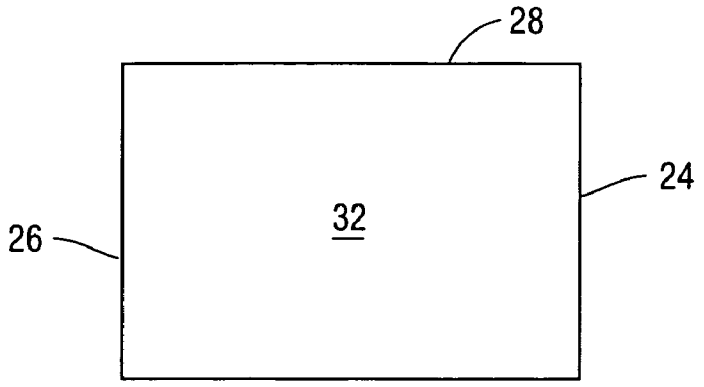

28
24
32
26

Fig.2

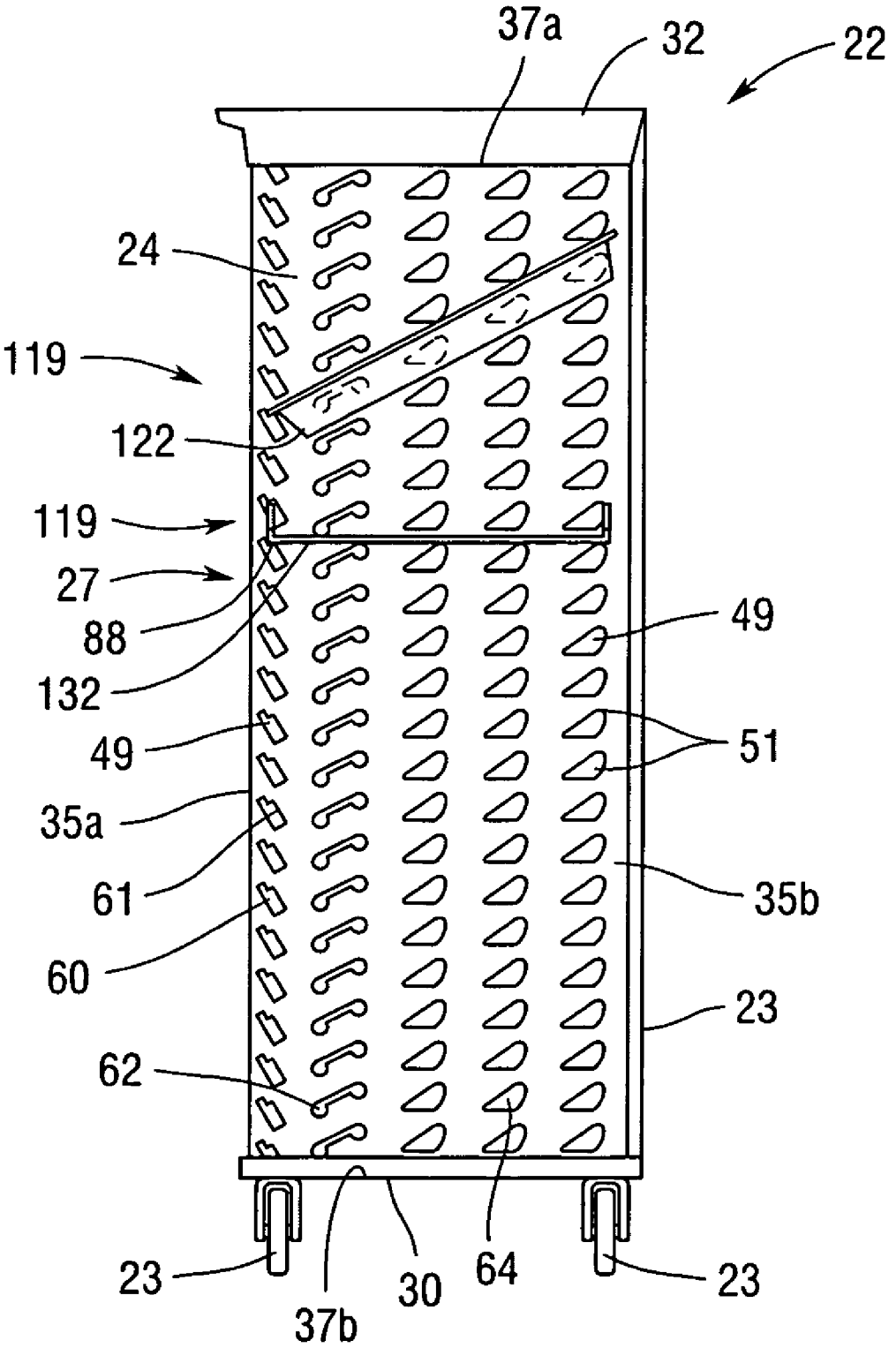

37a
32
22
24
119
122
119
27
88
132
49
35a
61
60
62
49
51
35b
23
23
37b
30
64
23

Fig.3

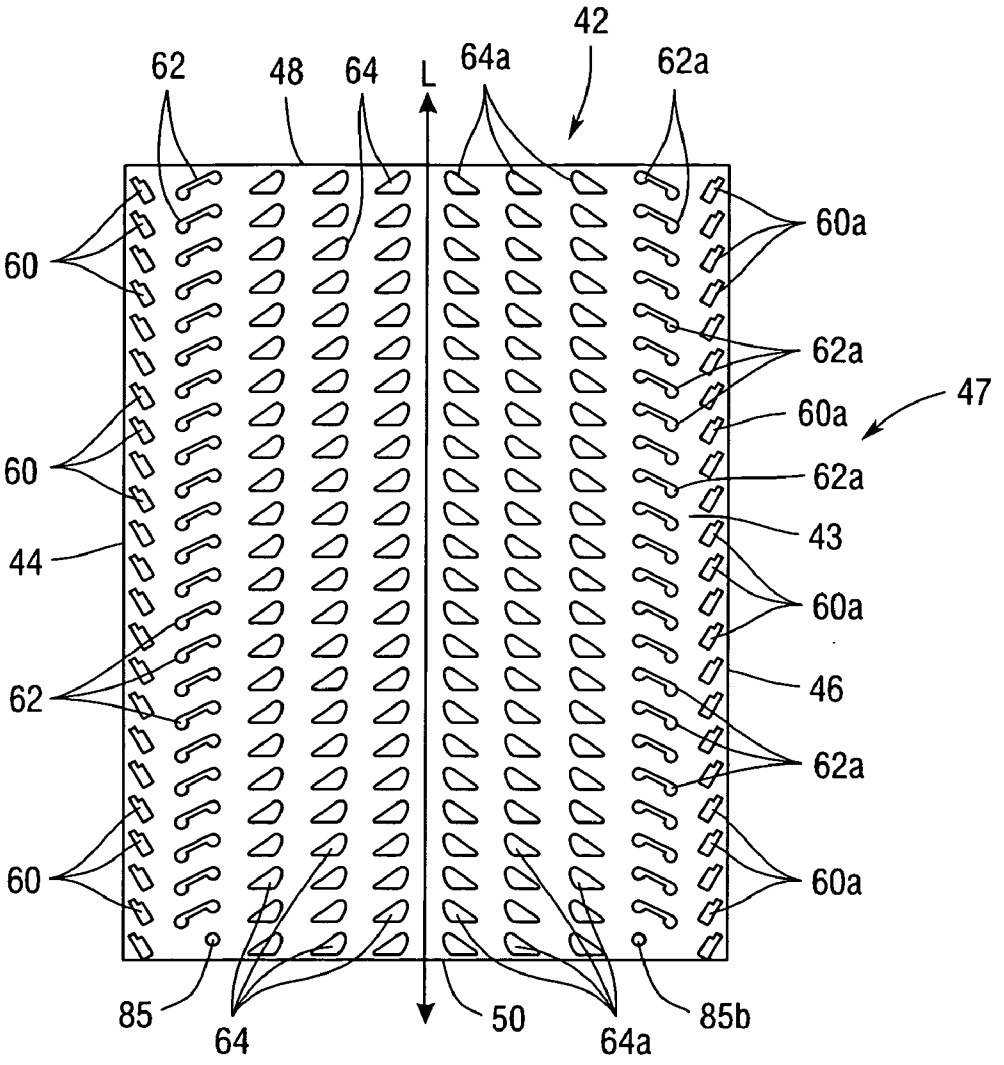

42
62
48
64
L
64a
62a
60a
60
62a
47
60a
60
62a
43
44
60a
46
62
62a
60
60a
85
64
50
64a
85b

Fig.4

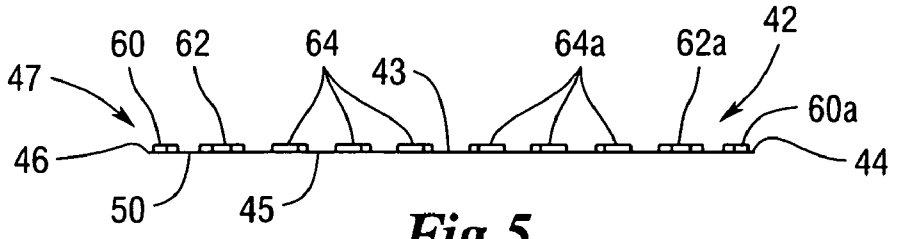

60
62
64
43
64a
62a
42
47
60a
46
44
50
45

Fig.5

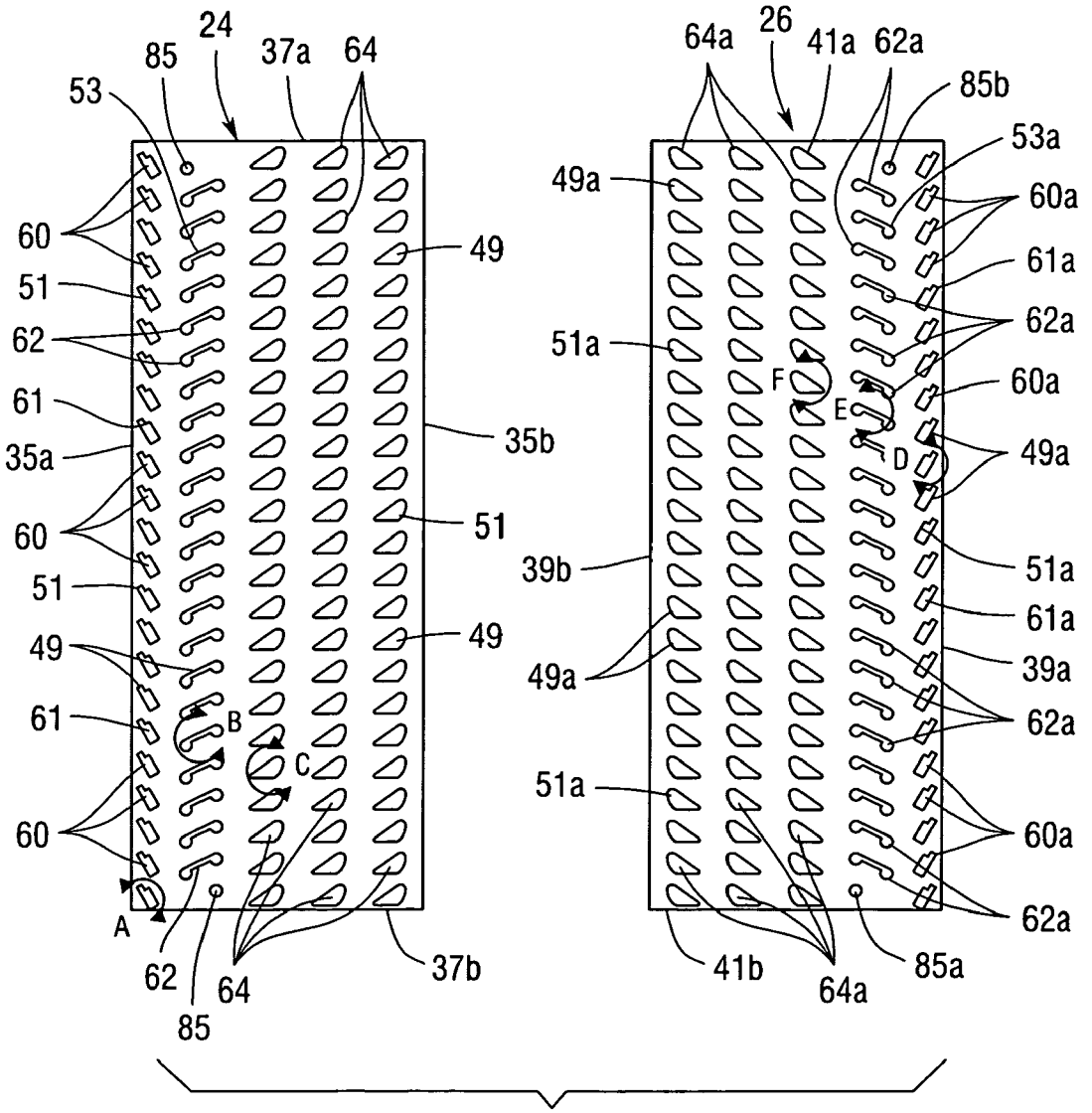

24
85
37a
64
53
60
51
62
61
35a
60
51
49
61
60
A
B
C
62
64
85
49
35b
51
49
37b
64a
26
41a
62a
85b
53a
49a
60a
61a
62a
51a
F
E
D
60a
49a
39b
51a
61a
49a
39a
62a
51a
60a
62a
41b
64a
85a

Fig.6

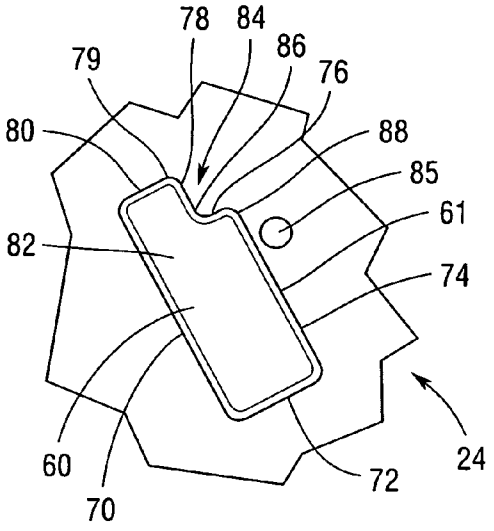


Fig.7

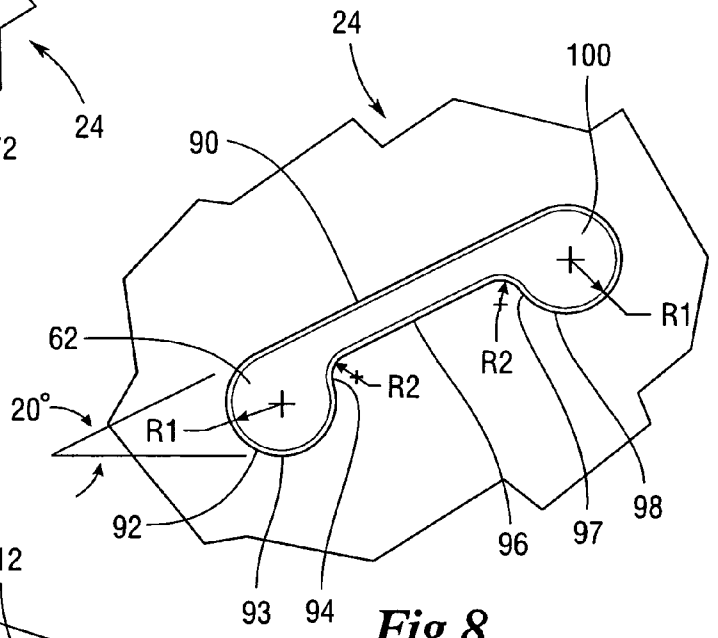


Fig.8

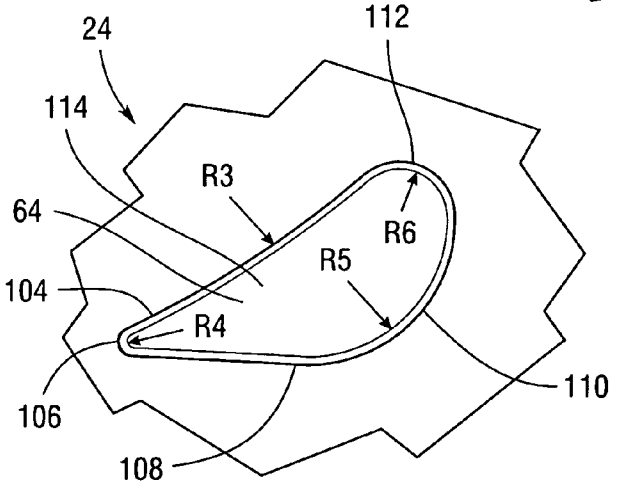


Fig.9

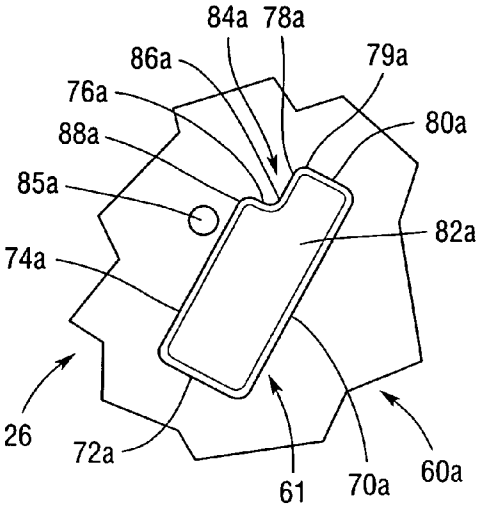


Fig.7A

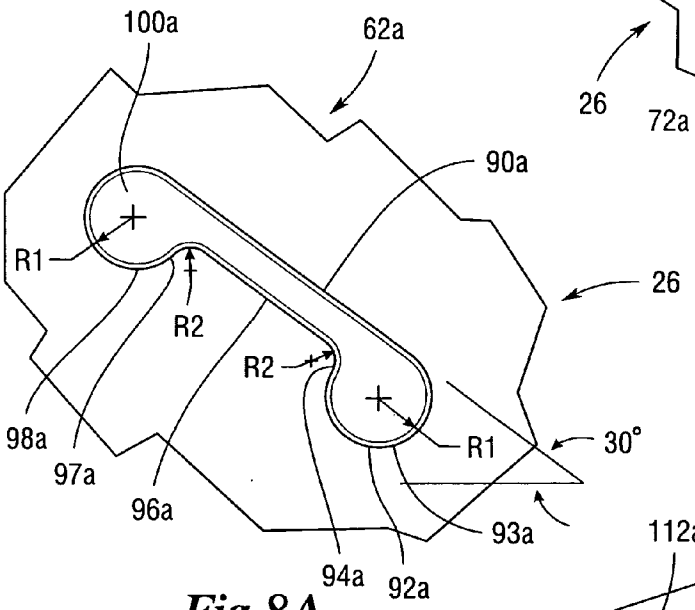


Fig.8A

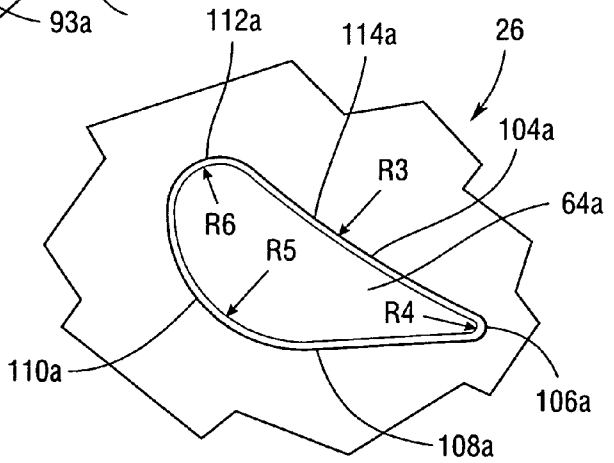


Fig.9A

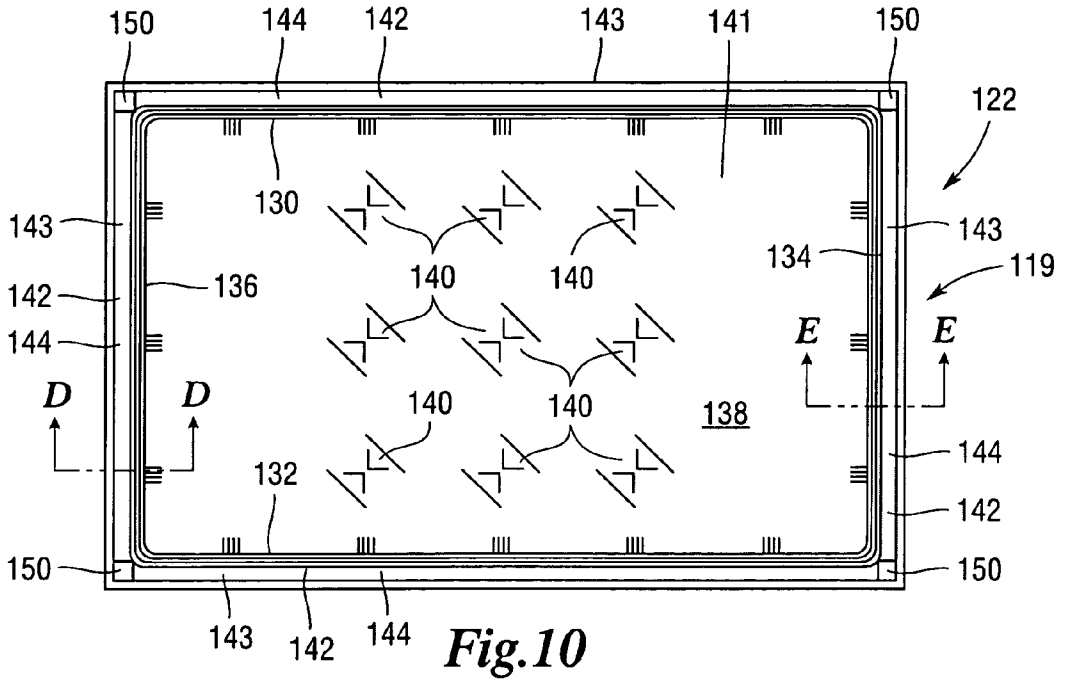


Fig.10

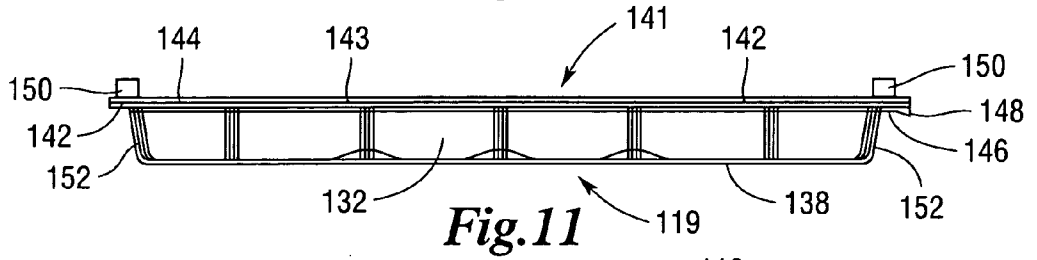


Fig.11

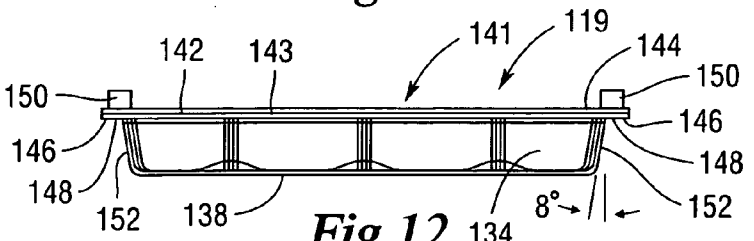


Fig.12

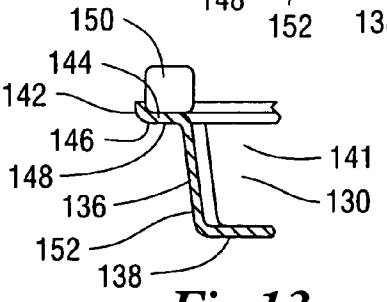


Fig.13

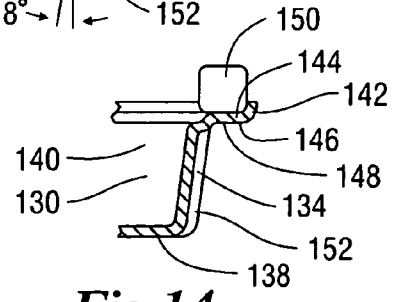


Fig.14

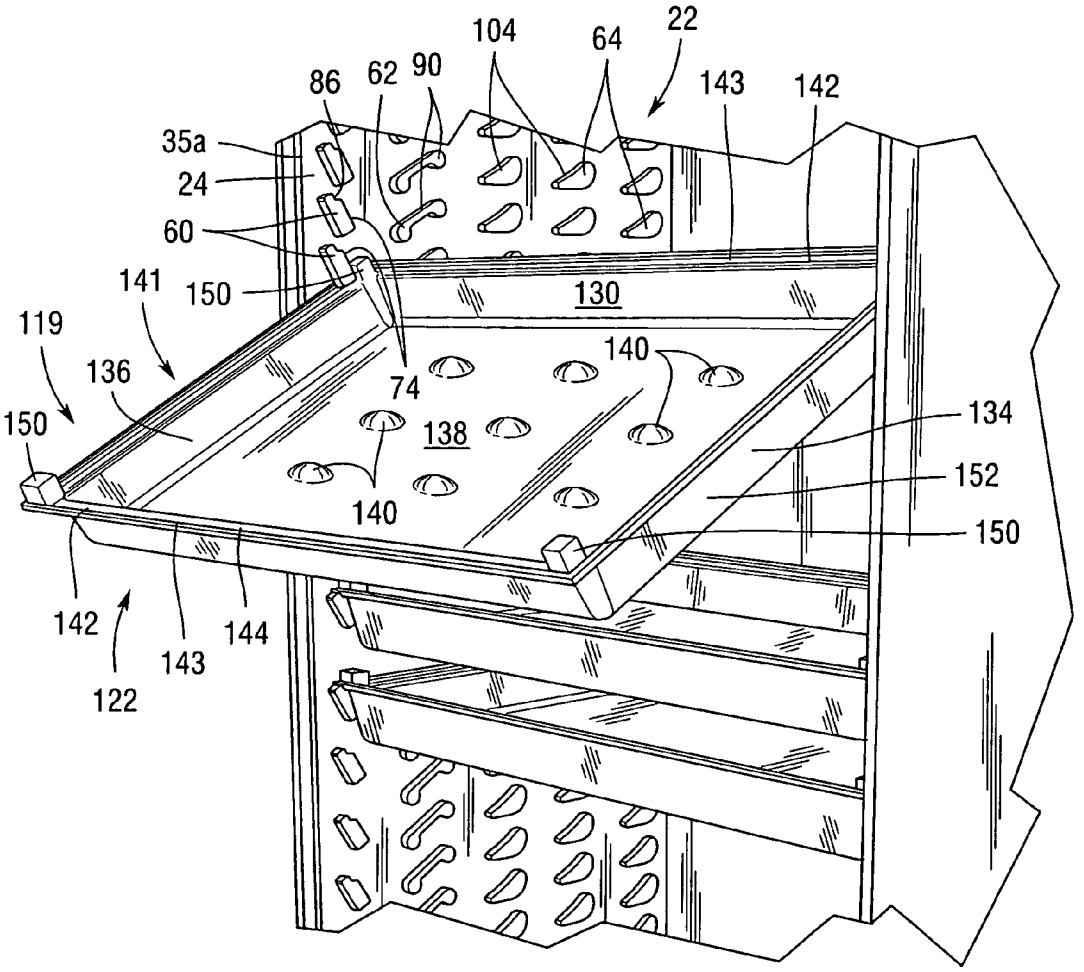

104
64
22
86
62
90
143
142
35a
24
60
141
150
130
119
136
74
140
150
138
134
152
140
150
142
144
143
122

Fig.14A

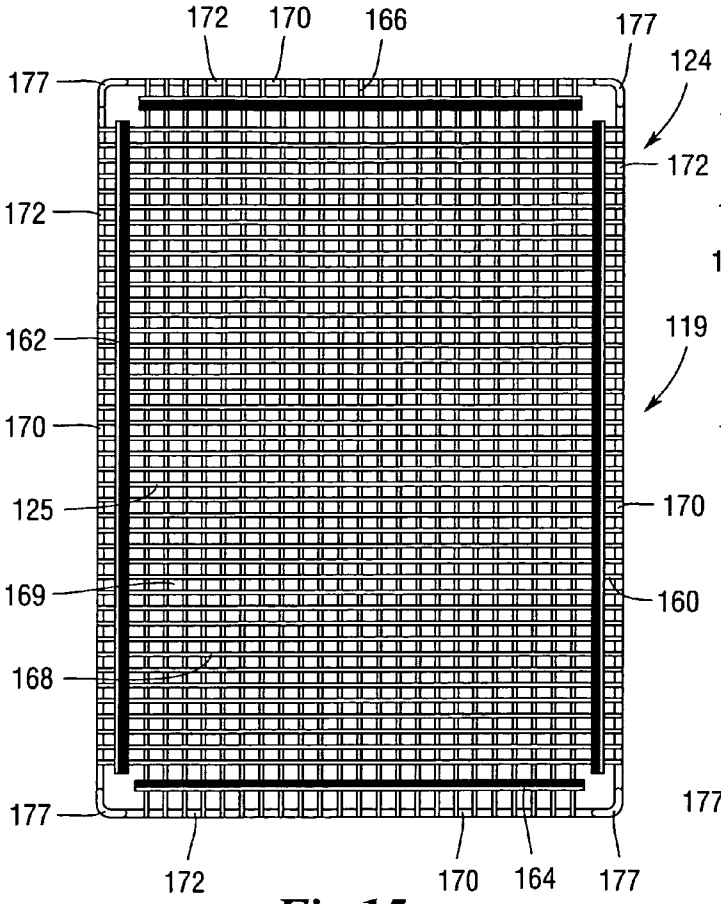


Fig.15

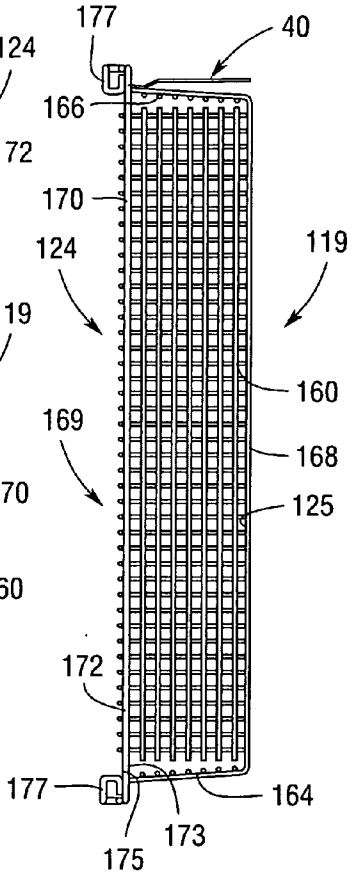


Fig.17

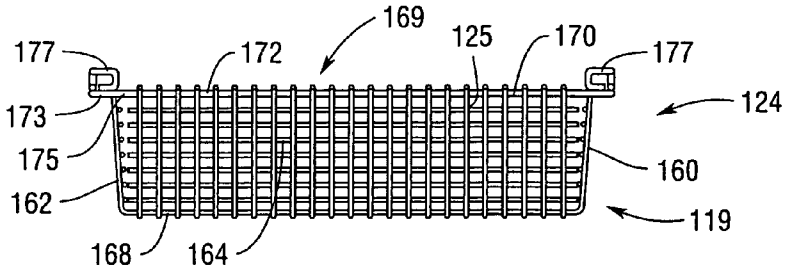


Fig.16

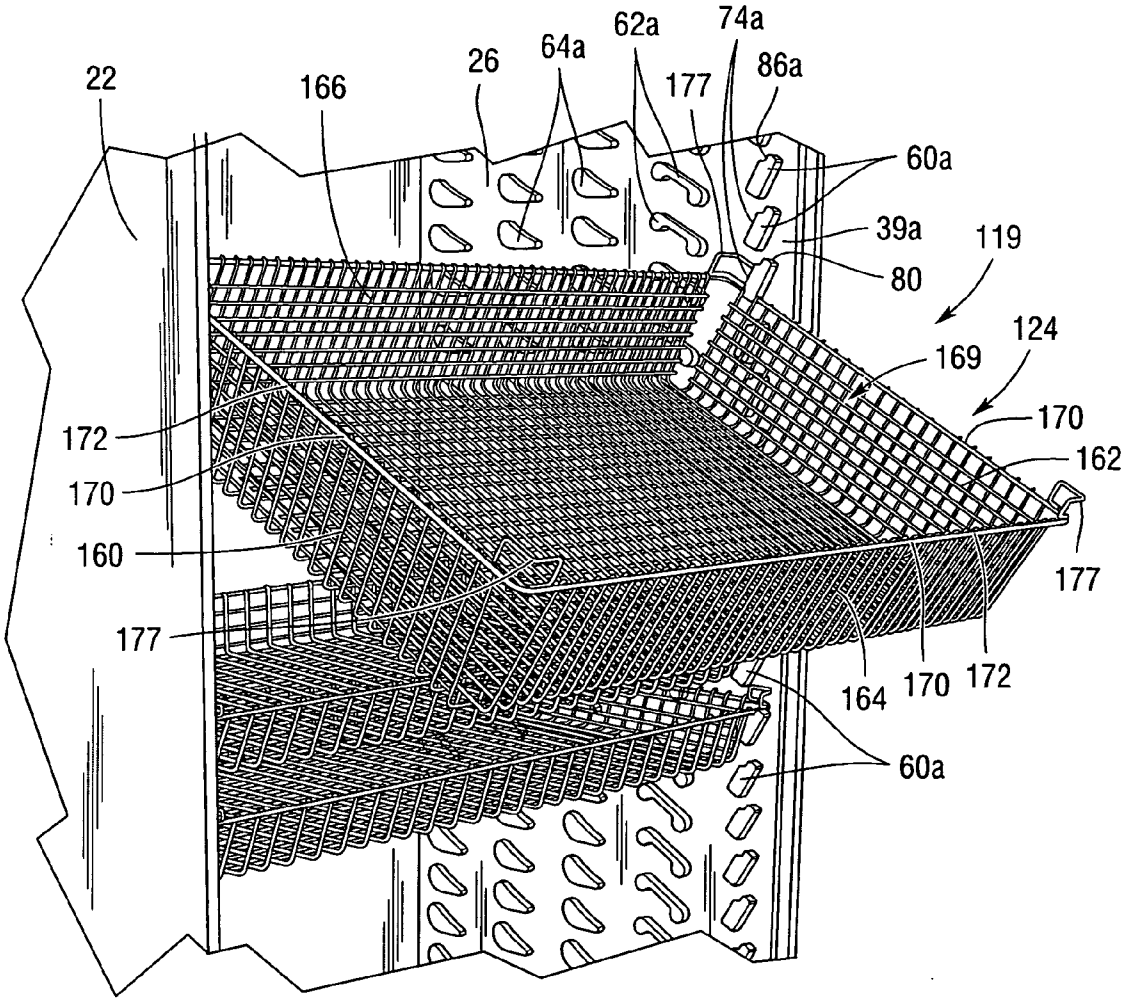

22
166
26
64a
62a
74a
177
86a
60a
39a
119
80
124
169
170
162
172
170
160
177
177
164
170
172
60a

Fig.17A

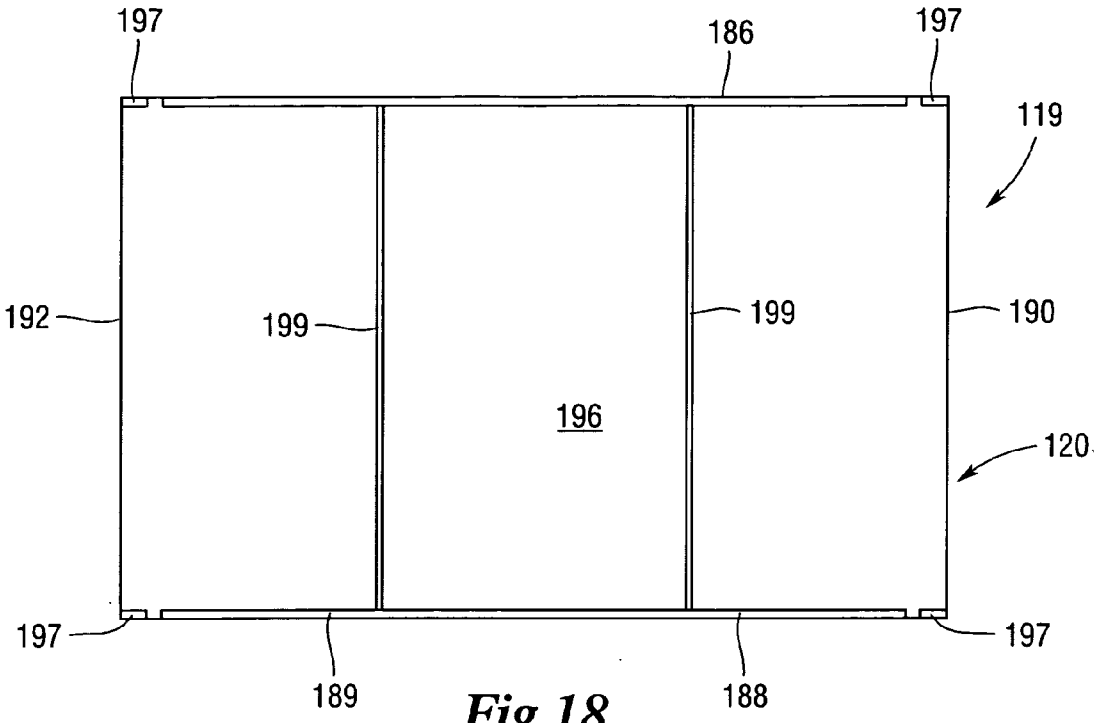


Fig.18

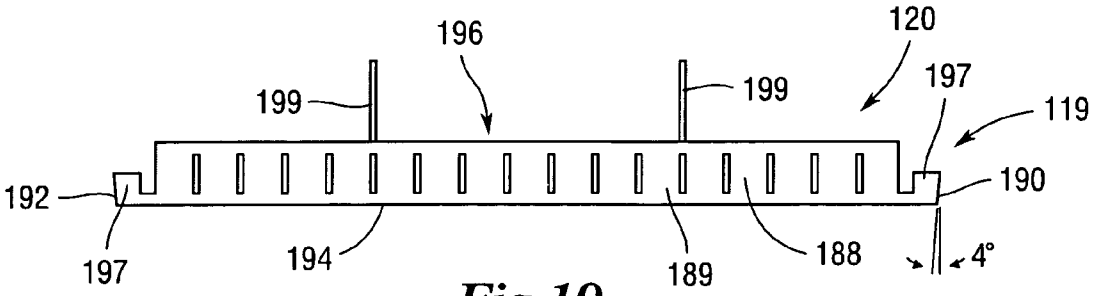


Fig.19

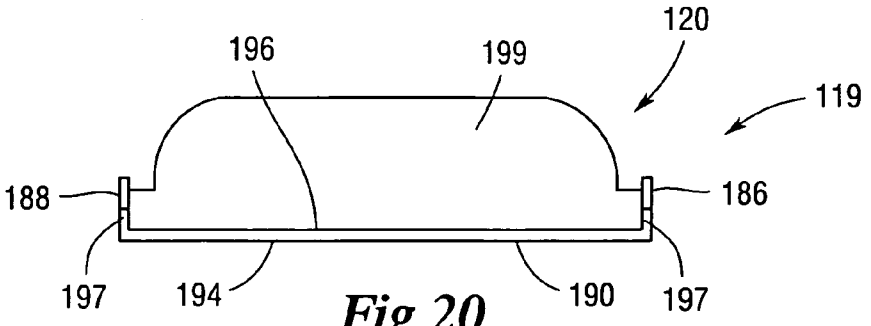


Fig.20

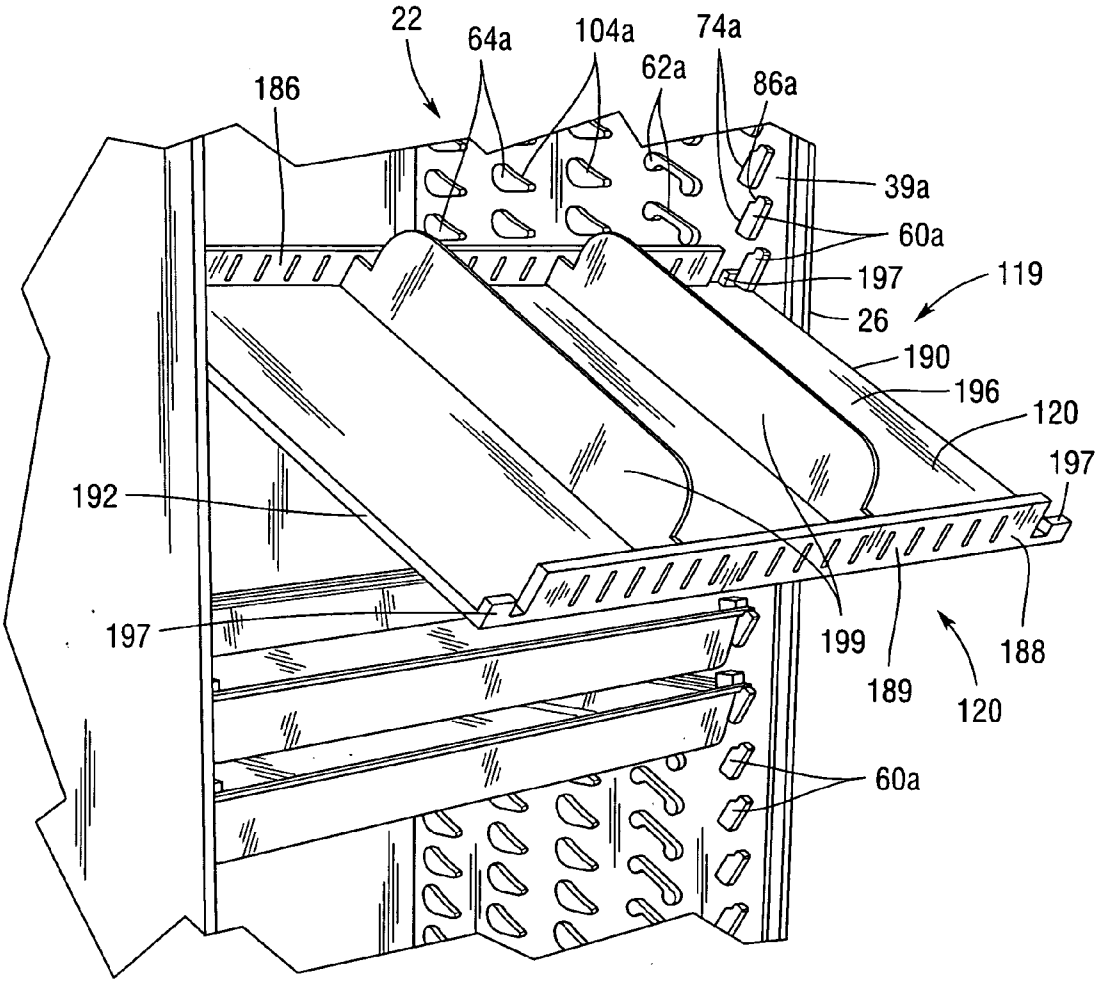

22
64a
104a
74a
62a
86a
186
39a
60a
197
119
26
190
196
120
197
192
197
199
189
120
188
60a

Fig.20A

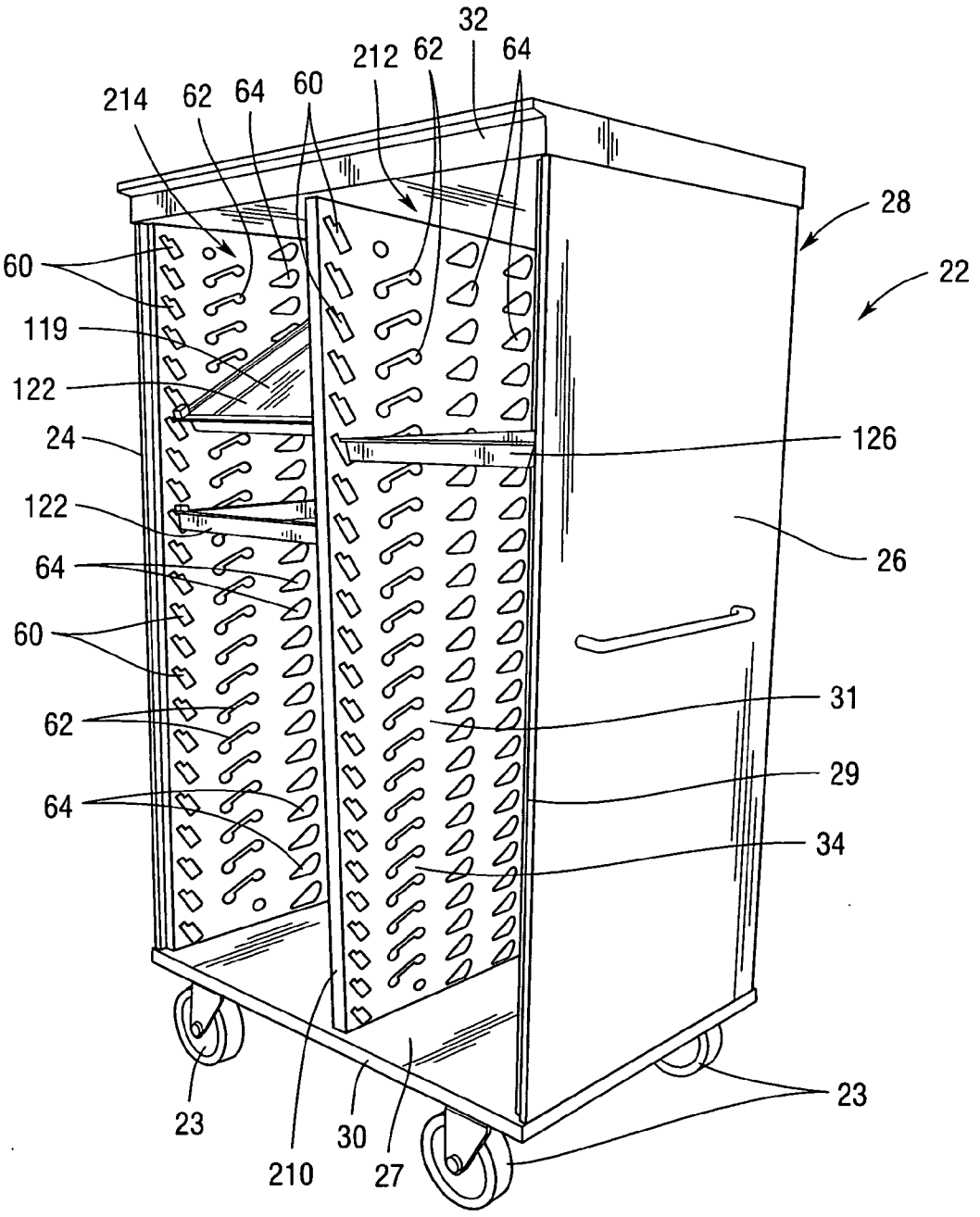

32
212
62
64
214
62
64
60
28
22
60
119
122
24
126
122
26
64
60
31
62
29
64
34
23
23
30
27
210

Fig.21

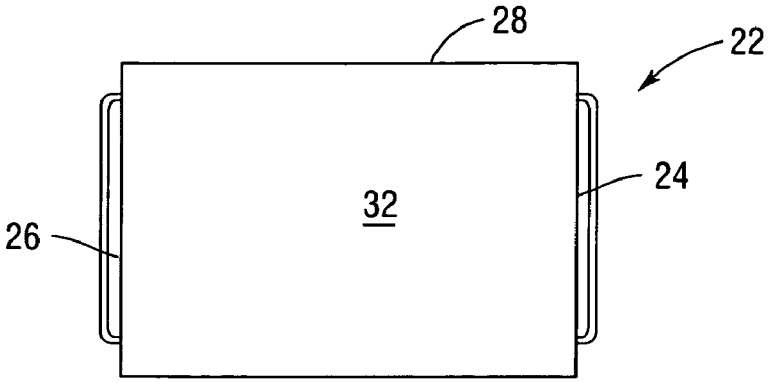

28
22
24
32
26

Fig.22

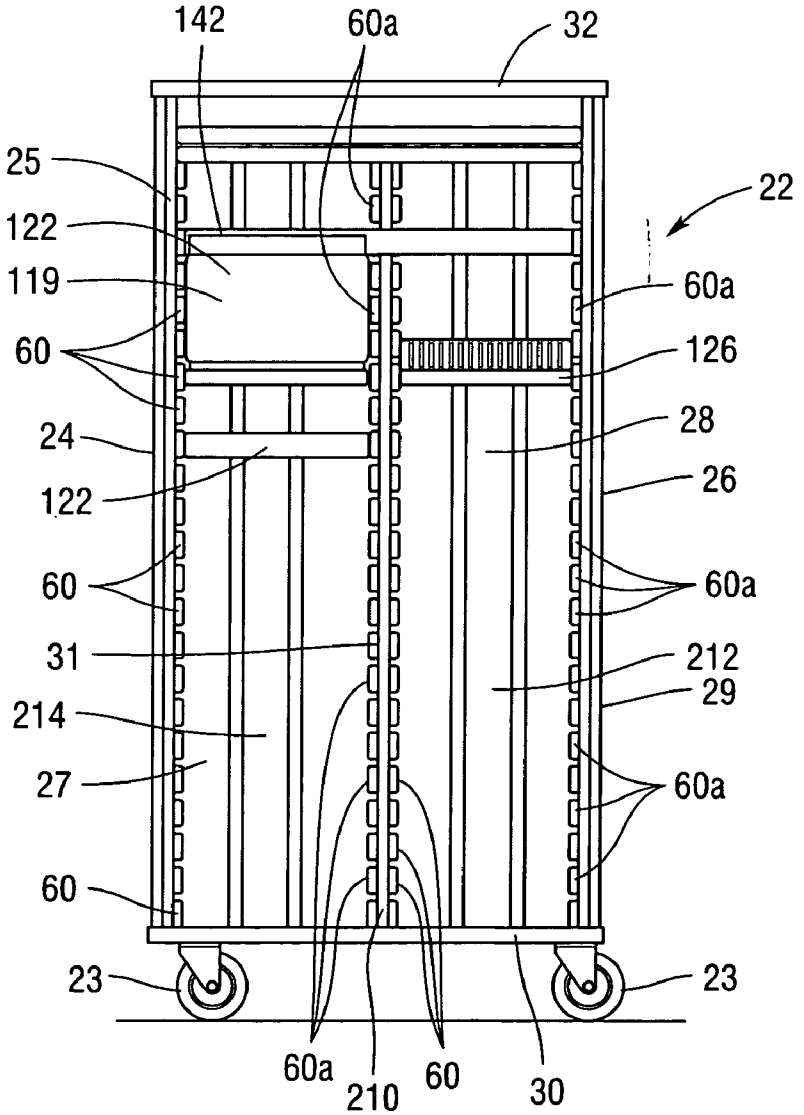

142
60a
32
25
22
122
119
60a
60
126
28
24
26
122
60
60a
31
212
29
214
27
60a
60
23
23
60a
210
60
30

Fig.23

TRACK SUPPORT SYSTEM AND METHOD

FIELD OF THE INVENTION

[0001] The present invention relates to the field of housings and storage systems for use therein.

BACKGROUND

[0002] There are housings, for example cabinets, locking cabinets, and carts that can support a shelf or shelves horizontally so that objects can be placed on the shelf. However, problems can exist with the introduction and/or removal of the shelves from the housing. For example, when shelves are introduced or removed from the housing, they can undesirably wedge or jam against the internal sides of the housing. In addition, there is no reliable way for the shelves to be supported in a housing at an angle, because the shelves supported at an angle have the tendency to slide out of the housing due to gravity forces.

[0003] Thus, there is a need for a system that overcomes the above-described problems. It addition, it would be desirable if such a system were easy to make and use, and have a long working life.

SUMMARY

[0004] The invention is a track support system for installation in a housing having opposed first and second side walls or opposed first and second panels. The housing includes a base wall and an opposed elevated wall, and a back wall, such that the first and second side walls extend between the base and elevated wall. There is an opening in the housing opposite the back wall. Each of opposed first and second side walls has opposed first and second edges and opposed third and fourth edges. The first edges of the first and second side walls are proximal the opening in the housing and extend vertically, the second edges extend along the back wall, the third edges extend along the elevated wall, and the fourth edges extend along the base.

[0005] The first side wall or first panel has a plurality of differently configured elements extending from it that are disposed in a plurality of vertically spaced horizontal rows of elements. The second side wall or second panel has a plurality of differently configured elements extending from it that are disposed in a plurality of vertically spaced horizontal rows of elements. The plurality of vertically spaced horizontal rows of elements form a pattern on the first side wall or first panel, and the plurality of vertically spaced horizontal rows of elements form a pattern on the second side wall or second panel.

[0006] Each of the differently configured elements disposed on the first side wall and the second side wall are opposite one another and are mirror images of one another, and the vertically spaced horizontal rows of elements disposed on the first and second side walls are opposite one another and are mirror images of one another, and the patterns disposed on the first and second side walls are opposite one another and are mirror images of one another. In this arrangement, storage units can be slidably received in the housing horizontally or at an angle supported on the mirror image horizontal rows.

[0007] In a preferred embodiment, each of the horizontal rows of elements disposed on the first side wall or panel includes a first component for supporting weight and providing a stop when the storage unit is fully introduced into the housing horizontally or at an angle, and for providing an extraction safety stop when the storage unit is partially removed from the housing. Each horizontal row further includes a second component for supporting weight and providing an inclined sliding surface for providing lift when the storage unit is introduced into the housing at an angle. The horizontal row further includes a third component for providing lift when the storage unit is introduced into the housing at an angle and for supporting the weight of the storage unit. In each horizontal row of elements, the first component is proximal the opening in the housing, the third component is proximal the back wall of the housing, and the second component is positioned between the first and third components. In one of the preferred embodiments, the first component on the first side wall or first panel has a rectangular shape, the second component has a telephone shape, and the third component has a tear drop shape. The second side wall has a mirror image first component has a mirror image rectangular shape, the mirror image second component has a mirror image telephone shape, and the mirror image third component has a mirror image tear drop shape.

DETAILED DESCRIPTION OF THE DRAWINGS FIGURES

[0008] FIG. **1** is a front elevational view of a housing having panels.

[0009] FIG. **2** is a top plan view of the housing.

[0010] FIG. **3** is a sectional view of the housing taken along cut line A-A in FIG. **1**.

[0011] FIG. **4** is a top plan view of a molded panel.

[0012] FIG. **5** is a front elevational view of the molded panel.

[0013] FIG. **6** is a diagrammatic view of the molded panel sliced in half to form a first panel and a second panel that are mirror images of one another.

[0014] FIG. **7** is an enlarged view, partly in broken lines, of element A shown in FIG. **6**, of the first panel showing a first component.

[0015] FIG. **7**A is an enlarged view, partly in broken lines, of element D shown in FIG. **6**, of the second panel showing a mirror image first component.

[0016] FIG. **8** is an enlarged view, partly in broken lines, of element B shown in FIG. **6**, of the first panel showing a second component.

[0017] FIG. **8**A is an enlarged view, partly in broken lines, of element E shown in FIG. **6**, of the second panel showing a mirror image second component.

[0018] FIG. **9** is an enlarged view, partly in broken lines, of element C shown in FIG. **6**, of the first panel showing a third component.

[0019] FIG. **9**A is an enlarged view, partly in broken lines, of element F shown in FIG. **6**, of the second panel showing a mirror image third component.

[0020] FIG. **10** is a top plan view of the tub.

[0021] FIG. **11** is a front elevational view of the tub.

[0022] FIG. **12** is right side elevational view of the tub.

[0023] FIG. **13** is a sectional view, partly in broken lines, of the tub taken along cut line D-D shown in FIG. **10**.

[0024] FIG. **14** is a sectional view of the tub, partly in broken lines, taken along cut line E-E shown in FIG. **10**.

[0025] FIG. **14**A is a is a perspective view of a tub partly withdrawn from the housing and tub blocking members preventing the tub from sliding out of the housing.

[0026] FIG. **15** is a top plan view of the wire basket.

[0027] FIG. **16** is a front elevational view of the wire basket.

[0028] FIG. **17** is a right side elevational view of the wire basket.

[0029] FIG. **17**A is a perspective view of the wire basket partly withdrawn from the housing and wire basket blocking members preventing the wire basket from sliding out of the housing.

[0030] FIG. **18** is a top plan view of the shelf.

[0031] FIG. **19** is a front elevational view of the shelf.

[0032] FIG. **20** is a right side elevational view of the shelf.

[0033] FIG. **20**A is a is a perspective view of a shelf partly withdrawn from the housing and the shelf blocking members preventing the shelf from being withdrawn from the housing.

[0034] FIG. **21** is a front perspective view of a second embodiment wherein the housing has two cavities,

[0035] FIG. **22** is a top plan view of the second embodiment.

[0036] FIG. **23** is a front elevation view of the second embodiment.

DESCRIPTION

[0037] The present invention is a track support system **20** and is shown generally in FIGS. **1**-**20**A. FIGS. **1**-**3** show a housing **22**, for example, a cabinet, that has opposed first and second side walls or first and second panels **24**, **26**, respectively. It is to be understood that the terms sidewalls and panels are used interchangeably throughout this description. The housing **22** also has a back wall **28** that extends between the first side wall **24** and the second side wall **26**. The housing **22** also has a base **30** and an opposed elevated wall **32**, with the base **30** and the opposed elevated wall **32** each extending between the first side wall **24**, the second side wall **26** and the back wall **28**. The housing **22** has an opening **27** opposite the back wall **28** and has a cavity **38**, as shown in FIG. **1**. The housing **22** can be mounted on casters or wheels **23**, as shown in FIGS. **1** and **3**.

[0038] The first and second side walls **24**, **26**, respectively, are cut to size from a molded panel **42**, as shown in FIG. **4**, so that they can be used as the first and second side walls **24**, **26**, respectively of the housing **22**. As will be described presently, the first and second side walls **24**, **26**, respectively, are adapted to support storage units **119** horizontally and at angles in the housing **22**. The storage units **119** include tubs shelves **120**, tubs **122** and wire baskets **124**, as shown in FIGS. **1**, **2**, **11**-**20**A. As shown in FIGS. **4** and **5**, the molded panel **42** is generally rectangular shaped and has a first edge **44** and an opposed second edge **46**, and a third edge **48** and an opposed fourth edge **50**, as shown in FIG. **4**. As shown in FIG. **5**, the molded panel **42** has a molded side **43** and an opposed joining side **45**. In a preferred embodiment, the molded panel **42** is vacuum formed from an Acrylonitrile Butadiene Styrene (hereinafter ABS) material, such that the molded panel **42** is a one piece construction. ABS material and vacuum forming ABS materials well known to those having ordinary skill in the art. The molded panel **42** could, in other embodiments, be made of different plastics and materials. The molded panel **42** has a longitudinal axis, designated L in FIG. **4**, and is sliced in half along its longitudinal axis L with a knife or blade(not shown) to thus form the first side wall or panel **24** and the second side wall or panel **26**.

[0039] As shown in FIG. **6**, the first side wall or panel **24** has opposed first and second edges **35***a*, **35***b*, respectively, and opposed third and a fourth edges **37***a*, **37***b*. The second side wall or panel **26** has opposed first and second edges **39***a*, **39***b*, respectively, and opposed third and fourth edges **41***a*, **41***b*. FIG. **6** also shows that the first side wall **24** has a plurality of differently configured elements **49** extending from it that are disposed in a plurality of vertically spaced horizontal rows **51**. The second side wall **26** has a plurality of differently configured elements **49***a* extending from it that are disposed in a plurality of vertically spaced horizontal rows **51** a. The plurality of vertically spaced horizontal rows **51** form a pattern **53** on the first side wall **24**, and the plurality of vertically spaced horizontal rows **51***a* form a pattern **53***a* on the second side wall **26**.

[0040] When the housing **22** is assembled or otherwise brought together, the second edge **35***b* of the first side wall **24**, and the second edge **39***b* of the second side wall **26**, abut against the back wall **28** of the housing **22**, as shown in FIGS. **1** and **3**. In addition, the first edges **35***a*, **39***a*, respectively, of the first and second side walls **24**, **26**, respectively, are proximal to the opening **27** in the housing **22**, as shown in FIG. **1**. In addition, the third edges **37***a*, **41***a*, respectively, of the first and second side walls **24**, **26**, respectively, abut against the elevated wall **32**, and the fourth edges **37***b*, **41***b*, respectively, abut against the base **30**. Thus, forming the housing **22**, each of the differently configured elements **49**, **49***a*, respectively, disposed on the first side wall and second side wall **24**, **26**, respectively, are opposite one another, and the differently configured element **49***a* is a mirror image of the differently configured elements **49**. Similarly, the vertically spaced horizontal rows **51**, **51***a*, respectively, disposed on the first and second panels, **34**, **36**, respectively, are opposite one, and the vertically spaced horizontal rows **51** a are a mirror image of the vertical spaced horizontal rows **51**. And, the patterns **53**, **53***a* disposed on the first and second side walls **24**, **26**, respectively, are opposite one another, and the pattern **53***a* disposed on the second side wall **26** is a mirror image of the pattern **53** disposed on the first side wall **24**. In this arrangement, storage units **119** can be slidably received in the housing horizontally or at an angle, as will be described presently, supported on the opposed mirror image vertically spaced horizontal rows **51**, **51***a*.

[0041] As shown in FIGS. **1**, **3** and **6**, in one of the preferred embodiments the plurality of differently configured elements **49** that form each of the vertically spaced

horizontal rows **51** on the first side wall **24** includes, moving from left to right as viewed in FIG. **6**, a first component or protrusion **60** that is located proximal to the first edge **35***a*, a second component or protrusion **62** proximal the first component **60**, and third components or protrusions **64** proximal the second edge **35***b*. The first component **60** is thus located at the opening **27** in the housing **22**, the third components **64** are located proximal the back wall **28** of the housing **22**, and the second component **62** is positioned between the first and third components **60**, **64**, respectively. Similarly, the plurality of mirror image differently configured elements **49***a* that form each of the mirror image vertically spaced horizontal rows **51** a on the second side wall **26** include, moving from right to left as viewed in FIG. **6**, a mirror image first component or protrusion **60***a* that is located adjacent the first edge **39***a* of the second side wall **26**, a mirror image second component or protrusion **62***a* proximal the first component **60***a*, and mirror image third components or protrusions **64***a* proximal the second edge **39***b*. The mirror image first component **60***a* is located at the opening **27** in the housing **22**, the mirror image third components **64***a* are located next to the back wall **28** of the housing **22**, and the mirror image second component **62***a* is positioned between the first and third components **60***a*, **64***a*, respectively. Thus, the first component and mirror image first component **60**,**60***a*, respectively, the second component and mirror image second component **62**, **62***a*, respectively, and the third component and mirror image third component **64**,**64***a*, respectively, are disposed opposite one another and are mirror images of one another. It is pointed out that in other embodiments, the molded panel **42** can be embodied with more or fewer than three third components and mirror image third components **64**, **64***a*, respectively, and the molded panel **42** can be cut to size for a particular application.

[**0042**] As shown in FIGS. **1**, **3**, **14**A, **17**A and **20**A, the first component and mirror image first component **60**, **60***a*, respectively, together support the weight of the storage unit **119** and provide for safety stops **86**, **86***a*, respectively, for storage units **119** fully received in the housing **22** horizontally or at an angle, and provide for extraction safety stops and have extraction safety stop surfaces **74**, **74***a*, respectively, for stopping or blocking the complete removal of storage units **119** that are partly pulled out of the housing **22** horizontally or at an angle. In addition, the opposed first component and mirror image first component **60**, **60***a*, respectfully serve as a vertical insertion locator, because the storage unit **119** is introduced into the housing horizontally between the vertically disposed mirror image horizontal rows **51**, **51***a,* and between the opposed first component and mirror image first component **60**, **60***a*, respectively. The opposed second component and mirror image second component **62**, **62***a*, respectively, support the weight of storage units **119** installed horizontally or at an angle, and provide mirror image sliding surfaces **90**, **90***a*, respectively, so that a storage unit **119** can be slidably introduced and removed from the housing **22** at an angle. In addition and as will be described in greater detail presently, the opposed second component **62** has a base stop surface **93** and the mirror image second component **62***a* has a mirror image base stop surface **93***a* that engage the storage unit **119** disposed vertically below and block the it from being withdrawn horizontally out of the housing **22**. The third component and mirror image third component **64**, **64***a*, respectively supporting the weight of the storage unit **119** and provide lifting surfaces **104**, **104***a*, respectively, that lift and guide the storage units **119** when introduced into the housing **22** at an angle, and they provide mirror image third convex sliding surfaces **112**, **112***a*, respectively, over which the storage unit **119** slides when moved horizontally in and out of the housing **22**.

[**0043**] In one of the preferred embodiments the first component and mirror image first component **60**, **60***a*, respectively, are molded such that the first component **60** has a rectangular shape **61**, and the mirror image first component **60***a* has a mirror image rectangular shape **61***a*, as shown in FIGS. **4**, **7** and **7**A. FIGS. **7** and **7**A show enlarged views of portions of the first and second side walls or panels **24**, **26**, respectively, as indicated by arrows A and Al in FIG. **6**. It is to be understood that the opposed mirror image rectangular shapes **61**, **61** a, respectively, formed in the first and second side walls **24**, **26** respectively, have shapes that are mirror images of one another. The mirror image rectangular shapes **61**, **61***a* have mirror image first surfaces **70**, **70***a*, that extend to and makes a right angle bend with mirror image second surfaces **72**,**72***a*, respectively, the mirror image second surfaces **72**,**72***a*, respectively, extend to and makes a right angle bend with a mirror image extraction safety stop surfaces **74**,**74***a*, respectively, and the mirror image extraction stop surfaces **74**,**74***a*, respectively, extend to and makes a right angle bends with mirror image fourth surfaces **76**,**76***a*, respectively, and the mirror image fourth surfaces **76**,**76***a*, extend to and makes a right angle bends with mirror image fifth surfaces **78**, **78***a*, respectively, and the mirror image fifth surface **78**,**78***a*, extend to and make right angle bends with mirror image sixth surfaces **80**, **80***a*, respectively, and the mirror image sixth surfaces **80**,**80***a*, respectively, extend to and makes a right angle bends with the mirror image first surfaces **70**,**70***a*, respectively, all of which extend to mirror image rectangular flat surfaces **82**,**82***a*. The mirror image fourth surfaces **76**,**76***a*, respectively, and the mirror image fifth surfaces **78**,**78***a*, respectively, together form mirror image stops **86**, **86***a*, respectively in the opposed mirror image rectangular shaped components **60**,**60***a*. The mirror image third surfaces **74**,**74***a*, respectively and mirror image fourth surfaces **76**,**76***a* meet at mirror image support corners **88**,**88***a*. In addition, the first component **60** has s first component sliding surface **79**, and the mirror image first component **60***a* has a mirror image first component sliding surface **79***a*, and when storage units **119** are introduced into or slid out of the housing **22**, they slide over the first sliding surface **79** and mirror image sliding surface **79***a*.

[**0044**] As shown in FIG. **3**, when the storage unit **119** is supported in the housing **22** in the horizontal position, a portion of its weight is supported on the opposed mirror image support corners **88**,**88***a*, respectively, and as an advantage it cannot inadvertently slide out of the housing **22**, because the opposed mirror image fifth surfaces **78**,**78***a*. When the storage unit **119** is in the angled position, which can be, for example, about 30° angle and completely positioned inside the housing **22**, a portion of its weight is supported on the mirror image fifth surfaces **78**,**78***a*, respectively, and the mirror image fourth surfaces **76**,**76***a*, respectively, as shown in FIGS. **3**, as an advantage the storage unit **119** cannot inadvertently slide out of the housing because mirror images stops **86**,**86***a*, respectively, prevent such movement.

[0045] In one of the preferred embodiments the second component **62** is formed to have a telephone shape **63**, and the mirror image second component **62***a* is formed such it has a mirror image telephone shape **63***a*, as shown in FIGS. **3**, **4**, **8** and **8**A. The second component and mirror image second component **62**, **62***a*, respectively, extend from the first and second side walls or panels **24**, **26**, respectively. FIGS. **8** and **8**A show enlarged views of a portion of the first and second side walls **24**, **26**, respectively, as indicated by arrows B and B**1** in FIG. **6**. The second component and mirror image second component **62**, **62***a*, have mirror image sliding surfaces **90**, **90***a*, respectively, that meet with mirror image first convex curved surfaces **92**,**92***a*, respectively, having mirror image radii designated R**1**. The mirror image first convex surfaces **92**,**92***a*, respectively, meet with mirror image first concave surfaces **94**,**94***a*, having a radii designated R**2**. The first mirror image concave surfaces **94**,**94***a*, respectively, meet with mirror image straight surfaces **96**, **96***a*, respectively, and the straight surfaces **96**,**96***a*, respectively, extend to mirror image second concave surfaces **97**,**97***a*, respectively, having radii R**2**. The mirror image second concave surfaces **97**, **97***a*, meet with mirror image second convex surfaces **98**,**98***a*, respectively, and have a radii R**1**, and the second convex surfaces **98**, **98***a*, respectively, meets with the mirror image sliding surfaces **90**, **90***a*. All of the above described surface meet with mirror image telephone shaped flat surfaces **100**, **100***a*, respectively.

[0046] The second component and mirror image second component **62**,**62***a*, respectively, support weight and are at the location from which daily use will occur as storage units **119** are slid in and out of the housing **22** horizontally or at an angle. In addition, the second component and mirror image second component **62**, **62***a*, respectively, provide the guide track function for guiding the support units **119** when they are introduced into or removed from the housing **22** horizontally or at an angle. It is pointed out that when the storage unit **119** is introduced into the housing **22** and is slid past the mirror image first components **60**,**60***a*, respectively, the user (not shown) has several options. The user can slide the storage unit **119** horizontally into the housing **22** over the mirror image second components **62**, **62***a*, respectively. Or, as shown in FIG. **3**, the user can slide the storage unit **119** into the housing **22** such that when the storage unit **119** reaches the mirror image second components **62**, **62***a*, respectively, the user tilts the storage unit **119** toward the base **30** of the housing **22** and continues pushing the storage unit **119** into the housing **22**. The storage unit **119** is caused to slide over the mirror image sliding surfaces **90**,**90**, respectively, that are disposed in the mirror image horizontal rows **51**,**51***a*, respectively, that disposed vertically above. Thus, the support unit **119** advantageously cannot be mis-fed when introduced into the housing **22** horizontally or at an angle. Also, in one of the preferred embodiments, the mirror image sliding surfaces **90**, **90***a*, respectively, can be, for example, at a 30° angle, as shown in FIGS. **8** and **8**A, relative to the vertically spaced horizontal rows **51**, **51***a*.

[0047] In addition, as previously mentioned, the second component **62** has the base stop surface **93** and the mirror image base second component **62***a* has a mirror image base stop surface **93***a*, as shown in FIGS. **8** and **8**A. The base stop surface **93** and mirror image base stop surface **93***a* provide for a working level stop when a storage unit **119** is horizontally positioned in the housing **22**. In particular, when the storage unit **119** is fully received in the housing **22** and then pulled out of the housing **22**, the base stop surface and mirror image base stop surface **93***a* each engages the storage unit **119** disposed vertically below. As will be described in greater detail presently, the tub **122** has tub blocking members **150**, the wire basket **124** has wire basket blocking members **177**, and the shelf **120** has shelf blocking members **199** that extend therefrom. When the tub **122** is pulled from the housing **22**, one of the tub blocking members **150** engages the base stop surface **93** on the second component **62** disposed in the horizontal row **51** located vertically above, and one of the tub blocking members **150** engages the mirror image base stop surface **93***a* on the mirror image second component **62***a* disposed in the mirror image horizontal row **51** located vertically above. Thus, the tub **122** cannot be slid out of the housing **22** without the user taking addition action. When the tub **122** is horizontally slid out of the housing **22** in this manner, about 80% of the tub **122** is accessible to the user, and the tub hangs downwardly about 20 degree, which advantageously provides the user with easy access to the tub **122**. To remove the tub **122**, the user must lift the tub **122** about 20 degrees upwardly to move it under the base stop surface **93** on the second component **62** and the mirror image base stop surface **93***a* on the mirror image second component **62***a* that are disposed on the horizontal row **51** an mirror image horizontal row **51***a* vertically above the tub **122**. Once the tub **122** is moved out of the housing **22** past the second component **62** and mirror image second component **62***a*, the tub blocking members **150** contact the extraction safety surface **74** and the mirror image extraction safety stop **74***a*, disposed on the first component **60** and mirror image first component **60***a* disposed vertically above. This advantageously prevents or blocks the sliding movement of the tub **122** and thus prevents it from undesirably sliding out of the housing **22**. This thus advantageously allows the tub **122** to be partly withdrawn out of the housing so that the user can access items stored in the tub **122**, without the risk of the tub **122** sliding out of the housing **22**. To remove the tub completely from the housing **22**, the user lifts it over the first component **60** and mirror image first component **60**.

[0048] In one of the preferred embodiments the third component and mirror image third component **64**,**64***a*, respectively, are molded such that the third component **64** has a tear drop shape **65**, and the mirror image third component **65***a* has a mirror image tear drop shape **65***a*, as shown in FIGS. **4**, **6**, **9**, **9**A. FIGS. **9** and **9**A show enlarged views of portions of the first side wall or panel **24** and second side wall or panel **26** indicated by arrows C and C**1** in FIG. **6**. There are three third components and mirror image third components **64**, **64***a*, respectively, but in other embodiments the number could be less or more. The tear drop shape **65** and mirror image tear drop shape **65***a* have mirror image curved lifting surfaces, for example, curved or concave mirror image lifting surfaces **104**, **104***a*, having radii designated R**3**. The mirror image concave lifting surfaces **104**, **104***a*, respectively, meet with mirror image first convex surfaces **106**,**106***a*, respectively, having radii designated R**4**, and the mirror image first convex surfaces **106**,**106***a*, respectively, meet with mirror image linear surfaces **108**,**108***a*, respectively. The mirror image linear surfaces **108**,**108***a*, respectively, meet with mirror image second convex surface **110**,**110***a*, respectfully, having radii designated R**5**, and the mirror image second convex surfaces **110**,**110***a*, respectfully, meet with mirror image third convex sliding surfaces **112**,

112*a*, respectively, having radii designated R6. The mirror image third convex sliding surfaces **112**,**112***a*, respectively, meet with the mirror image concave lifting surfaces **104**, **104***a*, respectively. The above-described surfaces extend to tear drop shaped flat surfaces **114**, **114***a*, respectively.

[**0049**] The concave lifting surface **104** and mirror image concave lifting surface **104***a* support and guide the support unit **119** when it is introduced into the housing **22** at an angle, for example, a 30° angle, as described above. The third convex sliding surface **112** and mirror image third convex sliding surface **112***a* support the weight of the storage unit **119** when it is horizontally located in the housing **22**.

[**0050**] In one of the preferred embodiments the horizontal rows **51**, **51***a*, respectively, are spaced about 2.88 inches from one another, and the concave lifting surfaces **104**, **104***a*, respectively, have about an 8 (eight) inch radius that provides the lift required to slide in and correct the angle as the storage units **119** are introduced into the housing **22** at an angle. In other embodiments, these dimensions can be changed.

[**0051**] As shown in FIGS. **1**, **2**, and **11**-**20**A, the storage units **119** include a shelf **120** and tub **122** and basket **124**. The tub **122** is generally shown in FIGS. **10**-**14**A. The tub **122** has opposed first and second walls **130**, **132**, respectively, and opposed third and fourth walls **134**, **136**, respectively, each of which extends to a tub base **138** having elevated supports **140**. The tub **122** thus has a tub cavity **141** defined by the opposed first and second walls **130**, **132**, respectively, and opposed third and fourth walls **134**, **136**, respectively, and tub base **138**. A surrounding lip **142** having a first lip surface **144** and an opposed second lip surface **146** extends around the periphery of the tub **122**, and extends in a direction away from the tub cavity **141**. Tub blocking members **150** extends from the first lip surface **144** where straight portions **143** of the surrounding lip **142** meet proximal the corners of the tub **122**, as shown in FIG. **10**-**14**A. The tub blocking members **150** are for blocking the movement of the tub **122** when it is partly withdrawn from the housing **22**. This advantageously prevents the tub **122** from uncontrollably sliding out of the housing **22** when it is pulled out of the housing **22** to retrieve an object stored therein. In particular, as shown in FIG. **14**A, when the tub **122** is partly withdrawn from the housing **22**, the tub blocking members **150** contact the first component **60** and mirror image first component **60***a*, respectively, disposed vertically above the tub **122**, and in particular contact the extraction stop surface **74** and the mirror image extraction safety stop **74***a*, as shown. This advantageously prevents the entire tub **122** from undesirably sliding out of the housing **122**.

[**0052**] In addition, each of the opposed first and second walls **130**, **132**, respectively, and opposed third and fourth walls **134**, **136**, respectively, advantageously has a taper **152**. The taper **152** extends in a direction toward the tub base **138**, and in one the preferred embodiments the taper **152** can be about 8°. The taper **152** advantageously allows for the tub **122** to be slid in out of the housing **22** without interference with vertically disposed horizontal rows **51**,**51***a*, respectively.

[**0053**] It is pointed out that when the tub **122** is slid into the housing **22** at an angle, as shown in FIGS. **1**, **3** and **21**, the surrounding support lip **142** of the tub **122** abuts against the stop **86** and mirror image stop **86***a*, to thus advantageously prevent the tub **122** from sliding out of the housing **22**. The tub **122** can be removed from the housing **22** by lifting the tub **122** over the first component **60** and mirror image first component **60***a* and sliding the tub **122** out of the housing **22**. In addition, the second component **62** and mirror image second component **62***a*, and the third component **64**, and mirror image third component **64***a*, respectively, advantageously guide the tub **122**, and prevent the tub **122** from jamming or mis-feeding as the tub **122** is introduced or removed from the housing **22**. The tub **122** can comprise plastic, metal and other suitable materials.

[**0054**] The wire basket **124**, shown generally in FIGS. **15**-**17**A, is formed from wires **125**. The wires **125** can be plastic, metal or other suitable material. The wire basket **124** has an opposed first and second wire walls **160**, **162**, respectively, and opposed third and fourth wire walls **164**, **166**, respectively, each of which extends to a wire base **168**. The wire basket **124** thus has a wire basket cavity **169** defined by the opposed first and second wire walls **160**, **162**, respectively, and opposed third and fourth wire walls **164**, **166**, respectively, and wire basket base **168**. A surrounding wire lip **170** having a first wire lip surface **172** and an opposed second wire lip surface **173** having a wire lip support surface **175** extends around the periphery of the wire basket **124**. The surrounding wire lip **170** extends in a direction away from the wire basket cavity **169**. Wire basket blocking members **177** extend from the surrounding wire lip **170** and is for preventing the complete withdrawal of the wire basket **124** from the housing **22** in the same manner as described above in connection with the tub **122**. In particular the wire basket blocking members **177** contact the first component **60** and mirror image first component **60***a*, on the horizontal row **51**, **51** a, respectively, disposed vertically above the wire basket **124**, and in particular contact the extraction stop surfaces **74**, and the mirror image extraction safety stop **74***a*, as shown in FIG. **17**A. This advantageously prevents the wire basket **124** from sliding out of the housing **22** when in the partly open position. In addition, each of the opposed first and second wire walls **160**, **162**, respectively, and opposed third and fourth wire walls **164**, **166**, respectively, advantageously has a taper **180**. The taper **180** extends in a direction toward the wire base **168**, and in one the preferred embodiments the taper **180** can be about 4°, as shown in FIG. **17**. The **180** taper advantageously allows for the wire basket **124** to be slid in out of the housing **122** without interference from vertically disposed horizontal rows **51**, **51***a*, respectively.

[**0055**] It is pointed out that when the wire basket **124** is slid into the housing **22** at an angle as shown in FIG. **21**, the surrounding wire support lip **170** abuts against the stops **86**, **86***a*, formed in the first components **60**,**60***a*, respectively, to thus advantageously prevent the wire basket **124** from sliding out of the housing **22**. The wire basket **124** can be removed from the housing **22** by lifting it over the first components **60**,**60***a*, respectively, and sliding it out of the housing **22**.

[**0056**] The shelf **120** shown in FIGS. **1** and **3**, **18**-**20**A can be similarly slid into the housing **22** horizontally or at an angle, for example, a 30° angle. As shown in FIGS. **18**-**20**A, the shelf **120** has a shelf support surface **194** and an opposed shelf object surface **196**. First and second opposed shelf sides **186**,**188**, respectively, and third and fourth opposed

shelf sides, **190**, **192**, respectively, extend between the support shelf support surface **194** and shelf object surface **196**. The shelf has a slotted wall **189** such that the dividers **199** can be removably repositioned on the shelf **120**. A shelf blocking member **199** extends from the shelf **120** corners and is for preventing the complete withdrawal of the shelf **120** from the housing **22** in the same manner as described above in connection with the tub **122**. In particular, as shown in FIG. **20**A, the shelf blocking members **199** contact the first component **60** and mirror image first component **60***a*, on the horizontal row **51**, **51***a*, respectively, disposed vertically above the shelf **120**, and in particular contact the extraction stop surface **74** and mirror image extraction stop surface **74***a*. This advantageously prevents the shelf **120** from inadvertently sliding out of the housing **22** when in the partly open position. The shelf **124** can be introduced and removed from the housing **122** horizontally or at an angle. In addition, the shelf **120** has a taper that can be about 4° which facilitates introduction and removal of the shelf **120**. In other embodiments the shelf **120** can be made without a taper **194**. The shelf **120** can be introduced into the housing **22** by lifting the shelf **120** over the first components **60** and mirror image first component **60***a*, and sliding the shelf **120** into the housing **122** horizontally or at an angle of, for example, 30° angle, and can be supported horizontally and at angles in the same manner as describe above in connection with the tub **122**. As with the tub **122** and wire basket **124**, the first component and mirror image first component **60**,**60***a*, the second component and mirror image second component **62**,**62***a*, respectively, and the third component and mirror image third component **64**,**64***a*, respectively, guide the shelf **120** and advantageously prevent it from jamming or misfeeding when introduced or removed from the housing **22** horizontally or at an angle.

[**0057**] In use, taking for example the tub **122**, the tub **122** is moved horizontally between opposed mirror image first components **60**, **60***a*, respectively, and slid into the housing over the first component **60** and mirror image **60***a* first component. As insertion continues, the tub blocking members **150** extending from the tub will contact the second component **62** and mirror image second component **62** disposed in the horizontal row **51** and mirror image horizontal row **51***a* disposed vertically above. The user can push downwardly on the tub **122** such that the tub **122** slides up the second component **62** and the mirror image second component **62***a* disposed vertically above, and the tub **122** is thus moved to the angled position. The tub **122** then moves upwardly upon contacting the third component **64** and concave lifting surface **104** and mirror image third component **64***a* and mirror image concave lifting surface **104***a*. Once fully inserted the tub **122** comes to rest, and abuts against the stop **86** and mirror image stop **86***a*. If, on the other hand, during introduction the user lifts up on the tub **122** when it contacts the second component **62** and mirror image second component **62***a* disposed vertically above, then the blocking members **150** will move under the base stop surface **93** and mirror image base stop surface **93***a* disposed vertically above, such that the tub **122** can be moved into the housing **22** horizontally. Thus, the base stop surface **93** and mirror image base stop surface **93***a* provide for a working level stop when a storage unit **119** is horizontally positioned in the housing **22**. It is to be understood that the wire basket **124** and shelf **120** are introduced into the housing horizontally or vertically in a like manner.

[**0058**] As described above, the tub **122** has tub blocking members **150**, the wire basket **124** has wire basket blocking members **177**, and the shelf **120** has shelf blocking members **199**. Taking the tub **122** as an example, when the tub **122** is horizontally located in the housing **22** and pulled from the housing **22**, the tub blocking members **150** engage the base stop surface **93** on the second component **62** and the mirror image base stop surface **93***a* on the mirror image second component **62***a* that are disposed on the horizontal rows **51** and mirror image horizontal row **5**la spaced vertically above, such that the tub **122** cannot be slid out of the housing **22** without the user taking addition action. When the tub **122** is horizontally slid out of the housing **22** to this stopping location in this manner, about 80% of the tub **122** is accessible to the user, and the tub hangs downwardly at about a 20 degree angle, which advantageously provides the user with easy access to the tub **122** contents. This thus advantageously allows the tub **122** to be partly withdrawn out of the housing so that the user can access items stored in the tub **122**, without the risk of the tub **122** sliding out of the housing **22**. To further remove the tub **122**, the user must lift the tub **122** about 20 degrees upwardly to move the blocking members **150** under the base stop surface **93** and the mirror image base stop surface **93***a*. Thereafter, the user can continue to pull the tub **122** out of the housing **22**. In this connection, the blocking members **150** contact the first component **60** and mirror image first component **60***a*, respectively, disposed vertically above the tub **122**, and in particular contact the extraction stop surface **74** and the mirror image extraction stop **74***a*, which advantageously provides a safety stop such that the tub **22** is prevented from undesirably or uncontrollably sliding completely out of the housing **22**. To fully remove the tub, the user need only lift the tub **122** upwardly such that it is horizontal and pull it outward from the housing **22**. Similarly, to remove a tub **122** that is at an angle in the housing **22**, the user lifts the tub out of the stop **86** and mirror image stop **86***a*, until the blocking members **150** engage the first component **60** and mirror image first component **60***a* disposed vertically above. The tub **122** can be removed from the housing **22** by lifting it such that it is horizontal and sliding it out of the housing **22**. It is pointed out that the mirror image first and second components **60**, **60***a*, respectively, provide the working level stop in the **30** degree mode. The tub blocking members **150** engage the mirror image extraction stop surfaces **74**,**74***a*, respectively, disposed on the mirror image first components disposed vertically above. The tub **150** thus pivots on the first component **60** and mirror image first component **60***a* disposed vertically below. To remove the tub **122**, the user then tilts the tub **122** until it is horizontal and slides it out of the housing **22**.

[**0059**] In addition, it is to be understood that the shelf **120** and wire basket **124** can be introduced into the housing **22** horizontally and removed from the housing **22** horizontally in the same manner as described above in connection with the horizontal introduction and removal of the tub **122** from the housing **22**, and can be introduced into the housing **22** at an angle and removed from the housing **22** from an angle position in the same manner as described above in connection the angled introduction and removal of the tub **122** from the housing **22**.

[**0060**] It is pointed out that the third component **64** has a third convex sliding surface **112** and the mirror image third component **64***a* has a third convex sliding surface **112***a* each

supports the weight of the storage units **119** in the horizontal mode and provides for mirror image convex sliding surfaces **112**, **112***a* in the horizontal mode

[**0061**] In addition, the tubs **122** and wire baskets **124** are two dimensional shapes, and in one of the preferred embodiments, the tub **122** and basket **124** has a width of 400 millimeters and a depth of 600 millimeters. The system can advantageously can be used in combination with two dimensionally different shapes and their multiples. The first side wall **24** and the second side wall **26** can be sized accordingly.

[**0062**] A method is of making a shelving system is also provided including forming a molded panel **42** from an ABS material, providing the molded panel with horizontal rows of elements and slicing the molded panel in a half along its longitudinal axis to make the first side wall **24** and the second side wall **26** that is a mirror image thereof, and using the first and second side walls **24**, **26** to form a housing **22**.

[**0063**] As shown in FIGS. **21-23** in a second embodiment an internal divider panel **210** that divides the interior of the housing **22** in to a first cavity **212** and a second cavity **214**. This requires the use of additional first and second panels **22**, **24**, respectively. As shown, first and second side walls **24**, **26**, are mounted to opposed sides of the divider panel **210**. It is to be understood that the reference numbers used in FIGS. **21-23** that are the same as those used above in connection with the first embodiment are not described herein again.

[**0064**] In addition, in another embodiment a standard housing (not shown) could be provided having a base, a back wall, an elevated wall and first and second opposed outer walls having interior surfaces, wherein the elevated wall is opposite the base, and wherein the back wall extends between the first and second opposed outer walls.

[**0065**] The standard housing has a standard housing opening opposite the back wall. Such a standard housing having this basic structure is well known to those having ordinary skill in the art. The first side or panel **24** can be joined to the interior surface of the first outer wall with, for example, screws, and the second side or second panel **26** can be joined to the interior surface of the second outer wall with, for example, screws, such that the first second and third components, **60**, **62**, **64**, respectively, and mirror image first, second, and third components **60***a*, **62***a*, **64***a*, are opposite one another and are otherwise arrange in the standard housing exactly the same as described above in connection with the first embodiment. That is, the first component and mirror image component **60**, **60***a*, respectively, are proximal the standard housing opening. For the purpose of joining, the first and second side or panels **24**, **26**, respectively, can be provide with mirror image dimples **85**, **85***a*, respectively, through which the screw (not shown) can be passed, as shown in FIG. **6**. Once the first and second side walls or panels **24**, **26**, respectively, are installed to the opposed outer walls, storage units **119** can introduced and removed from the housing in the same manner as described above. Thus, the scope of the present invention is great.

[**0066**] Thus, the present invention provides superior solution that ends the problem of drawers that wedge or jam. It also advantageously provides a way for storage units to be partly withdrawn from a housing, for example, at an angle, and eliminates the risk that they can inadvertently slide out of the housing. The present invention also provides for a superior way to support storage units at an angle, feed storage unit into a housing at an angle, and remove storage units from an angled position.

[**0067**] In other embodiments, the housing **22** can also be embodied as a locking cabinet with doors and a lock.

[**0068**] It will be appreciated by those skilled in the art that while a track support system and method has been described above in connection with particular embodiments and examples, the invention is not necessarily so limited, and other embodiments, examples, uses, and modifications and departures from the described embodiments, examples, and uses may be made without departing from the track support system and method. All of these embodiments are intended to be within the scope and spirit of the present track support system and method.

What is claimed:

1. A track support system for installation in a housing having opposed first and second side walls with the housing capable of receiving a storage unit therein, the rack system comprising:

the first side wall and having a first component, a second component and a third component arranged in horizontal row,

the second side wall having a mirror image first component, a mirror image second component and a mirror image third component arranged in a mirror image horizontal row, and

wherein the first component provides a stop and the and mirror image first component provides a mirror image stop for preventing the storage unit from inadvertently sliding out of the housing when housed therein.

2. The track support system according to claim 1 wherein the first side has a plurality of vertically spaced horizontal rows of components and the second side has a mirror image plurality of vertically spaced horizontal rows of components and wherein the storage unit is capable of being introduced into the housing between the mirror image vertically spaced horizontal rows of components.

3. The track support system according to claim 1 wherein the stop and the mirror image stop are for preventing the storage unit from sliding out of the housing when the storage unit is slidably received in the housing at an angle.

4. The track support system according to claim 2 wherein the vertically spaced horizontal rows disposed on the first side form a pattern and wherein the mirror image plurality of vertically spaced horizontal rows disposed on the second side form a mirror image pattern.

5. The track support system according to claim 3 wherein the first component has an extraction safety stop surface and the mirror image first component has mirror image extraction safety stop surface for engaging the storage unit disposed vertically below to prevent the storage unit disposed vertically below from inadvertently sliding completely out of the housing when the storage unit disposed vertically below is partly withdrawn from the housing.

6. The track support system according to claim 5 wherein the storage unit disposed vertically below has blocking members for engaging the extraction safety stop surface and the mirror image extraction safety stop surface.

7. The track support system according to claim 1 wherein the second component has an angled sliding surface and the mirror image second component has a mirror image angled sliding surface and wherein the sliding surface and mirror image sliding surface are for supporting weight and for guiding the storage unit when the storage unit is introduced into the housing at an angle and wherein the second component has a base stop surface and mirror image second component has a mirror base stop surface and wherein the base stop surface and mirror image base stop surface are for stopping the horizontal movement of a storage unit disposed vertically below.

8. The track support system according to claim 1 wherein the third component has a concave surface and the mirror image third component has a mirror image concave surface and wherein the concave surface and mirror image concave surface are for allowing the lifting of the storage unit to an angled position when the storage unit is introduced into the housing at an angle and further wherein the third component has a convex sliding surface and a mirror image third component has a mirror image convex sliding surface for allowing the horizontal sliding movement of the storage unit.

9. The track support system according to claim 8 wherein the third component and the mirror image third component are for supporting weight when the storage unit is introduced into the housing horizontally and when the storage unit is introduced into the housing at an angle.

10. The track support system according the claim 8 wherein first component has an extraction safety stop surface and the mirror image first component has a mirror image extraction safety stop surface for preventing the inadvertent withdrawal of the storage unit disposed vertically below from the housing.

11. The track support system according to claim 10 wherein the storage unit includes a tub having tub blocking members, a shelf having shelf blocking members and a wire basket having wire basket blocking members, and wherein the tub blocking members, wire basket blocking members and shelf blocking members are for engaging the extraction safety stop surface and the mirror image extraction safety stop surface disposed vertically above such that the shelf, tub and wire basket can be partly withdrawn from the housing and maintained in the partly withdrawn position.

12. The track support system according to claim 1 wherein the first component has a rectangular shape formed with the stop and the mirror image first component has a mirror image rectangular shape formed with the mirror image stop, and the second component has a telephone shape having a sliding surface and the mirror image second component has a mirror image telephone shape having a mirror image sliding surface, and the third component has a tear drop shape having a concave lifting surface and the mirror image third component has a mirror image tear drop shape having a mirror image concave lifting surface.

13. The track support system according to claim 7 wherein the angled surface is at about a 30° angle.

14. A method of providing a track support system for installation in a housing having opposed first and second side walls with the housing capable of receiving a storage unit therein, the method comprising:

providing the first side wall with a first component, a second component and a third component and arranging the first component second component and third component in a horizontal row,

providing the second side wall with a mirror image first component, a mirror image second component and a mirror image third component and arranging the first component, the second component and the third component in a mirror image horizontal row, and

providing the first component with a stop and providing the mirror image first component with a stop for preventing the storage unit from inadvertently sliding out of the housing when housed therein.

15. The method according to claim 14 further comprising providing the first side with a plurality of vertically spaced horizontal rows of components and providing the second side with a mirror image plurality of vertically spaced horizontal rows of components and wherein the storage unit is capable of being introduced into the housing between the mirror image vertically spaced horizontal rows of components.

16. The method according to claim 15 further comprising providing the first component with an extraction safety stop surface and providing the mirror image first component with a mirror image extraction safety stop surface for engaging the storage unit disposed vertically below to prevent the storage unit disposed vertically below from inadvertently sliding completely out of the housing when the storage unit disposed vertically below is partly withdrawn from the housing and providing the storage unit disposed vertically below with blocking members for engaging the extraction safety stop surface and the mirror image extraction safety stop surface.

17. The method according to claim 16 further comprising providing the second component with an angled sliding surface and the mirror image second component with a mirror image angled sliding surface and wherein the sliding surface and mirror image sliding surface are for supporting weight and for guiding the storage unit when the storage unit is introduced into the housing at an angle and providing the second component with a base stop surface and providing the mirror image second component with a base stop surface and wherein the base stop surface and mirror image base stop surface are for engaging the storage unit disposed vertically below.

18. The method according to claim 17 further comprising providing the third component with a concave surface and the mirror image third component has a mirror image concave surface and wherein the concave surface and mirror image concave surface are for lifting the storage unit to an angled position when the storage unit is introduced into the housing at an angle and wherein the third component and the mirror image third component are for supporting weight when the storage unit is introduced into the housing horizontally and when the storage unit is introduced into the housing at an angle.

19. Method according to claim 14 comprising providing the first component with a rectangular shape and having the stop and providing the mirror image first component with a mirror image rectangular shape formed with the mirror image stop, and providing the second component with a telephone shape having a sliding surface and providing the mirror image second component has a mirror image telephone shape having a mirror image sliding surface, and providing the third component with a tear drop shape having

a concave lifting surface and providing the mirror image third-component with a tear drop shape having a mirror image concave lifting surface.

20. A track support system for supporting a storage unit and for use in a standard housing having first and second outer walls having interior surfaces, a back wall, a base and an opposed elevated wall, the track system comprising:

a first panel joined to the interior surface of the outer wall and having a first component, a second component and a third component arranged in horizontal row,

a second panel joined to the interior surface of the second outer wall and having a mirror image first component, a mirror image second component and a mirror image third component arranged in a mirror image horizontal row, and

wherein the first component provides a stop and the and mirror image first component provides a mirror image stop for preventing the storage unit from inadvertently sliding out of the housing when housed therein, and further wherein the second component and mirror image second component each provide mirror image angled sliding surfaces that allow for angled sliding of a storage unit and having mirror image base stop surfaces for blocking horizontal movement of the support unit disposed vertically below and wherein the third component and mirror image third component have mirror image curved surfaces, such that the storage unit can be introduced into the standard housing horizontally and at an angle, and when introduced at an angle the storage unit is supported on the mirror image sliding surfaces, and wherein the first panel and the second pane comprise plastic.

* * * * *