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(54) **WIRE BASKET PATHWAY SYSTEM**

Related U.S. Application Data

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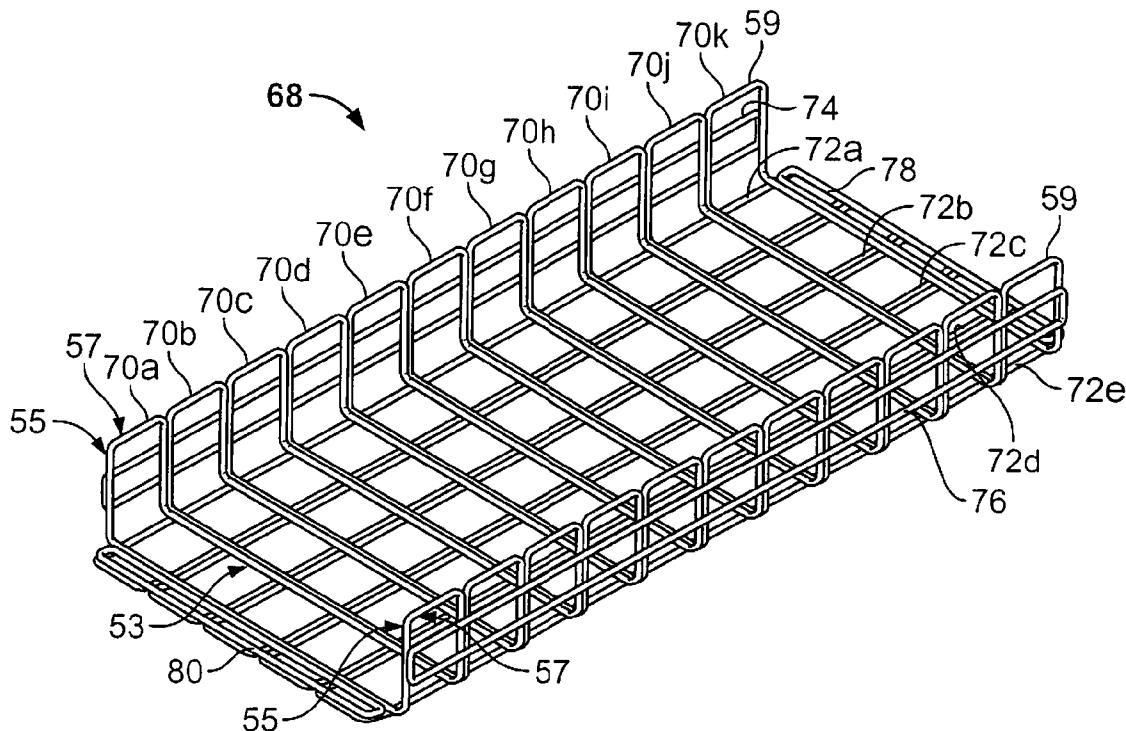
(57) **ABSTRACT**

A wire basket for supporting cables includes a plurality of wire frames connected together in a side-by-side manner in forming a generally flat bottom and first and second opposed upraised end portions so as to form a generally U-shaped frame. Each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposite ends of the wire frame. The wire frame may also include an extended mounting member attached to the frame such that a distal end of the mounting member is generally aligned with and extends beyond the bottom portion.

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(21) Appl. No.: **11/930,376**

(22) Filed: **Oct. 31, 2007**



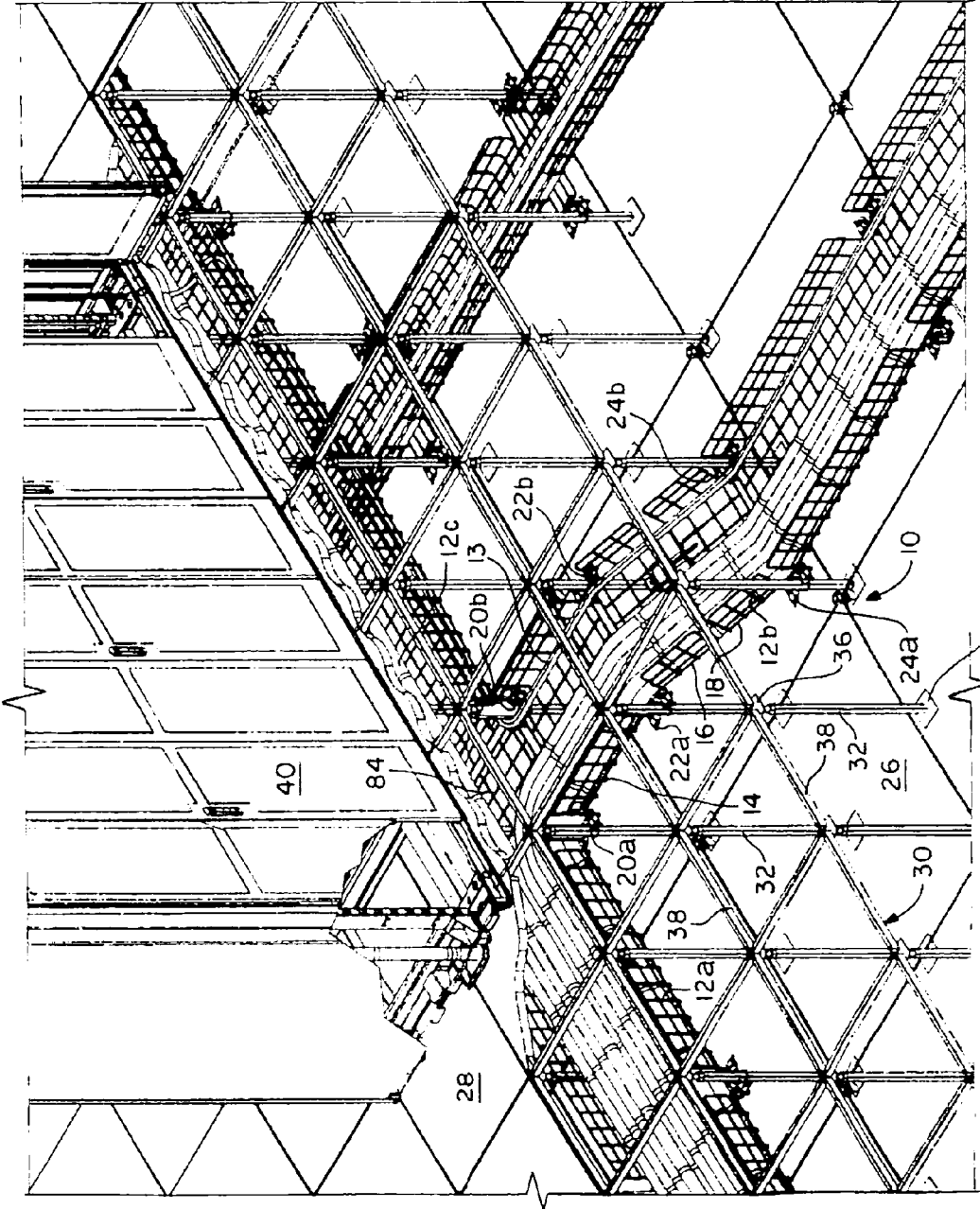


FIG. 1

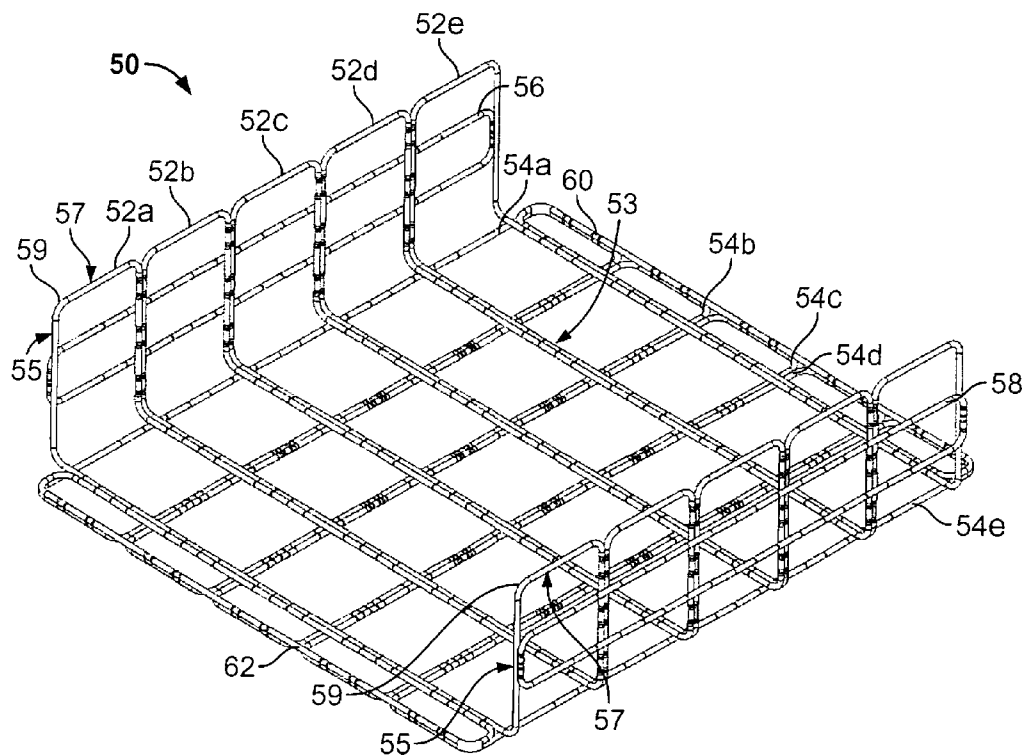


FIG. 2

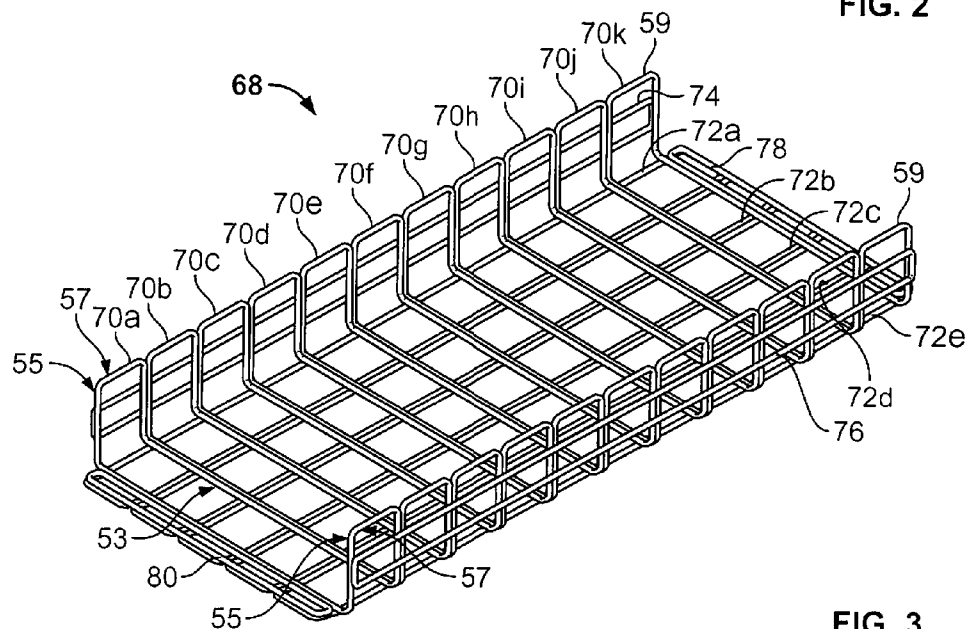


FIG. 3

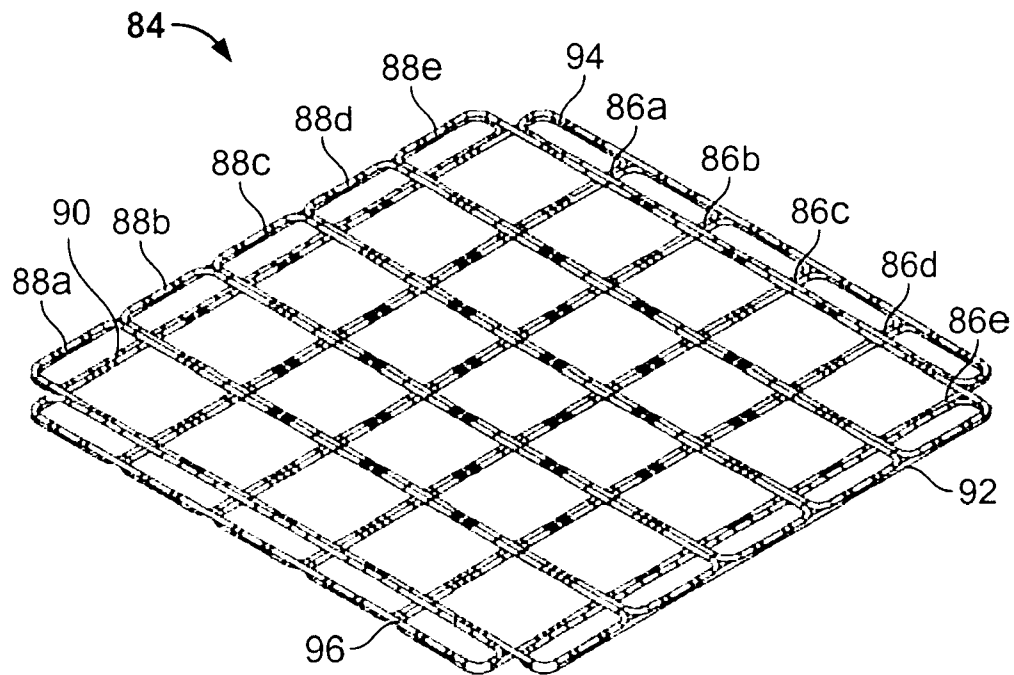


FIG. 4

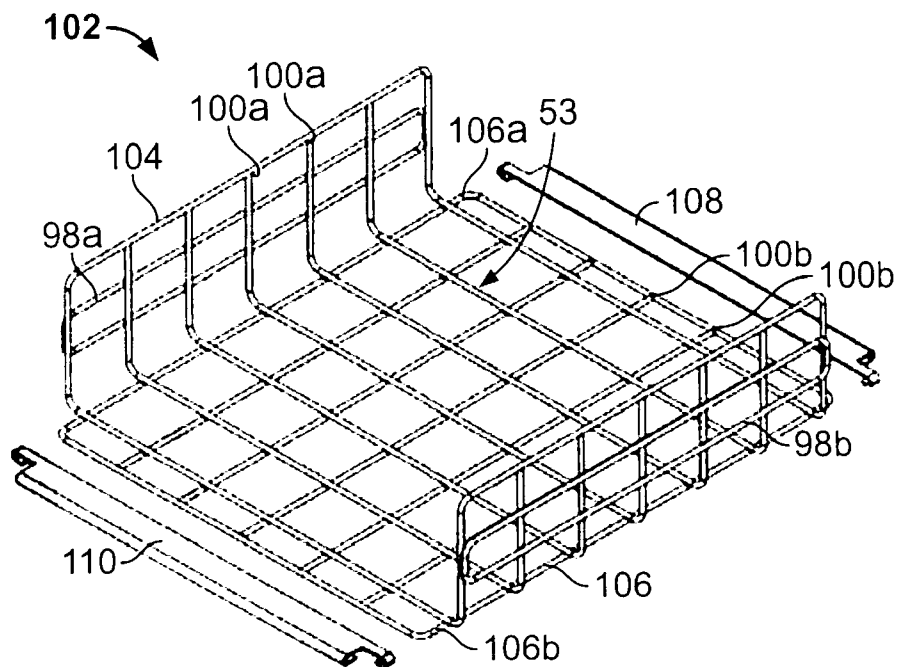


FIG. 5

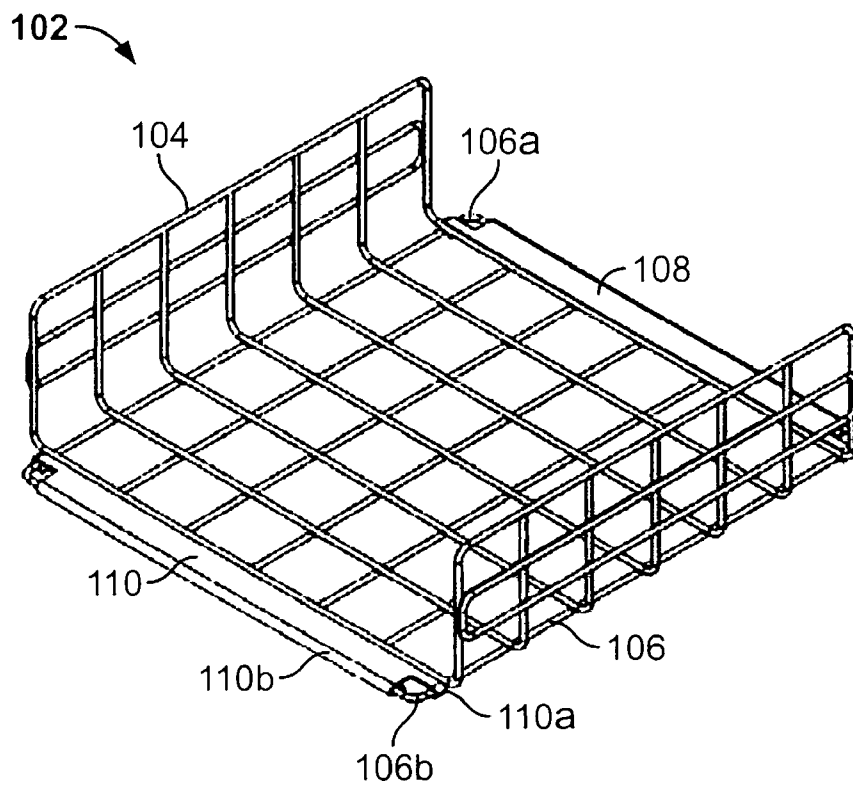


FIG. 6

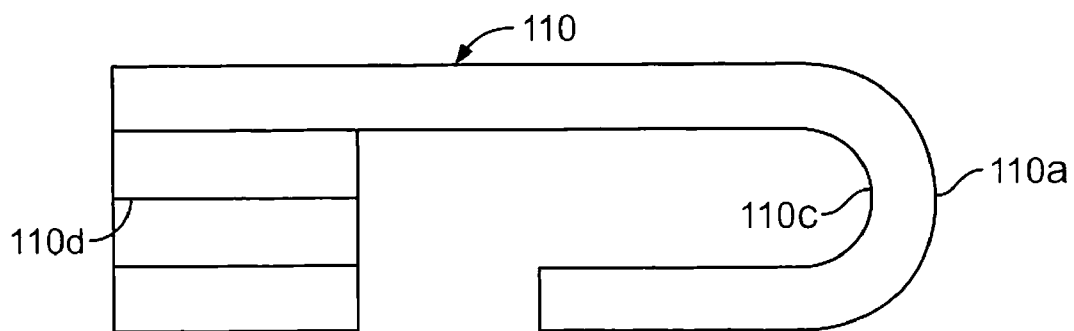


FIG. 7

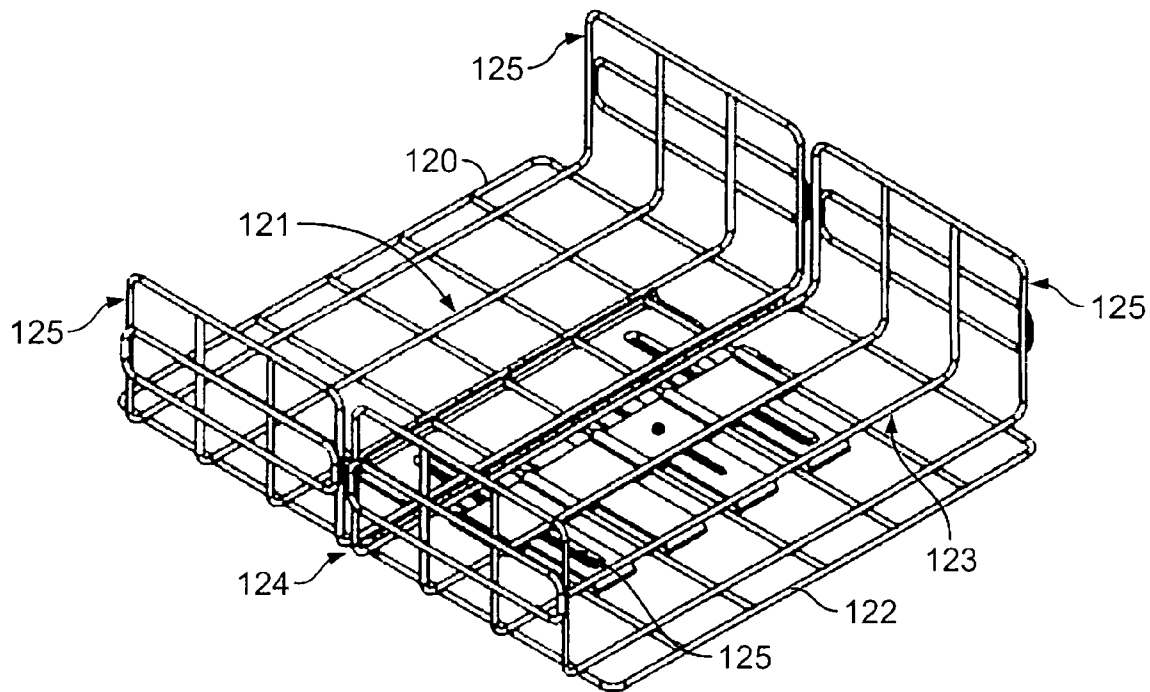


FIG. 8

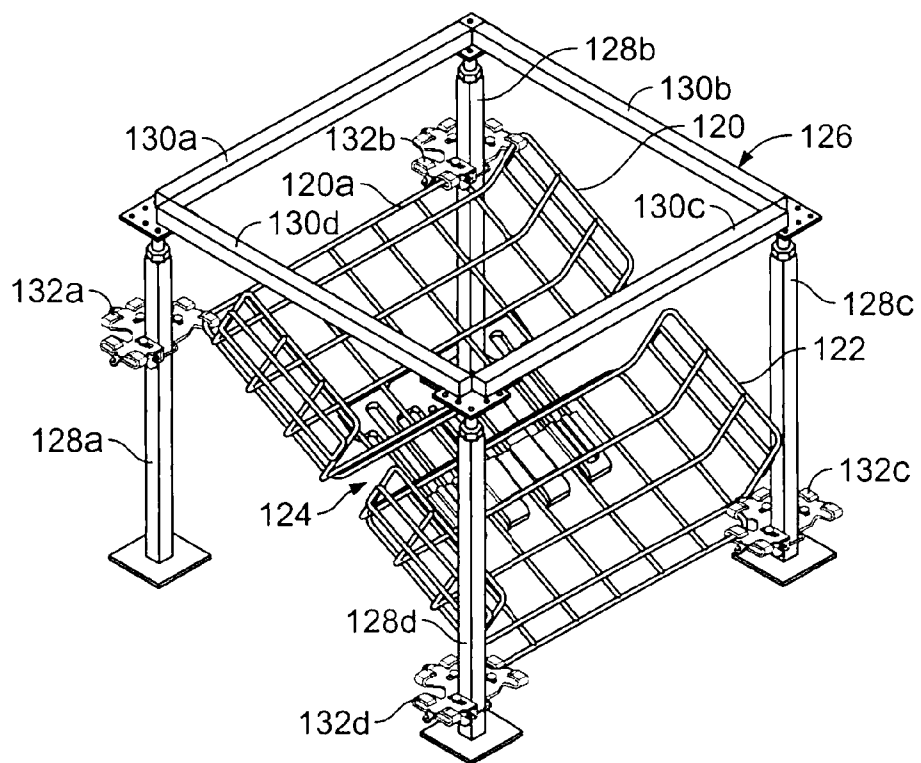


FIG. 9

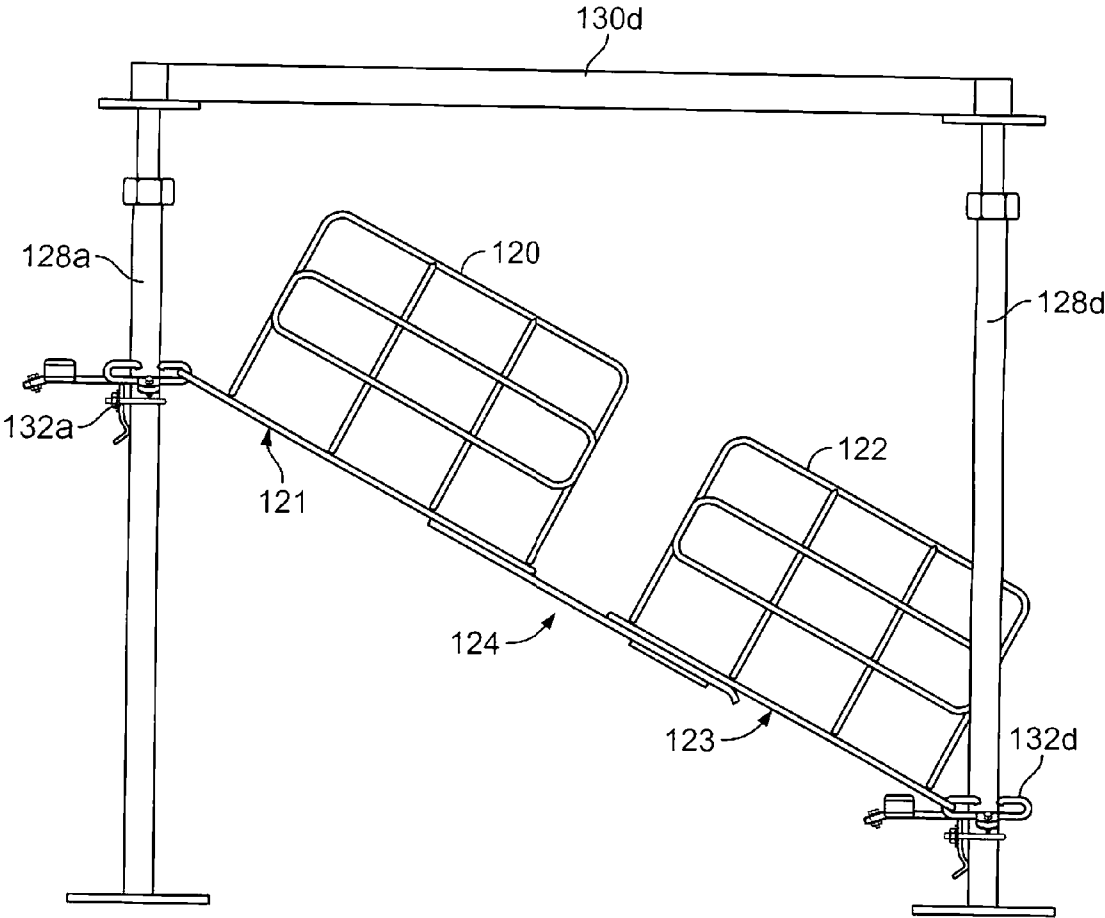
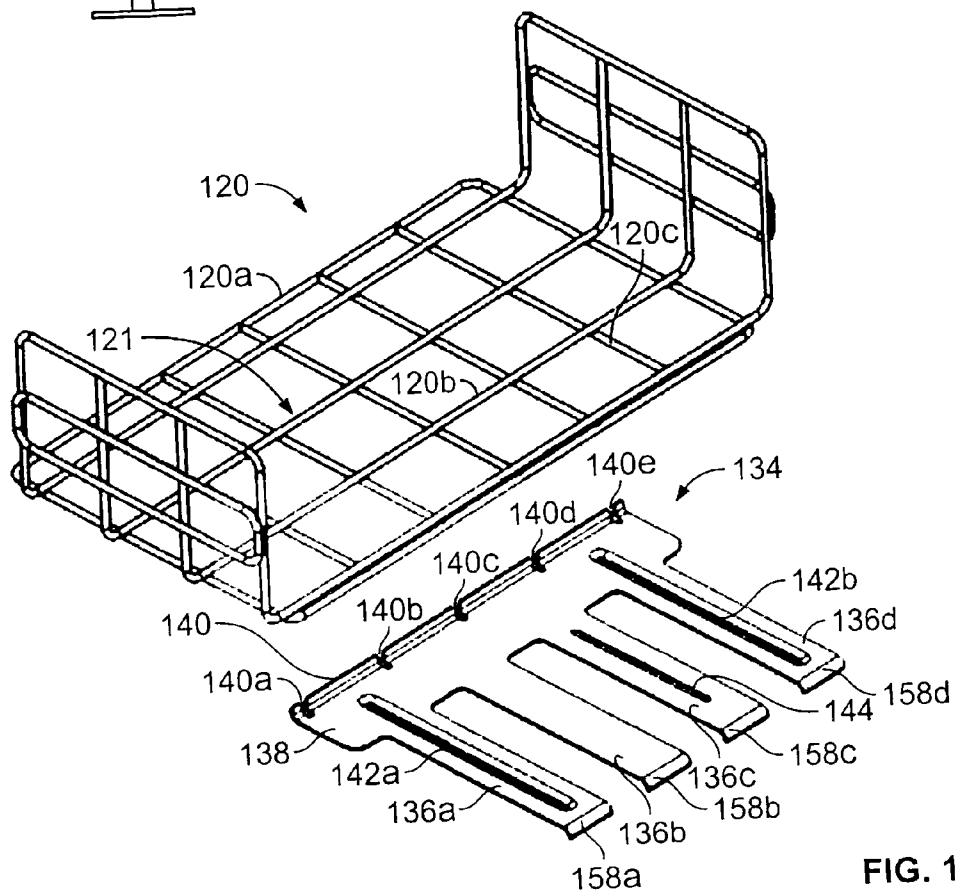
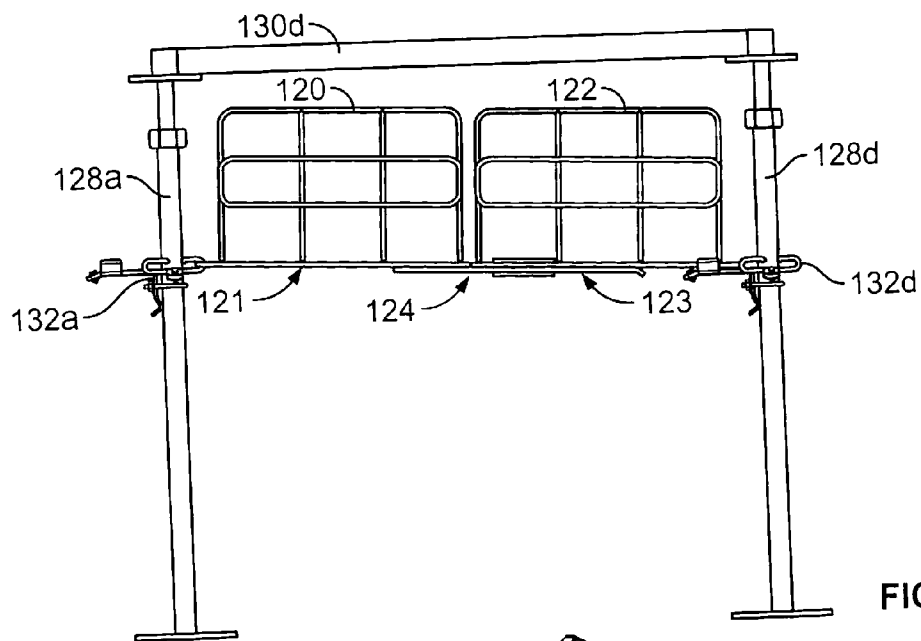


FIG. 10



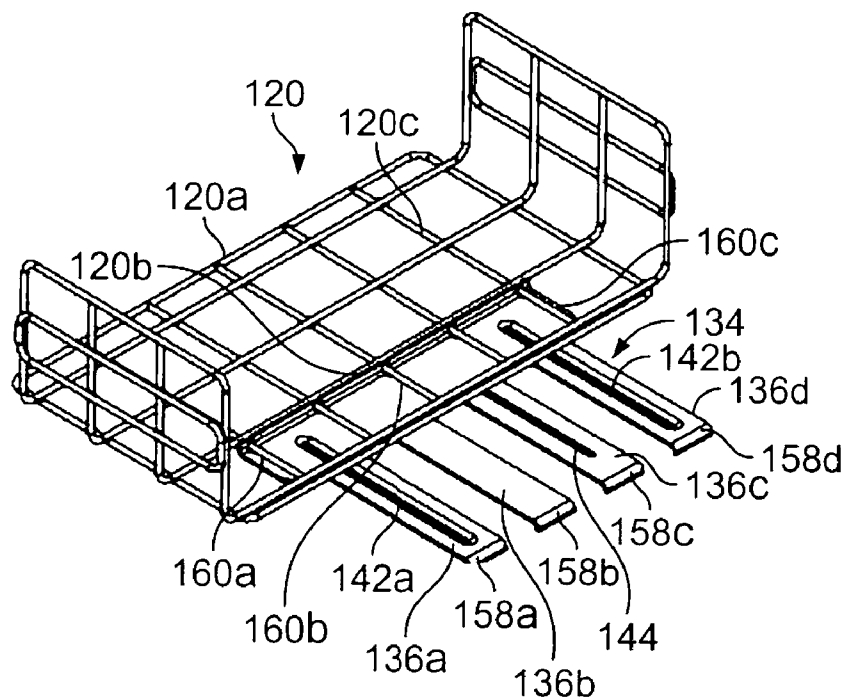


FIG. 13

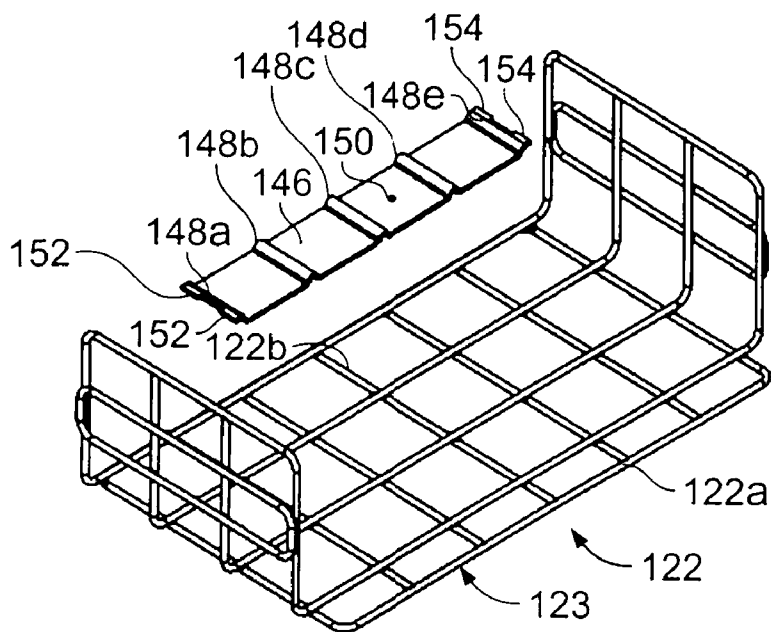


FIG. 14

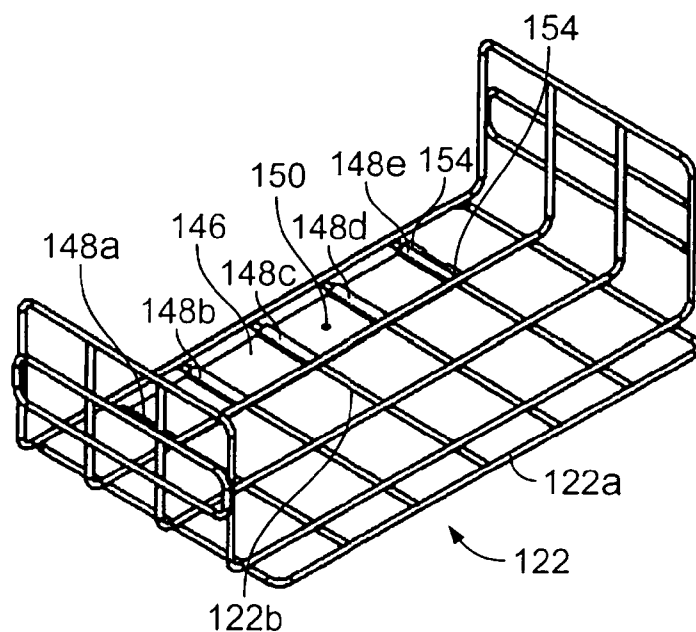


FIG. 15

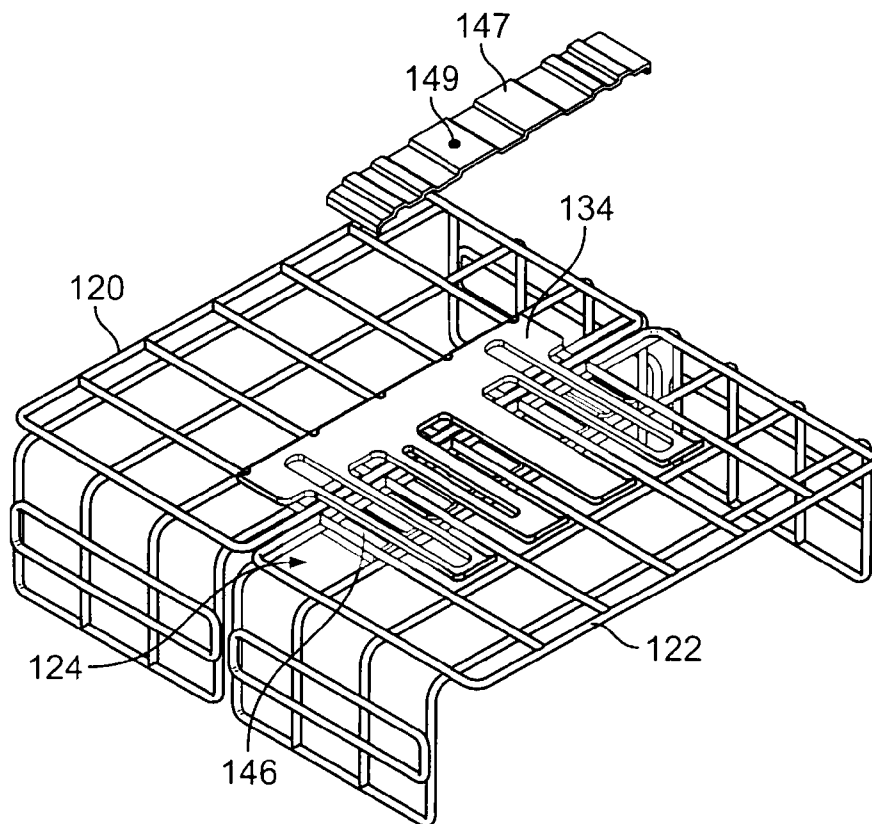


FIG. 16

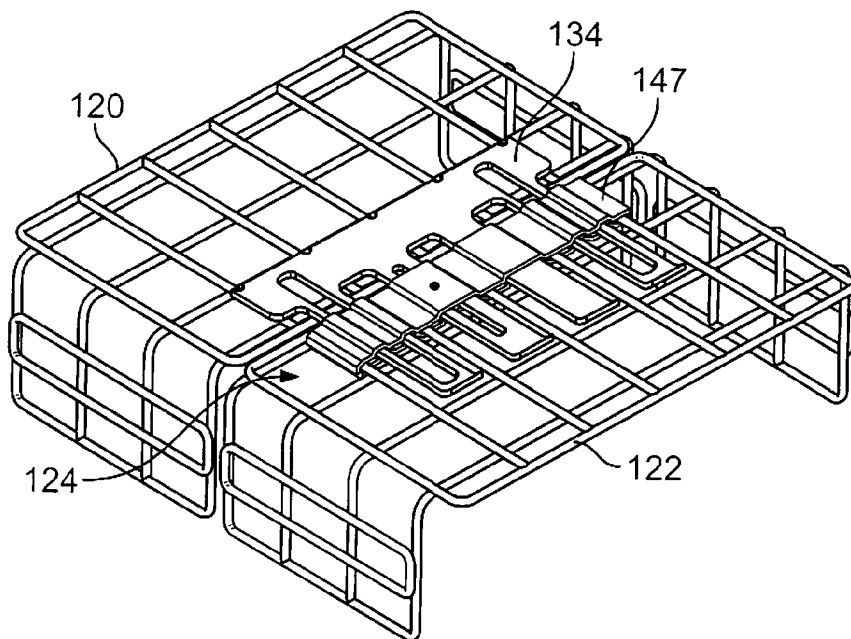


FIG. 17

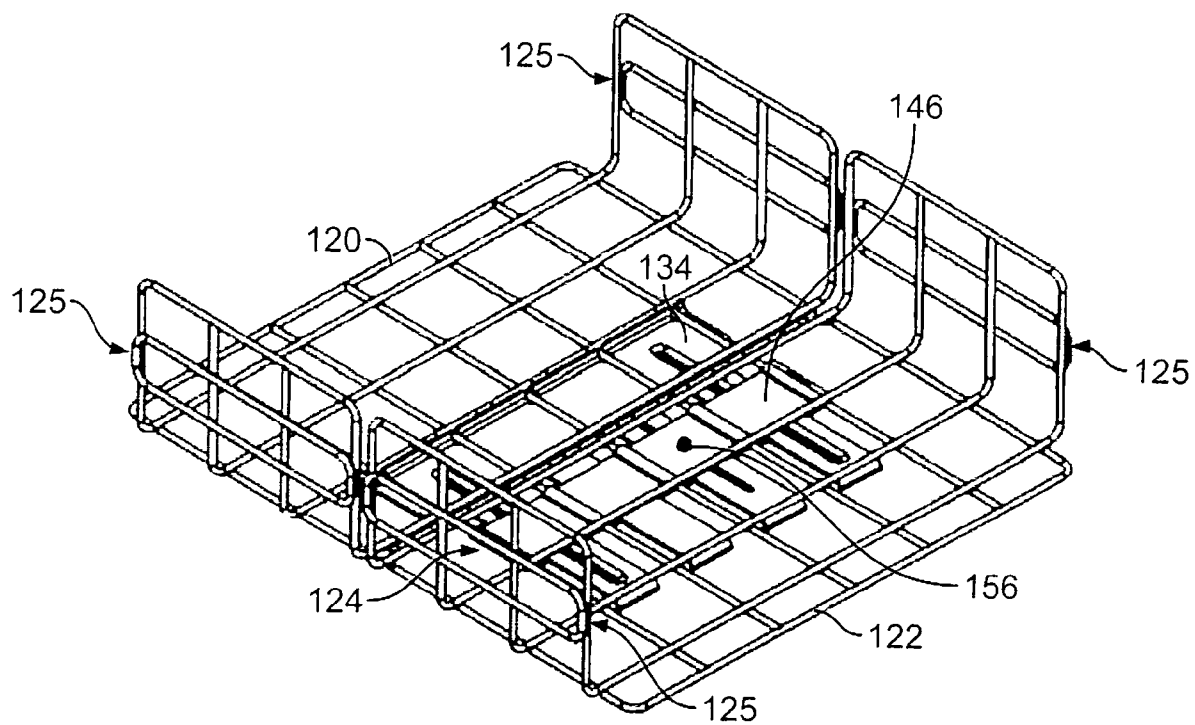


FIG. 18

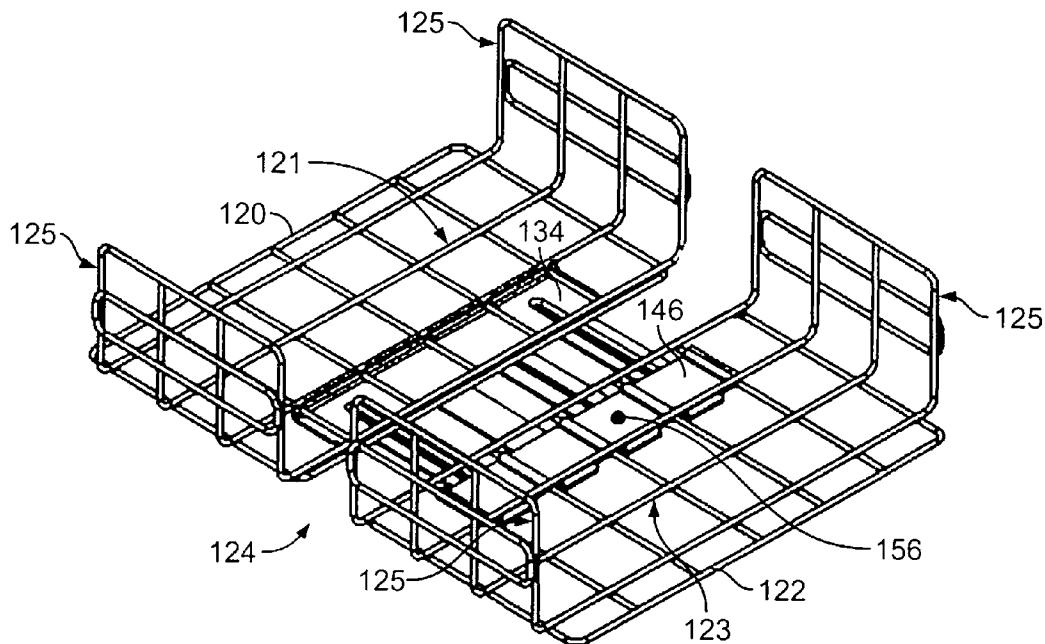


FIG. 19

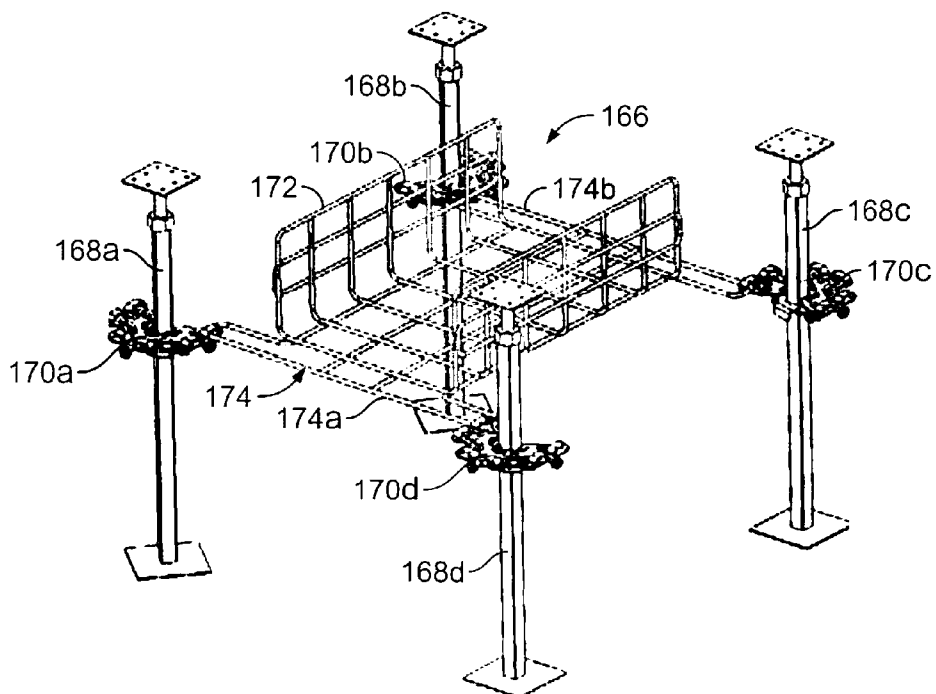


FIG. 20

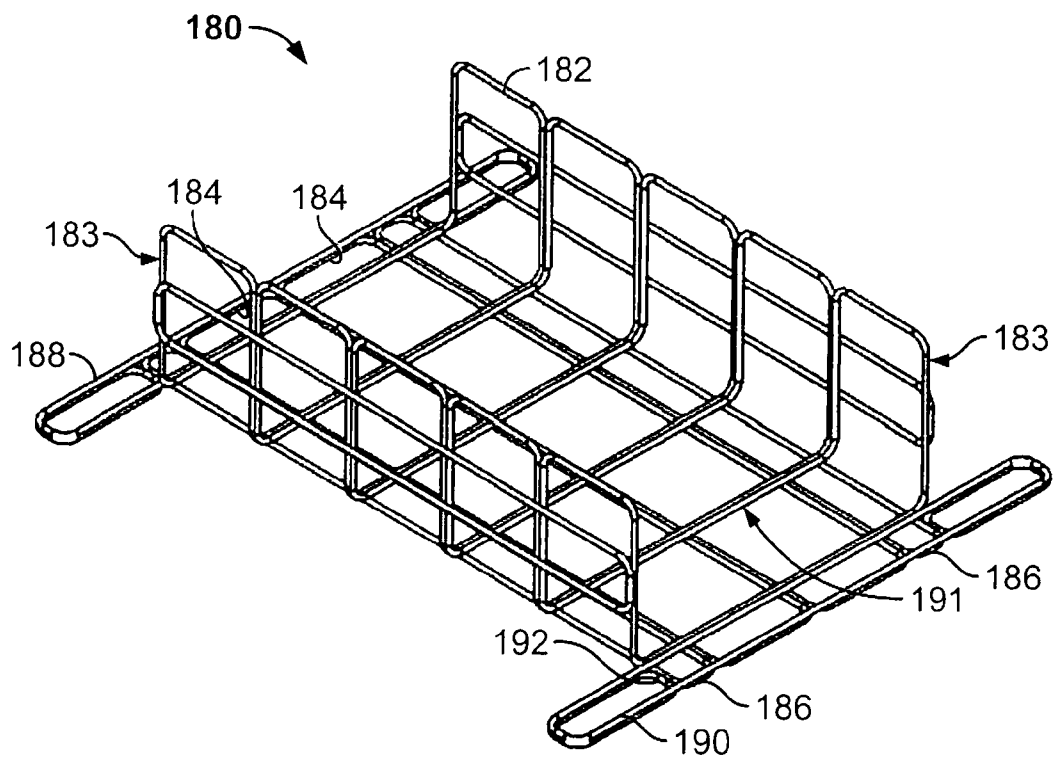


FIG. 21

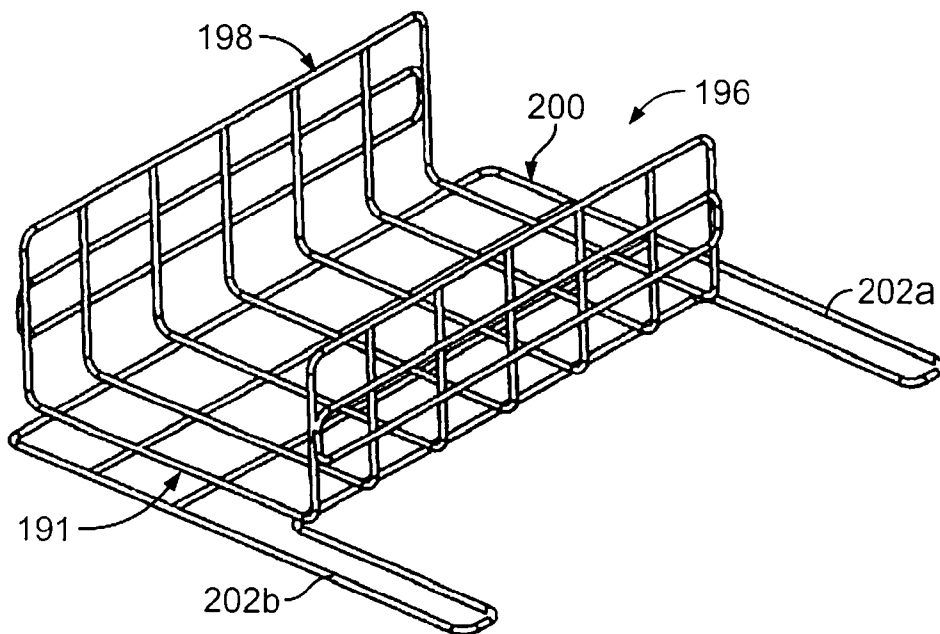


FIG. 22

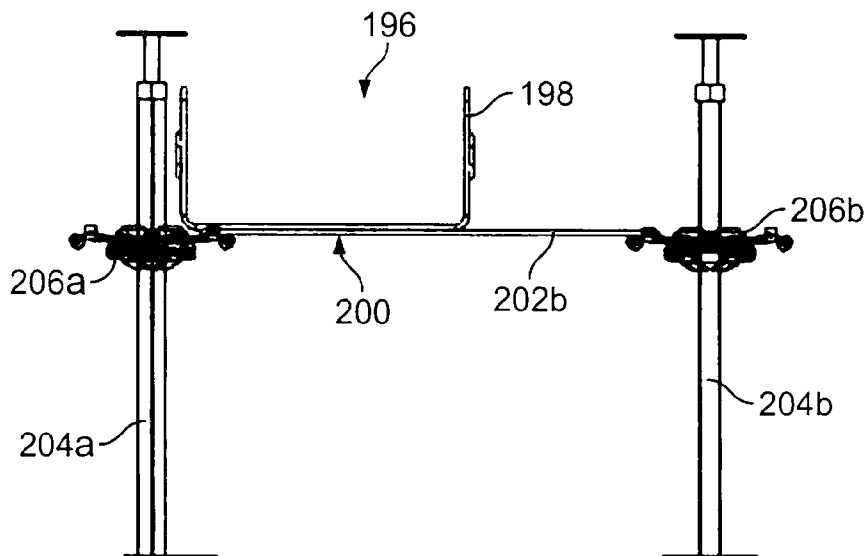


FIG. 23

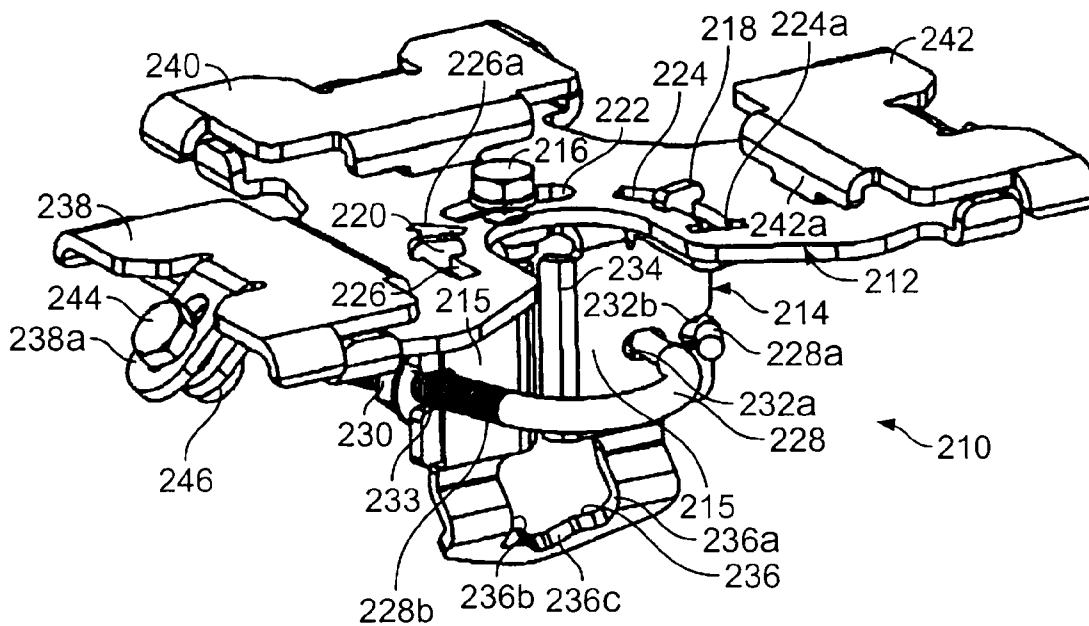


FIG. 24

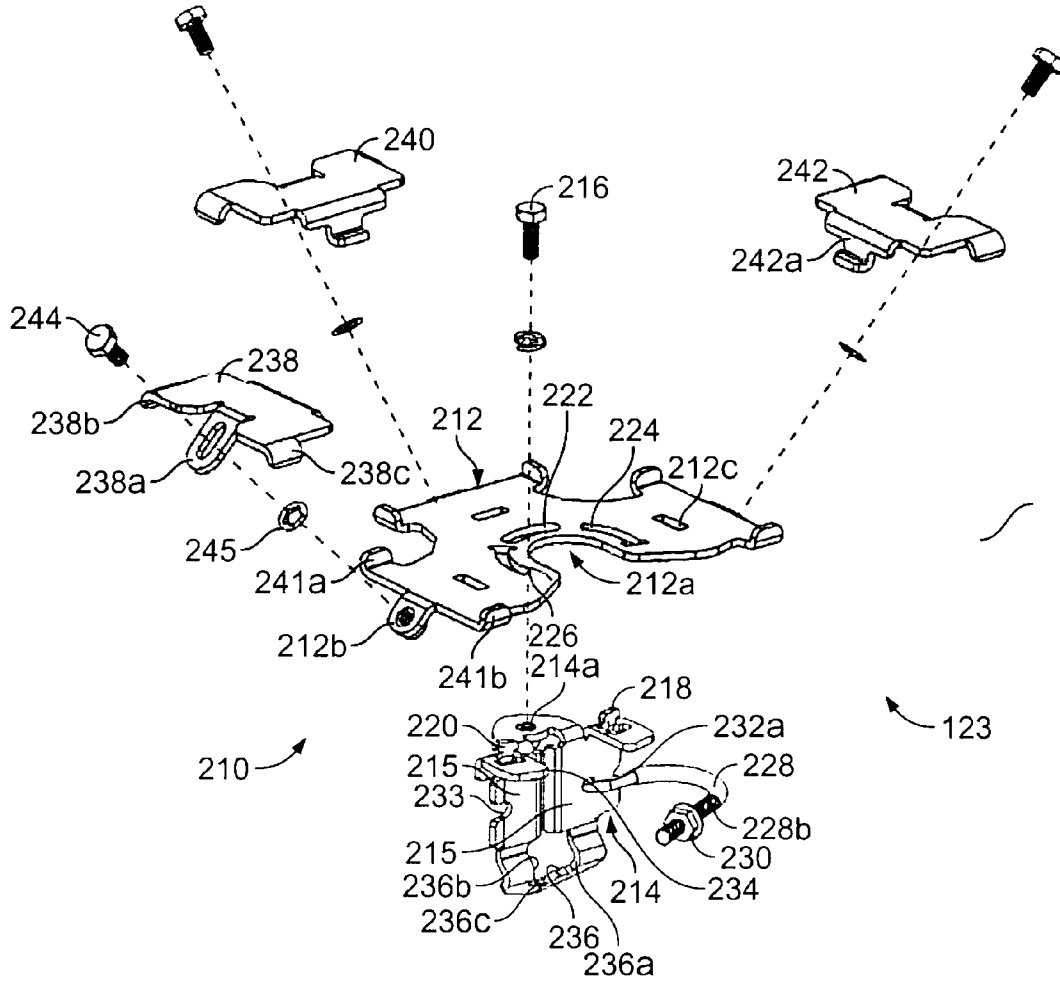


FIG. 25

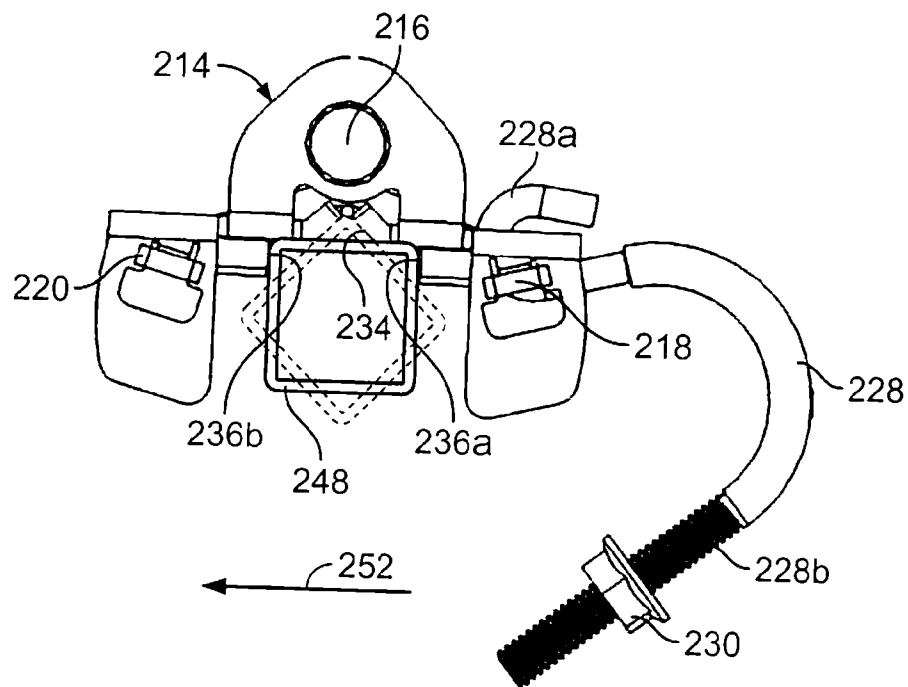


FIG. 26

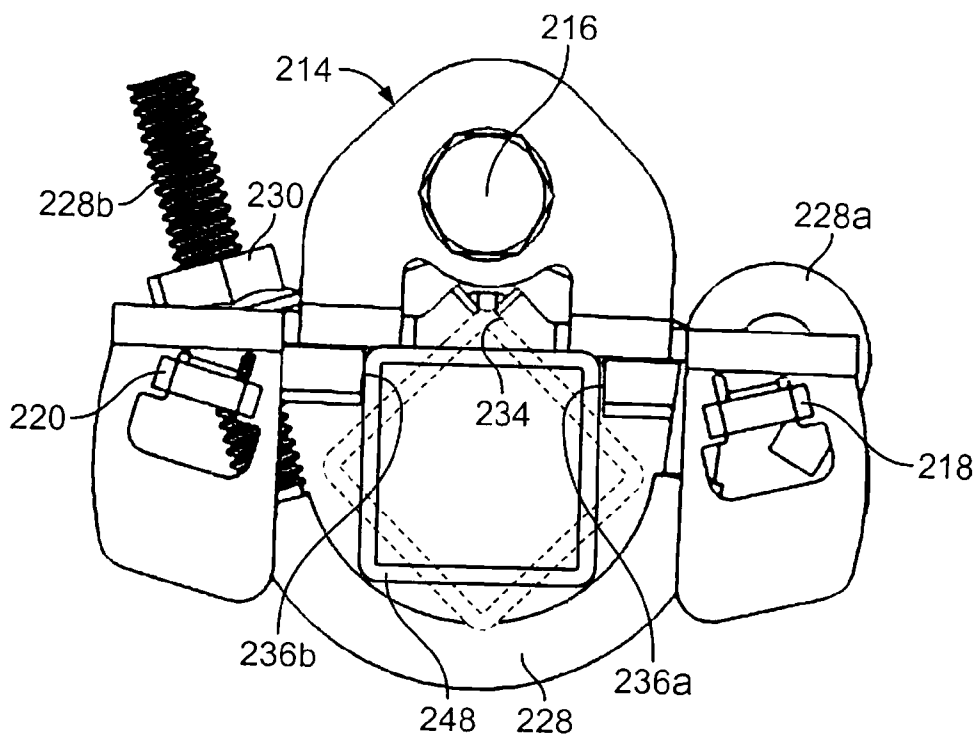


FIG. 27

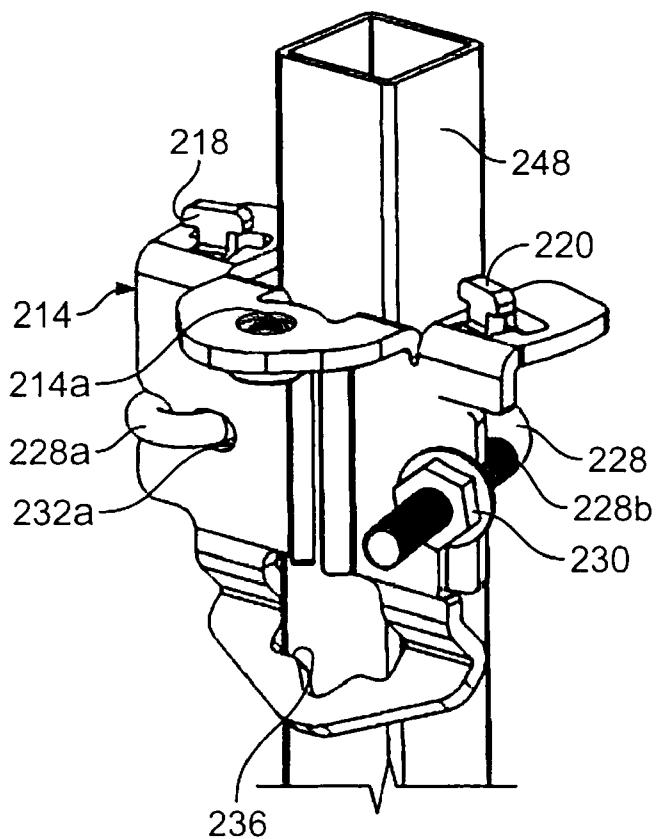


FIG. 28

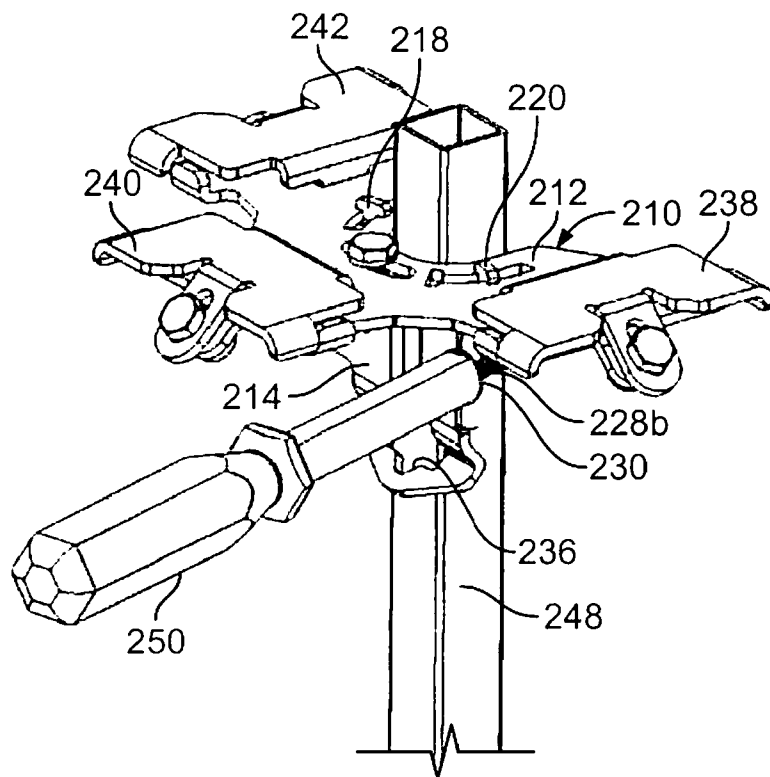
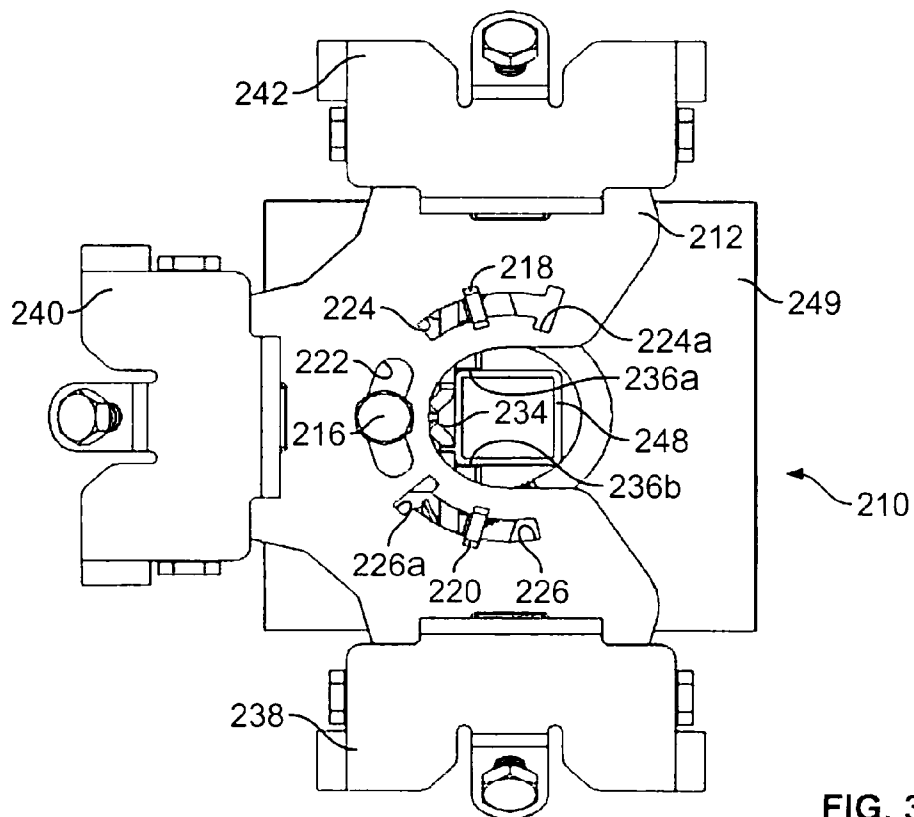
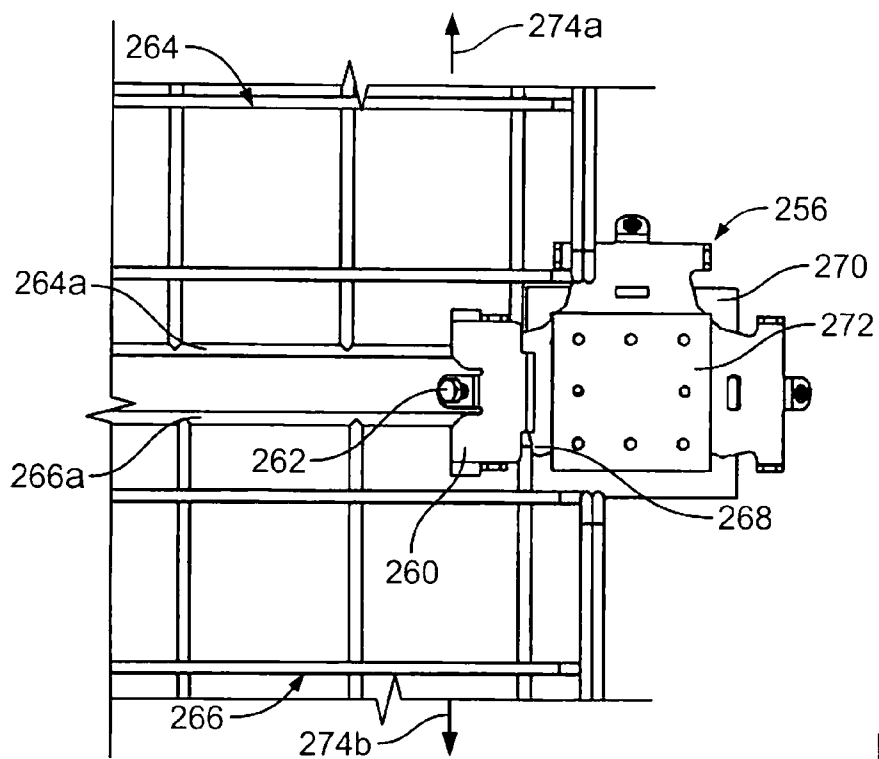


FIG. 29



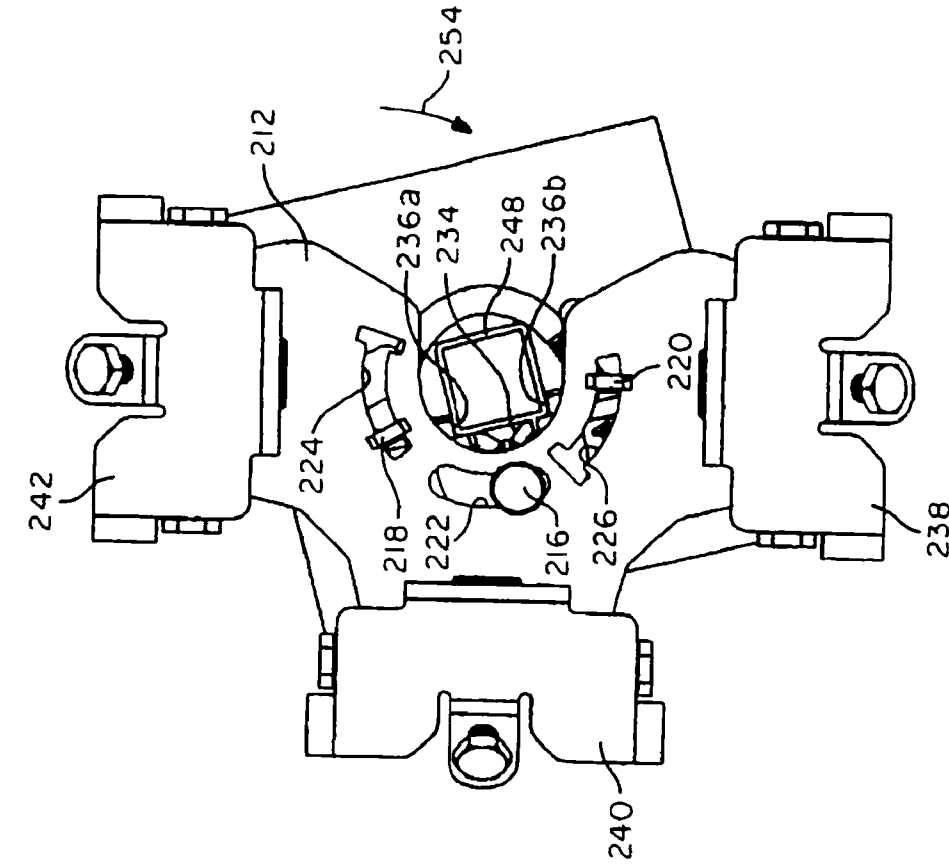


FIG. 32

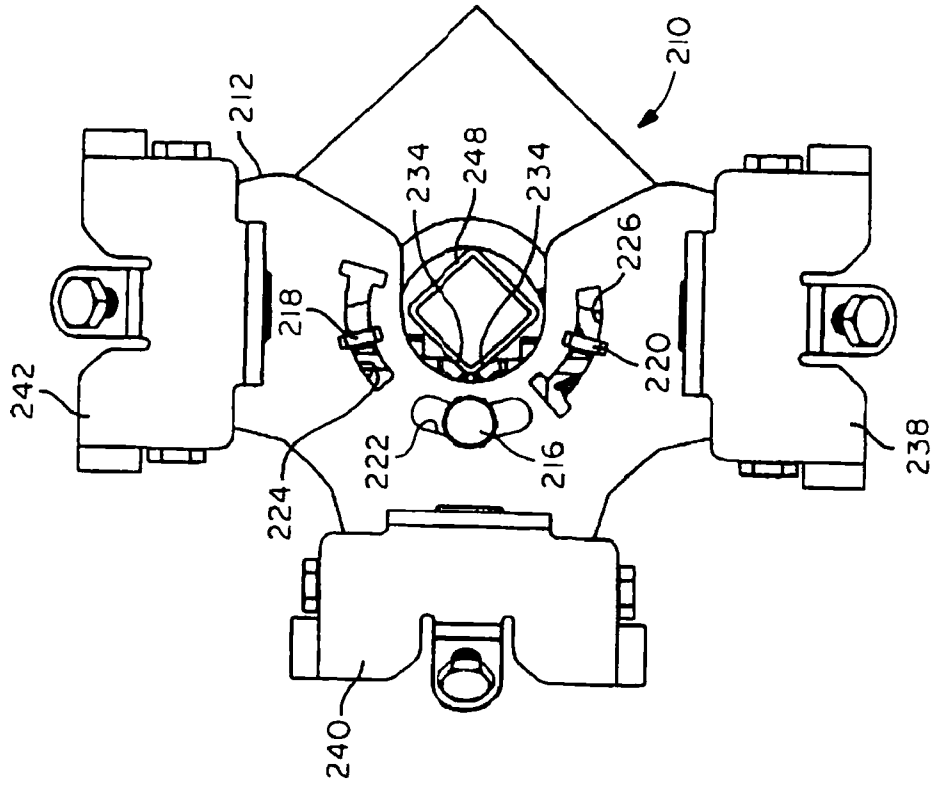


FIG. 33

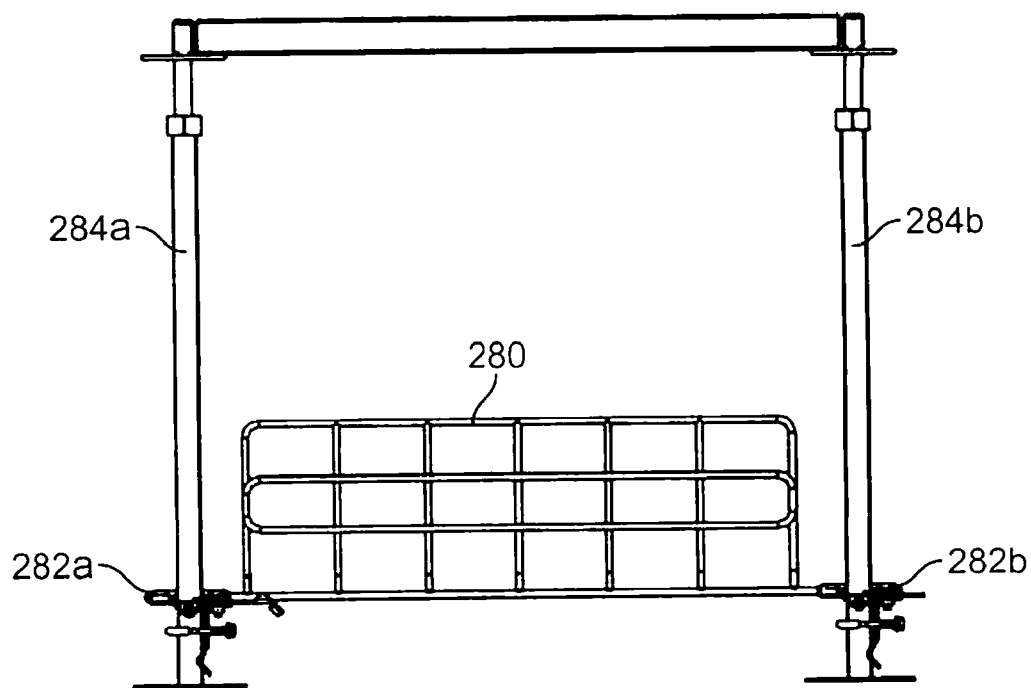


FIG. 34

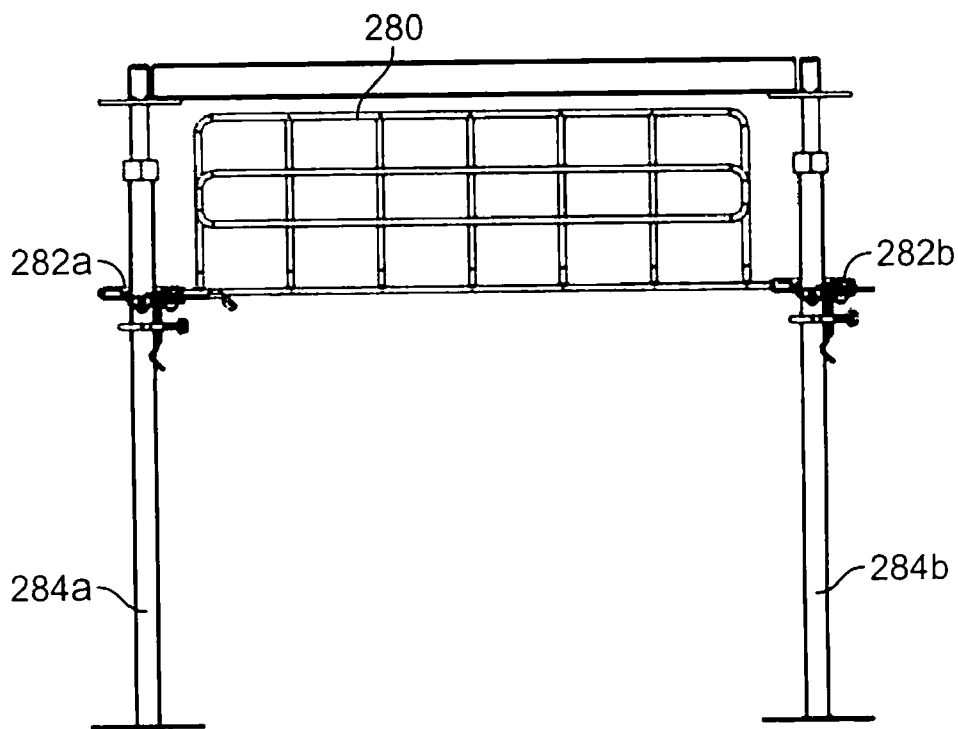


FIG. 35

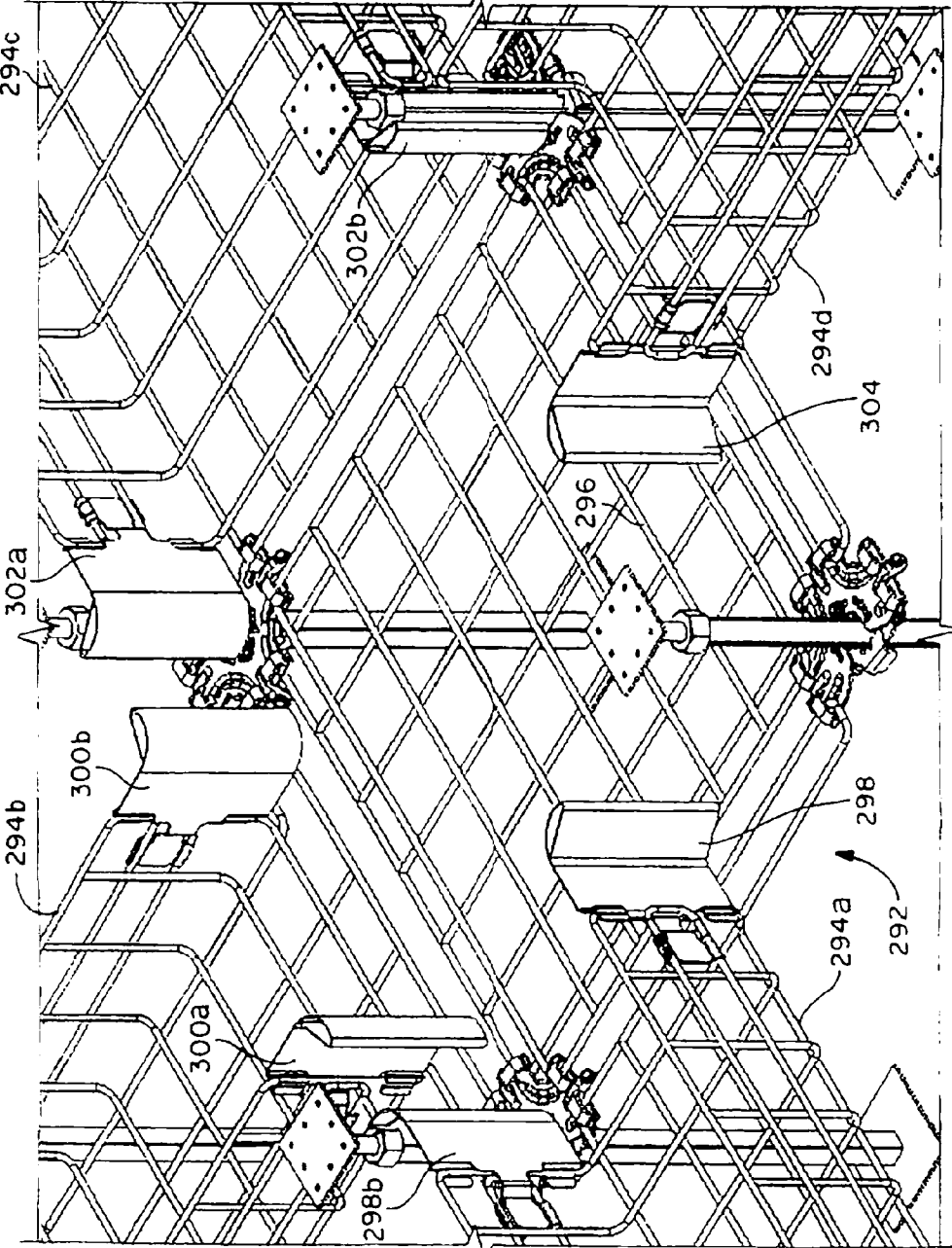


FIG. 36

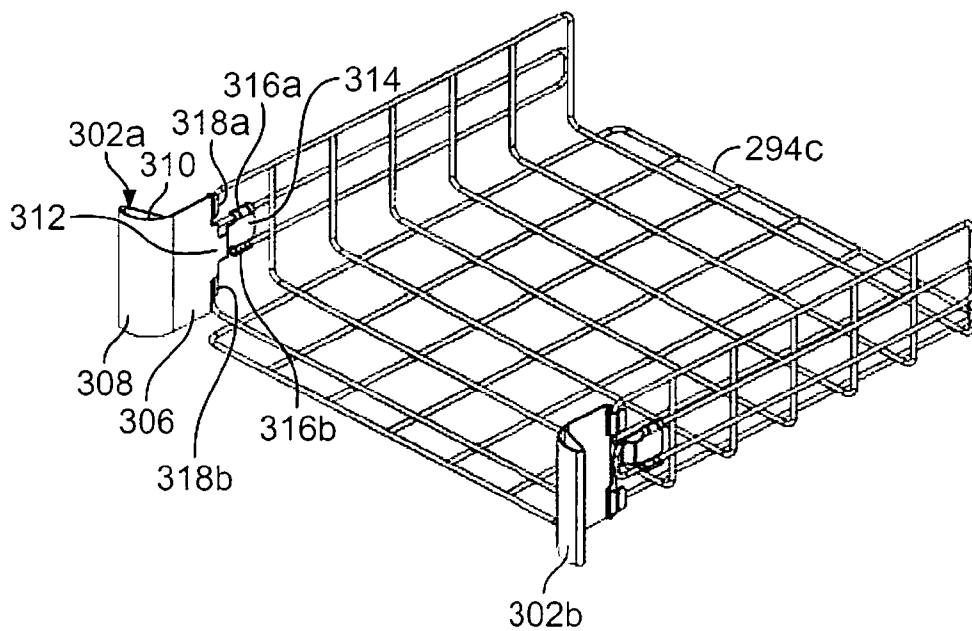


FIG. 37

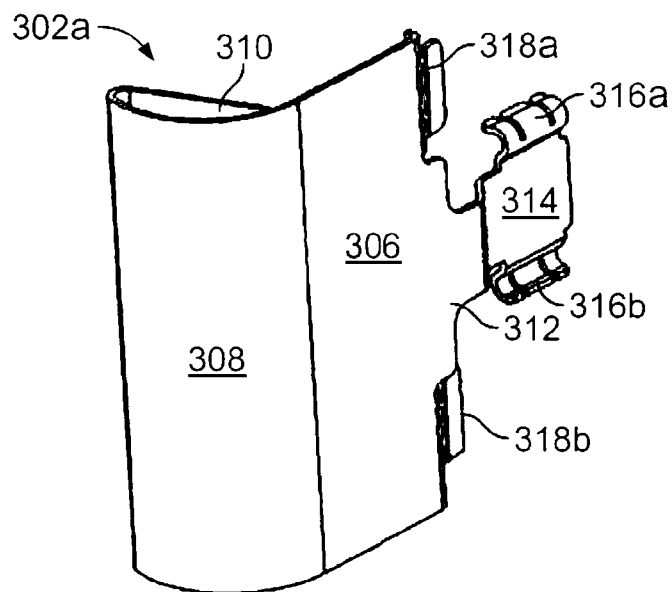


FIG. 38

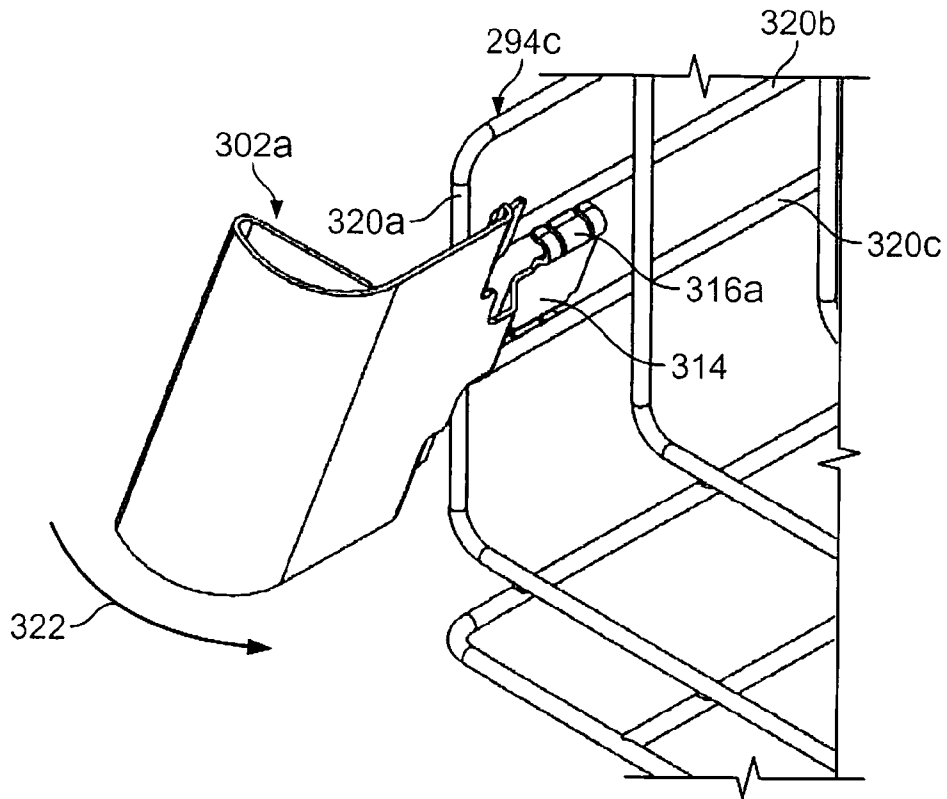


FIG. 39

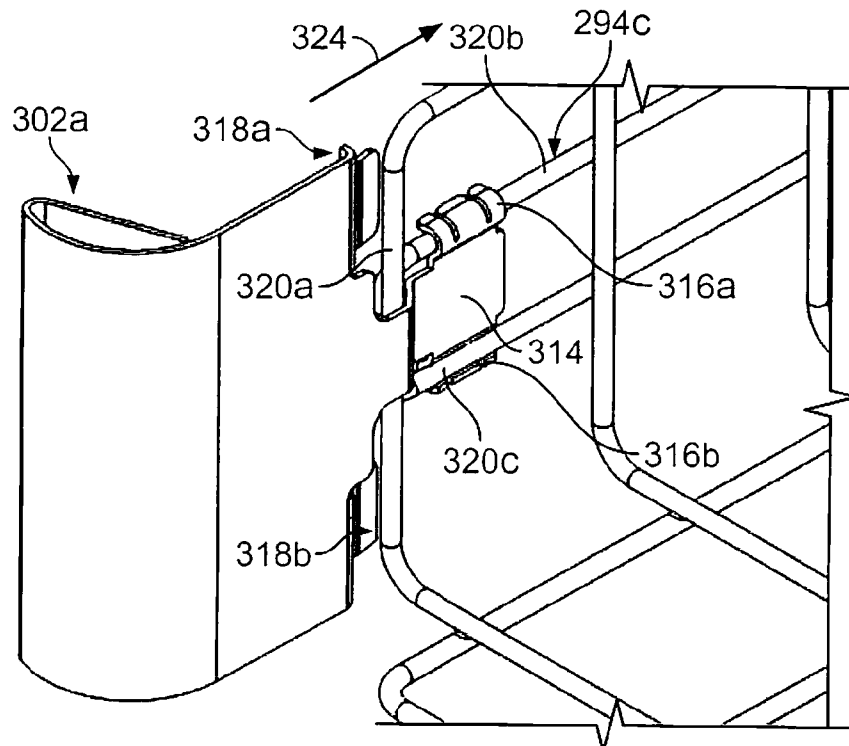


FIG. 40

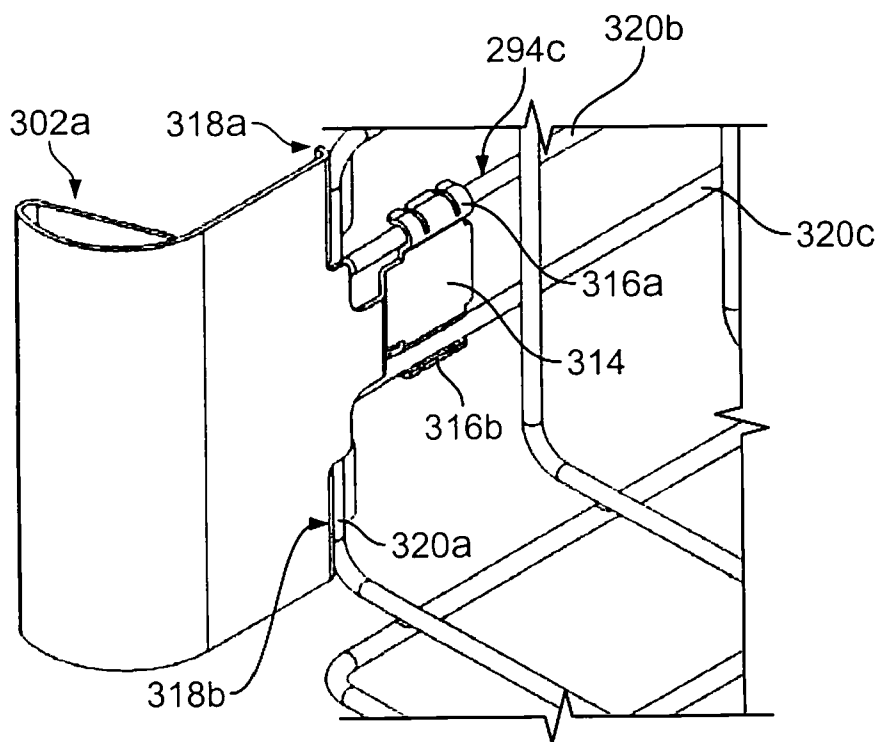


FIG. 41

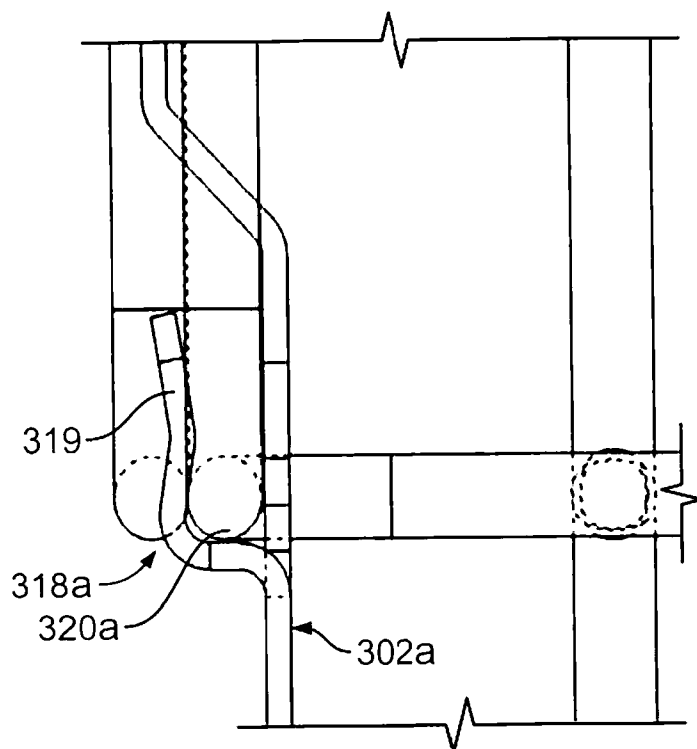


FIG. 42

WIRE BASKET PATHWAY SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional Patent Application No. 60/948,071, filed Jul. 5, 2007, the subject matter of which is hereby incorporated herein by reference in its entirety.

FIELD OF INVENTION

[0002] This invention relates generally to the positioning, support and protection of cables, and is particularly directed to wire basket arrangements for maintaining pathways of cables securely and safely in position in a raised floor system.

BACKGROUND OF THE INVENTION

[0003] The widespread use of electronic systems in business and industry has led to the requirement to route large numbers of cables throughout the work environment. Various types of cable tray assemblies are used as a support system for carrying these cables throughout various locations in buildings and other commercial structures.

[0004] Attempts to provide additional space to accommodate greater numbers of cables have led to the development of raised floor systems. Raised floor systems make use of the space between the structure's original floor and an upper floor disposed in a spaced manner above the original floor.

[0005] Cable tray assemblies are particularly adapted for positioning beneath the floor panels of the raised floor to contain and direct cables along their respective pathways. Cable tray assemblies are generally comprised of a large number of individual cable trays which are typically made of wire lengths welded together in a cage-like arrangement to provide a support surface for the cables.

[0006] One problem encountered in these prior art cable support systems is the presence of sharp edges in the cable tray assemblies which are capable of cutting the cable's outer protective sheathing. In addition, increasing the number of cables within the confined space of the raised floor system restricts access to cable pathways which is required for carrying out maintenance and repair functions. The ability to vary the horizontal and vertical positioning of cable pathways in a controlled manner for improving cooling air circulation, optimizing cable pathway spacing and providing additional cable pathways is also limited in existing cable support systems.

[0007] The present invention addresses the aforementioned limitations of the prior art by providing for the flexible vertical and lateral positioning of cable pathways in a raised floor system, as well as the elimination of sharp edges in, and an increase in the strength of, individual cable trays for accommodating larger numbers of cables.

SUMMARY OF THE INVENTION

[0008] The present invention relates to an improved arrangement for supporting, grounding and connecting together plural wire frames in a cable tray system.

[0009] The present invention also relates to the safe and secure support of large numbers of cables in a raised floor system, while providing cable access for inspection and maintenance.

[0010] The present invention further relates to an improved arrangement for a cable pathway system which facilitates rerouting of the cables and the incorporation of additional cables.

[0011] The present invention relates still further to improved cable tray wire frames having substantially increased strength and rigidity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Certain embodiments of the present invention are illustrated by the accompanying figures. It should be understood that the figures are not necessarily to scale and that details that are not necessary for an understanding of the invention or that render other details difficult to perceive may be omitted. It should be understood, of course, that the invention is not necessarily limited to the particular embodiments illustrated herein.

[0013] FIG. 1 is a perspective view of an improved wire basket pathway system in accordance with the principles of the present invention;

[0014] FIG. 2 is an upper perspective view of an improved wire basket for use in a cable pathway system in accordance with another embodiment of the present invention;

[0015] FIG. 3 is an upper perspective view of another embodiment of a wire basket for use in a cable pathway system in accordance with the present invention;

[0016] FIG. 4 is a perspective view of a wire basket intersection for use in a cable pathway system in accordance with another aspect of the present invention;

[0017] FIG. 5 is a partially exploded perspective view of a reinforced wire basket in accordance with another aspect of the present invention;

[0018] FIG. 6 is an upper perspective view of the reinforced wire basket of FIG. 5 shown assembled;

[0019] FIG. 7 is a sectional view of an end portion of a reinforcing member incorporated in the wire basket shown in FIG. 6;

[0020] FIG. 8 is an upper perspective view of a pair of wire baskets connected together in a telescoping manner in accordance with another aspect of the present invention;

[0021] FIG. 9 is a perspective view of the telescopically coupled pair of wire baskets of FIG. 8 shown suspended from a support structure;

[0022] FIG. 10 is a side elevation view of the telescopically coupled pair of wire baskets shown in FIG. 9 extending over a large height change;

[0023] FIG. 11 is a side elevation view of the telescopically coupled pair of wire baskets shown in FIG. 9 extending over a small height change;

[0024] FIGS. 12 and 13 are upper perspective views of a first of the wire baskets shown in FIG. 8 illustrating a first telescoping member respectively detached from and attached to the wire basket;

[0025] FIGS. 14 and 15 are upper perspective views of a second of the wire baskets shown in FIG. 8 illustrating a second telescoping member respectively detached from and attached to the wire basket;

[0026] FIG. 16 is a lower perspective view of the telescopically coupled pair of wire baskets shown in FIG. 8 illustrating the second telescoping member prior to attachment to the telescoping arrangement;

[0027] FIG. 17 is a lower perspective view of the telescopically coupled pair of wire baskets shown in FIG. 8;

[0028] FIG. 18 is an upper perspective view of the pair of telescopically coupled wire baskets shown in FIG. 8 illustrating the two baskets in the non-extended configuration;

[0029] FIG. 19 is an upper perspective view of the pair of telescopically coupled wire baskets shown in FIG. 8 illustrating the two baskets in the fully-extended configuration;

[0030] FIG. 20 is an upper perspective view of a centered wire basket attached to four vertical pedestal members, or support columns, in accordance with another embodiment of the present invention;

[0031] FIG. 21 is an upper perspective view of a reinforced centered wire basket in accordance with another embodiment of the present invention;

[0032] FIG. 22 is an upper perspective view of an off-center wire basket in accordance with another embodiment of the present invention;

[0033] FIG. 23 is a front elevation view of the off-center wire basket of FIG. 22 shown attached to and supported by plural support members;

[0034] FIG. 24 is a perspective view of a pedestal bracket for attaching a wire basket to a support structure in accordance with another embodiment of the present invention;

[0035] FIG. 25 is an exploded perspective view of the pedestal bracket shown in FIG. 24;

[0036] FIG. 26 is a top plan view of a support clamp portion of the inventive pedestal bracket illustrating its U-bolt clamp in the open position;

[0037] FIG. 27 is a top plan view of the support clamp portion of the inventive pedestal bracket illustrating the U-bolt clamp in the closed position;

[0038] FIG. 28 is a perspective view of the support clamp portion of the inventive pedestal bracket attached to a vertical support member;

[0039] FIG. 29 is a perspective view of the inventive pedestal bracket attached to a vertical support member illustrating the manner in which the pedestal bracket's U-bolt clamp is tightened;

[0040] FIG. 30 is a top plan view of a pedestal bracket in accordance with the present invention attached to and supporting a pair of wire baskets;

[0041] FIGS. 31-33 are top plan views of the inventive pedestal bracket illustrating the manner in which the angular orientation of the pedestal bracket on a vertical support member to which it is attached may be varied over a 360° range;

[0042] FIGS. 34-35 are side elevation views of a wire basket attached to a pair of vertical supports by means of a pair of pedestal brackets in accordance with the present invention, wherein the vertical position of the wire baskets may be varied in a continuous manner over a vertical height range;

[0043] FIG. 36 is a perspective view of a portion of a wire basket pathway system incorporating plural cable bend guides in accordance with another aspect of the present invention;

[0044] FIG. 37 is an upper perspective view of a wire basket to which are attached a pair of inventive cable bend guides;

[0045] FIG. 38 is a perspective view of the inventive cable bend guide;

[0046] FIGS. 39-41 are perspective views illustrating the sequence of steps involved with attaching the inventive cable bend guide to a wire basket; and

[0047] FIG. 42 is a sectional view of a portion of the inventive cable bend guide attached to a wire basket.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0048] Referring to FIG. 1, there is shown a perspective view of an improved wire basket pathway system 10 in accordance with the principles of the present invention. The wire basket pathway system 10 provides for plural cable runs 12a, 12b and 12c, which are shown as an example, as the present invention is adapted for use with virtually any number of cable runs. Each of these three cable runs 12a, 12b and 12c includes plural cables carrying electronic signals. The wire basket pathway system 10 may also include one or more optical cables 13, as well as, possibly power cables which are not shown in the figure for simplicity.

[0049] The first, second and third cable runs 12a, 12b and 12c are disposed between a first lower floor 26 and a second raised floor 28. Electronic instrumentation is disposed on the second raised floor 28 and is typically enclosed in one or more cabinets 40.

[0050] The cable runs 12a, 12b and 12c are positioned on and supported by the inventive wire basket pathway system 10. The wire basket pathway system 10 includes plural wire baskets connected together and maintained in position by means of a support structure 30. Support structure 30 includes plural spaced vertical members 32 disposed on the first lower floor 26 and interconnected by means of plural upper horizontal members 38. Each of the vertical members 32 includes a respective lower plate 34 disposed on the first lower floor 26 and an upper plate 36 engaging and supporting plural upper horizontal members 38. This type of wire basket support structure 30 is conventional in structure and function. Typically, upper horizontal members 38 are also utilized to support floor panels of upper floor 28. As will be mentioned later below, the floor panels are currently at a United States standard of 24 inches by 24 inches and at a European standard of 600 mm by 600 mm.

[0051] The wire basket pathway system 10 shown in FIG. 1 includes a large number of wire baskets, but only three wire baskets 14, 16 and 18 will be discussed herein for simplicity. Each of the first, second and third wire baskets 14, 16 and 18 support the second cable run 12b, as well as, a portion of the optical cable run 13. Each of the first, second and third wire baskets 14, 16 and 18 is connected to and supported by two or more vertical members 32. Thus, the first wire basket 14 is connected to and supported by four vertical members 32 by means of four pedestal brackets 20a, 20b, 22a and 22b. Similarly, the second wire basket 16 is coupled to and supported by a pair of vertical members 32 by means of pedestal brackets 22a and 22b. Finally, the third wire basket 18 is coupled to and supported by a pair of vertical members 32 by means of pedestal brackets 24a and 24b. In accordance with one aspect of the present invention, each of these pedestal brackets couple the wire basket or baskets to which it is connected to the building ground system via the vertical member on which the pedestal bracket is positioned (assuming the vertical member is otherwise grounded to the building ground). The second and third wire baskets 16, 18 are connected together in a telescoping manner to allow for a change in vertical height of the second cable run 12b in a manner which is described in detail below.

[0052] Referring to FIG. 2, there is shown an upper perspective of a reinforced wire basket 50 in accordance with one

embodiment of the present invention. Reinforced wire basket **50** is comprised of plural connected wires and is designed to provide additional rigidity and strength for supporting and maintaining, in fixed position, large numbers of cables. The wires are preferably comprised of high pre-galvanized steel wire. However, the wires can be constructed of other metals such as stainless steel, cold-rolled steel, and the like. All 90° angles, as shown in this embodiment, in reinforced wire basket **50**, as well as, in all other wire basket structures in accordance with the present invention disclosed herein, are formed by bending wires in a smooth curve and do not include any sharp edges which could damage a cable supported by the basket. The avoidance of sharp edges also prevents injuries to installers and technicians working with and around the system. Reinforced wire basket **50** is comprised of plural aligned U-shaped closed wire frames **52a-52e** which are connected together in a side-by-side relationship forming a generally flat bottom **53** and opposed upraised end portions **55**. This construction provides wire basket **50** with a generally overall U-shaped frame. As can be seen in FIG. 2, upraised end portion **55** comprises a closed section **57** without an end and in this example, two bend radii **59** are positioned one at each end of closed section **57**. Reinforced wire basket **50** further includes plural aligned flat closed wire frames **54a-54e** similarly, constructed in side-by-side relationship forming a generally flat structure. The lower portion of each of the U-shaped closed wire frames **52a-52e** are placed in contact with and securely connected to each of the flat closed wire frames **54a-54e** by means of resistance weldments at each wire intersection. Disposed on and securely attached to opposed vertical or upraised end portions **55** of the U-shaped closed wire frames **52a-52e** by means of resistance weldments are first and second closed parallel wire frames **56** and **58**. Opposed end portions of each of the flat closed wire frames **54a-54e** extend beyond the respective end U-shaped closed wire frames **52a** and **52e**. Disposed on and securely attached by means of resistance weldments to each of the end extensions of the flat closed wire frames **54a-54e** are third and fourth closed parallel wire frames **60** and **62**. The double wire configuration of the connected U-shaped and flat closed wire frames as well as on its two opposed side and end portions substantially increases the strength and rigidity of the wire basket for supporting the weight of additional cables. The reinforced wire basket **50** is 21" wide by 6" high by 24" long.

[0053] Shown in FIG. 3 is a larger reinforced wire basket **68** which is 21" wide by 6" high by 48" long. Reinforced wire basket **68** in accordance with another embodiment of the present invention has a larger number of U-shaped closed wire frames **70a-70k** than that of reinforced wire basket **50** shown in FIG. 2. As in the previously described embodiment, reinforced wire basket **68** includes plural flat closed wire frames **72a-72e**, first and second closed parallel wire frames **74** and **76** disposed on lateral portions of the U-shaped closed wire frames, and third and fourth closed parallel wire frames **78** and **80** disposed on opposed ends of the reinforced wire basket. The larger reinforced wire basket **68** shown in FIG. 3 would permit the use of fewer pedestal brackets in a wire basket pathway system in which it is incorporated. The inventive reinforced wire baskets disclosed herein are not limited to the specific dimensions discussed herein, but may have a wide range of dimensions depending upon the dimensions of the cable pathways being supported.

[0054] Referring to FIG. 4, there is shown a reinforced wire basket intersection **84** also in accordance with the present

invention. Reinforced wire basket intersection **84** is also shown in the wire basket pathway system **10** of FIG. 1. Reinforced wire basket intersection **84** is installed and attached in the wire basket pathway system **10** in the same manner as the aforementioned wire baskets and allows for horizontal directional changes of the cables with a single component. Reinforced wire basket intersection **84** includes first plural closed parallel wire frames **86a-86e** and second plural closed parallel wire frames **88a-88e** which are aligned generally transverse to and are disposed in contact with one another. The ends of the first plural closed parallel wire frames **86a-86e** extend beyond the width of the second plural closed parallel wire frames **88a-88e**. Similarly, the ends of the second plural closed parallel wire frames **88a-88e** extend beyond the width of the first plural closed parallel wire frames **86a-86e**. First and second closed parallel wire frames **90** and **92** are disposed on and attached to opposed ends of the second plural closed parallel wire frames **88a-88e**. Similarly, third and fourth closed parallel wire frames **94** and **96** are disposed upon and attached to opposed ends of the first plural closed parallel wire frames **86a-86e**. Each wire frame is securely attached to all other wire frames with which it is in contact by means of resistance weldments. Providing a resistance weldment at each intersection of the various wire frames substantially increases the strength and rigidity of the reinforced wire basket intersection **84**.

[0055] Referring to FIG. 5, there is shown an upper perspective view of another embodiment of a reinforced wire basket **102** in accordance with the present invention. Reinforced wire basket **102** includes an upper U-shaped frame assembly **104** and a lower planar frame assembly **106**. The upper and lower frame assemblies **104**, **106** are secured together by means of plural resistance weldments at their intersections. Disposed at opposed ends of the lower planar frame assembly **106** are first and second end reinforcing members **108** and **110**, which are shown removed from the reinforced wire basket **102** in FIG. 5. FIG. 6 shows the first and second end reinforcing members **108**, **110** attached to opposed ends of the reinforced wire basket's lower planar frame assembly **106a, b**, as discussed in more detail below. First and second closed parallel wire frames **98a** and **98b** are attached to respective opposed ends of the upper U-shaped frame assembly **104** by means of weldments. Similarly, plural T-welds such as at locations **100a** and **100b** securely connect inner wires to the outer peripheral wires of upper and lower frame assemblies **104** and **106**. The first and second end reinforcing members **108**, **110** are preferably comprised of pre-galvanized steel; however, other metals such as stainless steel, cold-rolled steel, and the like can be employed.

[0056] Referring also to FIG. 7, there is shown a sectional view of an end portion of the second end reinforcing member **110**. The second end reinforcing member **110** includes opposed lateral curvilinear end portions **110a** and an aft end curvilinear portion **110b** extending substantially the entire length of the reinforcing member as shown in FIG. 6. The first curvilinear end portion **110a** forms a first inner recessed portion **110c** in the end of the second end reinforcing member **110**. The second curvilinear aft portion **110b** forms a second inner recessed portion **110d** extending substantially the length of the second end reinforcing member **110**. The first and second inner recessed portions **110c** and **110d** are adapted for receiving end portions of the lower planar frame assembly **106** in a tight fitting manner so that the first and

second end reinforcing members **108** and **110** are securely maintained in position on reinforced wire basket **102**.

[0057] Referring to FIG. **8**, there is shown first and second wire basket sections **120** and **122** coupled together by adjustable coupling assembly **124** in accordance with another embodiment of the present invention. The telescoping wire basket arrangement shown in FIG. **8** is also illustrated in FIG. **9**, where the first and second wire basket sections **120**, **122** are shown connected to and maintained in position by utilization of a support structure **126**. Support structure **126** includes first through fourth vertical support members **128a-128d** and first through fourth horizontal support members **130a-130d**. One end portion of the first wire basket **120** is coupled to the first and second vertical support members **128a** and **128b** by use of pedestal brackets **132a** and **132b**, respectively. Similarly, one end of the second wire basket **122** is connected to the third and fourth vertical support members **128c** and **128d** by use of pedestal brackets **132c** and **132d**, respectively. The adjustable coupling assembly **124** allows the first and second wire basket sections **120**, **122** to be either moved together in closely spaced relation or to be moved apart in all extended configuration. The extended configuration is shown in the side elevation view of FIG. **10**, while the retracted configuration is shown in the side elevation view of FIG. **11**. By adjusting the spacing between the first and second wire basket sections **120**, **122**, the vertical height change between the two wire baskets, and plural cables disposed thereon, may be adjusted in a continuous manner over a wide range of height differences, as desired. For example, for a minimal height change such as 1", the first and second wire basket sections **120**, **122** are arranged in closely spaced relation as shown in FIG. **11**. To accommodate a height change of 12", the first and second wire basket sections **120**, **122** are arranged in the fully extended configuration as shown in FIG. **10**. A maximum height differential of 12" is possible with a horizontal spacing of 24" between adjacent vertical support members **128a** and **128d**. Each floor tile is typically a 24"×24" square.

[0058] Referring to FIG. **12**, there is shown a perspective view of the first wire basket **120** which includes an extended portion **120a** extending substantially across its width. The first and second wire basket sections **120**, **122** are identical in size and configuration. Each basket section **120**, **122** is similarly constructed to wire basket **50**, described above. Each section **120**, **122** comprises a flat bottom portion **121** and **123** respectively, and opposing upraised end portions **125**, wherein each section **120**, **122** takes on a generally U-shaped overall frame configuration. Also shown in FIG. **12** is a first telescoping member **134** which is adapted for secure attachment to the first wire basket **120** as shown in FIG. **13**. First telescoping member **134** is in the form of a single piece of high-strength metal and includes a body portion **138** and four elongated linear portions **136a-136d** extending laterally from the body portion **138**. The four elongated linear portions **136a-136d** are arranged in a spaced manner along the length of the body portion **138**. The two outer elongated linear portions **136a** and **136d** are each provided with a respective reinforcing rib **142a** and **142b**. The third elongated linear portion **136c** is provided with an elongated, linear clearance slot **144**. While not shown, a linear clearance slot could also be formed on elongated linear portion **136b**. Disposed on the end of each of the four elongated, linear portions **136a-136d** is a respective stop tab **158a-158d**. Similarly, disposed on the outer edge of body portion **138** is an angled edge **140** having plural, spaced recesses **140a-140e** disposed along its length.

With the first telescoping member **134** positioned in contact with the first wire basket section **120** as shown in FIG. **13**, the first telescoping member is securely connected to the first wire basket by means of plural resistance weldments **160a**, **160b** and **160c**. With the first telescoping member **134** thus attached to the first wire basket section **120**, the angled edge **140** of the first telescoping member engages wire **120b** of the first wire basket. In addition, each of the spaced recesses **140a-140e** in the angled edge **140** is adapted to receive a respective wire in a lower portion of the first wire basket **120**. For example, wire **120c** of the first wire basket section **120** is disposed within recess **140e** in the first telescoping member's angled edge **140**.

[0059] Referring to FIG. **14**, there is shown an upper perspective view of the second wire basket section **122** including extension portion **122a** and a second telescoping member **146**. Second telescoping member **146** is shown positioned on second wire basket section **122** in FIG. **15**. Second telescoping member **146** includes plural spaced upraised portions **148a-148e** along its length. Disposed on the first upraised portion **148a** are a pair of spaced tabs **152**. Similarly, disposed on the fifth upraised portion **148e** of the second telescoping member **146** are a second pair of spaced tabs **154**. With the second telescoping member **146** disposed on the second wire basket section **122**, a lower surface of each of the upraised portions **148a-148e** is adapted to receive a respective wire of the second wire basket. For example, the lower surface of the third upraised portion **148c** is adapted to receive wire **122b** of the second wire basket section **122**. Second telescoping member **146** further includes an aperture **150**. Second telescoping member **146** is securely attached to the second wire basket by means of plural resistance weldments disposed between respective wires of the second wire basket and spaced recesses on the lower surface of the second telescoping member.

[0060] With reference to FIG. **16**, which is a lower perspective view of the first and second wire basket sections **120**, **122**, the combination is assembled by positioning the first telescoping member **134** which is attached to the first wire basket section **120** in an overlapping manner with respect to the second wire basket. The four elongated linear portions **136a-136d** of the first telescoping member **134** are each positioned in contact with the second telescoping member **146** between adjacent upraised portions of the second telescoping member. A third telescoping member **147** having an aperture **149** is then positioned over the elongated linear portions **136a-136d** of the first telescoping member **134** as shown in FIG. **17**. A threaded fastener is inserted through apertures **150** and **149** in the second and third telescoping members **146** and **147**, respectively, as well as through the elongated, linear clearance slot **144** in the first telescoping member **134**, which are in mutual alignment. It is in this manner that the first and second wire basket sections **120**, **122** are securely maintained in sliding engagement with each other to provide a telescoping feature for the two wire baskets and provide an electrical bond between wire basket sections **120**, **122**.

[0061] FIG. **18** is a perspective view showing the first and second wire basket sections **120**, **122** in the retracted, closely spaced position, while FIG. **19** is a perspective view showing the two wire baskets in the fully extended position. The threaded fastener **156** disposed within the aligned apertures **150**, **149** of the second and third telescoping members **146**, **147** and within the elongated, linear clearance slot **144** of the first telescoping member **134**, in combination with the plural

stop tabs **158a-159d** also disposed on the first telescoping member, prevent separation of the first and second wire basket sections **120, 122**. Once the proper spacing between the first and second wire basket sections **120, 122** is achieved, depending upon the required change in height between the two wire baskets, the threaded fastener **156** is tightened to maintain the required wire basket spacing.

[0062] Referring to FIG. 20, there is shown all upper perspective view of a centered wire basket **166** without sharp edges and in accordance with another aspect of the present invention. Centered wire basket **166** is without sharp edges and is coupled to plural vertical pedestal members **168a-168d** by means of plural pedestal brackets **170a-170d**. Centered wire basket **166** includes a generally U-shaped upper frame member **172** connected to a lower frame member **174** by means of plural resistance weldments as previously described. Lower frame member **174** includes first and second extended end members **174a** and **174b**. The width of the wire basket's upper frame member **172** is less than the length of the extended end members **174a, 174b** of the wire basket's lower frame member **174**. The wire basket's upper frame member **172** is centered between the ends of its extended end members **174a, 174b** and between the first and fourth pedestal members **168a, 168d** and the second and third pedestal members **168b, 168c**. The spaces between the sides of the wire basket's upper frame member **172** and the ends of the lower frame member's extended end members **174a** and **174b** provide access to the space below the centered wire basket **166** for maintenance or repair of system components located beneath the centered wire basket.

[0063] Referring to FIG. 21, there is shown another embodiment of a centered wire basket **180** in accordance with this aspect of the present invention. Centered wire basket **180** is also without any sharp edges and is similarly constructed as described above for wire basket **50** wherein plural U-shaped closed wire frames **182** with opposing upraised sections **183** are positioned in side-by-side relationship in mutual alignment and connected to a pair of inner flat closed wire frames **184** and a pair of outer flat closed wire frames **186**. Plural wire frames **182** when connected form an overall U-shaped frame for wire basket **180**. First and second end reinforcing members **188** and **190** are securely attached by use of resistance weldments (not shown for simplicity) to the end portions of the inner and outer flat closed wire frames **184** and **186**. Extended end portions **188, 190** have distal ends that generally align with bottom **191** and extend away therefrom. A smaller flat closed wire frame **192** is disposed on opposed ends of each of the first and second end reinforcing members **188, 190** and is resistance welded to adjacent structural elements.

[0064] Referring to FIG. 22, there is shown an upper perspective view of an offset wire basket **196** in accordance with another embodiment of this aspect of the present invention. Offset wire basket **196** is shown in the front elevation view of FIG. 23 attached to first and second vertical supports **204a** and **204b** by means of first and second pedestal brackets **206a** and **206b**, respectively. Offset wire basket **196** includes a generally U-shaped upper frame **198** attached to a generally planar lower frame **200** by means of plural resistance weldments as previously described. Offset wire basket **196** also includes first and second extended end portions **202a** and **202b**. The offset wire basket's upper frame **198** is disposed on one end of each of the first and second extended end portions **202a, 202b** to provide a space, or gap, between a lateral edge

of the upper frame and the distal ends of the first and second extended end portions **202a, 202b**. It is this space between a lateral portion of the offset wire basket's upper frame **198** and the distal ends of the lower frame's extended end portions, as shown for the case of extended end portion **202b** in FIG. 23, which provides access for maintenance or repair of system components located below the offset wire basket **196**.

[0065] Referring to FIG. 24, there is shown a perspective view of a pedestal bracket **210** in accordance with another aspect of the present invention. An exploded perspective view of the inventive pedestal bracket **210** is shown in FIG. 5, while FIGS. 26-29 illustrate additional details of the inventive pedestal bracket.

[0066] Pedestal bracket **210** includes an upper support plate **212** and a lower support clamp assembly **214**. Support plate **212** is securely attached to support clamp assembly **214** by use of a support plate locking screw **216** inserted through a first curvilinear elongated slot **222** in the support plate and into a threaded aperture **214a** in an upper portion of the support clamp assembly **214**. Support plate **212** and support clamp assembly **214** are further coupled together by means of first and second shoulder locking tabs **218** and **220**. First shoulder locking tab **218** is inserted through a second curvilinear slot **224** through insert slot **224a** in support plate **212**, while second shoulder locking tab **220** is similarly inserted through a third curvilinear slot **226** within the support plate through insert slot **226a**. An opening **212a** is formed in support plate **212** for receiving a vertical support member. Attached to the upper surface of support plate **212** are three retainer clips **238, 240** and **242**. Each retainer clip includes a respective inwardly directed angled tab, as shown for the case of the third retainer clip **242** having angled tab **242a**. Angled tab **242a** is adapted for insertion in slot **212c** in support plate **212**. Each retainer clip further includes an outwardly extending apertured tab, as shown for the first retainer clip **238** having apertured tab **238a**. Each pair of angled and apertured tabs are disposed on opposed portions of a retainer clip and extended downwardly from the retainer clip. Each apertured tab **238a** of a retainer clip is disposed in contact with an apertured mounting tab **212b** attached to and extending from the support plate **212**. A retainer clip screw **244** is inserted through the aligned apertures of the retainer clip's apertured tab **238a** and an apertured mounting tab **212b** attached to and extending from support plate **212**. A connector **246** engages screw **244** for maintaining each retainer clip securely in position on the upper surface of the support plate **212**. A screw retainer **245** is used to secure the screw **244** to the retainer clip **238** in an assembly. Each of the first, second and third retainer clips **238, 240** and **242** is adapted to engage and support at least one wire basket as described in detail below. In order to more securely maintain a wire basket on the pedestal clamp's support plate **212**, each retainer clip is provided with first and second edge tabs **238b** and **238c** as shown for the first retainer clip **238** in FIG. 25. Disposed adjacent each retainer clip are upward extending tabs **241a** and **241b** on the pedestal clamp's support plate **212** as also shown in FIG. 25 for maintaining a wire basket in engagement with the pedestal bracket **210**.

[0067] Attached to support clamp assembly **214** is a U-bolt clamp **228** in the form of a metal rod. U-bolt clamp **228** is adapted for securely connecting pedestal bracket **210** to a support member **248**. U-bolt clamp **228** includes a first curvilinear end **228a** and a second threaded end **228b**. The first curvilinear end **228a** of U-bolt clamp **228** is adapted for insertion through an aperture **232a** as well as through a slot

232b within the support clamp assembly **214**. The first curvilinear end **228a** of U-bolt clamp **228** is capable of undergoing pivoting displacement about the portion of the support clamp **214** between its aperture **232a** and slot **232b** in the direction of arrow **252** in FIG. 26.

[0068] The U-bolt clamp **228** may, thus, be moved to a position in contact with vertical support member **248** (also referred to as **32** in earlier figures), as shown in FIG. 27. In this position, the threaded end **228b** of U-bolt clamp **228** is disposed within a notched portion **233** in an outer edge of the support clamp **214**. Tightening of a nut **230** disposed on the threaded end **228b** of the U-bolt clamp **228** secures pedestal bracket **210** in fixed position on vertical support member **248**.

[0069] The support clamp assembly **214** of pedestal bracket **210** further includes a V-shaped recess **234** formed from wall **215** and adapted to engage an outer corner of a generally square, or rectangular, vertical support member **248** as shown in FIGS. 26 and 27, as well as a circular or round vertical support member, not shown. The V-shaped recess **234** and U-bolt clamp **228** maintain the support clamp **214** in secure position on vertical support **248**. Support clamp assembly **214** further includes a pair of spaced, facing flat surfaces **236a** and **236b** for engaging opposed outer surfaces of vertical support member **248** as also shown in FIGS. 26 and 27. First and second facing flat surfaces **236a**, **236b** of support clamp assembly **214** in combination with U-bolt clamp **228** maintain the pedestal bracket **210** securely in fixed position on vertical support member **248**. The lower end of the V-shaped recess **234** and the spaced, facing flat surfaces **236a** and **236b** form a portion of an aperture **236** in a lower portion of support clamp assembly **214**. As shown in the various figures, the portion of the support clamp assembly **214** adjacent the lower aperture **236** therein is angled inwardly to increase the strength of this portion of the support clamp to provide increased resistance to rotation of the pedestal bracket **210** on vertical support member **248**. As shown in FIG. 29, U-bolt clamp **228** of the support clamp assembly **214** is securely attached to the vertical support member **248** by tightening nut **230** around the threaded end portion **228b** of the U-bolt clamp by means of a conventional tool such as a nut driver **250**.

[0070] Referring to FIG. 30, there is shown the manner in which a pedestal bracket **256** engages and provides support for a pair of wire baskets **264** and **266**. Adjacent corner portions of the wire baskets **264** and **266** are positioned on the upper surface of the pedestal bracket's support plate **268**. Retainer clip **260** is positioned over adjacent edges of the first and second wire baskets **264**, **266** and a screw **262** is inserted through the aligned apertures within retainer clip and the pedestal bracket's support plate **268** and is tightened. Adjacent wires **264a** and **266a** of the first and second wire baskets **264**, **266**, respectively, are securely and fixedly maintained in position between the pedestal bracket's support plate **268** and retainer clip **260**. Each retainer clip **260** is adapted for securely attaching either a single wire basket or a pair of wire baskets to pedestal bracket **256**. Also shown in FIG. 30 is the lower plate **270** and an upper plate **272** of the vertical support member (not shown for simplicity) to which pedestal bracket **256** is attached.

[0071] As shown in FIG. 30, the positions of wires **264a** and **266a**, which are attached to pedestal bracket **256** by means of its retainer clip **260**, may be variably positioned between the pedestal bracket's support plate **268** and its retainer clip in both the longitudinal and lateral directions. For example, wire **264a** is disposed closer to the outer edge of

retainer clip **260**, while wire **266a** is positioned closer to the center of retainer clip **260**, and is almost in contact with the tab of the retainer clip through which the retainer clip screw **262** is inserted. By adjusting the positioning of wires **264a** and **266a** in the direction of arrow **274a** or in the direction of arrow **274b**, the spacing between the first and second wire baskets **264** and **266** may be adjusted longitudinally, as desired. The capability to adjust the spacing between adjacent wire baskets allows these pedestal brackets of the present invention to be used with the United States standard grid system of a 24 inch by 24 inch for the spacings of vertical supports **248** as well as the 600 mm by 600 mm grid spacing of the vertical supports for the Europe standard.

[0072] Referring to FIGS. 31-33, the manner in which the inventive pedestal bracket **210** may be positioned at any angular orientation on a generally square vertical support member **248** will now be described. As shown in FIG. 31, pedestal bracket **210** engages a pair of opposed lateral sides of vertical support member **248** between its opposed facing flat surfaces **236a** and **236b**. The orientation of pedestal bracket **210** relative to vertical support member **248** may be changed by rotating pedestal bracket 45° and inserting an outer corner of the vertical support member in the pedestal bracket's V-shaped, recess **234** as previously described and as shown in FIG. 32. Pedestal bracket **210** may be oriented at any angle between 0°, as shown in FIG. 31, and 45°, as shown in FIG. 32. In FIG. 33, the pedestal bracket **210** is also shown engaging opposed outer walls of vertical support member **248** between its first and second facing flat surfaces **236a** and **236b**. However, in FIG. 33, support plate locking screw **216** has been loosened, allowing support plate **212** to rotate relative to support clamp **214** in the direction of arrow **254**. Changing the orientation of pedestal bracket **210** relative to the vertical support member **248** causes the support plate locking screw **216** to be positioned at the lower end of first curvilinear slot **222** in support plate **212** as shown in FIG. 33. Similarly, the first and second shoulder locking tabs **218** and **220** have moved within the second and third curvilinear slots **224** and **226**, respectively. Rotational displacement of the pedestal bracket **210** relative to the vertical support member **248** in the opposite direction would position the support plate locking screw **216** in an upper portion of the first curvilinear slot **222**. Similarly, the first and second shoulder locking tabs **218**, **220** would be moved to respective opposed ends of the second and third curvilinear slots **224** and **226** from that shown in FIG. 33. Once the support plate **212** is in the desired orientation relative to the vertical support member **248**, the support plate locking screw **216** is tightened for securely and fixedly connecting the support plate **212** to the support clamp **214**, with the pedestal bracket **210** similarly in fixed orientation relative to the vertical support member. Support plate **212** and support clamp **214** remain connected during relative rotational displacement between these two components by means of support plate locking screw **216** and shoulder locking tabs **218**, **220**. Support plate **212** is capable of undergoing up to 22½° rotational displacement relative to support clamp **214**. Thus, any angular orientation between pedestal bracket **210** and vertical support member **248** may be achieved. For example, by attaching pedestal clamp **210** to the vertical support member **248**, as shown in FIG. 31, with opposed sides of the vertical support member engaged by the pedestal clamp, the angle between the pedestal clamp and vertical support member may be changed by up to 22½° by rotating the pedestal bracket's plate **212** relative to its support clamp

214 in a first direction. Any angle between $22\frac{1}{2}^\circ$ and 45° between the pedestal clamp **210** and vertical support member **248** may be achieved by positioning the pedestal bracket in engagement with two adjacent surfaces, or with a corner, of the vertical support member **248** and rotating the support clamp **212** relative to the vertical support member in a second, opposed direction.

[0073] The inventive pedestal clamp **210** has a further benefit in that it is capable of universal height adjustment of a wire basket to which it is connected. U-bolt clamp **228** can be releasably secured to vertical support member **248** at any desired position along the length of vertical support member **248**. For example, as shown in FIG. **34**, wire basket **280** is connected to lower end portions of first and second vertical support members **284a** and **284b** by first and second pedestal brackets **282a** and **282b**, respectively. FIG. **35** shows the vertical wire basket **280** connected to upper portions of the first and second vertical support members **284a** and **284b** by the first and second pedestal brackets **282a** and **282b**, respectively. Thus, the pedestal brackets of the present invention are capable of securely and fixedly positioning a wire basket at any height along the length of the vertical support members of the wire basket support system.

[0074] Referring to FIG. **36**, there is shown an upper perspective view of a wire basket pathway system **292** in accordance with the present invention. Wire basket pathway system **292** includes plural wire baskets **294a-294d** connected together by use of a wire basket intersection **296**. Plural cable bend guides are attached to the ends of the various wire baskets shown in FIG. **36** to accommodate a 90° turn in the cable runs. Thus, the first wire basket **294a** has attached to its end adjacent to the wire basket intersection **296** first and second cable bend guides **298a** and **298b**. The second wire basket **294b** has third and fourth cable bend guides **300a** and **300b** attached to its end which is adjacent to the wire basket intersection **296**. The third wire basket **294c** similarly has a pair of cable bend guides **302a** and **302b** connected to its end adjacent to the wire basket intersection **296**. Finally, the fourth wire basket **294d** has a cable bend guide **304** attached to its end adjacent to the wire basket intersection **296**. The cable bend guides provide a smooth bend radius for the cables undergoing a 90° turn in passing from one wire basket to another adjacent wire basket.

[0075] FIG. **37** is an upper perspective view of wire basket **294c** illustrating additional details of cable bend guides **302a** and **302b** which will now be described in terms of FIGS. **38-42** which show the manner in which a cable bend guide is attached to a wire basket. Referring to FIG. **38**, there is shown a perspective view of cable bend guide **302a**. Cable bend guide **302a** includes a first generally planar wall section **306**, a second curvilinear wall section **308** and a third generally planar wall section **310**. The three sections are formed from a single piece of high strength metal such as pre-galvanized sheetsteel. The curvilinear wall section **308** of the cable bend guide **302a** engages one or more cables undergoing a turn in their routing for providing the cable, or cables, with a smooth bend radius. The third planar wall section **310** serves to reinforce, or strengthen, the cable bend guide **302a** for use with large numbers of cables and eliminates any sharp edges which could damage the cables. Extending rearwardly from the first planar wall section **306** of the cable bend guide **302a** is a tab **312** to which is attached a mounting clip **314**. Mounting clip **314** includes upper wire hooks **316a** and lower wire hooks

316b. Also extending from the aft edge of the cable bend guide's first planar wall section **306** are upper and lower retaining tabs **318a** and **318b**.

[0076] Cable bend guide **302a** is attached to wire basket **294c** in the following manner. Cable bend guide **302a** is positioned inside of a first end wire **320a** of the wire basket **294c**, with its mounting clip **314** located between second and third wires **320b** and **320c** of the wire basket as shown in FIG. **39**. In this position, the first upper wire hooks **316a** are disposed on a first side of the second wire **320b**, while the second lower wire hooks **316b** are disposed on a second, opposed side of the third wire **320c**. Cable bend guide **302a** is then rotated in the direction of arrow **322** in a counter clockwise direction as viewed in FIG. **39**. The first upper wire hooks **316a** then engage the second wire **320b** in a snap-acting manner while the second lower wire hooks **316b** engage the third wire **320c** also in a snap-acting manner as shown in FIG. **40**. The wire hooks are sized so as to securely engage a wire of wire basket **294c** when pressure is applied by rotational displacement of the cable bend guide **302a**, as described. The cable bend guide **302a** is then linearly displaced in the direction of arrow **324** as shown in FIG. **40**. This causes the first and second retaining tabs **318a** and **318b** to engage the wire basket's first wire **320a**, also in a snap-acting manner, as shown in FIG. **41**. Each of the retaining tabs includes an angled portion **319** as shown with the first retaining tab **318a** in FIG. **42** which engages the first wire **320a** and further attaches the cable bend guide **302a** to wire basket **294c**. With the first and second wire hooks **316a**, **316b** engaging opposed sides of the second and third wires **320b** and **320c**, and with each of the retaining tabs **318a** and **318b** engaging the wire basket's first wire **320a**, cable bend guide **302a** is securely attached in a fixed manner to wire basket **294c**.

[0077] Though particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the relevant arts that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim of the appended claims is to cover all such changes and modifications as falls within the true spirit and scope of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only and not as a limitation. The actual scope of the invention is intended to be defined in the following claims when viewed in their proper perspective based on the prior art.

1. A wire basket for supporting cables, the wire basket comprising:

- a plurality of wire frames connected together in a side-by-side manner in forming a generally flat bottom and first and second opposed upraised end portions so as to form a generally U-shaped frame;

- wherein each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposing ends of the wire frame.

2. A wire basket for supporting cables, the wire basket comprising:

- a generally flat bottom portion and first and second opposed upraised end portions that form a generally U-shaped frame; and

- an extended mounting member interconnected to the frame such that a distal end of the mounting member is generally aligned with and extends beyond the bottom portion.

3. The wire basket of claim 1, wherein adjacent wire frames are connected to each other with at least one resistance weldment.

4. The wire basket of claim 1, further comprising first and second closed wire frames wherein each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposing ends of the wire frame, the first closed wire frame connected to the first upraised end portion with at least one resistance weldment and the second closed wire frame is connected to the second upraised end portion with at least one resistance weldment.

5. The wire basket of claim 4, wherein each of the first and second closed wire frames extend along a length of the respective frame, which is generally transverse to a length of the plurality of wire frames.

6. The wire basket of claim 1, further comprising a second plurality of wire frames, wherein each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposing ends of the wire frame, wherein the second plurality of wire frames are positioned in a side-by-side manner and each of the wire frames extend along their respective length in a direction generally transverse to a length of the plurality of wire frames.

7. The wire basket of claim 6, wherein adjacent wire frames of the second plurality of wire frames are connected to each other with at least one resistance weldment.

8. The wire basket of claim 6, wherein at least one wire frame of the plurality of wire frames is connected to at least one adjacent wire frame of the second plurality of wire frames with a resistant weldment.

9. The wire basket of claim 6, further comprising third and fourth closed wire frames, wherein each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposing ends of the wire frame, wherein each wire frame extends along its respective length and generally in a direction transverse to a length of the second plurality of wire frames, the third and fourth closed

wire frames are connected to at least one wire frame of the second plurality of the wire frames by way of a resistance weldment, and the third and fourth closed wire frames are positioned in generally the same plane as the flat bottom.

10. The wire basket of claim 2, wherein the generally U-shaped frame is constructed of a plurality of wire frames connected together in a side-by-side manner wherein each wire frame is formed of a single closed section of wire comprising at least one radial bend positioned at opposing ends of the wire frame.

11. The wire basket of claim 2, wherein adjacent wire frames are connected together with at least one resistance weldment.

12. The wire basket of claim 2, further including a second extended mounting member comprising another distal end generally aligned with and extending beyond the bottom portion, wherein the extended mounting member is positioned at an end of the generally U-shaped frame and the second extended mounting member is positioned on an opposite end of the generally U-shaped frame.

13. The wire basket of claim 12, wherein the extended mounting member and the second extended mounting member both extend in generally the same direction away from the generally U-shaped frame such that the distal end and the other distal end are both positioned closer to one of the first and second upraised portions.

14. The wire basket of claim 12, wherein each of the extended mounting member and second extended mounting member extends in a direction generally transverse to the first and second upraised end portions.

15. The wire basket of claim 12, wherein each of the extended mounting member and the second extended mounting member extends away from both the first and second upraised portions on opposing sides of the generally U-shaped frame.

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