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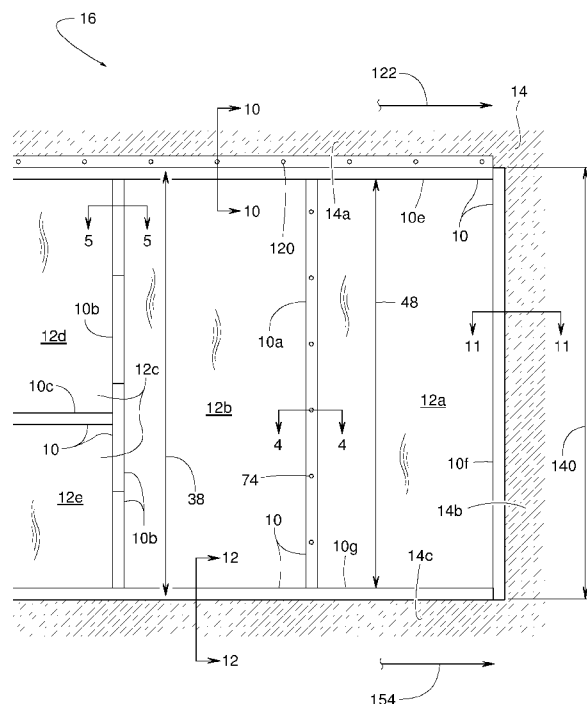
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(54) Title: CONNECTOR APPARATUS FOR WALL PANELS

FIG. 1



(57) Abstract: Connector (10a, 10b, 10g, 10e, 10f, 10c) apparatus for wall panels (12a, 12b, 12d, 12e) are disclosed herein. An example room divider (16) includes a first curtain (12a), a second curtain (12b) spaced from the first curtain, and a connector (10a) to couple the first curtain and the second curtain. The connector includes a first flange (52), a second flange (54) and a web (56), the web (56) lying between the first flange (52) and the second flange (54) such that the first flange, the second flange and the web overlap each other. A first pocket (66) is defined by the first flange and the web, where the first curtain (12a) extends into the first pocket (66) between the first flange and the web. A second pocket (68) is defined by the second flange and the web, where the second curtain (12b) extends into the second pocket (68) between the second flange and the web. A fastener (74) coupled to the connector, where the fastener (74) penetrates the first curtain (12a), the second curtain (12b), the web (56), the first flange (52) and the second flange (54).



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Connector Apparatus for Wall Panels

Field of the Disclosure

[0001] This patent generally pertains to flexible room dividers and, more specifically, to connector apparatus for wall panels.

Background

[0002] Some room dividers include a series of semi-flexible curtains that are suspended from an overhead structure and are interconnected along their vertical edges by hook-and-loop fasteners. Some such room dividers provide a relatively quick, easy, and affordable way for separating interior spaces having different environmental requirements or for isolating spaces from dust, paint overspray, odors, and/or other airborne contaminants. In some examples, some room dividers include insulation to reduce heat migration within a building and to help maintain a desired air temperature and humidity within designated areas. Such areas, for example, may include areas used for storing refrigerated or frozen foods and/or other perishable goods.

[0003] Some room dividers are made of curtains having special qualities for certain purposes. For example, some curtains have acoustic insulation for noise absorption, impenetrable strength for security, and/or flame resistance for limiting the spread of smoke and/or fire.

Brief Description of the Drawings

[0004] FIG. 1 is a front view of an example room divider having an example connector constructed in accordance with the teachings disclosed herein.

[0005] FIG. 2 is a cross-sectional end view of the example room divider of FIG. 1 in a first partially assembled state.

[0006] FIG. 3 is a cross-sectional end view of the example room divider of FIGS. 1 and 2 in a second partially assembled state.

[0007] FIG. 4 is a cross-sectional view taken along line 4-4 of FIG. 1.

[0008] FIG. 5 is a cross-sectional end view taken along line 5-5 of FIG. 1.

[0009] FIG. 6 is a cross-sectional end view similar to FIG. 4 but showing another example connector apparatus constructed in accordance with the teachings disclosed herein.

[0010] FIG. 7 is a cross-sectional end view similar to FIG. 4 but showing another example connector apparatus constructed in accordance with the teachings disclosed herein.

[0011] FIG. 8 is a schematic view of another example connector constructed in accordance with the teachings disclosed herein.

- [0012] FIG. 9 is another schematic view of the example connector shown in FIG. 8.
- [0013] FIG. 10 is a cross-sectional view taken along line 10-10 of FIG. 1.
- [0014] FIG. 11 is a cross-sectional view taken along line 11-11 of FIG. 1.
- [0015] FIG. 12 is a cross-sectional view taken along line 12-12 of FIG. 1.
- [0016] FIG. 13 is a cross-sectional view similar to FIG. 10 but showing an example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0017] FIG. 14 is a cross-sectional view similar to FIG. 10 but showing another example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0018] FIG. 15 is a schematic view of another example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0019] FIG. 16 is a schematic view of another example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0020] FIG. 17 is a schematic view of another example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0021] FIG. 18 is a front view of another example connector apparatus constructed in accordance with the teachings disclosed herein.
- [0022] FIG. 19 is a cross-sectional view taken along line 19-19 of FIG. 18.

Detailed Description

[0023] Example room dividers disclosed herein include elongate connectors to interconnect and/or seal longitudinal edges of a plurality or series of insulated and/or otherwise padded curtains. Some example connectors disclosed herein have an S-shaped cross-sectional profile that establishes an overlapping joint at adjoining edges of the example curtains. In some examples, the example curtains employ hems folded over onto opposite faces of the curtain. In some such examples, the example connectors disclosed herein may employ a barb to engage at least a portion of an edge of the folded-over hem to help secure and/or hold a curtain in position. Some example curtains disclosed herein have a resiliently compressible core that expands to fill a pocket defined by the connector when the compressible core is coupled to the pocket of the connector. In particular, an expanded portion of the compressible core positioned within the pocket mechanically and/or frictionally holds the curtain engaged or coupled to the connector. To further ensure the integrity of a joint provided by the example connectors, some example connectors disclosed herein may employ a fastener that extends or passes through an example connector and/or overlapping edges of adjoining curtains. Some example connectors disclosed herein are

support multiple curtains and/or attach the curtains to a building (e.g., a wall, a beam, and/or other structure).

[0024] FIGS. 1 – 14 illustrate example connectors 10 (e.g., connectors 10a-j) to interconnect one or more curtains 12 (e.g., curtains 12a, 12b and 12c) and/or to attach a curtain assembly to various building members 14 such as, for example, an overhead structure 14a (e.g., ceiling, beam, truss, etc.), a wall 14b, and/or a floor 14c. Once installed, the curtain assembly can serve as a room divider 16, as shown for example in FIG. 1. FIG. 1 shows a variety of different curtains 12 and connectors 10 provided in a single curtain assembly. Other installations, however, would not necessarily have such variety at one location.

[0025] In the example of FIG. 1, a room divider 16 is shown having curtains 12a 12b, 12d and 12e. A connector 10c of the illustrated example connects the adjoining (e.g., horizontal) edges of curtains 12d and 12e to provide a curtain assembly 12c that is similar in size to curtains 12a and 12b. A connector 10e of the illustrated example hangs curtains 12a, 12b and 12c from an overhead structure 14a, and a connector 10g anchors the (e.g., lower) ends of curtains 12a, 12b and 12c to floor 14. A connector 10a joins the adjacent (e.g., vertical) edges of the curtains 12a and 12b, and a connector 10b joins the (e.g., left vertical) edge of curtain 12b to an adjacent (e.g., right) edge of curtain 12c (e.g., in the orientation of FIG. 1). In the illustrated example of FIG. 1, the connector 10b includes a plurality of connector segments 10b' distributed (e.g., vertically) along a substantially or entire (e.g., a full) height of the left edge of curtain 12b. In some examples, the connector 10a, the connector 10b and/or connector 10c has a cross-sectional profile similar to those shown in FIGS. 2 – 9. The connector 10f of the illustrated example anchors the (e.g., right vertical) edge of the curtain 12a to the wall 14b. The cross-sectional profiles of the example connectors 10a-i and their various mounting configurations are shown in FIGS. 2 – 14.

[0026] FIGS. 2-4 show an example sequence of using the connector 10a to couple a left edge 18 of the curtain 12a to a right edge 20 of the curtain 12b. In this example, each of the curtains 12a and 12b includes a core sandwiched or positioned between two covers. More specifically, the curtain 12a of the illustrated example includes a first core 22 sandwiched or positioned between a first front cover 24 and a first back cover 26. The curtain 12b of the illustrated example includes a second core 28 sandwiched or positioned between a second front cover 30 and a second back cover 32.

[0027] The cores 22 and 28 provide the respective curtains 12a and 12b with characteristic(s) such as, for example, thermal insulation, fire resistance, sound absorption, and/or porosity. In some examples, porosity reduces weight, promotes compressibility, and/or

increases thermal resistance. Thermal resistance is commonly quantified in terms of “R-value,” where higher R-values refer to structures (e.g., core, cover, etc.) having greater thermal resistance. Example core materials include, but are not limited to, batting, resiliently compressible foam, polyester fiber batting, carbon fiber batting, and/or fiberglass batting. Example nominal core thicknesses 34 include, but are not limited to, 0.25 inches, 0.5 inches, 0.75 inches, 1 inch, and 1.5 inches. To achieve such thicknesses, some core examples are single layer and some are multiple layers. For sound dampening, some example cores also include a mass loaded vinyl sheet (e.g., 1 lb/sqft).

[0028] The outer covers 24, 26, 30 and 32 help protect the respective cores 22 and 28 from wear, moisture, mold, mildew, and/or air borne contaminants. In some examples, the covers 24, 26, 30 and 32 of the illustrated example improve the appearance of the curtains and/or make the curtains easier to clean. In some examples, the covers 24, 26, 30 and 32 include a fire resistant vinyl fabric (e.g., 18 oz/sqyd, 0.032 in thick, 0.063 in thick, and/or other material weights or thicknesses). The core/cover assembly provided by the core 22 and the outer covers 24 and 26 provides the curtains 12a with a nominal thickness 36 spanning from the outer cover 24 to the outer cover 26. Similarly, the core/cover assembly provided by the core 28 and the outer covers 30 and 32 provides the curtain 12b with the nominal thickness 36 spanning from the outer cover 30 to the outer cover 32. Further, the curtain 12a has an edge 18 that opposes the edge 20 of the curtain 12b. The example edges 18 and 20 of the illustrated example are vertically elongate. In addition, the cores 22 and 28 are both softer and more compressible than the outer covers 24, 26, 30 and 32. Providing relatively softer cores 22 and 28 (e.g., softer than the covers 24 and 26 and/or softer than the connector 10a) provides the respective curtains 12a and 12b with the compressibility to become pinched, indented, clamped, squeezed, deformed and/or otherwise compressed. As a result, the cores 22 and 28 enable the respective curtains 12a and 12b to be securely gripped by the connector 10a. The covers 24, 26, 30 and 32 are also sufficiently pliable to be securely gripped by the connector 10a. However, because the covers 24, 26, 30 and 32 are not as soft as the cores 22 and 28 provides the respective curtains 12a and 12b with strength and/or wear resistance. The term, “nominal thickness” (e.g., the thickness 36) as it pertains to a curtain (e.g., core plus covers) refers to the curtains average overall thickness excluding areas of the curtain that are compressed within a connector (e.g., the connector 10a). The curtains 12a and 12b of the illustrated example each has a curtain height 38 extending between an upper edge 40 (FIG. 10) and a lower edge 42 (FIG. 12).

[0029] In some examples the core 22 and/or the core 28 of the respective curtains 12a and 12b may be thicker (e.g., between a face adjacent the respective covers 24 and 30 and a face adjacent the respective covers 26 and 32), may have a greater thermal resistance, and/or may be more porous than the covers 24, 26, 30 and/or 32 of the respective curtains 12a and 12b. The thickness of the core 22 and/or 28 being greater than the thickness of the covers 24, 26, 30 and/or 32 provides compressibility to enable the connector 10a to grip the respective curtains 12a and 12b more securely and/or more firmly. The cores 22 and/or 28 being more porous than a porosity of the covers 24, 26, 30 and/or 32 provide the respective curtains 12a and 12b with a desired compressibility while retaining the curtain's wear resistance due to the characteristics and/or quality of the covers 24, 26, 30 and/or 32. Furthermore, the thermal resistance of the example cores 22 and 28 provides the respective curtains 12a and 12b with a relatively high R-value while retaining wear resistance due to the quality of the covers 24, 26, 30 and/or 32.

[0030] FIGS. 2 – 4 show the example connector 10a having a connector width 44 and a connector thickness 46. FIG 1 shows the example connector 10a vertically elongate having a connector height 48 that is at least five times greater than the width 44 and at least ten times greater than the thickness 46. Such dimensions in addition to connector 10a being harder and/or stiffer than the curtains 12a and 12b provide the connector 10a with a compact profile while still being able to securely hold and seal along the edges 18 and 20 of the respective curtains 12a and 12b. Example connector 10a materials include, but are not limited to, steel, aluminum, other metals, plastic, alloys and/or another material(s). Additionally, the example, the connectors 10a – 10j can be made by various methods, examples of which include, but are not limited to, extruding, brake formed, and/or roll formed. It should be noted that the difference between the connector thickness 46 and a material thickness 50 of connector 10a is that the connector thickness 46 is measured across the entire thickness of the connector 10a (e.g., across a first outermost edge or face and a second outermost edge or face opposite the first outermost edge or face) while the material thickness 50 is measured across a base material of the connector 10a. For example, the material thickness 50 is measured across a flange (e.g., a first flange 52, a second flange 54, or a web 56).

[0031] In the illustrated example, the connector 10a the first flange 52, the second flange 54, the web 56, a first bend 58 and a second bend 60. The term, “bend” refers to a structure that is curved or angled with no regard as to how the bend was made. For example, a bend is not necessary created by bending material. The web 56 of the illustrated example lies or is positioned between the flanges 52 and 54 such that the web 56 and the two flanges 52 and 54

overlap each other. The web 56 extends widthwise between a first bend 58 and a second bend 60. The first bend 58 connects or couples the first flange 52 and the web 56 and the second bend 60 connects or couples the second flange 54 and the web 56. The first flange 52 of the illustrated example terminates at a first flange edge 62 that is vertically elongate and proximate the second bend 60 and/or the web 56. The second flange 54 of the illustrated example terminates at a second flange edge 64 that is vertically elongate and proximate the first bend 58 and/or the web 56. In some examples, the term, “proximate” refers to a distance that is less than the connector’s thickness 46.

[0032] To couple the curtains 12a and 12b, the edge 18 of the curtain 12a is inserted or positioned into a first pocket 66 defined by the first flange 52, the first bend 58 and the web 56 of the connector 10a. Likewise, the edge 20 of the curtain 12b is inserted into a second pocket 68 defined by the second flange 54, the second bend 60 and the web 56. Upon the insertion of the edge 18 of the curtain 12a into the first pocket 66, the first outer cover 24 lies against or (e.g., directly) engages the web 56. The first core 22 of the illustrated example is compressed between the first flange 52 and the web 56 (and/or the second bend 60) to provide the first curtain 12a with a first (e.g., localized) compressed thickness 70 that is less than the nominal thickness 36 of the first curtain 12a. The indentation caused by the compression of the first core 22 helps hold the first curtain 12a within first pocket 66. For example, compressing a portion of the core 22 at the edge 18 to the compressed thickness 70 increases a frictional force between the curtain 12a and the connector 10a when the edge 18 is inserted in the first pocket 66. Likewise, upon the insertion of the curtain 12b into the second pocket 68, the second outer cover 30 lies against or (e.g., directly engages) the web 56. The second core 28 of the illustrated example is compressed between the second flange 54 and the web 56 (and/or the first bend 58) to provide the second curtain 12b with a second (e.g., localized) compressed thickness 72 that is less than the nominal thickness 36 of the second curtain 12b. The indentation caused by the compression of the second core 28 helps hold or secures the second curtain 12b within the second pocket 68. For example, compressing a portion of the core 28 at the edge 20 to the compressed thickness 72 increases a frictional force between the curtain 12b and the connector 10a when the edge 20 is inserted in the second pocket 68 of the connector 10a.

[0033] To further secure the curtains 12a and 12b to the connector 10a, some examples connectors disclosed herein may employ a fastener (e.g., mechanical fastener, a chemical fastener, a pin, adhesive, etc.). For example, the connector 10a of the illustrated example includes a fastener 74, such as a rivet 74a (e.g., a blind rivet, a pop rivet, other types of rivets,

etc.) and/or a threaded fastener 74b (e.g., a self-tapping screw, a sheet metal screw, other types of screws, etc.). To simplify and/or facilitate installation of the curtains 12a and 12b with the connector 10a, the fastener 74 can be installed via access to only one side of the curtains 12a and 12b (e.g., a side of the respective outer covers 24 and 30). In some examples, the connector 10a includes a hole 76 and the curtains 12a and 12b (e.g., drilled through the connector 10a in a direction of the thickness 46 as shown in FIG. 3). The fastener 74 can be inserted through the hole 76 such that the fastener 74 penetrates or passes through the first curtain 12a, the second curtain 12b, the web 56, the first flange 52 and the second flange 54, as shown in FIG. 4.

[0034] FIG. 4 illustrates the first curtain 12a and the second curtain 12b of the illustrated example coupled via the connector 10a. In some examples, the localized indentation in the curtain 12a at the first flange edge 62 and the similar indentation in the curtain 12b at the second flange edge 64 create or provide a living hinge along each indentation (e.g., at the respective first and second flange edges 62 and 64). The living hinges allow the web 56 of the connector 10a to tilt, cant and/or otherwise move slightly out of parallel alignment relative to the curtains 12a and 12b, thereby allowing the curtains 12a and 12b to lie or move in coplanar alignment with each other. Specifically, FIG. 4 shows the curtains 12a and 12b both lying along a common plane 78 while web 56 lies non-parallel or canted relative to the plane 78. For example, the compressed edge 18 of the curtain 12a may be at an angle or non-parallel relative to the non-compressed portion of the core 22 and/or curtain 12a. Similarly, the compressed edge 20 of the curtain 12b may be at an angle or non-parallel relative to the non-compressed portion of the core 28 and/or the curtain 12b. As a result, parallel faces (e.g., defined by the respective covers 24 and 30) of the example curtains 12a and 12b of the room divider 16 can appear to lie relatively flat from the curtain 12a to the curtain 12b.

[0035] FIGS. 5, 6 and 7 show examples of various connectors constructed in accordance with the teachings disclosed herein. FIG. 5 shows a connector/curtain assembly 80 similar to that shown in FIG. 4 but without the fastener 74. Without the fastener 74, the connector 10b grips two curtains 12b and 12c by way of friction and/or a mechanical interlock created by the curtains 12b and 12c being thicker at their edges 82 than at compressed indentations 84 where the flange edges 62 and 64 of the connector 10b pinch curtains 12b and 12c.

[0036] FIG. 6 shows a connector 10c having flange edges 86 each including a barb 88 that engages a folded-over hem 90 at a curtain edge 92. In this example, a front cover 94 and a back cover 96 are folded over to create the hem 90. The hem 90 can be held in the folded-over state by any suitable fastening process(es), examples of which include, but are not

limited to, sewing (e.g., a seam 98), ultrasonic welding, thermal welding, gluing, and/or other process(es). When using a plurality of connectors 10c to interconnect the edges of a series of curtains, the two edge hems 90 of each curtain 12b and 12c may be folded over in opposite directions, (i.e., one forward and one back). For example, FIG. 6 shows the hem 90 of curtain 12b folded toward an upward direction in the orientation of FIG. 6 and shows the hem 90 of the curtain 12c folded toward a downward direction in the orientation of FIG. 6. In some examples, a hem-engaging barb 88' is provided or formed on the flange edge 86 and/or on an opposing surface 87, as shown in FIGS. 15, 16 and 17. In some examples, a series of discrete barbs 88'' are stamped into a sheet metal connector 10j, as shown in FIGS. 18 and 19. In some examples, barbs 88'' protrude so as to engage the hem 90 of a curtain (e.g., the curtain 12c) along a series of contact points, while the remaining portion of the connector 10j provides a continuous seal along the hem's length.

[0037] FIG. 7 shows another example connector 10d constructed in accordance with the teachings of this disclosure. The connector 10d of the illustrated example is made primarily of metal (e.g., aluminum, steel, brake formed, roll formed, extruded, etc.) with a polymeric coating 100 (e.g., vinyl, polyurethane, etc.) on at least one flange 102. The coating 100 provides a layer of thermal insulation that helps prevent frost from accumulating on the side of the connector 10d that is facing warm ambient air 104 while the other side of the connector 10d is facing a refrigerated area 106.

[0038] FIGS. 8 and 9 schematically illustrate profile or shape of a connector (e.g., connector 10b of FIG. 5) that is representative of the connectors 10a-10d shown in FIGS. 2 – 7. For example, an example connector of the illustrated example of FIG. 8 has an S-shaped profile or cross-sectional shape. FIG. 8 shows the connector 10b having a first surface 108 extending contiguously from the first flange edge 62, across the first flange 52, around the first bend 58, across the web 56, around the second bend 60, across the second flange 54 and to the second flange edge 64. FIG. 9 shows the example connector 10b having a second surface 110 extending contiguously from the first flange edge 62, across the first flange 52, around the first bend 58, across the web 56, around the second bend 60, across the second flange 54 and to the second flange edge 64. When attached to the curtains 12b and 12c, as shown in FIG. 5, the curtain 12c engages the first surface 108 and is spaced from the second surface 110, and the curtain 12b engages the second surface 110 and is spaced from the first surface 108.

[0039] The example connector 10e of FIG. 10 connects or couples the upper edge 40 of the curtain 12b and the overhead structure 14a. In this example, the connector 10e is a

seamless unitary piece or structure having a mounting flange 112, a first flange 114 and a second flange 116. In the illustrated example, the mounting flange 112 is substantially parallel to and/or coplanar with the second flange 116. The curtain's upper edge 40 fits within a pocket 118 (e.g., a channel) between the flanges 114 and 116, and the barb 88 engages the hem 90 to help secure the curtain 12b. In some examples, the fastener 74 (not shown in FIG. 10) penetrates the flange 114, the flange 116 and the curtain 12b to further help secure the curtain 12b to the connector 10e in a manner similar to that shown in FIGS. 3 and 4. In some examples, a fastener 120 anchors the mounting flange 112 to the overhead structure 14a.

[0040] The connector 10e of the illustrated example has an overall length 122 (FIG. 1), a width 124 and a thickness 12b. In some examples, to avoid air or smoke passage between the curtain 12b and the connector 10e, the overall length 122 of the connector 10e is substantially equal to or greater than the length of the upper edge 40 of the curtain 12b. The term, "substantially equal to" as it pertains to the relative lengths of a connector and a curtain edge (running horizontally or vertically) means that the connector extends the (e.g., entire) full length of the curtain's edge (e.g., vertical edge or horizontal edge) less any relatively small clearance needed for connecting an adjacent connector at the end of the length. For example, in the room divider's upper right corner of FIG. 1, the connector 10e stops just short of the curtain's uppermost right corner to make room for the adjacent connector 10f at that corner. In some examples, the length or height of a curtain edge and the respective connector extend substantially vertically (e.g., connectors 10a, 10b, and 10f), and in other examples, the length of a curtain edge and the respective connector extend substantially horizontally (e.g., connectors 10c, 10g, and 10e).

[0041] FIG. 11 shows the example connector 10f connected or coupled to a right edge 128 of the curtain 12a and the wall 14b. In this example, the connector 10f is a seamless unitary piece or structure having a mounting flange 130, a first flange 132 and a second flange 134. In the illustrated example, the mounting flange 130 is substantially parallel to and/or coplanar with the second flange 134. The curtain's right edge 128 fits within a pocket 136 (e.g., a channel) between the flanges 132 and 134, and the barb 88 engages the hem 90 to help secure the curtain 12a. In some examples, the fastener 74 (not shown in FIG. 11) penetrates the flange 132, the flange 134 and the curtain 12a to further secure the curtain 12a to the connector 10f in a manner similar to that shown in FIGS. 3 and 4. In some examples, a fastener 138 anchors the mounting flange 130 to the wall 14b.

[0042] The connector 10f of the illustrated example has an overall length 140 (FIG. 1), a width 142 and a thickness 144. In some examples, to avoid air or smoke passage between the curtain 12a and the connector 10f, the overall length 140 of the example connector 10f is substantially equal to or greater than the length of the right edge 128 of the curtain 12a.

[0043] FIG. 12 shows the example connector 10g connected or coupled to a lowermost edge 42 of the curtain 12b and the floor 14c. In this example, the connector 10g is a seamless unitary piece or structure having a mounting flange 146, a first flange 148 and a second flange 150. In the illustrated example, the mounting flange 146 is substantially perpendicular relative to the second flange 150. The curtain's lower edge 42 fits within a pocket 152 (e.g., a channel) between the flanges 148 and 150, and the barb 88 engages the hem 90 to help secure the curtain 12b. In some examples, the fastener 74 (not shown in FIG. 12) penetrates the flange 148, the flange 150 and the curtain 12b to further secure the curtain 12b to the connector 10g in a manner similar to that shown in FIGS. 3 and 4. In some examples, the fastener 120 anchors the mounting flange 146 to the floor 14c.

[0044] The connector 10g of the illustrated example has an overall length 154 (FIG. 1), a width 156 and a thickness 158. In some examples, to avoid air or smoke passage between the curtain 12b and the connector 10g, the connector's overall length 154 is substantially equal to or greater than the length of the curtain's lower edge 42.

[0045] To achieve greater thermal insulation and/or sound absorption, some example room dividers disclosed herein have multiple curtain layers, as shown in FIGS. 13 and 14. In FIG. 13, the connector 10h is connected or coupled to a first curtain 162 and a second curtain 164. The connector 10h is a seamless unitary piece or structure having a mounting flange 166, a first flange 168, a second flange 170, and a third flange 172. In this example, the fastener 120 anchors the mounting flange 166 to the building member 14. A first edge 174 of first curtain 162 fits or is inserted within a pocket 176 (e.g., a channel) between the flanges 168 and 172, and the barb 88 engages the hem 90 to help secure the first curtain 162. Likewise, a second edge 178 of the second curtain 164 fits or is inserted within a pocket 80 (e.g., a channel) between the flanges 170 and 172, and the barb 88 engages the hem 90 to help secure the second curtain 164. In some examples, the fastener 74 (not shown in FIG. 13) penetrates the first curtain 162, the second curtain 164, and the flanges 168, 170 and 172 to further secure the curtains 162 and 164 to the connector 10h in a manner similar to that shown in FIGS. 3 and 4.

[0046] In another multilayer curtain example, as shown for example in FIG. 14, the connector 10i connects to a first curtain 162 and a second curtain 164. The connector 10i is a

seamless unitary piece or structure having a mounting flange 182, a first flange 168, a second flange 170, and a third flange 172. In this example, the fastener 120 anchors the mounting flange 182 to the building member 14. The first edge 174 of the first curtain 162 fits or is inserted within pocket 176 (e.g., a channel) between the flanges 168 and 172, and the barb 88 engages the hem 90 to help secure the first curtain 162. Likewise, the second edge 178 of the second curtain 164 fits or is inserted within the pocket 180 (e.g., a channel) between the flanges 170 and 172, and the barb 88 engages the hem 90 to help secure the second curtain 164. In some examples, the fastener 74 (not shown in FIG. 14) penetrates or passes through the first curtain 162, the second curtain 164, and the flanges 168, 170 and 172 to further secure the curtains 162 and 164 to the connector 10i in a manner similar to that shown in FIGS. 3 and 4.

[0047] At least some of the aforementioned examples include one or more features and/or benefits including, but not limited to, the following:

[0048] In some examples, a room divider includes a first curtain, a second curtain spaced from the first curtain, and a connector to couple the first curtain and the second curtain. In some such examples, the connector includes a first flange, a second flange and a web, where the web lying between the first flange and the second flange such that the first flange, the second flange and the web overlap each other. In some such examples, the connector includes a first pocket defined by the first flange and the web, where the first curtain to extend into the first pocket between the first flange and the web. In some such examples, a second pocket defined by the second flange and the web, where the second curtain to extend into the second pocket between the second flange and the web. In some such examples, a fastener to be coupled to the connector, where the fastener to penetrate the first curtain, the second curtain, the web, the first flange and the second flange.

[0049] In some examples, the first curtain is spaced from the second flange, and the second curtain is spaced from the first flange.

[0050] In some examples, the first curtain overlaps the second curtain to sandwich the web between the first curtain and the second curtain.

[0051] In some examples, a room divider includes a first curtain having a first curtain edge and a first hem. In some such examples, the first curtain edge and the first hem are vertically elongate. In some such examples, the first hem is folded-over along a first crease that is vertically elongate, where the first crease being proximate and substantially parallel to the first curtain edge. In some such examples, a second curtain has a second curtain edge and a second hem, where the second curtain edge and the second hem are vertically elongate, and

the second hem is folded-over along a second crease that is vertically elongate, where the second crease being proximate and substantially parallel to the second curtain edge. In some such examples, a connector includes a first flange, a second flange and a web. In some such examples, the web lying between the first flange and the second flange such that the first flange, the second flange and the web overlap each other. In some such examples, a first barb to extend between the first flange and the web. In some such examples, a second barb to extend between the second flange and the web. In some such examples, a first pocket defined by the first flange and the web, the first hem of the first curtain to extend into the first pocket between the first flange and the web such that the first hem engages the first barb. In some such examples, a second pocket defined by the second flange and the web, the second hem of the second curtain to extend into the second pocket between the second flange and the web such that the second hem engages the second barb.

[0052] In some examples, the first barb extends from the first flange and protrudes toward the web, and the second barb extends from the second flange and protrudes toward the web.

[0053] In some examples, the first curtain is spaced from the second flange, and the second curtain is spaced from the first flange.

[0054] In some examples, a room divider includes a first curtain having a first core sandwiched between a first front cover and a first back cover. In some examples, the first core is softer than both the first front cover and the first back cover. In some examples, the first curtain having a first curtain edge that is vertically elongate. In some examples, the first curtain has a first nominal curtain thickness spanning the first front cover. In some examples, the first core and the first back cover. In some examples, a second curtain includes a second core sandwiched between a second front cover and a second back cover. In some examples, the second core being softer than both the second front cover and the second back cover. In some examples, the second curtain having a second curtain edge that is vertically elongate. In some examples, the second curtain has a second nominal curtain thickness spanning the second front cover. In some examples, the second core and the second back cover. In some examples, both the first front cover and the second front cover face in a first direction. In some examples, a connector having a connector height, a connector width and a connector thickness. In some examples, the connector is vertically elongate with the connector height being at least five times greater than the connector width and at least ten times greater than the connector thickness. In some examples, the connector being of a material that is harder than a material of the first core and the second core. In some examples, the connector comprising a first flange, a second flange, a web, a first bend and a second bend. In some

examples, the web to lie between the first flange and the second flange such that the first flange, the second flange and the web overlap each other. In some examples, the web to extend widthwise from the first bend to the second bend. In some examples, the first bend connects the first flange to the web. In some examples, the second bend connecting the second flange to the web. In some examples, the first flange terminating at a first flange edge that is vertically elongate and proximate at least one of the second bend and the web. In some examples, the second flange terminating at a second flange edge that is vertically elongate and proximate at least one of the first bend and the web. In some examples, a first pocket defined by the first flange, the first bend and the web. In some examples, the first curtain edge to extend into the first pocket such that the first front cover lies against the web. In some examples, the first core being compressed by the first flange to provide the first curtain with a first localized compressed thickness that is less than the first nominal thickness of the first curtain. In some examples, a second pocket defined by the second flange, the second bend and the web. In some examples, the second curtain edge to extend into the second pocket such that the second back cover lies against the web. In some examples, the second core being compressed by the second flange to provide the second curtain with a second localized compressed thickness that is less than the second nominal thickness of the second curtain.

[0055] In some examples, the connector has a first surface extending contiguously from the first flange edge, across the first flange, around the first bend, across the web, around the second bend, across the second flange and to the second flange edge. In some examples, the connector has a second surface extending contiguously from the first flange edge, across the first flange, around the first bend, across the web, around the second bend, across the second flange and to the second flange edge. In some examples, the first curtain engages the first surface and is spaced from the second surface, and the second curtain engages the second surface and is spaced from the first surface.

[0056] In some examples, the first surface is substantially parallel to the second surface, and the connector has a material thickness extending from the first surface to the second surface.

[0057] In some examples, the first nominal thickness of the first curtain and the second nominal thickness of the second curtain is greater than the connector thickness.

[0058] In some examples, the first curtain and the second curtain are substantially coplanar, and the web is angularly displaced out of coplanar alignment with both the first curtain and the second curtain.

[0059] In some examples, the first curtain has a first hem at the first curtain edge, the second curtain has a second hem at the second curtain edge, the connector has a first barb at the first flange edge, the connector has a second barb at the second flange edge, the first barb engages the first hem, and the second barb engages the second hem.

[0060] In some examples, the first curtain overlaps the second curtain to sandwich the web between the first curtain and the second curtain.

[0061] In some examples, a fastener penetrates the first curtain, the second curtain, the web, the first flange and the second flange.

[0062] In some examples, the fastener is a rivet.

[0063] In some examples, the fastener includes threads.

[0064] In some examples, the first curtain edge extends vertically from a lower edge of the first curtain to an upper edge of the first curtain, the first curtain having a curtain height extending from the lower edge to the upper edge, wherein the connector height is substantially equal to the curtain height.

[0065] In some examples, the first curtain edge extends vertically from a lower edge of the first curtain to an upper edge of the first curtain. In some examples, the first curtain has a curtain height extending from the lower edge to the upper edge. In some examples, the connector has a series of connector segments distributed vertically along the first curtain edge, the connector height being a cumulative stacked height of the series of connector segments. In some examples, the connector extends vertically over most of the curtain height.

[0066] In some examples, the first core has a core thickness that is greater than a cover thickness of the first front cover.

[0067] In some examples, the first core has a greater R-value than that of the first front cover.

[0068] In some examples, the first core is more porous than both the first front cover and the first back cover.

[0069] In some examples, a room divider for use in a building having a building structure includes a mounting flange attached to the building structure. In some examples, the room divider includes a first flange extends from the mounting flange. In some examples, a second flange extends from the mounting flange. In some examples, the first flange, the second flange and the mounting flange are a seamless unitary structure having an overall length. In some examples, a first pocket provided between and defined by the first flange and the second flange. In some examples, a first curtain includes a first core sandwiched between a

first front cover and a first back cover. In some examples, the first core being softer than both the first front cover and the first back cover. In some examples, the first curtain has a first curtain edge that extends over a first curtain edge length. In some examples, the overall length of the seamless unitary structure is substantially at least one of equal to or greater than the first curtain edge length. In some examples, the first curtain has a first nominal curtain thickness spanning the first front cover, the first core and the first back cover. In some examples, the first curtain edge extending into the first pocket such that the first front cover lies against the first flange, the first back cover lies against the second flange, and the first core is compressed between the first flange and the second flange to provide the first curtain with a first localized compressed thickness, the first localized compressed thickness being less than the first nominal thickness of the first curtain.

[0070] In some examples, the first curtain hangs downward from the seamless unitary piece.

[0071] In some examples, the first curtain edge defines a lowermost portion of the first curtain.

[0072] In some examples, the first curtain edge extends substantially vertically.

[0073] In some examples, the mounting flange is substantially parallel to the second flange.

[0074] In some examples, the mounting flange is substantially perpendicular to the second flange.

[0075] In some examples, the first curtain has a hem along the first curtain edge, and at least one of the first flange and the second flange includes a barb that engages the hem.

[0076] In some examples, a fastener penetrates the first curtain, the first flange, and the second flange.

[0077] In some examples, the fastener is a rivet.

[0078] In some examples, the fastener includes threads.

[0079] In some examples, the first core has a core thickness that is greater than a cover thickness of the front cover.

[0080] In some examples, the first core has a greater R-value than that of the front cover.

[0081] In some examples, the first core is more porous than both the front cover and the back cover.

[0082] In some examples, the room divider includes a third flange extending from the mounting flange such that the second flange is interposed between the first flange and the third flange. In some examples, a second pocket is provided between and defined by the second

flange and the third flange. In some examples, a second curtain includes a second core sandwiched between a second front cover and a second back cover. In some examples, the second core is softer than both the second front cover and the second back cover. In some examples, the second curtain has a second curtain edge that extends over a second curtain edge length. In some examples, the overall length of the seamless unitary structure is substantially equal to the second curtain edge length, the second curtain having a second nominal curtain thickness spanning the second front cover, the second core and the second back cover. In some examples, the second curtain edge extends into the second pocket such that the second front cover lies against the second flange, the second back cover to lie against the third flange, and the second core is compressed between the second flange and the third flange to provide the second curtain with a second localized compressed thickness. In some examples, the second localized thickness being less than the second nominal thickness of the second curtain.

[0083] Although certain example methods, apparatus and articles of manufacture have been described herein, the scope of the coverage of this patent is not limited thereto. On the contrary, this patent covers all methods, apparatus and articles of manufacture fairly falling within the scope of the appended claims either literally or under the doctrine of equivalents.

Claims

1. A room divider, comprising:
 - a first curtain;
 - a second curtain spaced from the first curtain; and
 - a connector to couple the first curtain and the second curtain, the connector including:
 - a first flange, a second flange and a web, the web lying between the first flange and the second flange such that the first flange, the second flange and the web overlap each other;
 - a first pocket defined by the first flange and the web, the first curtain to extend into the first pocket between the first flange and the web;
 - a second pocket defined by the second flange and the web, the second curtain to extend into the second pocket between the second flange and the web; and
 - a fastener to be coupled to the connector, the fastener to penetrate the first curtain, the second curtain, the web, the first flange and the second flange.
2. The room divider of claim 1, wherein the first curtain is spaced from the second flange, and the second curtain is spaced from the first flange.
3. The room divider of claim 1, wherein the first curtain overlaps the second curtain to sandwich the web between the first curtain and the second curtain.
4. A room divider, comprising:
 - a first curtain having a first curtain edge and a first hem, the first curtain edge and the first hem being vertically elongate, the first hem being folded-over along a first crease that is vertically elongate, the first crease being proximate and substantially parallel to the first curtain edge;
 - a second curtain having a second curtain edge and a second hem, the second curtain edge and the second hem being vertically elongate, the second hem being folded-over along a second crease that is vertically elongate, the second crease being proximate and substantially parallel to the second curtain edge;

a connector comprising a first flange, a second flange and a web, the web lying between the first flange and the second flange such that the first flange, the second flange and the web overlap each other;

a first barb to extend between the first flange and the web;

a second barb to extend between the second flange and the web;

a first pocket defined by the first flange and the web, the first hem of the first curtain to extend into the first pocket between the first flange and the web such that the first hem engages the first barb; and

a second pocket defined by the second flange and the web, the second hem of the second curtain to extend into the second pocket between the second flange and the web such that the second hem engages the second barb.

5. The room divider of claim 4, wherein the first barb extends from the first flange and protrudes toward the web, and the second barb extends from the second flange and protrudes toward the web.

6. The room divider of claim 4, wherein the first curtain is spaced from the second flange, and the second curtain is spaced from the first flange.

7. A room divider, comprising:

a first curtain comprising a first core sandwiched between a first front cover and a first back cover, the first core being softer than both the first front cover and the first back cover, the first curtain having a first curtain edge that is vertically elongate, the first curtain having a first nominal curtain thickness spanning the first front cover, the first core and the first back cover;

a second curtain comprising a second core sandwiched between a second front cover and a second back cover, the second core being softer than both the second front cover and the second back cover, the second curtain having a second curtain edge that is vertically elongate, the second curtain having a second nominal curtain thickness spanning the second front cover, the second core and the second back cover, wherein both the first front cover and the second front cover face in a first direction;

a connector having a connector height, a connector width and a connector thickness, the connector being vertically elongate with the connector height being at least five times greater than the connector width and at least ten times greater than the connector thickness,

the connector being of a material that is harder than a material of the first core and the second core;

the connector comprising a first flange, a second flange, a web, a first bend and a second bend, the web to lie between the first flange and the second flange such that the first flange, the second flange and the web overlap each other, the web to extend widthwise from the first bend to the second bend, the first bend connecting the first flange to the web, the second bend connecting the second flange to the web, the first flange terminating at a first flange edge that is vertically elongate and proximate at least one of the second bend and the web, the second flange terminating at a second flange edge that is vertically elongate and proximate at least one of the first bend and the web;

a first pocket defined by the first flange, the first bend and the web, the first curtain edge to extend into the first pocket such that the first front cover lies against the web, the first core being compressed by the first flange to provide the first curtain with a first localized compressed thickness that is less than the first nominal thickness of the first curtain; and

a second pocket defined by the second flange, the second bend and the web, the second curtain edge to extend into the second pocket such that the second back cover lies against the web, the second core being compressed by the second flange to provide the second curtain with a second localized compressed thickness that is less than the second nominal thickness of the second curtain.

8. The room divider of claim 7, wherein:

the connector has a first surface extending contiguously from the first flange edge, across the first flange, around the first bend, across the web, around the second bend, across the second flange and to the second flange edge; and

the connector has a second surface extending contiguously from the first flange edge, across the first flange, around the first bend, across the web, around the second bend, across the second flange and to the second flange edge, wherein the first curtain engages the first surface and is spaced from the second surface, and the second curtain engages the second surface and is spaced from the first surface.

9. The room divider of claim 8, wherein the first surface is substantially parallel to the second surface, and the connector has a material thickness extending from the first surface to the second surface.

10. The room divider of claim 7, wherein the first nominal thickness of the first curtain and the second nominal thickness of the second curtain is greater than the connector thickness.
11. The room divider of claim 7, wherein the first curtain and the second curtain are substantially coplanar, and the web is angularly displaced out of coplanar alignment with both the first curtain and the second curtain.
12. The room divider of claim 7, wherein the first curtain has a first hem at the first curtain edge, the second curtain has a second hem at the second curtain edge, the connector has a first barb at the first flange edge, the connector has a second barb at the second flange edge, the first barb engages the first hem, and the second barb engages the second hem.
13. The room divider of claim 7, wherein the first curtain overlaps the second curtain to sandwich the web between the first curtain and the second curtain.
14. The room divider of claim 7, further comprising a fastener penetrating the first curtain, the second curtain, the web, the first flange and the second flange.
15. The room divider of claim 14, wherein the fastener is a rivet.
16. The room divider of claim 14, wherein the fastener includes threads.
17. The room divider of claim 7, wherein the first curtain edge extends vertically from a lower edge of the first curtain to an upper edge of the first curtain, the first curtain having a curtain height extending from the lower edge to the upper edge, wherein the connector height is substantially equal to the curtain height.
18. The room divider of claim 7, wherein the first curtain edge extends vertically from a lower edge of the first curtain to an upper edge of the first curtain, the first curtain having a curtain height extending from the lower edge to the upper edge, the connector having a series of connector segments distributed vertically along the first curtain edge, the connector height being a cumulative stacked height of the series of connector segments, wherein the connector extends vertically over most of the curtain height.

19. The room divider of claim 7, wherein the first core has a core thickness that is greater than a cover thickness of the first front cover.

20. The room divider of claim 7, wherein the first core has a greater R-value than that of the first front cover.

21. The room divider of claim 7, wherein the first core is more porous than both the first front cover and the first back cover.

22. A room divider for use in a building having a building structure, the room divider comprising:

- a mounting flange attached to the building structure;

- a first flange extending from the mounting flange;

- a second flange extending from the mounting flange, wherein the first flange, the second flange and the mounting flange are a seamless unitary structure having an overall length;

- a first pocket provided between and defined by the first flange and the second flange;

and

- a first curtain including a first core sandwiched between a first front cover and a first back cover,; the first core being softer than both the first front cover and the first back cover, the first curtain having a first curtain edge that extends over a first curtain edge length, wherein the overall length of the seamless unitary structure is substantially at least one of equal to or greater than the first curtain edge length, the first curtain having a first nominal curtain thickness spanning the first front cover, the first core and the first back cover, the first curtain edge extending into the first pocket such that the first front cover lies against the first flange, the first back cover lies against the second flange, and the first core is compressed between the first flange and the second flange to provide the first curtain with a first localized compressed thickness, the first localized compressed thickness being less than the first nominal thickness of the first curtain.

23. The room divider of claim 22, wherein the first curtain hangs downward from the seamless unitary piece.

24. The room divider of claim 22, wherein the first curtain edge defines a lowermost portion of the first curtain.
25. The room divider of claim 22, wherein the first curtain edge extends substantially vertically.
26. The room divider of claim 22, wherein the mounting flange is substantially parallel to the second flange.
27. The room divider of claim 22, wherein the mounting flange is substantially perpendicular to the second flange.
28. The room divider of claim 22, wherein the first curtain has a hem along the first curtain edge, and at least one of the first flange and the second flange includes a barb that engages the hem.
29. The room divider of claim 22, further comprising a fastener to penetrate the first curtain, the first flange, and the second flange.
30. The room divider of claim 29, wherein the fastener is a rivet.
31. The room divider of claim 29, wherein the fastener includes threads.
32. The room divider of claim 22, wherein the first core has a core thickness that is greater than a cover thickness of the front cover.
33. The room divider of claim 22, wherein the first core has a greater R-value than that of the front cover.
34. The room divider of claim 22, wherein the first core is more porous than both the front cover and the back cover.
35. The room divider of claim 22, further comprising:

a third flange extending from the mounting flange such that the second flange is interposed between the first flange and the third flange;

a second pocket provided between and defined by the second flange and the third flange; and

a second curtain including a second core sandwiched between a second front cover and a second back cover, the second core being softer than both the second front cover and the second back cover, the second curtain having a second curtain edge that extends over a second curtain edge length, wherein the overall length of the seamless unitary structure is substantially equal to the second curtain edge length, the second curtain having a second nominal curtain thickness spanning the second front cover, the second core and the second back cover, wherein the second curtain edge extends into the second pocket such that the second front cover lies against the second flange, the second back cover to lie against the third flange, and the second core is compressed between the second flange and the third flange to provide the second curtain with a second localized compressed thickness, the second localized thickness being less than the second nominal thickness of the second curtain.

FIG. 1

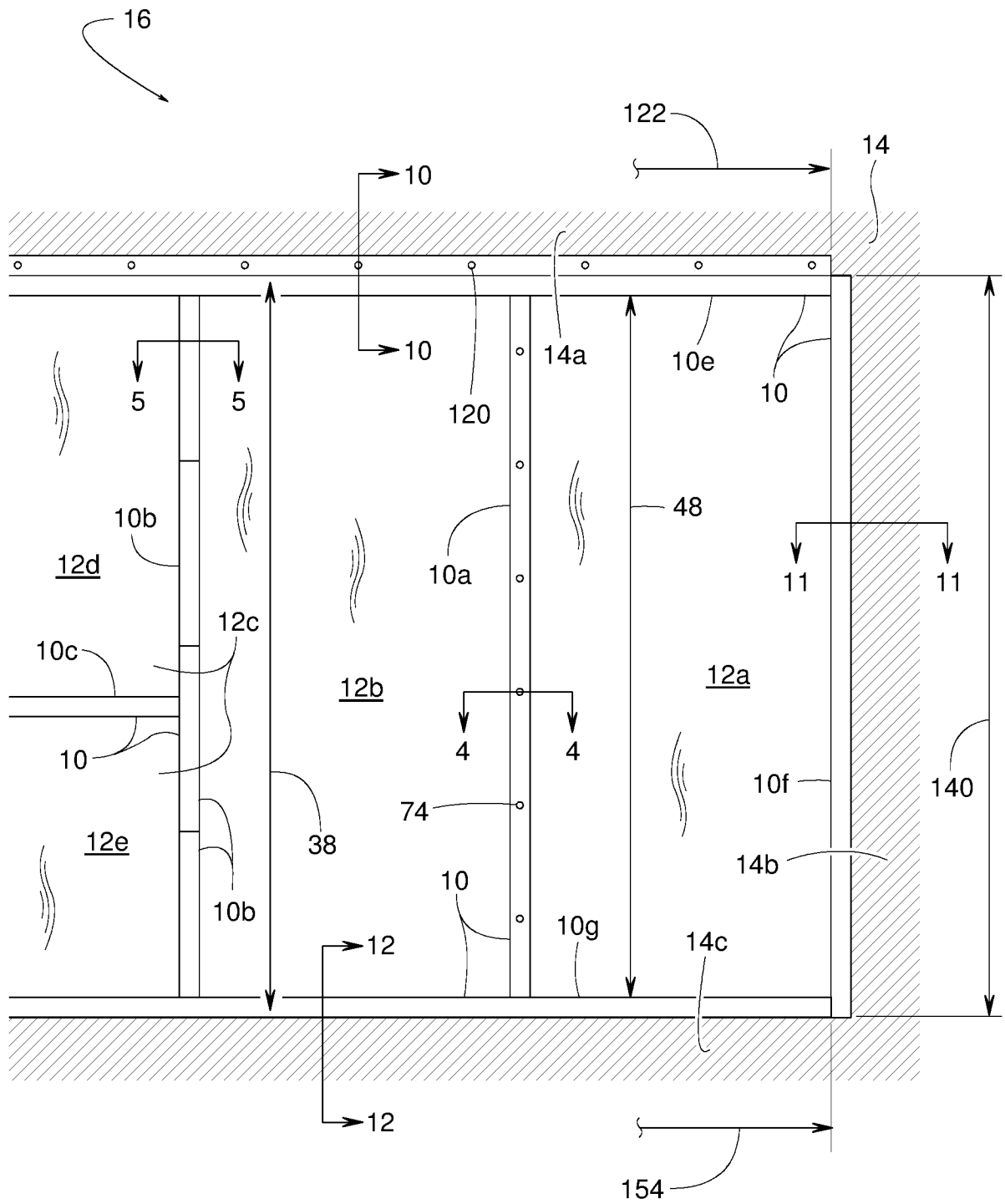


FIG. 2

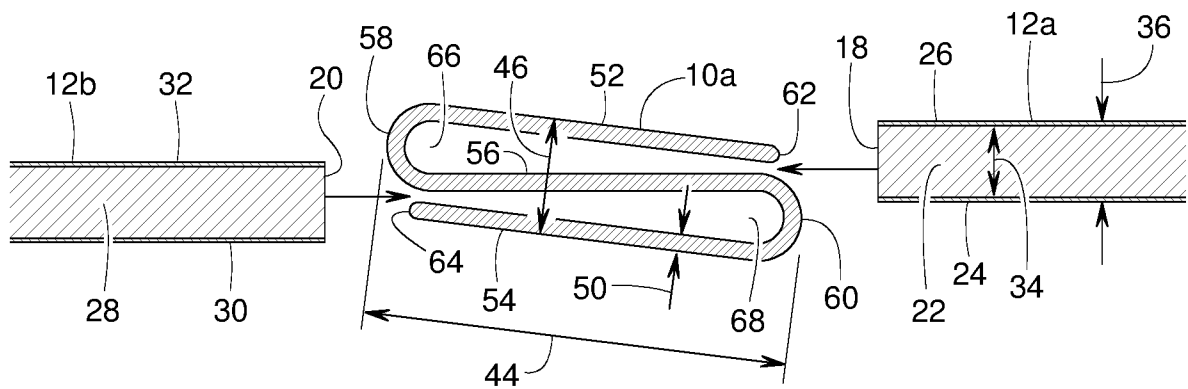


FIG. 3

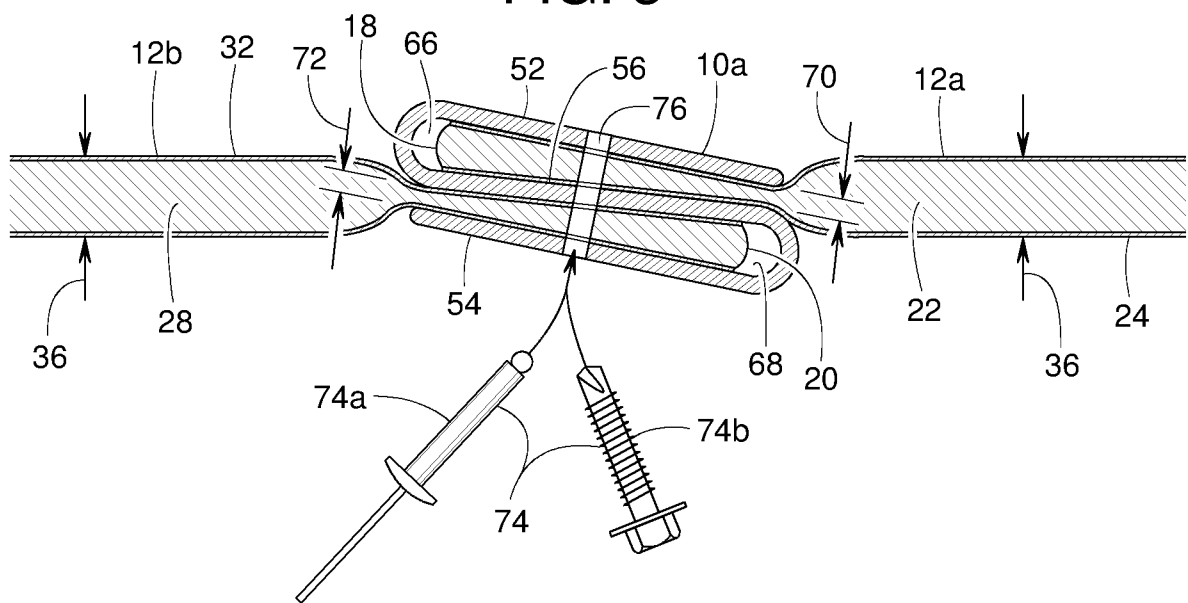


FIG. 4

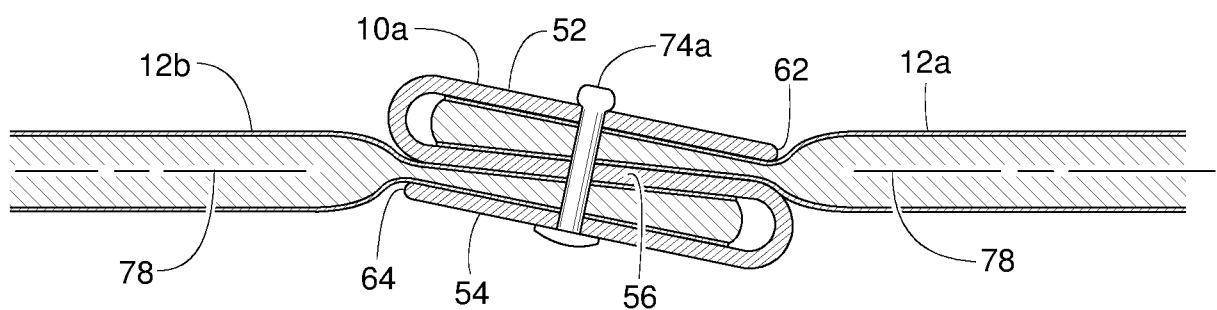


FIG. 5

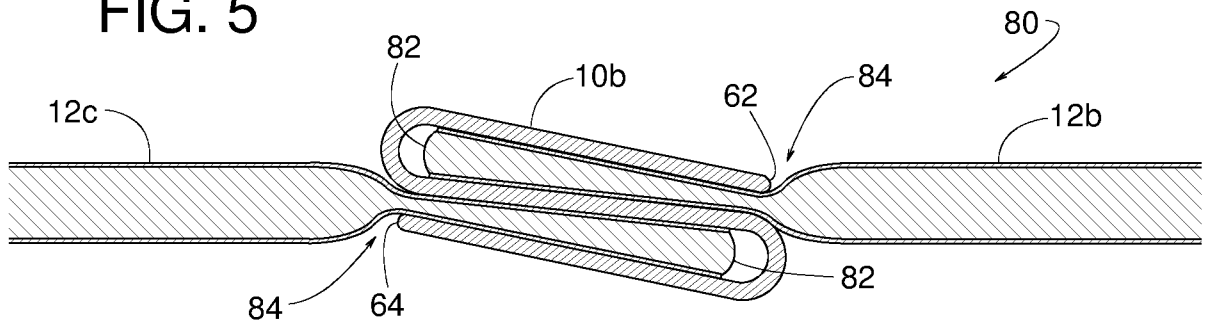


FIG. 6

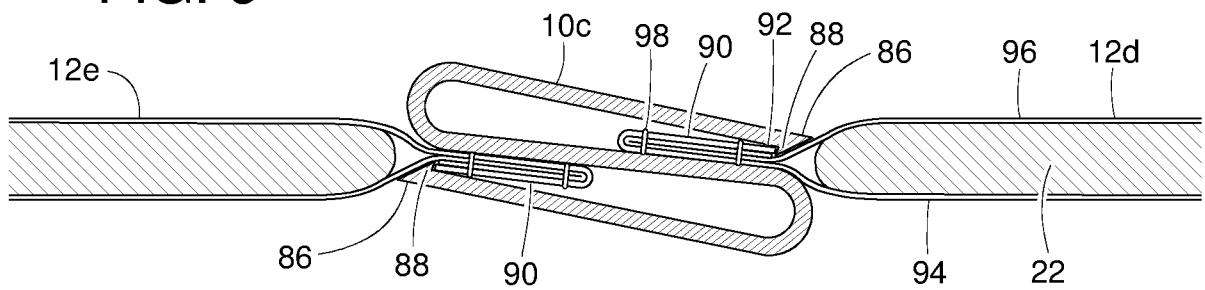


FIG. 7

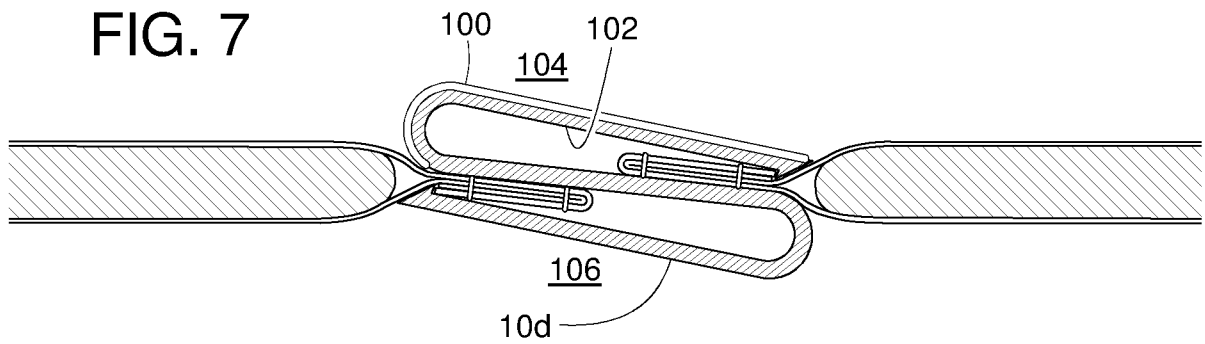


FIG. 8

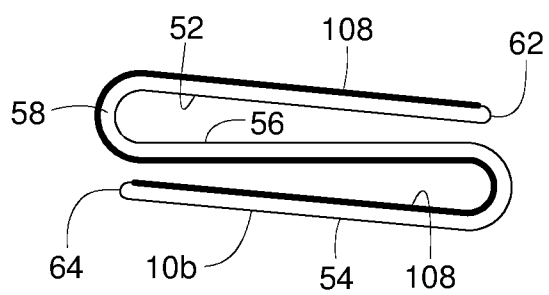


FIG. 9

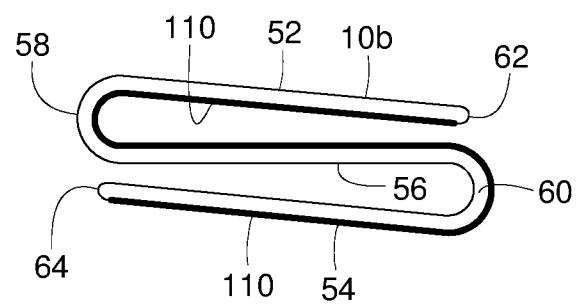


FIG. 10

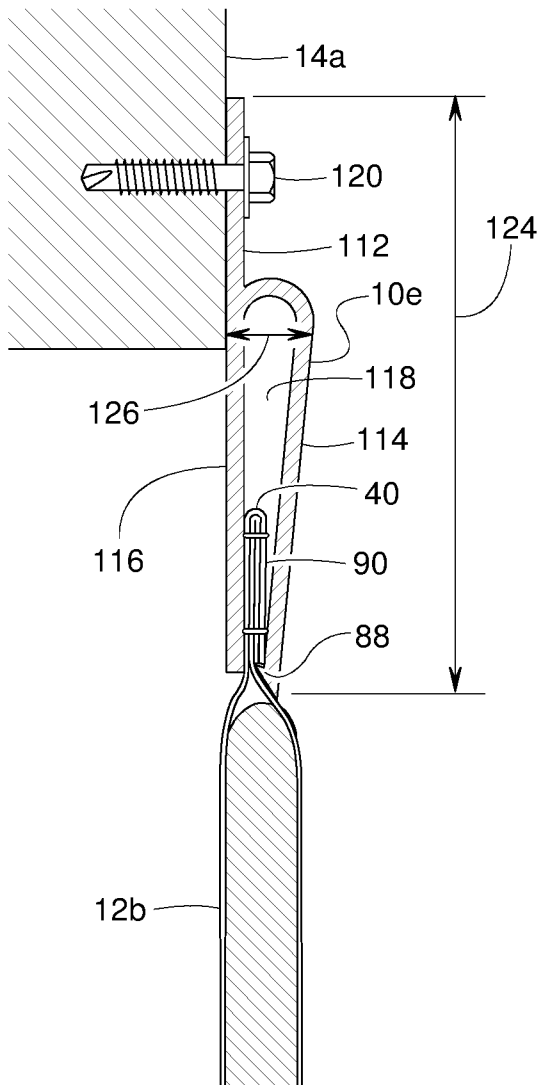


FIG. 12

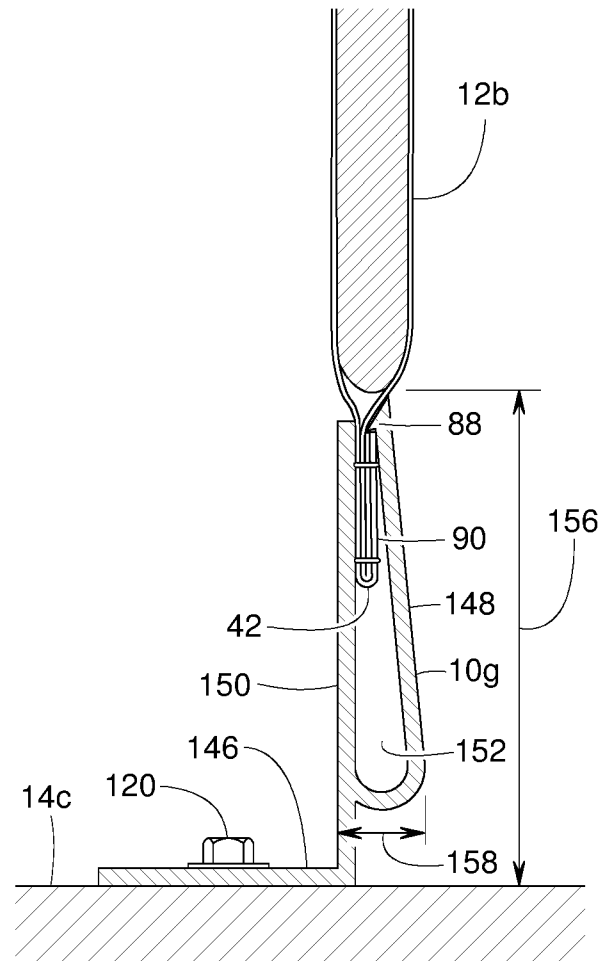


FIG. 11

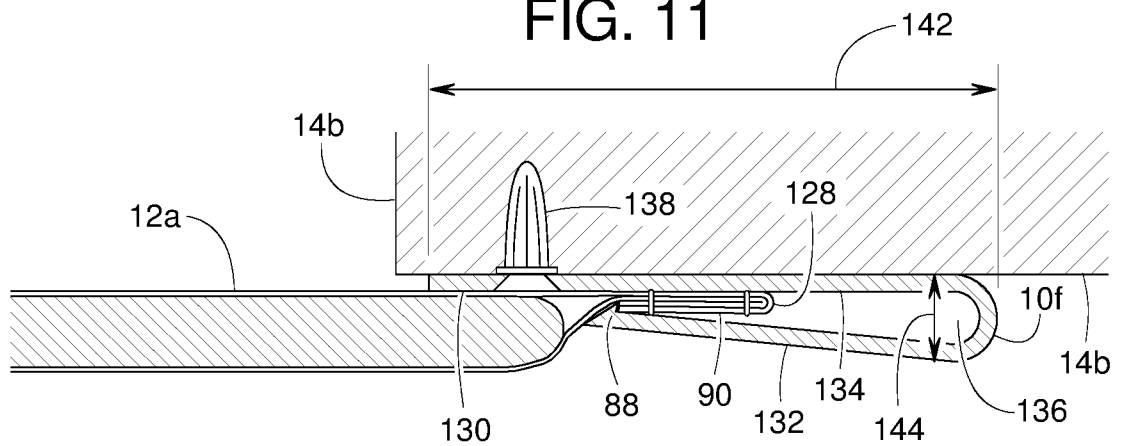


FIG. 13

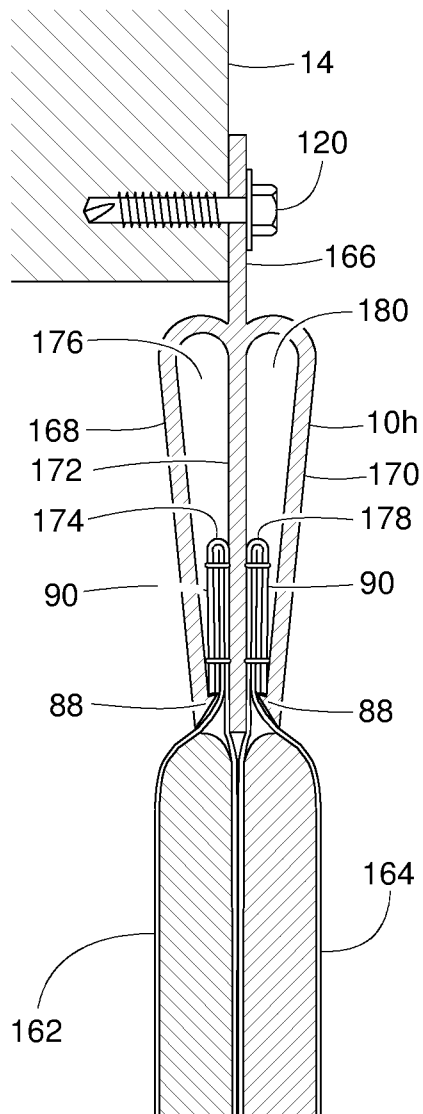


FIG. 14

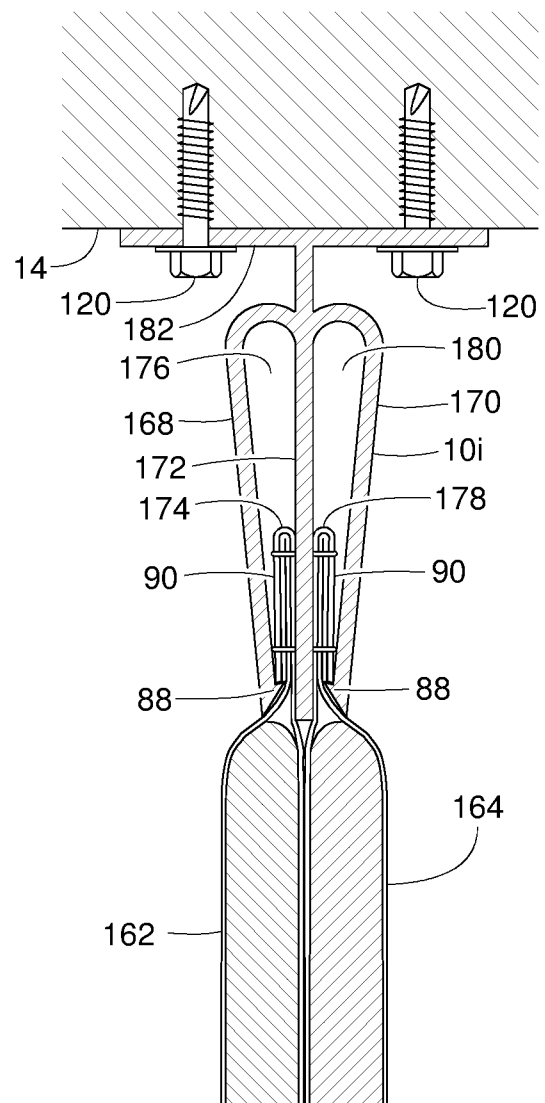


FIG. 15

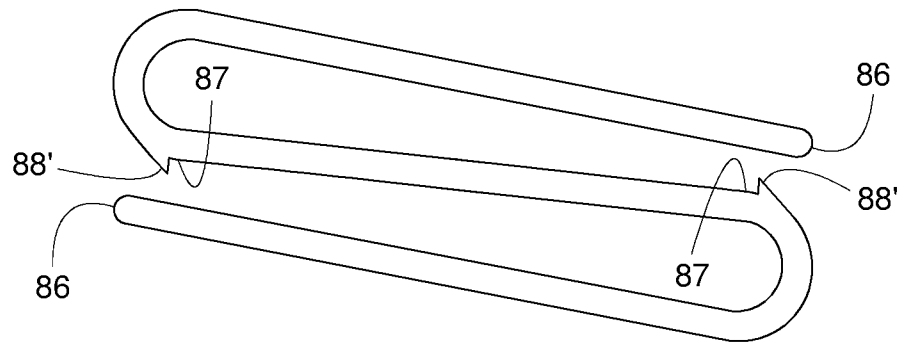


FIG. 16

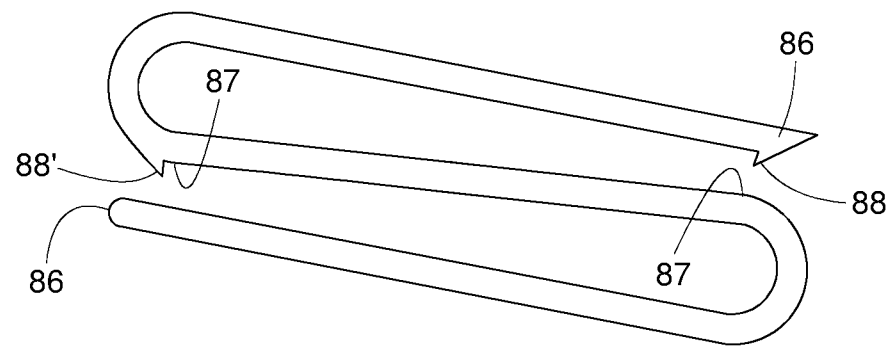


FIG. 17

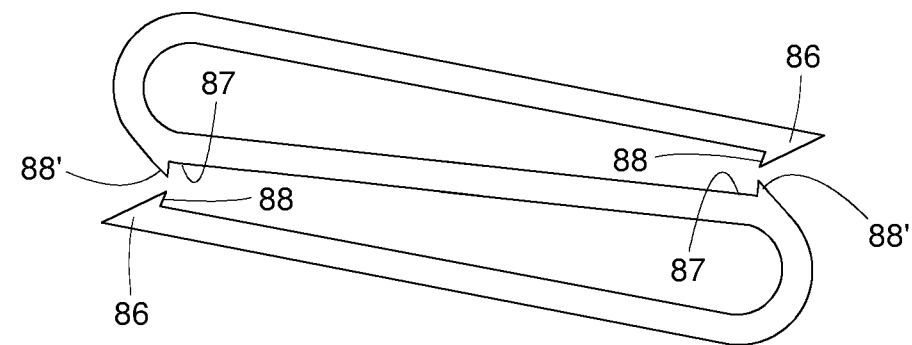


FIG. 18

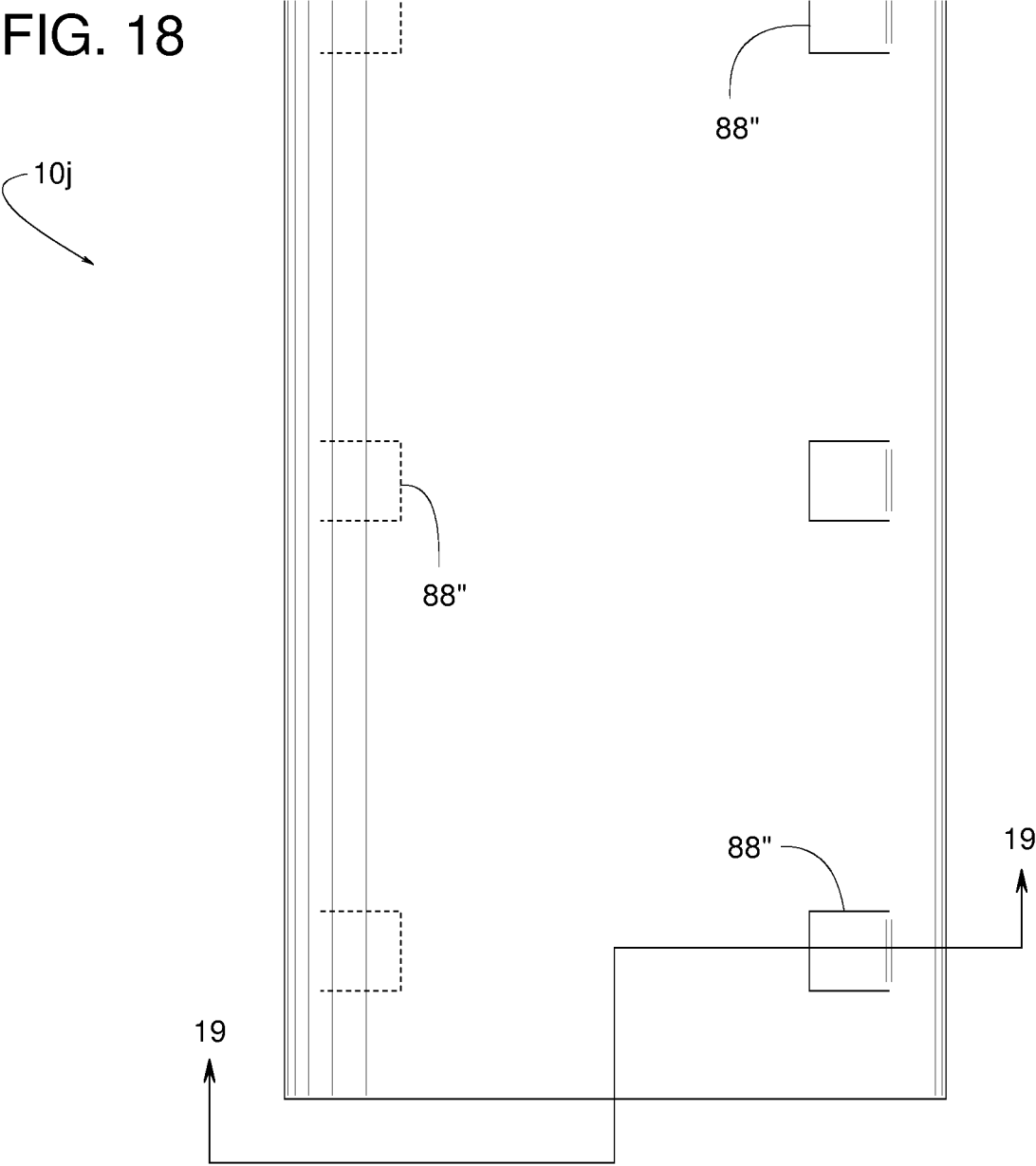
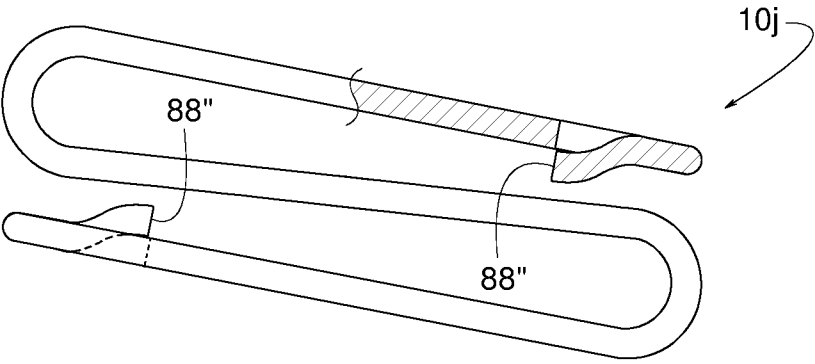


FIG. 19



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/020386

A. CLASSIFICATION OF SUBJECT MATTER

INV. E04B2/72 E04B2/74 E04G21/30
ADD. E04G21/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04B A47H A62C E06B E04G E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 524 689 A (CLARK JAMES T [US]) 11 June 1996 (1996-06-11) column 5, lines 15-25; figures 5, 8 -----	4-13, 17-21
A	WO 2014/093058 A2 (RITE HITE HOLDING CORP [US]; HOFFMANN DAVID J [US]) 19 June 2014 (2014-06-19) abstract; figures 6-10 -----	1,4,7
A	WO 2012/012038 A2 (RITE HITE HOLDING CORP [US]; ASHELIN CHARLES J [US]; HOFFMAN DAVID J []) 26 January 2012 (2012-01-26) abstract; figures 1-8 -----	1,4,7
A	US 2011/088918 A1 (GONZALES CURTIS P [US]) 21 April 2011 (2011-04-21) abstract; figures 1, 4, 5B ----- -/-	1,4,7



Further documents are listed in the continuation of Box C.



See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

20 May 2016

Date of mailing of the international search report

09/08/2016

Name and mailing address of the ISA/

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Authorized officer

Couprie, Brice

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/020386

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 1 499 980 A (ORMYLEX SOC) 3 November 1967 (1967-11-03) figures 1-5 -----	1,4,7
A	DE 24 07 552 A1 (LAYHER GMBH WILHELM) 28 August 1975 (1975-08-28) figures 1-3 -----	1,4,7
A	US 4 437 505 A (RODGERS PATRICIA [US]) 20 March 1984 (1984-03-20) abstract; figures 1-5 -----	1,4,7
A	DE 32 39 191 A1 (METAKO KIGYO KK [JP]) 19 May 1983 (1983-05-19) figures 1-11 -----	1,4,7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/020386

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-21

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-21

Connector to couple two curtains

2. claims: 22-35

Mounting device for fastening at least one curtain to a wall, ceiling, floor or the like

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/020386

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