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(71) Applicant: **Gemtron Corporation
Sweetwater, Tennessee 37874 (US)**

(72) Inventors:
• **Bienick, Craig
49428, Jenison (US)**

• **Ramik, Vincent L.
22003, Annandale (US)**

(74) Representative: **Selting, Günther
Von Kreisler Selting Werner
Deichmannhaus am Dom
Bahnhofsvorplatz 1
50667 Köln (DE)**

Remarks:

Amended claims in accordance with Rule 86 (2) EPC.

(54) **Vertically Adjustable Shelves and Refrigerator Compartment Housing the Same**

(57) An adjustable shelf assembly includes a shelf formed by a panel of tempered glass, at least one metal shelf bracket, and a rim securing the panel to the shelf bracket. The shelf bracket includes a pin vertically movable in a trackway which extends substantially the entire distance between top and bottom walls of a refrigerator compartment. Slots in lateral walls of the trackway define a transverse/normal path of travel by way of which the

shelf can be assembled to or disassembled from the trackway, particularly contiguous the top wall of the refrigerator compartment. The shelf bracket includes at least one stabilization member for preventing lateral instability during assembly, disassembly and use of the shelf assembly.

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This is a continuation-in-part application of pending Application Serial No. 10/355,136 filed January 31, 2003 in the names of Craig Bienick et al. entitled refrigerator Compartment Housing Vertically Adjustable Shelves, and now U.S. Patent No.

BACKGROUND OF THE INVENTION

[0002] This invention relates to sheving particularly for refrigerator, but is equally adapted for utilization in a variety of different environments, such as furniture shelves, cabinet shelves, point-of-sale displays, and the like.

[0003] A conventional refrigerator shelf typically include a substantially planar shelf member, and a pair of metal shelf brackets connected to the shelf member, preferably by an injection molded resinous peripheral encapsulation, rim or border. The support brackets typically include a pair of hooks which are received in pairs of slots carried by vertical shelf supports, channels or tracks secured to or forming an integral portion of a rear wall of a refrigerator compartment. The shelves can be step adjusted along the vertical supports in a convention manner by hooking and unhooking the shelf brackets relative to the vertical supports or tracks. The latter is readily accomplished when the shelf is devoid of any products/articles. However, if relatively heavy products are supported upon the planar shelf member of the shelf, it is not uncommon for the weight and imbalance of the products to cause the shelf and the products thereon to dislodge and/or drop with attendant damage (breakage, pillage, etc.). At times a cantilevered shelf with articles/products thereon is partially unhooked from the vertical support rails of the refrigerator compartment and tilts or cants which causes the articles/products to slide off the shelf with resultant damage even though the shelf itself does not drop. Therefore, cantilevered shelves which are designed to be step-adjusted relative to shelf tracks or channels provided on the rear wall of a refrigerator are susceptible to damage during adjustment, along with the products/articles supported thereon.

SUMMARY OF THE INVENTION

[0004] Accordingly, the present invention provides a refrigerator shelf assembly defined in part by a conventional shelf, namely, a pair of metal support brackets, a planar shelf member, preferably made of clear tempered glass, and an injection molded encapsulation, border or rim unitizing the shelf brackets and the planar shelf member. However, the invention provides a novel adapter bracket utilized in pairs. Each adapter bracket is preferably constructed from metal and includes a first bracket member having front edges along each of which is a slide-way or channel into which opens a plurality of vertically

spaced slots. The rear of each first bracket member is conventionally secured to the rear wall of a refrigerator compartment. Each second bracket member includes a pair of oppositely projecting projections or supports which are vertically spaced from each other a distance corresponding to the slots in the first member. Moreover, the distance between the ends of the second member projections corresponds substantially to the same distance between the channels and is substantially equal to the maximum distance between support edges defined by the vertical slots of the second member. The latter dimensional relationships permit the shelf bracket first and second members, one of which carries the shelf, to be moved upwardly and downwardly in the slideways or channels without being fully disassembled therefrom thereby precluding inadvertent or accidental disassembly of the shelf from the pair of adapter brackets. The second members preferably include slots into which are hooked hooks of the shelf and remain so attached when the shelf is adjusted vertically upwardly or downwardly by sliding movement of the second members. In this fashion the is never bodily removed from the adapter brackets and the first and second members of the adapter brackets are never bodily disconnected from each other unless done intentionally.

[0005] In further accordance with the invention, the projecting supports of the second members and the slideways and slots of the first member are so related that should the shelf be accidentally released when the second member projections are in the slideways, the weight of the cantilevered shelf, with or without products/articles thereon, tilts or cants the cantilevered shelf forwardly and downwardly which automatically introduces a lowermost of the second member projections into associated slots of the first member which bottom against support edges of the slots and automatically lock the cantilevered shelf in the position of a slight forward tilt. In this manner the entire shelf and the articles/products supported thereon will not drop and most, if not all, products/articles will be retained upon the glass shelf member thereof.

[0006] The novel shelf assembly and the pair of shelf adapter brackets associated therewith thereby effect limited vertical sliding movement to space shelves different vertical distances from each other but permit the latter to be accomplished without bodily or entirety disconnecting the shelf from the adapter brackets and the adapter brackets from the refrigerator compartment. The latter, with the automatic locking feature latter described, virtually eliminates inadvertent/accidental shelf, shelf assembly, product and/or article breakage or damage during vertical shelf adjustment.

[0007] Another object of this invention is a novel shelf assembly which can provide incremental vertical adjustment in a conventional refrigerator compartment, be it a freezer compartment or fresh food compartment, absent inadvertent, accidental or undesired downward shelf movement during vertical adjustment when utilized with one or more trackways formed as integral vertical wall

portions of rear or side walls of the refrigerator compartment or as individual trackways fastened to the refrigerator compartment side and/or rear walls. In each case, preferably a pair of vertical trackways extend substantially the entire vertical distance between upper and lower walls of the refrigerator compartment, and the shelf associated therewith can, therefore, be incrementally vertically adjusted substantially the entire vertical height of the associated refrigerator compartment. In the case of a pair of vertical trackways, the shelf includes a pair of shelf support brackets, each carrying a latching pin with each latching pin being vertically adjustable in a slideway of its vertical trackway while being movable into slots or openings of the vertical trackways to interlock, therewith and hold the shelf in a substantially horizontal position of use. Preferably, one or more such shelves are supported by and are adjustable relative to the pair of trackways, but, most importantly, the shelves and trackways are so constructed and arranged as to provide a transverse entry/removal path of travel for the shelf pins, preferably at upper, lower and medial positions along the vertical trackways. The transverse entry/removal path of travel for the shelf supporting pins is defined by a pair of transverse slots in lateral walls of each vertical trackway through which each self bracket pin can transversely enter or leave the slideway and the latching or support openings or slots associated therewith. The latter is particularly important because it maximizes the vertical adjustment of the shelf assembly, particularly adjacent an associated top wall of the refrigerator compartment. Therefore, not only are the trackways and shelves specifically designed with the automatic locking feature earlier described, but one or more shelves can be transversely assembled to or disassembled from the trackways at at least three locations to maximize refrigerator storage compartment capacity while facilitating removal and disassembly for a variety of purposes, such as cleaning, repositioning, etc.

[0008] In further accordance with this invention, in the case of separate vertical trackways which are fastened to interior walls of a refrigerator compartment, each trackway is preferably of a U-shaped transverse cross-sectional configuration defined by a bight wall and lateral walls with each of the lateral walls defining a slideway of a predetermined size and more closely adjacent elongated terminal edges. The trackways open in a direction away from the refrigerator compartment rear wall and include openings for fastening the same to either opposite side walls and/or the rear wall of the refrigerator compartment. Such openings need not be provided should the trackways constitute integral vertical wall portions of, for example, the refrigerator compartment rear wall. However, in either case, the forwardmost terminal lateral edges of the lateral walls are relieved by an opening or a slot in each immediately adjacent the compartment top wall, somewhat less adjacent the compartment bottom wall, and if desired at a position therebetween. Since the shelf brackets of the shelf carry pins at uppermost edges there-

of, an uppermost shelf can be assembled through the uppermost access openings immediately adjacent the top wall of the refrigerator compartment and can be vertically adjusted as need be thereafter, or removed therefrom in a like manner along a substantially transverse path of travel relative to the vertical slideways of the trackways. The lowermost access openings are spaced above the bottom wall of the compartment at a point at which the locking or latching slots of the trackways are immediately accessible and thereby define the lowest shelf position of the refrigerator compartment.

[0009] A further object of this invention is to provide a novel shelf assembly as immediately heretofore set forth wherein the shelf includes a shelf panel and opposite shelf brackets, and the shelf brackets include means for intimately slidably engaging side walls of the vertical trackways to thereby reduce sidewise shelf movement.

[0010] A further object of this invention is to provide a novel shelf assembly as immediately heretofore set forth wherein the shelf includes a shelf panel and opposite shelf brackets, and the shelf brackets include means projecting rearwardly from each shelf bracket for engaging stops in the vertical trackways during undesired vertical downward travel of the shelf.

[0011] Another object of this invention is to provide a novel shelf assembly in which each shelf bracket has an opening and at least one pin in the opening having end portions projecting in opposite directions, the pin includes a pair of collars larger than the opening and sandwiching the opening therebetween, and at least one of the collars is formed of material of its associated pin end portions swaged from a size corresponding substantially to the opening to a size larger than the opening to thereby retain the pin in the opening.

[0012] With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly, understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIGURE 1 is a perspective view of a refrigerator, a refrigerator compartment thereof and a novel shelf assembly of the invention defined by a shelf having an injection molded encapsulation or rim unitizing a tempered glass shelf member to a pair of metal shelf support brackets, and a pair of shelf adapter brackets each defined by first and second bracket members, each of the first bracket members being secured to a rear wall of the refrigerator compartment and having opposing slideways and a plurality of vertically spaced slots therein, and a second bracket member having oppositely directed projecting supports received in the slots and additionally having slits or slots receiving hooks of the metal shelf support brackets.

[0014] FIGURE 2 is an enlarged fragmentary cross-sectional view taken generally along line 2-2 of Figure 1,

and illustrates the injection molded rim encapsulating and unitizing a peripheral edge of the glass shelf member to an upper edge of one of the metal shelf support brackets.

[0015] FIGURE 3 is a fragmentary exploded view of one of the shelf adapter brackets, and illustrates details of the slideways and slots of the first shelf bracket member, oppositely directed projecting supports and slits of the second shelf bracket member and hooks of the shelf.

[0016] FIGURE 4 is a fragmentary side elevational view of one of the shelf adapter brackets, and illustrates the manner in which the oppositely directed projections of the second shelf bracket member are seated in the slots of the first shelf bracket member and hooks of the shelf support brackets are received in slits of the second shelf bracket member.

[0017] FIGURE 5 is an enlarged top plan view of each shelf adapter bracket of Figure 1, and illustrates the manner in which the projecting supports of the second shelf bracket member slide in the slideways of the first shelf bracket member to effect vertical sliding adjustment therebetween.

[0018] FIGURE 6 is a side elevational view of the shelf adapter bracket of Figure 4, and illustrates the manner in which the shelf will automatically lock in a slightly inclined or canted position if inadvertently or accidentally released or dropped when the projecting supports of the second shelf bracket member are in the slideways of first shelf bracket member.

[0019] FIGURE 7 is a fragmentary cross-sectional view taken generally along line 7-7 of Figure 4, and illustrates one of the shelf adapter brackets in the adjusted and locked position thereof.

[0020] FIGURE 8 is fragmentary perspective view of a shelf bracket constructed in accordance with this invention, and illustrates as an integral part thereof a rear member in the form of a second shelf bracket member carrying oppositely directed supporting projections.

[0021] FIGURE 9 is a fragmentary cross-sectional view taken generally along line 9-9 of Figure 10, and illustrates the shelf bracket having a glass panel member unitized thereto by an injection molded rim or encapsulation and the oppositely directed supporting projections thereof seated in slots of an associated first shelf bracket member conventionally secured to a wall of the refrigerator compartment.

[0022] FIGURE 10 is a fragmentary side elevational view of the shelf and shelf adapter bracket of Figure 9, and illustrates the interlocked relationship between the first and second shelf bracket members thereof to achieve desired vertical adjustment.

[0023] FIGURE 11 is a top perspective view of another shelf adapter bracket of the present invention and illustrates one of the second shelf bracket members of Figure 1 integrally unitized to a shelf by an injection molded encapsulation or rim at a reinforced corner thereof.

[0024] FIGURE 12 is a fragmentary top plan view looking downwardly in Figure 11, and illustrates oppositely directed projecting supports of the second shelf bracket

member.

[0025] FIGURE 13 is an enlarged fragmentary cross-sectional view taken generally along line 13-13, and illustrates the manner in which the shelf bracket member is unitized to the shelf by the injection molded encapsulation or rim at the corner thereof.

[0026] FIGURE 14 is an enlarged fragmentary perspective view of another shelf adapter bracket, and illustrates a first shelf bracket member having opposing channels or slideways and vertically spaced slots and a second shelf bracket member locked thereto and supporting a shelf.

[0027] FIGURE 15 is a vertical cross-sectional view taken generally along line 15-15 of Figure 14, and illustrates the interlocked relationship between the first and second shelf bracket members, and integral hooks of a shelf carried by one of the second shelf bracket members.

[0028] FIGURE 16 is a fragmentary exploded view of the shelf and second shelf bracket member of Figures 14 and 15, and illustrates details thereof.

[0029] FIGURE 17 is a perspective view of a refrigerator including a refrigerator compartment thereof and another novel shelf assembly of the invention, and illustrates a shelf having an injection molded encapsulation or rim unitizing a tempered glass shelf member to a pair of metal shelf support brackets and a pair of vertical slotted trackways each of a generally U-shaped transverse cross-sectional configuration defined by a bight wall and a pair of spaced lateral walls each defining a slideway which can be accessed by latching pins of the shelf bracket by means of uppermost and lowermost slots or openings formed in the lateral walls of each trackway.

[0030] FIGURE 18 is a fragmentary exploded perspective view of one of the shelf support brackets and the associated trackway of Figure 17, and illustrates details of the trackway including a vertical slideway defined by lateral walls and access openings or slots in the lateral walls through which a latching or supporting projecting pin can be inserted into or removed from the slideway along a path of travel substantially transverse or normal thereto.

[0031] FIGURE 19 is a fragmentary side elevational view of one of the trackways, and illustrates an uppermost shelf contiguous the refrigerator compartment top wall incident to the shelf being moved to the right whereupon the latching or support pin passes through the access openings of the lateral walls of the trackway, enters the slideway and can be moved vertically downwardly therealong to a desired position of final adjustment, as is illustrated in phantom outline.

[0032] FIGURE 20 is fragmentary side elevational view of the shelf trackway and shelf assembly of Figure 19, and illustrates the manner in which the upper shelf with its latching pin in the slideways will, if inadvertently released or dropped, pivot or cant counterclockwise to the phantom outline position thereof with further descent being blocked by a bottom projecting finger of the shelf support bracket engaging a lower one of three or more

stops or hooks of the trackway.

[0033] FIGURE 21 is a fragmentary enlarged cross-sectional view taken generally along line 21-21 of Figure 17, and illustrates one of the shelf support brackets with its pin supported by edges of slots of the trackway, narrower vertical terminal edge portions of the side walls engaging laterally projecting stabilizing ribs of the shelf support bracket, and one of several screws or fasteners securing the trackway to the aide wall of the refrigerator compartment.

[0034] FIGURE 22 is an enlarged top plan view of each trackway of Figure 17, and illustrates the generally forwardly opening U-shaped transverse cross-sectional configuration thereof, including lateral walls defining the slideway, narrower terminal edges for stabilization purposes and a forwardly projecting shelf stop hook formed the material of the bight wall of the trackway.

[0035] FIGURE 23 is a fragmentary rear view of one of the trackways, and illustrates details of the transversely aligned, vertically spaced slots for supporting the shelf bracket pins, and one of several vertically spaced forwardly projecting shelf stop hooks of the trackway.

[0036] FIGURE 24 is a top perspective view of another shelf which can be utilized in the shelf assemblies heretofore described, and illustrates a circular tempered glass panel encapsulated by an injection molded rim or encapsulation which diametrically attaches thereto a single metal shelf bracket, carrying a latching pin and a lubricity increasing block of material.

[0037] FIGURE 25 is a cross-sectional view taken generally along line 25-25 of Figure 24, and illustrates details of the metal shelf bracket including the latching pin, a rearwardly projected shelf stop nose and the lubricity block.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0038] A novel refrigerator shelf assembly constructed in accordance with the present invention is generally designated by the reference numeral 10, and is illustrated in Figure 1 in association with a cabinet or compartment C of a refrigerator R.

[0039] The shelf assembly 10 includes a shelf 15 defined by opposite substantially parallel metal shelf brackets 16, 17 unitized to a peripheral edge (unnumbered) of a shelf member 18 of tempered glass by an injection molded encapsulation, rim or border 20 (Figure 2) formed in accordance with the method disclosed in U.S. Patent No. 5,362,149 granted on November 8, 1994 to Bird et al., the totality of which is incorporate hereat by reference. Each of the metal support brackets 16, 17 includes conventional downwardly directed hooks 21, 22 which normally engage in vertically disposed parallel shelf tracks in a convention refrigerator compartment, as is fully disclosed in the latter-identified patent. Such conventional shelves 10 can be hooked to, completely unhooked from and re-hooked to the slots of the shelf tracks to effect step-wise vertical adjustments of the shelves relative to

other shelves and/or top and bottom walls of an associated refrigerator compartment. However, a disadvantage of such total disconnection noted earlier herein between conventional shelf hooks and conventional vertical shelf tracks can result in advertent or accidental shelf and/or product droppage and result in damage or breakage. The latter is precluded by the novel refrigerator shelf assembly 10 of the present invention.

[0040] The shelf assembly 10 further includes a pair 25, 25 (Figure 1) of identical shelf adapter brackets, each defined by a first shelf bracket member 26 and a second shelf bracket member 27 (Figures 3-5). Each first shelf bracket member 26 of the pair 25, 25 of shelf bracket adapters is of a generally U-shaped transverse cross section (Figures 5 and 7) and is preferably constructed of relatively rigid metallic sheet material stamped, blanked and formed to the specific configuration best illustrated in Figure 3 of the drawings. Each U-shaped first bracket member includes a bight wall or bight portion 28 and opposite legs or leg portions 29, 30. Each leg 29, 30 includes a relatively straight front edge or edge portion 31, a top edge or edge portion 32 and a bottom edge or edge portion 33. The bight portion or wall 28 has a plurality of openings 34 (Figures 5, 6 and 7) for securing each of the first bracket members 26, 26 to a rear wall 13 of the refrigerator compartment C, as is readily apparent in Figure 1 of the drawings.

[0041] Each of the legs 29, 30 of each of the first shelf bracket members 26, 26 is provided with a vertical slideway or channel 41 immediately adjacent each front edge 31 and substantially parallel thereto. Each slideway 41 is of a generally U-shaped transverse cross section (Figures 3, 5 and 7) and is defined by a first leg or leg portion 42 most adjacent each front edge 31, a second leg or leg portion 43 and a bight portion 44 therebetween. The legs or leg portions 42, 43 are in diverging relationship to each other in a direction away from the bight portion 44. Each slideway or channel 41 includes a narrowest transverse width W which increases in the opening direction of the slideways 41, 41. Each leg portion 43 also blends with a medial portion 45 (Figures 3-7) of each of the legs 29, 30.

[0042] A plurality of identical vertically spaced support means 50 in the form of slots or openings 50 are formed along the length of the medial portion 45 of each of the legs 29, 30 between the upper edge 32 and the lower edge 33 thereof. Each slot 50 includes a front vertical edge 51, a rear vertical edge 52 and a slightly curved top edge 53. The edges 51, 52 are substantially parallel to each other and are parallel to the front edge 31 of the associated legs 29, 30. A lower edge or ledge of each slot 50 includes a lowermost substantially horizontally disposed edge or ledge 54 defining means for supporting projecting supports or projections 60 of each of the second bracket members 27, as will be described more fully hereinafter. A curved transition edge or ledge 55 extends from each edge 51 to each edge 54 beginning at a point midway in the bight portion 44 of each slideway 41, continuing along the ledge portion 43 and ending at a merge

point (unnumbered) with the supporting ledge or edge 54 (Figures 3-7).

[0043] The purpose and function of the transition edges or ledges 55 of the legs 29, 30 of each of the first shelf bracket members 26 is to permit the projecting supports, projections or pins 60 of the second shelf bracket members 27 ready entry from the associated slideways 41, 41 toward and downwardly upon the support edges or ledges 54 of the slots 50 and the like ready removal thereof in an opposite direction for purposes of assembling or vertically slidably adjusting the shelf 15 relative to the first bracket members 26 by sliding the second bracket members 27 vertically relative thereto.

[0044] As is best illustrated in Figures 3 through 5 of the drawings, the second shelf bracket member 27 of each of the pairs 25, 25 of adapter brackets is also of a generally U-shaped transverse cross-sectional configuration, and is preferably also constructed of relatively rigid sheet metal material blanked, stamped and formed to the configuration best illustrated in Figures 3 and 5 of the drawings. Each second shelf bracket member 27 includes a bight wall 68 and oppositely substantially parallel legs 69, 70 which converge toward each other and terminating in substantially parallel end edges or edge portions 71, 72, respectively. The end edges 71, 72 each have a plurality of vertically spaced openings 73 (Figures 4 and 5) through which injected polymeric/copolymeric plastic material can pass during the formation of slide members 74 (Figure 3) on outer surfaces (unnumbered) of the terminal end portion 71, 72 and enlarged heads 75 (Figure 5) on inboard surfaces (unnumbered) of the terminal edges 71, 72. Slots 81, 82 (Figures 3 and 5) are formed in the bight wall 86 of each second shelf bracket member 27 for receipt therein of the hooks 21, 22 of the shelf 15. The pins or projections 60 have a maximum diameter D (Figure 5) increasing from the narrowest transverse width W of the slideways 41, 41 to the maximum width thereof to permit relative vertical sliding movement therebetween during which the glide members 74, 74 engage inner surfaces (unnumbered) of the legs 29, 30 of the first bracket members 26, as is best illustrated in Figures 5 and 7 of the drawings.

[0045] As is best illustrated in Figure 5 of the drawings, the oppositely projecting pins 60, 60 carried by each second shelf bracket member 27 are spaced from each other a maximum effective distance D1 which is slightly less than an effective distance D2 measured between the bight portions 44 of the slideways 41. Because of the slight difference in the distances D1, D2, the projecting pins or projecting supports 60 move readily easily vertically upwardly and downwardly within the slideways 41. Therefore, during initial installation after each of the first bracket members 26, 26 has been secured to the rear wall 13 of the refrigerator compartment C with the slots 50, 50 thereof in horizontal alignment, the pins 60 can be introduced into the slideways 41 from above or below. This can be done by first hooking the hooks 21, 22 into the respective slots 81, 82 of the second shelf bracket

members 27 and thereafter simultaneously introducing the latter from the bottom or from the top into the first shelf bracket members 26, 26. Alternately, the shelf 15 need not be connected through its hooks 21, 22 to the slots 81, 82 of the second shelf bracket members 27 but instead the latter can be individually or simultaneously introduced into the first bracket members 26 via the slideways 41 and when horizontally aligned, the second shelf bracket members 27 are simply pushed inwardly in a direction toward the bight walls 28 of the first shelf bracket members 26. As the second shelf bracket members 26 are pushed inwardly, the projecting pins 60 thereof engage and are guided downwardly by the upper edges 53 and/or by the lower edges 55 of a pair of the slots 50. Since the slideways 41, 41 of each of the first bracket members 26, 26 oppose each other, the leg portions 43 thereof are in converging relationship to each other in a direction away from the front edges 31, 31 of the legs, 29, 30 and toward the bight wall 28 (Figure 5). Therefore, during the inward movement of the supporting pins 60 from within the slideways 41 (Figure 5), the pins 60 move along the converging edges or ledges 55 of the converging walls 43, 43 (Figure 5) progressively inward from the outermost distance D2, measured across the bight walls 44, 44 of the slideways 41, 41 to a distance D3 (Figure 5) which is the maximum distance between the horizontally adjacent supporting edges 54. In this manner the transition edges 55, 55 (Figure 7) of horizontally adjacent slots 50, 50 in the legs 29, 30 of each of the first shelf bracket members 26, 26 contact and guide the associated pins 60, 60 from the slideways 41, 41 toward and upon the supporting edges 54 (Figures 4 and 7) and conversely away from the supporting edges 54 and into the slideways 41 for disassembly purposes.

[0046] It is to be particularly noted that during any of the vertical adjustment just described of the shelf 15 when attached to the second shelf bracket members 27, 27, and specifically the movement of the latter along the slots 50 and the slideways 41, there is no total or complete disassembly of the shelf 15 relative to the second shelf bracket members 27 or any total disassembly of the second shelf bracket members 27 relative to the first shelf bracket members 26. Therefore, during vertical adjustment of the shelf 15, when connected to the second shelf bracket members 27, it is extremely unlikely that the shelf 15, with or without products/articles thereon, will be inadvertently dropped or tilted because during any such adjusting movement the projecting pins 60, 60 are at all times in contact with portions of the first shelf bracket members 26, be it through the slots 50, 50 or the slideways 41, 41 thereof. It is only upon moving the projecting pins 60 upwardly or downwardly along their associated slideways 41 that the shelf 15 can accidentally drop substantially vertically if released, and only upon the removal of all three projecting pins 60 from each slideway 41 could the shelf 15 drop to the bottom of the compartement C, though the latter is virtually impossible for reasons explained immediately hereinafter

[0047] Reference is made to Figure 6 of the drawings which illustrates the position of the shelf 15' after it has been introduced from above by inserting each second shelf bracket member 27, 27 into an associated first bracket member 26, 26 with the projecting pins 60 disposed in the slideways 41. With the uppermost pins 60, 60 of each second shelf bracket member 27 are immediately adjacent the upper edges 32 of each first shelf bracket members 26, it is assumed that the shelf 15' is accidentally released/dropped. Since the shelf 15' is cantilevered, even absent products or articles supported thereon, its weight Wt (Figure 6) will effect downward movement and vertical pivoting and/or tilting movement. In other words if the shelf 15' were released from the uppermost assumed position, it would begin to fall vertically because of gravity acting upon its weight Wt, but since the shelf 15' is cantilevered, it will also pivot, tilt or cant in a counterclockwise direction, as is indicated by the curved line of travel A associated therewith in figure 6 bringing the uppermost projecting pins 60 into bearing engagement with the front leg portions 42 of the slideways 41 and the lowermost projecting supports or pins 60 into bearing engagement with the rear leg portions 43 at the slideways 41. If the slots 50 did not project into the bight portions 44 of the slideways 41, the shelf 15' would most assuredly continue a downward slide while being slightly cocked or tilted with the uppermost and lowermost projecting supports 60, 60 bearing against the respective front and rear leg portions 42, 43 of the slideways 41 until dropping out the bottom thereof. However, since the slots 50 include the ledge or edge portions 55 (Figures 4 and 5) which begin within the medial portion 44 of each slideway 41, the lowermost projecting supports 60 (Figure 6) eventually reach the slots 50, devoid of the inner leg portion 43, which allows the projecting supports 60 to progressively enter horizontally aligns slots 50 guided by the transition edges 55, as is readily visualized in Figure 6, until eventually fully overlying the transition edges 55 thereof which guide the lowermost projecting supports 60 toward and upon the horizontal supporting edges 54. Thus, the shelf 15' can be adjusted along the slideways 41 to any one of a number of vertically desired positions of adjustment absent fear of disengagement of the second shelf bracket members 27 from the first shelf bracket members 26. The latter function is extremely important because even under a worse case scenario, the shelf 15' will not drop from the first bracket members 26 and will tilt substantially no worse than that illustrated in Figure 6 of the drawings. Even should the latter occur while articles or products are being supported upon the shelf 15', a person most likely could prevent the articles/products from falling because both hands could be utilized for the latter purpose, as opposed to being used to essentially simultaneously catch and/or hold the shelf 15' and the articles/products supported thereupon

[0048] Another novel refrigerator shelf assembly constructed in accordance with the present invention is illustrated in Figures 8 through 10 of the drawings and is

generally designated by the reference numeral 10". All the structure and components of the refrigerator shelf assembly 10" which are structurally identical to or equivalent to the refrigerator shelf assembly 10 of Figures 1 through 5 of the drawings bear the same reference numerals and reference characters but are double primed.

[0049] The refrigerator shelf assembly 10" includes a shelf 15" formed by two metal shelf supporting brackets of which only the shelf supporting bracket 17" is illustrated. A shelf member 18" of tempered glass and an injection molded encapsulation, rim or border 20" unitize the latter components which can be hooked, re-hooked and vertically adjusted relative to first bracket member 26". Therefore, the overall shelf assembly 10" is identical to the shelf assembly 10 except that in lieu of the separate second shelf bracket member 27, the shelf bracket support 17" and the opposite equivalent unillustrated metal shelf bracket support, are each provided with a second shelf bracket member 90 which is an integral part of the shelf supporting bracket 17" (Figure 8). The shelf bracket 17" is slit longitudinally, blanked, stamped and formed to define an upper leg 91, a medial leg 92, and a lower leg 93. The upper and lower legs 91, 93, respectively, are offset to one side of a vertical plane of the shelf bracket 17" while the medial or central leg 92 is offset an equal amount to an opposite side of a vertical plane through the shelf bracket 17" resulting in the generally U-shaped configuration when viewed from above or below (Figure 9). The legs 91 through 93 include projecting supports or projecting pins 94 through 96, respectively. The projecting supports 94, 96 project away from and axially opposite to the direction of projection of the projecting support 95, as is most apparent from Figure 9. The vertical spacing between the projecting supports 94, 95; 95, 96 corresponds to the vertical spacing between the slots 50" of the first shelf bracket member 26".

[0050] As in the case of the shelf 15, the shelf 15" can be inserted into the first shelf bracket member 26" from above or below by simply introducing the projecting supports 94 through 96 in the associated slideways 41", 41" (Figure 9) and positioning the projecting supports 94 through 96 in three desired slots 50", as is illustrated in Figure 10. Structurally and functionally the shelf assemblies 10, 10' are virtually identical except for the fact that by constructing the shelf support 17" and the second shelf bracket member 90 as a single one-piece component from a single piece of metallic material, the overall expense of manufacture of the shelf assembly 10" is appreciably lessened as compared to that of the shelf assembly 10.

[0051] Another shelf assembly constructed in accordance with this invention is illustrated in Figures 11 through 13 of the drawings and is generally designated by the reference numeral 100. The shelf assembly 100 is similar in structure and is substantially identical in function to the shelf assembly 10 and at each of two rear corners (un-numbered) of an injection molded encapsulation, border or rim 120, there is a second shelf bracket member 127

which is substantially identical to the second shelf bracket member 27 (Figure 3) and functions in the manner heretofore described with respect to an associated one of a pair of first shelf bracket members 26 to adjust the shelf 150 vertically in a refrigerator compartment. The shelf assembly 100 differs from the shelf assembly 10 in that the shelf 150 excludes metallic shelf brackets corresponding to the shelf brackets 16, 17, and in lieu thereof the injection molded encapsulation, border or rim 120 integrally unitizes or unites a shelf member 118 of tempered glass to the second shelf bracket member 127 at each of the two rear corners of the rim 120 during the injection molding of the rim 120 which causes the injection molded polymeric/copolymeric material thereof to fuse across a plurality of slots 181 through 183 (Figure 13). With one of the second shelf bracket members 127 at each corner of the shelf 150, oppositely directed projections 160 thereof function with respect to slideways 41 and slots 50 of associated first shelf bracket members 26 in the manner heretofore described relative to the shelf assembly 10.

[0052] Another refrigerator shelf assembly constructed in accordance with the invention is illustrated in Figures 14 through 16 of the drawings and is generally designated by the reference numeral 210. Structure of the shelf assembly 210 which is structurally or functionally equivalent to the shelf assembly 10 is identified by identical reference numerals preceded by 200, such as a shelf 215 defined by a shelf member 218 of tempered glass which is encapsulated along a peripheral edge (unnumbered) thereof by an injection molded encapsulation, rim or border 220 which at opposite rear corners (unnumbered) includes downwardly directed relatively rigid integral hooks 216, each of which includes a centrally located, downwardly projecting, thinner flexible latching or locking tab 300 having a locking ledge 305 and a finger/thumb tab 310 (Figure 15). Each hook 216 hooks over and behind a front wall 301 of a second shelf bracket member 227 constructed from molded polymeric/copolymeric synthetic plastic material. Each of the two second shelf bracket members 227, of which only one is illustrated, is adapted for introduction into and can be vertically adjusted relative to a first shelf bracket member 226 (Figure 14) also constructed from synthetic polymeric/copolymeric plastic material. Each second shelf bracket member 227 includes a pair of vertically spaced oppositely directed projecting supports or supporting pins 260 (Figures 15 and 16) which slide in associated slideways 241 (Figures 14 and 15) which open toward each other in opposite legs 229, 230 (Figure 14) of each first shelf bracket member 226. Each leg 229, 230 includes a front edge or front flange 231, with the flanges 231, 231 being in opposing relationship to each other and in part each defining one of the slideways 241 which extend the entire vertical length of the first shelf bracket member 226. Each of the legs 229, 230 is molded to define a plurality of slots 250 having surfaces, edges and/or ledges corresponding to like structure of each slot 50 which has been identified

by reference numerals 252 through 255. The projecting supports 260 of each second shelf bracket member 227 cooperate with the slots 250 of each of the two first shelf bracket members 226, 226 precisely in the manner set forth with respect to the operation of the respective first and second shelf bracket members 26, 27 of the two pair of adapter brackets 25 heretofore described relative to Figures 1 through 7 of the drawings which are incorporated hereat by reference. Obviously, a major difference between the latter two constructions is that the slots 50 are "open," i.e., pass through the legs 29, 30 whereas the slots 250 are "closed," i.e., do not pass through the legs 229, 230. The latter may at times be considered preferable for aesthetic purposes inasmuch as the slots 250 are essentially hidden by the legs 229, 231. Furthermore, the outer surfaces (unnumbered) of the legs 229, 230 of the first shelf bracket member 226 are relatively flat and uniplanar which might also be considered to be more aesthetic than the undulating exterior configuration of the legs 29, 30, particularly in the area of the slideways 41 thereof. However, both shelf assemblies 10, 210 function identically with respect to vertical adjustment and the prevention of inadvertent or accidental shelf droppage in the manner heretofore described with respect to the shelf 15' of Figures 6 and 7. In the case of the shelf 215, should the latter tend to pivot, tilt or cant clockwise under its weight Wt' , as viewed in Figures 14 and 15, when the projecting supports or pins 260 are in the slideways 241, the upper projecting supports or pins 260 will contact the front flanges 231, 231 of the legs 229, 230 which limit the tilting of the shelf 215 and the eventual introduction of the lowermost projecting supports or pins 260 into the slots 250 to achieve the orientation of the shelf 215 corresponding to the shelf 15' of Figure 6.

[0053] After each hook 216 of the shelf 215 has been hooked upon the front wall 301 of the associated second shelf bracket member 227, the locking nose or ledge 305 of each locking tab 300 engages beneath and locks with a lower edge 306 of each second shelf bracket member 227 to prevent the shelf 215 from being inadvertently or accidentally withdrawn or removed from the second shelf bracket members 227, as is readily apparent from figure 15. The locking function is achieved by simply sliding each hook 216 downwardly into each second bracket member 227 which automatically prevents disengagement therebetween until desired by a person pushing the finger/thumb tabs 310 to the left, as viewed in Figure 15, to effect disengagement of the hooks 216, 216 from the walls 301, 301 of the second shelf bracket members 227, 227.

[0054] Another novel refrigerator shelf assembly constructed in accordance with the present invention is illustrated in Figures 17 through 23 of the drawings and is generally designated by the reference numeral 100. Components of the shelf assembly 100 which correspond to the like components of the shelf assembly 10 have been prefixed by "100" to identify identical structure without specifically describing the same. For example, as in

the case of the shelf assembly 10, the shelf assembly 100 includes a shelf 115 defined by opposite substantially parallel metal shelf brackets 116, 117 unitized to a peripheral edge (unnumbered) of a shelf member or panel 118 of tempered glass by an injection molded encapsulation, rim or border 120 formed in accordance with the method disclosed in U.S. Patent No. 5,362,149. However, as opposed to the metal support brackets 16, 17 of the shelf assembly 10, each metal shelf bracket 116, 117 of the shelf assembly 100 include at a rearmost end portion (unnumbered) thereof latch means or pin means 200 (Figure 18) for effecting vertical stepwise adjustment with respect to vertically spaced support means, slots or openings 150 of vertical trackways 126, 126 corresponding substantially identically to the first shelf bracket member 26 earlier described. Each metal shelf bracket 116, 117 further includes lateral stabilization means 220 (Figures 18 and 21) for intimately slidably engaging vertical terminal side edges or walls 131, 131 of trackway side walls 142, 142 of the trackways 126 to reduce sidewise or lateral shelf movement in any adjusted position of the shelf 115 during vertical upward or vertical downward adjustment thereof with respect to the trackways 126.

[0055] Each metal shelf bracket 116, 117 further includes means 240 (Figure 18) in the form of a block of plastic material having a very low coefficient of friction and excellent lubricity which thereby reduces frictional forces during sliding adjustment of the shelf 115 upwardly or downwardly with respect to the trackways 126, 126 particularly as the lubricity block 240 slides in intimate contacting relationship with the inner vertical side edges or walls 131, 131 of the side walls 142, 142 of each of the trackways 126 (Figure 21).

[0056] Cooperative means 260 (Figures 18 and 20) in the form of a projection or projecting nose of each of the shelf brackets 116, 117 cooperates with a plurality of stop means 270 (Figure 19) struck from a bight wall 128 of each of the trackways 126 to preclude inadvertent or accidental descent of the shelf 115 during adjustment in the manner heretofore described and as is readily apparent from Figure 20 which illustrates the projection 260 of the metal shelf bracket 117 shown in phantom outline engaging a lowermost one of a plurality of the stops 270 of the trackway 126.

[0057] Each of the trackways 126, 126 also includes means 280 (Figures 18 and 21) for securing the same directly to conventional side walls SW1, SW2 and/or a rear wall RW of a conventional fresh food compartment or freezer compartment C1 of a conventional refrigerator R1 (Figure 17) which also includes top and bottom walls TW and BW, respectively. It is to be understood that the top and bottom walls TW, BW, respectively, are not necessarily the uppermost or lowermost interior walls of the compartment C1 of the refrigerator R1. For example, the top wall TW can be the bottom wall of an upper separately front accessible freezer compartment (not shown), while the bottom wall BW can be the upper wall of an inner crisper compartment accessed by an inner door sliding

therebeneath. Rather, the compartment, C1 is intended to illustrate the major volume of a fresh food compartment or a frozen food compartment in which one or a plurality of shelves, such as the shelf 115, are mounted for maximum of vertical distance movement Dm as is possible and practical between the top and bottom walls TW, BW, respectively. Toward the latter end, one necessary prerequisite to achieve maximum distance Dm vertical adjustment of the shelf or shelves 115 is for the trackways 126 to substantially vertically span or extend the same maximum vertical distance Dm between the walls TW, BW, as is readily apparent from Figure 17 of the drawings. The latter could present a problem with respect to shelf insertion/removal unless otherwise provided for by the present invention, as will be described more fully hereinafter.

[0058] The latching means or latching pin 200 (Figures 18 and 21) of each metal shelf bracket 116, 117 is formed of a substantially cylindrical piece of metal and has oppositely projecting concentric end portions 201, 202 (Figure 21). Prior to each pin 200 being assembled with respect to a circular opening 210 of each metal shelf bracket 116, 117, the pin 200 is provided with only one of two collars 203, 204. Assuming, for example, that only the collar 203 at the pin end portion 201 is an integral portion of the pin 200, in lieu of the collar 204, the pin 200 includes an annular portion having a diameter corresponding to the diameter of the opening 210 which permits the same to be freely slid therein and therethrough until the collar 203 abuts against the metal shelf bracket 116, 117. Thereafter, the annular metal collar which projects through the circular shelf bracket opening 210 is upset or staked to form the collar 204. In the latter manner, each pin 200 is a substantially rigid homogeneous single piece of material which is rigidly united to the metal shelf brackets 116, 117 through the collars 203, 204. The specifics of the method of forming the pin 200 beyond that just described are found in Applicant's co-pending application Serial No. ____ filed on and entitled "Vertically Adjustable Shelf and Refrigerator Compartment Housing the Same," and the totality of the latter disclosure is incorporated herein by reference.

[0059] Suffice it to say that the shelf 115 through the latching or support pins 200 and particularly the end portions 201, 202 thereof are adjusted with respect to the shelf adaptor brackets or trackways 126, 126 (Figure 17) in the manner heretofore described with respect to the shelf assembly 10 of Figures 1 through 7 of the drawings. However, each pin 200 and specifically the axially opposite end portions 201, 202 thereof cannot be inserted in the slideways 141, 141 of the trackways 126, 126 directly vertically from above or directly vertically from below (Figures 17 and 19) because the ends (unnumbered) of the trackways 126, 126 are immediately contiguous the respective top and bottom walls TW, BW of the refrigerator compartment C1. Furthermore, the axial length of the pins 200, as is best illustrated in Figure 21, is greater than the distance between the vertical terminal edges

131, 131 of each of the trackway lateral wall 142, 142. Accordingly, in accordance with the present invention, means 142', 142' in the form of transverse openings or slots are provided in the trackway lateral walls 142, 142 for defining a transverse or normal entry/removal path of travel for the pins 200, 200 of each of the shelf brackets 116, 117 into the vertical path of travel defined by the slideways 141, 141. As is most readily evident in Figure 19, a horizontal plane P which is tangent to a lowermost surface of the pin 200 passes directly into the slideway at a point above the slots or openings 142', 142'. Therefore, when the shelf 115 of Figure 19 is positioned as shown in solid lines in Figure 19, it need but be moved to the right, the pin 200 passes along a path of travel normal to the vertical path of travel established by the slideways 141, 141 of the trackways 126, 126 which effects both assembly and disassembly of an uppermost shelf 115 as immediately adjacent the top wall TW of the compartment C1 as is possible. The shelf 115 then need but be moved downwardly until spaced a desired distance below the top wall TW (phantom outline in Figure 19) after which the pin 200 thereof can be latched in the latching openings 150, as is illustrated by the phantom outline shelf 115 of Figure 19. Figures 18 and 19 illustrate equivalent slots or openings 142', 142' formed in the trackways 126, 126 substantially midway of the end-to-end length thereof, while substantially identical slots or openings 142', 142' are formed in each trackway 126, 126 (Figure 17) adjacent but spaced above the bottom wall BW of the compartment C1. The lowermost pair of slots 142', 142' of each trackway 126, 126 are spaced from the bottom wall BW a minimum bottom distance Db (Figure 17) which corresponds substantially to the vertical distance between a bottom edge (unnumbered) of the shelf brackets 116, 117 and a like horizontal plane P associated with the shelf 115 when resting with its lower edge against the bottom wall BW incident to being moved toward the rear wall RW at which time each of the pins 200, 200 enter through the lowermost access openings 142', 142' of each of the trackways 126, 126 and into the slideways 141, 141 for, in this case, upward adjusting movement. Obviously, downward adjusting movement at the point of entry just described is not possible, but the shelf thus positioned can be vertically adjusted as desired.

[0060] Each of the metal shelf brackets 116, 117 is relatively thin and unless otherwise provided for might tend to wobble, sway or move sidewise or laterally or torque or cant within the trackways 126, 126, particularly under heavy product loads, unless otherwise provided for which is accomplished herein by the lateral stabilizing means 220 (Figures 18 and 21). The stabilizing means 220 are designed for intimately slidably engaging the forward side edges 131, 131 of trackway side walls 142, 142 of each of the trackways 126 to thereby reduce sidewise shelf movement. The latter is accomplished by forming the lateral stabilizing means 220 as three ribs 221, 222 and 223 disposed in substantially spaced parallel

relationship to each other. The ribs 221, 223 project to one side of the metal shelf brackets 116, 117 whereas the rib 222 projects to an opposite side of each of the metal shelf brackets 116, 117. Through the ribs 221 through 223 are substantially in parallel horizontal spaced relationship to each other, the same can also be inclined or can be of other configurations so long as the maximum distance Md (Figure 21) between the inboard-most portion of the inboard rib 222 and the outboardmost: portion (unnumbered) of either or both of the outboard ribs 221, 223 approximates the same distance Md between the lateral wall terminal vertical edges 131, 131 of the side walls 142, 142 in the manner best illustrated in Figure 21 of the drawings. As is readily apparent from Figure 21, the innermost rib 222 and the outermost rib 221, as well as the unillustrated lowermost outermost rib 223, engage the edges 131, 131 of the respective inner and outer walls 142, 142 of each of the trackways 126 and thereby preclude lateral or sidewise movement and/or torquing of the shelf brackets 116, 117 thereby obviously stabilizing/ rigidifying the shelf 115, particularly in its position of use (Figure 17). It is to be particularly noted that since the maximum distance Md of the ribs 221 through 223 is substantially equal to the distance between the vertical terminal edges 131, 131 of the trackways 126, the transverse/normal entry and exit movement of the shelf 115 relative to the trackways 126 is unhindered, as is most readily apparent from Figure 21 of the drawings.

[0061] Even through the metal shelf brackets 116, 117 and the trackways 126 are painted and the surfaces thereof are relatively slick, it is preferred that the stabilizing means or lateral movement preventing means 220 and/or the stabilizing ribs 221 through 223 do not necessarily at all times engage the walls 142, 142 of the shelf adapter brackets 126, 126. In other words, it is highly desirable that the dimensioning of the ribs 221 through 223 is such that they are spaced a transverse maximum distance Md very slightly less than the distance between the terminal vertical edges 131, 131 of the walls 142, 142 of the trackways 126, 126 to barely avoid sliding/rubbing frictional contact therebetween during adjustment both to decrease frictional contact and, obviously, prevent wear and/or scratching of the opposing painted surfaces. In order to maintain such exact distance and aid in low friction sliding, the block 240 of low coefficient of friction/ high lubricity material (Figure 18) is provided in the form of synthetic polymeric/ copolymeric plastic material of a generally U-shaped transverse cross-section defined by opposite side walls 241, 242 and a bight or bight wall 243 therebetween. A slot 244 between the walls 241, 242 corresponds substantially to the thickness of the metal support brackets 116, 117. A conical recess 245 is provided in the wall 242 and a cylindrical opening 246 aligns with an opening 247 formed along a lower edge (unnumbered) of each of the shelf support brackets 116, 117. After the lower edge of each shelf support bracket 116, 117 is slid into an associated slot 244, a sheet metal

screw 248 is threaded into the opening 247 to retain the block 240 appropriately assembled to its associated shelf bracket 116, 117. The distance between exterior surfaces (unnumbered) of the side walls 241, 242 is very slightly greater than the maximum distance M_d heretofore described from the outermost surface of the rib 222 to the outermost surface of either of the ribs 221, 223, with the latter distances being measured normal to each other which brings the surfaces (unnumbered) of the walls 241, 242 into intimate sliding relationship to the vertical edges 131, 131 of the walls 142, 142 of the trackways 126, 126. In the latter position, the ends of the ribs 221-223 preferably are extremely virtually indiscernibly spaced from the vertical edges 131, 131 of the walls 142, 142 whereby major sliding engagement between the walls 142, 142 is between the edges 131, 131 of the latter and the outside surfaces of the side walls 241, 242 of the lubricity block 240. It is to be particularly noted that since the maximum distance M_d of the ribs 121 through 123 is substantially equal to the distance between the vertical terminal edges 131, 131 of the trackways 126, the transverse/normal entry and exit movement of the shelf 115 relative to the trackways 126 is unhindered, as is most readily apparent from Figure 21 of the drawings.

[0062] As in the case of the shelves 15, 15' heretofore described, particularly with respect to Figure 6, the shelf 115 will under its own weight with or without product thereon will, if advertently or accidentally released, pivot, tilt or cant from a horizontal position (solid lines in Figure 20) counter-clockwise, as viewed in Figure 20, to the phantom outline position illustrated therein along a curved line of travel corresponding to the curve line of travel A associated with the shelf 15' of Figure 6. The latter movement in the case of the shelf 115 brings each of the projecting pins 200 into bearing engagement with the front leg portions 142, 142 of the slideways 141, 141 of each trackway 126, 126 but, in this case, the shelf brackets 116, 117 each include only a single pin 200 and in lieu of an additional pin or pins, each shelf bracket 116, 117 includes the shelf stop projections or shelf stop noses 260 which engage the stops or stop hooks 270 (phantom outline in Figure 20) of each trackway 126. The projections or noses 260 are vertically aligned with the stops or stop hooks 270, and should the shelf 115 move to the position shown in phantom outline Figure 20, the nose 260 of each of the shelf brackets 116, 117 will engage the nearest lowermost stop 270 of the bight wall 128 of each trackway 126 in the manner clearly evident in Figure 20 of the drawings. A minimum of three upwardly directed stops or stop hooks 270 are preferred, but it is to be understood that more or less than the latter number of stops 270 may be provided as need be, particularly by adding additional stops 270 thereto to limit incremental inadvertent/accidental downward descent of the shelf 115.

[0063] As is best illustrated in Figures 18 and 21 of the drawings, the means 280 for securing each of the trackways 126, 126 to the refrigerator compartment side walls SW1, SW2 include aligned pairs of vertically spaced

small circular openings 281 and larger circular openings 282 formed in the respective lateral or side walls 129, 130, respectively. A fastener 283 having a head 284 which will pass through the opening 282 but not through the opening 281 can be thereby screwed into the side wall SW2 or SW1 in the manner apparent from Figure 21 of the drawings. If it were desired to attach the trackways 126, 126 to the rear wall RW, only the smaller circular holes 281 need be formed in the bight wall 128 of the trackways 126, 126,

Needless to say, through the trackways 126, 126 have been described as separate individual components of the overall shelf assembly 100, each could be an integral blanked and formed portion of the rear wall RW in particular, but the same could also be integrally blanked and formed from the side walls SW1, SW2, particularly if the walls SW1, RW and SW2 were a single piece of material. The latter is readily envisioned in Figure 17 by visualizing the side walls SW1, SW2 as being continuations of the most remote edges 131, 131 of the trackways 126, 126, while the rear wall RW is a like continuation of a wall spanning the inboardmost edges 131, 131 of the trackways 126. The latter has been drawn in Figure 17 in dash-dot lines only at the top of the figure and is identified by the reference characters IS1, IR an IS2. Thus, in an integral one-piece construction, the side walls IS and IS2 would constitute merely a continuation of the left and right trackways 126, 126, as viewed in Figure 17, and the rear wall IR would span these same trackways.

[0064] Another shelf assembly 300 (Figures 24 and 25) which includes components substantially identical to those heretofore described with respect to the shelf assemblies 10 and 100 has been prefixed by reference numeral "300" to identify such identical components. For example, the shelf assembly 300 of Figures 24 and 25 includes a shelf 315 defined by a single metal shelf bracket 316 unitized to a peripheral edge (unnumbered) of a substantially circular shelf member 318 of tempered glass by an injection molded encapsulation, rim or border 319 formed in accordance with U.S. Patent No. 5,362,149. However, since the metal shelf bracket 316 diametrically spans the tempered glass shelf member 318, the latter is preferably translucent or opaque to reduce or preclude visibility of the shelf bracket 316 from above. The shelf 315 can be utilized with the shelf adapter bracket 26, 26 and/or the trackways 126, 126. Since the shelf 315 is relatively small and is designed for supporting relatively lightweight articles thereon, the shelf bracket 316 is shown devoid of the stabilizing means 260 in the form of the three stabilizing ribs 121 through 123 for preventing sidewise or lateral shifting or wobbling or canting of the shelf 315 relative to an associated trackway 126. However, such shifting or wobbling is precluded through the utilization of a lubricity block 340. However, the shelf bracket 316 may be provided with ribs corresponding to the ribs 121, 122 and 123 (Figure 18). The shelf assembly 300 also includes as part of the single shelf bracket 316 a vertical latching or latch adjusting or support pin 320

corresponding to the pin 200 of the shelf brackets 116, 117 and a projecting stop nose, projection or stop 360.

[0065] During the manufacture of the shelf assembly 300, a substantially circular tempered glass panel 318 and shelf bracket 316 are inserted in a mold with an upper edge 408 of the shelf bracket or shelf arm 316 bearing against a lower surface 409 of the tempered glass panel 318. The mold is closed and hot pressurized polymeric/copolymeric plastic material is injected into cavities which not only form the overall rim or encapsulation 319 but at forward and rear end portions 410, 411 of the shelf bracket 316 the latter ends are encapsulated by diametrically opposite encapsulation portions 412, 413, respectively. The forward encapsulation portion 412 totally encapsulates the front end or nose 410 of the shelf bracket 316 whereas the rear encapsulation portion 413 is formed to include a narrow "belt" 414 which surrounds and encases the shelf bracket 316 affording rigidity thereto for stabilization and anti-torquing purposes.

[0066] Although a preferred embodiment of the invention has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the apparatus without departing from the spirit and scope of the invention, as defined by the appended claims.

Claims

1. A refrigerator compartment comprising a top wall, a bottom wall below said top wall, a rear wall between said top and bottom walls, and a pair of spaced side walls between said top and bottom walls; a shelf means for establishing a substantially vertical path of travel in said compartment substantially between said top and bottom walls along which said shelf can be selectively vertically adjustably positioned, means for holding said shelf at any one of a plurality of positions of adjustment along said substantially vertical path of travel means, means for effecting the release of said holding means to permit selective vertical adjustment of said shelf along said vertical path of travel means, and means contiguous said top wall for defining a transverse entry/removal path of travel for said shelf holding means into said vertical path of travel means to introduce/remove said shelf relative to said vertical path of travel means.
2. The refrigerator compartment as defined in claim 1 including means for preventing undesired inadvertent downward movement of the shelf upon the release of said holding means and accompanying release of the shelf.
3. The refrigerator compartment as defined in claim 1 wherein said vertical path of travel means is integrally formed from the material of one of said side and rear walls.
4. The refrigerator compartment as defined in claim 1 including means for fastening said vertical path of travel means to at least one of said side and rear walls.
5. The refrigerator compartment as defined in claim 1 including means for defining a second transverse entry/removal path of travel for said shelf holding means into said vertical path of travel means to introduce/ remove said shelf relative to said vertical path of travel means, and said first-mentioned and second transverse path of travel means are disposed in substantially vertically spaced relationship.
6. The refrigerator compartment as defined in claim 1 including means for defining a second transverse entry/removal path of travel for said shelf holding means into said vertical path of travel means to introduce/ remove said shelf relative to said vertical path of travel means, said second transverse path of travel means is disposed in substantially adjacent said bottom walls and the vertical distance between said top wall and said first-mentioned transverse path of travel means is appreciably less than the vertical distance between said bottom wall and said second transverse path of travel means.
7. The refrigerator compartment as defined in claim 1 wherein said transverse path of travel means is substantially immediately at a lower surface of said top wall.
8. The refrigerator compartment as defined in claim 1 wherein said transverse path of travel means includes a slot having a lower edge spaced a predetermined vertical distance below said top wall, and said predetermined vertical distance corresponds substantially to the vertical distance between an upper surface plane of said shelf and a lower surface plane of said shelf holding means.
9. The refrigerator compartment as defined in claim 1 including means for preventing undesired inadvertent downward movement of the shelf upon the release of said holding means and accompanying release of the shelf, and said downward movement preventing means includes at least one stop means along said vertical path of travel means for stopping downward movement of the shelf.
10. The refrigerator compartment as defined in claim 1 wherein said vertical path of travel means is defined by an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall portions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a pre-

determined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means include pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, and said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions.

11. The refrigerator compartment as defined in claim 1 wherein said vertical path of travel means is an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall portions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means include pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions, said lateral walls include inboardmost wall portions, said inboard wall portions are spaced a predetermined distance from each other substantially less than the pin means predetermined axial distance, and said holding means are defined by edges of said shelf adjusting openings formed in said inboard wall portions.

12. The refrigerator compartment as defined in claim 5 including means for preventing undesired inadvertent downward movement of the shelf upon the release of said holding means and accompanying release of the shelf.

13. The refrigerator compartment as defined in claim 5 wherein said vertical path of travel means is integrally formed from the material of one of said side and rear walls.

14. The refrigerator compartment as defined in claim 5 including means for fastening said vertical path of travel means to at least one of said side and rear

walls.

15. The refrigerator compartment as defined in claim 5 wherein said vertical path of travel means is an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall portions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means include pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, and said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions.

16. The refrigerator compartment as defined in claim 5 wherein said vertical path of travel means is an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall portions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means includes pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions, said lateral walls include inboardmost wall portions, said inboard wall portions are spaced a predetermined distance from each other substantially less than the pin means predetermined axial distance, and said holding means are defined by edges of said shelf adjusting openings formed in said inboard wall portions.

17. The refrigerator compartment as defined in claim 6 wherein said vertical path of travel means is an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall por-

- tions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means include pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, and said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions.
18. The refrigerator compartment as defined in claim 6 wherein said vertical path of travel means is an elongated member defined at least in part by lateral walls, said lateral walls having elongated terminal wall portions spaced from each other a predetermined distance, said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance and in part defining the vertical path of travel means, said shelf holding means includes pin means of said shelf for latching with vertically spaced shelf adjusting openings of said spaced lateral walls, said pin means being of a predetermined axial length substantially between said first and second predetermined distances, said transverse path of travel means is defined by substantially laterally aligned slots in said elongated terminal wall portions which effect transverse entry/removal of said pin means relative to said vertical path of travel means along said elongated medial wall portions, said lateral walls include inboardmost wall portions, said inboard wall portions are spaced a predetermined distance from each other substantially less than the pin means predetermined axial distance, and said holding means are defined by edges of said shelf adjusting openings formed in said inboard wall portions.
19. A refrigerator compartment comprising a top wall, a bottom wall below said top wall, a rear wall between said top and bottom walls, and a pair of spaced side walls between said top and bottom walls; a shelf means for establishing a substantially vertical path of travel in said compartment substantially between said top and bottom walls along which said shelf can be selectively vertically adjustably positioned, means for holding said shelf at any one of a plurality of positions of adjustment along said substantially
- vertical path of travel means, means for effecting the release of said holding means to permit selective vertical adjustment of said shelf along said vertical path of travel means, means contiguous said top wall for defining a transverse entry/removal path of travel for said shelf holding means into said vertical path of travel means to introduce/remove said shelf relative to said vertical path of travel means, said vertical path of travel means is a trackway, and said trackway is integrally formed from the material of at least one of said side and rear walls.
20. A refrigerator compartment comprising a top wall, a bottom wall below said top wall, a rear wall between said top and bottom walls, and a pair of spaced side walls between said top and bottom walls; a shelf means for establishing a substantially vertical path of travel in said compartment substantially between said top and bottom walls along which said shelf can be selectively vertically adjustably positioned, means for holding said shelf at any one of a plurality of positions of adjustment along said substantially vertical path of travel means, means for effecting the release of said holding means to permit selective vertical adjustment of said shelf along said vertical path of travel means, means contiguous said top wall for defining a transverse entry/removal path of travel for said shelf holding means into said vertical path of travel means to introduce/remove said shelf relative to said vertical path of travel means, and means carried by said shelf for effecting lateral stabilization of said shelf.
21. The refrigerator compartment as defined in claim 20 wherein said vertical path of travel means include a pair of laterally spaced vertically extending walls, each vertically extending wall includes first and second vertically extending wall portions, said first vertically extending wall portions being spaced a first predetermined distance from each other, said second vertically extending wall portions being spaced a second predetermined distance from each other, said holding means includes pin means for latching with vertically spaced laterally aligned latching ledges of one of said first and second vertically extending wall portions, and said stabilization effecting means is in contiguous relationship to the other of said first and second vertically extending wall portions.
22. The refrigerator compartment as defined in claim 21 wherein said stabilization means is in contiguous relationship with the vertically extending wall portions defining the lesser of said first and second predetermined distances.
23. The refrigerator compartment as defined in claim 22 wherein the greater of said first and second predetermined distances corresponds substantially to the

axial length of said pin means.

24. The refrigerator compartment as defined in claim 21 wherein said laterally spaced vertically extending walls define a vertically extending slot therebetween, said slot having terminal vertical edges defined by said first vertically extending wall portions, and a vertically slideway defined by said second vertically extending wall portions. 5
25. The refrigerator compartment as defined in claim 21 wherein said laterally spaced vertically extending walls define a vertically extending slot therebetween, said slot having terminal vertical edges defined by said first vertically extending wall portions, a vertically slideway defined by said second vertically extending wall portions, and said second predetermined distance is greater than said first predetermined distance. 10 15
26. The refrigerator compartment as defined in claim 25 wherein said stabilization effecting means is in contiguous relationship to said first vertically extending wall portions. 20
27. A shelf comprising a shelf panel and a shelf bracket, said shelf bracket and shelf panel being disposed in substantially normal relationship to each other, said shelf bracket being substantially inboard of a peripheral edge portion of said shelf panel except at substantially diametrically opposite peripheral edge portions of said glass panel peripheral edge, an encapsulation of synthetic polymeric/copolymeric plastic material defining a rim of said shelf panel, and diametrically opposite portions of said encapsulation defining diametrically opposite means for encapsulatingly securing a front end portion and a rear end portion of said shelf bracket to said shelf panel. 25 30 35
28. The shelf as defined in claim 27 wherein said shelf bracket is substantially devoid of encapsulating material between said diametrically opposite encapsulating rim portions. 40
29. The shelf as defined in claim 27 wherein said shelf panel is made of tempered glass. 45

Amended claims in accordance with Rule 86(2) EPC. 50

1. A refrigerator compartment comprising a top wall (TW), a bottom wall (BW) below said top wall, a rear wall (RW) between said top and bottom walls, and a pair of spaced side walls (SW1, SW2) between said top and bottom walls; a shelf means for establishing a substantially vertical path of travel (126) in said compartment substantially between said top and bottom walls along which said shelf (115) can be 55

selectively vertically adjustably positioned, means (150,200) for holding said shelf at any one of a plurality of positions of adjustment along said substantially vertical path of travel means (126), means for effecting the release of said holding means (150,200) to permit selective vertical adjustment of said shelf (115) along said vertical path of travel means (116),

characterized by comprising means (142', 142') contiguous said top wall (TW) for defining a transverse entry/removal path of travel for said shelf holding means (150,200) into and out of said vertical path of travel means (126) to introduce/remove said shelf (115) relative to said vertical path of travel means (126).

2. The refrigerator compartment as defined in Claim 1 including means (260,270) for preventing undesired inadvertent downward movement of the shelf (115) upon the release of said holding means (200) and accompanying release of the shelf.

3. The refrigerator compartment as defined in Claim 1 wherein said vertical path of travel means (126) is integrally formed from the material of one of said side and rear walls.

4. The refrigerator compartment as defined in Claim 1 including means (34) for fastening said vertical path of travel means (26) to at least one of said side and rear walls.

5. The refrigerator compartment as defined in one of claims 1 - 4 including means (142') for defining a second transverse entry/removal path of travel for said shelf holding means (150) into said vertical path of travel means (126) to introduce/ remove said shelf (115) relative to said vertical path of travel means (126), and said first-mentioned and second transverse path of travel means (142', 142') are disposed in substantially vertically spaced relationship.

6. The refrigerator compartment as defined in claim 1 including means (142') for defining a second transverse entry/removal path of travel for said shelf holding means (200) into said vertical path of travel means (126) to introduce/ remove said shelf relative to said vertical path of travel means (126), said second transverse path of travel means is disposed in substantially adjacent said bottom walls (BW) and the vertical distance between said top wall (TW) and said first-mentioned transverse path of travel means (142') is appreciably less than the vertical distance (Db) between said bottom wall (BW) and said second transverse path of travel means (142').

7. The refrigerator compartment as defined in claim 1 wherein said transverse path of travel means (142')

is substantially immediately at a lower surface of said top wall (TW).

8. The refrigerator compartment as defined in claim 1 wherein said transverse path of travel means (142') includes a slot having a lower edge spaced a predetermined vertical distance below said top wall (TW), and said predetermined vertical distance corresponds substantially to the vertical distance between an upper surface plane of said shelf (115) and a lower surface plane of said shelf holding means (116,117). 5 10

9. The refrigerator compartment as defined in claim 2, wherein said downward movement preventing means (260,270) includes at least one stop means (270) along said vertical path of travel means for stopping downward movement of the shelf (115). 15

10. The refrigerator compartment as defined in one of claims 1 - 9 wherein said vertical path of travel means (126) is defined by an elongated member defined at least in part by lateral walls (142), said lateral walls having elongated terminal wall portions (131) spaced from each other a predetermined distance (Md), said lateral walls having elongated medial wall portions inboard of said elongated terminal wall portions (131) spaced from each other a predetermined distance substantially greater than said elongated terminal wall portions predetermined distance (Md) and in part defining the vertical path of travel means, said shelf holding means (116,117) include pin means (200) of said shelf (115) for latching with vertically spaced shelf adjusting openings (150) of said spaced lateral walls, said pin means (200) being of a predetermined axial length substantially between said first and second predetermined distances, and said transverse path of travel means (126) is defined by substantially laterally aligned slots in said elongated terminal wall portions (131) which effect transverse entry/removal of said pin means (200) relative to said vertical path of travel means (126) along said elongated medial wall portions. 20 25 30 35 40

11. The refrigerator compartment as defined in claim 10 wherein said lateral walls 142 include inboard-most wall portions, said inboard wall portions are spaced a predetermined distance from each other substantially less than the pin means (200) predetermined axial distance, and said holding means are defined by edges of said shelf adjusting openings (150) formed in said inboard wall portions. 45 50

12. The refrigerator compartment of one of claims 1 - 11, comprising means (220) carried by said shelf (115) for effecting lateral stabilization of said shelf. 55

13. The refrigerator compartment as defined in one

of claims 1 - 12 wherein said vertical path of travel means (116) include a pair of laterally spaced vertically extending walls (142), each vertically extending wall includes first and second vertically extending wall portions, said first vertically extending wall portions being spaced a first predetermined distance from each other, said second vertically extending wall portions being spaced a second predetermined distance from each other, said holding means (150,200) includes pin means (200) for latching with vertically spaced laterally aligned latching ledges of one of said first and second vertically extending wall portions, and said stabilization effecting means (220) is in contiguous relationship to the other (131) of said first and second vertically extending wall portions.

14. The refrigerator compartment as defined in claim 13 wherein said stabilization means (220) is in contiguous relationship with the vertically extending wall portions (131) defining the lesser of said first and second predetermined distances.

15. The refrigerator compartment as defined in claim 14 wherein the greater of said first and second predetermined distances corresponds substantially to the axial length of said pin means (200).

16. The refrigerator compartment as defined in one of claims 13 - 15 wherein said laterally spaced vertically extending walls (142) define a vertically extending slot therebetween, said slot having terminal vertical edges (131) defined by said first vertically extending wall portions, and a vertically slideway defined by said second vertically extending wall portions.

17. The refrigerator compartment as defined in claim 16 wherein said second predetermined distance is greater than said first predetermined distance.

18. The refrigerator compartment as defined in claim 17 wherein said stabilization effecting means (220) is in contiguous relationship to said first vertically extending wall portions (131).

FIG. 1

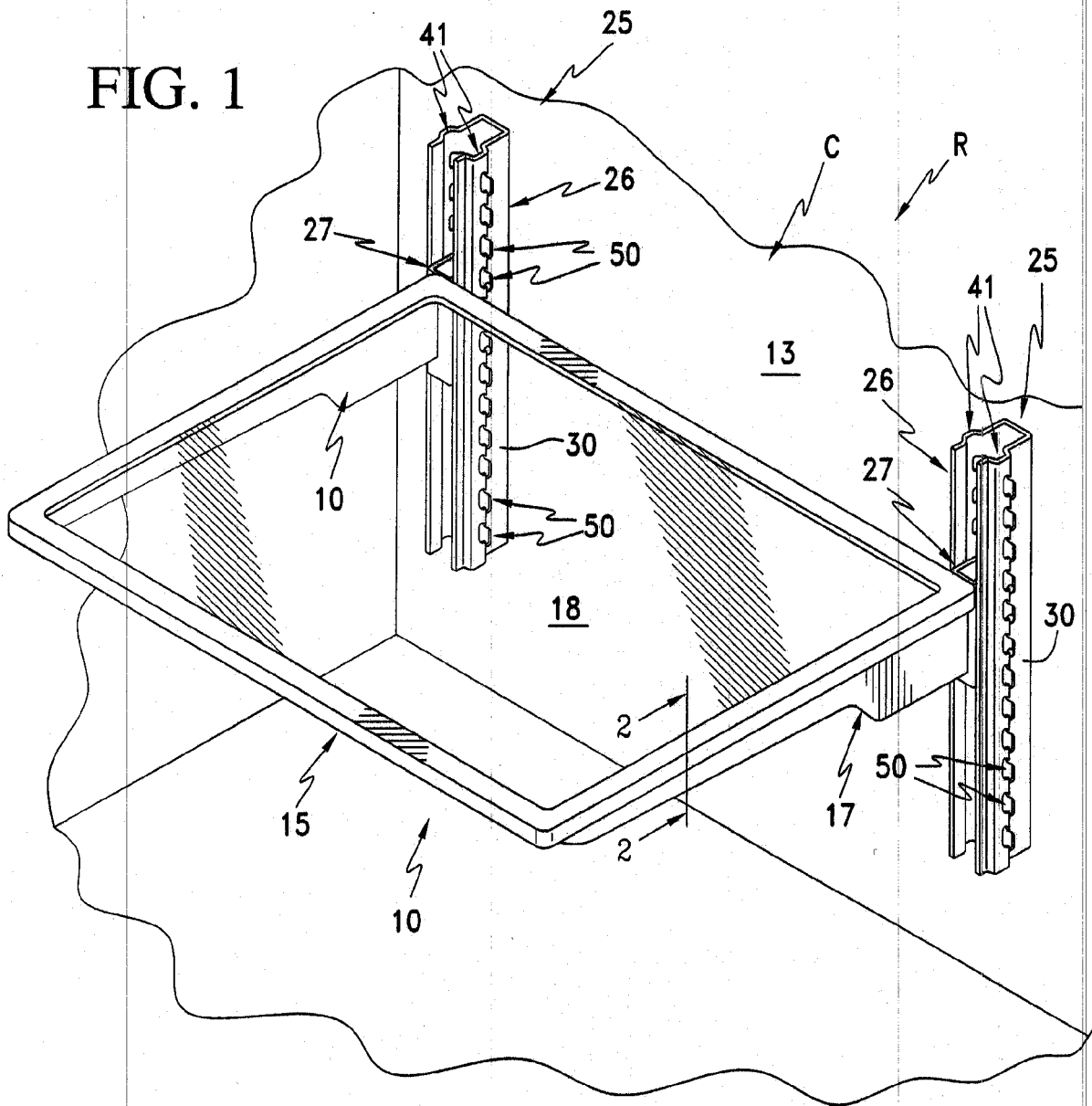
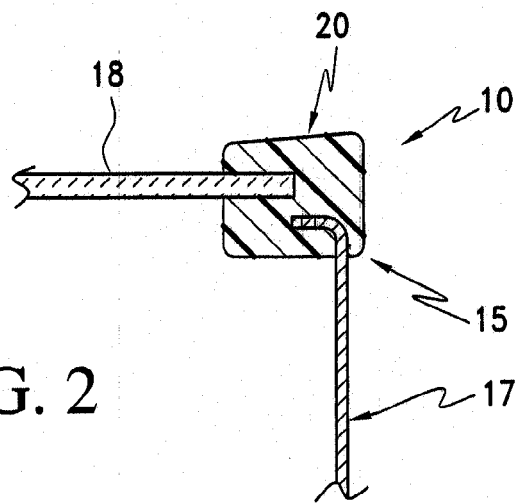


FIG. 2



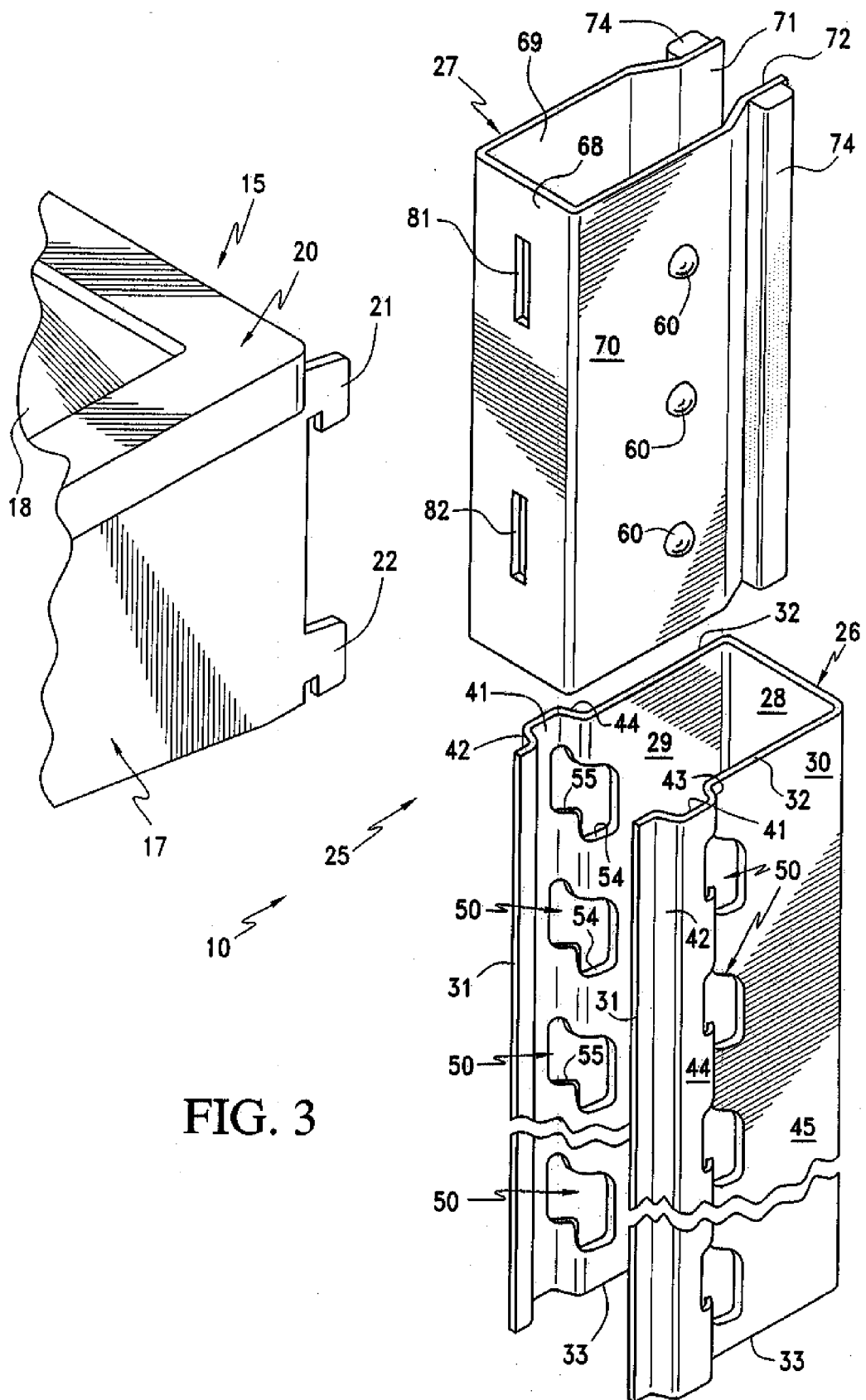


FIG. 3

FIG. 4

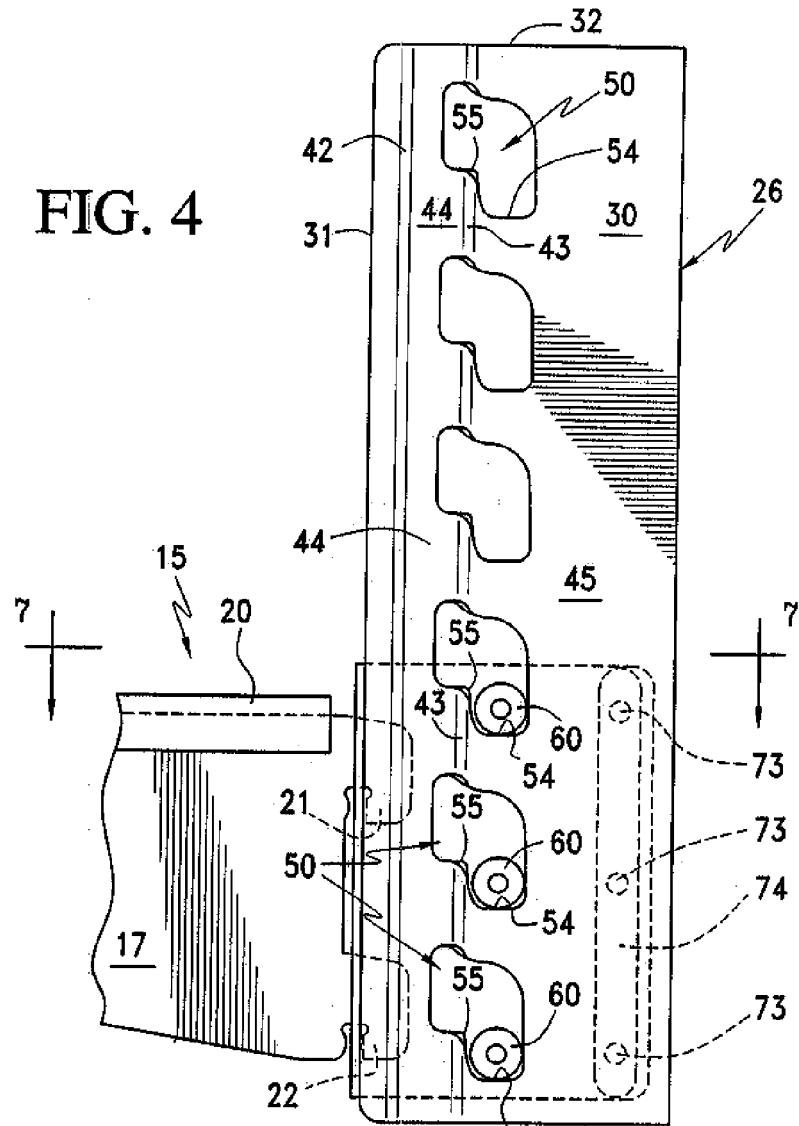


FIG. 5

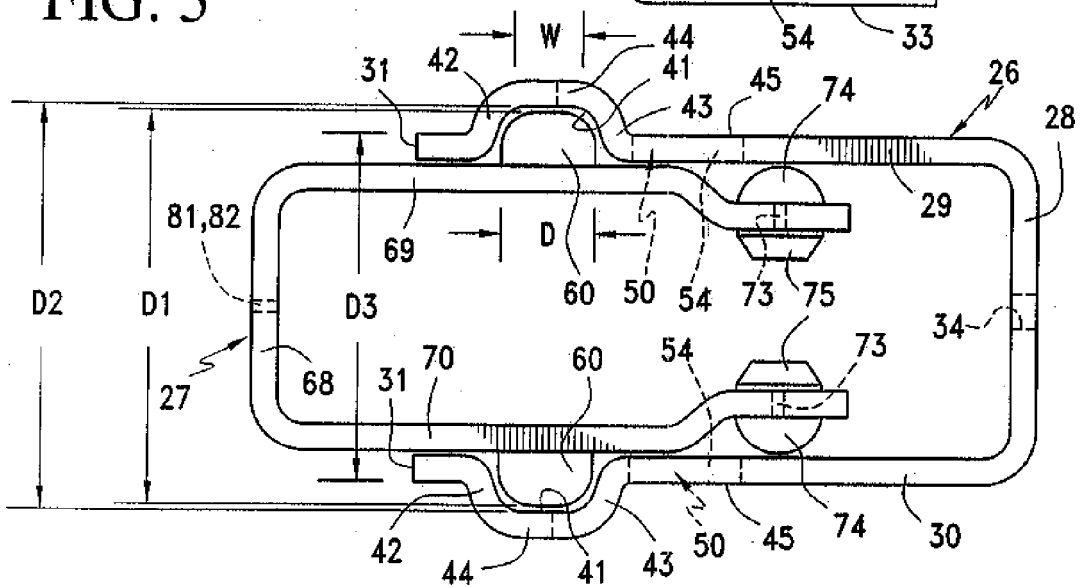


FIG. 6

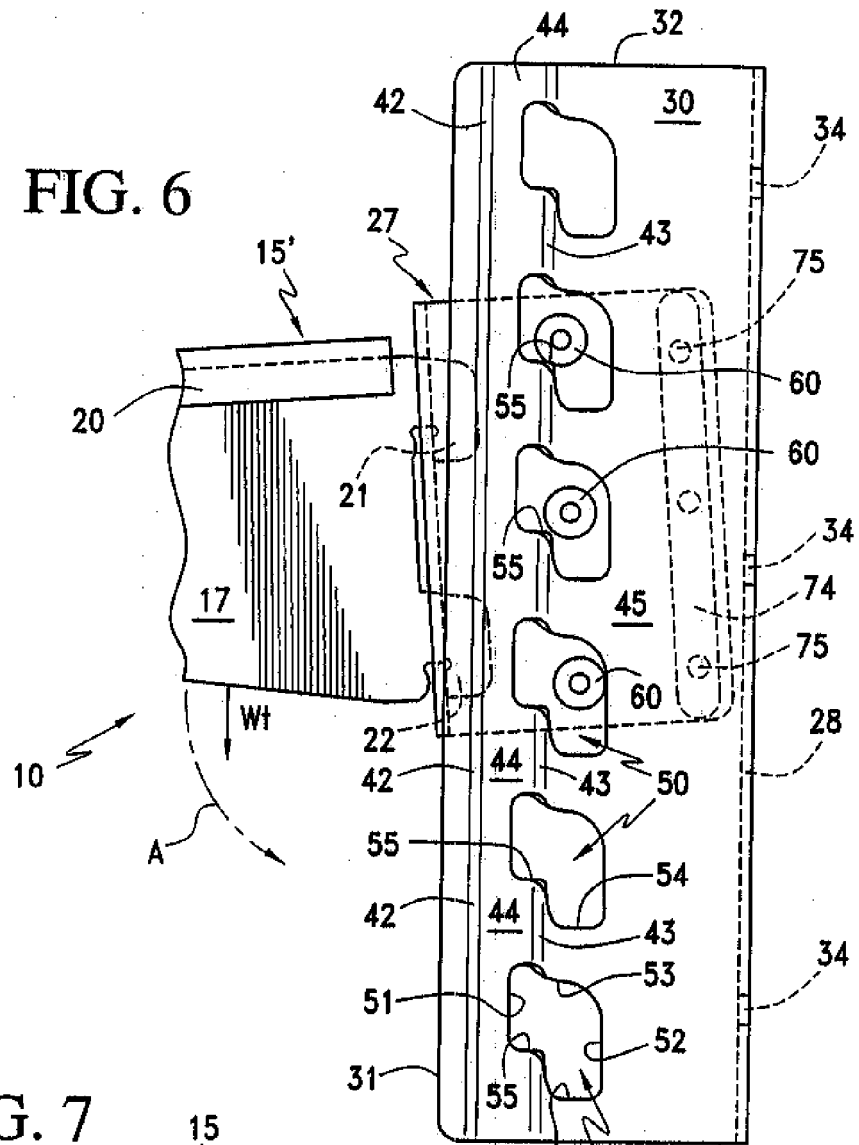


FIG. 7

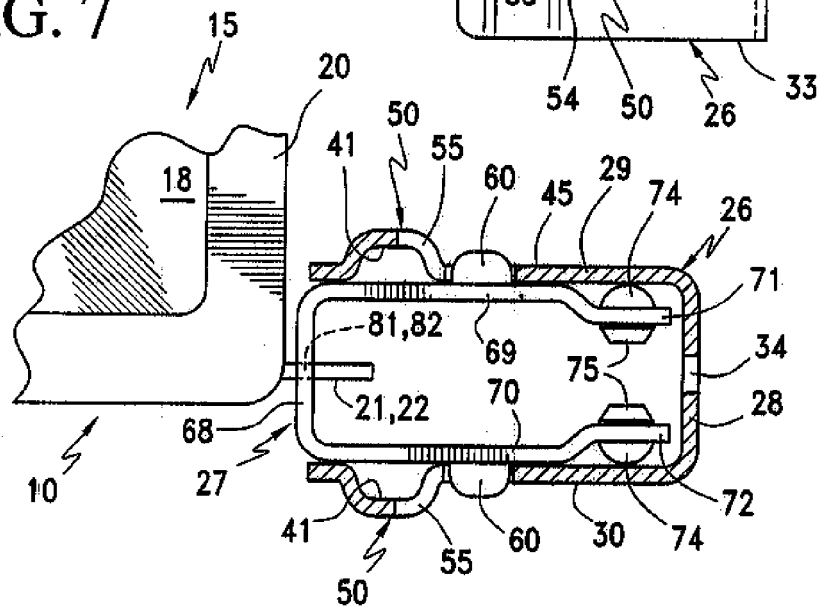


FIG. 9

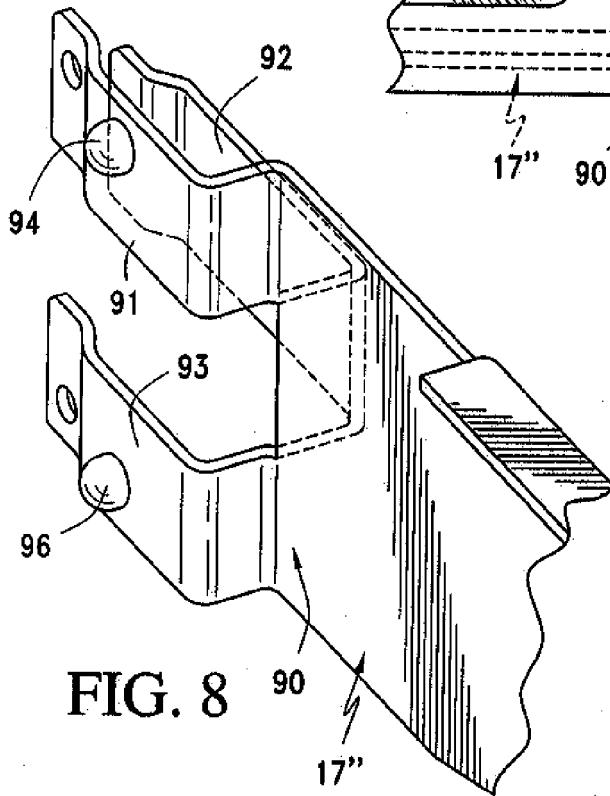
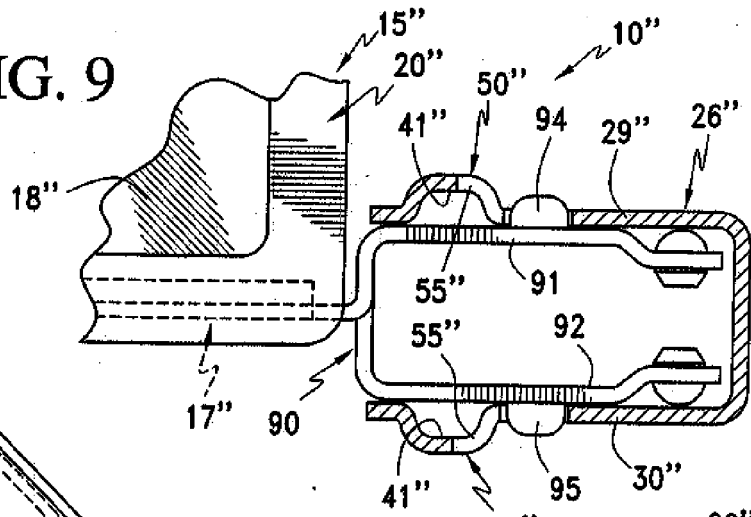


FIG. 8

FIG. 10

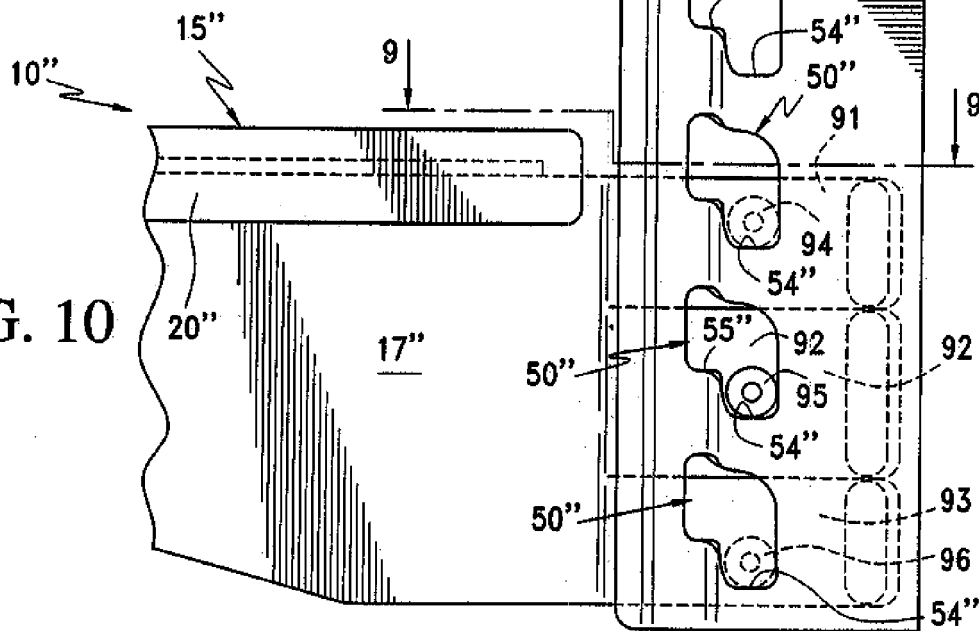


FIG. 11

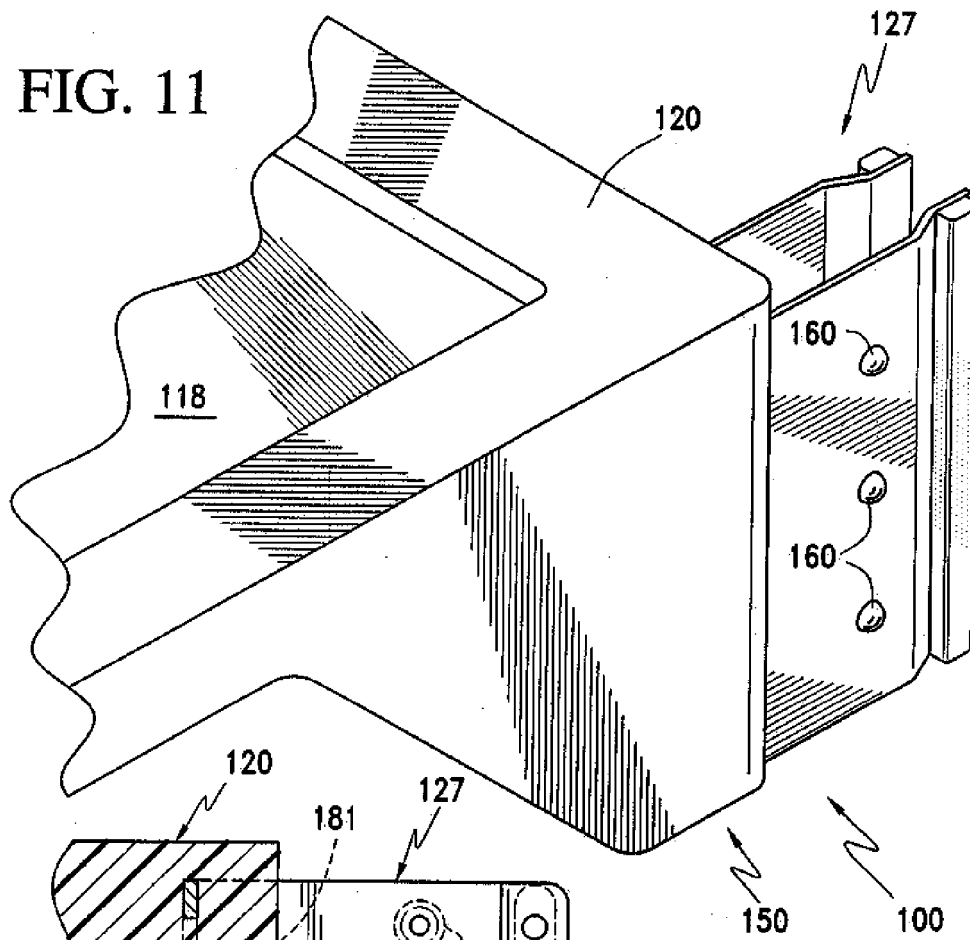


FIG. 13

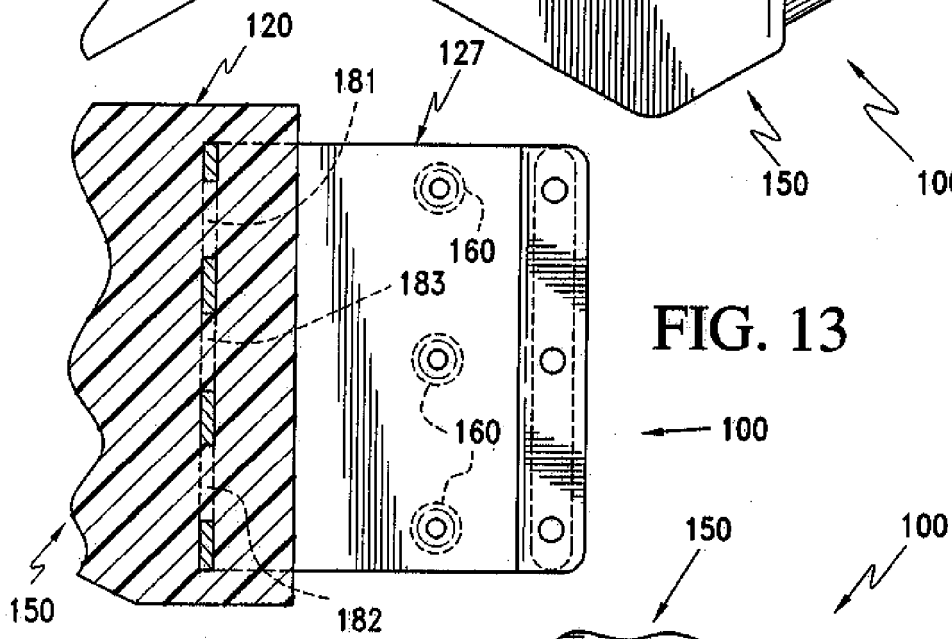
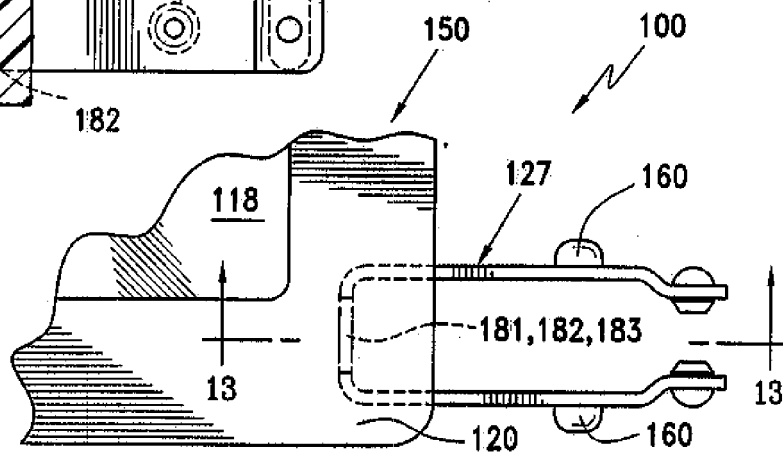
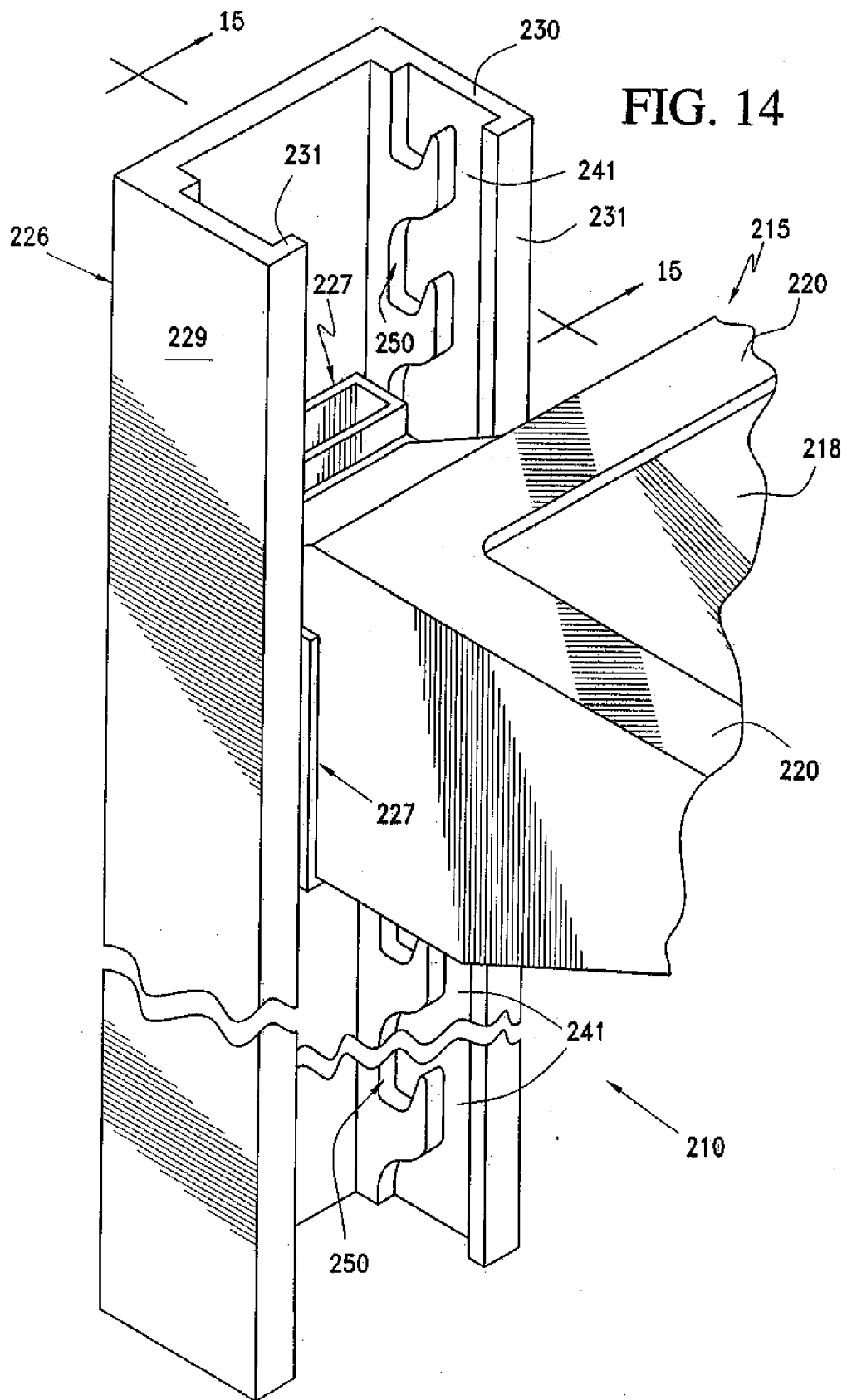


FIG. 12





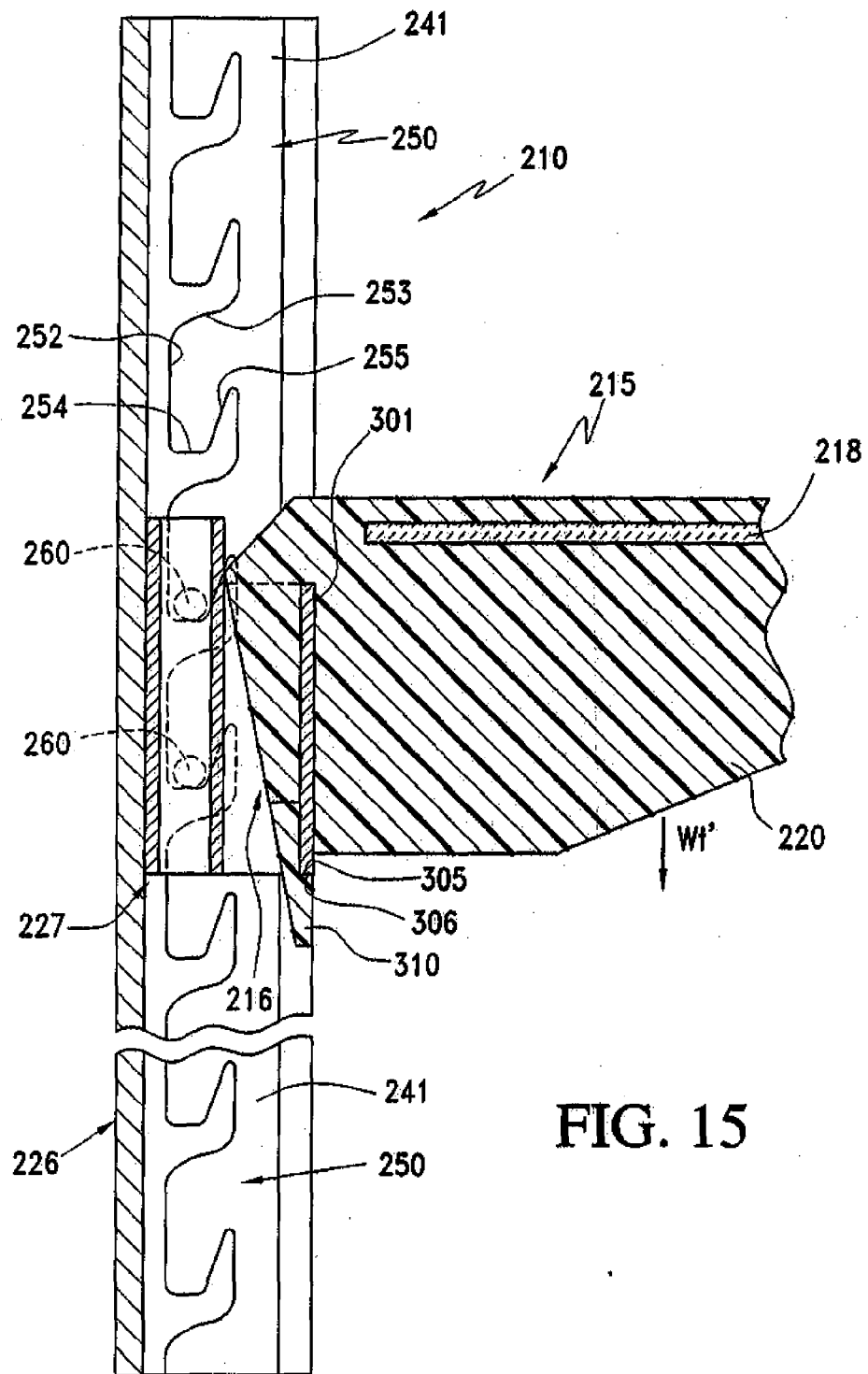


FIG. 16

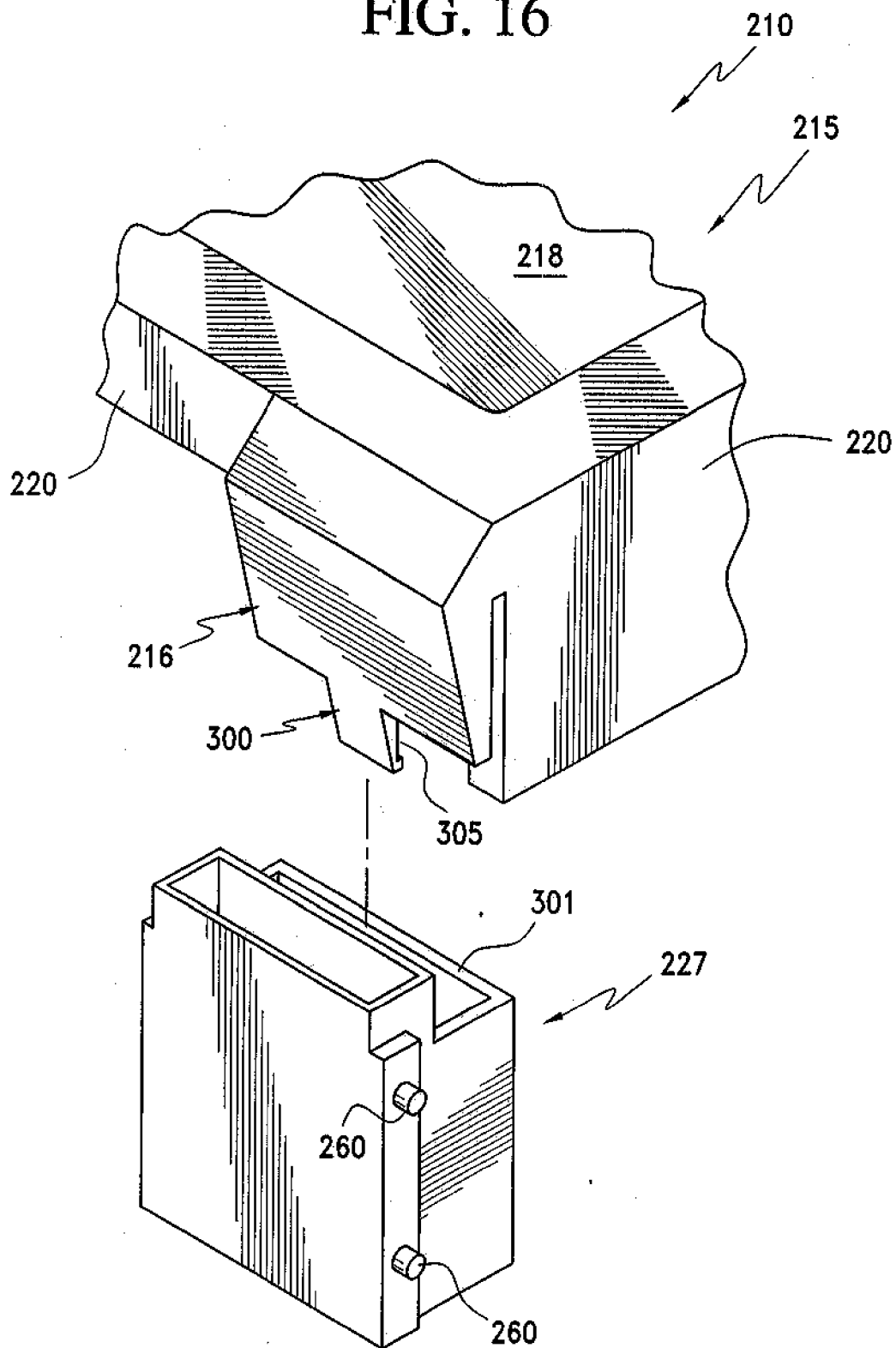


FIG. 17

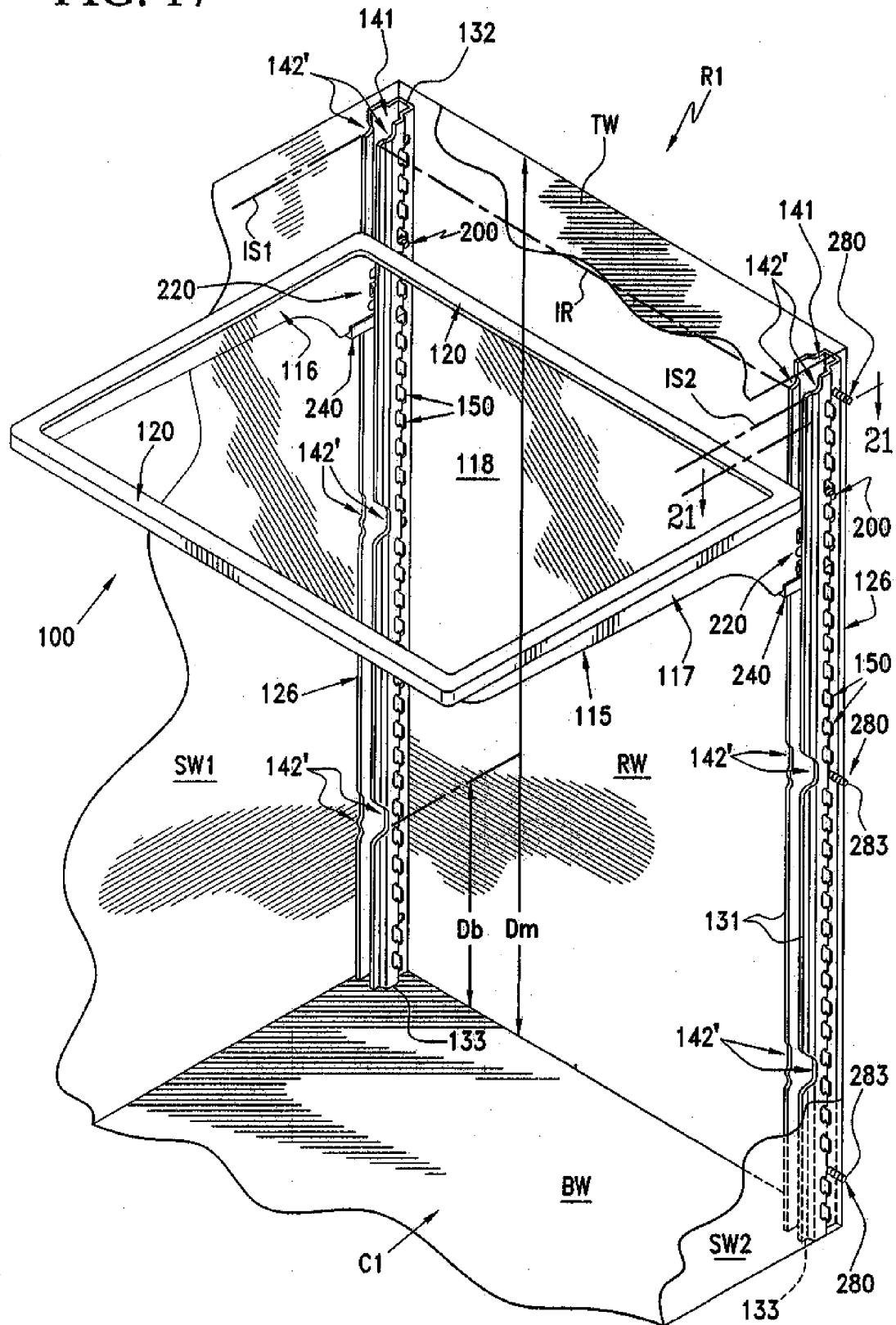
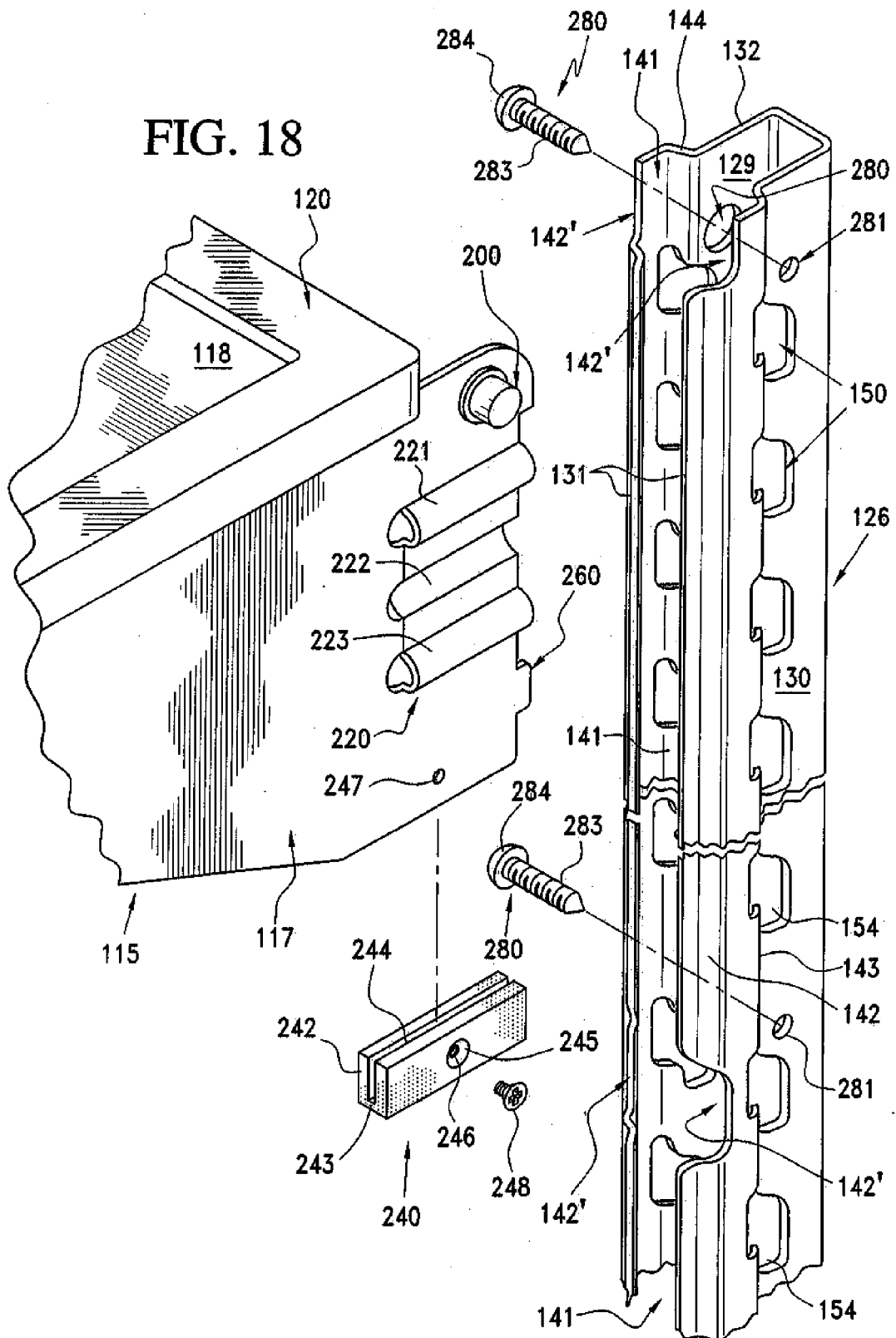


FIG. 18



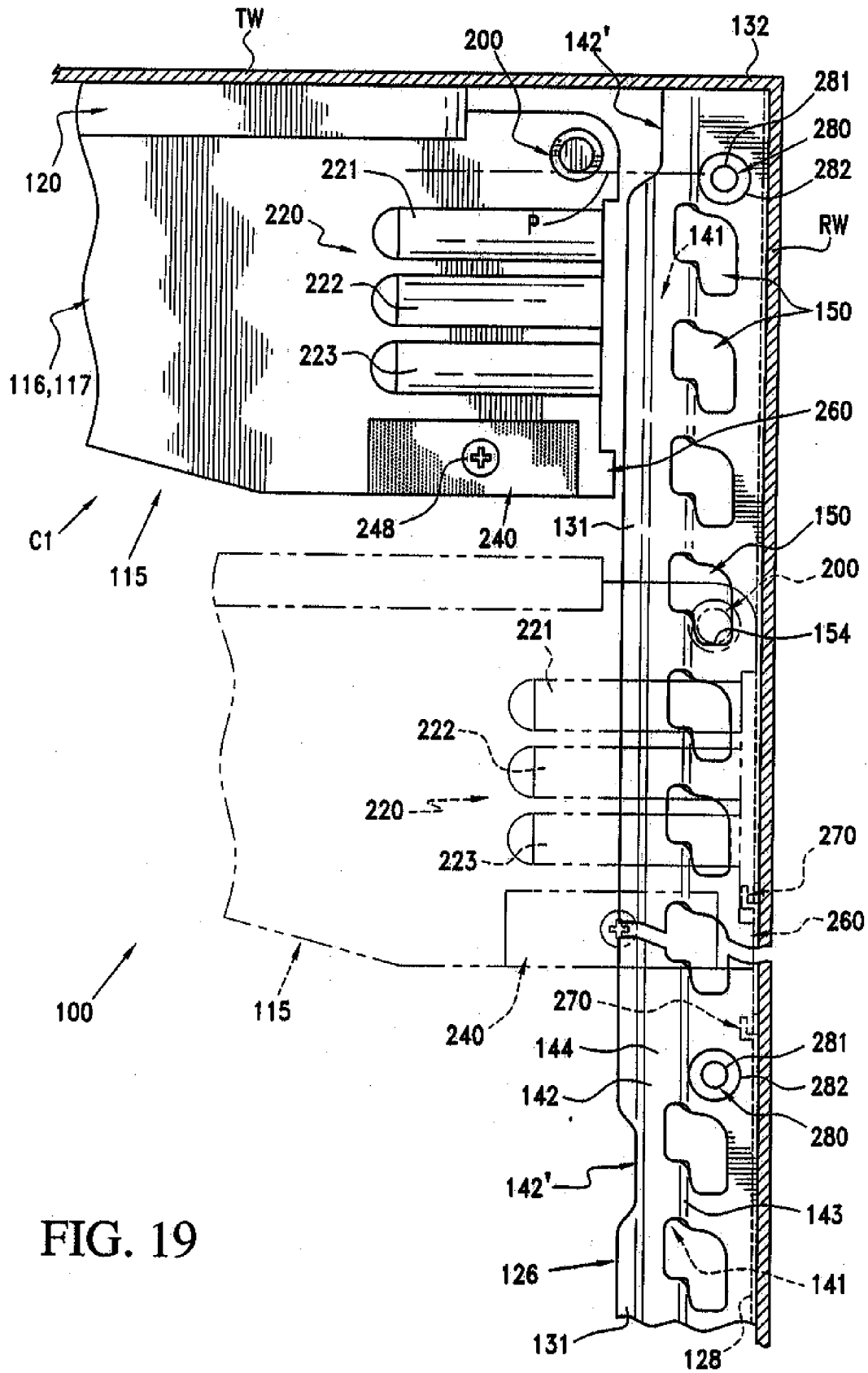
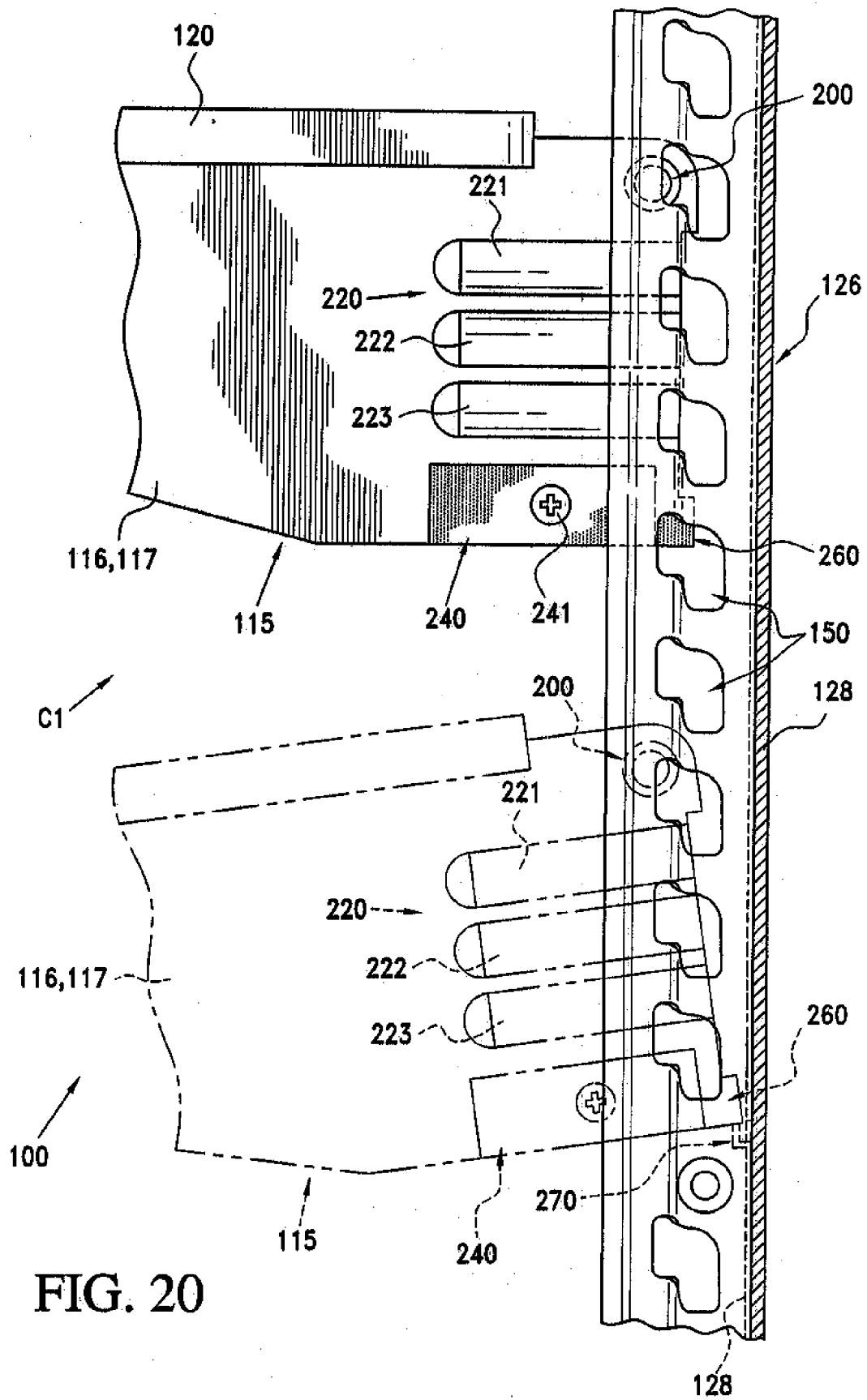


FIG. 19



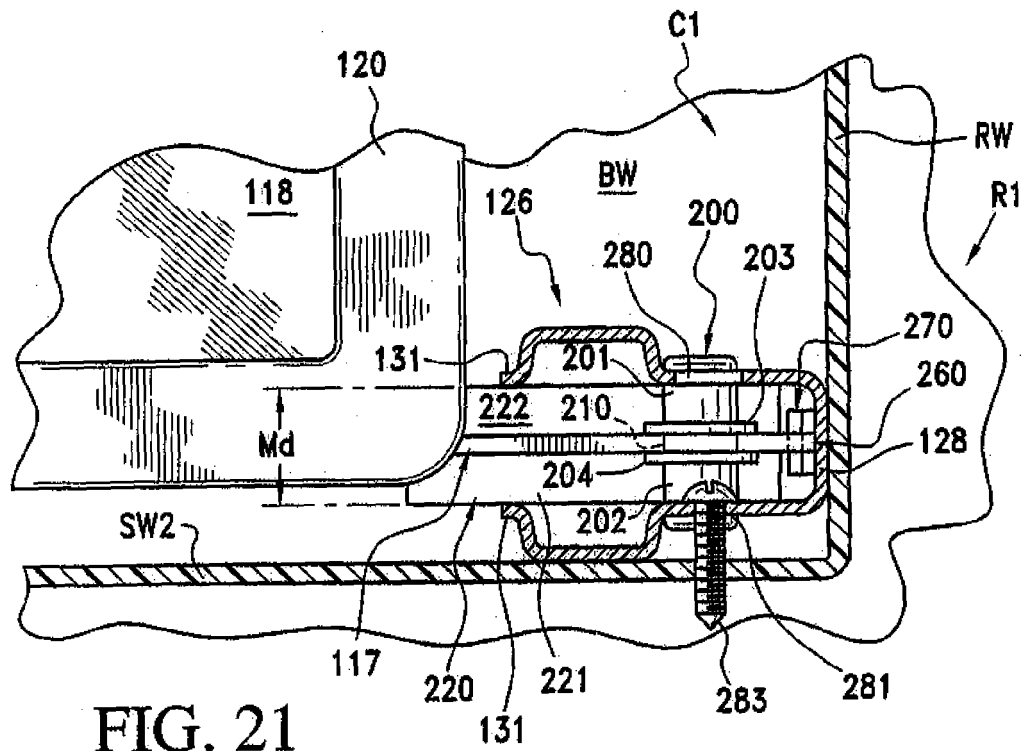


FIG. 21

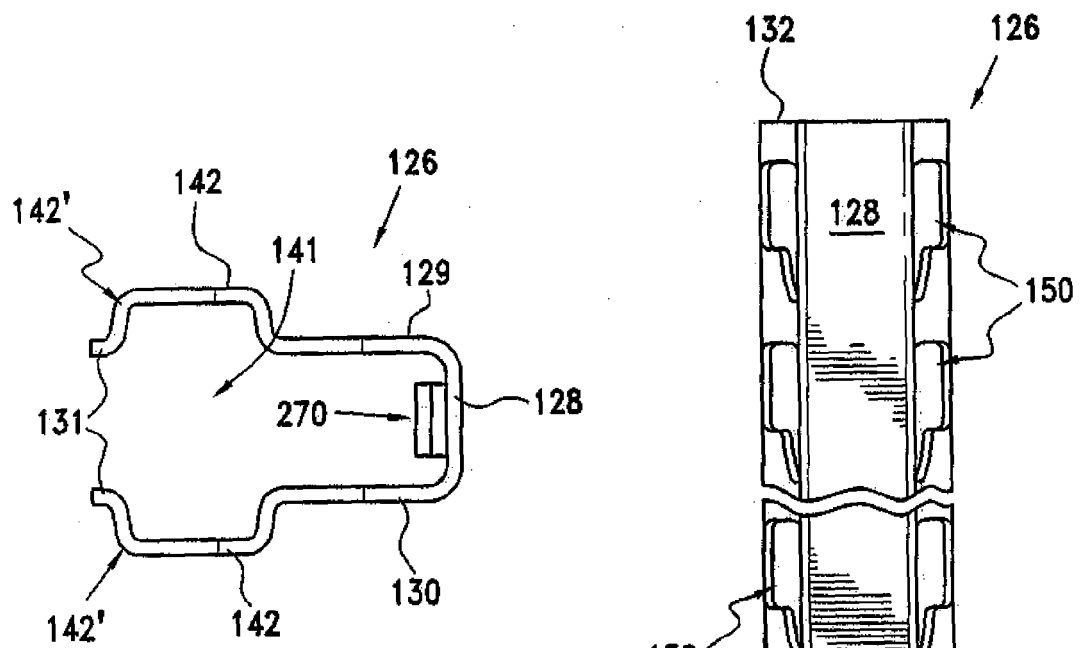


FIG. 22

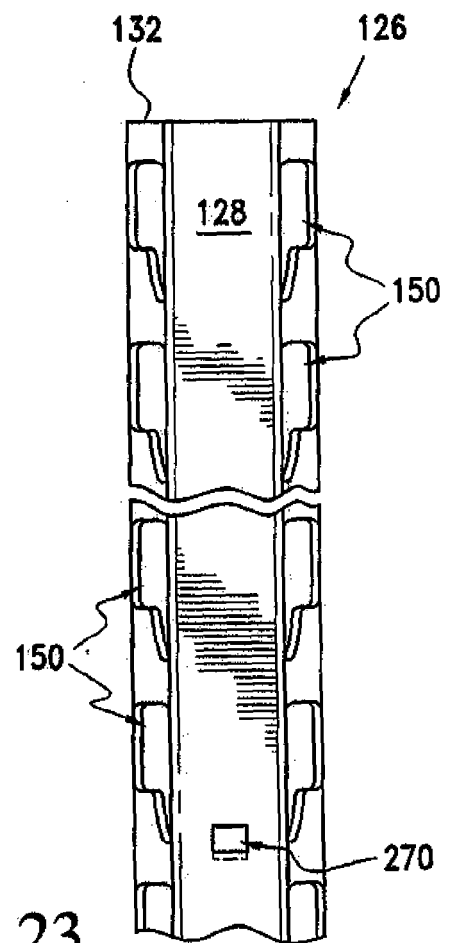


FIG. 23

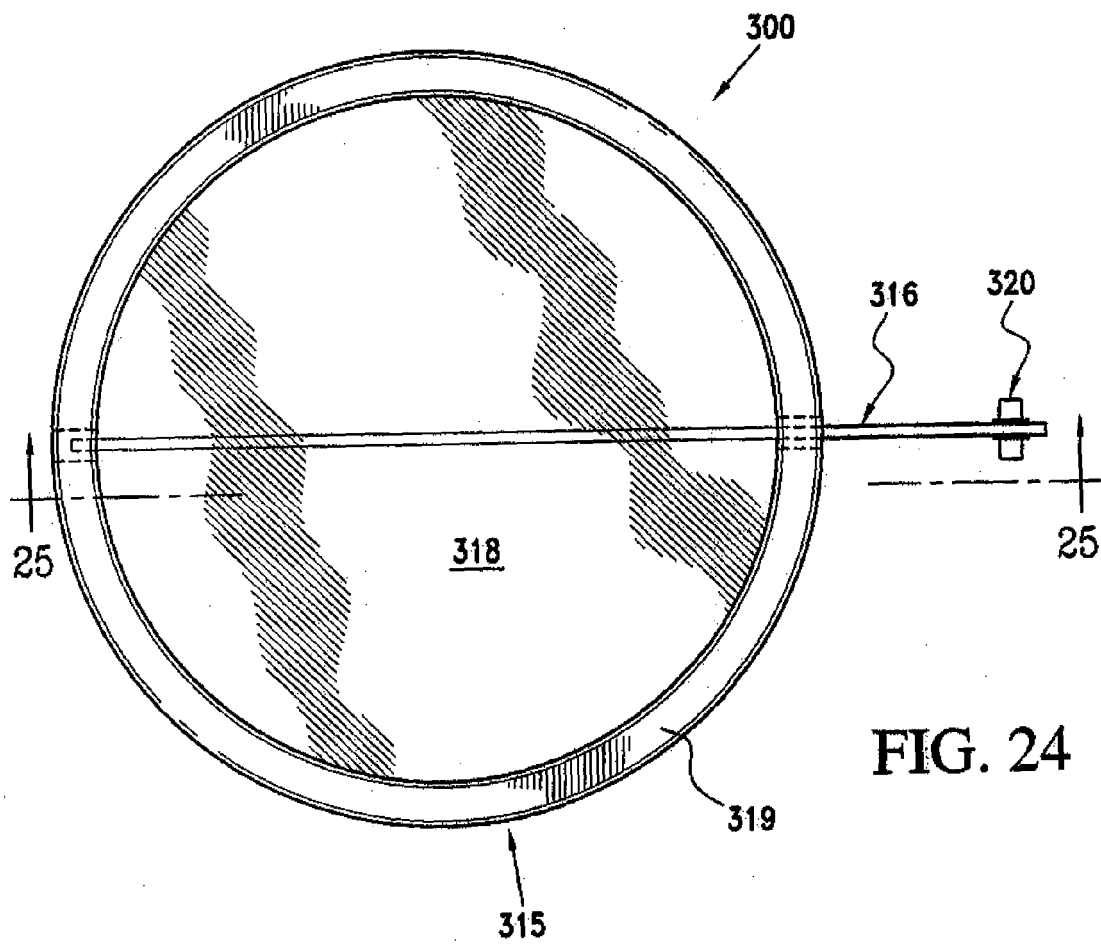


FIG. 24

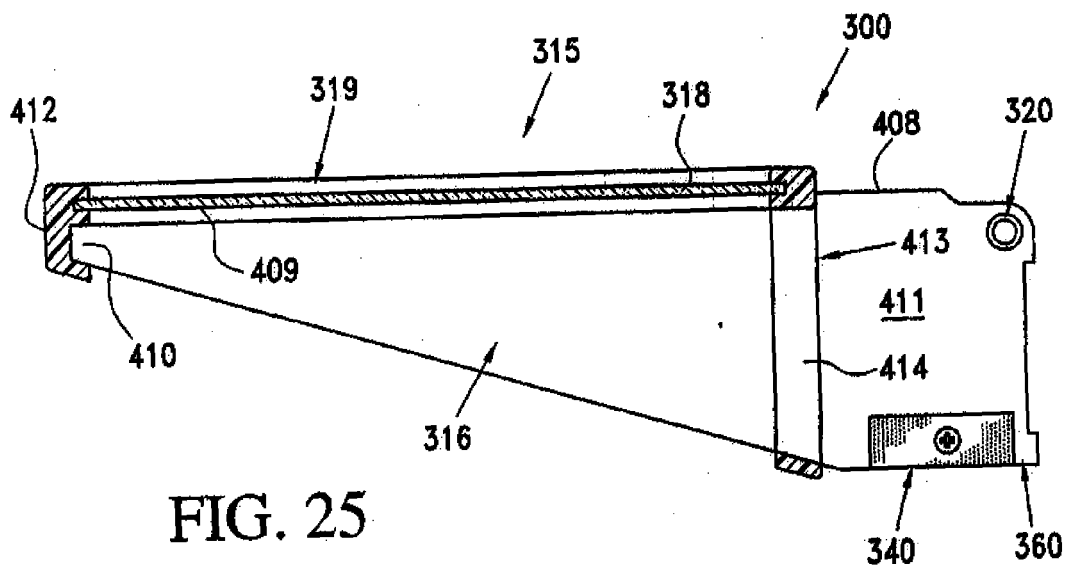


FIG. 25



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 10 6826

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 443 292 A (GEMTRON CORPORATION) 4 August 2004 (2004-08-04) * abstract * * paragraphs [0024] - [0027] * * figures 1,3,5,7 * -----	1,7,8, 10,11	INV. F25D25/02 A47B57/48
X	US 6 065 821 A (ANDERSON ET AL) 23 May 2000 (2000-05-23) * abstract; figures 1,11 * -----	1,7	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25D A47B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 February 2006	Examiner Salaün, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

4
EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- 1,7,8,10,11



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1,7,8,10,11

A refrigerator compartment with a shelf, means for establishing a vertical path of travel in said compartment, means for holding the shelf, means for effecting the release of said holding means, and means for defining a transverse entry/removal path of travel for said shelf holding means.

2. claims: 2,9,12

A refrigerator compartment with means for preventing undesired downward movement of the shelf upon release of the holding means.

3. claims: 3,13,19

A refrigerator compartment in which the means for establishing a vertical path of travel is integrally formed from the material of the walls of said compartment.

4. claims: 4,14

A refrigerator compartment with means for fastening the vertical path of travel means to a wall of said compartment.

5. claims: 5,6,12-18

A refrigerator compartment with two spaced-apart means for defining a transverse entry/removal path of travel for said shelf holding means.

6. claims: 20-26

A refrigerator compartment with means for effecting lateral stabilization of the shelf.

7. claims: 27-29

A shelf comprising a shelf panel and a shelf bracket.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 10 6826

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-02-2006

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REFERENCES CITED IN THE DESCRIPTION

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- US 5362149 A, Bird [0039] [0054] [0064]