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(54) Container

(57) The present invention relates to a collapsible container comprising a pair of stacking members which, when the container is erect, are movable between a stacking position in which the stacking members are positioned to support the base of another container stacked thereon and a filling position in which the stacking members are substantially removed from the opening in the top of the container, and wherein the container further comprises a pair of releasable locking mechanisms, each of the releasable locking mechanisms operable to retain one wall of the first pair of opposed walls in an upstanding position and locked to both the walls of the second pair of walls when the walls of the second pair of walls are also in an upstanding position, and wherein the pair of releasable locking mechanisms are independent of the stacking members.

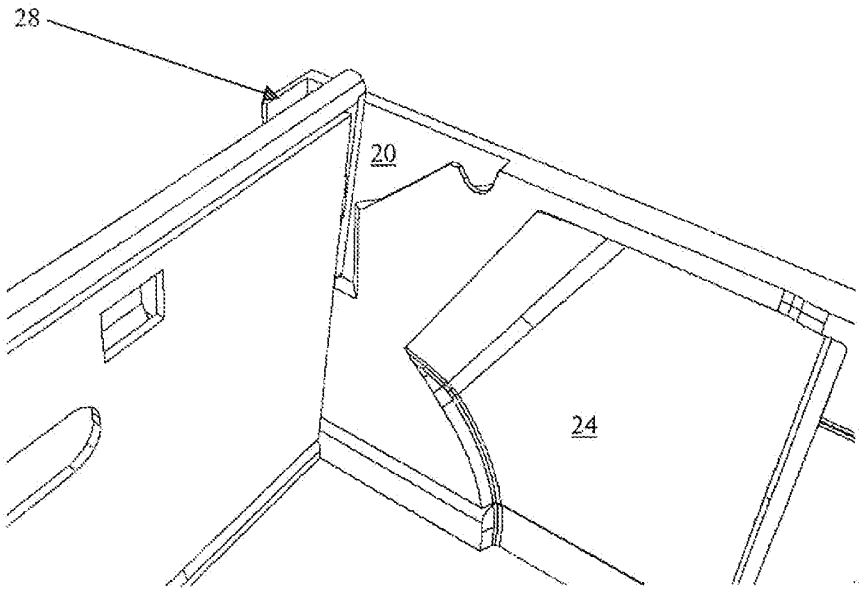

Figure 5

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Description

[0001] The present invention relates to a container, and, more particularly, to a container for consumer-products that is used for the transport of such products, and their display in a retail outlet.

[0002] Collapsible containers are known for use in many applications, including retail delivery. Typically, the containers are formed of plastics material and comprise a base and two pairs of opposed walls. Both the pairs of walls pivot about the base at the lower edges thereof, so that the container can be collapsed into a substantially flat position when not in use.

[0003] In applications where collapsible containers and nesting containers (with smaller base dimensions) are used together, solutions are known that provide stacking rails or bars that enable nesting containers to be stacked onto collapsible containers. In order to get bars sufficiently inboard to allow easy stacking location it is required that the normal method of folding the short ends first, be reversed (see GB 2359066). Using stacking rails (see GB 2431917) gives conventional folding but does not allow the rail to come inboard far enough. Both these issues make handling difficult. The present invention helps overcome these issues.

[0004] The present invention provides a collapsible container comprising a base, a first pair of opposed walls and a second pair of opposed walls, the first pair of opposed walls and the second pair of opposed walls defining an opening in the top of the container, wherein the container further comprises a pair of stacking members which, when the container is erect, are movable between a stacking position in which the stacking members are positioned to support the base of another container stacked thereon and a filling position in which the stacking members are substantially removed from the opening in the top of the container, and wherein the container further comprises a pair of releasable locking mechanisms, each of the releasable locking mechanisms operable to retain one wall of the first pair of opposed walls in an upstanding position and locked to both the walls of the second pair of walls when the walls of the second pair of walls are also in an upstanding position, and wherein the pair of releasable locking mechanisms are independent of the stacking members.

[0005] The first pair of opposed walls may form the end walls of the container and the second pair of opposed walls may form the side walls of the container. However, the opposite configuration is also possible and may be useful in certain applications.

[0006] Preferably, both the first pair of opposed walls and the second pair of opposed walls are connected to the base by a hinge, such as a living hinge or a barrel hinge.

[0007] Preferably, the stacking members pivot about the first pair of opposed walls. The stacking members may take the form of stacking bars that, when in the stacking position, run parallel to the first pair of opposed walls to provide surfaces reaching between the second pair of opposed walls to support the base of another container. Each stacking bar may comprise a rod of approximately the same length as the walls of the first pair of opposed walls and two legs that extend downwards from either end of the rod with pivot pins located at the end of each of the legs. The pivot pins may fit into pivot slots formed at either end of each of the walls of the first pair of opposed walls. Additionally, recesses may be located on the legs of the stacking bar, which recesses are designed to mate with blocks located on the ends of each of the walls of the first pair of opposed walls 14 when the stacking bar is in the filling position. This ensures that the stacking bar "clicks" into place as it adopts the filling position. However, the interaction between the blocks and the leg recesses is sufficiently weak that the stacking bar may be moved into the stacking position from the filling position without a user having to exert excessive force.

[0008] In one embodiment, the inner faces of the second pair of opposed walls interact with the outermost vertical surfaces of each of the walls of the first pair of opposed walls such that when each wall starts to collapse the second pair of opposed walls are pushed out past vertical to allow the collapsing wall to move freely and/or such that when at least one of the walls of the first pair of opposed walls starts to return to an upstanding position from a collapsed position the second pair of opposed walls are pushed out past vertical to allow the wall returning to an upstanding position to move freely. The outermost vertical surfaces of each wall may be the vertical edges of the wall itself and/or may be parts of a stacking member running parallel to each wall.

[0009] Each of the second pair of opposed walls may comprise two first recesses located at either end on the inner face of each of the second pair of opposed walls. The stacking members may be located within two opposing first recesses on the two walls of the second pair of opposed walls when the stacking members adopt the stacking position thereby preventing the first pair of opposed walls from adopting a collapsed position. This ensures that accidental activation of the releasable locking mechanisms will not cause the container to collapse when it is supporting the base of another container.

[0010] The first recesses may comprise an angled face that interacts with the outermost vertical surfaces of each of the walls of the first pair of opposed walls to allow the collapsing wall to move freely. That is, the outermost vertical surfaces of each wall of the first pair of opposed walls run along the angled faces of two opposing first recesses as the wall starts to collapse thereby pushing the second pair of opposed walls out past vertical.

[0011] Alternatively, the outermost vertical surfaces of each of the walls of the first pair of opposed walls may comprise angled faces that interact with the inner faces of the second pair of opposed walls such that when at least one of the walls of the first pair of opposed walls starts to collapse the second pair of opposed walls are pushed out past vertical to allow the collapsing wall to

move freely and/or such that when at least one of the walls of the first pair of opposed walls starts to return to an upstanding position from a collapsed position the second pair of opposed walls are pushed out past vertical to allow the wall returning to an upstanding position to move freely. As above, the outermost vertical surfaces of each wall may be the vertical edges of the wall itself and/or may be parts of a stacking member running parallel to each wall.

[0012] The first recesses may comprise an angled face that interacts with the outermost vertical surfaces of each of the walls of the first pair of opposed walls to allow the collapsing wall to move freely. That is, the outermost vertical surfaces of each wall of the first pair of opposed walls run along the angled faces of two opposing first recesses as the wall starts to collapse thereby pushing the second pair of opposed walls out past vertical.

[0013] Each of the second pair of opposed walls may comprise two second recesses located at either end on the inner face of each of the second pair of opposed walls. The stacking members may be located within two opposing second recesses when each of the walls of the first pair of opposed walls has collapsed. This ensures that, if the stacking members are in an intermediate position between the filling position and the stacking position when the first pair of opposed walls start to collapse, the stacking members are caused to adopt the filling position by interaction with the two opposing second recesses. This assists in the collapse of the first pair of opposed walls of the container.

[0014] The second recesses may comprise an angled face that interacts with the outermost vertical surfaces of each of the walls of the first pair of opposed walls to allow a wall returning to an upstanding position to move freely. That is, the outermost vertical surfaces of each wall of the first pair of opposed walls run along the angled faces of two opposing first recesses as the wall starts to return to an upstanding position from a collapsed position thereby pushing the second pair of opposed walls out past vertical.

[0015] In one embodiment, the first pair of opposed walls and the second pair of opposed walls comprise inter-engaging formations that inter-engage when the first pair of opposed walls and the second pair of opposed walls are in an upstanding position. This helps prevent the collapsible container from bursting open and collapsing outwards.

[0016] The inter-engaging formations may progressively engage from the bottom formations (those formations closest to the base of the container) to top (those formations furthest from the base of the container) and progressively disengage from top to bottom. That is, the inter-engaging formations may behave like a zip that is done up as one of the walls of the first pair of opposed walls returns to an upstanding position from a collapsed position and is undone as the same wall moves from an upstanding position to a collapsed position. Progressive engagement of the inter-engaging formations helps ensure the walls adopt the correct position as one of the walls of the first pair of opposed walls returns to an upstanding position from a collapsed position, and thereby helps the container adopt an erect position.

[0017] The inter-engaging formations may comprise at least one pair of holes located on one pair of opposed walls and at least one pair of pins on the other pair of opposed walls. Preferably, multiple pairs of holes and pins are located on the pairs of walls. In the context of the present invention, the word "pins" is used to describe any protruding shape that can fit into a corresponding hole, such as a peg, and the word "holes" is used to describe any recessed shape that a corresponding pin can fit into, such as an aperture formed between two upstands.

[0018] The holes may be located on the first pair of opposed walls and the pins on the second pair of opposed walls or the pins may be located on the first pair of opposed walls and the holes on the second pair of opposed walls. The holes or pins my be located on an end stop or flange extending perpendicular from each end of each walls of the second pair of opposed walls. The end stops or flanges can help prevent the walls of the first pair of opposed walls from overshooting an upstanding position and collapsing outwards away from the base.

[0019] The container may be designed to prevent the stacking members from rotating "backwards". In the context of the present invention, "forwards" refers to the stacking members having rotated at an angle such that they are positioned over the opening in the top of the container to support the base of another container stacked thereon the filling position (i.e. the stacking members are in the stacking position), and "backwards" refers to the stacking members having rotated in the opposite direction. When the walls of the first pair of opposed walls and the walls of the second pair of opposed walls are in an upstanding position, the stacking members may be prevented from rotating backwards by the end stop or flange extending perpendicular of the second pair of opposed walls. When the walls of the first pair of opposed walls are not in an upstanding position, the stacking members may be prevented from rotating backwards by upstands formed at either end of each of the walls of the first pair of opposed walls.

[0020] Each releasable locking mechanism may be integrally formed with a wall of the collapsible container or separately formed and then "snap-fit" into place. Alternatively, a combination of integrally moulded and separately formed features may co-operate to form each releasable locking mechanism.

[0021] Preferably, each of the releasable locking mechanisms are located on one of the walls of the first pair of opposed walls. This allows each releasable locking mechanism to independently control the collapse of one of the walls of the first pair of opposed walls.

[0022] Alternatively, a combination of features, at least one located on one of the walls of the first pair of opposed walls and at least one located on each of the walls of the

second pair of opposed walls may co-operate to form each releasable locking mechanism. For example, integrally moulded features on one of the walls of the first pair of opposed walls may interact with located on each of the walls of the second pair of opposed walls.

[0023] In one embodiment, the releasable locking mechanisms comprise a latching member; biasing means for biasing the latching member in an engaged position in which the latching member provides locking engagement between one of the walls of the first pair of opposed walls in an upstanding position and both the walls of the second pair of walls when the walls of the second pair of walls are also in an upstanding position; and at least one actuator operable against the biasing means, to move the latching member to a disengaged position in which the latching member is released so as to disengage the wall of the first pair of opposed walls and both the walls of the second pair of walls.

[0024] Preferably, the biasing means is configured to bias the latching member in an extended position, and the at least one actuator is operable against the biasing means, to move the latching member to a retracted position.

[0025] Such actuators may comprise a button which, when depressed, causes retraction of the latching member. Alternatively, such actuators may comprise a rotatable lever, which, when rotated, causes retraction of the latching member. Typically, each releasable locking mechanism comprises a single actuator, however, multiple actuators may be preferred for some applications.

[0026] The latching member may comprise a pair of catches, which, when the latching member is in an engaged position interlock engage with formations on one of the pairs of opposed walls.

[0027] In one embodiment, at least one end of the latching member is received in a complementary recess in an adjacent wall or is located under a hook formation on an adjacent wall. Preferably, both ends of the latching member are received in complementary recesses in a pair of opposed walls or are located under hook formations on adjacent walls.

[0028] The at least one actuator may be located towards the centre of one of the walls of the first pair of opposed walls, with the latching member extending from either side thereof. In one arrangement, the latching bar is configured with a kink, which is adapted to slide over a projection, to thereby move the latching bar towards the at least one actuator. In this way, the latching bar and button may be formed in one piece. Other methods for connecting the at least one actuator to the latching bar, to enable retraction thereof, are possible and contemplated.

[0029] The at least one actuator may be configured to change an orientation of at least a portion of the latching member, so as to reduce its effective length along the lateral direction, parallel to the wall it is located on.

[0030] Alternatively, the latching mechanism may comprise a clip, and the biasing means biases the clip to engage with a complementary recess. The at least one actuator is operable against the biasing means, to disengage the clip from the recess. The clip may be pivotally mounted on a wall from a one of the pairs of opposed walls, and the recess formed in a wall from the other pair of opposed walls, with the at least one actuator operable to pivot the clip to engage and disengage it from the recess.

[0031] The at least one actuator may be located in a central portion of a wall. The clip and recess or hook formation may be provided between one of the walls of the first pair of opposed walls and the end stop or flange.

[0032] Preferably the biasing means comprises at least one leaf spring, which is compressed against its biasing action by operation of the at least one actuator. For example, the leaf spring may be compressed against a surface of a wall by any method that resists rotation.

[0033] Preferably, the container is collapsible to a substantially flat configuration. This makes it easier to store such containers when they are not in use.

[0034] Collapsible containers according to the present invention will typically be formed from a plastics material. Plastics materials have multiple advantages, including the fact that they are lightweight and easy to clean.

[0035] Collapsible containers according to the invention may further comprise retention means for retaining a stacking member in the plane of the wall to which it is pivotably attached. This feature is particularly advantageous when the containers are being washed, typically upside down, in general use or when the container is being erected or folded.

[0036] The retention means may comprise one or more ears extending from the uppermost, in use, surface of the wall and partially surrounding the stacking member. The ear(s) are arranged and constructed so that they prevent the stacking member from pivoting outwardly from the wall (i.e. away from the inner space defined by the erected container). The retention means may further comprise one or more cut backs or accesses to the stacking member in the filling position.

[0037] Preferably, the retention means comprises one or more upstands extending from the uppermost, in use, surface of the wall. The upstand(s) are arranged and constructed so that they prevent the stacking member from pivoting inwardly (i.e. towards the stacking position or the inner space defined by the erected container).

[0038] The collapsible containers may comprise one or more ribs extending inwardly from one or both of the second pair of walls. Preferably, the rib(s) extend along or adjacent the upper, in use, edge of the wall. When the rib(s) extend along the upper edge of the wall, they prevent the stacking member from moving above the top rim of the container when the container is being lifted or is placed upside down for washing.

[0039] The first recess formed on the inner face of a wall of the second pair of opposed walls may comprise a slot for receiving an end of the bar rod for securing the stacking bar, when the bar is in the stacking position.

[0040] The outermost vertical surfaces of each of the walls of the first pair of opposed walls may comprise one or more angled recesses preferably adjacent the top, in use, of said outermost vertical surface. In this embodiment, the stacking member may comprise an upstand, whereby the one or more angled recesses of the wall are engageable with the upstand. These features prevent the stacking member from moving away (inwardly or outwardly) from the plane of the wall to which it is pivotably connected.

[0041] The stacking member may comprise a pair of pivot pins, each pin being movable within a slot extending along part of the outermost vertical surface of a wall of the first pair of opposed walls, and wherein the slot comprises a protrusion for securing the stacking member in the filling position. Preferably, the protrusion comprises a first and a second angled surface, the first angled surface being shorter than the second angled surface. The first shorter angled surface prevents the bar pivot pin from travelling up the slot and secures the bar in the filling position and the second longer angled surface helps the bar pivot to slide past the protrusion into the bottom portion of the slot.

[0042] When the stacking members are stacking bars, each of the two first recesses may comprise an undercut to receive one end of the stacking bar when the stacking bar is in the stacking position thereby preventing the wall 14 from being folded when the bar 18 is in the stacking position. The stacking bar may comprise a nose which, in use, secures the end of the stacking bar in the undercut.

[0043] The present invention will now be described in more detail, by way of example only, and with reference to the Figures, in which:

Figure 1 is a perspective view of a collapsible container according to the present invention;
Figure 2 is a perspective view of a portion of a stacking bar suitable for use in the present invention;
Figure 3 is an overhead view of the collapsible container, showing a stacking member in the stackable position;
Figure 4 is a perspective view of a portion of one of the walls of the first pair of opposed walls suitable for use in the present invention;
Figure 5 is a perspective view of the collapsible container, showing the position of two of the walls as one of the walls starts to collapse;
Figure 6 is a perspective view of the collapsible container, showing the position of two of the walls as one of the walls continues to collapse;
Figure 7 is a perspective view of the collapsible container, showing the position of two of the walls as one of the walls has almost completely collapsed;
Figure 8 is a perspective view of a releasable locking mechanism suitable for use in the present invention;
Figure 9 is a perspective view of the collapsible container, showing the outside comer;
Figure 10 is a perspective view of a second collapsible container according to the invention, showing a stacking member in the filling position;
Figure 11 is a perspective view of the collapsible container, showing the stacking member of
Figure 10 in the stacking position;
Figure 12 is an overhead view of the collapsible container, showing the stacking member of
Figure 10 in the stacking position;
Figure 13 is a perspective view of the collapsible container, showing the stacking member of
Figure 10 between a filling position and a stacking position;
Figure 14 is a perspective view of a portion of a stacking bar suitable for use in the container of Figure 10;
Figure 15 is a further perspective view of a portion of the stacking bar of Figure 14;
Figure 16 is a perspective view of a third collapsible container according to the invention, showing a stacking member in the filling position;
Figure 17 is a front view of a portion of a stacking bar suitable for use in the container of
Figure 16;
Figure 18 is a perspective view of a portion of a stacking bar suitable for use in the container of Figure 16;
Figure 19 is a perspective view of a portion of one of the walls of the first pair of opposed walls suitable for use in the container of Figure 16;
Figure 20 is a perspective view of a portion of the wall of Figure 16, with a stacking bar in the filling position;
Figure 21 is a perspective view of a portion of the wall of Figure 16, with a stacking bar between the filling position and the stacking position;
Figure 22 is a further perspective view of a portion of the wall of Figure 16, with a stacking bar in the filling position;
Figure 23 is a perspective view of a portion of the wall of Figure 16, with a stacking bar in the filling position;
Figure 24 is a further perspective view of a portion of the wall of Figure 16, with a stacking bar between the filling position and the stacking position;
Figure 25 is a cross-sectional view of a fourth collapsible container according to the invention, showing a stacking member in the stacking position;
Figure 26 is a perspective view of the container of Figure 25, showing a stacking member in the stacking position;
Figure 27 is a perspective view of the container of Figure 25, without the stacking bar; and
Figure 28 is a perspective view of a portion of a stacking bar suitable for use in the container of Figure 25.

[0044] Figure 1 illustrates a collapsible container 10 in accordance with one embodiment of the present invention. The container 10 comprises a base 12, a first pair of opposed walls 14 and a second pair of opposed walls 16. The first and second pairs of opposed walls 14, 16

are pivotally attached, by hinges (not shown), at their lower edges to the base 12.

[0045] Container 10 is typically formed by injection moulding from a suitable plastics material, with a pattern of openings in the base 12 and walls 14, 16 to minimize the weight of an unfilled container 10. A handle opening is provided in a central, upper area of each of the walls of the first pair of opposed walls 14, for use in carrying the container 10. As the skilled person will appreciate, the shape, configuration and dimensions of the container 10, including the relative proportions and thicknesses of the base 12 and walls 14, 16 are chosen according to the design requirements. The base 12, walls 14, 16 and other parts of container 10 are typically moulded as separate parts and assembled together by snap-fit connection or otherwise.

[0046] Stacking bars 18 are located at either end of the container parallel to the first pair of opposed walls 14. Each stacking bar 18 comprises a rod 18a, which is approximately the same length as the walls of the first pair of opposed walls 14 and extends horizontally across the container when the stacking bar 18 is in the stacking position, and two legs 18b, which extend downwards from either end of the rod 18a when the stacking bar is in the filling position (see Figure 2). Each stacking bar 18 pivots about one of the walls of the first pair of opposed walls 14. Pivot pins 18c located at the end of each of the legs 18b fit into pivot slots 14a formed at either end of each of the walls of the first pair of opposed walls 14. Blocks 14b located on the ends of each of the walls of the first pair of opposed walls 14 mate with recesses 18d located on the legs 18b when the stacking bar 18 is in the filling position (see Figure 4).

[0047] When a stacking bar 18 is in the stacking position (see Figure 3), each end of the stacking bar 18 is located within a pair of first recesses 20 within the second pair of opposed walls 16. This allows the stacking bars to settle into the stacked position and prevents the wall 14 about which the stacking bar 18 pivots from collapsing. However, when the stacking bars 18 are in the filling position the wall 14 about which the stacking bars 18 pivot are free to collapse (see Figures 5, 6 and 7). Additionally, each of the first recesses have an angled face 22 that interacts with the outer edge of the stacking bar 18 and an adjacent vertical edge of a collapsing wall 14. Interaction at either end of a collapsing wall 14 with two opposing first recesses within the second pair of opposed walls 16 pushes both of the second pair of opposed walls 16 out past vertical.

[0048] If a stacking bar 18 is in an intermediate position (between the filling position and the stacking position) when one of the walls of the first pair of opposed walls 14 starts to collapse, either end of each stacking bar 18 will interact with a pair of second recesses 24 within the second pair of opposed walls 16 and be pushed into the filling position. Additionally, each of the second recesses have an angled face 26 that interacts with the outer edge of the stacking bar 18 and an adjacent vertical edge of one of the walls of the first pair of walls 14 as the wall 14 returns to an upstanding position from a collapsed position. This interaction at either end of the wall 14 returning to an upstanding position with two opposing second recesses within the second pair of opposed walls 16 pushes both of the second pair of opposed walls 16 out past vertical.

[0049] The container 10 is designed such that the stacking bars 18 can adopt the stacking position (in which the stacking bars 18 rotate forwards such that they are positioned over the opening in the top of the container 10), the filling position (in which the stacking bars 18 are arranged substantially perpendicular to the walls of the first pair of walls 14), and intermediate positions (between the filling position and the stacking position). The container 10 is also designed to prevent the stacking bars 18 from rotating backwards. When the walls of the first pair of opposed walls 14 and the walls of the second pair of opposed walls 16 are in an upstanding position, the stacking bars 18 will be prevented from rotating backwards by the end stop or flange 28 extending from each end of each of the second pair of opposed walls 16. When the walls of the first pair of opposed walls 14 are not in an upstanding position, the stacking bars 18 are prevented from rotating backwards by upstands 14c formed at either end of each of the walls of the first pair of opposed walls 14.

[0050] Releasable locking mechanisms 30 are located within each of the walls of the first pair of opposed walls 14 (see Figure 9). Each releasable locking mechanism comprises a latching bar 30a, biasing means 30b and two actuators 30c (see Figure 8). When the walls of the first pair of opposed walls 14 are in an upstanding position, the walls are held in an upstanding position by both ends of the latching bar 30a being located under hook formations 28 located on the end stop or flange 28. Also located on the end stop or flange 28 are multiple pins 32 that engage with holes (not shown) located on the vertical edge of one of the walls of the first pair of opposing walls 14.

[0051] The containers 10 shown in Figures 1 to 10 are generally washed in an upside down position. In doing so, the stacking bars 18 can fall out of location, i.e. away from the filling or stacking position, and hanging down, out of the plane of the walls to which they are attached. When hanging down, the bars 18 can be damaged and cause a jam in the tray wash.

[0052] The container shown in Figures 10 to 15 comprises features for maintaining the bar rod 18a sitting on top of the upper, in use, edge of wall 14 and for preventing the bar 18 from moving above the top rim of the container 10. In Figure 10, the bar 18 is shown in the filling position with the bar rod 18a positioned above the upper edge of the wall 14.

[0053] A retention means 34 comprises an ear 34a extending from the upper edge of wall 14 and partially surrounding the bar 18. Preferably, the combined height of the wall 14 and ear 34a upper surface of the ear(s) is the

same or smaller than the height of the adjacent wall 16. The bar 18 sits between the ear and the top edge of the wall 14 and the ear 34a prevents the bar 18 8 from moving above the top rim of the container 10. In addition, when the container 10 is being erected, the bar 18 is prevented from pivoting outwardly from the wall 14. Preferably, the ear 34a comprises a cut back 34b to give access to the bar rod 18a for manual and automated operation.

[0054] A further retention means is shown comprising one or more upstands 36 extending from the upper edge of the wall 14. When the container 10 is being folded or erected, the bar 18 is prevented from pivoting inwardly from the wall 14 (towards the stacking position) by the upstand(s) 36. In use, when the containers are being stacked on top of each other, the bar 18 can be pulled manually over the upstand(s) 36 into the stacking position.

[0055] The bar 18 might move above the top rim of the container 10 when the container is being washed upside down but also in general operation or when the container is lifted by holding the bars 18 in the stacking position. The container 10 may therefore comprise one or more ribs 38 extending inwardly from the upper edge of the wall 16 to prevent such movement. The rib(s) may extend along the inner surface of the wall 16 so that the rib guides the bar 18 into the filling position. The bar 18 or bar rod 18a may comprise a recess 18e (see Figure 15) to fit under the rib 38.

[0056] First recess 20 can be seen for example on Figure 13. The bar legs 18b may comprise a corresponding recess 18f to facilitate the engagement of the bar 18 with the wall 16 for added security, in particular when the bar 18 is being rotated between the stacking and the filling position. First recesses 20 may each comprise a slot 40 to receive an end of the bar rod 18a to secure the bar 18 is in the stacking position. In use, the bar 18 can be lifted out of the slot 40 and pulled into the filling position.

[0057] It has therefore been shown that the features described with reference to Figures 10-15 are advantageous when the containers are in an upside down position e.g. for washing, and will also protect the bar during general handling because the bars are retained in the overall dimensions of the container, even when the containeris upside down. This solution will also help prevent the bar leg getting damaged during handling generally.

[0058] Further advantageous features will be described with reference to Figures 16 to 24. When the containers 10 described above are being erected, the stacking bar 18 needs to be out of the way, i.e. secured within the plane of the wall 14. If the stacking bar 18 falls forward, the side wall will not move back to vertical and the end wall will not locate. The container shown in Figures 16 to 24 comprises features that enables the bar 18 to be retained within the plane of the wall 14 when the container is being erected and when the container is being washed upside down.

[0059] The stacking bar 18 may comprise an upstand 18g on the bar rod 18a or the bar leg 18b, adjacent the junction between the bar rod 18a and the bar leg 18b. The upstand 18g retains the stacking bar within the plane of the wall 14 by interacting with the end of the wall 14. The end of the wall 14 may comprise or more angled recess 14d adjacent the junction between the end and the upper edge of the wall 14. When the stacking bar 18 is in the filling position and the bar pivot 18c is at the bottom of pivot slots 14a, the stacking bar is preventing from moving inwardly towards the stacking position because of the engagement between the upstand 18g and the angles recess(es) 14d. Preferably, the end of the wall 14 comprises two angled recesses 14d. The first recess 14d on the side of the wall 14 facing the inner space of the container 10 enables the stacking bar 18 to ride up and over the end of the wall 14 when returning from a stacking to a filling position. The second recess 14d on the opposite side of the wall 14 engages with the bar upstand 18g to secure the stacking bar in the filling position.

[0060] The pivot slot 14a may comprise an extension or a protrusion 14e to prevent the bar pivot pin 18c from moving up so that the stacking bar 18 does not move upwards beyond the top rim of the container. When the stacking bar is rotated or lifted, the wall 14 of the container 10 resiliently deforms to allow the pivot pin 18c to move past the protrusion 14e.

[0061] The protrusion 14e may comprise a first shorter angled surface to prevent the bar pivot pin 18c from sliding up the slot 14 c and securing the bar 18 in the filling position and a second longer angled surface to allow the bar pivot pin 18c to travel down, in use, the slot 14c past the protrusion 14e. Therefore, in use, when the stacking bar 18 is lifted or pushed towards the stacking position, the bar pivot pin 18c moved up along the shorter angled surfaced, past the protrusion 14e, along the longer angled surface to the top of the slot 14c.

[0062] With reference to Figures 25 to 28, when the stacking bar 18 is in the stacking position and the wall 14 is folded towards the base of the container, there may be a tendency of the stacking bar 18 to be pushed forward and above the container and folding cannot be completed. Therefore, the recess 20 may comprise an undercut 40 to receive the end of the bar rod 18a thereby preventing the wall 14 from being folded when the bar 18 is in the stacking position. Preferably, the stacking bar 18 comprises a corresponding nose 18h at the end of the bar rod 18a.

Claims

1. A collapsible container comprising a base, a first pair of opposed walls and a second pair of opposed walls, the first pair of opposed walls and the second pair of opposed walls defining an opening in the top of the container, wherein the container further comprises a pair of stacking members which, when the container is erect, are movable between a stacking po-

sition in which the stacking members are positioned to support the base of another container stacked thereon and a filling position in which the stacking members are substantially removed from the opening in the top of the container, and wherein the container further comprises a pair of releasable locking mechanisms, each of the releasable locking mechanisms operable to retain one wall of the first pair of opposed walls in an upstanding position and locked to both the walls of the second pair of walls when the walls of the second pair of walls are also in an upstanding position, and wherein the pair of releasable locking mechanisms are independent of the stacking members.

2. A collapsible container according to claim 1, wherein the first pair of opposed walls are end walls and the second pair of opposed walls are side walls.

3. A collapsible container according to claim 1 or 2, wherein both the first pair of opposed walls and the second pair of opposed walls pivot about the base.

4. A collapsible container according to claim 1, 2 or 3, wherein the stacking members pivot about the first pair of opposed walls.

5. A collapsible container according to claim 4, wherein, when the walls of the first pair of opposed walls and the walls of the second pair of opposed walls are in an upstanding position, the stacking members are prevented from rotating backwards by an end stop or flange extending perpendicular of the second pair of opposed walls.

6. A collapsible container according to claim 4 or claim 5, wherein, when the walls of the first pair of opposed walls are not in an upstanding position, the stacking members are prevented from rotating backwards by upstands formed at either end of each of the walls of the first pair of opposed walls.

7. A collapsible container according to any preceding claim, wherein the stacking members are stacking bars.

8. A collapsible container according to any preceding claim, wherein the inner faces of the second pair of opposed walls interact with the outermost vertical surface of each of the walls of the first pair of opposed walls such that when each wall starts to collapse the second pair of opposed walls are pushed out past vertical to allow the collapsing wall to move freely and/or such that when at least one of the walls of the first pair of opposed walls starts to return to an upstanding position from a collapsed position the second pair of opposed walls are pushed out past vertical to allow the wall returning to an upstanding position to move freely.

9. A collapsible container according to any preceding claim, wherein each of the second pair of opposed walls comprise two first recesses located at either end on the inner face of each of the second pair of opposed walls, and wherein the stacking members are located within two opposing first recesses on the two walls of the second pair of opposed walls when the stacking members adopt the stacking position thereby preventing the first pair of opposed walls from adopting a collapsed position.

10. A collapsible container according to claim 9, wherein each of the first recesses comprise an angled face that interacts with the outermost vertical surface of one each of the walls of the first pair of opposed walls when said wall starts to collapse such that the second pair of opposed walls are pushed out past vertical to allow the collapsing wall to move freely.

11. A collapsible container according to any preceding claim, wherein each of the second pair of opposed walls comprise second recesses located at either end on the inner face of each of the second pair of opposed walls, and wherein the stacking members are located within two opposing second recesses when each of the walls of the first pair of opposed walls has collapsed such that, if the stacking members are in an intermediate position between the filling position and the stacking position when the first pair of opposed walls start to collapse, the stacking members are caused to adopt the filling position by interaction with the two opposing second recesses.

12. A collapsible container according to claim 11, wherein each of the second recesses comprise an angled face that interacts with the outermost vertical surfaces of one each of the walls of the first pair of opposed walls when at least one of the walls of the first pair of opposed walls starts to return to an upstanding position from a collapsed position such that the second pair of opposed walls are pushed out past vertical to allow the wall returning to an upstanding position to move freely.

13. A collapsible container according to claim 8, wherein the outermost vertical surfaces of each of the walls of the first pair of opposed walls comprise angled faces that interact with the inner faces of the second pair of opposed walls such that when at least one of the walls of the first pair of opposed walls starts to collapse the second pair of opposed walls are pushed out past vertical to allow the collapsing wall to move freely and/or such that when at least one of the walls of the first pair of opposed walls starts to return to an upstanding position from a collapsed position the second pair of opposed walls are pushed

out past vertical to allow the wall returning to an upstanding position to move freely.

14. A collapsible container according to any preceding claim, wherein the first pair of opposed walls and the second pair of opposed walls comprise inter-engaging formations that inter-engage when the first pair of opposed walls and the second pair of opposed walls are in an upstanding position.

15. A collapsible container according to claim 14, wherein the inter-engaging formations may progressively engage from the formations closest to the base of the container to the formations furthest from the base of the container, and progressively disengage from the formations furthest from the base of the container to the formations closest to the base of the container.

16. A collapsible container according to claim 14 or claim 15, wherein the inter-engaging formations comprise at least one pair of holes located on one pair of opposed walls and at least one pair of pins on the other pair of opposed walls.

17. A collapsible container according to any preceding claim, wherein each of the releasable locking mechanisms are located on one of the walls of the first pair of opposed walls.

18. A collapsible container according to any preceding claim, wherein each of the releasable locking mechanisms are integrally formed with one of the walls of the collapsible container or each of the releasable locking mechanisms may be separately formed and then "snap-fit" into place.

19. A collapsible container according to any preceding claim, wherein each of the releasable locking mechanisms comprise:

a latching member;
biasing means for biasing the latching member in an engaged position in which the latching member provides locking engagement between one of the walls of the first pair of opposed walls in an upstanding position and both the walls of the second pair of walls when the walls of the second pair of walls are also in an upstanding position, and
at least one actuator operable against the biasing means, to move the latching member to a disengaged position in which the latching member is released so as to disengage the wall of the first pair of opposed walls and both the walls of the second pair of walls.

20. A collapsible container according to claim 19, wherein the biasing means is configured to bias the latching member in an extended position, and the at least one actuator is operable against the biasing means, to move the latching member to a retracted position.

21. A collapsible container according to claim 20, wherein the at least one actuator comprises a button which, when depressed, causes retraction of the latching member.

22. A collapsible container according to claim 20, wherein the at least one actuator comprises a rotatable lever, which, when rotated, causes retraction of the latching member.

23. A collapsible container according to any of claims 19 to 22, wherein the latching member comprises a pair of catches, which, when the latching member is in an engaged position interlock engage with formations on one of the pairs of opposed walls.

24. A collapsible container according to any preceding claim, wherein the container is collapsible to a substantially flat configuration.

25. A collapsible container according to any preceding claim, wherein the container is formed from a plastics material.

26. A collapsible container according to any preceding claim, further comprising retention means for retaining a stacking member in the plane of a wall of the first pair of opposed walls.

27. A collapsible container according to claim 26, wherein the retention means comprises one or more ears extending from the uppermost, in use, surface of the wall and partially surrounding the stacking member.

28. A collapsible container according to claim 26 or 27, wherein the retention means comprises one or more cut backs to enable access to the stacking member in the filling position.

29. A collapsible container according to claim 26, wherein the retention means comprises one or more upstands extending from the uppermost, in use, surface of the wall.

30. A collapsible container according to any one of the preceding claim, further comprising one or more ribs inwardly extending from one or both of the second pair of walls.

31. A collapsible container according to claim 9, wherein one or both of the first recesses comprise a slot to receive an end of the bar rod for securing the bar is in the stacking position.

32. A collapsible container according to any one of the preceding claims, wherein the outermost vertical surfaces of each of the walls of the first pair of opposed walls comprise one or more angled recesses and the stacking member comprises one or more upstands, whereby the one or more angled recesses are engageable with the one or more upstands.

33. A collapsible container according any one of the preceding claims, wherein the stacking member comprises a pair of pivot pins, each pin being movable within a slot extending along part of the outermost vertical surface of a wall of the first pair of opposed walls, and wherein the slot comprises a protrusion for securing the stacking member in the plane of the wall.

34. A collapsible container according to claim 33, wherein the protrusion comprises a first and a second angled surface, the first angled surface being shorter than the second angled surface.

35. A collapsible container according to claim 9, wherein the stacking members are stacking bars and each of the two first recesses comprises an undercut to receive an end of the stacking bar when the stacking bar is in the stacking position.

36. A collapsible container according to claim 35, wherein the stacking bar comprises a nose which, in use, secures the end of the stacking bar in the undercut.

37. A collapsible container substantially as described herein and with reference to the accompanying Figures.

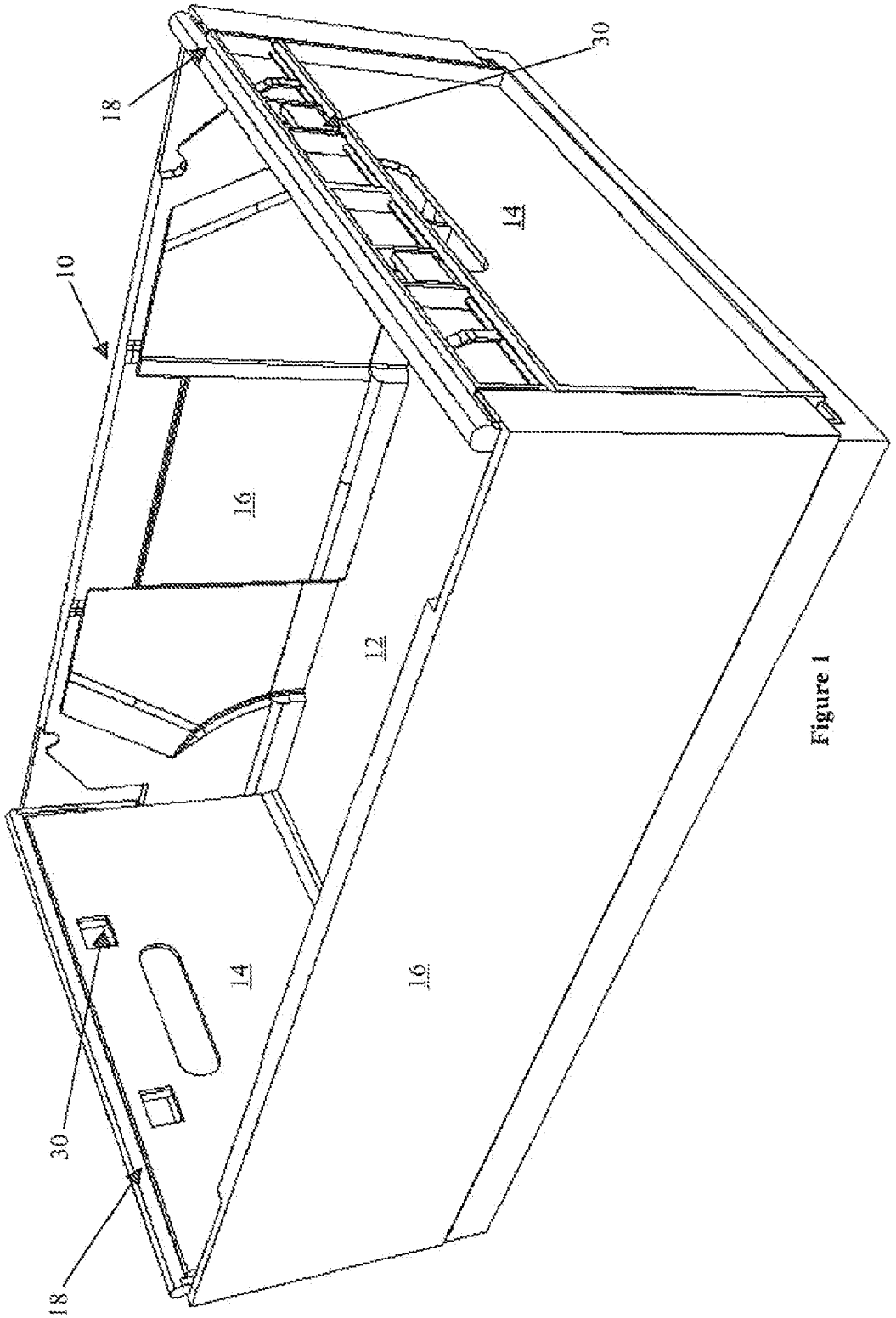


Figure 1

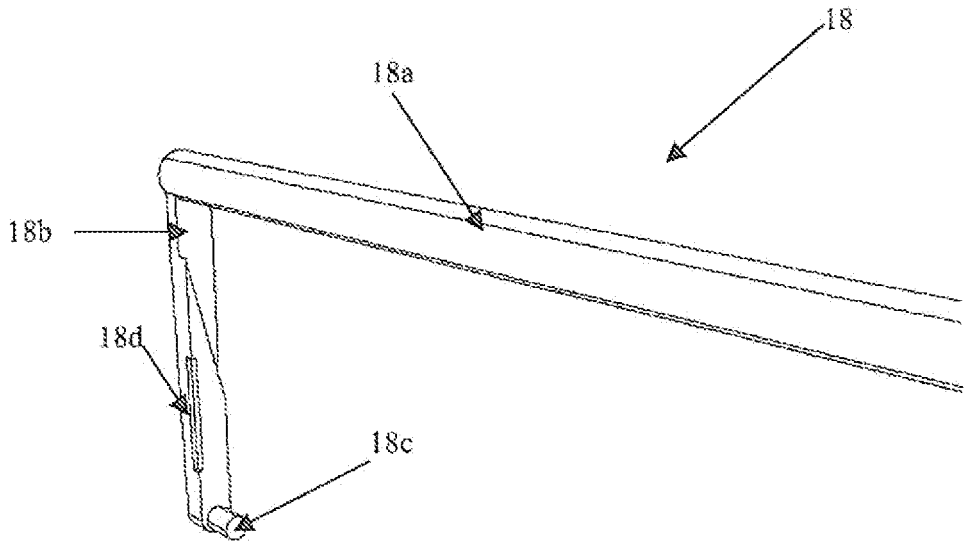


Figure 2

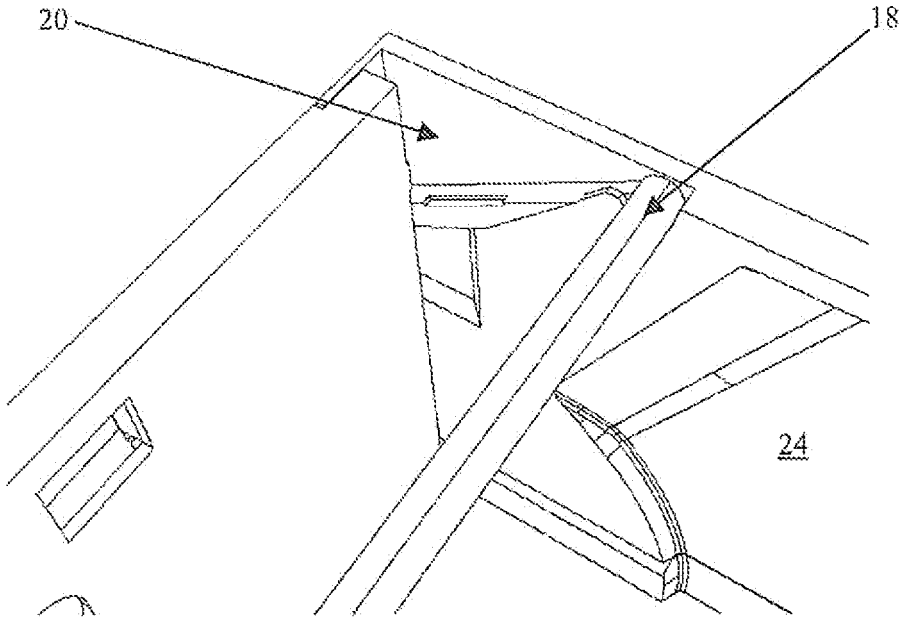


Figure 3

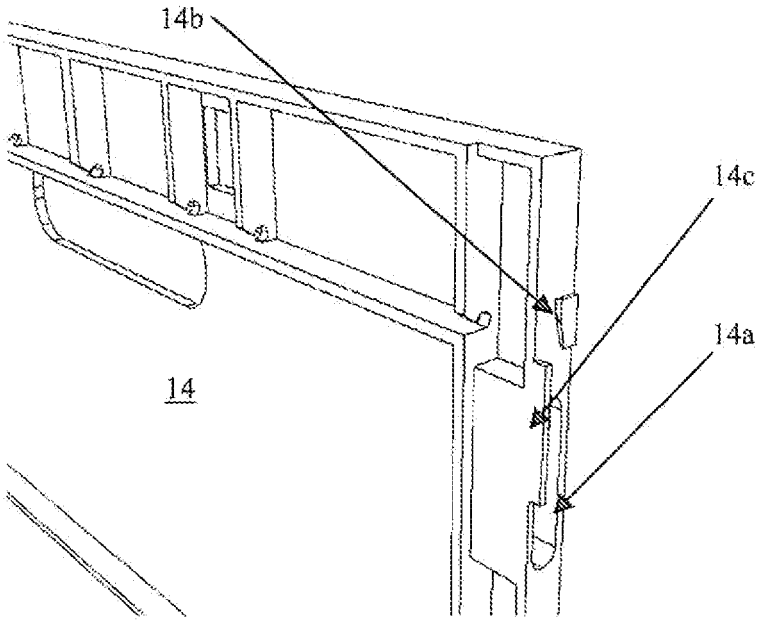
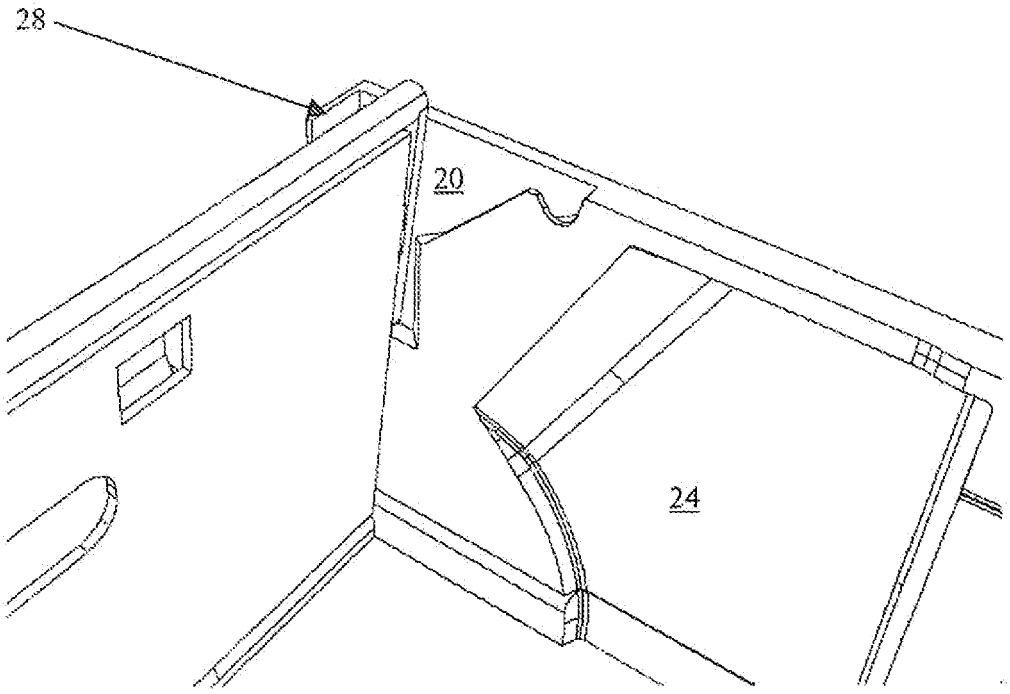


Figure 4



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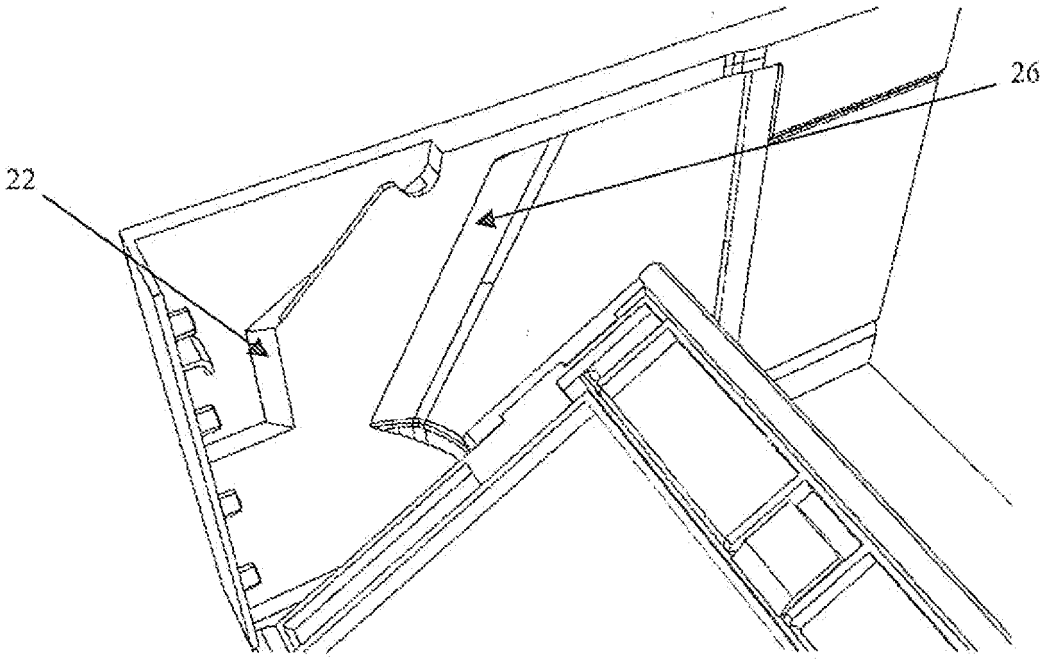

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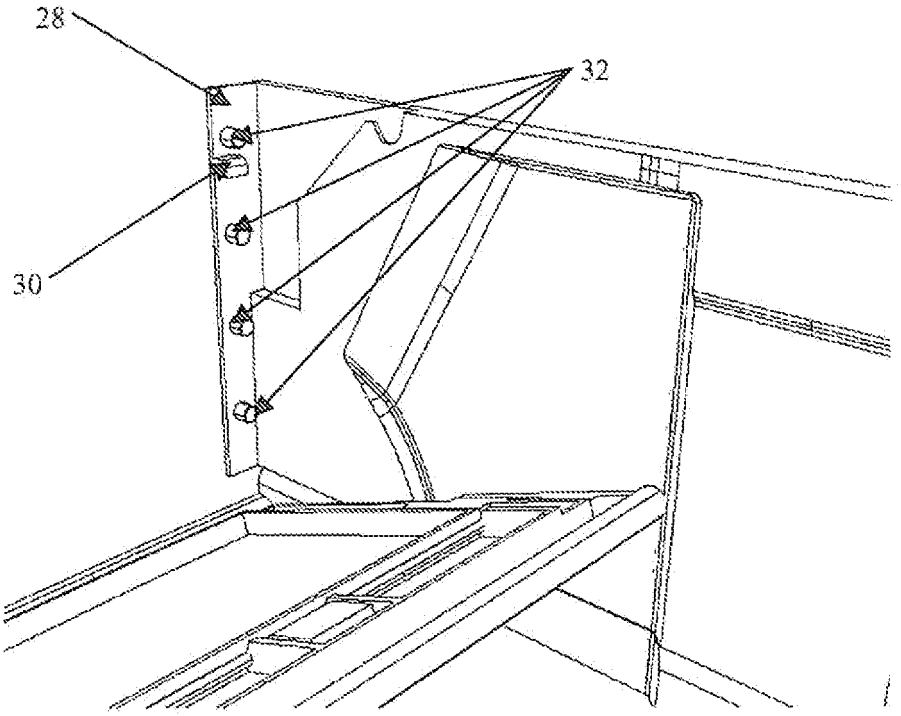

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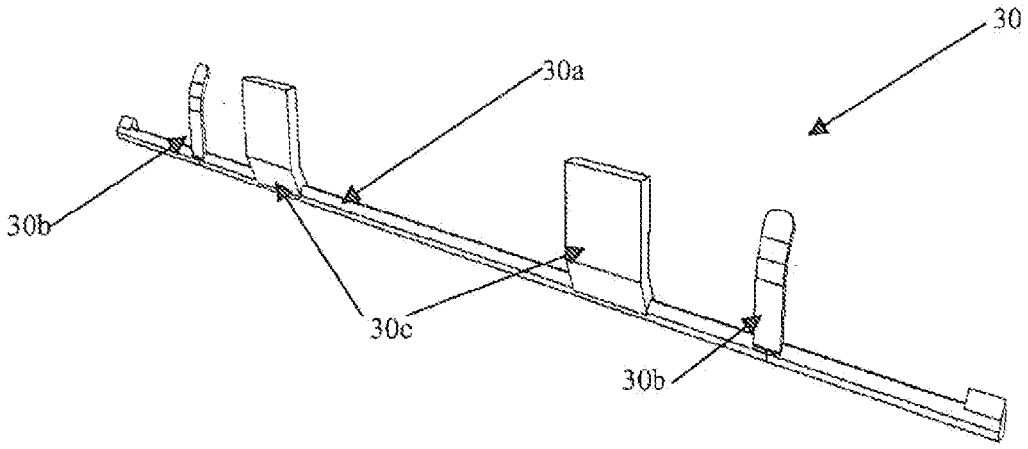

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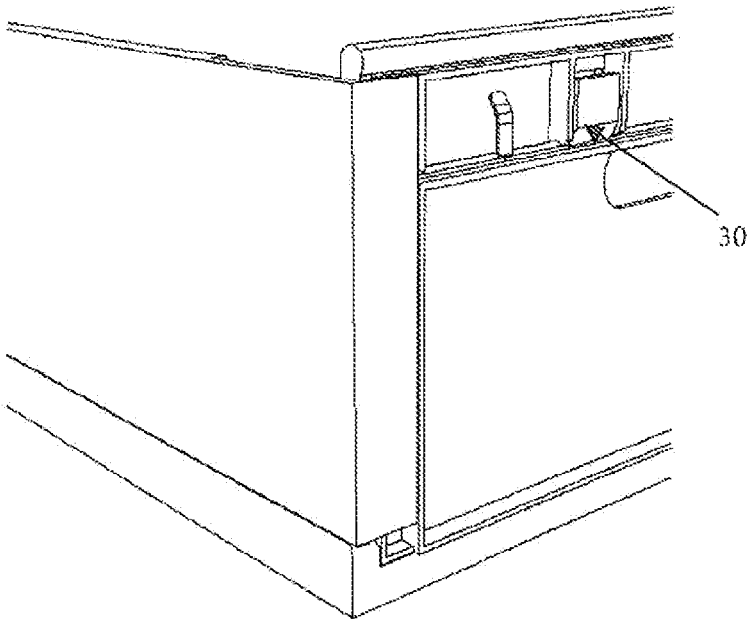

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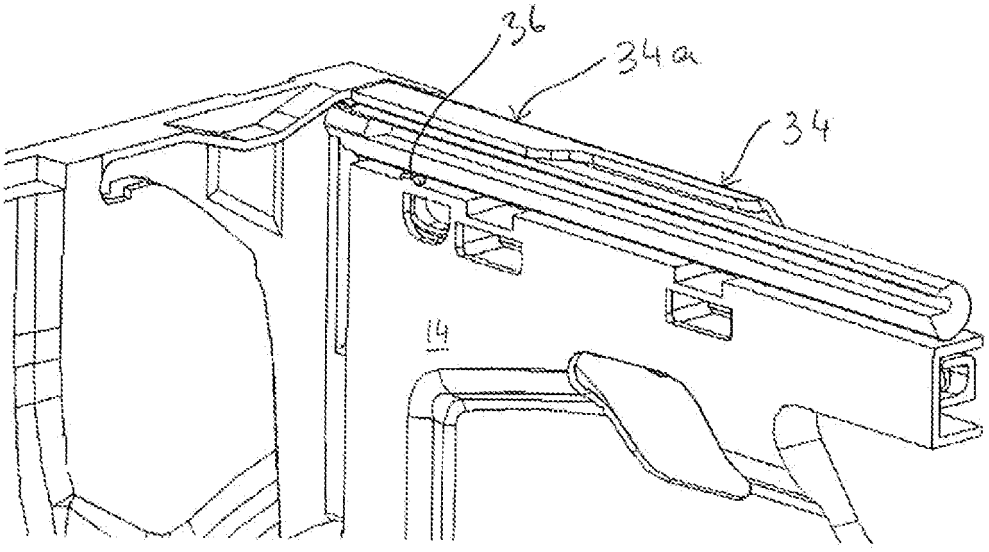

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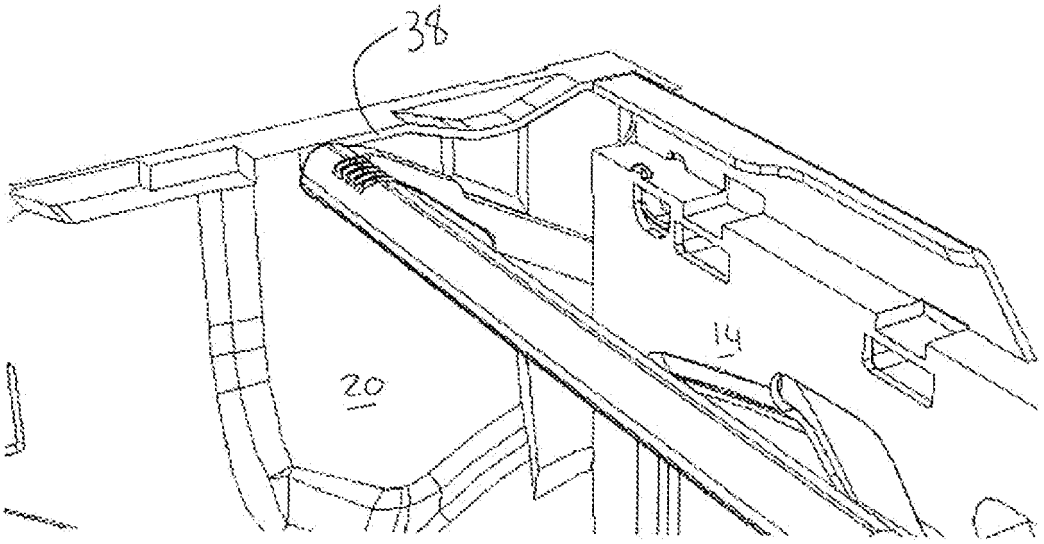

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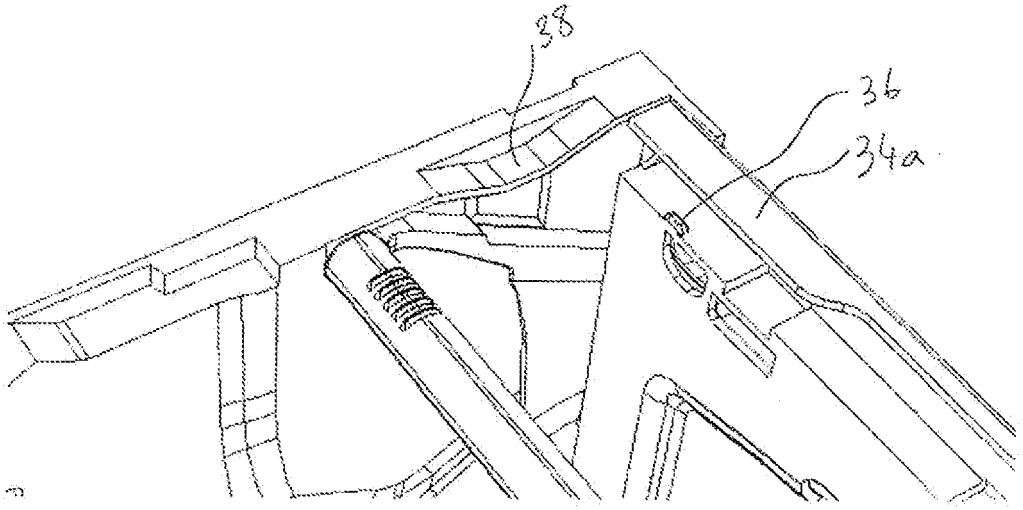

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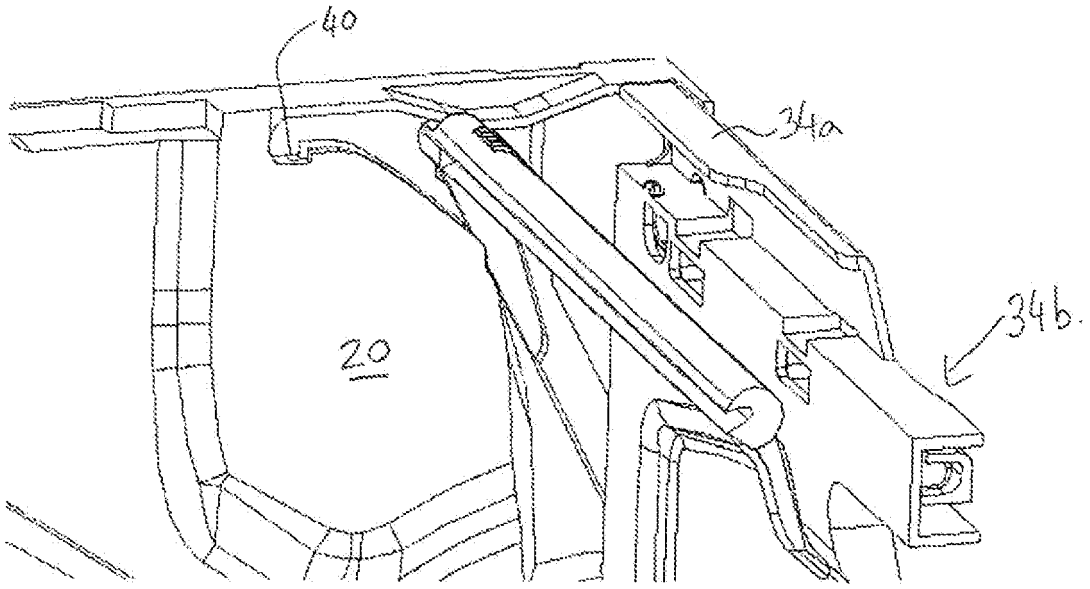

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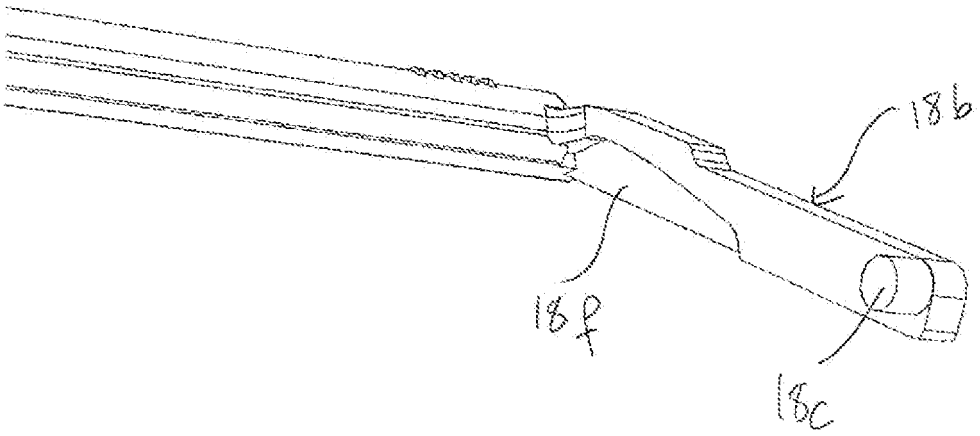
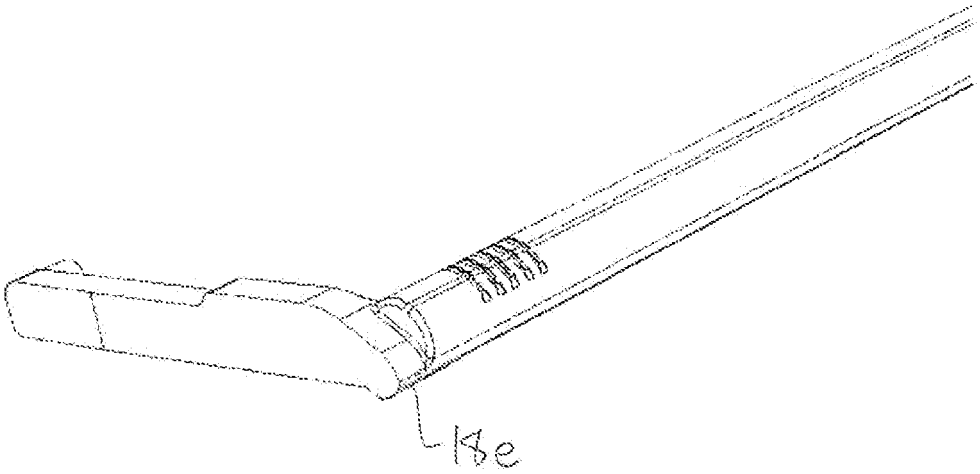


Figure 14



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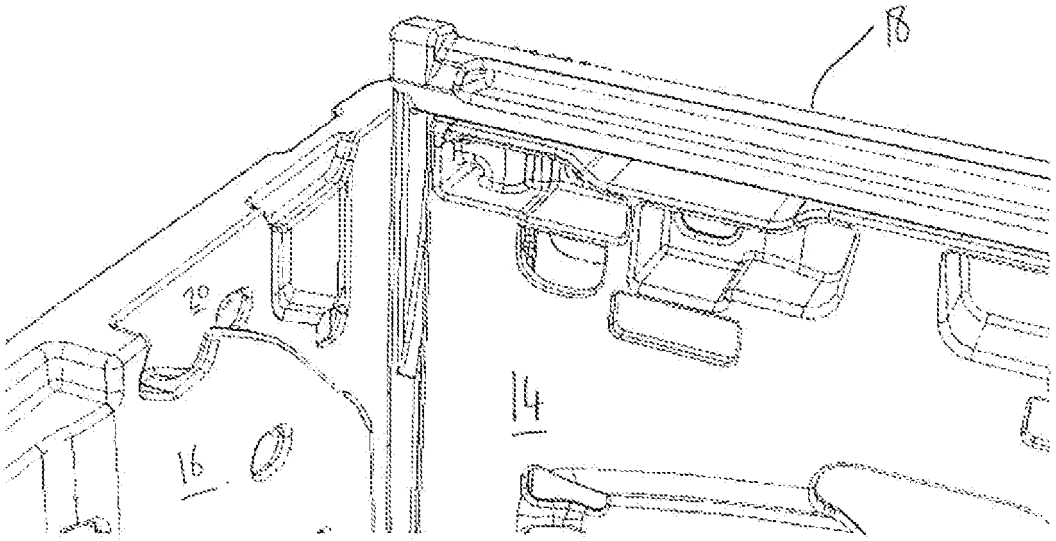
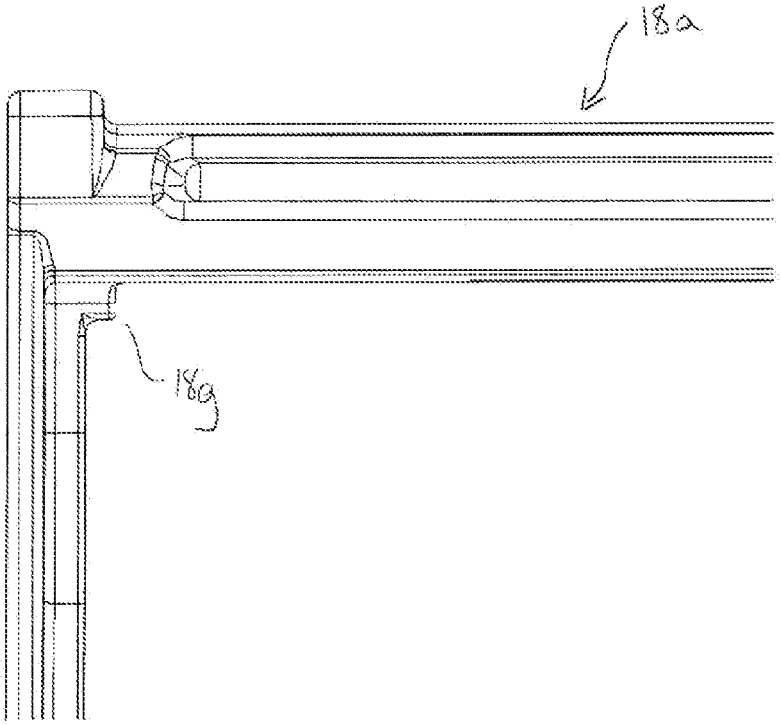


Figure 16



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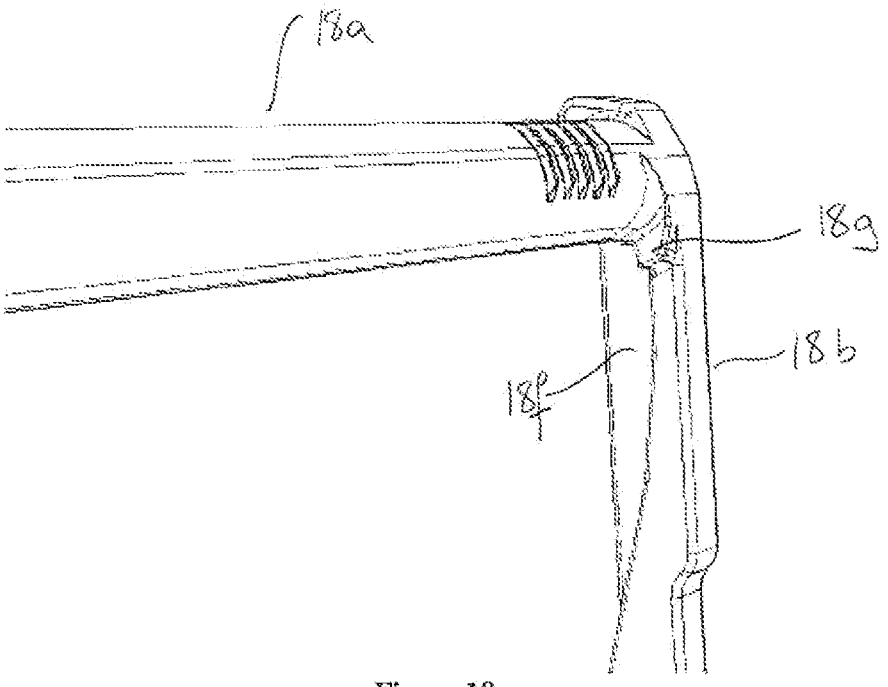

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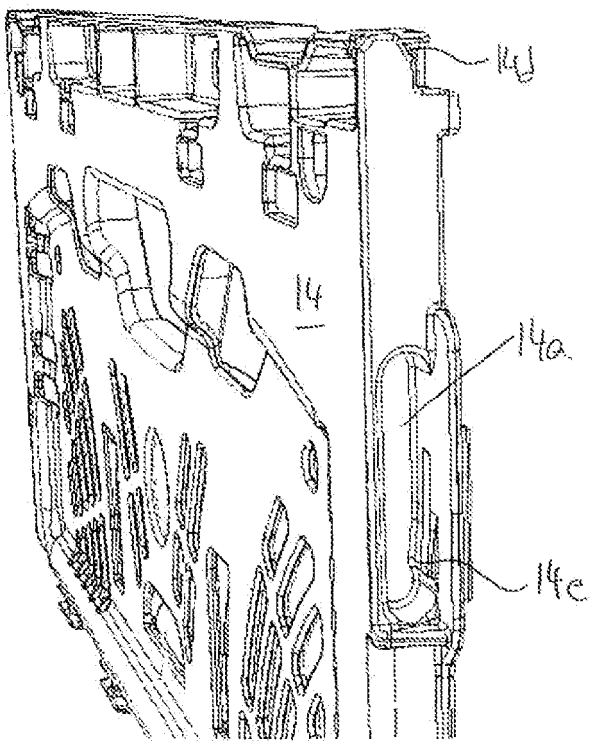
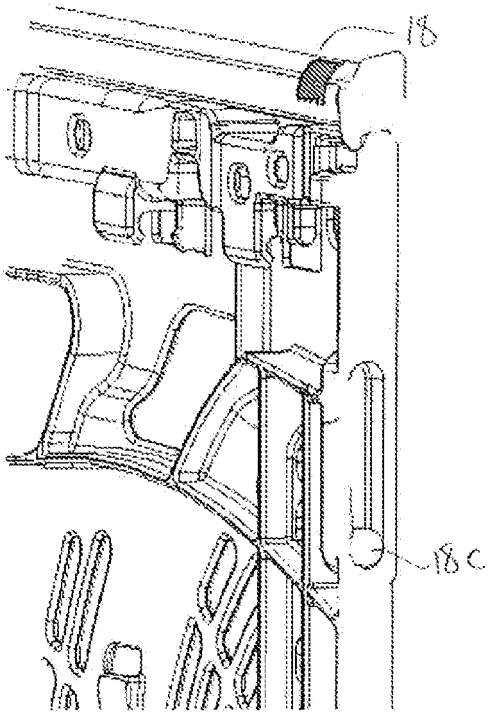


Figure 19



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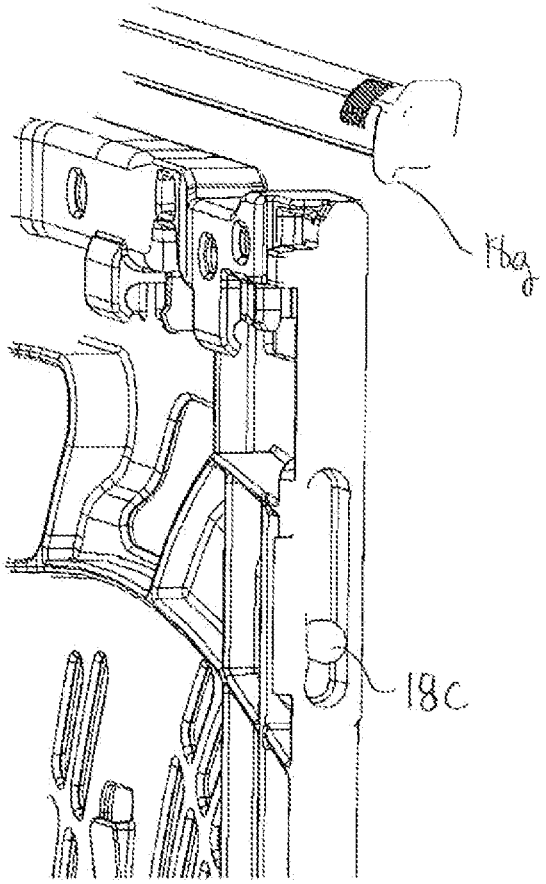

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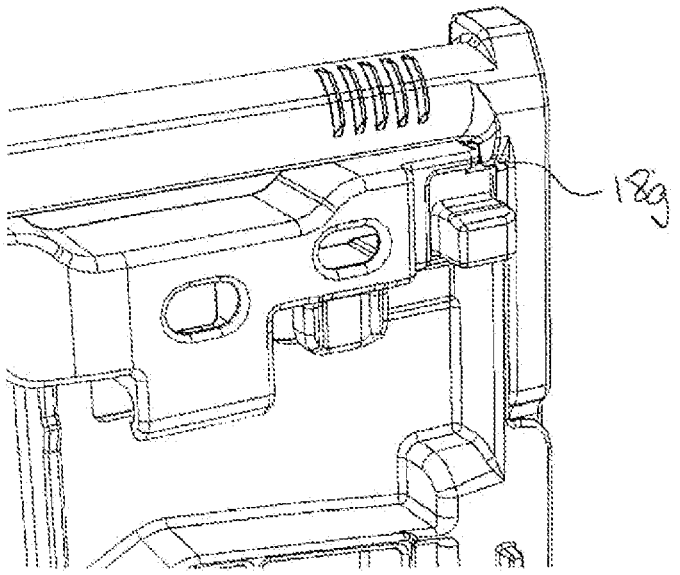

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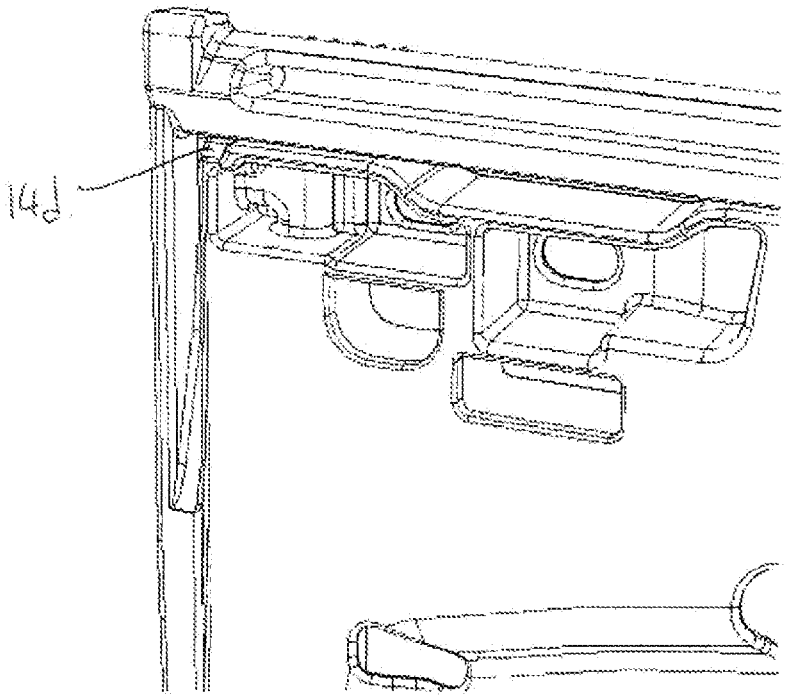


Figure 23

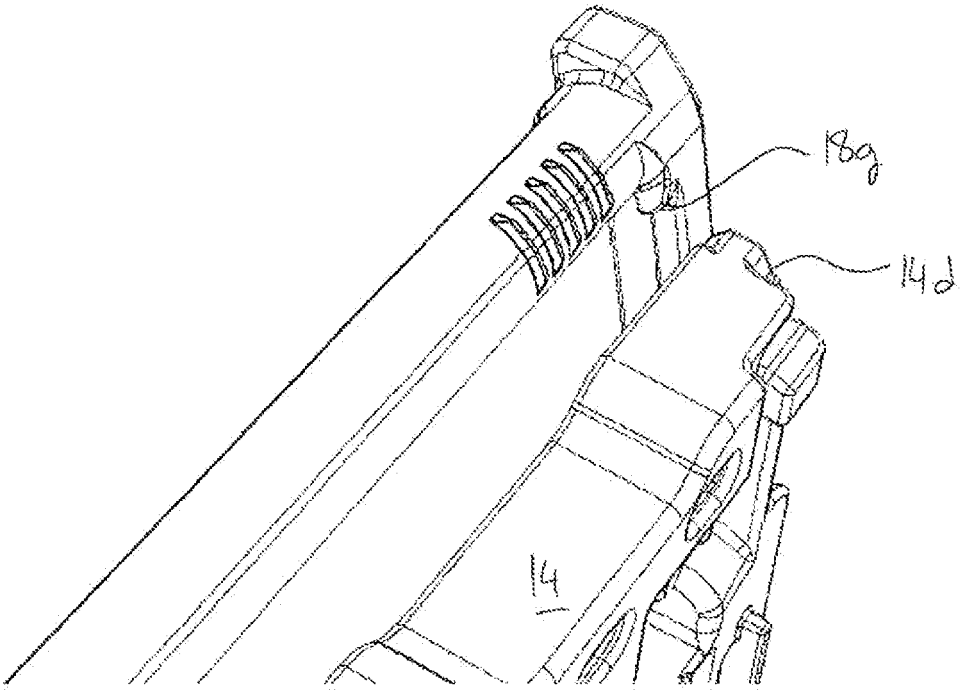
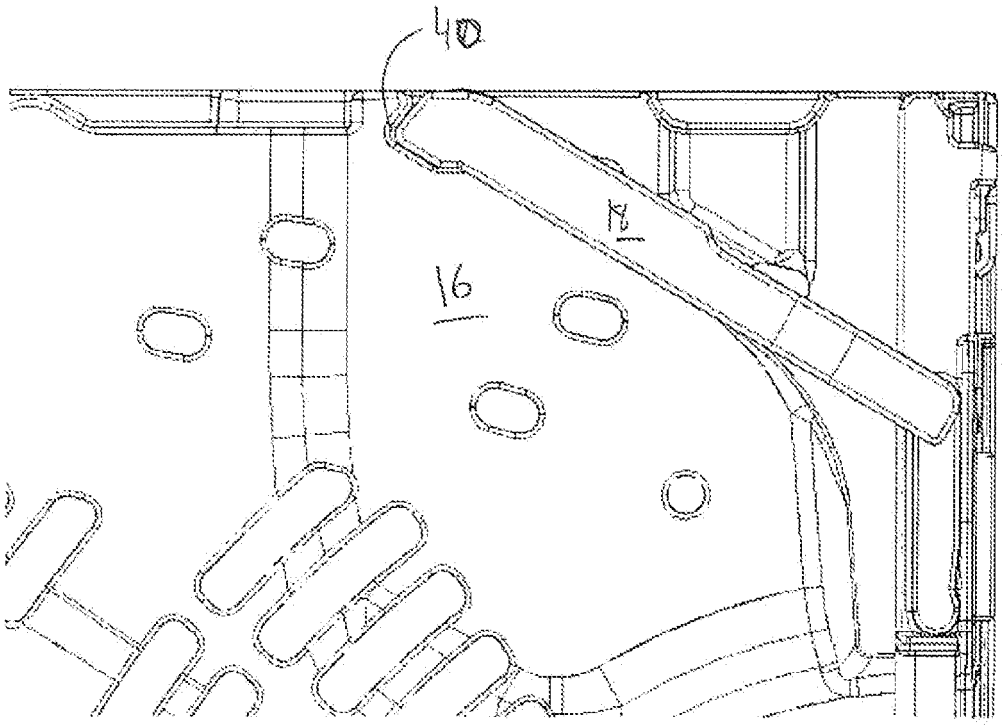


Figure 24



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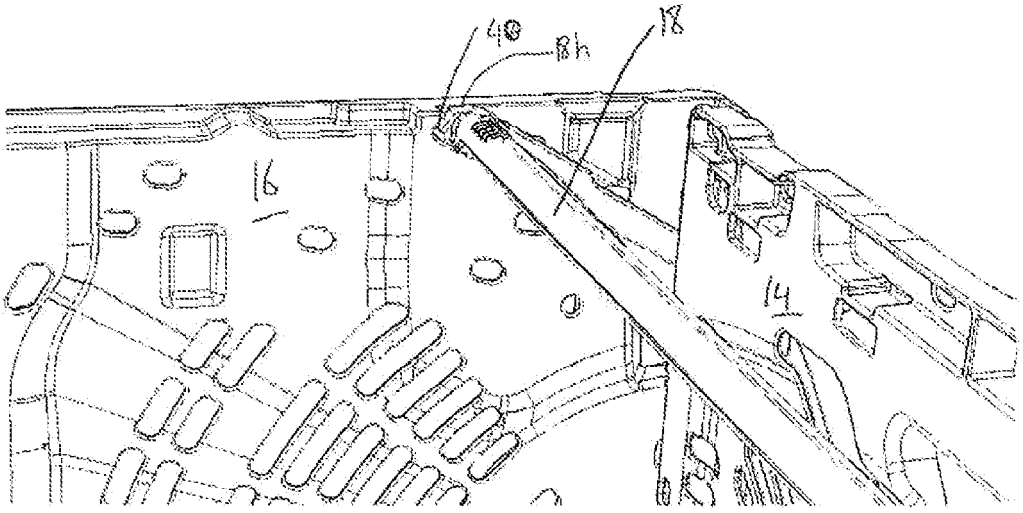

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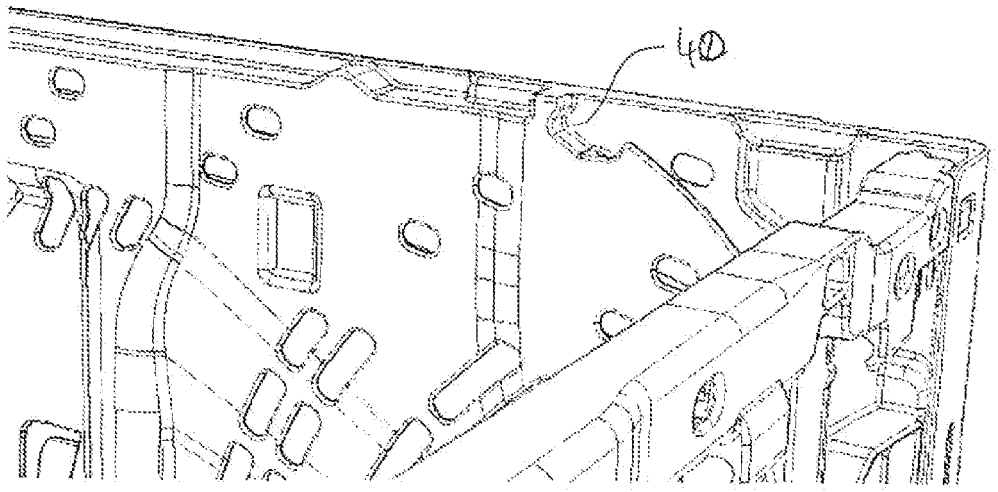

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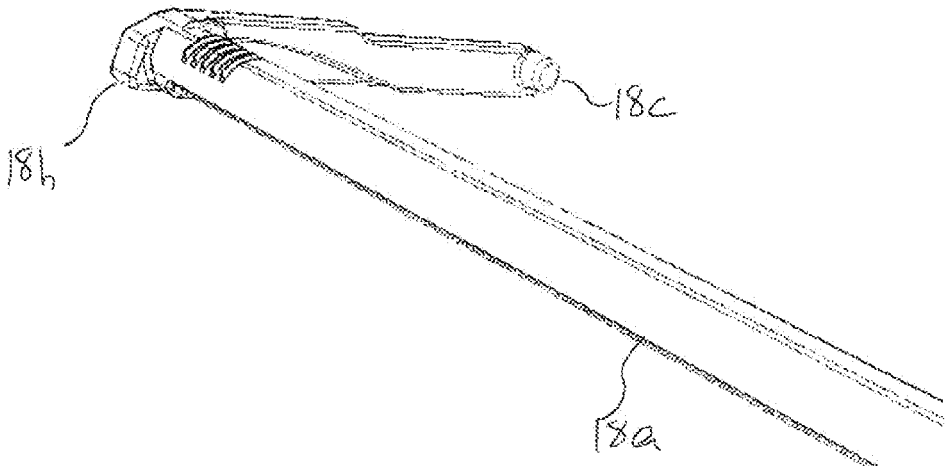

Figure 28

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2359066 A **[0003]**
- GB 2431917 A **[0003]**