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Description

[0001] The present invention relates to an container, and more particularly, to a container for storing and carrying tools.

[0002] Numerous storage containers are known in the art. However, there is a constant need in the industry to improve upon existing containers by making them more efficient and easy to use.

[0003] One aspect provides a container having a container portion defining a space for storing tools and a lid portion pivotally connected to the container portion. The lid portion is pivotally movable between open and closed positions. The container also includes a latch assembly carried by the lid portion and constructed and arranged to latch the lid portion in the closed position. The latch assembly includes a single latch handle carried by the lid portion and a latch comprising spaced latch portions, the spaced latch portions being moveable together between a latched position and a released position. The latch portions respectively are on opposite sides of the latch handle. The latch portions are engageable with latch engaging portions of the container portion. The latch assembly also includes a spring that biases the spaced latch portions toward the latched position, the latch handle constructed and arranged to be moved to effect movement of the latch portions from the latched position to the released position.

[0004] These and other aspects of the present invention, as well as the methods of operation and functions of the related elements of structure and the combination of parts and economies of manufacture, will become more apparent upon consideration of the following description and the appended claims with reference to the accompanying drawings, all of which form a part of this specification, wherein like reference numerals designate corresponding parts in the various figures. In one embodiment, the structural components illustrated herein can be considered drawn to scale. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not a limitation of the invention. In addition, it should be appreciated that structural features shown or described in any one embodiment herein can be used in other embodiments as well. As used in the specification and in the claims, the singular form of "a", "an", and "the" include plural referents unless the context clearly dictates otherwise.

Fig. 1 is a perspective front view of a container, with certain components and portions removed to better reveal others, with a latch assembly in a latched position and wherein some components obstructed from view are shown in dashed lines;

Fig. 2 is a perspective front view of the container with the latch assembly in accordance with an embodiment;

Fig. 3 is a perspective rear view of the container, with

certain components and portions removed to better reveal others, with the latch assembly in the latched position and wherein some components obstructed from view are shown in dashed lines;

Fig. 4 is a rear plan view of the container in accordance with an embodiment;

Fig. 5 is a perspective front view of the container, with certain components and portions removed to better reveal others, with the latch assembly in a released position and wherein some components obstructed from view are shown in dashed lines;

Fig. 6 is a perspective rear view of the container with the latch assembly with certain components and portions removed to better reveal others, with the latch assembly in the released position and wherein some components obstructed from view are shown in dashed lines;

Fig. 7 is a partial cross sectional side view of the container, with certain portions removed to better reveal others, with the latch assembly in the latched position in accordance with an embodiment;

Fig. 8 is a partial cross sectional side view of the container, with certain portions removed to better reveal others, with the latch assembly in the released position in accordance with an embodiment;

Fig. 9 is a perspective view of the container with the latch assembly with certain portions removed to better reveal others; and

Fig. 10 is a partial front view (from above) of a portion of the container, with certain parts removed to better reveal others, in accordance with the embodiment shown in Fig. 9;

Fig. 11 is a partial perspective view of a portion of the container with a lid of the container in the open position and revealing a latch cover;

Fig. 12 is an exploded view of portions of the latch assembly and other portions of the container; and

Fig. 13 is a partial cross sectional view of the container, with certain portions removed to better reveal others, showing the latch assembly in the unlocked position and the latch cover.

[0005] Figure 1 shows a container 10 having a container portion 12 defining a space for storing tools. The container 10 also includes a lid portion 14 that is pivotally connected to the container portion 12 and that is pivotally movable between open and closed positions. The container 10 includes a latch assembly 16 carried by the lid portion 14 that is constructed and arranged to latch the lid portion 14 in the closed position. The latch assembly 16 includes a single latch handle 18 (see Fig. 2) carried by the lid portion 14. Components or portions of components that are obstructed from view by other portions or components of the container 10 are shown in dashed lines. As shown in Fig. 1, the latch assembly 16 also includes a single latch 20 having spaced latch portions 20a, 20b that are moveable together between a latched position (shown in Figs. 1 and 3) and a released or un-

latched position (shown in Figs. 5 and 6). In one embodiment, the spaced latch portions 20a, 20b may be integrally molded with one another, but in another embodiment they can be separately formed and then joined to form the latch 20. The latch portions 20a, 20b respectively are on opposite sides of the latch handle 18. The latch portions 20a, 20b are engageable with latch engaging portions 22a, 22b (see Figs. 3 and 7) of the container portion 12. The latch assembly 16 also includes a spring 24 (see Fig. 1) that biases the spaced latch portions toward the latched position. The latch handle 18 is constructed and arranged to be moved to effect movement of the latch portions 20a, 20b from the latched position to the released position.

[0006] As shown in Fig. 2, the lid portion 14 may include a top wall or side 36, a front wall or side 38, a right wall or side 40, a left wall or side 42, and a back wall or side 44. A protruding portion 39 may be provided on the front wall 38 of the lid portion 14. In one embodiment, the latch portions 20a, 20b are housed in the protruding portion 39 of the lid portion 14. The lid portion 14 may be moved between an open position wherein access to an interior space 13 (see Fig. 11) of the container portion 12 is permitted and a closed position wherein access to the interior space 13 of the container portion 12 is prevented.

[0007] Referring back to Fig. 2, the container portion 12 may include a front wall or side 48, a right wall or side 50, a left wall or side 52, a back wall or side 54, and a bottom wall or side 56. The container portion 12 may also include a pair of opposing upper rims 51 formed on the left wall 52 and the right wall 50 that are constructed and arranged to be disposed against the lid portion 14 when the lid portion 14 is latched to the container portion 12. A protruding portion 59 may be provided on the front wall 48 of the container portion 12. In one embodiment, the latch engaging portions 22a, 22b are housed in the protruding portion 59 of the container portion 12. The container 10 may include a handle 57 on the lid portion 14 to enable the user to lift and carry the container 10. A depression 67 formed on the top wall 36 of the lid portion 14 may be constructed and arranged to receive the handle 57 when the handle 57 is not in use. The handle 57 may be pivotally attached to the top wall 36 of the lid portion 14 via pins 63. When the handle 57 is to be used, the handle 57 may be pivoted away from the depression 67 to a position wherein the handle 57 is generally perpendicular to a plane defined by the top wall 36. Grooves may be formed on the surface thereof so as to facilitate the grasping of the handle 57 during transport of the container 10. Rubber or other friction providing materials may optionally be provided on the surface thereof. The handle 57 may optionally be attached to the container 10 via hinges, snap-fit connections, or other connecting mechanisms and/or may be attached to the container 10 at other locations thereof. The lid portion 14, container portion 12, and/or any other parts of the container 10 may be made of plastic, metal, wood, other materials, or any combination thereof. The lid portion 14, container portion

12, and/or other parts of the container 10 may optionally be made from molded plastic. In one embodiment, the container 10 may be made of a combination of metal and plastic. In addition, although the illustrated embodiments of the container 10 are generally rectangular, the container 10 may have other shapes and structures.

[0008] The container 10 may also be provided with feet 49 (two are shown in this Figure), to facilitate placement of the container 10 on a surface. Rubber, foam, or other materials may be provided on the surfaces of the feet 49.

[0009] In the embodiment shown in Fig. 4, the lid portion 14 is pivotally attached to the container portion 12 via a hinge structure 23. The hinge structure(s) 23 may comprise any type of pivotal arrangement, such as, for example, a living hinge or pins and hoops. Although, in one embodiment, the hinge structure(s) 23 may have a permanent connection, a permanent connection is not required. It is contemplated that in some embodiments, a particular hinge structure 23 may be disconnected such that the lid portion 14 and the container portion 12 are no longer attached by the hinge structure 23. It should be appreciated that the lid portion 14 may also be other types of lids, such as, just for example, a snap fit lid or an accordion type lid.

[0010] Referring back Fig. 2, the lid portion 14 may also include a first section 68 and a second section 70. In the illustrated embodiment, elongated ridges 72 are provided on the surfaces thereof. However, it is contemplated that in other embodiments, the surfaces of the first section 68 and second section 70 may be smooth or may have other shapes or structures provided thereon. The first section 68 and the second section 70 may be pivotally attached to the lid 16 and may be pivoted between an open position wherein access to storage spaces (not shown) under the first and second sections 68, 70 is permitted and a closed position wherein access to the storage spaces is prevented. In this embodiment, a first depression 74 is provided in the front wall 38 of the lid portion 14 beneath the first section 68, and a second depression 76 is provided in the front wall 38 of the lid portion 14 beneath the second section 70. Accordingly, the first and second depressions 74, 76 enable a user to insert fingers therein to pivot the first and sections 68, 70, respectively, between open and closed positions so as to permit and prevent access to the storage spaces.

[0011] As mentioned above, the latch handle 18 is carried by the lid portion 14. In the illustrated embodiment, the latch handle 18 is pivotally attached to the lid portion 14 and may be pivoted along pivot axis A (see Fig. 1). The pivot axis A may be defined by protrusions 83 (one is shown in Fig. 12) that are provided on the latch handle 18 to connect the latch handle 18 to the lid 14. The protrusions 83 may be received in recesses 91 (two are shown in Fig. 12) provided in the lid 14 to enable pivotal movement of the latch handle 18. In other embodiments, the latch handle 18 may be pivotally attached to the lid portion 14 using pivot pins or other attachment mechanisms. The latch handle 18 includes a handle portion 80.

The handle portion 80 may be located on the top wall 36 of the lid portion 14. In this embodiment, a depression 82 is formed in the lid portion 14 underneath the handle portion 80. The depression 82 may be constructed and arranged to receive a user's fingers so as to facilitate the user in pivoting the latch handle 18 to operate the latch assembly 16.

[0012] A lock 120, which may take the form of a cylinder lock, may be provided on the lid portion 14 so as to lock the lid 14 in the closed position to secure the contents therein and to prevent unauthorized access to the contents therein. In one embodiment, the cylinder lock 120 may be used to lock the lid 14 so as to prevent pivoting movement thereof to the open position. In such embodiment, the latch handle 18 may still be lifted to its pivoted position. Alternatively, in one embodiment, the lock 120 may be used to lock the latch handle 18 in its unpivoted, default position so as to prevent the latch handle 18 from being pivoted to move the latch assembly 16 to the released position.

[0013] Although the latch handle 18 is a separate structure in the illustrated embodiment, it should be appreciated that the latch handle 18 may be integrally molded with the latch 20 or attached to the spaced latch portions 20a, 20b in other embodiments. In such embodiments, the latch handle 18 and the spaced latch portions 20a, 20b may be pivotable about a common axis. The spaced latch portions 20a, 20b comprise separated teeth of the single latch 20.

[0014] Referring back to Fig. 1, the latch handle 18 may also include one or more latch contact portions 84a, 84b (two shown) extending from the handle portion 80. As further illustrated in this embodiment, the spaced latch portions 20a, 20b may be integrally formed with a main latch portion 17. That is, the main latch portion 17 may be an elongated portion disposed between and integrally formed with the spaced latch portions 20a, 20b. As mentioned above, the spaced latch portions 20a, 20b are constructed and arranged to engage with the latch engaging portions 22a, 22b. In one embodiment, the integral structure of the spaced latch portions 20a, 20b enables the lid portion 14 to be stably latched to the container portion 12. The integral structure of the spaced latch portions 20a, 20b may also provide efficient latching because of the minimal number of moveable components used to latch the lid portion 14 to the container portion 12.

[0015] The latch 20 may also include one or more extending portions 86a, 86b (two shown). In this embodiment, the extending portions 86a, 86b are constructed and arranged to contact the one or more latch contact portions 84a, 84b of the latch handle 18, respectively. Accordingly, the latch handle 18 is constructed and arranged to operate with the main latch portion 17 and the spaced latch portions 20a, 20b via the contact between the latch contact portions 84a, 84b and the extending portions 86a, 86b to move the spaced latch portions 20a, 20b between the latched and released positions. In one embodiment, the extending portions 86a, 86b may be

integrally formed with the main latch portion 17. In other embodiments, the extending portions 86a, 86b may optionally integrally form a single extending portion. The latch 20 may be pivotally connected to the lid portion 14 via a rod 88. Thus, the main latch portion 17 and the latch portions 20a, 20b are pivotable about an axis defined by the rod 88. The rod 88 may be received in openings 89 (see Fig. 12) formed in the latch 20 between the extending portions 86a, 86b and stop portions 90a, 90b extending from the latch 20. As shown in Fig. 1, the rod 88 may define an axis B along which the latch 20 may pivot. In one embodiment, the axis B defined by the rod 88 is parallel to the pivotal axis A of the latch handle 18.

[0016] In the illustrated embodiment, however, relative movement between the handle 18 and the latch 20 is permitted. For example, when the lid 14 is closed and such closing action forces the latch 20 to pivot, the handle 18 does not pivot along with the latch 20, as the member 84b disengages away from the member 86b (as can be appreciated from Fig. 7).

[0017] In one embodiment, the stop portions 90a, 90b may extend generally in the same direction as the latch portions 20a, 20b. In one embodiment, the spring 24 may be located on the rod 88 (see Fig. 1) and may take the form of a torsion spring. As shown in Fig. 1, the spring 24 may be wrapped around at least a portion of the rod 88 and may bias the latch 20, including the latch portions 20a, 20b, toward the latched position. It should be appreciated that the single spring 24 may be located in other locations and/or may be other types of springs. For example, in one embodiment, the spring 24 may be a tensile spring with one end attached to the latch 20 and the other end attached to another portion of the container 10 so as to bias the latch 20 (and thus the latch portions 20a, 20b) in the latched position.

[0018] Fig. 7 shows the latch assembly 16 in the latched position. In the latched position, the latch handle 18 is in the unpivoted, default position. In the illustrated embodiment, the latch contact portion 84b of the latch handle 18 is in contact with the extending portion 86b of the latch 20. In particular, in this embodiment, the latch contact portion 84b of the latch handle 18 includes a hooked portion 92 constructed and arranged to engage with an end portion 94 of the extending portion 86b of the latch 20. In addition, when the latch assembly 16 is in the latched position, the stop portion 90b of the latch 20 may abut against a stop surface 96 of the lid portion 14. Accordingly, the contact between the stop portion 90b and the stop surface 96 may prevent over-rotation of the latch 20 in the clockwise direction due to bias of the spring 24. A similar stop surface (not shown) may be provided to contact the stop portion 90a (obstructed from view in this Figure).

[0019] In the illustrated embodiment, the latch portion 20b includes a hooked portion or projection 21b. The latch portion 20b includes a corner 100 and a first contact surface 98 adjacent to the corner 100. A slanted camming surface 102 extends generally downwards from the first

contact surface 98. The corner 100, the first contact surface 98, and the slanted camming surface 102 may define the projections 21 b. A similar projection 21 a may be provided on the latch portion 20a.

[0020] In the illustrated embodiment, the latch engaging portion 22b includes a recess 99b constructed and arranged to receive the projection 21 b of the latch portion 20b. The recess 99b is partially defined by a tip 108 and a second contact surface 104 constructed and arranged to engage with the first contact surface 98 of the latch portion 20b when the latch assembly 16 is in the latched position. The latch engaging portion 22b may include a similar recess 99a as the recess 99b. In this embodiment, the latch engaging portion 22b also includes a slanted third contact surface 110 adjacent the tip 108. The camming surface 102 of the latch 20 is constructed and arranged to contact the slanted third surface 110 during the latching operation, which will be described in more detail later.

[0021] Although Fig. 7 shows the latch portion 20b and the latch engaging portion 22b, it is contemplated that the latch portion 20a and latch engaging portion 22a may be constructed and arranged in a similar manner. Accordingly, the latch portion 20a and the latch engaging portion 22a may operate in a similar manner as the latch portion 20b and the latch engaging portion 22b.

[0022] Fig. 8 illustrates the latch assembly 16 in the released position in accordance with an embodiment. In the illustrated embodiment, the latch handle 18 is in a pivoted position such that the latch contact portion 84b is rotated clockwise from its position shown in Fig. 7 when the latch handle 18 is in the unpivoted, default position. In addition, the extending portion 86b of the latch 20 is rotated counterclockwise from its position shown in Fig. 7. The end portion 94 of the extending portion 86b is removed from the hooked portion 92 of the latch contact portion 84b and is slid to a higher position on a sliding surface 112 of the latch contact portion 84b. Furthermore, in the unlatched position, the tip 108 of the latch engaging portion 22b is removed from the corner 100 of the latch portion 20b. As a result, when the latch assembly 16 is in the unlatched position, the latch engaging portion 22b is disengaged from the latch portion 20b and the lid portion 14 may be pivoted to the open position away from the container portion 12.

[0023] Fig. 9 is a perspective view of the container 10 with certain parts removed to better reveal others. In this embodiment, the container 10 includes a latch cover 123 that may be optionally provided in the lid 14. The latch cover 123 may include a protrusion 125 constructed and arranged to engage with a portion of the lid 14 so as to attach the latch cover 123 to the lid 14. The attachment of the latch cover 123 to the lid 14 will be described in more detail later. The latch cover 123 may be constructed and arranged to block access/view of at least portions of the latch 20 when the lid 14 is pivoted to the open position (see Fig. 11). Fig. 10 illustrates a frontal view (from above) of the container 10 with certain parts removed to

better reveal others. In this embodiment, the container 10 includes the latch cover 123. The example of the latch cover 123 is not intended to be limiting, and it is contemplated that the location of the latch cover 123 and the connection mechanism used to connect the latch cover 123 to the lid 14 may vary in other embodiments.

[0024] Fig. 11 shows the lid 14 in the open position in accordance with an embodiment. The lid 14 includes opposing lower side walls 138a, 138b. The latch cover 123 may be positioned between the lower side walls 138a, 138b. Accordingly, the latch cover 123, the lower side walls 138a, 138b, a lower rear wall 142 (see Fig. 13), and a lower wall 130 (see Fig. 12) of the lid 14 may form a latch housing 140 that encloses at least portions of the latch 20 within the latch housing 140. Thus, the latch cover 123 and the other parts of the latch housing 140 may block access to/view of the portions of the latch 20 and/or other parts of the latch assembly 16.

[0025] In one embodiment, the portions of the latch 20 that are engaging/contacting the spring 24 and the rod 88 may be hidden from view by the latch housing 140. Accordingly, the cover latch 123 and other parts of the latch housing 140 may prevent objects or fingers from becoming lodged in parts of the latch assembly 16 (e.g., near the points of contact between the latch contact portions 84a, 84b of the latch handle 18 and the extending portions 86a, 86b of the latch 20, near the pivot axis B of the latch 20 defined by the rod 88). As shown in Fig. 11, a recess 127 is provided in the latch cover 123 for the latch portions 20a, 20b to extend therethrough so that the latch portions 20a, 20b may engage with the latch engaging portions 22a, 22b (obstructed from view in this Figure) of the container portion 12.

[0026] Fig. 12 illustrates an exploded view of the latch assembly 16 and other portions of the container 10. In the illustrated embodiment, the lid 14 includes a recessed portion 128 constructed and arranged to receive the handle 18. The recessed portion 128 may include the depression 82 for receiving the user's fingers during movement of the latch handle 18. The recessed portion 128 may be partially defined by the lower wall 130 of the lid 14. The latch 20 may be pivotally connected to the lid 14 under the recessed portion 128 (see Fig. 13). As shown in Fig. 12, the latch cover 123 includes fingers 129 extending from opposite ends of the latch cover 123 with the recess 127 therebetween. It should be appreciated that in other embodiments, the location, construction, and number of the fingers 129 may vary. The latch cover 123 may also include a raised periphery 131 that surrounds at least portions of the latch cover 123. The fingers 129 and the raised periphery 131 may help guide and connect the latch cover 123 to the lid 14 during the arrangement of the cover latch 123 on the lid 14 of the container 10. In one embodiment, the raised periphery 131 may contact the lower side walls 138a, 138b of the lid 14 when the latch cover 123 is attached to the lid 14. In addition, the protrusions 125 with hook-shaped ends (three are shown in this embodiment) may also be constructed and

arranged to connect the latch cover 123 to the lid 14. As shown in Fig. 13, the lid 14 may include the lower rear wall 142 that extends downward from the lower wall 130. As mentioned above, the lower rear wall 142, the lower wall 130, and the latch cover 123 help define the lock housing 140. Thus, the cover latch 123 may be attached to the lower rear wall 142 of the lid 14. For example, the lower rear wall 142 may be provided with engaging members 144 constructed and arranged to engage with the hook-shaped ends of the protrusions 125. A portion of the raised periphery 131 may also contact the lower rear wall 142 when the latch cover 123 is attached to the lid 14. The attachment of the latch cover 123 to the lid 14 may vary in other embodiments. It is also contemplated that the latch cover 123 may be optional. For example, in some embodiments, the container 10 is not provided with the latch cover 123.

[0027] The lid portion 14 may be latched to the container portion 12 as follows in accordance with an embodiment. The lid portion 14 may initially be in the open position wherein contents of the container portion 12 can be accessed. The lid portion 14 may then be pivoted towards the container portion 12. As the lid portion 14 is moved towards the container portion 12, the slanted camming surfaces 102 of the latch portions 20a, 20b of the latch 20 may cam against the slanted third surfaces 110 of the latch engaging portions 22a, 22b. During the camming movement, the latch 20 may be rotated in the counterclockwise direction against the bias of the spring 24 due to camming force between the slanted camming surfaces 102 of the latch portions 20a, 20b and the slanted third surfaces 110 of the latch engaging portions 22a, 22b. The slanted camming surfaces 102 of the latch portions 20a, 20b may cam against the slanted third surfaces 110 of the latch engaging portions 22a, 22b until the tip 108 of the latch engaging portions 22a, 22b clear the camming surfaces 102 of the latching portions 20a, 20b so that the latch portions 20a, 20b are in the unlatched position, whereupon the spring 24 may snap the latch portions 20a, 2b towards the latch engaging portions 22a, 22b. Accordingly, the second contact surfaces 104 of the latch engaging portions 22a, 22b may slide against the first contact surfaces 98 of the latch portions 20a, 20b until the tips 110 of the latch engaging portions 22a, 22b are received in the corners 100 of the latch portions 20a, 20b. The stop portions 90a, 90b of the latch 20 may abut against the stop surfaces 96, thus preventing over-rotation in the clockwise direction of the latch 20. As a result, the projections 21a, 21b of the latch portions 20a, 20b are received in the recesses 99a, 99b of the latch engaging portions 22a, 22b. That is, the latch portions 20a, 20b are in the latched position with the latch engaging portions 22a, 22b, as shown in Fig. 7. Thus, the lid portion 14 may be "automatically" latched to the container portion 12 by simply moving the lid portion 14 towards the container portion 12.

[0028] It should be appreciated that, in one embodiment, the user may be required to push the lid portion 14

towards the container portion 12 with force to latch the lid portion 14 to the container portion 12. In an alternate embodiment, gravity alone can move the lid portion 14 to the latched position. That is, in one embodiment, the lid portion 14 may optionally have a weight that is sufficiently heavy in relation to the spring constant of the spring 24 such that the force of gravity alone is enough to move the lid portion 14 to the closed position, whereupon the lid assembly 16 may "automatically" latch the lid portion 14 to the container portion 12 as described above. In one embodiment, the lid portion 14 may have sufficient weight such that the force of gravity alone is sufficient to move the lid portion 14 to the latched position when the lid portion 14 is released from any position. Alternatively, in one embodiment, the force of gravity alone is sufficient to move the lid portion 14 to the latched position only when the lid portion 14 is released from higher than a predetermined height position. For example, in one embodiment, the lid portion 14 may be moved to the latched position by the force of gravity when the lid portion 14 is released from a position wherein the angle between a plane defined by the lid portion 14 and a plane defined by the pair of opposing upper rims 51 of the container portion 12 is at least 45 degrees. The relative orientations can easily be changed, and not limiting, as can be appreciated by those skilled in the art.

[0029] Alternatively, the lid portion 14 may be latched to the container portion 12 as follows. The user may lift the latch handle 18 such that the latch handle 18 is rotated in the clockwise direction, as shown in Fig. 8, from its unpivoted, default position (shown in Fig. 7). Thus, the latch contact portions 84a, 84b of the latch handle 18 are also pivoted in the clockwise direction. The contact between the latch contact portions 84a, 84b and the extending portions 86a, 86b may cause the latch contact portions 84a, 84b to push the extending portions 86a, 86b so that the latch 20 is rotated in the counterclockwise direction around the rod 88 to the unlatched position. As a result, the lid portion 14 may be placed on the container portion 12 without the third slanted surface 110 of the latch engaging portions 22a, 22b obstructing the latch portions 20a, 20b. After the lid portion 14 has been placed on the container portion 12 such that the latch portions 20a, 20b are located beneath the latch engaging portions 22a, 22b, the user may let go of the latch handle 18, whereupon the spring 24 may snap the latch 20 in the clockwise direction. Accordingly, the second contact surface 104 of the latch engaging portions 22a, 22b may slide against the first contact surface 98 of the latch portions 20a, 20b until the tips 110 of the latch engaging portions 22a, 22b are received in the corner 100 of the latch portions 20a, 20b. The stop portions 90a, 90b of the latch 20 may abut against the stop surfaces 96, thus preventing over-rotation in the clockwise direction of the latch 20. The ends 94 of the extending portions 86a, 86b may be received in the hooked portion 92 of the latch handle 18. During rotation of the latch 20 by the bias of the spring 24, the extending portions 86a, 86b of the latch

20 may push against the contact portions 84a, 84b of the latch handle 18, and thus rotate the latch handle 18 in the counterclockwise direction until the latch handle 18 is in the unpivoted, default position, as shown in Fig. 7. Accordingly, the latch portion 20a, 20b are in the latched position with the latch engaging portions 22a, 22b, as shown in Fig. 7. That is, the projections 21a, 21b of the latch portions 20a, 20b are received in the recesses 99a, 99b of the latch engaging portions 22a, 22b.

[0030] The lid portion 14 may be unlatched from the container portion 12 as follows in accordance with an embodiment. The lid portion 14 may initially be latched to the container portion 12, as shown in Fig. 7. The engagement between the latch engaging portions 22a, 22b and the latch portions 20a, 20b may prevent the lid portion 14 from being moved to the open position. That is, attempts to lift the lid portion 14 from the container portion 12 may cause the first contact surfaces 98 of the latch portion 20a, 20b to abut against the second contact surfaces 104 of the latch engaging portions 22a, 22b. The user may then insert fingers into the depression 82 to pivot the handle portion 80 of the latch handle 18 upwards. As the handle 18 is pivoted upwards, the handle 18 is rotated in the clockwise direction. Accordingly, the latch contact portions 84a, 84b of the latch handle 18 are also rotated in the clockwise direction. The latch contact portions 84a, 84b may push against the extending portions 86a, 86b of the latch 20, thus pivoting the extending portions 86a, 86b (and the rest of the latch 20) in the counterclockwise direction around the rod 88. The ends 94 of the extending portions 86a, 86b may slide upwards on the sliding surfaces 112 of the latch contact portion 84b during the pivoting movement, as shown in Fig. 8. As the latch 20 is rotated in the counterclockwise direction, the second contact surfaces 104 of the latch engaging portion 22a, 22b are slid out of engagement with the first contact surfaces 98 of the latch portions 20a, 20b and the tips 108 of the latch engaging portions 22a, 22b are removed from the corners 100 of the latch portions 20a, 20b. Accordingly, the latch portions 20a, 20b are in the release position and are no longer engaged with the latch engaging portions 22a, 22b. The lid 16 may then be pivoted upwards to the open position. Thus, the latch assembly 16 is constructed and arranged to enable unlatching of the spaced latch portions 20a, 20b by pivotal movement of the latch handle 18.

[0031] In some embodiments, the container 10 may be divided into compartments or may include removable compartments. In one embodiment, the compartments may be defined by container member or dividers. The container members may optionally be constructed and arranged to be removable and to be insertable at various locations in the container portion 12 so that the configuration of the compartments may be changed. The container members may also be removed completely from the container portion 12 so that larger compartments may be formed by the walls of the container 10 and/or the walls of the other container members. The container

members may also be removed to be carried separately. The container members may optionally have various shapes and/or various sizes. The container portion 12 may optionally include inserts made of a flexible or memory-retaining materials with depressions formed therein to receive objects. In some embodiments, the depressions may be the same shape as the tools. In some embodiments, the inserts may be made of foam material. It should also be appreciated that trays 124 having an optional handle portion 126 (see Fig. 11) or other containers may be provided in the interior space 13 of the container 10.

[0032] It should be appreciated that the examples described above are not intended to be limiting. It is contemplated that the latch assembly 16 may be used in other types of boxes or containers. For example, the latch assembly 16 may be incorporated in the containers of the rolling container assembly described in U.S. Patent Application Serial No. 12/858,376, which is incorporated herein in its entirety.

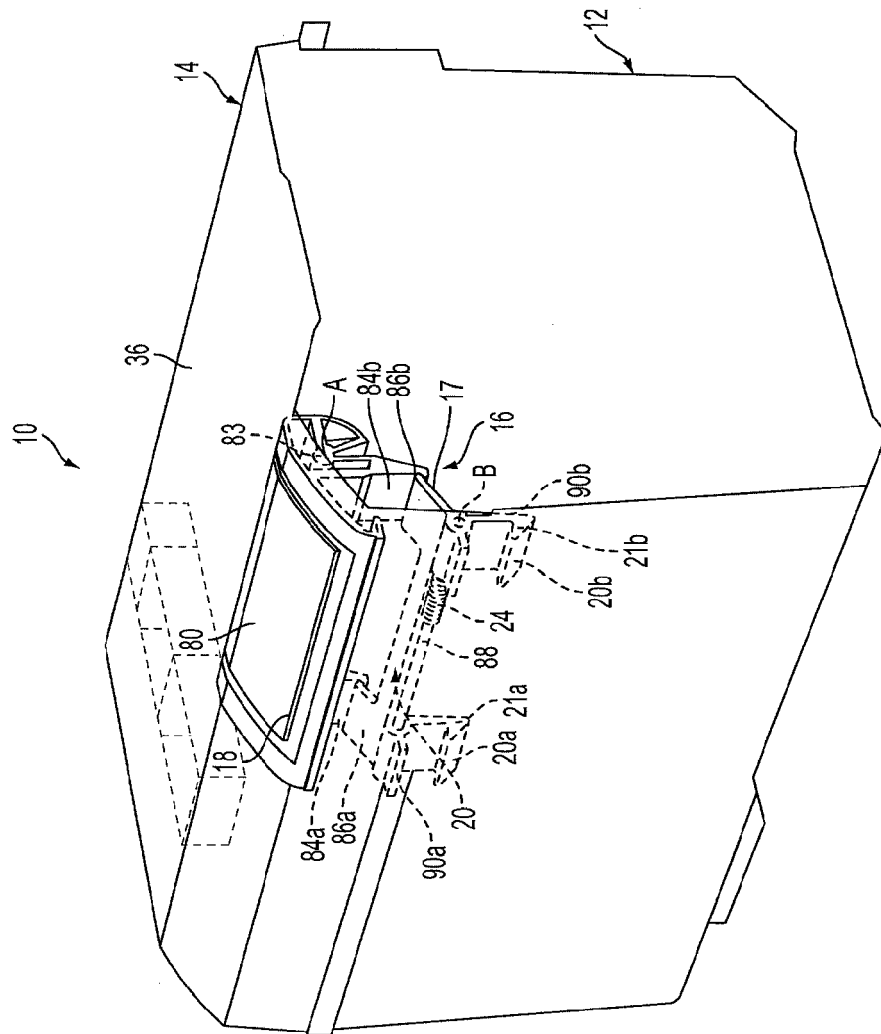
[0033] Although the invention has been described in detail for the purpose of illustration based on what is currently considered to be the most practical and preferred embodiments, it is to be understood that such detail is solely for that purpose and that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover modifications and equivalent arrangements that are within the spirit and scope of the appended claims. For example, it is to be understood that the present invention contemplates that, to the extent possible, one or more features of any embodiment may be combined with one or more features of any other embodiment.

Claims

1. A container, comprising:

- a container portion defining a space for storing tools;
- a lid portion pivotally connected to the container portion; the lid portion being pivotally movable between open and closed positions;
- a latch assembly carried by the lid portion and constructed and arranged to latch the lid portion in the closed position, the latch assembly including:
 - a single latch handle carried by the lid portion,
 - a latch comprising spaced latch portions, the spaced latch portions being moveable together between a latched position and a released position, the latch portions respectively being on opposite sides of the latch handle, the latch portions engageable with latch engaging portions of the container por-

- tion, and
a spring that biases the spaced latch portions toward the latched position, the latch handle constructed and arranged to be moved to effect movement of the latch portions from the latched position to the released position.
2. The container of claim 1, wherein the spaced latch portions are integrally molded with one another. 10
 3. The container of claim 2, wherein the single latch handle is integrally molded with the spaced latch portions. 15
 4. The container of claim 1, wherein the single latch handle and the spaced latch portions are pivotable about a common axis.
 5. The container of claim 1, wherein the spaced latch portions each comprise a projection, and wherein the latch engaging portions receive the projection when the latch portions are in the latched position. 20
 6. The container of claim 1, wherein the spaced latch portions each comprise a recess, and wherein the latch engaging portions engage in the recess when the latch portions are in the latched position. 25
 7. The container of claim 1, wherein forcing the lid portion to the closed position causes the latch portions to first move to the unlatched position, and wherein the spring biases the latch portions to subsequently move to the latched position. 30
35
 8. The container of claim 1, wherein the lid portion has a weight that is sufficiently heavy in relation to the spring constant of the spring, such that the force of gravity alone is enough to move the lid portion to the latched position, wherein during movement of the lid portion under the force of gravity alone first moves the latch portions to the unlatched position against the bias of the spring, and wherein the force of the spring subsequently moves the latch portions to the latched position. 40
45
 9. The container of claim 8, wherein the force of gravity alone is sufficient to move the lid portion to the latched position only when the lid is released from higher than a predetermined height position. 50
 10. The container of claim 1, wherein the latch handle includes a contact portion constructed and arranged to contact the spaced latch portions so as to effect movement of the latch portions from the latched position to the released position. 55
 11. The container of claim 1, wherein the latch handle
- is pivotable about a first axis, and the spaced latch portions are pivotable about a second axis, the first and second axis being parallel to one another.
- 5 12. The container of claim 1, wherein the latch handle is separately formed from the latch and comprises at least one latch contact portion for contacting the latch.



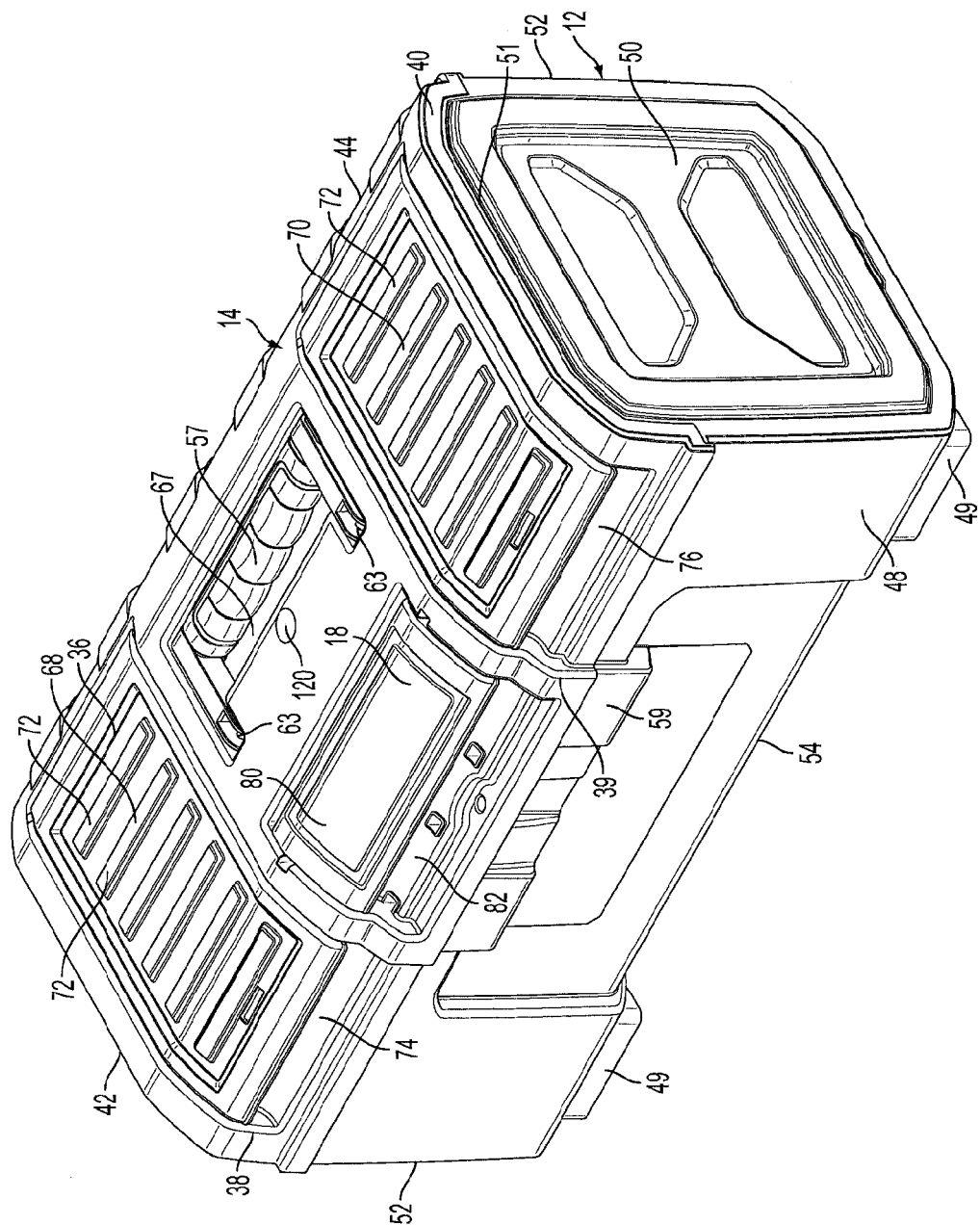
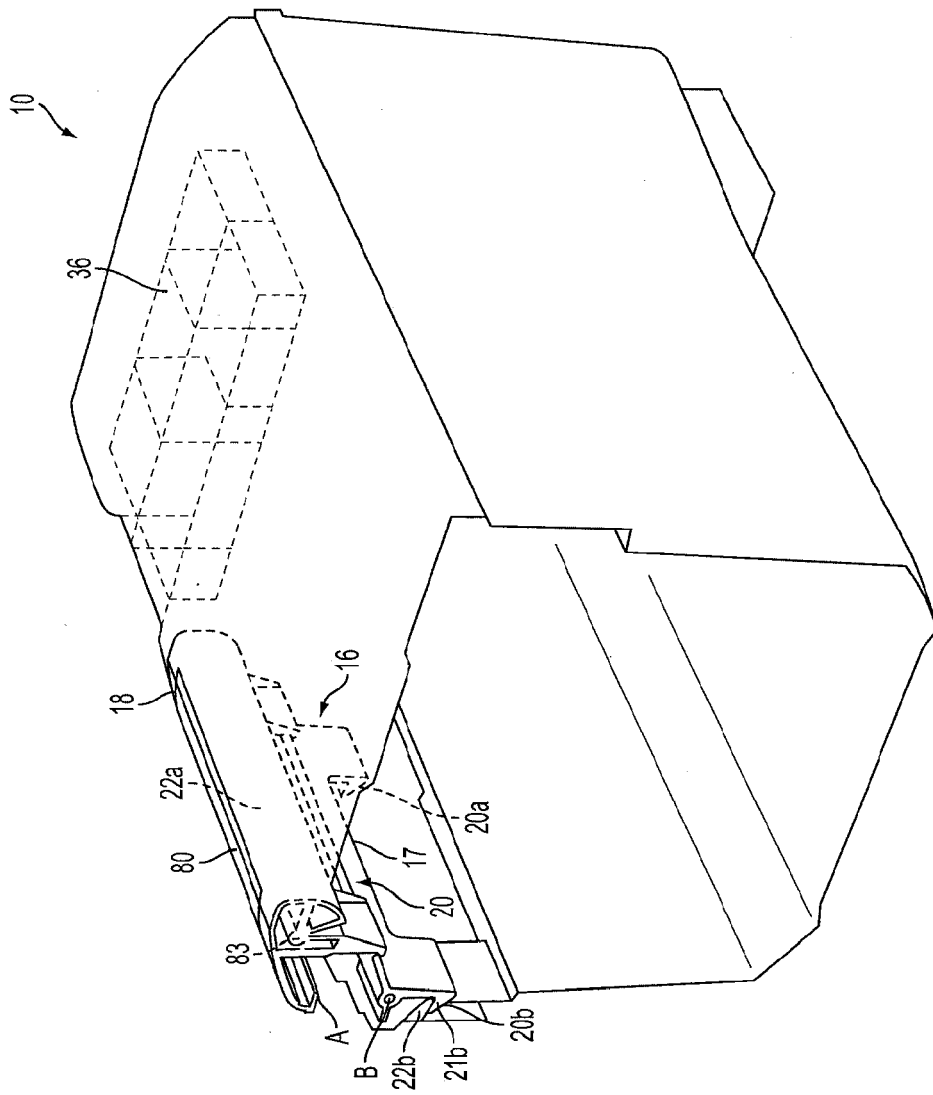


FIG. 2



F/G. 3

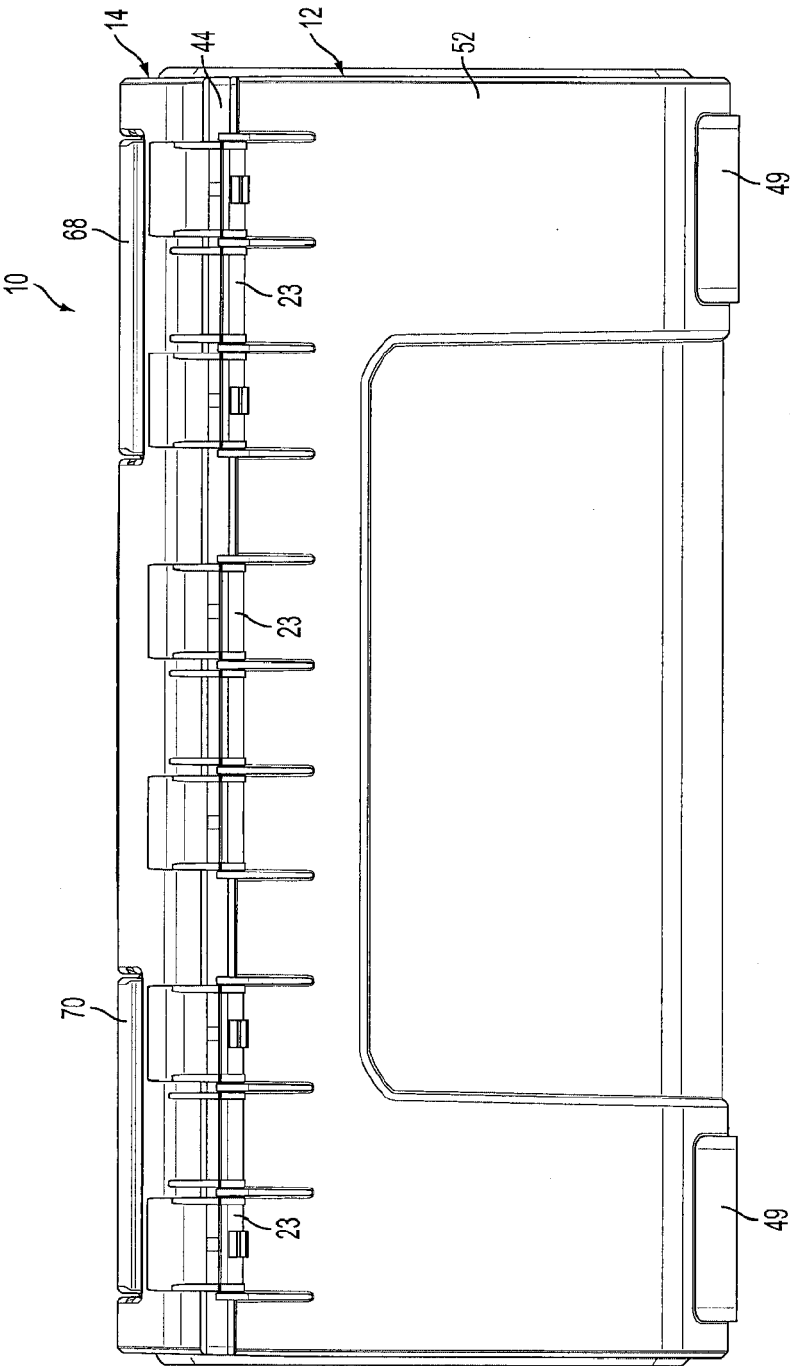


FIG. 4

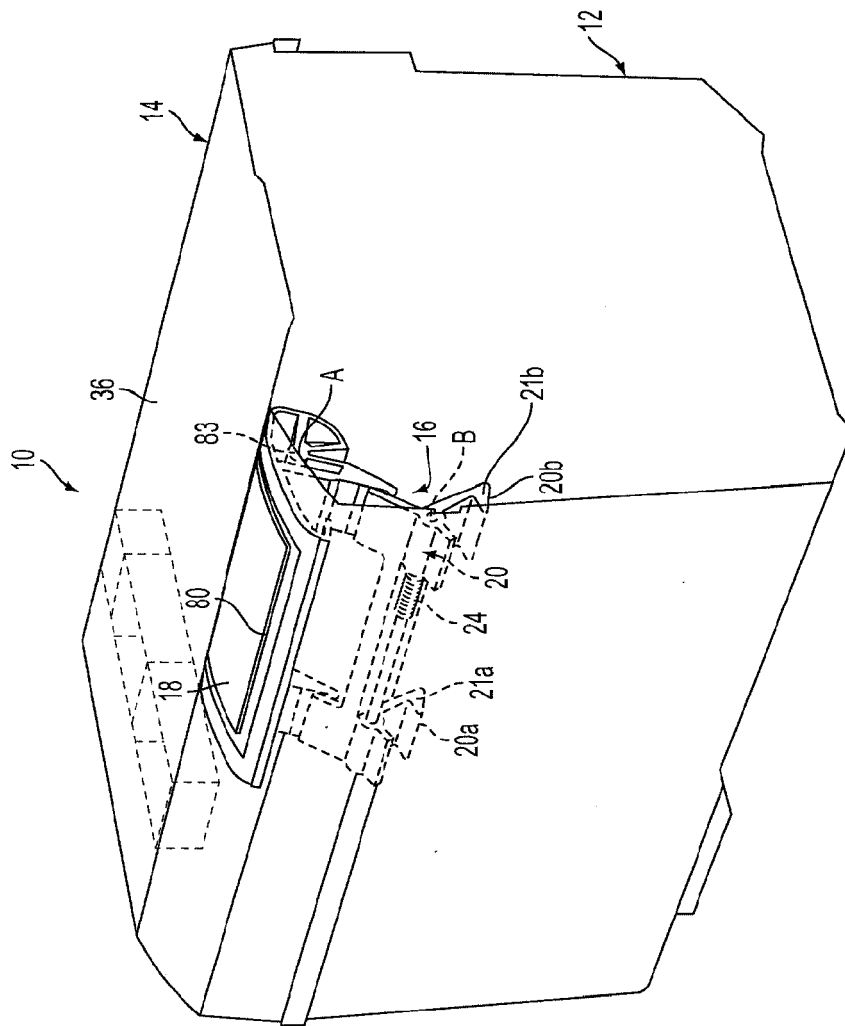


FIG. 5

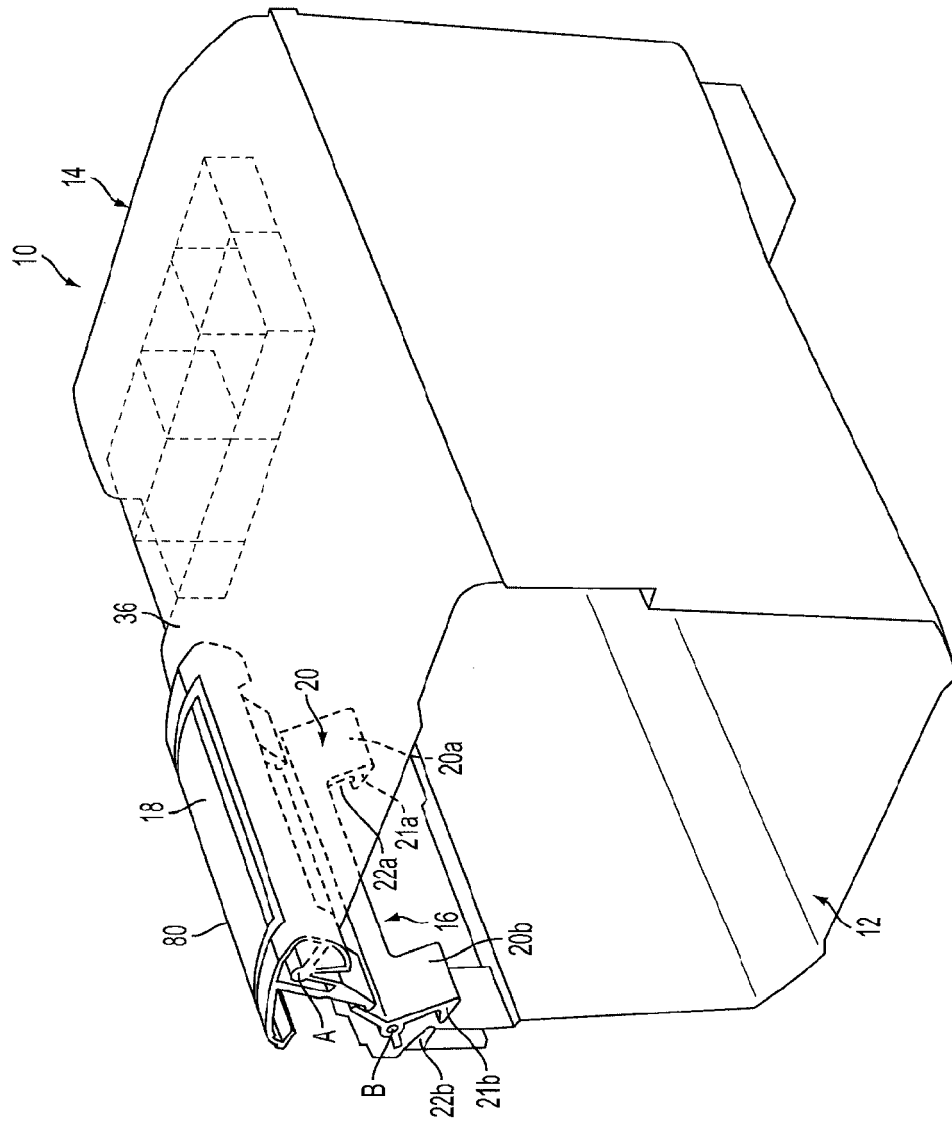


FIG. 6

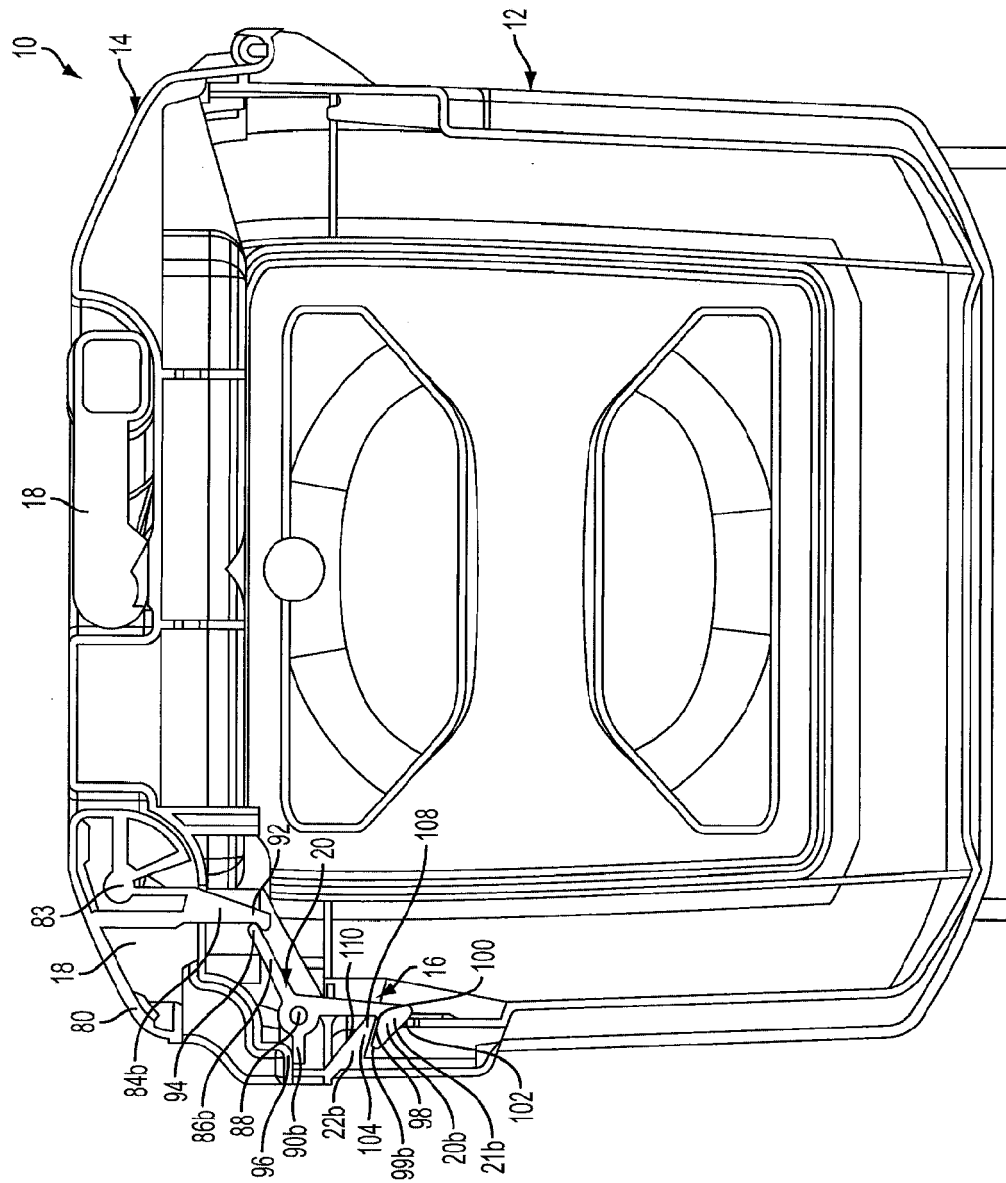


FIG. 7

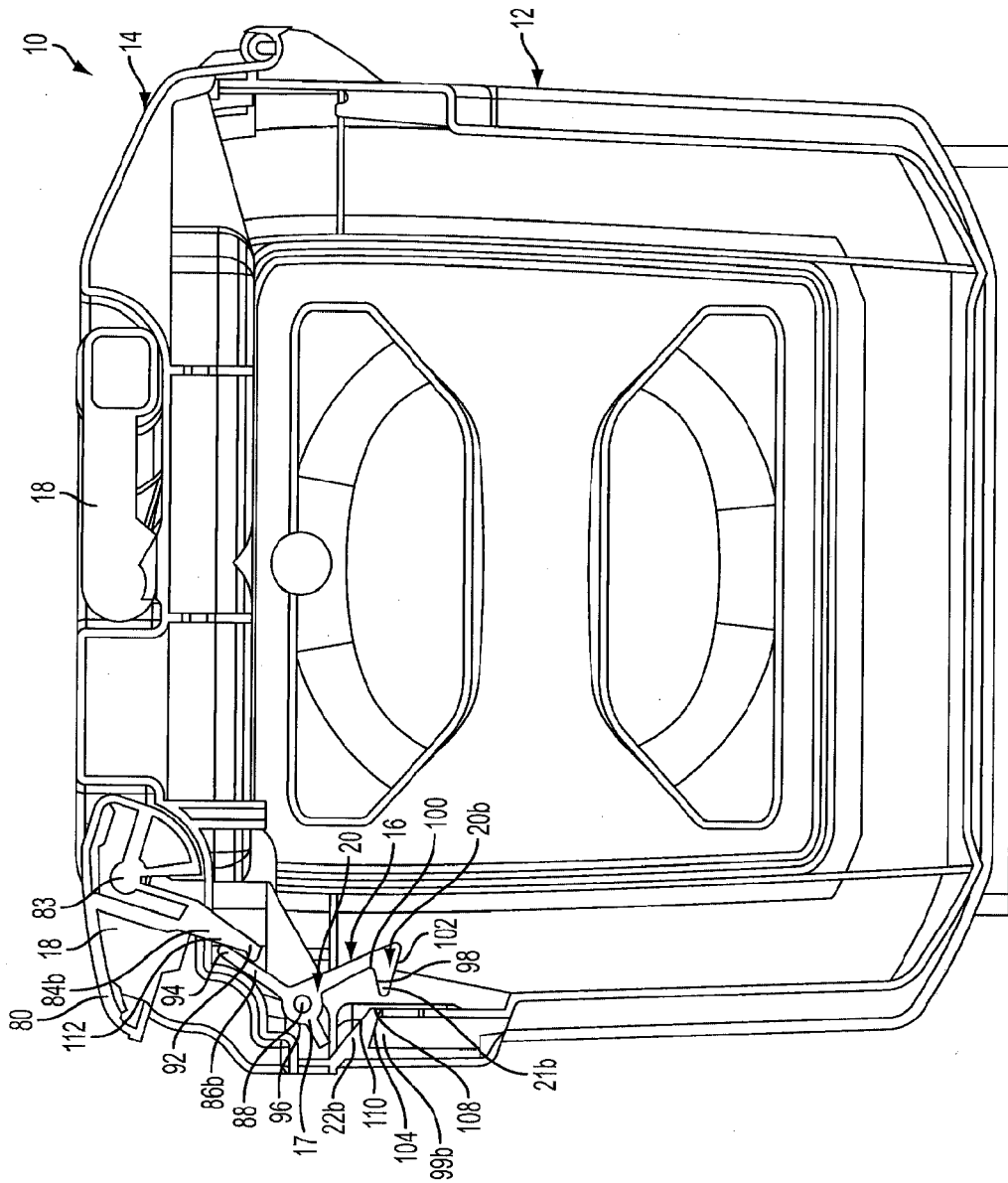


FIG. 8

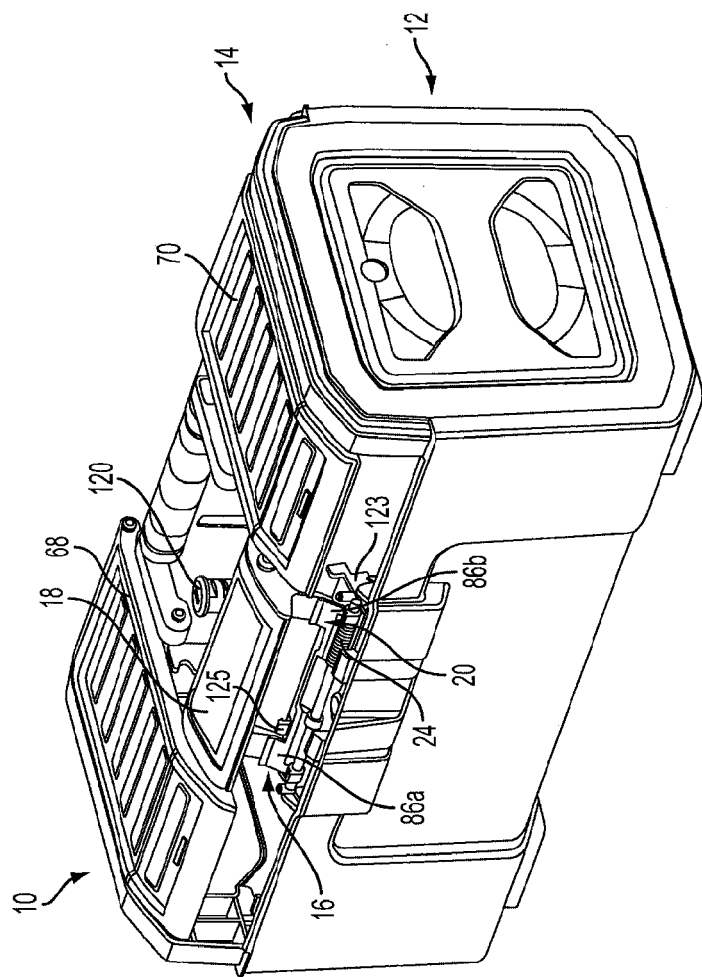


FIG. 9

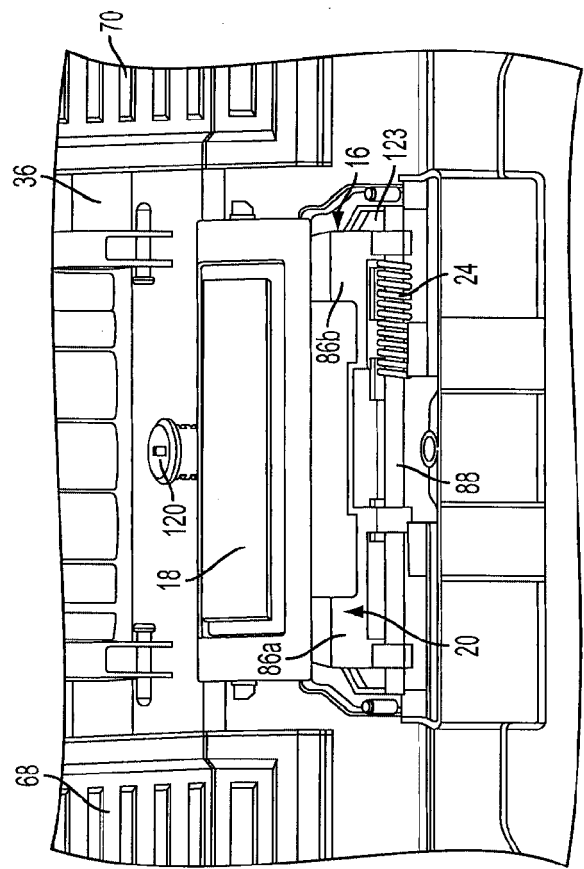


FIG. 10

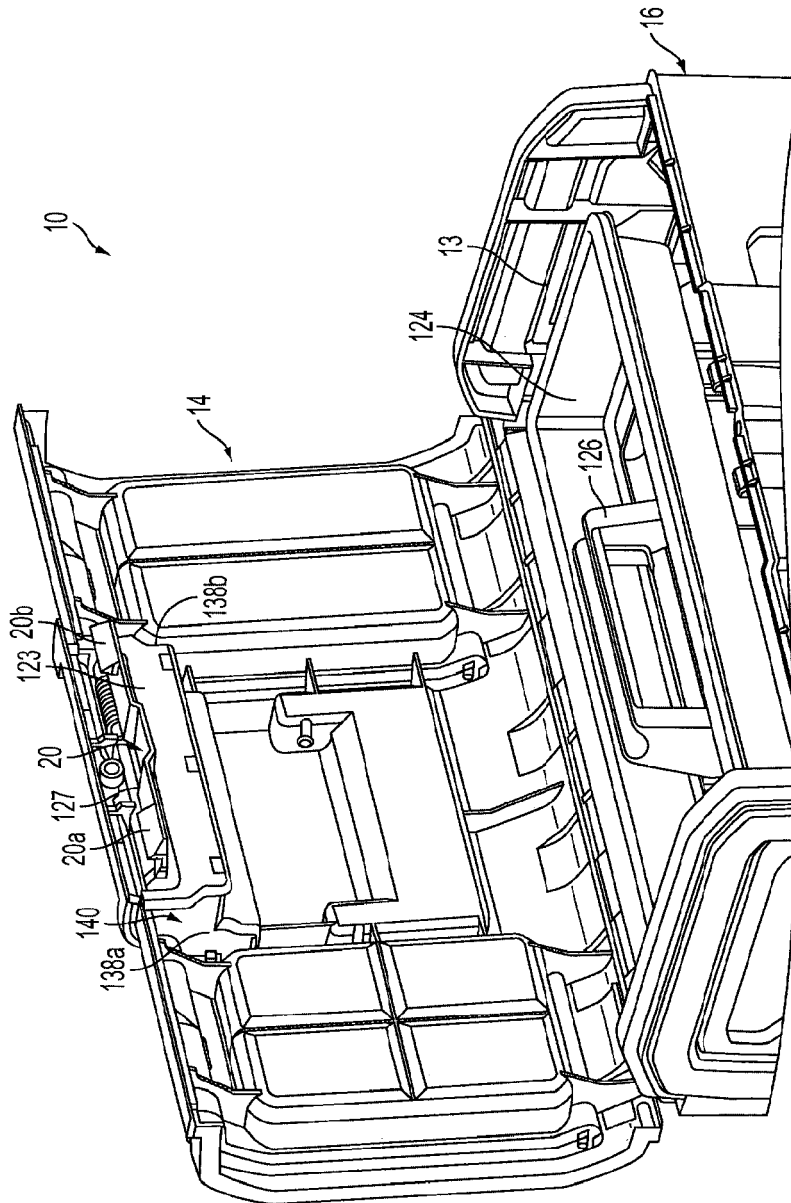
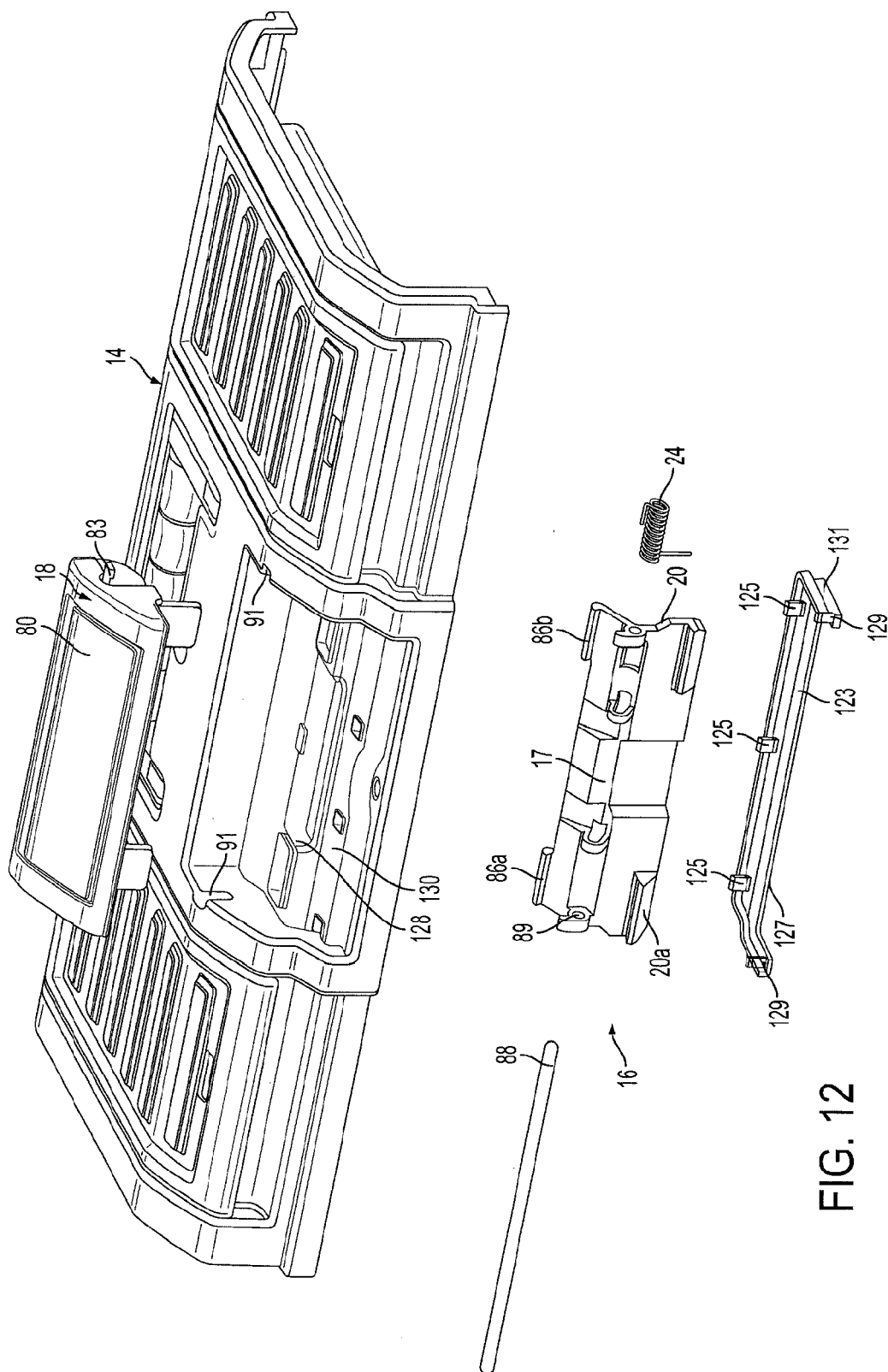


FIG. 11



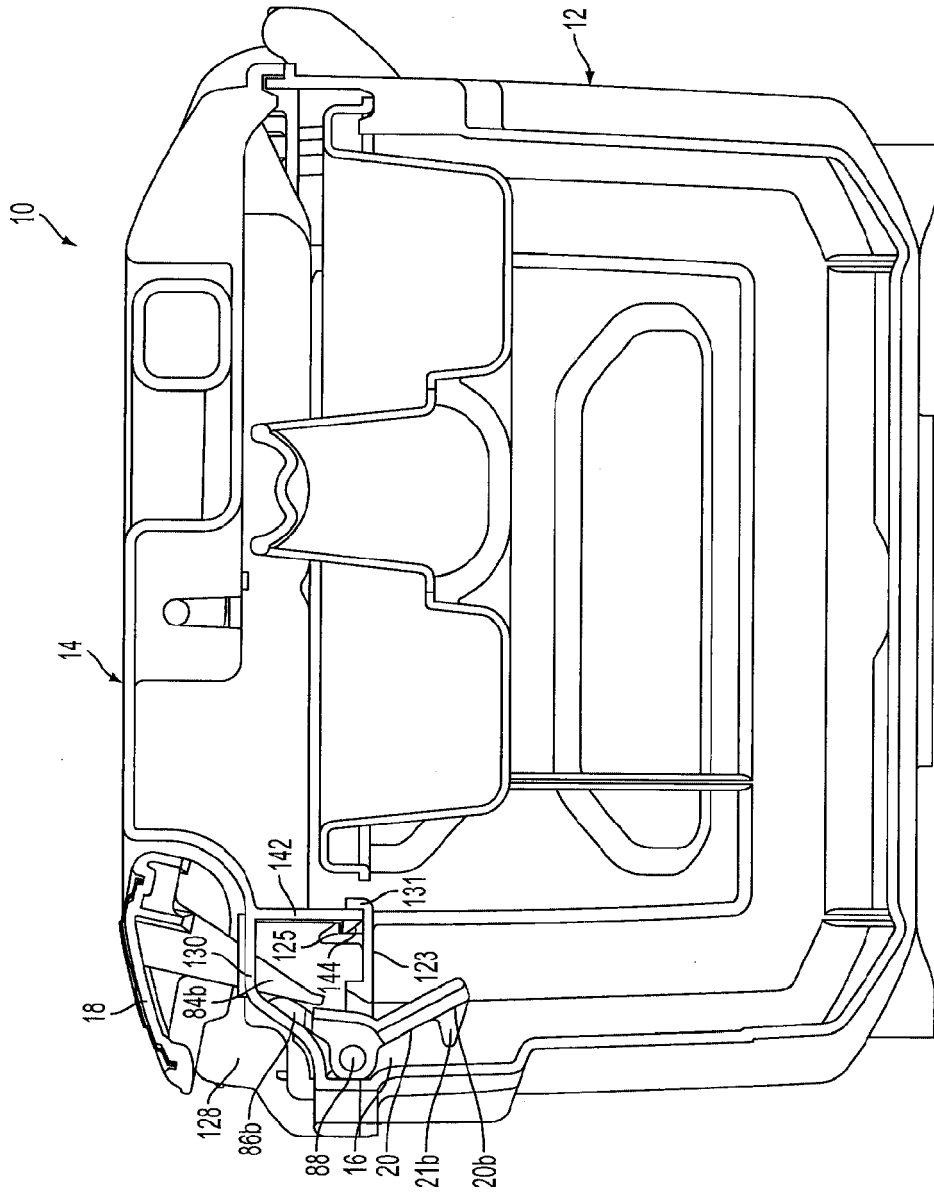


FIG. 13

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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