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(54) Multi-height container

(57) A container includes a base (12) and a plurality of walls (14) extending upward from the base (12). A support (18) includes a support portion (20) connected to the walls by a pair of arms. The arms each include a first arm portion (22) connected to the support portion (20) and a second arm portion (24) pivotably connected to the first arm portion (22). The second arm portion (24) is pivotably connected to the walls (14).

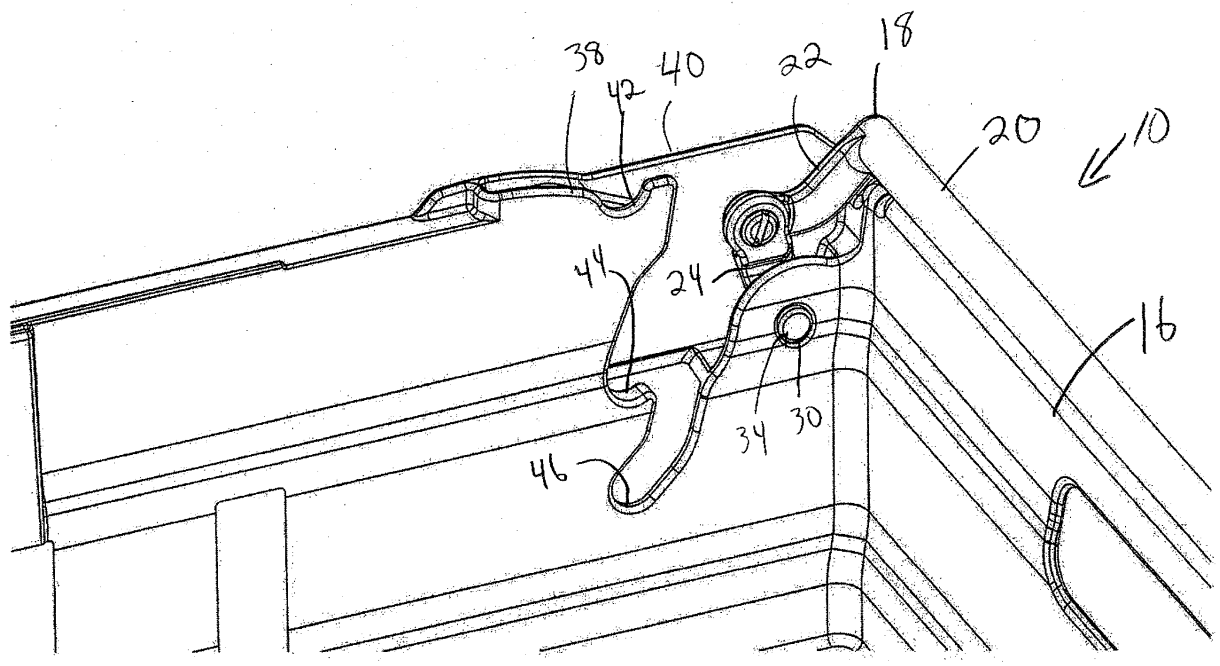

Figure 5

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Description

BACKGROUND

[0001] Nestable containers often include supports (or "bails") that can be pivoted between a nesting position, where the support is outside the footprint of the base, such that an identical container can be nested therein, and a stack position over the base, such that an identical container can be stacked thereon.

[0002] Multi-height containers permit the supports to be moved to different heights so that the upper container can be stacked thereon at the lowest height that accommodates the goods. This typically requires that the supports be both slidable and pivotable relative to the container. Pivot pins captured in elongated slots in the walls of the container permit the sliding and pivoting motion of the supports. However, the elongated slots weaken the walls and the sliding motion is sometimes difficult, as the support twists and the pivot pins bind in the slots.

SUMMARY

[0003] The container disclosed herein includes supports with hinged support arms. The hinged support arms can eliminate elongated slots in the container walls or any sliding motion of the supports, but still reach a plurality of positions or stacking heights. Alternatively, the hinged support arms could be used in combination with shorter elongated slots.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0004] A container 10 according to one example embodiment is shown in Figure 1. The container 10 includes a base 12, side walls 14 and end walls 16. Supports 18 (or "bails") are pivotably connected to the container 10 at each end. Each support 18 includes an elongated support portion 20 and support arms extending from each end of the support portion 20. Each support arm includes a first arm portion 22 and a second arm portion 24. The first arm portion 22 is connected proximate an end of the support portion 20. The first arm portion 22 is also pivotably connected to the second arm portion 24. The second arm portion 24 is pivotably connected to the container 10 at a fixed pivot point.

[0005] Figure 2 is an exploded, enlarged view of one end of the container 10 of Figure 1. As shown, upper portions of the side walls 14 generally include an outer wall portion 40 and an inner wall portion 38. Pivot holes 34, 36 are formed in the inner wall portion 38 and outer wall portion 40, respectively. The second arm portions 24 pivot relative to the container 10 about the pivot holes 34, 36. The second arm portions 24 are captured between the inner wall portions 38 and outer wall portions 40.

[0006] Figures 3 and 4 are enlarged views of one end of the support 18 and second arm portion 24. An outer end of the first arm portion 22 includes a pivot pin 26 protruding inwardly (i.e. toward the pivot pin 26 and first arm portion 22 of the other arm; Figure 2), which is adapted to snap-fit into an aperture 28 at one end of the second arm portion 24. The other end of the second arm portion 24 includes a pair of pivot pins 30, 32. It should be recognized that pivot pins and holes at any hinge connection could be switched to either component. By forming large contact surfaces in the hinge between the first arm portion 22 and the second arm portion 24, torsional flex between the first arm portion 22 and the second arm portion 24 is reduced. Large contact surfaces can be formed by having a large diameter pivot pin 26 and/or large mating surfaces between the first arm portion 22 and second arm portion 24.

[0007] Figures 5 and 6 show the support 18 in a nesting position, with the support portion 20 of the support 18 aligned with the end wall 16. The inner wall portion 38 includes a high stack surface 42, a middle stack surface 44 and a low stack surface 46. The pivot pin 30 of the second arm portion 24 is pivotably connected to the hole 34 in the inner wall portion 38. The pivot pin 32 of the second arm portion 24 is pivotably connected to the hole 36 in the outer wall portion 40 (Figure 1). As shown, in this position, the first arm portion 22 is roughly perpendicular to the second arm portion 24. An identical container 10 could be nested within the container 10 when the support 18 is in the nesting position. As can be seen in Figure 6, the high stack surface 42, the middle stack surface 44 and the low stack surface 46 are vertically aligned, such that the support portion 20 of the support 18 would contact the base 12 of an identical container in the same location in all stacking heights.

[0008] Figures 7 and 8 show the support 18 in the high stack position, with the support portion 20 of the support 18 supported on the high stack surface 42. The first arm portion 22 and second arm portion 24 are nearly extended to 180 degrees relative to one another to permit the support to reach this position. The pivot points are substantially aligned along a straight line.

[0009] Figures 9 and 10 show the support 18 in the middle stack position, with the support portion 20 of the support 18 supported on the middle stack surface 44. The first arm portion 22 and second arm portion 24 are roughly perpendicular to one another again, although in the opposite direction as in the nesting position. This permits an identical container stacked thereon to be stacked at a middle height.

[0010] Figures 11 and 12 show the support 18 in the low stack position, with the support portion 20 of the support 18 supported on the low stack surface 46. The first arm portion 22 and second arm portion 24 are extended to approximately 100 degrees. This permits an identical container stacked thereon to be stacked at a low height, for stacking efficiency with smaller goods.

[0011] Figure 13 demonstrates the section line for Figures 8, 10 and 12. Figure 14 is a top view of the container 10. Figure 15 is a side view of the container 10. Figure

16 is an end view of the container 10.

[0012] As shown, the provision of a pivot between the pivot connection to the container and the support portion of the support permits the support to be moved to various positions without the need for elongated slots in the container and without the need for sliding movement between the support and the container. This may provide easier, smoother movement of the support to the various positions and increased wall strength in the container. The operation of the container 10 is much like existing containers, but without the sliding action and elongated slots in the container. Alternatively, the pivoting or hinged arm may also be used with a shorter slot in the container, so that the supports have both pivoting and sliding action for additional flexibility, but stronger walls than previous designs.

[0013] In accordance with the provisions of the patent statutes and jurisprudence, exemplary configurations described above are considered to represent a preferred embodiment of the invention. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its scope as is defined by the following claims.

Claims

1. A container (10) comprising:

a base (12);
a plurality of walls (14) extending upward from the base (12);
a support (18) including a support portion (20) connected to the walls (14) by an arm, the arm including a first arm portion (22) connected to the support portion (20) and a second arm portion (24) pivotably connected to the first arm portion (22) and pivotably connected to the walls (14).

2. The container of claim 1 wherein the arm is a first arm connected to the support portion (20) near one end of the support portion (20), the support further including a second arm connected to the support portion (20) near an opposite end of the support portion (20), the second arm including a first arm portion (22) pivotably connected to a second arm portion (24) pivotably connected to the walls (14).

3. The container of claim 1 or 2 wherein the plurality of walls includes a first wall (14), the arm is connected to the first wall (14), the first wall (14) including an inner wall portion (38) and an outer wall portion (40), the second arm portion (24) between the inner wall portion (38) and the outer wall portion (40).

4. The container of claim 3 wherein the second arm portion (24) includes a pair of pivot pins (30,32) received in holes (34,36) in the inner wall portion (38) and the outer wall portion (40).

5. The container of any preceding claim wherein the support (18) is pivotable between a nesting position where the support portion (20) does not extend over the base (12) of the container and a stack position where the support portion (20) extends over the base (12) of the container.

6. The container of claim 5 wherein the stack position is a high stack position, the support (18) also movable to a low stack position.

7. The container of claim 6 wherein the support (18) is also movable to a middle stack position higher than the low stack position and lower than the high stack position, wherein an identical container can be stacked on the support (18) in the low stack position, the middle stack position or the high stack position and wherein the identical container can be nested within the container (10) when the support is in the nesting position.

8. The container of claim 7 wherein the plurality of walls includes a first wall (14), the arm is connected to the first wall (14), the first wall (14) including an inner wall portion (38) and an outer wall portion (40), the second arm portion (38) between the inner wall portion and the outer wall portion (40).

9. The container of claim 8 wherein the inner wall portion (38) includes a high stack surface (42), a middle stack surface (44) and a low stack surface (46), the support (18) contacting the high stack surface (42) in the high stack position, the middle stack surface (44) in the middle stack position and the low stack surface (46) in the low stack position.

10. The container of any preceding claim wherein the first arm portion (22) and the second arm portion (24) are connected by a hinge, the hinge including a pivot pin (26) snap-fit into an aperture (28).

11. The container of any preceding claim wherein the second arm portion (24) is pivotably connected to the plurality of walls (14) at a fixed pivot axis.

12. A container (10) comprising:

a base (12);
a plurality of walls (14) extending upward from the base (12); and
a support (18) pivotably connected to the walls (14) about a fixed pivot axis, the support (18) movable between a nesting position, a high stack position and a low stack position, wherein the support (18) includes a support portion (20)

that is positioned over the base in the high stack position and the low stack position, wherein the support portion (20) is not positioned over the base (12) in the nesting position.

13. The container of any of claims 6 to 12 wherein positions of the support portion (20) in the high stack position and low stack position are vertically aligned with one another.

14. The container of claim 13 wherein the plurality of walls include a pair of opposed side walls (14) and a pair of opposed end walls (16) and wherein the support (18) is a first support, the container further including a second support (18), wherein the first support (18) and the second support (18) are each pivotably connected to the pair of side walls (14).

15. The container of claim 14 wherein each of the side walls (14) includes a high stack surface (42), a middle stack surface (44) and a low stack surface (46), the first support (18) and the second support (18) contacting the high stack surface (42) in the high stack position, the middle stack surface (44) in the middle stack position and the low stack surface (46) in the low stack position.

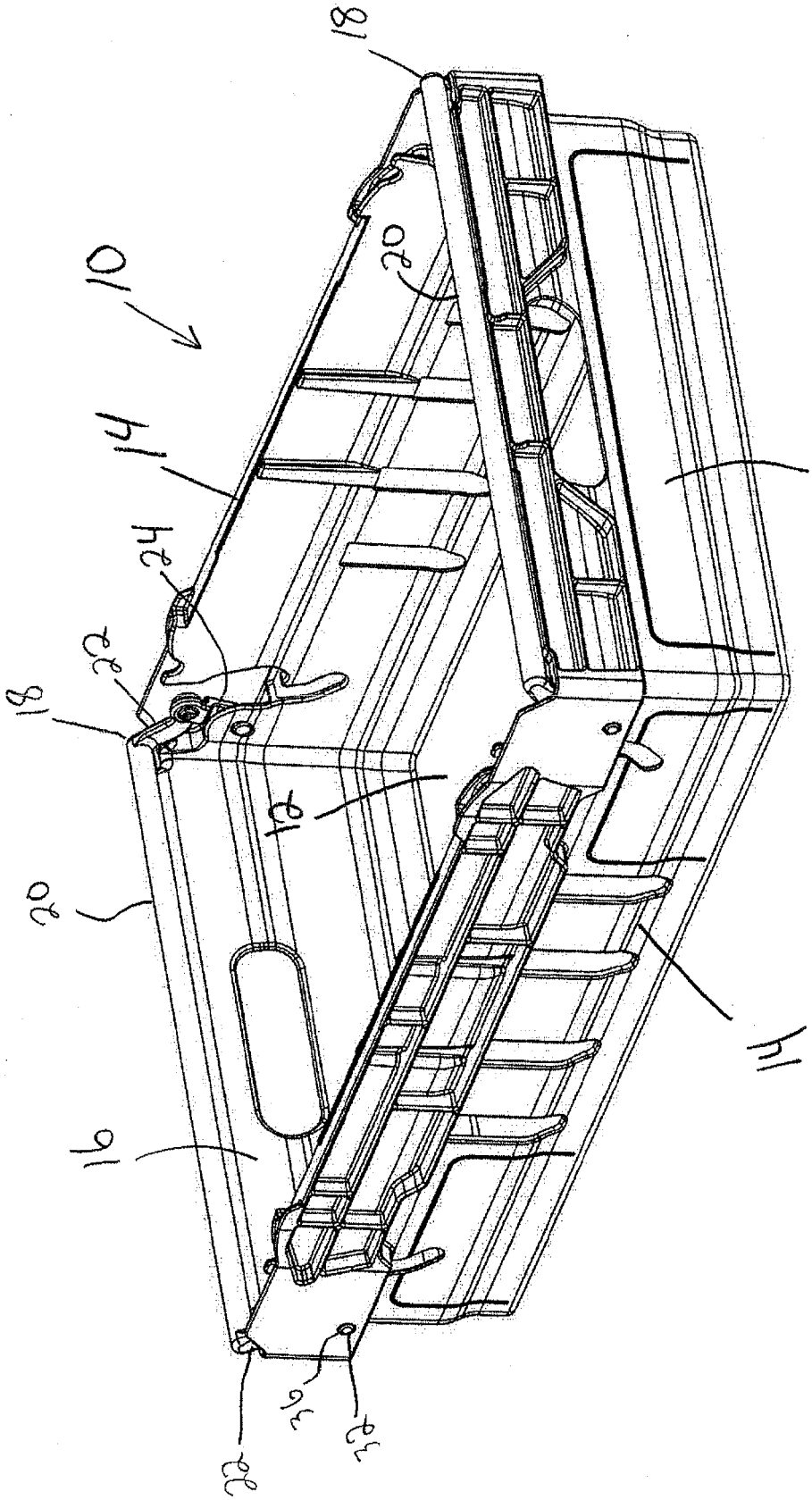


Figure 1

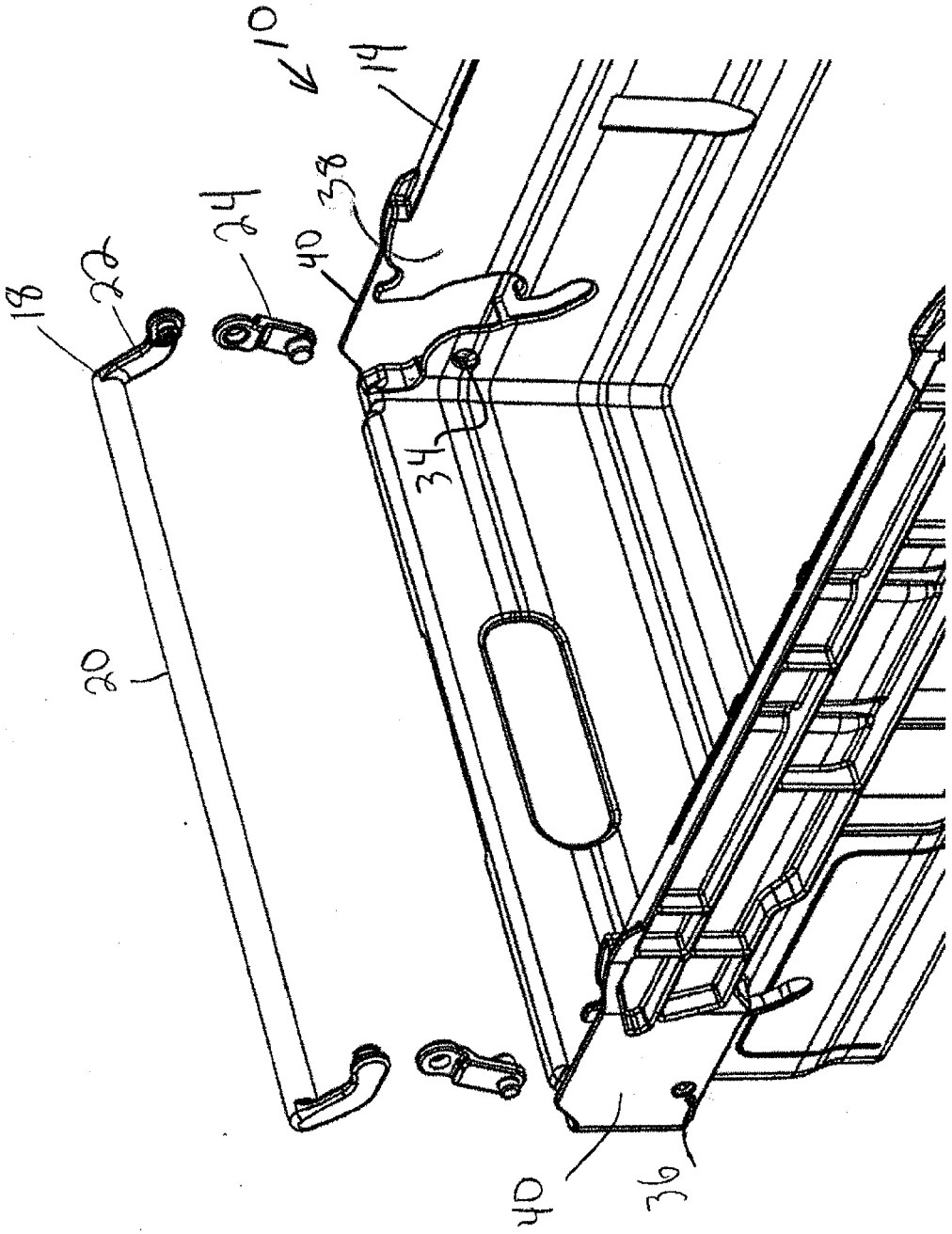


Figure 2

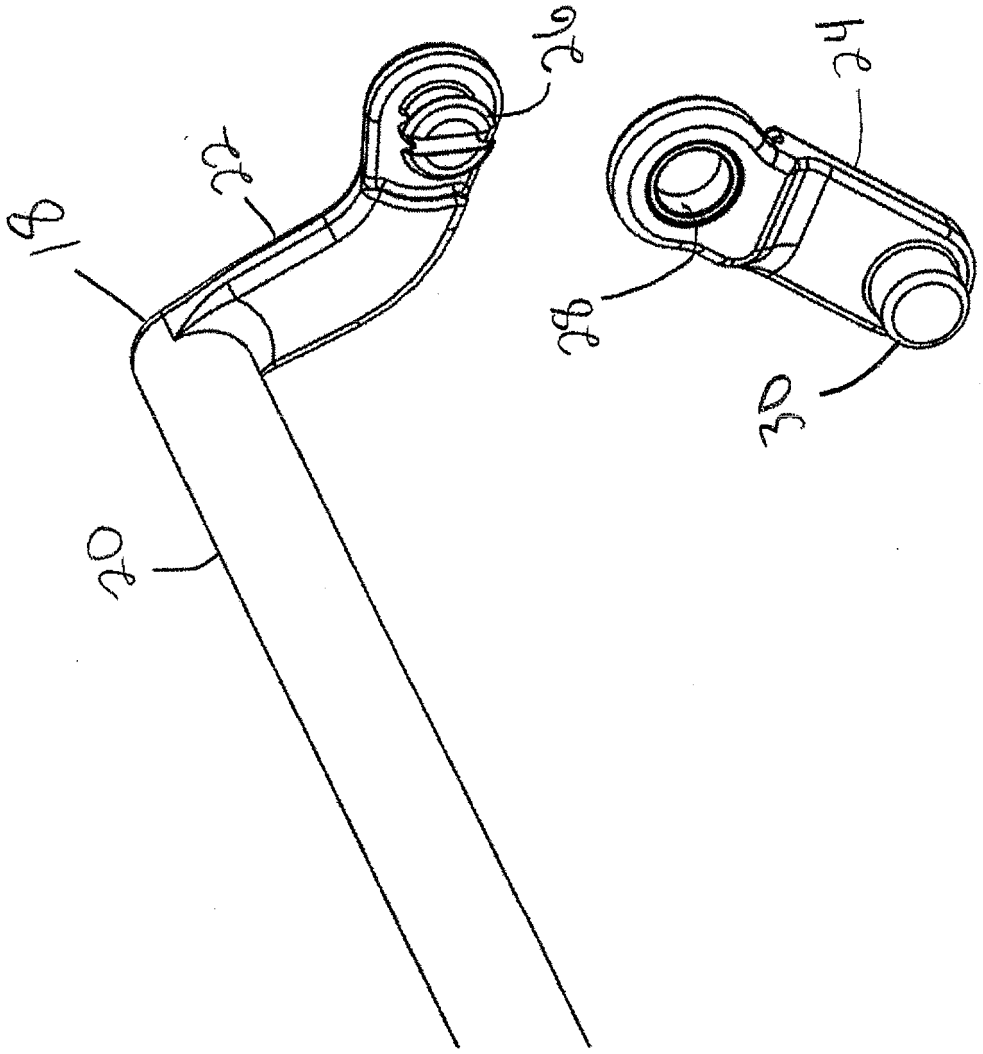


Figure 3

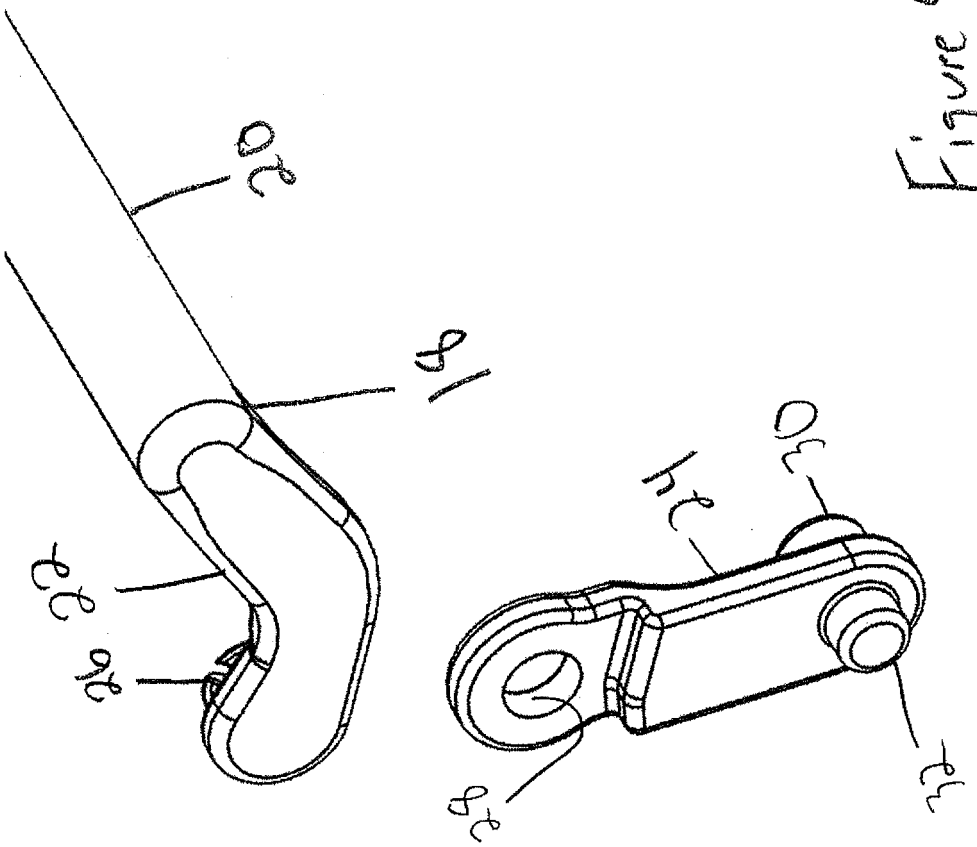


Figure 4

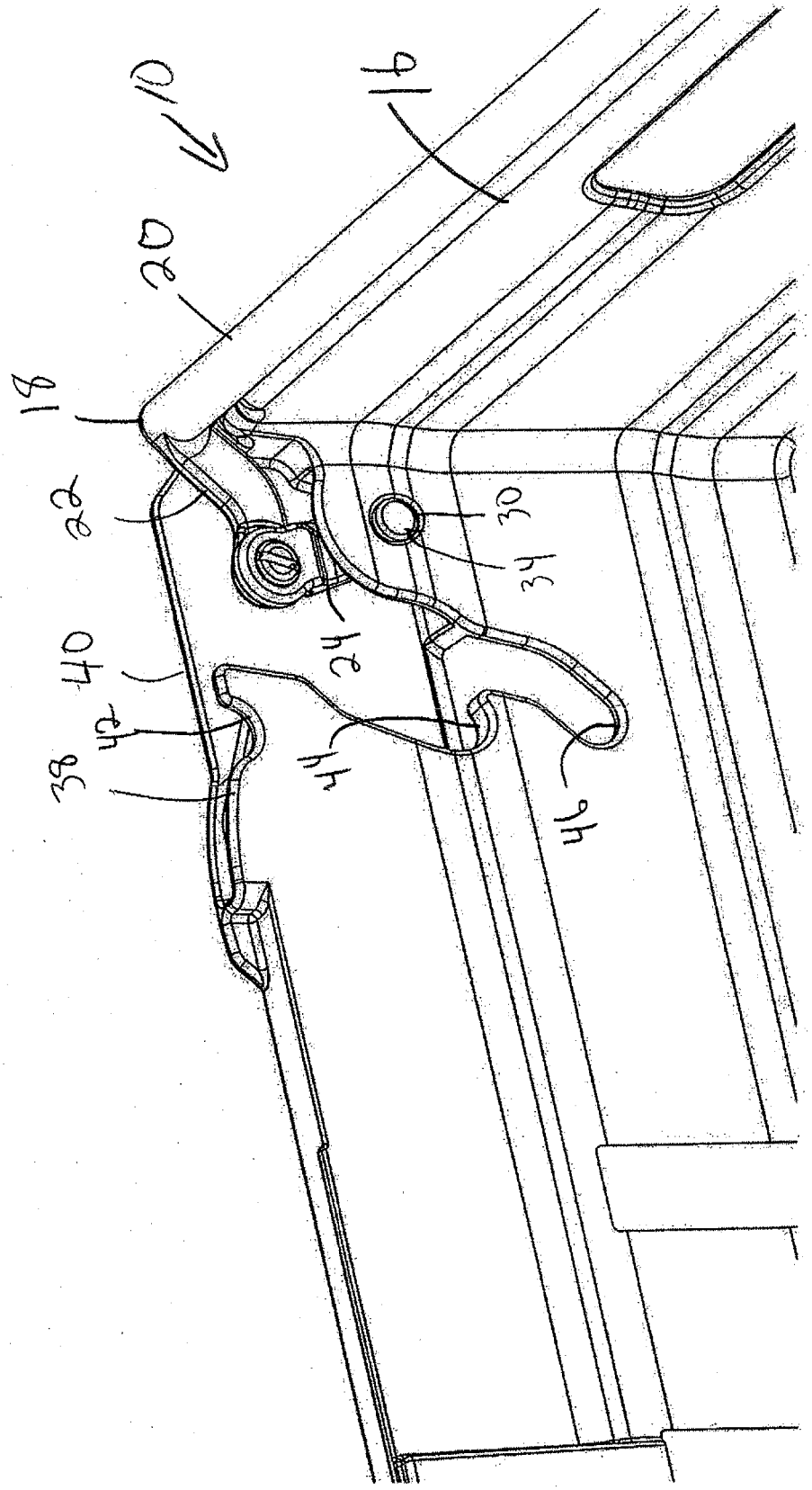


Figure 5

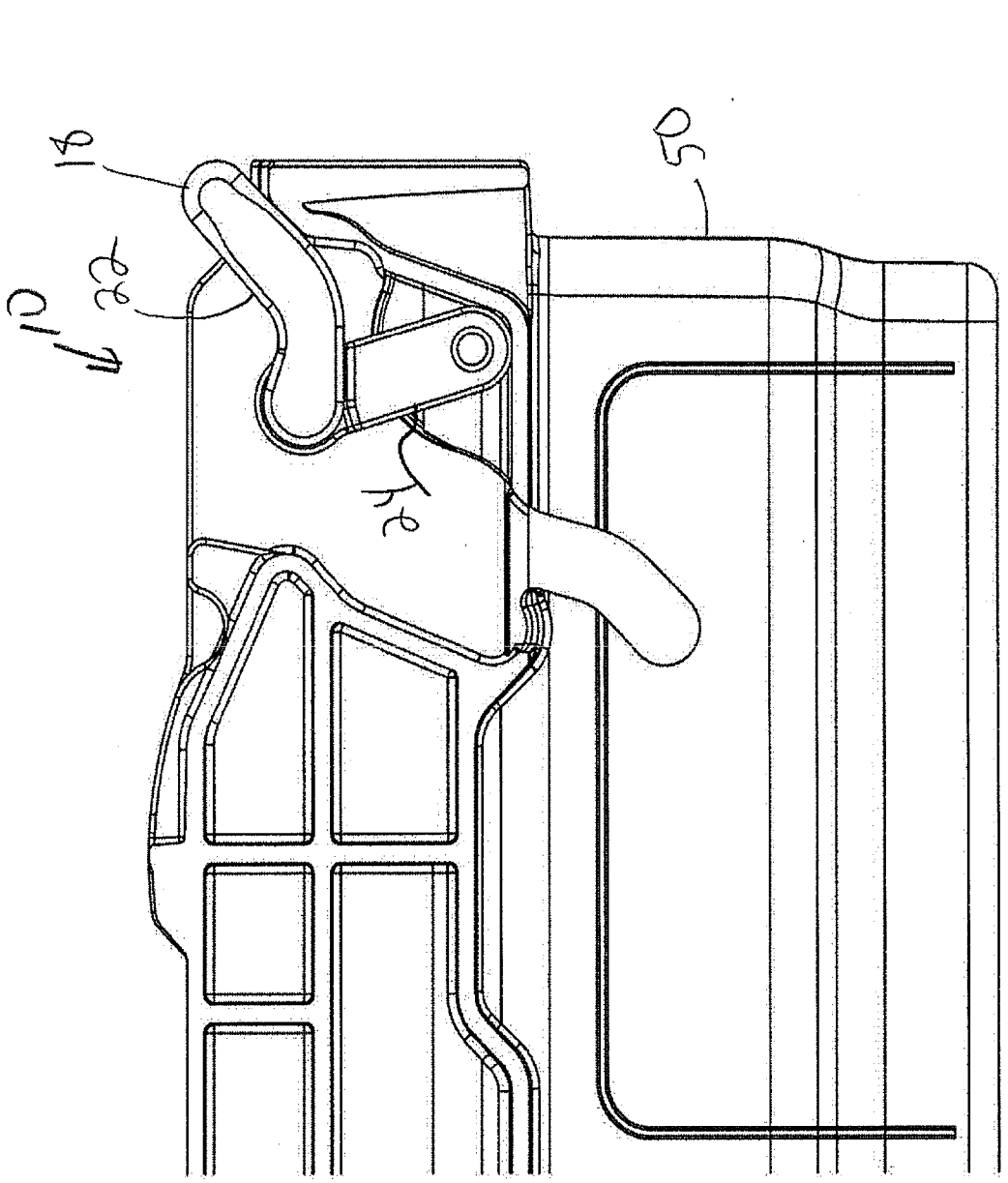


Figure 6

Section View of Nesting Position:

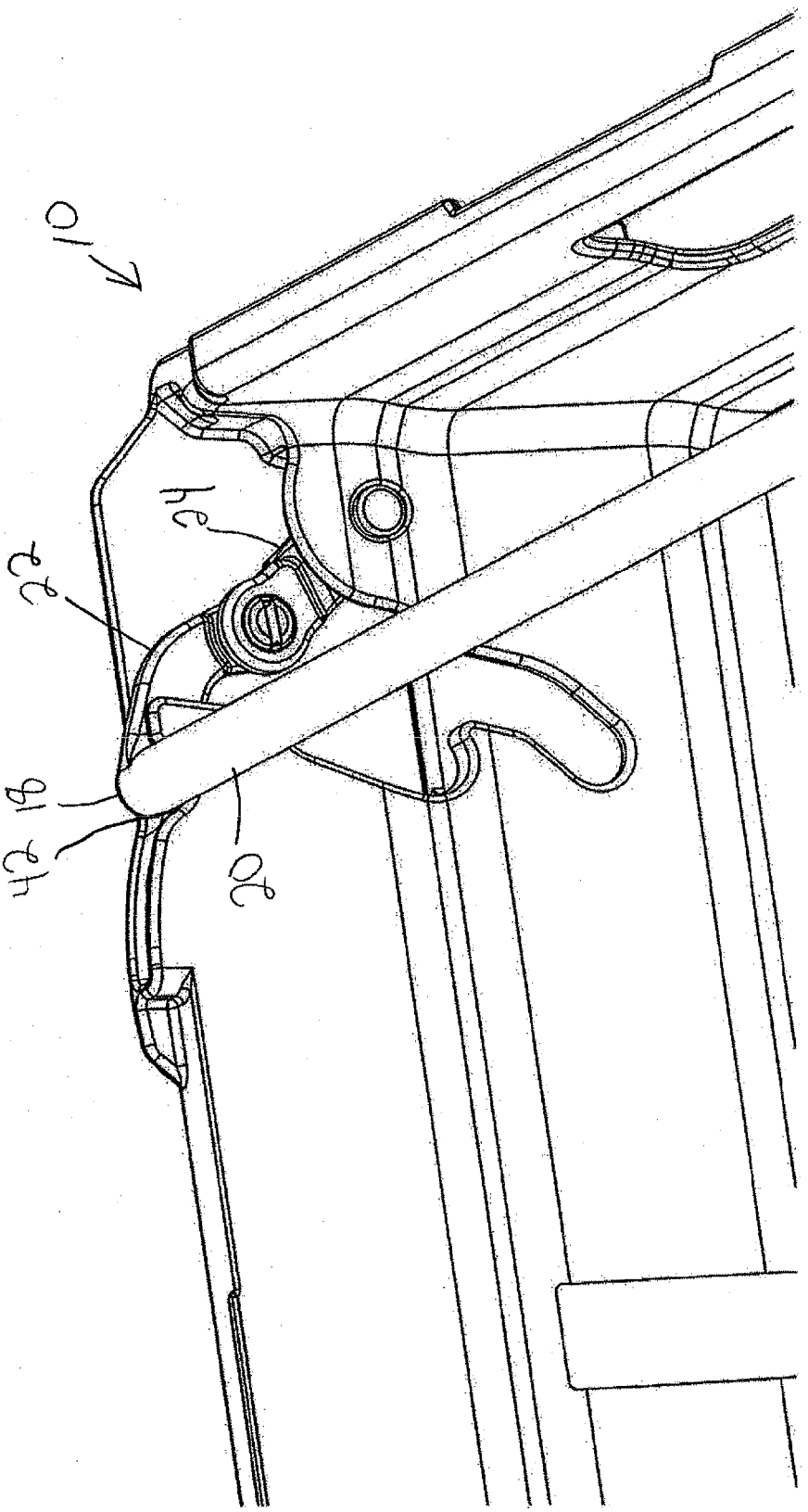


Figure 7

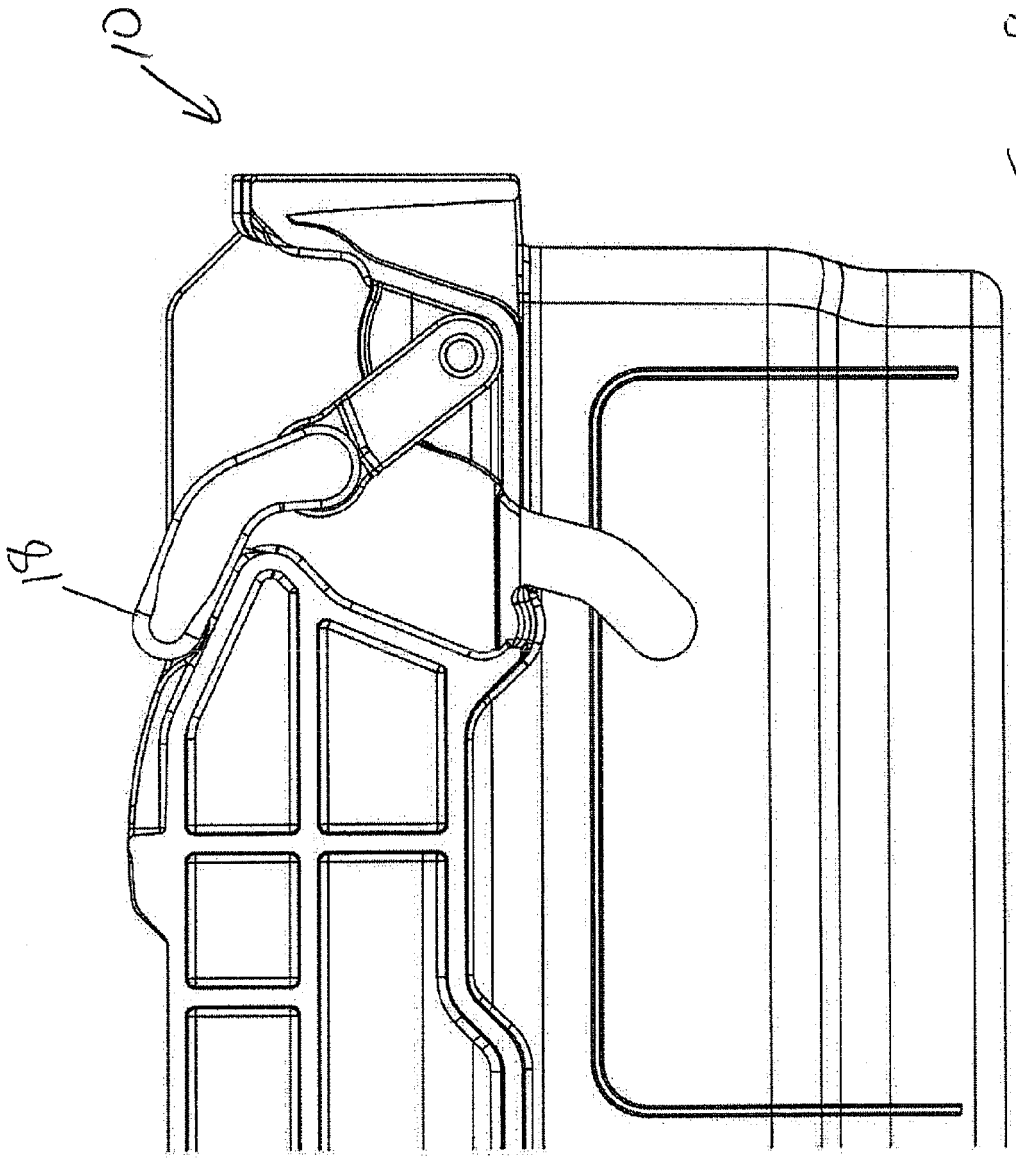


Figure 8

Section View of Stacking Position:

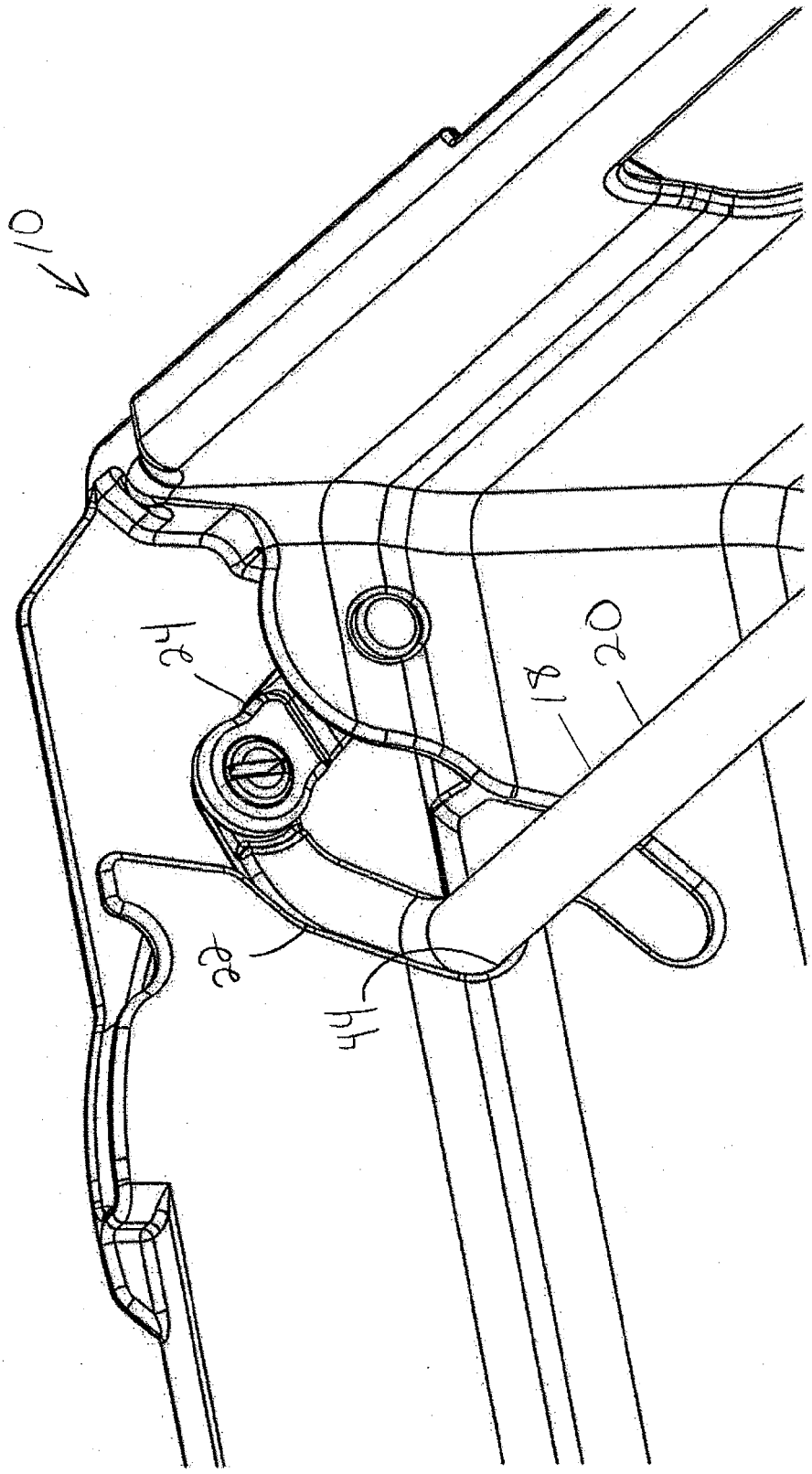


Figure 9

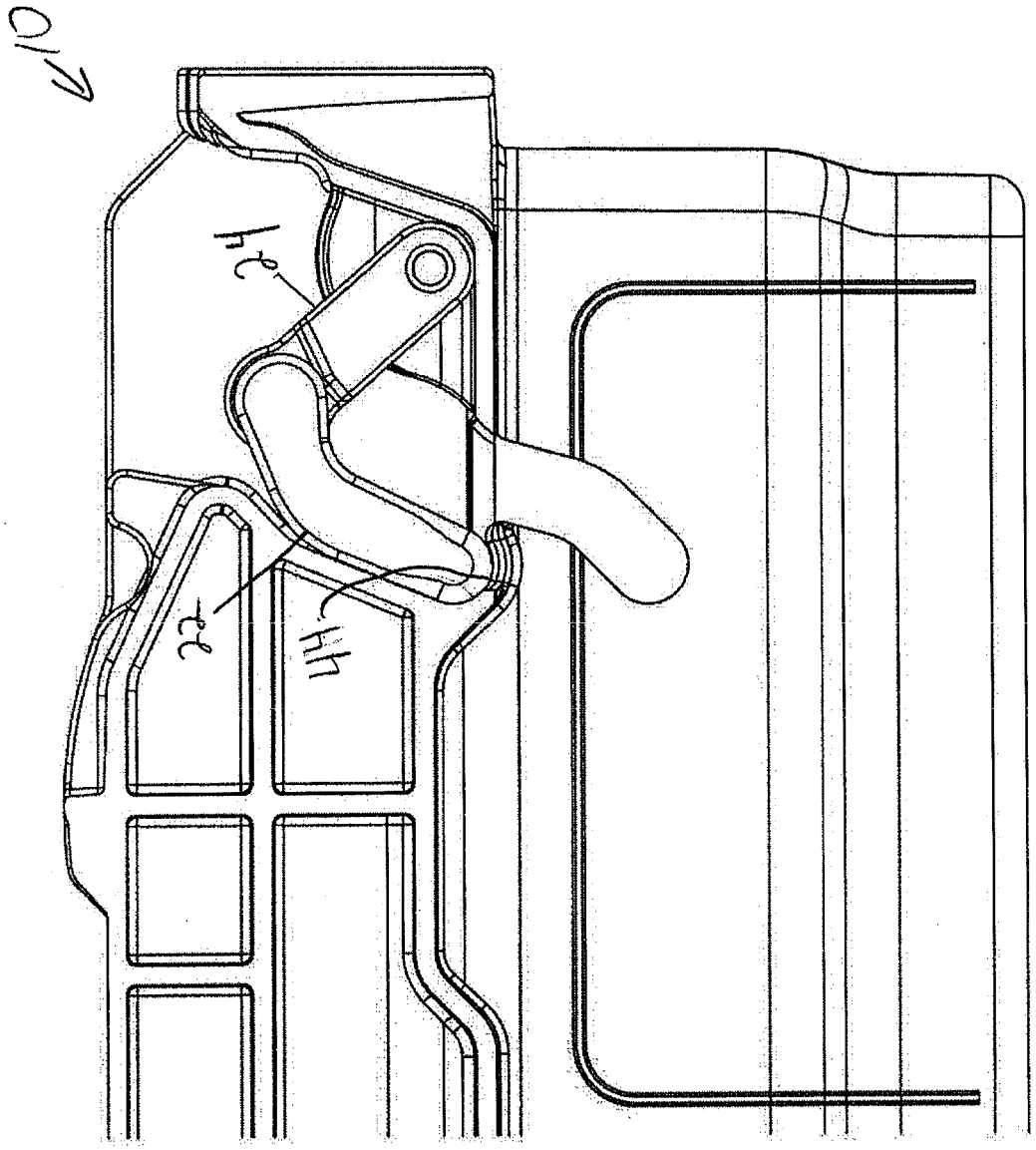


Figure 10

Section View of Middle Height Position:

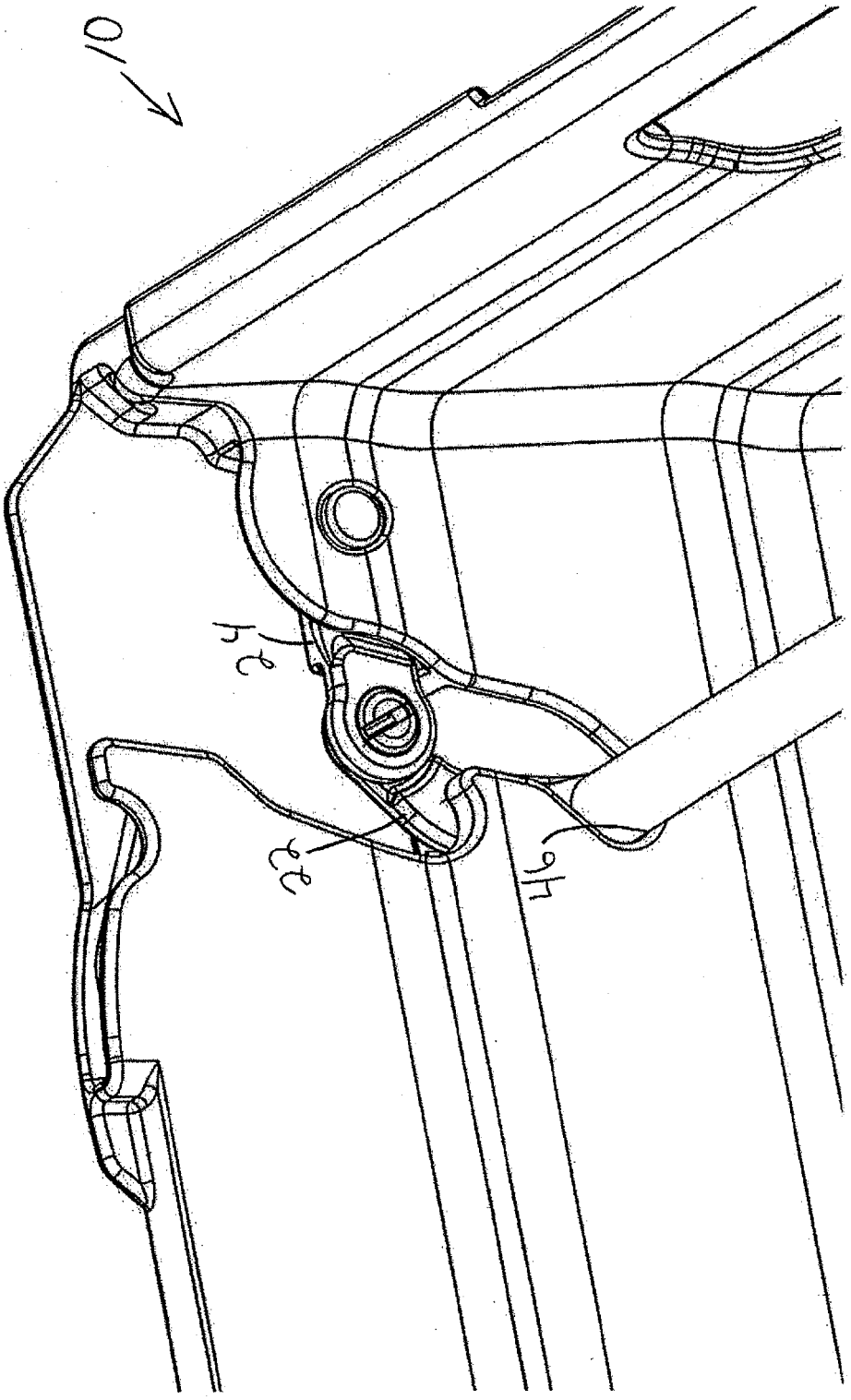


Figure 11

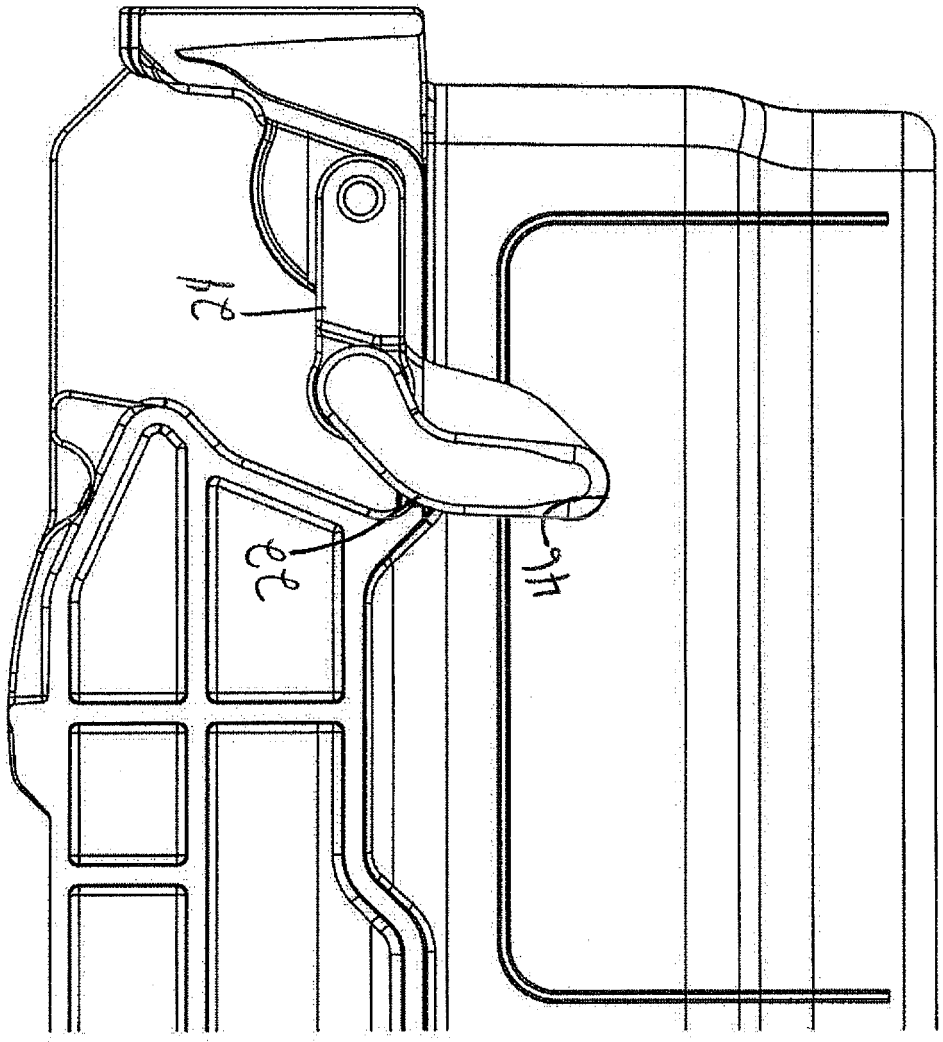
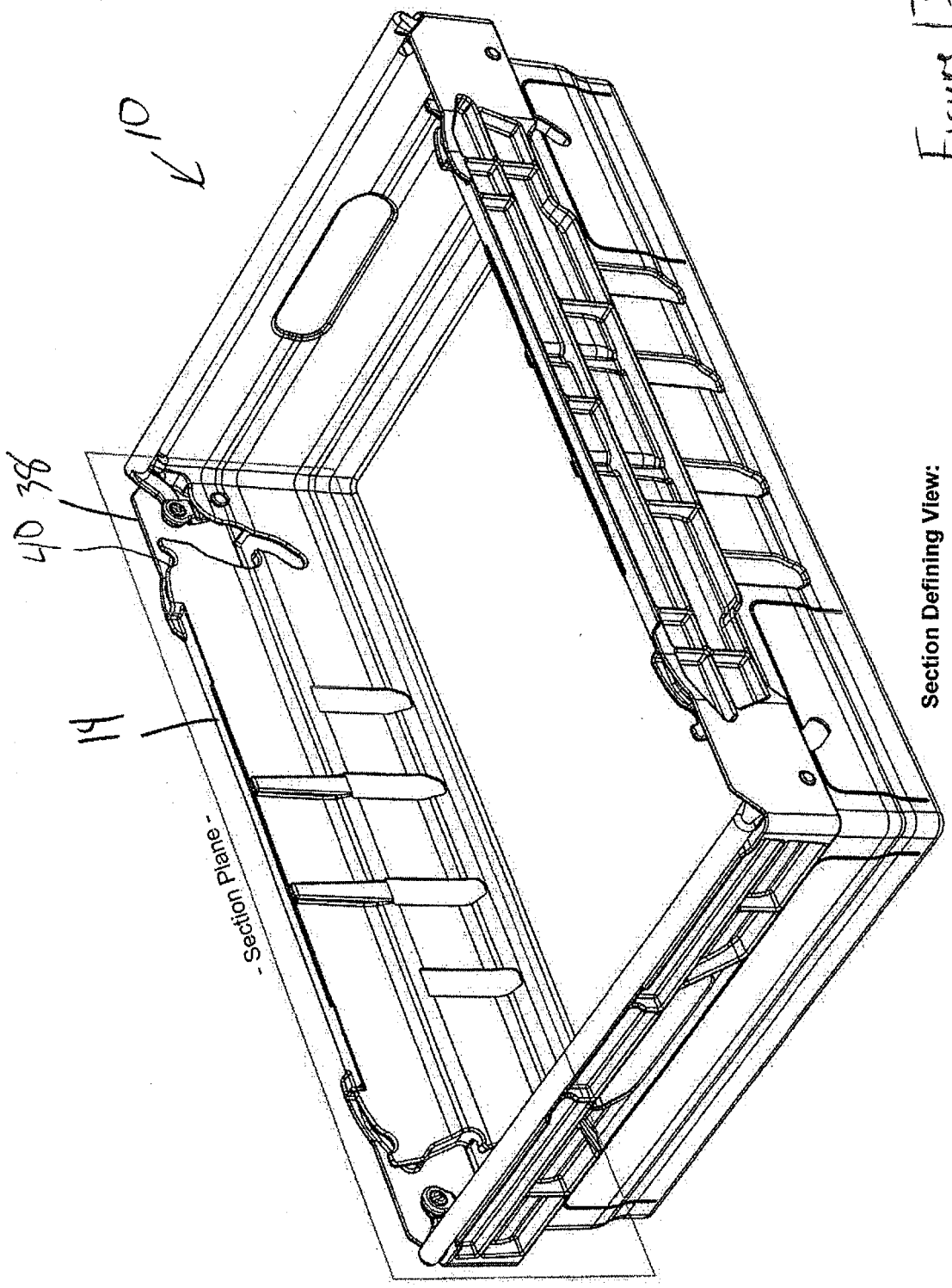


Figure 12

Section View of Lower Height Position:



Section Defining View:

Figure 13

Figure 14

Top View:

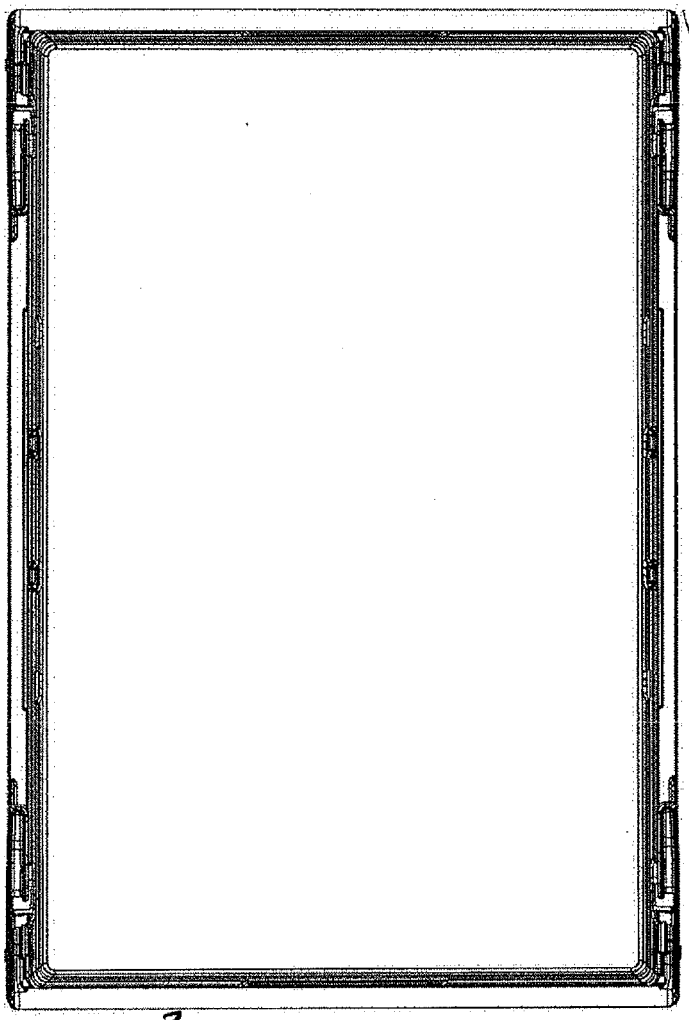
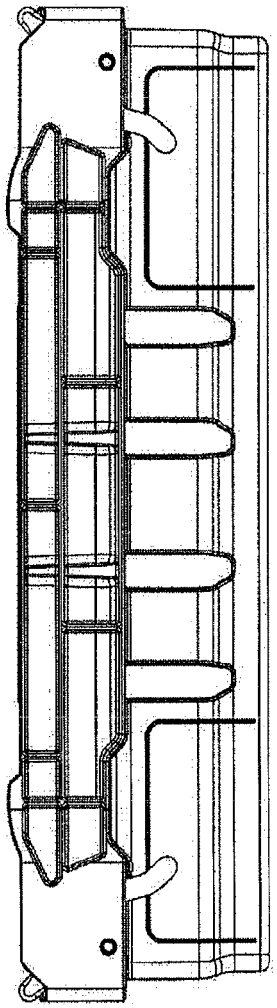


Figure 15

Side View:



End View:

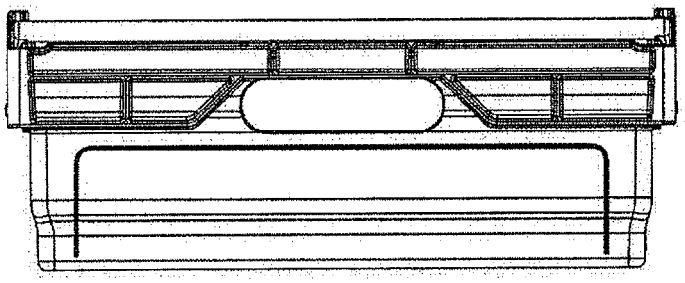


Figure 16

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 6437

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 772 033 A (LOFTUS STEPHEN CLIVE [GB] ET AL) 30 June 1998 (1998-06-30) * column 1, line 56 - line 58 * * column 2, line 22 - line 40 * * column 4, line 56 - column 5, line 25; figures 4,5 * -----	1-15	INV. B65D21/06
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 May 2012	Zanghi, Amedeo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

1

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 16 6437

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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29-05-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5772033 A	30-06-1998	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82