(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 455 692 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.05.2012 Bulletin 2012/21

(51) Int Cl.:
F25D 23/00 *(2006.01)*

(21) Application number: **11189524.9**

(22) Date of filing: **17.11.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **23.11.2010 TR 201009588**

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(54) A domestic cooling device with spacer

(57) Invention relates to a domestic cooling device comprises a rear wall (140); a condenser (400) provided at the rear wall (140); at least one spacer (300) provided at the rear wall (140) and movable to a spacing position in which a free end (344) of the spacer (300) is in contact with to the outer wall (500) and defining a gap. The spacer (300) is further movable to a parking position in which distance of the free end (344) in transverse direction at the gap is substantially equal or smaller than height of the condenser (400).

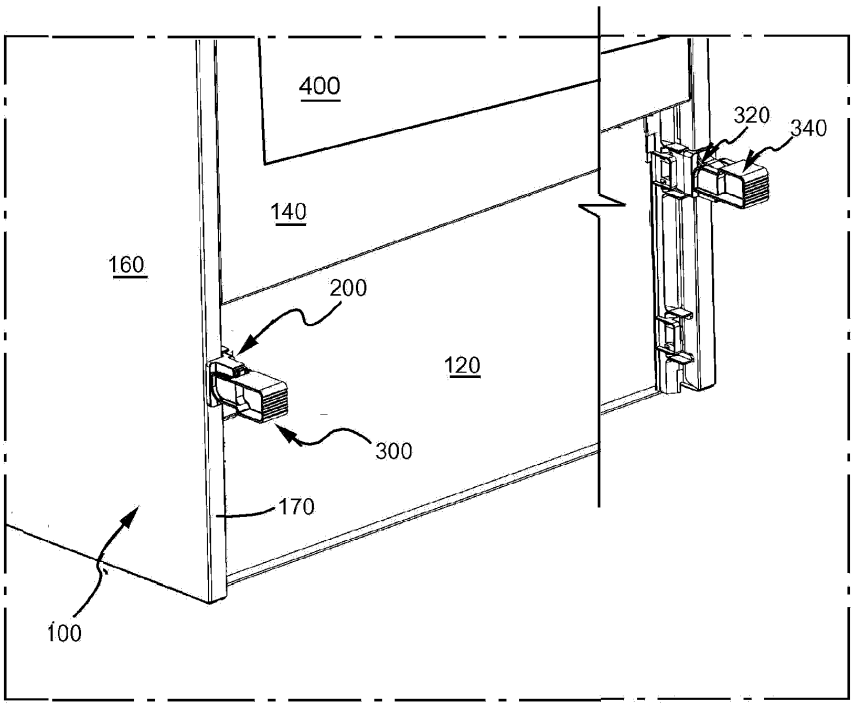

FIG. 1a

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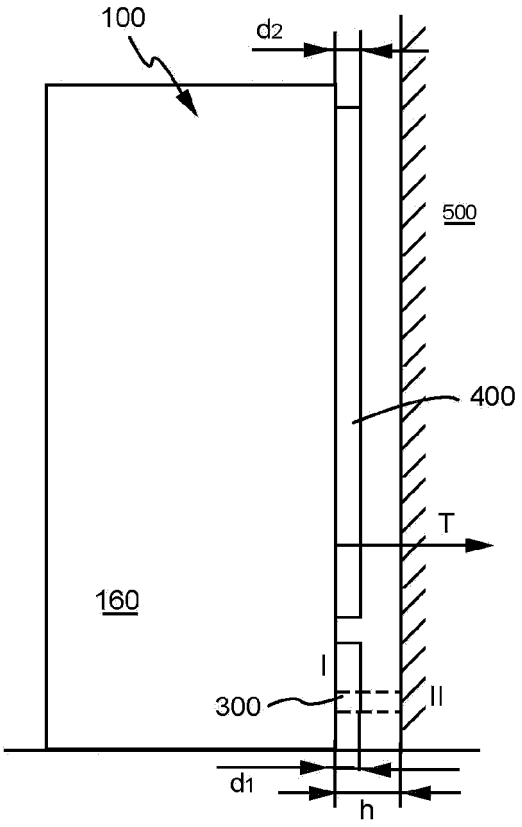

FIG. 1b

Description

TECHNICAL FIELD

[0001] The present invention relates to domestic cooling devices with a spacer preventing the approaching of a cabinet to an outer wall more than a predetermined distance, and particularly relates to spacers, which can be folded between a parking position and a spacing position thereof.

KNOWN STATE OF THE ART

[0002] The conventional condensers of domestic cooling devices, which are attached to the cabinet rear wall in a parallel manner, give heat to the environment and they form a part of the cooling cycle. The cooling cabinets with such condensers should be positioned so as to have a distance with an outer wall and thus a space has to be provided between the rear wall and the outer wall. Said space provides heat transfer by means of natural convection from the condenser. When the spacer height is under a certain value in proportion with the condenser area, convection can not be realized substantially and thus the efficiency of the cooling cycle decreases. Therefore, in the user instructions, the distance which has to be left between the cabinet rear wall and the outer wall is mentioned. However, it is difficult for the user to realize distance measurement.

[0003] In order to prevent the cooling cabinet from approaching to an outer wall more than a predetermined spacer height, a spacer is fixed to the rear wall which extends towards the rear wall.

[0004] In the patent KR20100008602A, a spacer is illustrated which can be seated to a housing on the rear wall. Such a spacer is seated to the housing before the cabinet is approached to the wall and the spacer prevents the approaching of the cabinet to the outer wall more than required. However, before the cabinet approaches the outer wall, the user may forget to fix the spacer to the housing.

[0005] In the patent KR20100023296A, a spacer with spring is illustrated which is assembled to the rear wall and which passes to a spacing position when the electrical plug is removed from the housing in the body thereof when in park position. This spacer does not provide a rigid solution and in case a condenser is used on the rear wall, since the passage of the electric plug upwardly will be difficult, this solution will not be applied.

BRIEF DESCRIPTION OF THE INVENTION

[0006] The object of the invention is to provide energy efficiency during the usage of domestic cooling devices with condenser on the rear wall.

[0007] Another object of the invention is to facilitate the packaging of domestic cooling devices whose rear wall has a condenser and whose energy efficiency is preserved.

[0008] In order to realize the abovementioned objects, the present invention is a cooling device, particularly a domestic cooling device, comprising a rear wall; a condenser provided at the rear wall; at least one spacer for defining a gap between the rear wall and the outer wall being provided at the rear wall and movable to a spacing position in which a free end of the spacer is in contact with to the outer wall characterized in that the spacer is further movable to a parking position in which distance of the free end in transverse direction at the gap is substantially equal or smaller than height of the condenser. In this case, when the spacer is in the spacing position, it will provide the required space for the efficient operation of the condenser. In addition to this, a package member, which will wrap the rear wall when the spacer is in park position, will easily cover the spacer which will not project from the condenser.

[0009] In a preferred embodiment of the present invention, the spacer is secured to the rear wall from a mounting section which is opposite to the free end. The spacer can be secured to the rear wall in a removable manner from the mounting section thereof in a modular manner.

[0010] In a preferred embodiment of the present invention, the free end of the spacer is vertically aligned with the condenser. In this case, the free end and the condenser have projections from the rear wall which are equal to each other or which have a similar length with each other. A planar package member grasps the rear wall through the condenser and at the same time, said planar package member can also wrap the spacer.

[0011] In a preferred embodiment of the present invention, the spacer is having a post attached to the rear wall and a limb hinged at a tip of the post having the free end. Thus, by means of a simple mechanism with two limbs with a hinge between the limbs, both the spacing position and the park position can be provided.

[0012] In a preferred embodiment of the present invention, a locking member is arranged between the limb and the post which is activated at the spacing position to lock the limb in a substantially perpendicular angle to the outer wall. When the limb is not in contact with the wall, the locking member preserves the position thereof. Thus, before the rear wall is approached to the outer wall, the limb is locked at the spacing position.

[0013] In a preferred embodiment of the present invention, a slot of a holding element is secured to the rear wall and receiving the post in a removable manner. In this case, the post's end which is close to the rear wall is pushed inside the slot and it is secured in a simple manner.

[0014] In a preferred embodiment of the present invention, a projection engaging to a depression with a blocking section is provided on the tip and corresponding second end to form a hinge with limited rotational movement of the limb between parking position and spacing position. Between the parking and spacing positions, the extension rotates inside the depression and when it contacts

with the blocking part, it stops the rotation movement. Thus, the movement between the parking position or the spacing position is fixed at a predetermined angle.

[0015] In a preferred embodiment of the present invention, second end has a radial edge at the second end in contact with a support wall of the post during the rotation of the limb. The radial edge moves on the blocking section between the park position and the spacing position. In this case, it meets the pressure towards the limb, which is in the direction of the post.

[0016] In a preferred embodiment of the present invention, the free end of the limb is having a corrugated section which is being contacted with the outer wall in the spacing position. The corrugated section increases the holding amount of the limb to the porous parts on the outer wall.

[0017] In a preferred embodiment of the present invention, the limb is substantially parallel to the condenser in the parking position. Thus, the spacing member in the park position can be kept in the vicinity of the condenser in a simple manner.

[0018] In a preferred embodiment of the present invention, the movement of the spacer to the spacing position is reverse direction of the parking position. In a probable embodiment, this two-directional movement is essentially a rotation movement with ninety degrees.

BRIEF DESCRIPTION OF THE FIGURES

[0019] The additional characteristics and the advantages of the subject matter invention can be obtained from the exemplary embodiments giving reference to the accompanied figures.

[0020] In Figure 1a, the rear perspective view of a refrigerator with a conventional condenser which has a representative embodiment of the subject matter spacer is given.

[0021] In Figure 1b, the schematic view of a spacer is given, where the spacer is in a cooling device cabinet in a park position and in a spacing position.

[0022] In Figure 2, the perspective zoomed view of a spacer, where the spacer is in park position on the refrigerator rear wall is given, with respect to the embodiment illustrated in Figure 1.

[0023] In Figure 3, the perspective zoomed view of the embodiment of the spacer illustrated in the figures is given in spacing position.

[0024] In Figure 4, the perspective view of the embodiment of the spacer illustrated in the figures is given in park position.

[0025] In Figure 5, the perspective view of the embodiment of the spacer illustrated in the figures is given in spacing position.

[0026] In Figure 6, the dismantled perspective view of a post piece existing in a representative embodiment of the subject matter spacer is given.

[0027] In Figure 7, the perspective view of the post piece illustrated in Figure 6 is given from the opposite angle.

[0028] In Figure 8, the dismantled perspective view of a limb piece existing in a representative embodiment of the subject matter spacer is given.

THE DETAILED DESCRIPTION OF THE INVENTION

[0029] In Figure 1a, the zoomed rear perspective view of the bottom part of a refrigerator cabinet (100) with the subject matter representative spacer (300) is given. Here, the mutual side walls (160) of the cabinet (100) form the borders of a rear wall (140). A flange (170) part is obtained by the bending, onto the rear wall (140), of the side walls' (160) metal panel's edge which is adjacent to the rear wall (140). The spacer (300) is positioned on the rear wall (140) so as to be adjacent to this flange (170). The rear wall (140) bottom part embodies a cavity (120) wherein for instance a compressor (not illustrated in the figure) is placed. The spacer (300) which is provided from inside the cavity (120) so as to project from the rear wall (140) extends towards an outer wall (500) which is parallel to the rear wall (140). The spacer (300) is assembled to a corresponding holding element (200) which is fixed onto the rear wall (140).

[0030] As illustrated in Figure 1b, the spacer (300) can move between a park position (I) and a spacing position (II). While the cooling device is being transported, the spacer (300) is in a park position (I). When the spacer (300) is in park position (I), it extends parallel to the condenser (400) on the rear wall (140). In order for the packaging to be realized in a simple manner, in park position (I), the spacer extension distance (d1) is equal to or smaller than the condenser width (d2).

[0031] Before the cooling device is operated, the cabinet (100) is positioned close to an outer wall (500) facing the rear wall (140) so that there is a gap in between. In order to assign the gap distance, when the package thereof is removed, the spacer (300) is taken from the park position (I) to the spacing position (II). Thus, the spacer (300) provides a spacer height (h) between itself and an outer wall (500) which is in parallel form to a condenser (400) fixed to the rear wall (140). The spacer height (h) is greater than the condenser (400) width (d2). In the present embodiment, proportionally to the surface area of the condenser (400), the spacer extension distance (d1) is minimum 3 cm and maximum 7 cm greater than the condenser width (d2). Thus, in the gap, a volume is formed which is sufficient for heat transfer by convection to the condenser (400) in the spacer height (h). Between the park and spacing positions (I, II), the spacer (300) free end rotates around a pin (328) existing on the rear wall (140) so as to move towards the condenser (400).

[0032] In Figure 2, a zoomed representative embodiment of the spacer (300) in park position (I) on the rear wall (140) is illustrated. The spacer (300) has a finger-like form. The spacer (300) comprises a post (320) fixed to the rear wall (140); and a limb (340) in connection with said post (320). Between the post (320) and the limb

(340), there is a locking member (348) which helps the post (320) and the limb (340) to be in fixed position in the park and spacing positions (I, II). The post (320) is assembled to the holding element (200) from the end thereof which is close to the rear wall (140). In order to provide this, the holding element (200) comprises a slot (220) which receives the post (320); and a tab (240) which provides the fixation thereof in a removable manner. In Figure 3, the same spacer (300) is illustrated in the spacing position (II). In the spacing position (II), the holding element (200) and the spacer (300) extend coaxially and orthogonally to the rear wall (140). In said embodiments, between the park position and the spacing position (I, II), the angle between the post (320) and the limb (340) is 90 degrees.

[0033] In Figure 4, the spacer (300) is illustrated in park position, where it is dismantled from the holding element (200). A movable free end (343) of the limb (340) comprises a corrugated section (341) embodied on a wide front surface. In a similar manner, there is a corrugated section (345) on the wall facing outwardly at a second end (344) opposite to the free end (343). A radial edge (342) is formed on the second end's (344) part facing the post (320). The second end (344) has a form similar to a fork. An tip (324) of the post (320) enters into the gap provided by the second end (344), and it is hinged here. As illustrated in Figure 8, there is a tab (346) at a part of the radial edge (344) close to the free end (343). In the park position (I), with the engagement of the tab (346) to a support projection (327) of the post (320), the position thereof is fixed. At the same time, the locking member (348) on the limb (340) is engaged to a corresponding locking member (329) which exists on a post (320) compliant to the locking member (348). The mounting section (323) which is the bottom end of the post (320) is in the form of a plug compliant with the slot (220). The end edge of the mounting section (323) has a pin (328) whose corresponding part exists on the slot (220) base. Moreover, on the lateral edge of the mounting section (323), there is a bump (321) which is fixed to the tab (240) on the holding element (200). While the post (320) is being received by the slot (220), with the bending of the slot (220), the bump (321) is fixed to the tab (240) and the post (320) is assembled inside the slot (220). For the dismantling process, the slot (220) walls are bent laterally and the bump (321) is released from the tab (240).

[0034] In Figure 5, the spacer (300) is illustrated in dismantled form in the spacing position (II). In the spacing position (II), the limb (340) extends coaxially with the post (320). In this case, the front part of the second end (344) seats onto the blocking section (326) which is in a planar tab form and which extends outwardly from the finishing part of the tip (324). During the passage from the park position (I) to the spacing position (II), the radial edge (342) moves on the blocking section (326). In the park position (I), the lateral edge of the second end (344) facing inwardly is seated onto the blocking section (326).

[0035] In order to delimit the movement between the post (230) and the limb (340), a hinge is embodied in between whose rotation movement is delimited. This hinge comprises a projection (347) and a corresponding depression (325). The projection (327) is in semicircular form. The depression (325) is in the form of a circle whose quarter circular part is closed. The projection (327) is seated into the depression (325) in a rotatable manner. Thus, inside the depression (325), there is only an empty space of a quarter circle. This is equal to the angle between the park and spacing positions (I, II). The planar surface of the projection (327) contacts with one of the blocking surfaces of the depression (325) and it stops the rotation of the projection (347) inside the depression (325). In the present embodiment, the projection (347) is provided between the fork part at the second end (344) of the limb (340). In correspondence to this, the depression (325) is on the post (320).

[0036] Onto the rear wall (140) of the cooling device cabinet (100), the spacer (300) is assembled so as to seat inside the slot (220). When the spacer (300) is in park position (I), in terms of the cabinet, the spacer extension distance (d1) towards the space in the transverse direction (T) is smaller than or equal to the condenser (400) on the rear wall (140). By means of this, when the cabinet (100) is packaged using a packaging member (not illustrated in the figure), the spacer (300) does not hit any part. When the spacer (300) is brought to the spacing position (II) and when the cabinet (100) is positioned in the vicinity of the outer wall (500), the corrugated section (341) contacts with the outer wall (500), and the cabinet (100) is prevented from approaching the outer wall (500) more than a pre determined spacer height (h).

[0037] Between the park and spacing positions (I, II), the limb (340) rotates on the projection (347) at the tip (324) of the post (320). In the park position (I), the spacer (300) is parallel to the rear wall (140) and in the spacing position (11), the spacer (300) is orthogonal to the rear wall (140).

REFERENCE NUMBERS

[0038]

100 Cabinet
120 Cavity
140 Rear wall
160 Side wall
170 Flange
200 Holding element
220 Slot
240 Tab
300 Spacer
320 Post
321 Bump
322 Cutout
323 Mounting section
324 Tip
325 Depression

326 Blocking section
327 Projection
328 Pin
329 Locking member
340 Limb
341 Corrugated section
342 Radial edge
343 Free end
344 Second end
345 Corrugated section
346 Tab
347 Projection
348 Locking member
400 Condenser
500 Outer wall
d1 Spacer extension distance
d2 Condenser width
T Transverse direction
h spacer height

Claims

1. A cooling device, particularly a domestic cooling device, comprising a rear wall (140); a condenser (400) provided at the rear wall (140); at least one spacer (300) for defining a gap between the rear wall (140) and the outer wall (500) being provided at the rear wall (140) and movable to a spacing position in which a free end (344) of the spacer (300) is in contact with to the outer wall (500) **characterized in that** the spacer (300) is further movable to a parking position in which distance of the free end (344) in transverse direction at the gap is substantially equal or smaller than height of the condenser (400).

2. A domestic cooling device according to claim 1, wherein the spacer (300) is secured to the rear wall (140) from a mounting section (323) which is opposite to the free end (344).

3. A domestic cooling device according to any one of the preceding claims, wherein the free end (343) of the spacer (300) is vertically aligned with the condenser (400).

4. A domestic cooling device according to any one of the preceding claims, wherein the spacer (300) is having a post (320) attached to the rear wall (140) and a limb (340) hinged at a tip (324) of the post (320) having the free end (343).

5. A domestic cooling device according to claim 4, wherein a locking member (348) is arranged between the limb (340) and the post (320) which is activated at the spacing position to lock the limb (348) in a substantially perpendicular angle to the outer wall (500).

6. A domestic cooling device according to claims 4-5, wherein a slot (220) of a holding element (200) is secured to the rear wall (140) and receiving the post (320) in a removable manner.

7. A domestic cooling device according to claims 4-6, wherein a projection (347) engaging to a depression (325) with a blocking section (326) is provided on the tip (324) and corresponding second end (344) to form a hinge with limited rotational movement of the limb (340) between parking position and spacing position.

8. A domestic cooling device according to claims 4-7, wherein second end (344) has a radial edge (342) at the second end (344) in contact with a support wall (327) of the post (320) during the rotation of the limb (340).

9. A domestic cooling device according to any one of the preceding claims, wherein the free end (343) of the limb (340) is having a corrugated section (341) which is being contacted with the outer wall (500) in the spacing position.

10. A domestic cooling device according to any one of the preceding claims, wherein the limb (340) is substantially parallel to the condenser (400) in the parking position.

11. A domestic cooling device according to any one of the preceding claims, wherein the movement of the spacer (300) to the spacing position is reverse direction of the parking position.

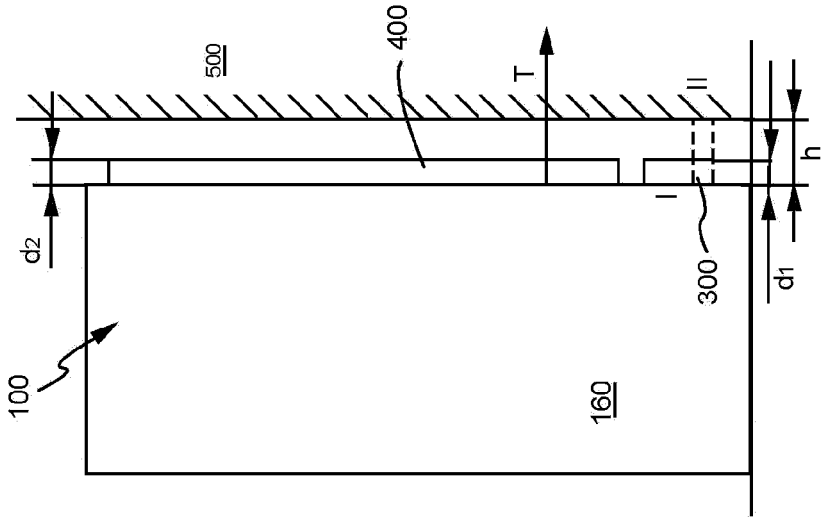
500
400
T
II
h
I
d2
300
d1
100
160

FIG. 1b

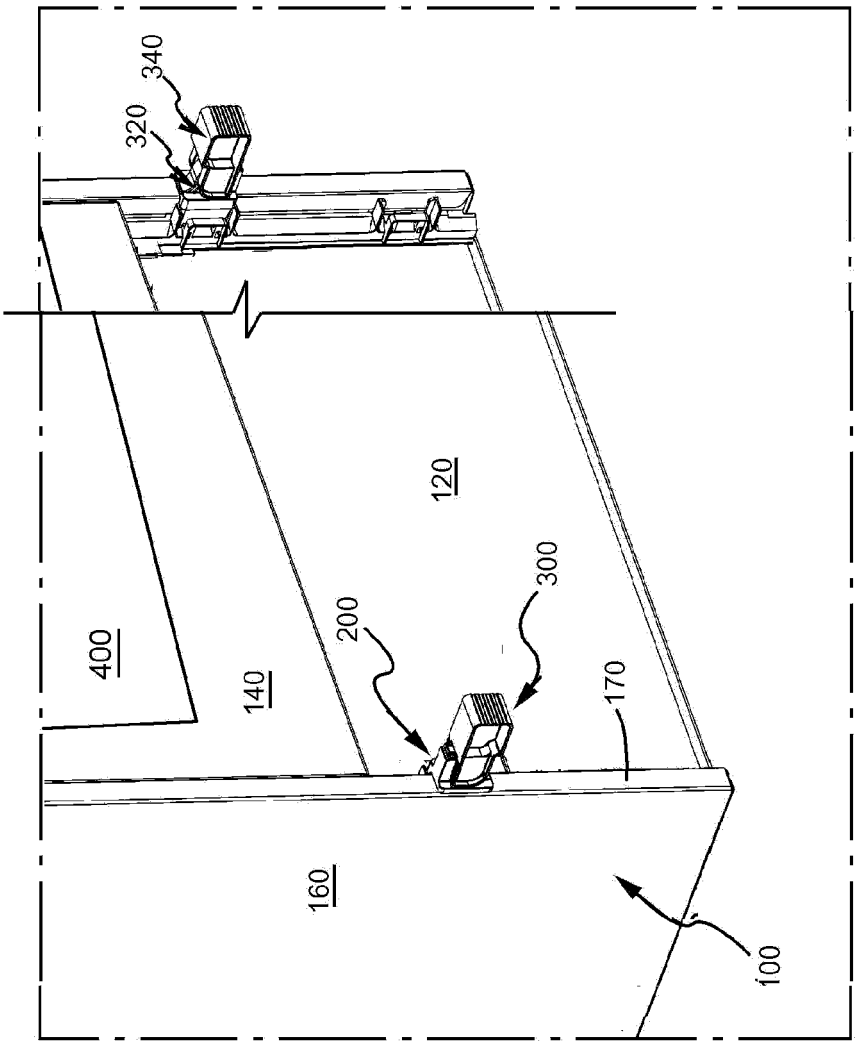
340
320
120
300
200
400
140
170
160
100

FIG. 1a

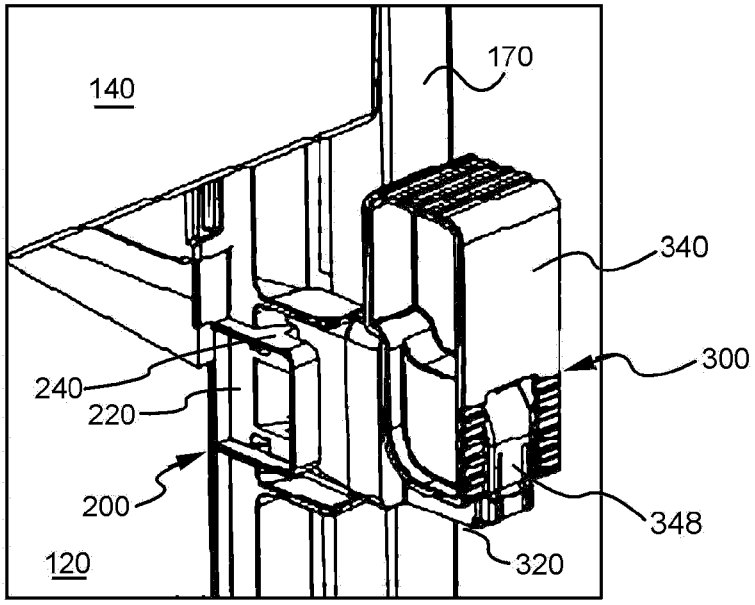

FIG. 2

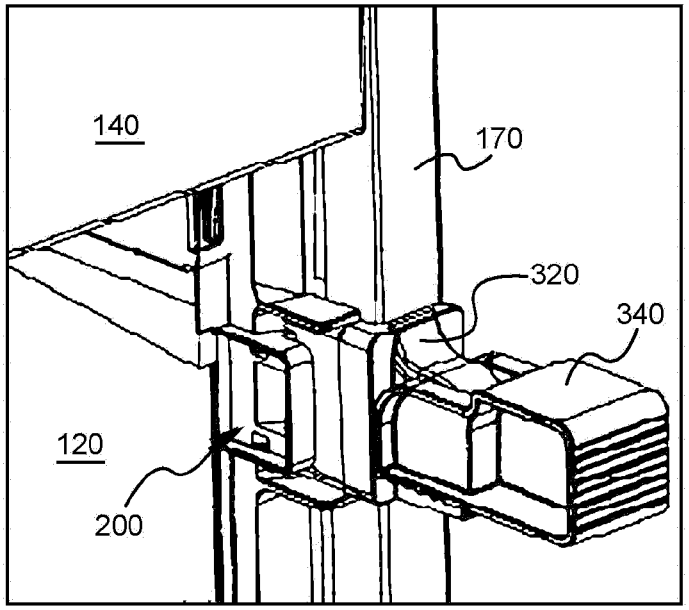

FIG. 3

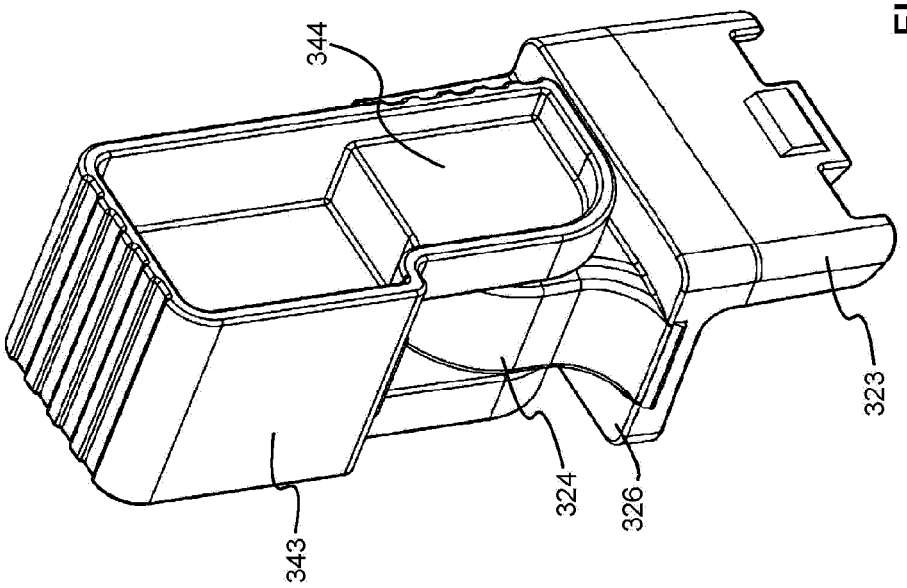
344
323
324
326
343

FIG. 5

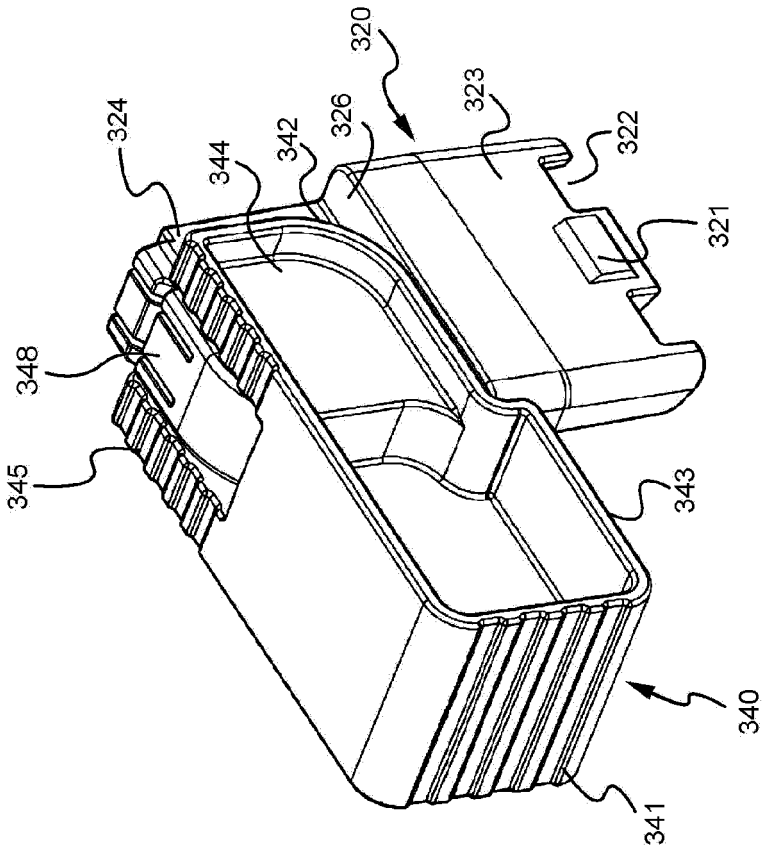
320
324
344
342
326
323
322
321
348
345
343
340
341

FIG. 4

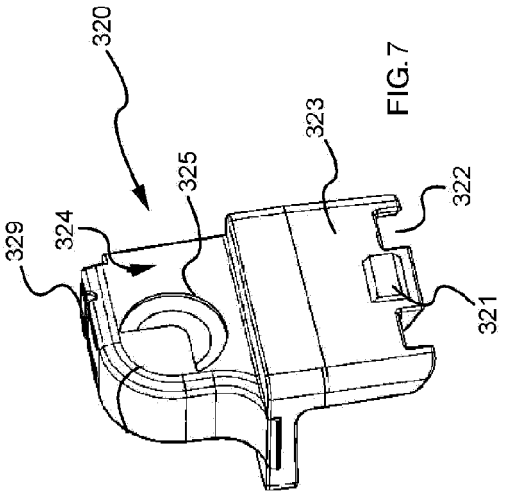

FIG. 7

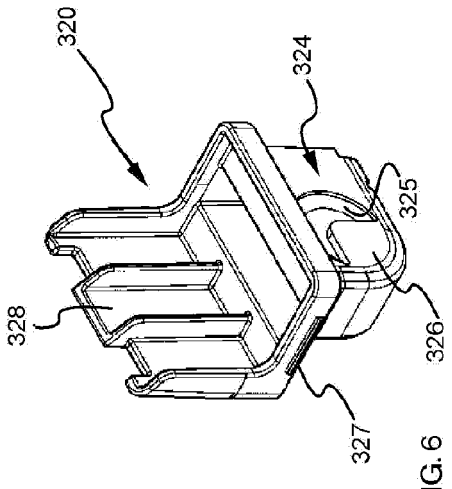

FIG. 6

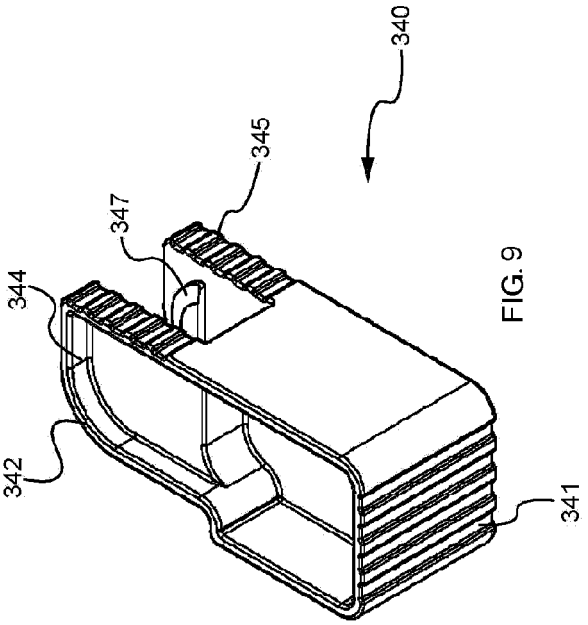

FIG. 9

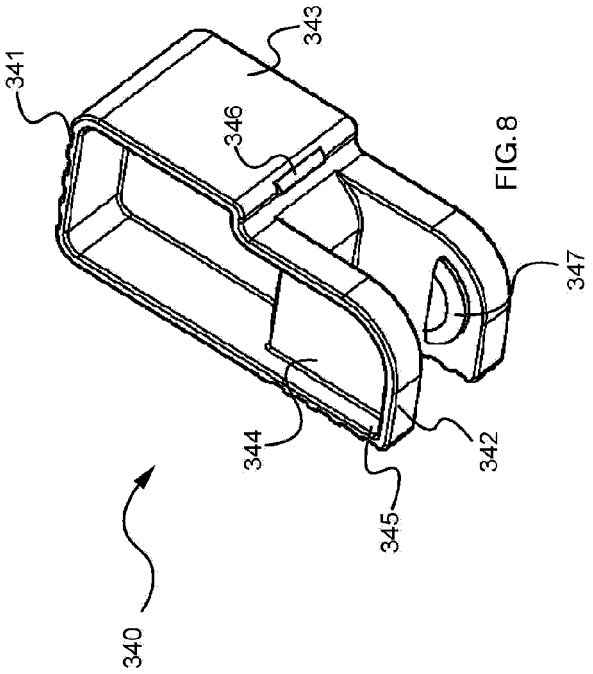

FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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