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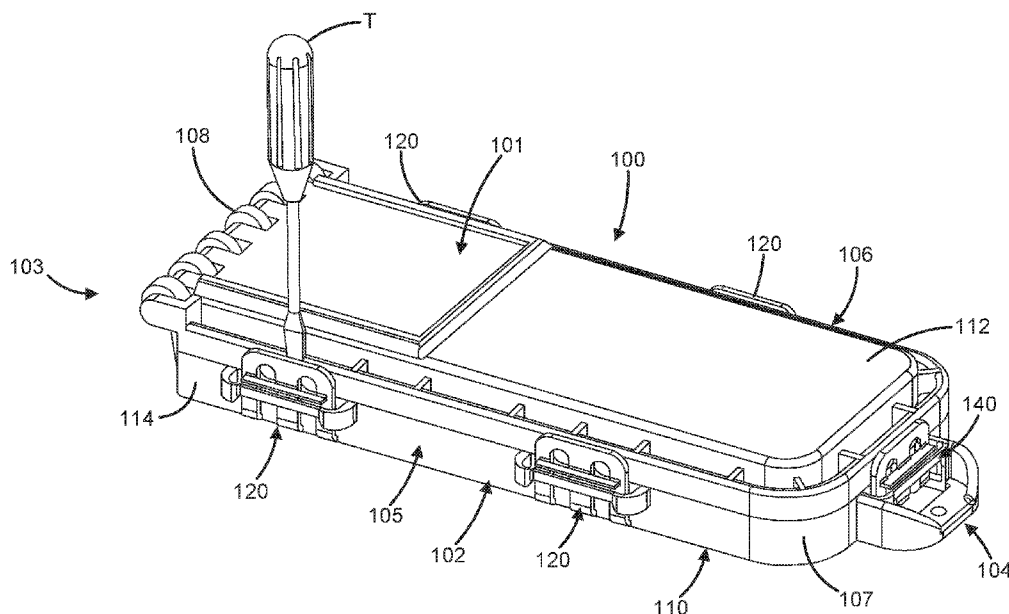
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FIG. 1



(57) Abstract: An enclosure includes one or more latch systems coupled to a perimeter of a housing to releasably retain the housing in a closed configuration. Each latch system includes a catch carried by a first housing piece and a cantilevered latch carried by a second housing piece. The cantilevered latch moves between a fully latched position in which the cantilevered latch engages the catch and an unlatched position in which the cantilevered latch disengages the catch. The cantilevered latch also can be moved to and maintained in a stowed position until manually released.

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LATCHING SYSTEM FOR ENCLOSURE

Cross-Reference to Related Application

This application is being filed on March 13, 2020 as a PCT International Patent Application and claims the benefit of U.S. Patent Application Serial No. 62/817,823, filed on March 13, 2019, the disclosure of which is incorporated herein by reference in its entirety.

Background

Telecommunications systems typically employ a network of telecommunications cables capable of transmitting large volumes of data and voice signals over relatively long distances. The telecommunications cables can include fiber optic cables, electrical cables, or combinations of electrical and fiber optic cables. A typical telecommunications network also includes a plurality of telecommunications enclosures integrated throughout the network of telecommunications cables. The telecommunications enclosures are adapted to house and protect telecommunications components such as splices, termination panels, power splitters, and wavelength division multiplexers.

It is often preferred for telecommunications enclosures to be re-enterable. The term "re-enterable" means that the telecommunications enclosures can be reopened to allow access to the telecommunications components housed therein without requiring the removal and destruction of the telecommunications enclosures. For example, certain telecommunications enclosures can include separate access panels that can be opened to access the interiors of the enclosures, and then closed to re-seal the enclosures. Other telecommunications enclosures take the form of elongated sleeves formed by wrap-around covers or half-shells having longitudinal edges that are joined by clamps or other retainers. Still other telecommunications enclosures include two half-pieces that are joined together through clamps, wedges or other structures. Telecommunications enclosures are typically sealed to inhibit the intrusion of moisture or other contaminants.

Summary

Aspects of the disclosure are directed to an enclosure including a housing and a latch system. The housing includes first and second housing pieces moveable relative to one another between an open configuration and a closed configuration. The latch system retains the first and second housing pieces in the closed configuration. The latch system includes a first latch catch unitarily formed with the first housing piece. The latch system also includes a latch arrangement including a first cantilever latch having a base end unitarily formed with the second housing piece. The first cantilever latch is configured to flex between a fully latched position and a stowed position. The first cantilever latch having an initial unlatched position positioned between the fully latched position and the stowed unlatched position, the first cantilever latch having a resilient construction that biases the first cantilever latch toward the fully latched position, the first cantilever latch being adapted to engage the first latch catch to retain the first and second housing piece in the closed configuration when the first cantilever latch is in the fully latched position, the first cantilever latch being disengaged from the first latch catch when in stowed unlatched position to allow the first and second housing pieces to be moved from the closed configuration to the open configuration, the latch arrangement further including a second latch catch unitarily formed with the second housing piece and a second cantilever latch having a base end unitarily formed with the first cantilever latch, wherein when the first cantilever latch is moved from the latched position to the stowed unlatched position, the second cantilever latch engages the second latch catch to retain the first cantilever latch in the stowed unlatched position, and wherein the first cantilever latch disengages from the first latch catch at the initial unlatched position prior to reaching the stowed unlatched position.

A variety of additional inventive aspects will be set forth in the description that follows. The inventive aspects can relate to individual features and to combinations of features. It is to be understood that both the forgoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the broad inventive concepts upon which the embodiments disclosed herein are based.

Brief Description of the Figures

The accompanying drawings, which are incorporated in and constitute a part of the description, illustrate several aspects of the present disclosure. A brief description of the drawings is as follows:

5 FIG. 1 is a perspective view of an example enclosure including one or more latch systems configured in accordance with the principles of the present disclosure, the enclosure includes first and second housing pieces disposed in a closed configuration;

 FIG. 2 is an enlarged view of one of the latch systems of FIG. 1 shown with the first and second housing pieces in an open (or partially open) configuration;

10 FIG. 3 is a perspective view of a portion of the latch system of FIG. 2 with the upper housing piece removed and a first cantilever latch disposed in a fully latched position;

 FIG. 4 is a perspective view of the portion of the latch system of FIG. 3 with the first cantilever latch disposed in a stowed position;

15 FIG. 5 is a perspective view of a portion of the enclosure and latch system of FIG. 2 showing an upper sealing piece of the first housing piece aligned with a channel of the second housing piece;

 FIG. 6 is a perspective view of the portion of the enclosure and latch system of FIG. 5 with the first and second housing pieces disposed in a closed configuration so that
20 the upper sealing piece contacts a lower sealing gasket within the channel;

 FIGS. 7-10 are side elevational views of transverse cross-sections of the example latch system of FIG. 3 showing a sequence of movements of the latch system as the second housing piece is moved relative to the first housing piece from an open configuration to a closed configuration; the cross-hatching has been removed for ease in
25 viewing; and

 FIG. 11 is a side elevational view of the latch system of FIGS. 7-10 with the first cantilever latch shown in the stowed position.

Detailed Description

Reference will now be made in detail to exemplary aspects of the present disclosure that are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

An enclosure 100 includes a housing 110 and a latch system 120. The housing 110 includes first and second housing pieces 112, 114 moveable relative to one another between an open configuration (e.g., see FIG. 2) and a closed configuration (e.g., see FIG. 1). The first and second housing pieces 112, 114 mate together and cooperate to that define at least a portion of an interior of the housing 110 when the first and second housing pieces are in the closed configuration. The interior of the housing 110 is accessible when the first and second housing pieces 112, 114 are in the open configuration.

The housing 110 has a front 101, a rear 102, a first end 103, an opposite second end 104, a first side 105, and an opposite second side 106. The rear side 103 is adapted to mount to a surface (e.g., a wall). The ends 103, 104 and sides 105, 106 define a perimeter 107 of the housing 110. In some implementations, the first and second housing pieces 112, 114 pivotally mount together at a hinge 108. In such implementations, the first and second housing pieces 112, 114 pivot about the hinge 108 between the closed configuration and the open configuration. In other implementations, the first and second housing pieces 112, 114 are separate from each other when in the open configuration. In an example, the first housing piece 112 is a front cover and the second housing piece 114 is a base of the housing 110.

One or more latch systems 120 are positioned about the perimeter 107 of the housing 110. Each latch system 120 aids in retaining the first and second housing pieces 112, 114 in the closed configuration. In certain implementations, each latch system 120 is operated independently. In certain examples, all of the latch systems 120 must be released to enable movement between the first and second housing pieces 112, 114. Each latch system 120 includes a first latch catch 122 unitarily formed with the first housing piece 112. The latch system 120 also includes a latch arrangement 124 unitarily formed with the second housing piece 114. Each latch arrangement 124 is formed without any

undercuts such that the second housing piece 114 and the latch arrangement 120 can be formed of plastic using a mold having only two pieces.

The latch arrangement 124 includes a first cantilever latch 126 having a base end 128 unitarily formed with the second housing piece 114. The first cantilever latch 126 has a free end 130 opposite the base end 128 that is movable relative to the second housing piece 114. The first cantilever latch 126 selectively engages the first latch catch 122 to retain the first and second housing pieces 112, 114 in the closed configuration. For example, the first cantilever latch 126 may define an opening 132 that receives the first latch catch 122. In an example, the opening 132 is located closer to the free end 130 than to the base end 128 of the first cantilever latch 126. The first cantilever latch 126 releases the first latch catch 122 to enable the first and second housing pieces 112, 114 to move to the open configuration. For example, the first cantilever latch 126 may be moved sufficient to enable the first latch catch 122 to clear the opening 132.

In certain examples, the first catch 122 includes multiple protrusions or other structures disposed on the first housing piece 112. In some such examples, the first cantilever latch 126 defines multiple openings 132 with each opening 132 aligned to receive one of the protrusions or other structures of the first catch 122 (e.g., see FIG. 2). In other such examples, the opening 132 defined by the first cantilever latch 126 is sufficiently large to receive the protrusions or other structures of the first latch catch 122.

The first cantilever latch 126 is configured to flex along a length between the free end 130 and the base end 128. The first cantilever latch 126 flexes between a fully latched position (e.g., see FIGS. 3 and 10) and an unlatched position (e.g., see FIG. 9). The first cantilever latch 126 is adapted to engage the first latch catch 122 to retain the first and second housing piece 112, 114 in the closed configuration when the first cantilever latch 126 is in the fully latched position. The unlatched position is the position at which the first cantilever latch 126 engages/disengages from the first catch 122. When the first cantilever latch 126 is moved to the unlatched position in a first direction (e.g., away from the perimeter 107 of the housing 110), the first cantilever latch 126 completely disengages from the first latch catch 122 at the unlatched position, thereby allowing the first and second housing pieces 112, 114 to be moved from the closed configuration to the open configuration. When the first cantilever latch 126 is moved to

the unlatched position in an opposite second direction (e.g., towards the perimeter 107), the first cantilever latch 126 begins to engage the first latch catch 122 at the unlatched position.

As the terms are used herein, the “fully latched position” and the “unlatched position” refers to the position of the first cantilever latch 126 relative to the second housing 114 and does not refer to the position of the first cantilever latch 126 relative to the first latch catch 122. Accordingly, the term “fully latched position” does not indicate that the first cantilever latch 126 is engaged with the first latch catch 122. The first cantilever latch 126 can be in the fully latched position even when the first and second housing pieces 112, 114 are in the open configuration and the first catch 122 is spaced from the first cantilever latch 126. The term “unlatched position” refers to the position of the first cantilever latch 126 relative to the second housing piece 114 at which the first cantilever latch 126 would initially latch or initially unlatch from the first catch 122 (depending on the direction of movement of the first cantilever latch 126) if the first catch 122 were aligned with the first cantilever latch 126 (e.g., with the opening 132).

The first cantilever latch 126 has a resilient construction that biases the first cantilever latch 126 toward the fully latched position. Accordingly, the latch system 120 automatically latches the first and second housing pieces 112, 114 together when the first and second housing pieces 112, 114 are moved to the closed configuration as will be described herein. Further, the latch system 120 remains latched until moved to the unlatched position (e.g., by a user). Such a design could increase the difficulty of moving the first and second housing piece 112, 114 to the open configuration if multiple latch systems 120 are utilized with the housing 110 (e.g., see FIG. 1). For example, the cantilever latch 126 of each of the latch systems 120 would need to be disposed in the unlatched position simultaneously in order to move the second housing piece 114 relative to the first housing piece 112.

To facilitate such simultaneous unlatching, the first cantilever latch 126 also is configured to flex past the unlatched position to a stowed position (e.g., see FIGS. 4 and 11) at which the first cantilever latch 126 can be maintained against the bias. The first cantilever latch 126 is spaced from the first latch catch 122 when in stowed position. The first cantilever latch 126 disengages from the first latch catch 124 at the unlatched

position prior to reaching the stowed position. Since the stowed position is beyond the unlatched position, the first cantilever latch 126 is still disengaged from the first latch catch 122 and the first and second housing pieces 112, 114 are still freely movable between the closed and open configurations.

5 The latch arrangement 124 further includes a second latch catch 140 unitarily formed with the second housing piece 114. When the first cantilever latch 126 is moved from the fully latched position to the stowed position, the second cantilever latch 142 engages the second latch catch 140 to retain the first cantilever latch 126 in the stowed position. In an example, the second cantilever latch 142 includes a latching hook 148
10 that snap-fits over the second latch catch 140. The engagement between the second cantilever latch 142 and the second latch catch 140 maintains the first cantilever latch 126 in the stowed position until the second cantilever latch 142 is manually disengaged from the second latch catch 140. Accordingly, the first cantilever latch 126 of multiple latch systems 120 can be maintained in the stowed simultaneously, thereby allowing
15 movement between the first and second housing pieces 112, 114.

 The second cantilever latch 142 has a base end 144 unitarily formed with the first cantilever latch 126. Accordingly, the second cantilever latch 142 is carried with the first cantilever latch 126 as the first cantilever latch 126 flexes between the latched position and the stowed position. The second latch catch 140 is stationary relative to the second
20 housing piece 114. The first cantilever latch 126 flexes towards the second latch catch 140 when moved towards the stowed position and flexes away from the second latch catch 140 when biased towards the fully latched position.

 In certain implementations, the second latch catch 140 forms a positive stop that limits movement of the first cantilever latch 126 in a direction away from the fully
25 latched position. For example, the second latch catch 140 can include a beam 141 that extends parallel with a perimeter 107 of the housing 110. The beam 141 may be offset from the perimeter 107 by extensions 143 disposed at opposite sides of the first cantilever latch 126. The first cantilever latch 126 flexes within a space defined between the housing perimeter 107 and the beam 141 (e.g., see FIGS. 3 and 4).

30 The second cantilever latch 142 also has a free end 146 opposite the base end 144. The second cantilever latch 142 flexes along a length between the base end 144 and the

free end 146. The free end 146 moves between a deflected position and an undeflected position. The second cantilever latch 142 has a resilient construction that biases the second cantilever latch 142 toward the undeflected position. Accordingly, the latching hook 148 remains engaged with the beam 141 of the second latch catch 140 until the
5 second cantilever latch 142 is manually flexed to the deflected position. In certain examples, the free end 146 of the second cantilever latch 142 is curved or ramped so that moving the free end 146 against the second latch catch 140 flexes the second cantilever latch 142 to the deflected position until the latching hook 148 snaps over the beam 141 of the second latch catch 142.

10 Referring to FIGS. 5 and 6, the interior of the enclosure 100 can be environmentally sealed. For example, at least one of the first and second housing pieces 112, 114 can carry a gasket that is compressed between the first and second housing pieces 112, 114 when the housing 110 is in the closed configuration. In certain examples, both of the housing pieces 112, 114 carrying a respective gasket that cooperates with the
15 gasket of the other housing piece 114, 112 to seal the interior.

In certain implementations, the second housing piece 114 defines a groove 116 that extends about the perimeter 107 of the housing 110 and receives a perimeter seal 117. The first housing piece 112 includes a sealing projection 118 that engages the perimeter seal 117 within the groove 116 when the first and second housing pieces 112,
20 114 are mated together. The perimeter seal 117 and the sealing projection 118 cooperate to environmentally seal the housing interior.

Referring to FIGS. 7-11, the first and second cantilever latches 126, 140 provide a double beam system that may inhibit stress relaxation on the system. Both latches within the system are in a non-stressed position (i.e., where the material is not being flexed)
25 when the housing 110 is latched in the closed configuration. Some stress is temporarily applied to the first cantilever latch 126 when the first cantilever latch 126 is moved towards and maintained in the stowed position. Some stress is temporarily applied to the second cantilever latch 142 during some of the travel between the unlatched position and the stowed position. In certain examples, minor amounts of stress are applied to the
30 second cantilever latch 142 when maintaining the first cantilever latch 126 in the stowed position.

The first cantilever latch 126 is moved through a total range of movement between the fully latched position and the stowed position. The total range of movement includes a first partial range of movement that extends from the fully latched position to the unlatched position, and a second partial range of movement that extends from the unlatched position to the stowed position. The first cantilever latch 126 remains engaged with the first latch catch 122 during the first partial range of movement and is disengaged with the first catch 122 during the second partial range of movement.

In certain implementations, the first and second cantilever latches 126, 142 are both flexed (i.e., stressed) during at least a portion of the range of movement, thereby providing resistance to the movement of the first cantilever latch 126 toward the stowed position. In certain examples, flexing stress is applied to only the first cantilever latch 126 as the first cantilever latch 126 moves through at least a first portion of the first partial range of movement. As will be discussed herein, in certain examples, flexing stress may be applied to both the first and second cantilever latches 126, 142 as the first cantilever latch 126 moves through a second portion of the first partial range of movement. Flexing stress is applied to both the first and second cantilever latches 126, 142 as the first cantilever latch 126 moves through the second partial range of movement.

FIGS. 7-10 show a sequence of first cantilever latch positions during movement of the first and second housing pieces 112, 114 to the closed configuration. FIG. 7 illustrates the first housing piece 112 in a position relative to the second housing piece 114 where the first latch catch 122 is initially contacting the free end 130 of the first cantilever latch 126. The first housing piece 112 is spaced from the second housing piece 114. The first cantilever latch 126 is disposed in the fully latched position, but the catch 122 is spaced out of alignment with the opening 132 of the first cantilever latch 126.

The first cantilever latch 126 has a primary beam length $L1$ extending from a flex point to a top of the opening 132. The second cantilever latch 142 has a secondary beam length $L2$ extending from a flex point to the latching hook 148. The second cantilever latch 142 extends from the first cantilever latch 126 at an initial angle α_0 . In an example, the initial angle α_0 is 90 degrees.

In FIG. 8, the first housing piece 112 has been moved closer to the second housing piece 114 such that the first catch 122 is pushing the free end 130 of the first

cantilever latch 126 against the bias from the fully latched position towards the unlatched position. At this stage, the first cantilever 126 is not yet latched to the first catch 122.

The second cantilever latch 142 is close to the second catch 140, but has not yet been deflected by the second catch 140. Accordingly, no flexing stress is applied to the second
5 cantilever latch 142 in this position.

Prior to the second cantilever latch 142 contacting the second catch, force is not being applied to the second cantilever latch 142 to flex the second cantilever latch 142 to the deflected position. Accordingly, if the second cantilever latch 142 does not contact the second catch 140 when the first cantilever latch 126 reaches the unlatched position,
10 then no stress is applied to the second cantilever latch 142 during the first partial range of movement. However, if the second cantilever latch 142 contacts the second catch 140 before the first cantilever latch 126 reaches the unlatched position, then the first portion of the first partial range of movement occurs between the fully latched position and the position at which the second cantilever latch 142 initially contacts the second catch 140.

15 The second portion of the first partial range of movement occurs between the first portion and the unlatched position.

As shown in FIG. 8, reference number L3 indicates a primary catch landing length. Reference number L4 indicates a distance between the point on the second cantilever latch 142 that will first contact the second catch 140 and the primary catch
20 landing length L3. The first portion of the first partial range of movement extends along a distance equal to the sum of the distance L3 and the distance L4. Reference number L5 indicates a secondary latch engagement length, which is the distance between the housing perimeter 107 and the outer side of the second catch 140. In certain examples, the distance L5 is greater than the distance L4 plus the distance L3. As long as $L5 > L4 +$
25 L3, stress will not be applied to the second cantilever latch 142 as the first cantilever latch 126 moves along the first partial range of movement.

In FIG. 9, the first and second housing pieces 112, 114 are disposed in the closed configuration so that the first and second housing pieces 112, 114 cooperate to define the perimeter 107 of the housing 110. The first cantilever latch 126 is disposed in the
30 unlatched position. The first catch 122 is aligned with the opening 132 defined by the first cantilever latch 126 and the first cantilever latch 126 is about to snap over the catch

122 towards the fully latched position. The second cantilever latch 142 is pushed to the deflected position by part of the second catch 140, but is not yet latched to the second catch 140. Accordingly, stress is being temporarily applied to the second cantilever latch 142.

5 The first cantilever latch 126 extends from the perimeter 107 of the housing 110 at a deflection angle α_1 and the second cantilever latch 142 extends from the first cantilever latch 126 at a deflection angle α_2 . The force at which the first cantilever latch 126 will snap over the first catch 122 can be calculated as:

$$Fr1 = F(\alpha_1 L1) + F(\alpha_2 L2).$$

10 In FIG. 10, the first cantilever latch 126 has snapped over the first catch 122 under the bias of the resilient construction of the cantilever latch 126. Accordingly, the first cantilever latch 126 is disposed in the fully latched position. In particular, the first catch 122 extends into the opening 132 in the first cantilever latch 126 and no material stress is being applied to the first cantilever latch 126. In other words, the first cantilever
15 latch 126 is not being forced away from its biased position. The second cantilever latch 142 is not contacting the second catch 140 or any other structure. No material stress is being applied to the second cantilever latch 142.

FIG. 11 illustrates the latch arrangement 124 being moved to the stowed position by a tool T (e.g., a flathead screwdriver, a wedge, or other structure). The first cantilever
20 latch 126 is forced to the stowed position by the tool T against the bias of the resilient construction of the first cantilever latch 126. The first cantilever latch 126 is moved sufficiently far that the latching hook 148 of the second cantilever latch 142 has snapped over the beam 141 of the second catch 122. In certain examples, the second cantilever latch 142 returns to the undeflected position when engaged with the second catch 140. In
25 such examples, no flexing stress is applied to the second cantilever latch 142 while the first cantilever latch 126 is disposed in the stowed position.

Referring back to FIG. 1, the latching system 120 is disposed and configured so that the latch system 120 can be accessed from a front side 101 of the enclosure 100 to move the first cantilever latch 126 from the fully latched position to the stowed unlatched
30 position. For example, the tool T can be inserted between the first cantilever latch 126 and the housing perimeter 107 by a technician standing in front of the housing 110.

Accordingly, the latch system 120 can be accessed even when the enclosure 100 is mounted in a tight space (e.g., a small space, a crowded space, etc.). No side access is needed to access the latch system 120.

Aspects of the Disclosure

Aspect 1. An enclosure comprising:

5 a housing including a first housing piece and a second housing piece that are movable relative to each other between a closed configuration and an open configuration; and

10 a latch system coupled to the housing to releasably retain the first and second housing pieces in the closed configuration, the latch system including a first catch carried by the first housing piece and a cantilevered latch carried by the second housing piece, the first cantilevered latch being configured to move between a fully latched position in which the first cantilevered latch engages the first catch and an unlatched position in which the first cantilevered latch disengages the first catch.

15 Aspect 2. The enclosure of aspect 1, wherein the first cantilevered latch also is configured to move past the unlatched position to a stowed position.

Aspect 3. The enclosure of aspect 2, wherein the first cantilevered latch can be selectively maintained in the stowed position.

20 Aspect 4. The enclosure of aspect 3, wherein the latch system includes a second cantilevered latch carried by the first cantilevered latch, the latch system also including a second catch carried by the second housing, the second cantilevered latch being configured to move between an undeflected position and a deflected position, the second cantilevered latch is configured to releasably engage the second catch to maintain the first
25 cantilevered latch in the stowed position.

Aspect 5. The enclosure of any of aspects 1-3, wherein the first cantilevered latch is biased to the fully latched position.

30 Aspect 6. The enclosure of aspect 1, wherein multiple latch systems are disposed about a perimeter of the housing.

Having described the preferred aspects and implementations of the present disclosure, modifications and equivalents of the disclosed concepts may readily occur to one skilled in the art. However, it is intended that such modifications and equivalents be included within the scope of the claims which are appended hereto.

What is claimed is:

1. An enclosure comprising:

a housing including first and second housing pieces moveable relative to one another between an open configuration and a closed configuration, the first and second housing pieces mating together and cooperate to that define at least a portion of an interior of the housing when the first and second housing pieces are in the closed configuration, the interior of the housing being accessible when the first and second housing pieces are in the open configuration; and

a latch system for retaining the first and second housing pieces in the closed configuration, the latch system including a first latch catch unitarily formed with the first housing piece, and the latch system also including a latch arrangement including a first cantilever latch having a base end unitarily formed with the second housing piece, the first cantilever latch being configured to flex between a fully latched position and a stowed position, the first cantilever latch having an unlatched position positioned between the fully latched position and the stowed position, the first cantilever latch having a resilient construction that biases the first cantilever latch toward the fully latched position, the first cantilever latch being adapted to engage the first latch catch to retain the first and second housing piece in the closed configuration when the first cantilever latch is in the fully latched position, the first cantilever latch being disengaged from the first latch catch when in stowed position to allow the first and second housing pieces to be moved from the closed configuration to the open configuration, the latch arrangement further including a second latch catch unitarily formed with the second housing piece and a second cantilever latch having a base end unitarily formed with the first cantilever latch, wherein when the first cantilever latch is moved from the latched position to the stowed position, the second cantilever latch engages the second latch catch to retain the first cantilever latch in the stowed position, and wherein the first cantilever latch disengages from the first latch catch at the unlatched position prior to reaching the stowed position.

2. The enclosure of claim 1, wherein the second latch catch forms a positive stop that limits movement of the first cantilever latch in a direction away from the fully latched position.
3. The enclosure of claims 1 or 2, wherein the housing defines a perimeter, and wherein more than one of the latching systems are positioned about the perimeter of the housing.
4. The enclosure of any of claims 1-3, wherein the first housing piece is a front cover and the second housing piece is a base.
5. The enclosure of claim 4, wherein the latching system can be accessed from a front side of the enclosure to move the first cantilever latch from the fully latched position to the stowed position.
6. The enclosure of any of claims 1-5, wherein the latch arrangement is formed without any undercuts such that the second housing piece and the latch arrangement can be formed of plastic using a mold having only two pieces.
7. The enclosure of any of claims 1-6, wherein the second housing piece defines a groove that extends about a perimeter of the housing and receives a perimeter seal, and wherein the first housing piece includes a sealing projection that engages the perimeter seal within the groove when the first and second housing pieces are mated together.
8. The enclosure of any of claims 1-7, wherein the first and second cantilever latches provide a double beam system that resists movement of the first cantilever latch from the fully latched position toward the initial unlatched position
9. The enclosure of any of claims 1-6, wherein the first cantilever latch is moved through a range of movement from the fully latched position to the unlatched position, and wherein the first and second cantilever latches both flex during at least a portion of

the range of movement to resist movement of the first cantilever latch toward the unlatched position.

10. The enclosure of claims 1-6, wherein the first cantilever latch is moved through a total range of movement between the fully latched position and the stowed position, wherein the total range of movement includes a first partial range of movement that extends from the fully latched position to the unlatched position, and a second partial range of movement that extends from the unlatched position to the stowed position, wherein only the first cantilever latch flexes to resist movement toward the unlatched position as the first cantilever latch moves through a first portion of the first partial range of movement, wherein both the first and second cantilever latches flex to resist movement toward the unlatched position as the first cantilever latch moves through a second portion of the first partial range of movement, and wherein both the first and second cantilever latches flex to resist movement toward the stowed position as the first cantilever latch moves through the second partial range of movement.

11. The enclosure of claim 10, wherein the first cantilever latch completely disengages from the first latch catch at the unlatched position and remains engaged with the first latch catch during the first partial range of movement.

12. An enclosure comprising:

a housing including a first housing piece and a second housing piece that are movable relative to each other between a closed configuration and an open configuration; and

a latch system coupled to the housing to releasably retain the first and second housing pieces in the closed configuration, the latch system including a first catch carried by the first housing piece and a cantilevered latch carried by the second housing piece, the first cantilevered latch being configured to move between a fully latched position in which the first cantilevered latch engages the first catch and an unlatched position in which the first cantilevered latch disengages the first catch, the first cantilevered latch also being configured to move past the unlatched position to a stowed position.

13. The enclosure of aspect 12, wherein the first cantilevered latch can be selectively maintained in the stowed position.

14. The enclosure of aspect 13, wherein the latch system includes a second cantilevered latch carried by the first cantilevered latch, the latch system also including a second catch carried by the second housing, the second cantilevered latch being configured to move between an undeflected position and a deflected position, the second cantilevered latch is configured to releasably engage the second catch to maintain the first cantilevered latch in the stowed position.

15. The enclosure of any of aspects 12-14, wherein the first cantilevered latch is biased to the fully latched position.

16. The enclosure of aspect 12, wherein multiple latch systems are disposed about a perimeter of the housing.

FIG. 1

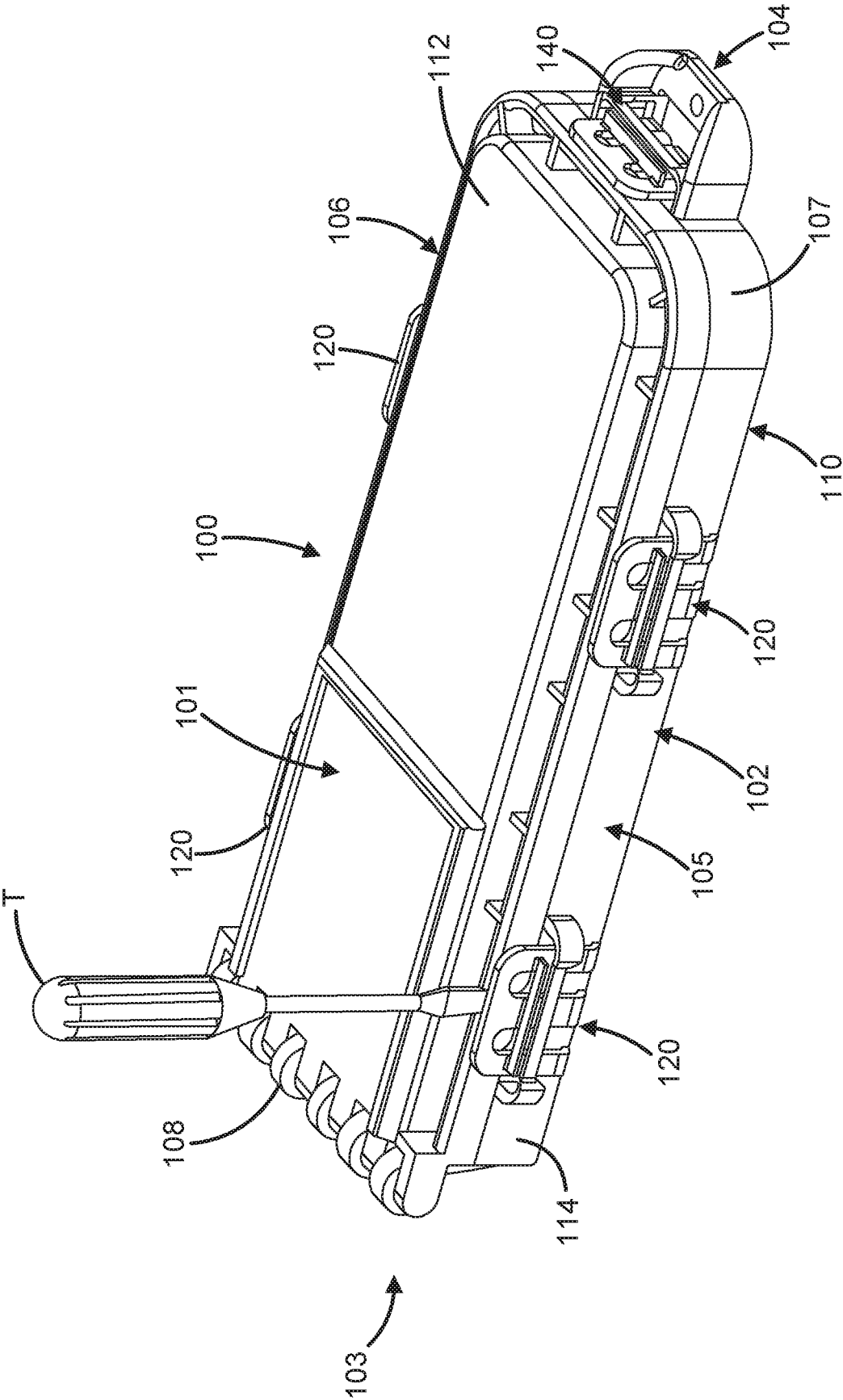


FIG. 2

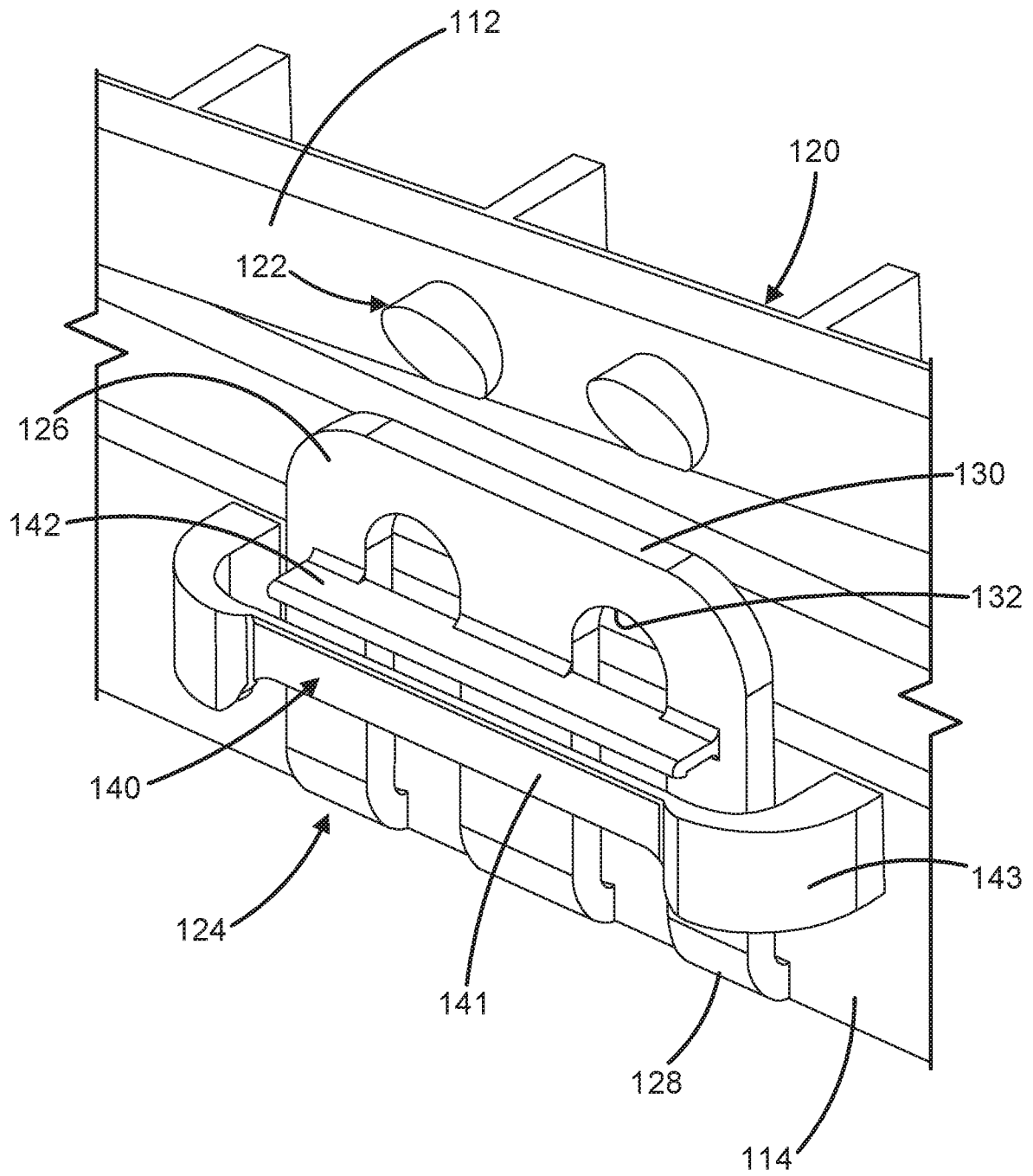


FIG. 3

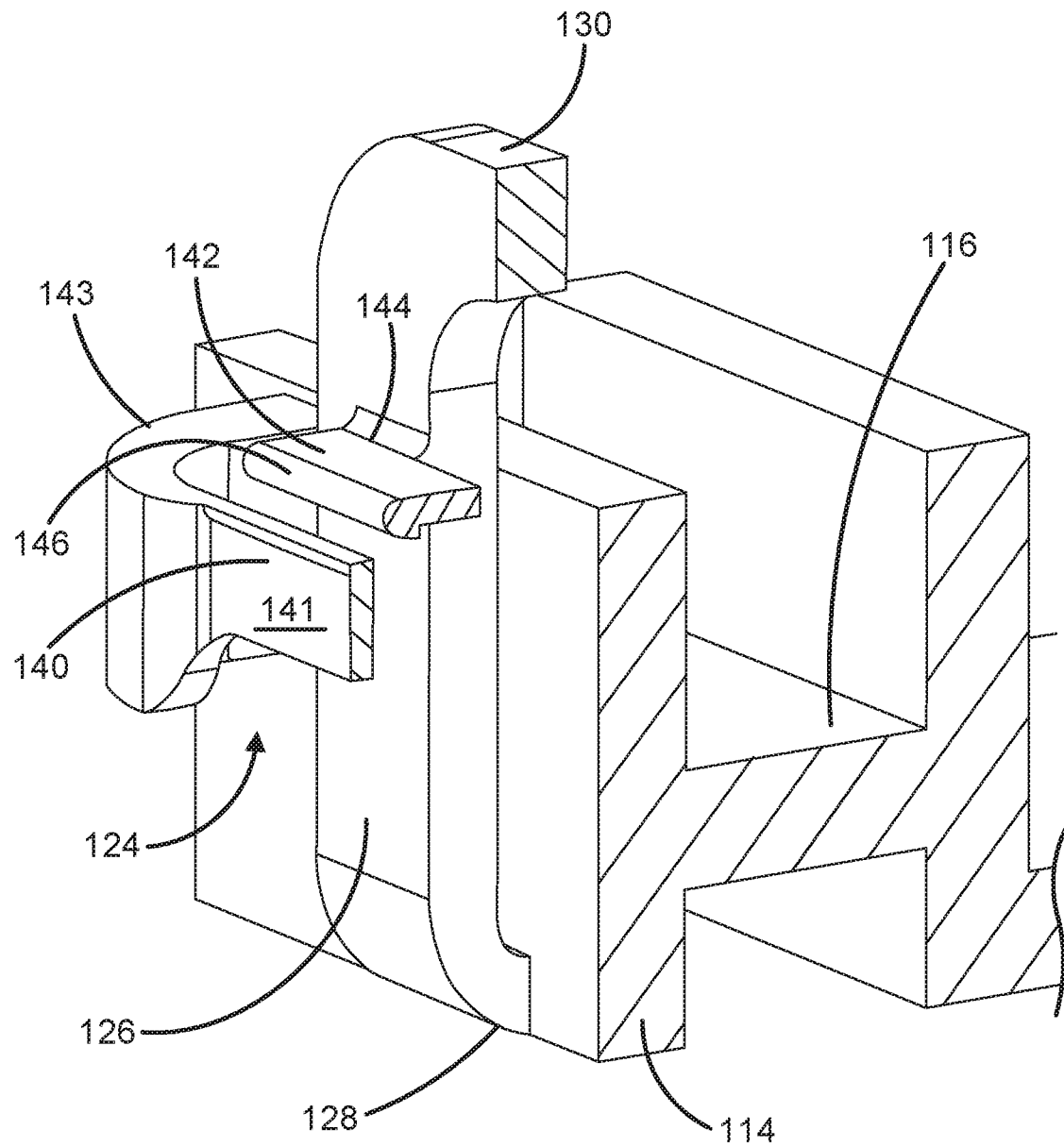


FIG. 4

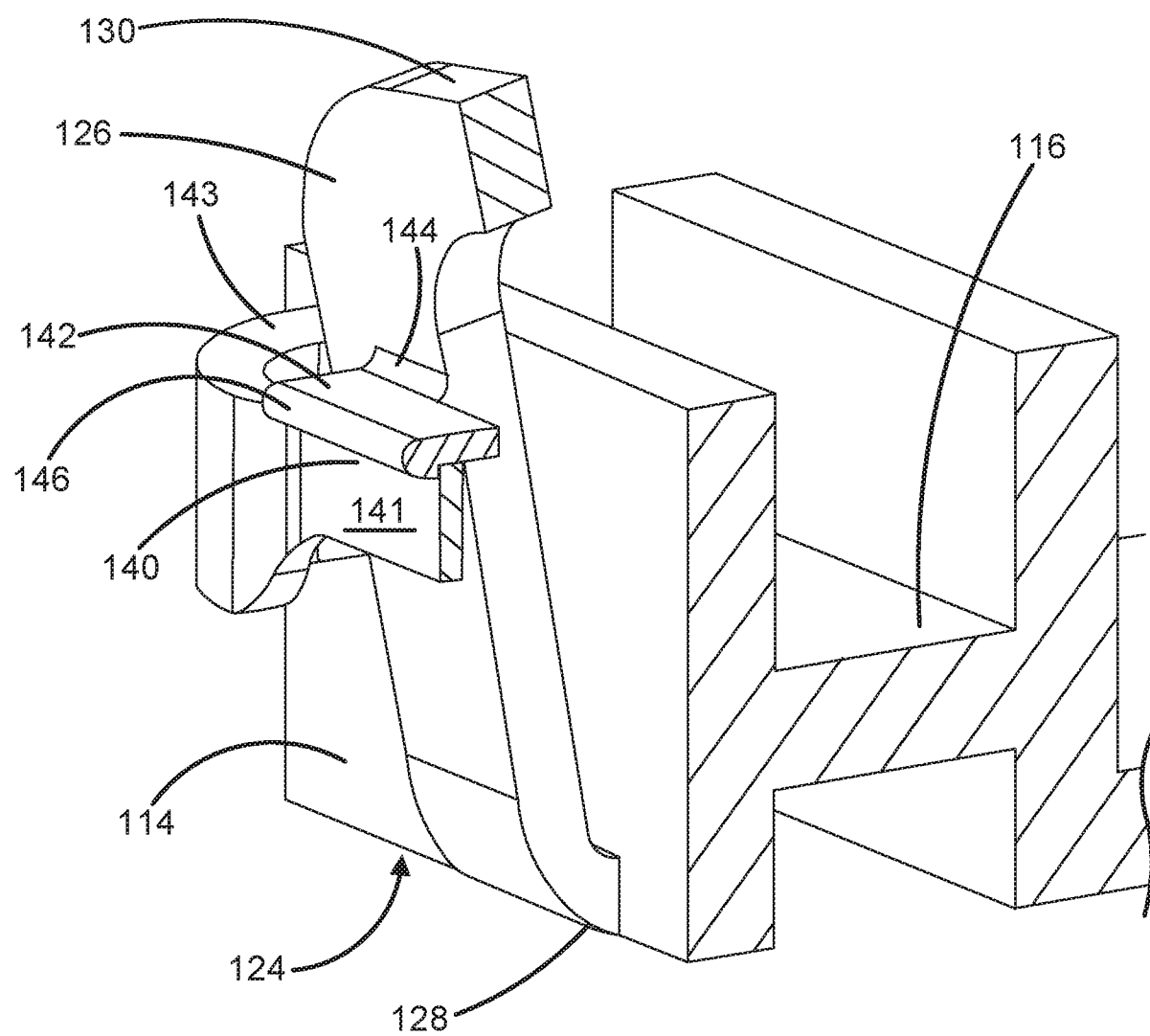


FIG. 5

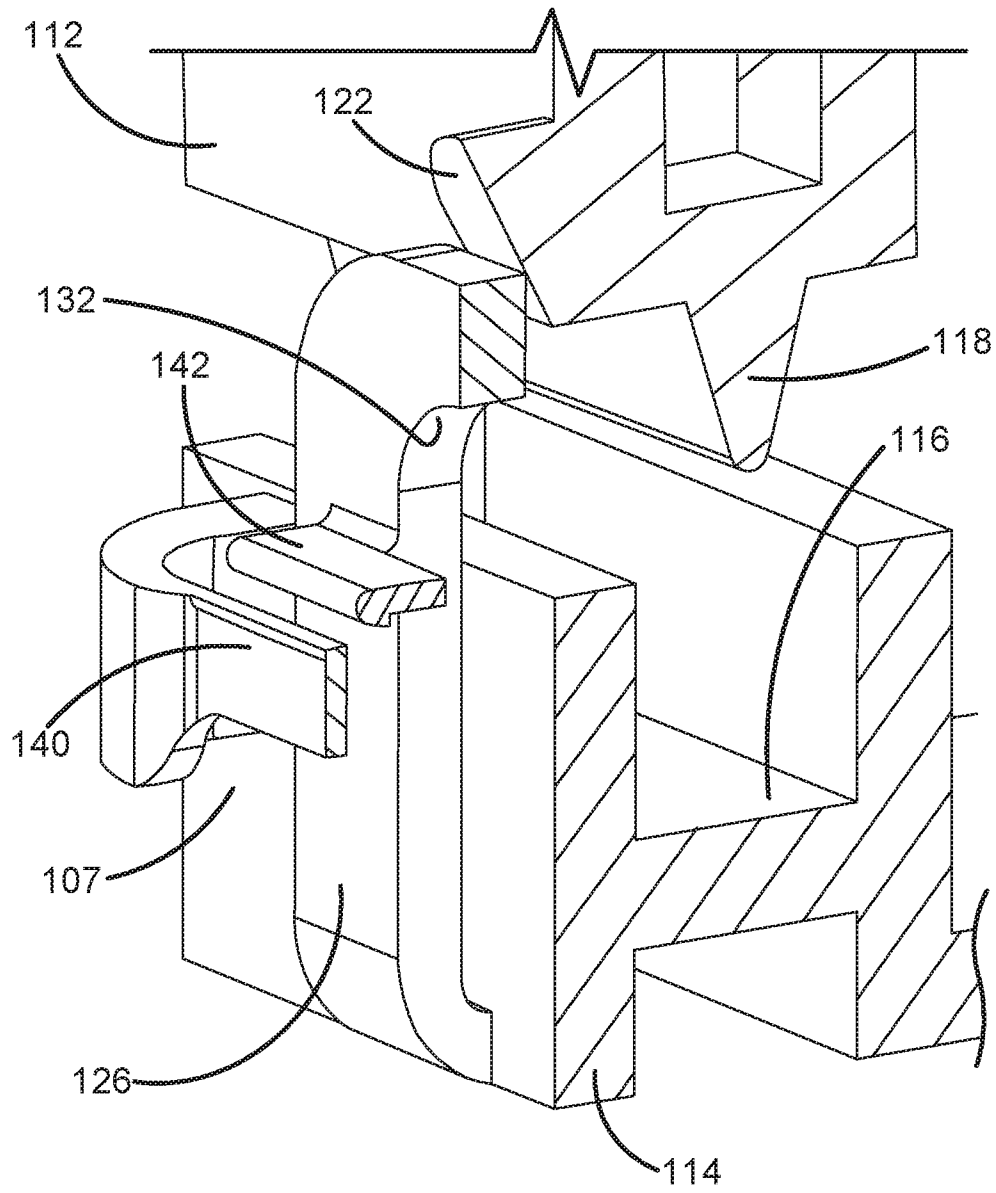


FIG. 6

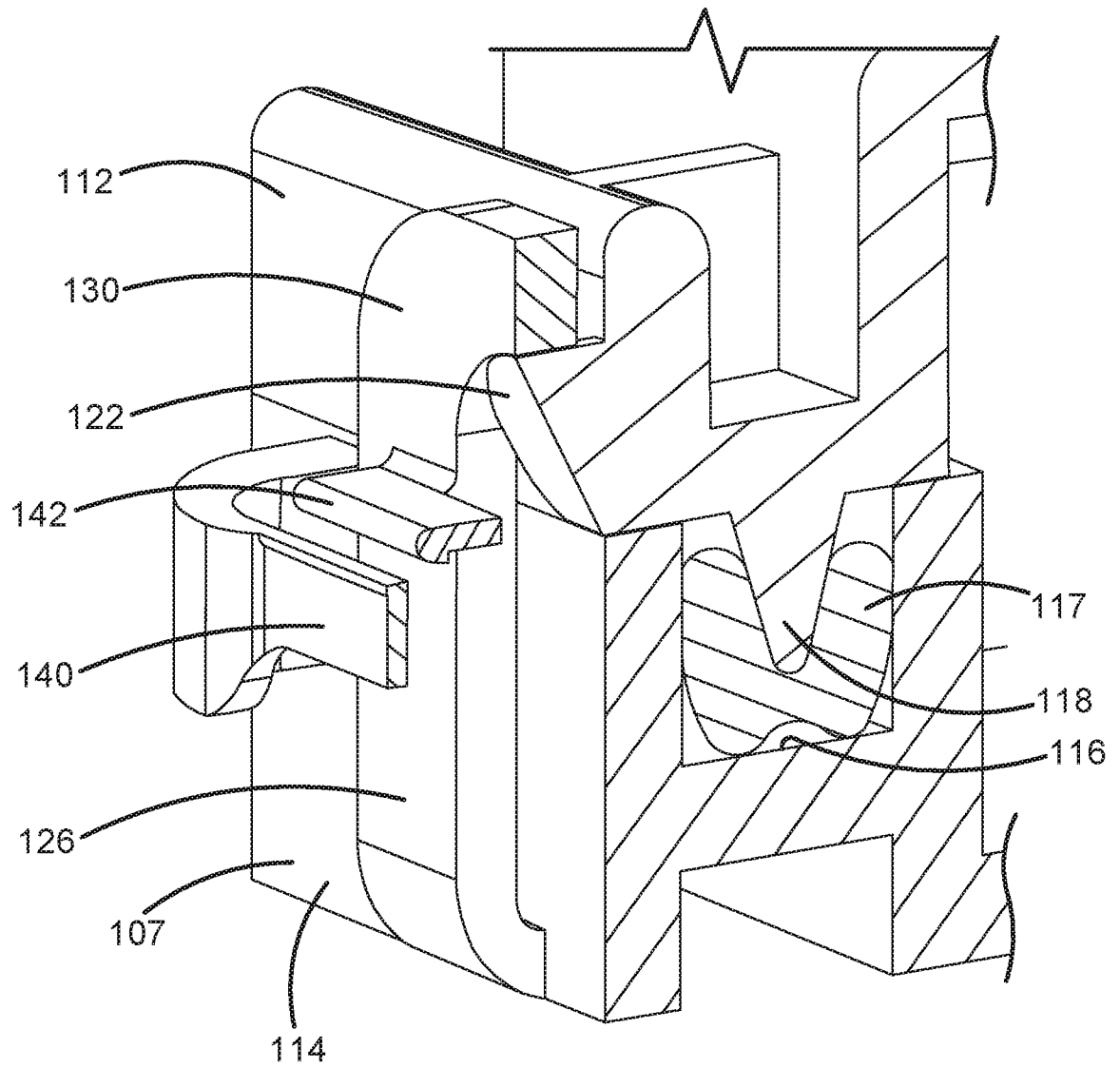


FIG. 7

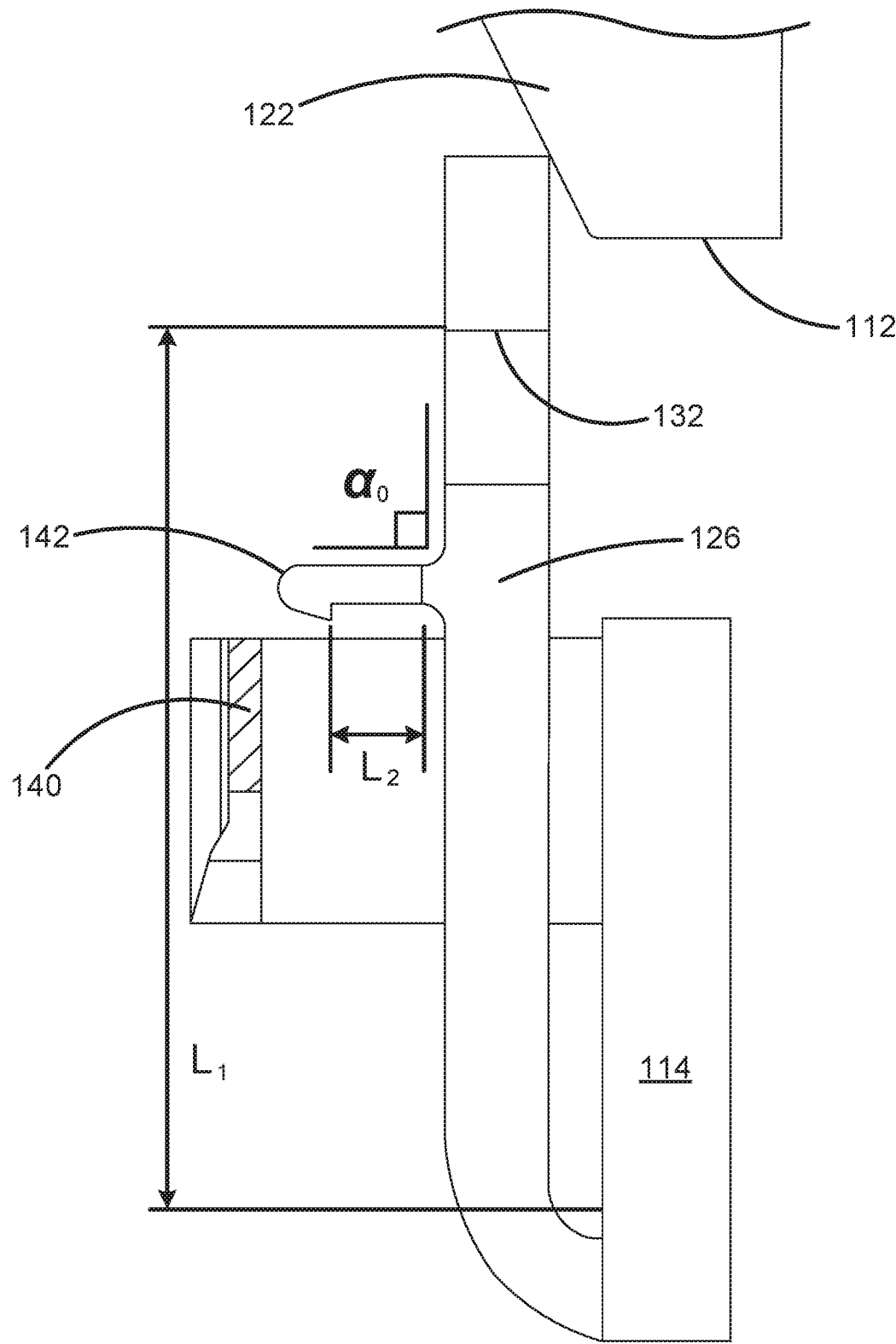


FIG. 9

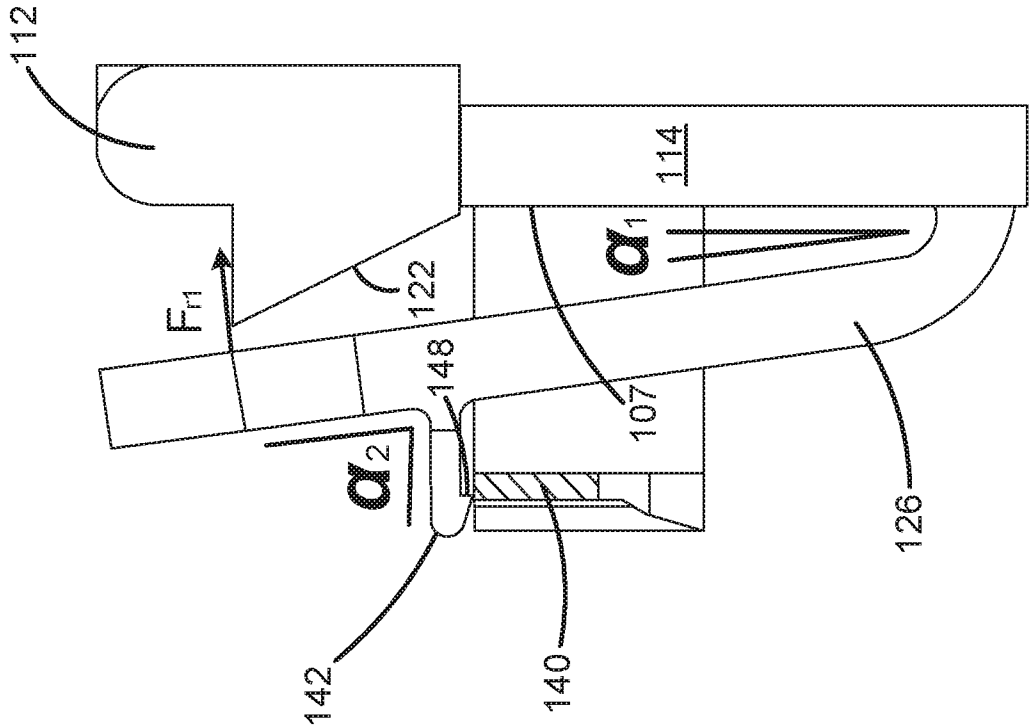


FIG. 8

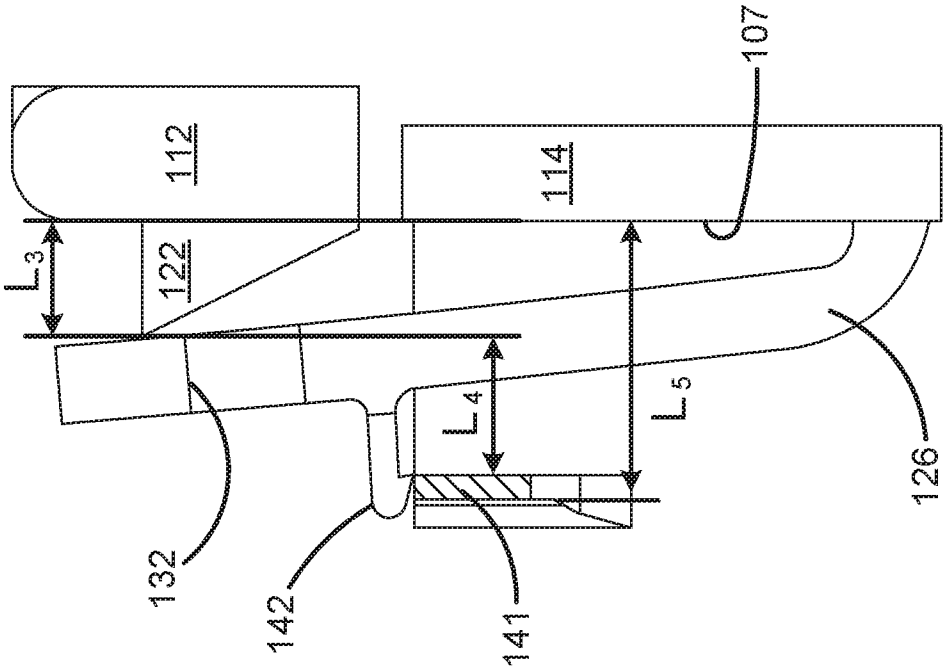


FIG. 11

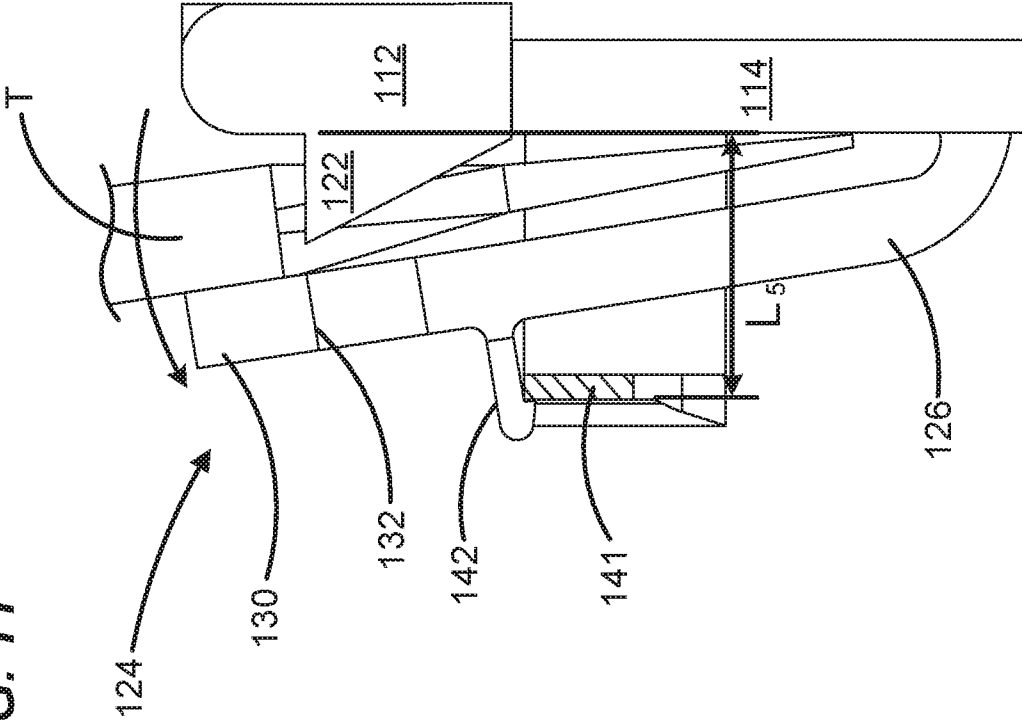
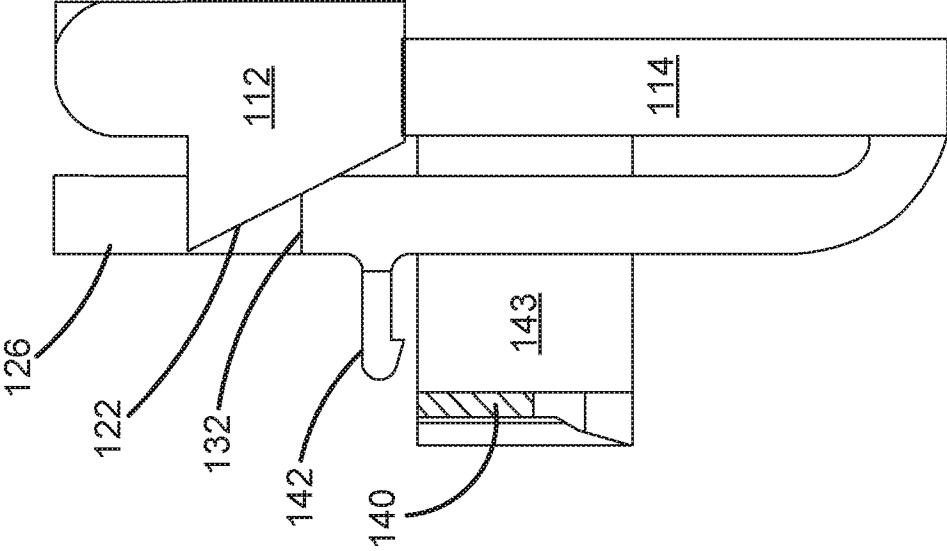


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/022654**A. CLASSIFICATION OF SUBJECT MATTER****H05K 5/02(2006.01)i, H05K 5/00(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
H05K 5/02; H01F 17/06; H02B 1/40; H05K 5/00; H05K 5/03; H05K 7/14; H05K 9/00Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: enclosure, latch catch, cantilever latch, stowed position**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 07-274321 A (TOSHIBA LIGHTING & TECHNOL CORP.) 20 October 1995 See paragraphs [0018]–[0034] and figures 1–7.	1–3, 12–16
A	US 2011-0026231 A1 (ALESSANDRO SCORDINO et al.) 03 February 2011 See paragraphs [0044]–[0063] and figures 1–3.	1–3, 12–16
A	US 2013-0081846 A1 (BAO-GANG ZHAO et al.) 04 April 2013 See paragraphs [0011]–[0025] and figures 1–4.	1–3, 12–16
A	JP 2006-024704 A (TDK CORP.) 26 January 2006 See paragraph [0037] and figure 14.	1–3, 12–16
A	US 2015-0109743 A1 (HON HAI PRECISION INDUSTRY CO., LTD.) 23 April 2015 See paragraphs [0012]–[0015] and figure 1.	1–3, 12–16



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

08 July 2020 (08.07.2020)

Date of mailing of the international search report

08 July 2020 (08.07.2020)

Name and mailing address of the ISA/KR

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International application No.
PCT/US2020/022654

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

- Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2020/022654

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