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

(11) EP 2 090 819 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.08.2009 Bulletin 2009/34

(51) Int Cl.:
F21S 8/00 *(2006.01)* ***F21V 17/16*** *(2006.01)*

(21) Application number: **09152622.8**

(22) Date of filing: **11.02.2009**

(84) Designated Contracting States:
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 SE SI SK TR
Designated Extension States:
AL BA RS

(30) Priority: **12.02.2008 US 29509**

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(54) Panel mount light emitting element assembly

(57) A light emitting element assembly (100) for mounting to a panel (113). The assembly (100) includes a housing (107) configured to receive a light emitting element therein. In addition, the assembly (100) includes a bezel (119) having a first set (1001) of latch arms (121) and a second set (1003) of latch arms (121) extending from a surface of the bezel (119). The bezel (119) is configured to retain the assembly (100) in a position relative to the panel (113). The assembly (100) also includes a mounting structure (101) having the light emitting element operably mounted therein. The first set (1001) of latch arms (121) include at least one latch arm (121) configured to detachably engage a surface of the housing (107) and the second set (1003) of latch arms (121) include at least one latch arm (121) configured to detachably engage a surface of the panel (113).

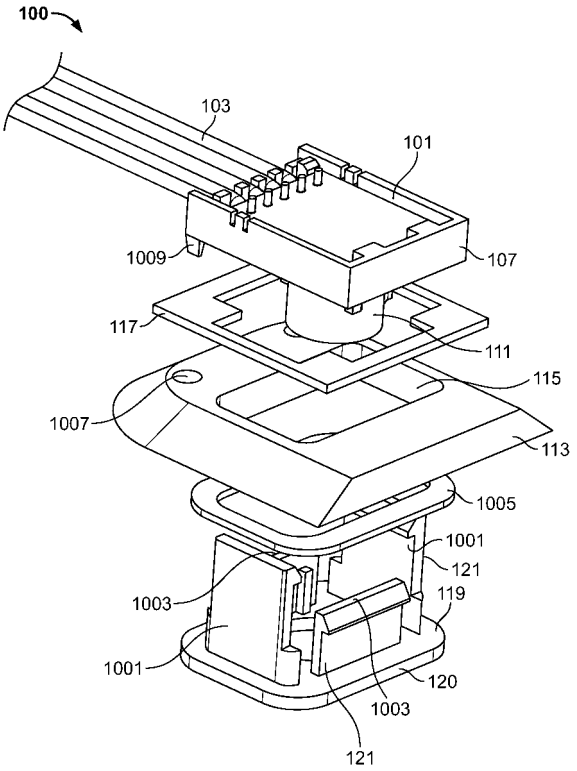

FIG. 10

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Description

[0001] The disclosure relates generally to light emitting assemblies and systems, and more particularly, the disclosure relates to a panel mounted light emitting element, assembly and system.

[0002] Recent technological advances in low voltage light sources, such as light emitting diodes (LEDs), now present low voltage light sources as suitable candidates as light sources. Low voltage light sources operate at a small fraction of the electrical power of conventionally used light sources and are an attractive option due to generally lower cost and higher efficiency than conventionally used light sources.

[0003] A specific use of an LED based light may be a small pin light emitting element assembly for spot illumination. These pin spot lights may be panel mounted for directing the illumination. In some proposed applications, the entire pin spot light assembly must be sufficiently small to fit in restricted spaces. Additionally, the light emitting assemblies must be accessible for repair or replacement. Conventional designs provide the latches outside of the lamp housing. This makes the overall size of the bezel used to mount the lamp assembly to the panel very large. The problem is that the bulky external latch configurations make the assembly less pleasing aesthetically and also make it difficult to package the light emitting assemblies in extremely tight locations. The minimization of space occupied by these light emitting assemblies is often an issue with applications, such as automotive interior lighting.

[0004] The solution is provided by a light emitting element assembly and system that are capable of being mounted in areas having restricted space and also afford easy installation and disassembly for repair, replacement and/or upgrading of individual components of the assembly as disclosed herein. The assembly includes a housing configured to receive a light emitting element therein. In addition, the assembly includes a bezel having a first set of latch arms and a second set of latch arms extending from a surface of the bezel. The bezel is configured to retain the assembly in a position relative to the panel. The assembly also includes a mounting structure having the light emitting element operably mounted therein. The first set of latch arms include at least one latch arm configured to detachably engage a surface of or within the housing and the second set of latch arms include at least one latch arm configured to detachably engage a surface of the panel.

[0005] The invention will now be described by way of example with reference to the accompanying drawings in which:

[0006] FIG. 1 shows an exploded perspective view of an exemplary embodiment of a light emitting element assembly according to an embodiment of the disclosure.

[0007] FIG. 2 shows a perspective view of an exemplary embodiment of a light emitting element assembly of the present disclosure mounted to a panel.

[0008] FIG. 3 is a cross-section of the light emitting element assembly of FIG. 2 parallel to wires connected thereto.

[0009] FIG. 4 is a cross-section of the light emitting element assembly of FIG. 2 perpendicular to wires connected thereto.

[0010] FIG. 5 is a perspective view of the PCB assembly of the light emitting element assembly of FIG. 2.

[0011] FIG. 6 is a perspective view of an exemplary embodiment of the bezel of the light emitting element assembly of FIG. 2.

[0012] FIG. 7 is a perspective view of a housing of the light emitting element assembly of FIG. 2.

[0013] FIG. 8 is a perspective view of a bezel according to an alternate embodiment.

[0014] FIG. 9 is a cross-section of the light emitting element assembly including the bezel of FIG. 8.

[0015] FIG. 10 shows an exploded perspective view of another exemplary embodiment of a light emitting element assembly according to an embodiment of the disclosure.

[0016] FIG. 11 shows a partially exploded view of an exemplary embodiment of a light emitting element assembly of the present disclosure having a bezel mounted to a panel.

[0017] FIG. 12 shows a perspective view of an exemplary embodiment of a light emitting element assembly of the present disclosure mounted to a panel.

[0018] FIG. 13 is a cross-section of the light emitting element assembly taken along line 13-13 of FIG. 12.

[0019] FIG. 14 is a cross-section of the light emitting element assembly taken along line 14-14 of FIG. 12.

[0020] FIG. 15 is a perspective view of a bezel according to an embodiment of the present disclosure.

[0021] FIG. 16 shows an exploded perspective view of another exemplary embodiment of a light emitting element assembly according to an embodiment of the disclosure.

[0022] FIG. 17 shows a partially exploded view of an exemplary embodiment of a light emitting element assembly of the present disclosure having a bezel mounted to a panel.

[0023] FIG. 18 shows a perspective view of an exemplary embodiment of a light emitting element assembly of the present disclosure mounted to a panel.

[0024] FIG. 19 is a cross-section of the light emitting element assembly taken along line 19-19 of FIG. 18.

[0025] FIG. 20 is a cross-section of the light emitting element assembly taken along line 20-20 of FIG. 18.

[0026] FIG. 21 is a perspective view of a housing according to an embodiment of the present disclosure.

[0027] FIG. 22 is a perspective view of a bezel according to an embodiment of the present disclosure.

[0028] Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0029] FIG. 1 shows an exploded view of a panel mounted light emitting element assembly 100 according

to an embodiment of the present disclosure. The assembly 100 includes a mounting board 101 having wires 103 in electrical communication therewith. Light emitting elements 105 may include any devices capable of providing illumination. Suitable light emitting elements 105 may include any light emitting elements 105 known for providing illumination, such as, but not limited to, light emitting diodes (LEDs), laser diodes, organic light emitting diodes (OLEDs), incandescent lights, fluorescent lights, polymer light emitting diodes, emissive phosphor lights and electroluminescent lights. Mounting board 101 may be any device, surface, structure or substrate capable of supporting, controlling and/or providing power to light emitting elements 105. Suitable structures for use as mounting board 101 include, but are not limited to printed circuit boards (PCB). In addition, wires 103 may be any configuration of wires or other power supplies. The source of power for the light emitting elements 105 is not limited to wired power, but may include batteries, photovoltaic cells or other power sources, which may or may not include wires 103. Housing 107 is configured to receive the mounting board 101 and the light emitting element 105. The housing 107 further includes flexible cantilevered legs 109 extending along distal ends of housing 107. The housing 107 may be fabricated from any suitable material, including electrically insulative polymeric material, such as acrylonitrile butadiene styrene (ABS) or other similar polymeric materials. The housing 107 further includes a lens portion 111 extending from the body of the housing. The lens portion 111 includes a substantially transparent, translucent or otherwise light distributing or dispersing material. Suitable material for the lens portion 111, includes, but is not limited to, transparent polymer, such as acrylic or polycarbonate.

[0030] Panel 113 includes an opening 115, which is disposed therethrough. The panel 113 is any surface, structure or substrate onto which a light emitting assembly 100 may be mounted. For example, the panel 113 may include a polymeric or other material sheet wherein lighting is desired on one side of the panel 113, wherein space is limited and the majority of the light emitting element structure, such as the housing 107, the mounting board 101 and the light emitting element 105, is disposed on the opposite side of the panel 113. Disposed between the housing 107 and a panel 113 is a gasket 117. While the assembly 100 is shown including gasket 117, the gasket may be omitted in certain embodiments of the disclosure. The gasket 117 may be fabricated from foam or other insulative material and provides sealing, shock/vibration resistance and/or protects the housing 107 and panel 113, particularly during installation and disassembly of the assembly 100. The assembly 100 further includes a bezel 119 having a display surface or face plate 120 and two latch arms 121 extending therefrom. The latch arms 121 are flexible cantilevered latches configured to pass through opening 115 and detachably engage a surface within housing 107. When engaged with housing 107, the bezel 119 rests against or adjacent to panel 113, wherein the engagement retains the assembly 100 in position with respect to panel 100. In other words, the latch arms 121 engage housing 107, wherein the engagement of the latch arms 121 with housing 107 provides an engagement between bezel 119 and panel 113, wherein the bezel 119 retains the positioning of the assembly 100. In one embodiment of the present disclosure, as shown in FIG. 1, bezel 119 includes a double beam latch. However, the present disclosure is not so limited and may include any latch arm 121 structure capable of extending through opening 115 and engaging housing 107.

[0031] FIG. 2 shows a bottom perspective view of an assembly 100 according to an embodiment of the disclosure mounted on a panel 113. As shown in FIG. 2, the bezel 119 is engaged with housing 107 through opening 115 (not visible in FIG. 2) of panel 113. The engagement of bezel 119 with housing 107 maintains the relative positioning of the assembly 100 with respect to the panel 113. During operation, the light emitting element 105 provides illumination wherein the lens portion 111 transmits or otherwise distributes the resultant light in a desired manner.

[0032] FIG. 3 shows a cutaway view of the assembly 100 of FIG. 2. As shown in FIG. 3, the mounting board 101 is engaged with housing 107. The housing 107 may include features 301 to secure the mounting board 101 with the light emitting element 105 facing downward in a direction toward housing 107. The mounting board 101 may be engaged or otherwise attached to housing 107 in any suitable manner known in the art. For example, although FIG. 2 shows a mechanical interlocking arrangement, the mounting board 101 may be affixed to housing 107 by adhesive, latches, or any other known method known for engaging PCB structures to housings 107. In addition, the positioning of light emitting element 105 is in sufficient proximity to the lens portion 111 to provide a high efficiency of light distribution into the desired locations.

[0033] FIG. 4 shows a cutaway view of the assembly 100 of FIG. 2 which is perpendicular to the view shown in Fig. 3. The latch arms 121 of bezel 119 extend through slots 401 in housing 107 and engaged a surface 403. As shown in FIG. 4, legs 109 are arranged adjacent or in proximity to latch arms 121 of bezel 119. In order to disengage bezel 119 from the housing 107, the legs 109 may be depressed inwardly for a sufficient distance to disengage the latch arms 121 from surface 403. Upon disengagement, bezel 119 may be removed via slot 401. Once the bezel 119 has been removed, the assembly 100 may be removed from panel 113 and/or disassembled for repair, replacement and/or upgrade of individual components.

[0034] FIG. 5 shows a bottom perspective view of mounting board 101. Mounting board 101 may be any device, surface, structure or substrate capable of supporting, controlling and/or providing power to light emitting elements 105. Suitable structures for use as mount-

ing board 101 include, but are not limited to printed circuit boards (PCB). Mounting board 101 may include a PCB assembly having a light emitting element 105, such as an LED and corresponding electronic components such as resistors and capacitors (not shown) soldered onto mounting board. A set of wires 103 may also be soldered onto the mounting board 101 to power the electronic components so that the light is emitted from the light emitting element 105. However, the source of power for the light emitting elements 105 is not limited to wired power, but may include batteries, photovoltaic cells or other power sources, which may or may not include wires 103.

[0035] FIG. 6 shows bezel 119 having latch arms 121. As discussed above, latch arms 121 are configured to engage housing 107, wherein the latch arms 121 may be inserted into slots 401 (see FIG. 4 and FIG. 7) and engage surface 403 of housing 107. In addition, the bezel 119 may include aesthetically desirable features, such as curved or decorative surfaces that are visible when the bezel 119 is engaged to trim the lens portion 111 in addition to securing the assembly 100 onto the panel 113.

[0036] FIG. 7 shows a perspective view from below housing 107. Housing 107 is preferably made of a polymeric material. The housing 107 further includes a lens portion 111, which is preferably fabricated from a clear polymer, such as, but not limited to, acrylic or polycarbonate. When these components are snapped together, the latch arms 121 engage housing 107 securing the housing 107 and permitting the exposure of the lens portion 111 to the space in which illumination is desired. The lens portion 111 distributes the light emitted by the light emitting element 105. In one embodiment, the lens portion is transparent and the light of the light emitting element 105 is permitted to travel through the lens portion substantially unaltered. The lens portion 111 may also be hollowed out to create yet different light patterns. The lens potion 111 may include optical features, filters or other effects that may be desirable for the particular lighting application. In addition, the surface of the lens portion 111 can be angled or made prismatic, so that various light distribution can be achieved by making simple changes to the housing 107.

[0037] FIG. 8 shows a perspective view of a bezel 119 according to an alternate embodiment. As shown and described above with respect to FIG. 6, bezel 119 includes latch arms 121. Latch arms 121 are configured to engage housing 107, wherein the latch arms 121 may be inserted into and engage a portion of housing 107 (see e.g., FIG. 4). In addition, the latch arms 121, the bezel 119, as shown in FIG. 8, includes positioning features 801, which extend from the bezel faceplate 120 and provide a geometry to facilitate desired positioning of the bezel with respect to the panel 113 and housing 107.

[0038] FIG. 9 shows a cutaway view of an alternate embodiment of the invention having the alternate bezel structure shown and described above with respect to FIG. 3. Specifically, FIG. 9 shows the mounting board 101 is engaged with housing 107. The housing 107 may include features 301 to secure the mounting board 101 with the light emitting element 105 facing downward in a direction toward housing 107. The mounting board 101 may be engaged or otherwise attached to housing 107 in any suitable manner known in the art. In addition, the positioning of light emitting element 105 is in sufficient proximity to the lens portion 111 to provide a high efficiency of light distribution into the desired locations. In addition, the bezel 119 shown in FIG. 9 includes positioning features 801. Positioning features 801, which extend from the bezel faceplate 120 and provide a geometry to facilitate proper positioning of the bezel with respect to the panel 113 and housing 107. In addition, the geometry of positioning features 801 mate or otherwise are inserted into corresponding geometries in the panel 113 and/or housing 107 to prevent rotation or undesired movement or disengagement.

[0039] FIG. 10 shows an exploded view of a panel mounted light emitting element assembly 100 according to another embodiment of the present disclosure. The assembly 100 includes a mounting board 101 having wires 103 in electrical communication therewith and includes a structure as further described above with respect to FIG. 1. Light emitting element 105 (not visible in FIG. 10) is affixed to mounting board 101 and may include any devices capable of providing illumination, as discussed in greater detail above with respect to FIG. 1. Housing 107 is configured to receive the mounting board 101 and the light emitting element 105. The housing 107 further includes a lens portion 111 extending from the body of the housing.

[0040] Panel 113 includes an opening 115, which is disposed therethrough. The panel 113 is any surface, structure or substrate onto which a light emitting assembly 100 may be mounted. Disposed between the housing 107 and a panel 113 is a gasket 117. While the assembly 100 is shown including gasket 117, the gasket may be omitted in certain embodiments of the disclosure. The gasket 117 may be fabricated from foam or other insulative material and provides sealing, shock/vibration resistance and/or protects the housing 107 and panel 113, particularly during installation and disassembly of the assembly 100. Panel 11 may be fabricated from a solid panel including, for example, acrylonitrile butadiene styrene (ABS), polypropylene, or a composite panel having a foam layer and a decorative or otherwise aesthetically pleasing cover sheet or fabric added to a solid panel. Panel 113 includes a panel feature 1007, which provides a cavity into which a corresponding housing feature 1009 may be inserted. The assembly 100 further includes a bezel 119 having a display surface or face plate 120 and a first set 1001 and a second set 1003 of latch arms 121, each of the first set 1001 and second set 1003 having two latch arms 121 extending therefrom. The latch arms 121 are flexible cantilevered latches configured to detachably engage a surface. The latch arms 121 of the first set 1001 are configured to extend through opening 115 and engage a surface of housing 107. The latch arms

121 of the second set 1003 are configured to extend through opening 115 and engage a surface of the panel 113.

[0041] When engaged with housing 107 and the panel 113, the bezel 119 rests against or is adjacent to panel 113, wherein the engagement retains the assembly 100 in position with respect to panel 113. In other words, the latch arms 121 engage housing 107 and panel 113, wherein the engagement of the latch arms 121 with housing 107 and panel 113 provides an engagement between bezel 119 and panel 113, wherein the bezel 119 retains the positioning of the assembly 100, including the housing 107 and the light emitting element 105 therein (not visible in FIG. 10) with respect to panel 113. A gasket 1005 is provided to facilitate variations in panel thickness and/or pre-position the bezel. In one embodiment of the present disclosure, as shown in FIG. 11, bezel 119 includes a configuration of latch arms 121 having an inwardly latching first set 1003 and an outwardly latching second set 1003. However, the present disclosure is not so limited and may include any latch arm 121 structures and any arrangement of latch arms 121 capable of extending through opening 115 and engaging housing 107 and panel 113.

[0042] FIG. 11 shows the assembly 100 of FIG. 10 with bezel 119 engaged with panel 113. The assembly 100 includes the structure, as shown and described above with respect to FIG. 10. However, in this embodiment, the latch arms 121 of second set 1003 engage a surface 1101 of panel 113. The positioning of the bezel 119 in the engaged position with the panel 113 provides a substantially rigid and stable structure into which the housing 107 may be directed. The bezel can be preassembled to the panel 113 and the housing 107 and the light emitting element 105 therein can be mounted later in a separate assembly operation to facilitate efficient manufacture. Also, if the panel 113 is a large object, it may be difficult to simultaneously hold or retain the housing 107 and the bezel 119, creating assembly difficulties. Allowing the bezel 119 to be preassembled to panel 113 permits mounting of the bezel 119 with a single hand.

[0043] FIG. 12 shows a top perspective view of the assembly 100 of FIGs. 10 and 11 according to an embodiment of the disclosure mounted on a panel 113. As shown in FIG. 12, the bezel 119 is engaged with housing 107 through opening 115 of panel 113 via latch arms 121 of first set 1001. The engagement of bezel 119 with housing 107 maintains the relative positioning of the assembly 100 with respect to the panel 113.

[0044] FIG. 13 shows a cutaway view taken along line 13-13 of FIG. 12. As shown in FIG. 13, the mounting board 101 is engaged with housing 107. The mounting board 101 may be engaged or otherwise attached to housing 107 in any suitable manner known in the art. For example, although FIG. 12 shows a mechanical interlocking arrangement, the mounting board 101 may be affixed to housing 107 by adhesive, latches, or any other known method known for engaging PCB structures to housings 107. In addition, the positioning of light emitting element 105 is in sufficient proximity to the lens portion 111 to provide a high efficiency of light distribution into the desired locations. The bezel 119 is detachably engaged with a surface 1101 of panel 113 and surface 1201 of housing 107. Specifically, the latch arms 121 of the first set 1001 elastically deflect outwardly around the housing during installation and lock or latch the housing 107 to provide retention and/or contact with surface 1201. The latch arms 121 of second set 1003 detachably engage surface 1101 of panel 113. Specifically, the latch arms 121 elastically deflect inwardly as the latch arms are directed though opening 115 of panel 113 and lock or latch the panel 113 to provide retention and/or contact with surface 1101.

[0045] FIG. 14 shows a cutaway view taken along line 14-14 of FIG. 12. As shown and described above with respect to FIG. 13, the latch arms 121 of first set 1001 extend through opening 115 of panel 113 and engage surface 1201. In order to disengage bezel 119 from the housing 107, the latch arms 121 may be deflected manually or by force applied by a tool or by other manipulation from surface 1201. Further, the second set 1003 of latch arms 121 may be disengaged in a similar manner from surface 1101. Upon disengagement, bezel 119 may be removed from opening 115 and the assembly 100 may be further disassembled, as desired for repair, replacement and/or upgrade of individual components.

[0046] FIG. 15 shows bezel 119 having a first set 1001 of latch arms 121 and a second set 1003 of latch arms. As discussed above, the first set 1001 of latch arms 121 are configured to engage housing 107, wherein the latch arms 121 may be inserted into opening 115 and engage surface 1201 of housing 107 (see e.g., FIG. 14). In addition, second set 1003 of latch arms 121 are arranged to extend through opening 115 and detachably engage surface 1101 of panel 113 (see e.g., FIG. 13). As discussed above, bezel 119 may include aesthetically desirable features, such as curved or decorative surfaces that are visible when the bezel 119 is engaged to trim the lens portion 111 in addition to securing the assembly 100 onto the panel 113. Further, bezel 119 may include functional features, such as alignment mechanisms, slots or other features that provide alignment, stability and/or improved mechanical properties. For example, vertical ribs may be provided along the latch arms 121 to guide and position the lens portion of the housing for easier assembly.

[0047] FIG. 16 shows an exploded view of a panel mounted light emitting element assembly 100 according to another embodiment of the present disclosure. The assembly 100 includes a mounting board 101 (not visible in FIG. 16) having wires 103 in electrical communication therewith and includes a structure as further described above with respect to FIG. 1. Light emitting element 105 (not visible in FIG. 16) is affixed to mounting board 101 and may include any devices capable of providing illumination, as discussed in greater detail above with respect

to FIG. 1. Housing 107 is configured to receive the mounting board 101 and the light emitting element 105. The housing 107 may be fabricated from any suitable material, including electrically insulative polymeric material, such as acrylonitrile butadiene styrene (ABS) or other similar polymeric materials. The housing 107 further includes a lens portion 111 extending from the body of the housing.

[0048] Panel 113 includes an opening 115, which is disposed therethrough. The panel 113 is any surface, structure or substrate onto which a light emitting assembly 100 may be mounted. Disposed between the housing 107 and a panel 113 is a gasket 117. While the assembly 100 is shown including gasket 117, the gasket may be omitted in certain embodiments of the disclosure. The gasket 117 may be fabricated from foam or other insulative material and provides sealing, shock/vibration resistance and/or protects the housing 107 and panel 113, particularly during installation and disassembly of the assembly 100. Positioning protrusion 1601 is a feature that permits rotational alignment of the housing 107, wherein the assembly is required to take place in a single, corrected direction. The assembly 100 further includes a bezel 119 having a display surface or face plate 120 and a first set 1001 and a second set 1003 of latch arms 121, each of the first set 1001 and second set 1003 having two latch arms 121 extending therefrom. The latch arms 121 are flexible cantilevered latches configured to detachably engage a surface. The latch arms 121 of the first set 1001 are configured to extend through opening 115 and engage a surface of housing 107. The latch arms 121 of the second set 1003 are configured to extend through opening 115 and engage a surface of the panel 113.

[0049] When engaged with housing 107 and the panel 113, the bezel 119 rests against or adjacent to panel 113, wherein the engagement retains the assembly 100 in position with respect to panel 113. In other words, the latch arms 121 engage housing 107 and panel 113, wherein the engagement of the latch arms 121 with housing 107 and panel 113 provides an engagement between bezel 119 and panel 113, wherein the bezel 119 retains the positioning of the assembly 100, including the housing 107 and the light emitting element 105 therein (not shown in FIG. 16) with respect to panel 113. A gasket 1005 is provided to facilitate variations in panel thickness and/or pre-position the bezel.

[0050] FIG. 17 shows the assembly 100 of FIG. 10 with bezel 119 engaged with panel 113. The assembly 100 includes the structure, as shown and described above with respect to FIG. 16. However, in this embodiment, the latch arms 121 of second set 1003 engage a surface 1101 of panel 113. The positioning of the bezel 119 in the engaged position with the panel 113 provides a substantially rigid and stable structure into which the housing 107 may be directed.

[0051] FIG. 18 shows a top perspective view of the assembly 100 of FIGs. 16 and 17 according to an embodiment of the disclosure mounted on a panel 113. As shown in FIG. 17, the bezel 119 is engaged with housing 107 through opening 115 of panel 113 via latch arms 121 of first set 1001. The engagement of bezel 119 with housing 107 maintains the relative positioning of the assembly 100 with respect to the panel 113.

[0052] FIG. 19 shows a cutaway view taken along line 19-19 of FIG. 18. As shown in FIG. 19, the mounting board 101 is engaged with housing 107. The mounting board 101 may be engaged or otherwise attached to housing 107 in any suitable manner known in the art. For example, although FIG. 12 shows a mechanical interlocking arrangement, the mounting board 101 may be affixed to housing 107 by adhesive, latches, or any other method known for engaging PCB structures to housings 107. In addition, the positioning of light emitting element 105 is in sufficient proximity to the lens portion 111 to provide a high efficiency of light distribution into the desired locations. The bezel 119 is detachably engaged with a surface 1101 of panel 113 and surface 1201 of housing 107. Specifically, the latch arms 121 of the first set 1001 elastically deflect outwardly around the housing during installation and lock or latch the housing 107 to provide retention and/or contact with surface 1201. The latch arms 121 of second set 1003 detachably engage surface 1201 of panel 113. Specifically, the latch arms 121 elastically deflect inwardly as the latch arms are directed though opening 115 of panel 113 and lock or latch the panel 113 to provide retention and/or contact with surface 1101.

[0053] FIG. 20 shows a cutaway view taken along line 20-20 of FIG. 18. As shown and described above with respect to FIG. 17, the latch arms 121 of first set 1001 extend through opening 115 of panel 113 and engage surface 1201. In order to disengage bezel 119 from the housing 107, the latch arms 121 may be deflected manually or by force applied by a tool or by other manipulation from surface 1201. Further, the second set 1003 of latch arms 121 may be disengaged in a similar manner from surface 1101. Upon disengagement, bezel 119 may be removed from opening 115 and the assembly 100 may be further disassembled, as desired for repair, replacement and/or upgrade of individual components.

[0054] FIG. 21 shows the elongated housing 107 according to this embodiment of the disclosure. The housing 107 includes a first dimension 2100 that is approximately equal to the diameter of the lens 111. Such reduced diameter permits the positioning and placement of the housing 107 and the assembly 100 into locations having little clearance or having elongated geometries. While not so limited, latches, slots or other features may be utilized to engage mounting board 101.

[0055] FIG. 22 shows bezel 119 having a first set 1001 of latch arms 121 and a second set of latch arms 1003. As discussed above, the first set 1001 of latch arms 121 are configured to engage housing 107, wherein the latch arms 121 may be inserted into opening 115 and engage surface 1201 of housing 107 (see e.g., FIG. 20). In ad-

dition, second set 1003 of latch arms 121 are arranged to extend through opening 115 and detachably engage surface 1101 of panel 113 (see e.g., FIG. 19). As discussed above, bezel 119 may include aesthetically desirable features, such as curved or decorative surfaces that are visible when the bezel 119 is engaged to trim the lens portion 111 in addition to securing the assembly 100 onto the panel 113. Further bezel 119 may include functional features, such as alignment mechanisms, slots or other features that provide alignment, stability and/or improved mechanical properties. In addition, as shown, the latch arm 121 of first set 1001 includes a circular chamfer geometry configured to guide engagement of the lens portion of the housing.

[0056] While the invention has been described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention as defined by the claims. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

Claims

1. A light emitting element assembly (100) for mounting to a panel (113), comprising:

a housing (107) configured to receive a light emitting element (105) therein;
a bezel (119) comprising a first set (1001) of latch arms (121) extending from a surface (120) of the bezel (119), the bezel (119) being configured to retain the assembly (100) in a position relative to the panel (113);
a mounting structure (101) comprising the light emitting element (105) operably mounted on the mounting structure (101); and
wherein the first set (1001) of latch arms (121) include at least one latch arm (121) configured to detachably engage a surface (403, 1201) of the housing (107).

2. The assembly of claim 1, further comprising a gasket (117) disposed between the panel (113) and the housing (107).

3. The assembly of claim 1 or 2, wherein the housing (107) further comprises a lens portion (111) arranged and disposed to distribute light from the light emitting element (105).

4. The assembly of claim 3, wherein the lens portion (111) is angled.

5. The assembly of any preceding claim, wherein the first set (1001) of latch arms (121) is configured to engage the surface (403, 1201) of the housing (107) inwardly.

6. The assembly of any preceding claim, further comprising a second set (1003) of latch arms (121), wherein the second set (1003) is configured to engage a surface (1101) of the panel (113) outwardly.

7. The assembly of claim 6, wherein each of the first set (1001) and second set (1003) comprises two latch arms (121).

8. The assembly of claim 6 or 7, wherein the second set (1003) is configured to detachably engage the surface (1101) of the panel (113) prior to engagement of the first set (1001) with the surface (1201) of the housing (107).

9. The assembly of any preceding claim, wherein the light emitting element (105) is a light emitting diode or an organic light emitting diode.

10. The assembly of any one of claim 1 to 8, wherein the light emitting element is a printed circuit board (101) with a light emitting diode (105) disposed on the printed circuit board (101).

11. The assembly of any preceding claim, wherein the housing (107) further comprises positioning features (1009) corresponding to features (1007) on the panel (113).

12. The assembly of claim 11, wherein the positioning features (1009) are configured to align the housing (107) with one or both of the bezel (119) or the panel (113).

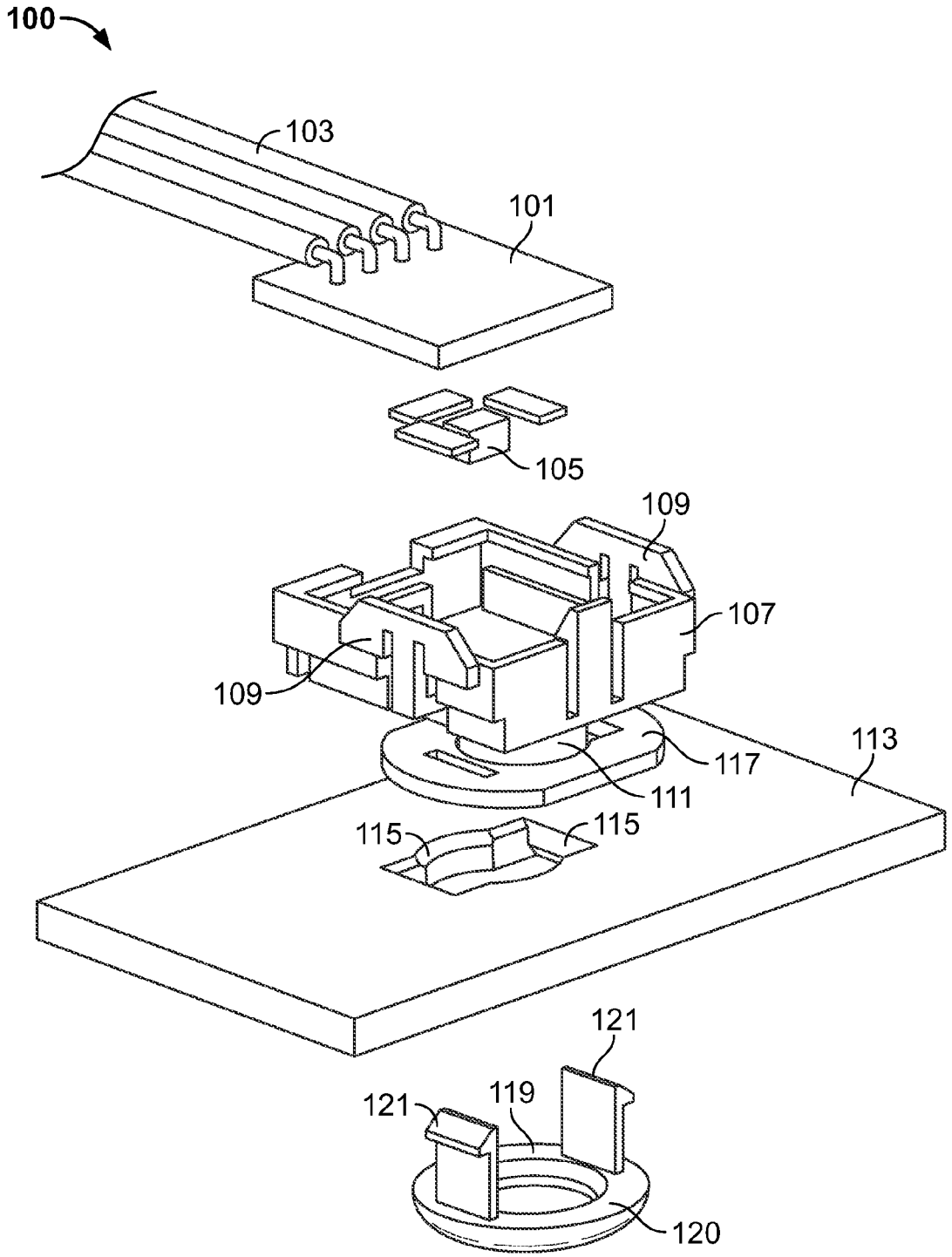


FIG. 1

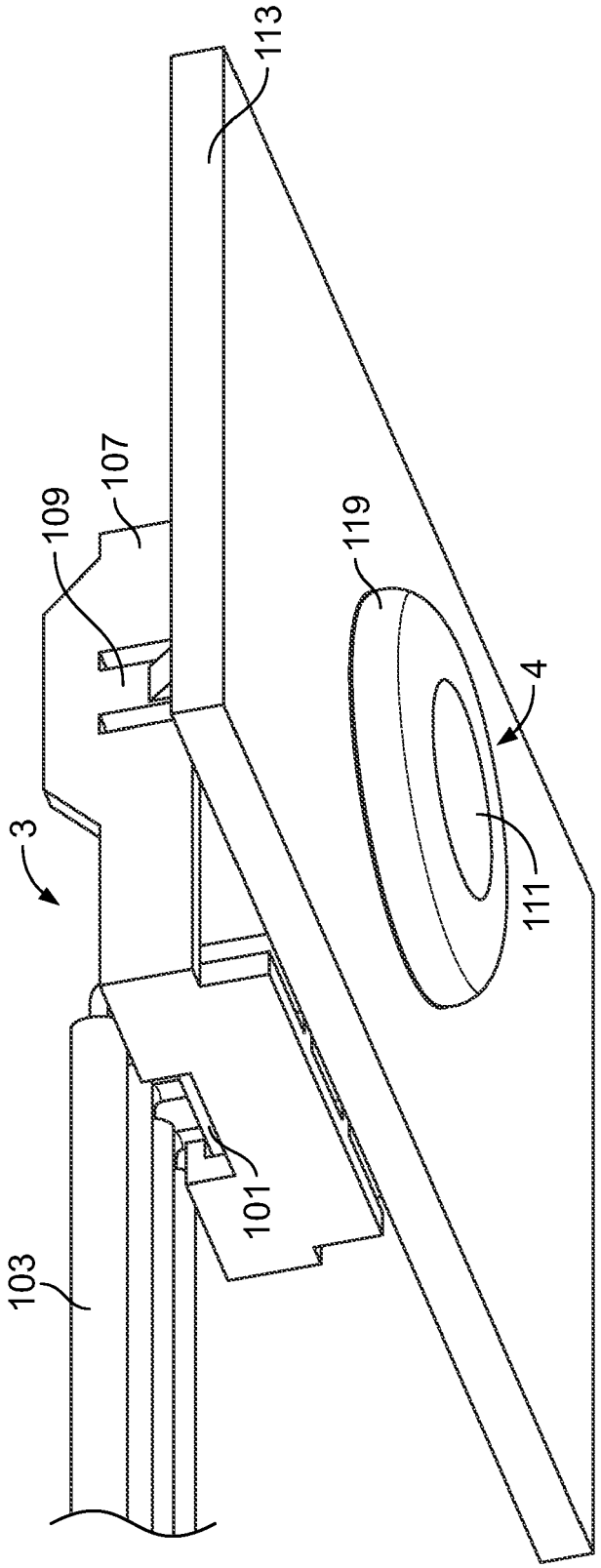
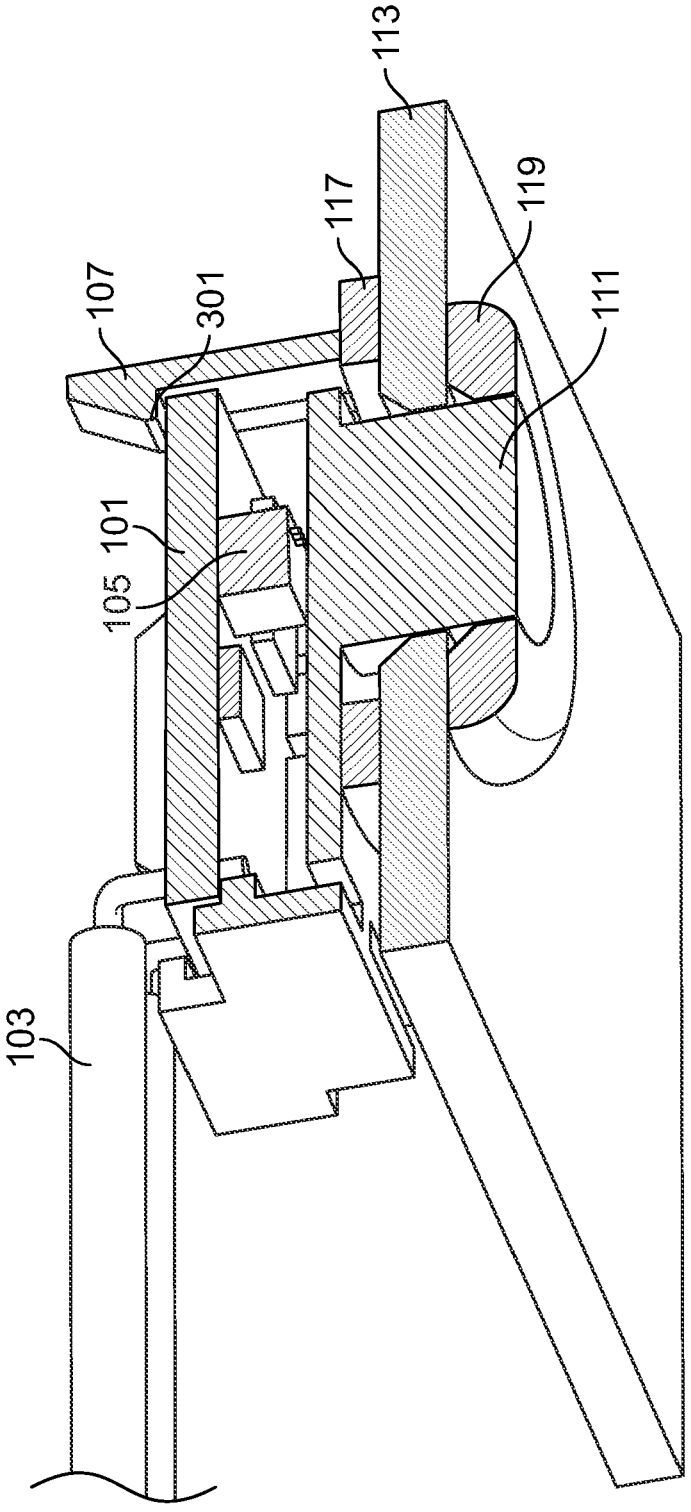


FIG. 2



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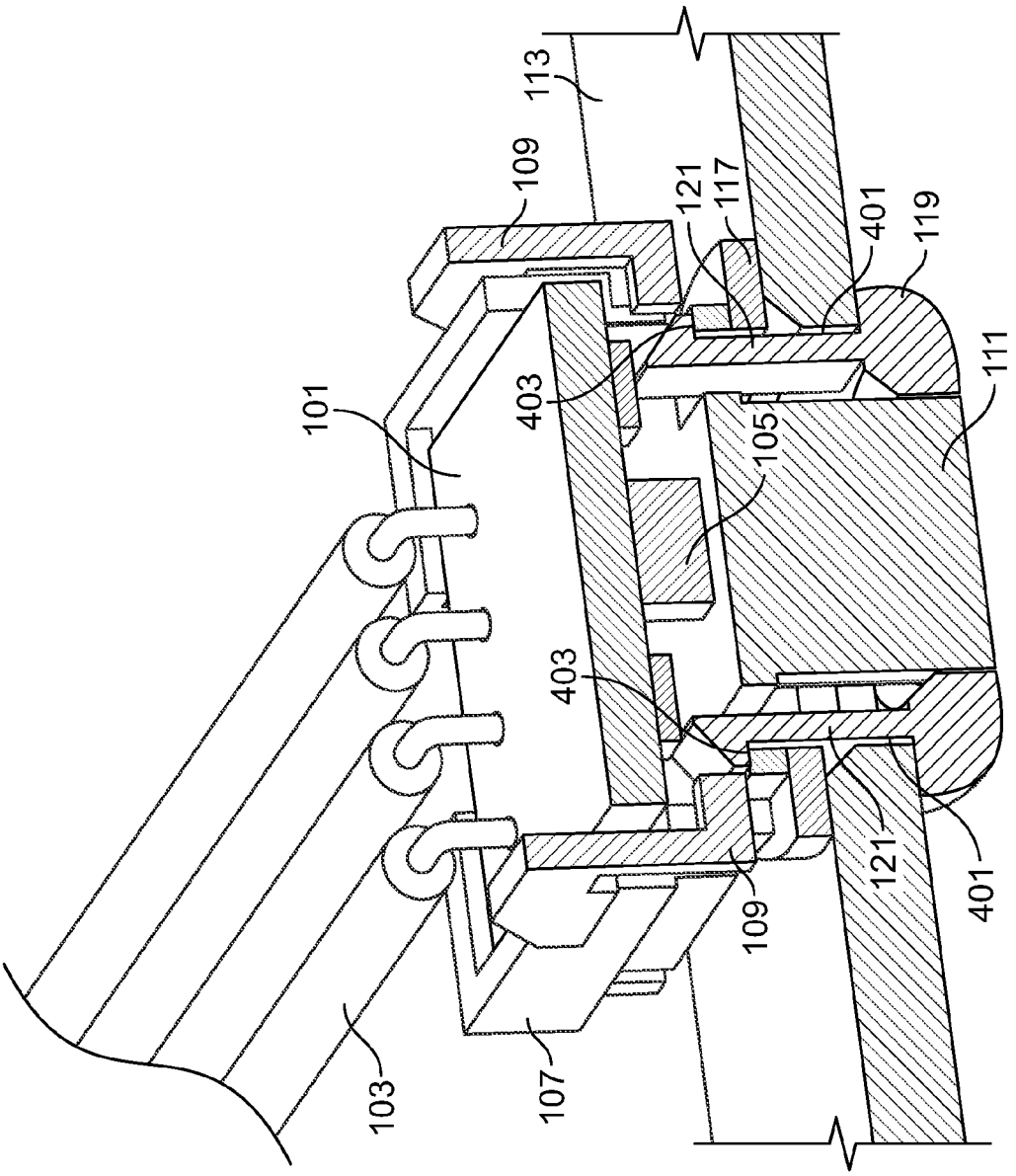

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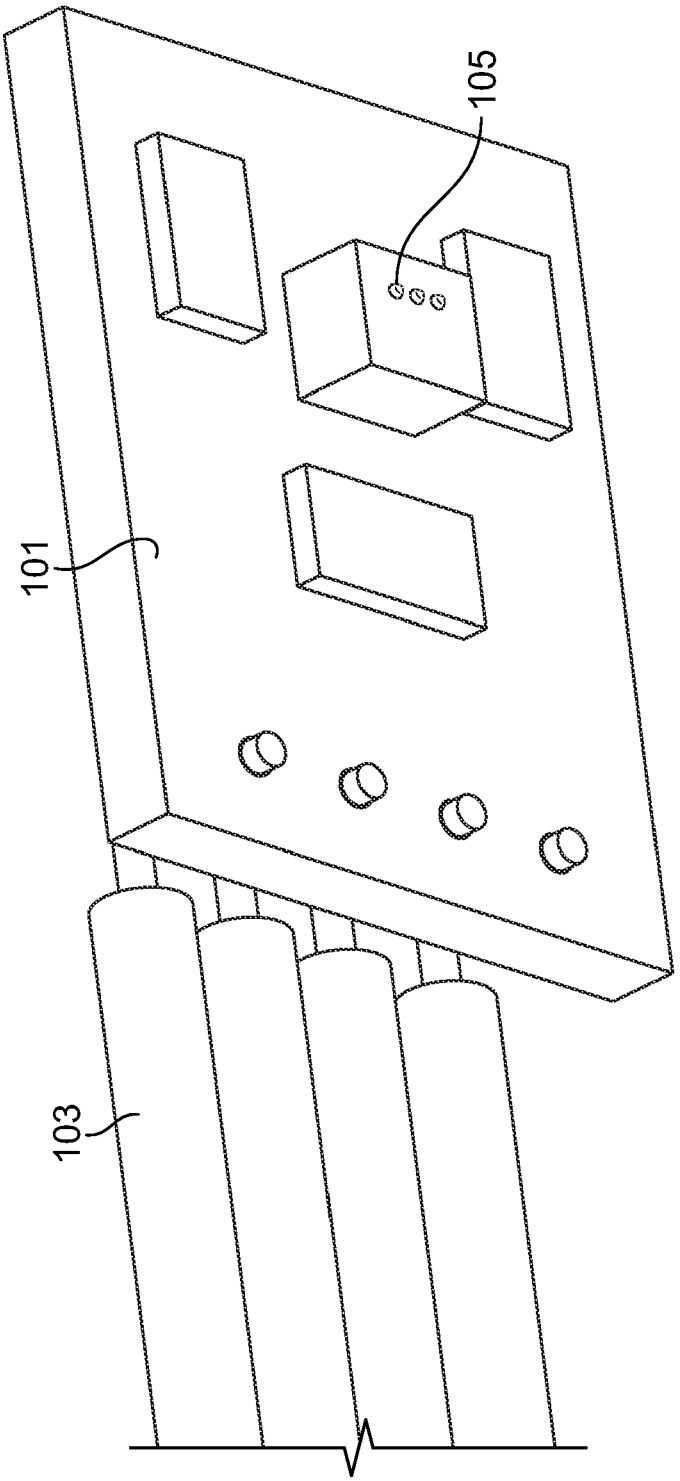
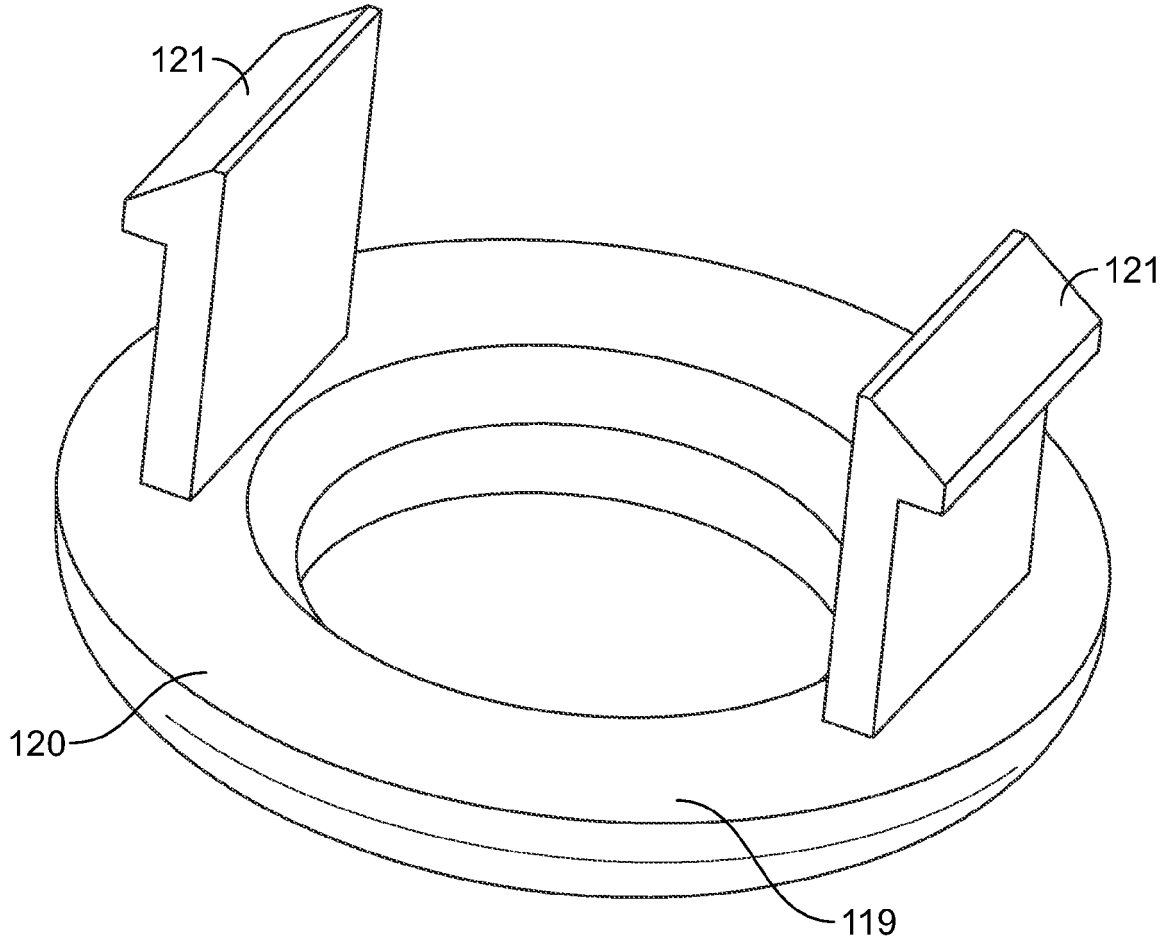


FIG. 5



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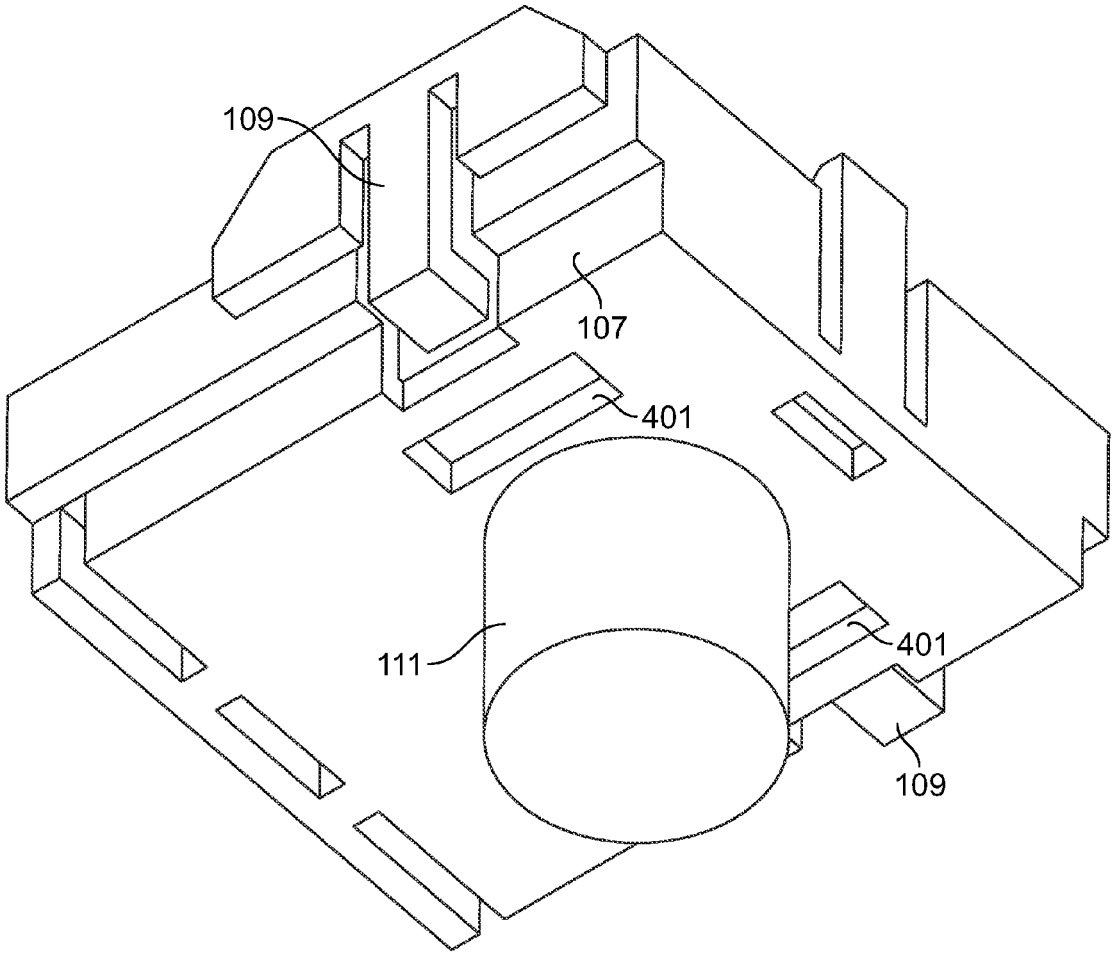

FIG. 7

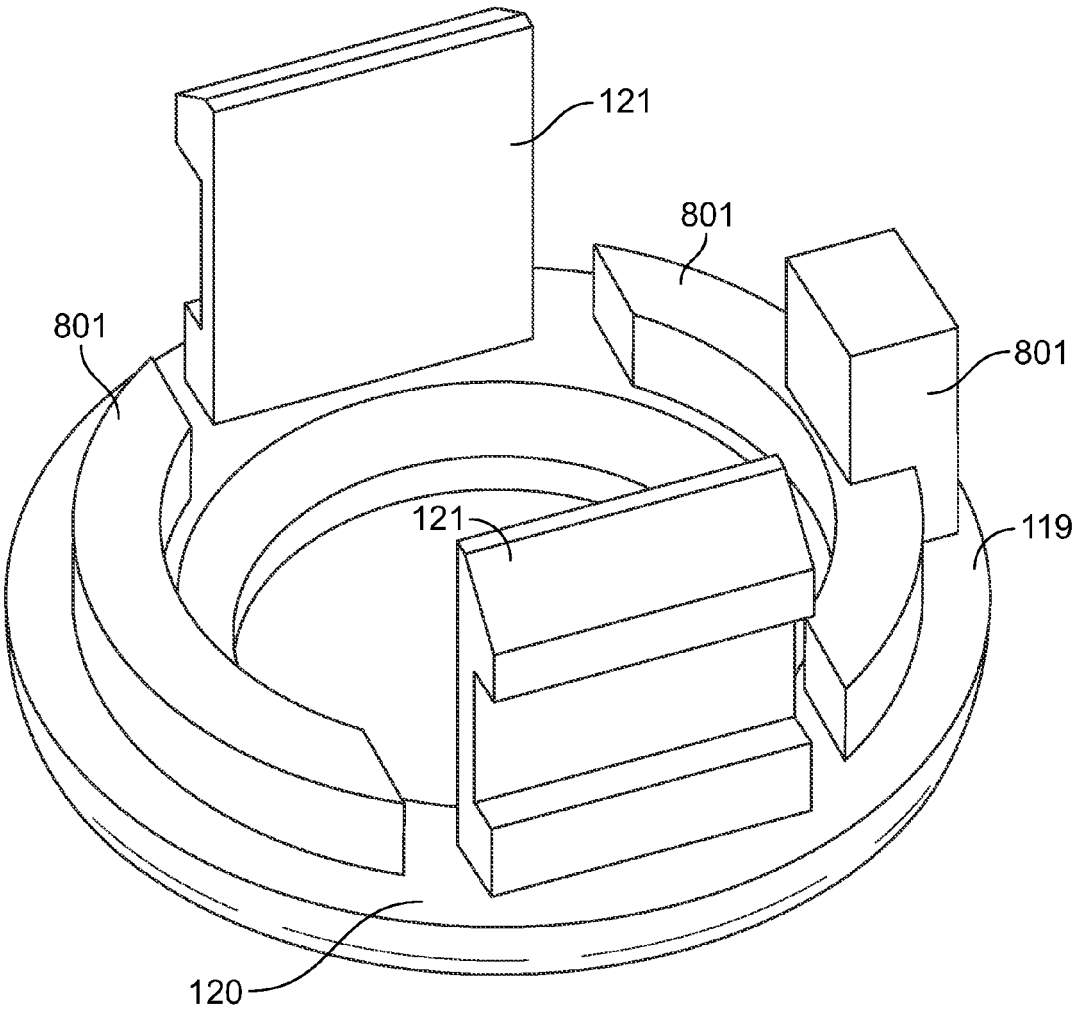

FIG. 8

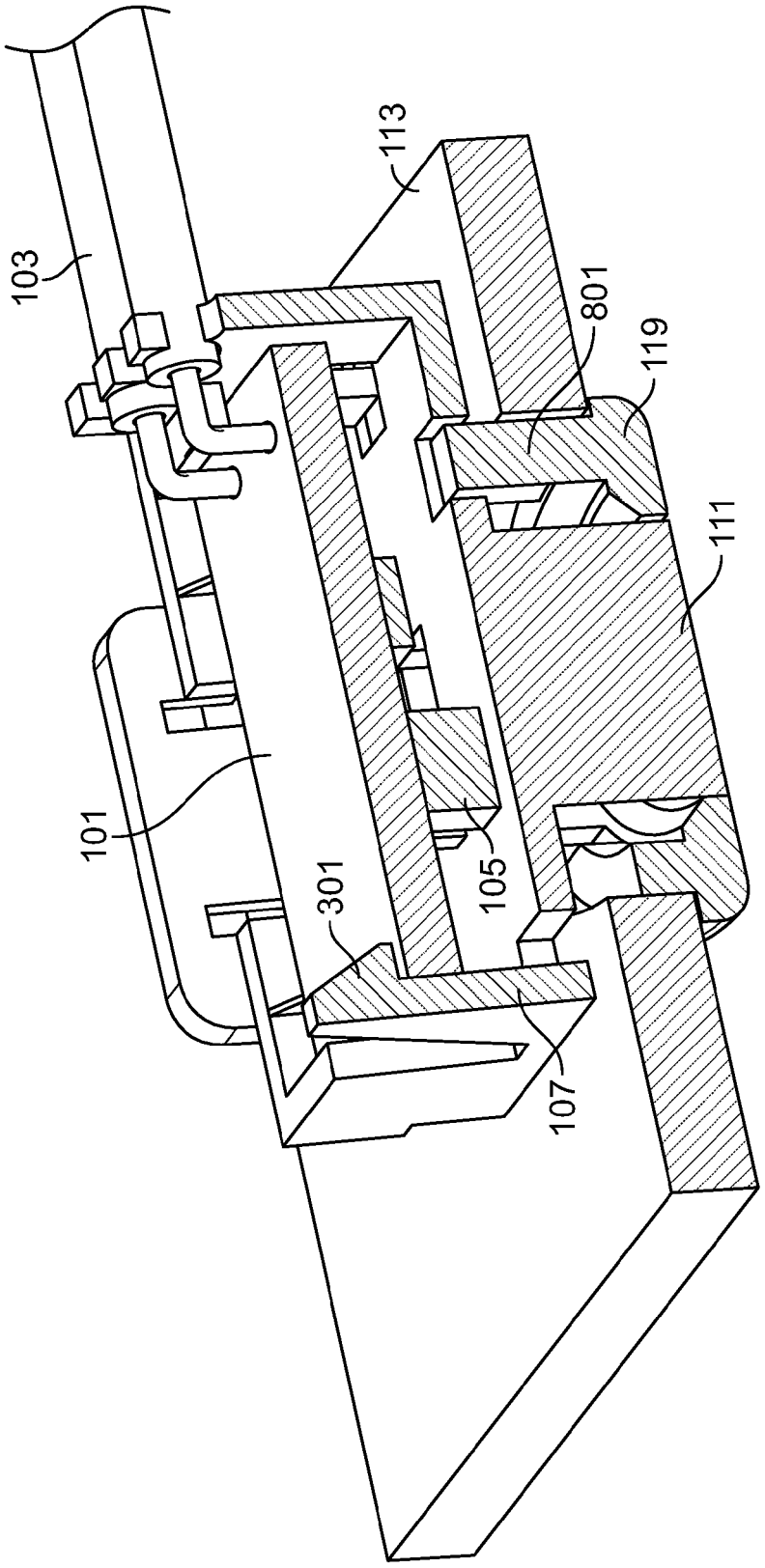

FIG. 9

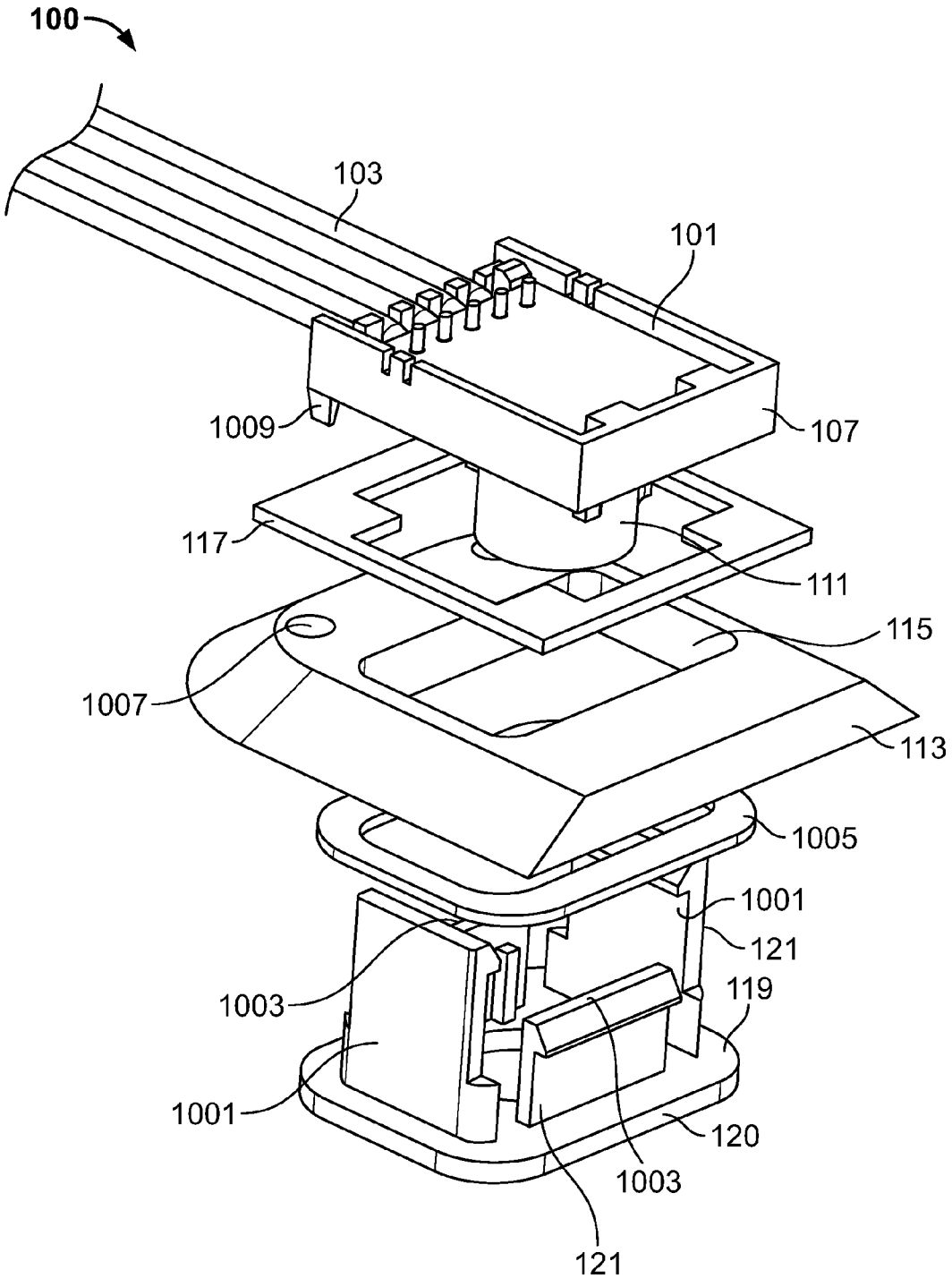
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FIG. 10

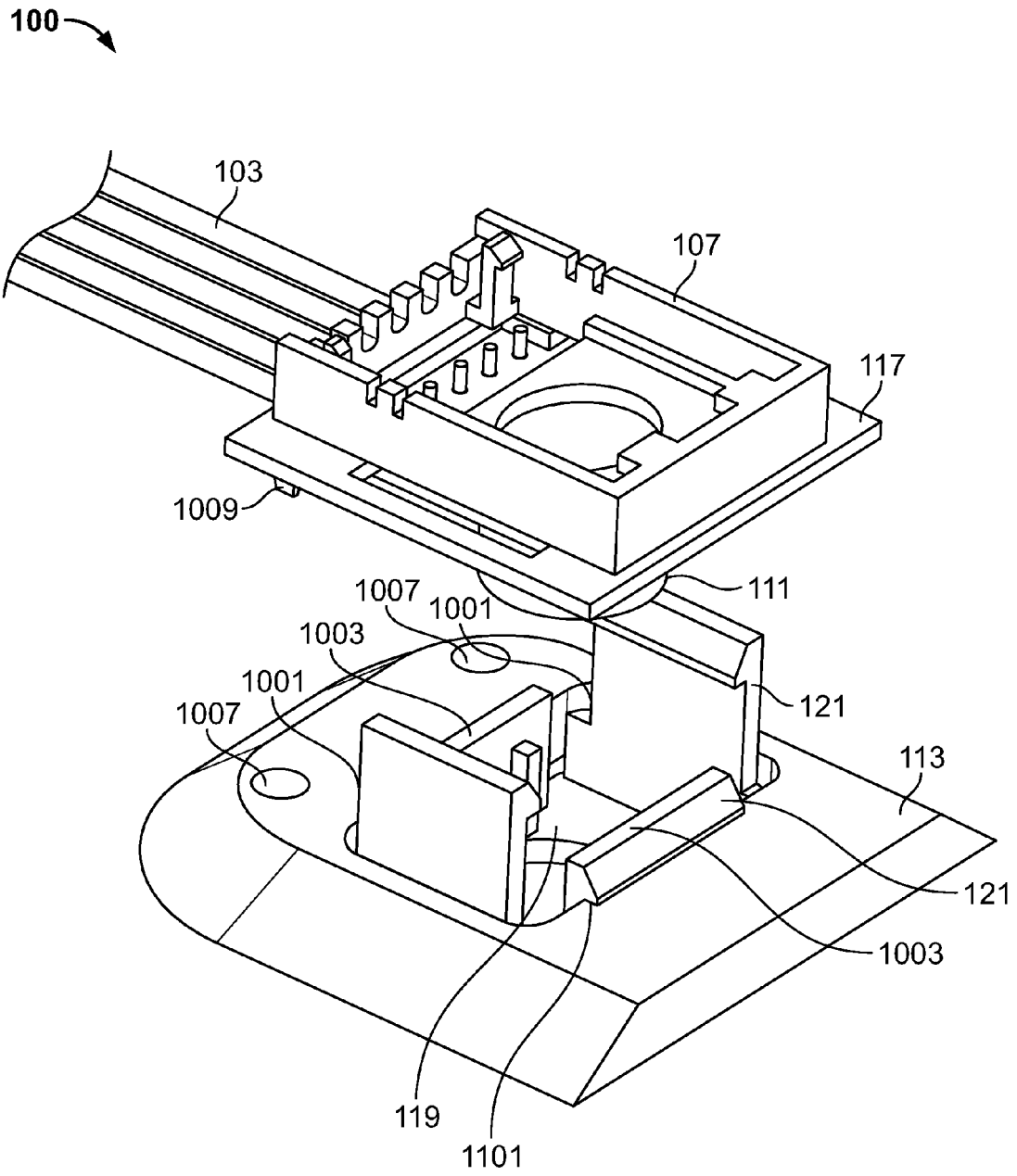
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FIG. 11

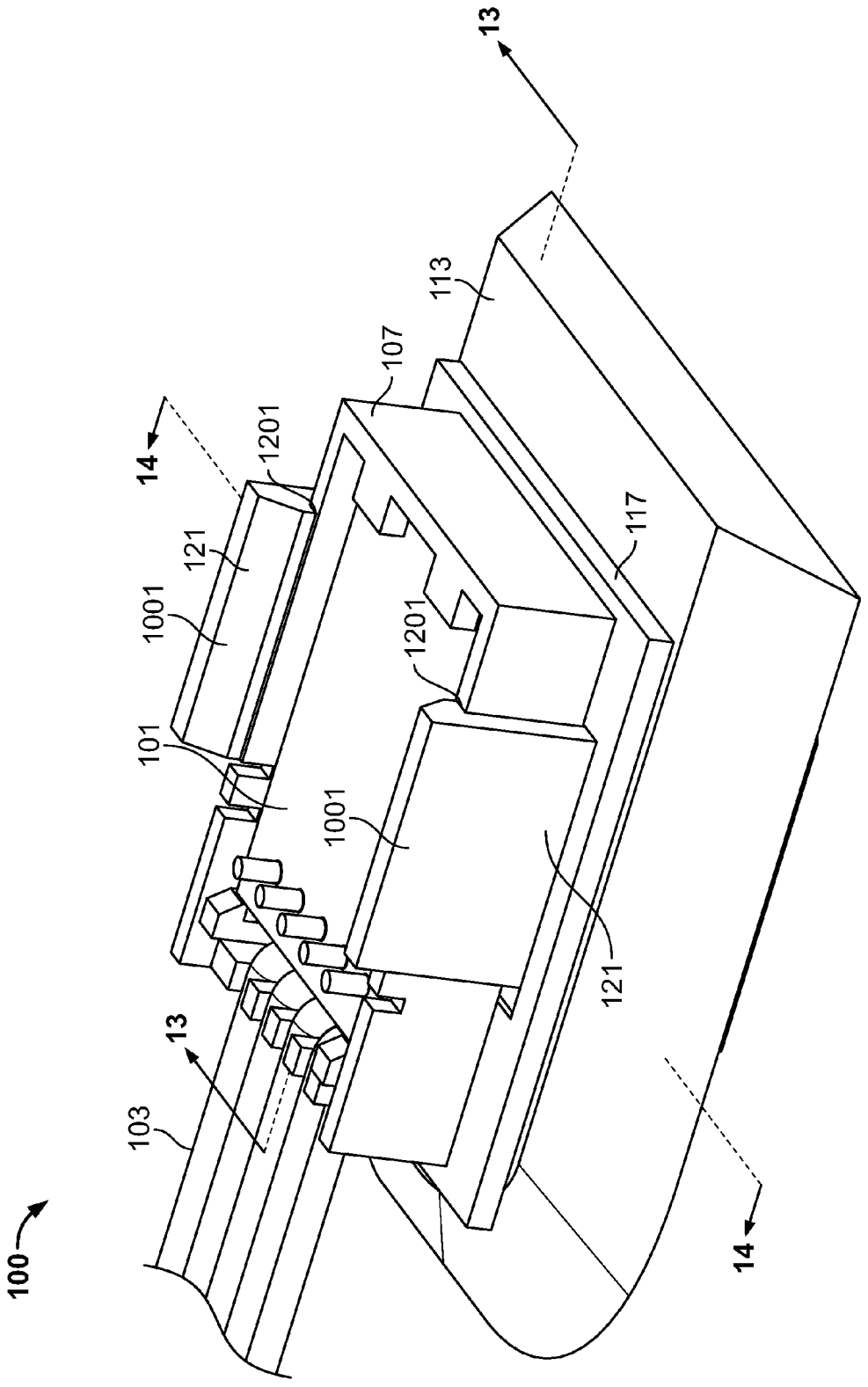

FIG. 12

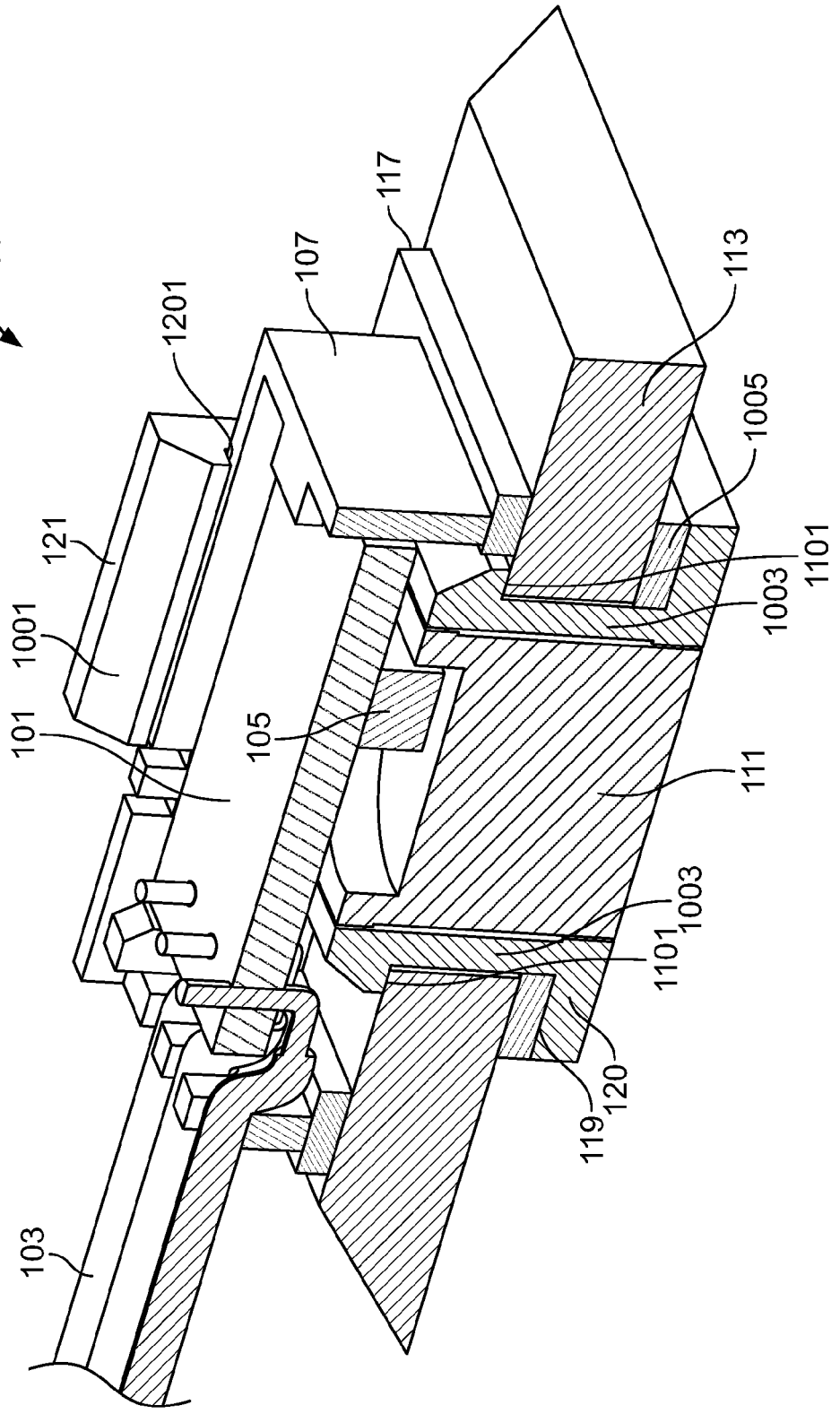
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FIG. 13

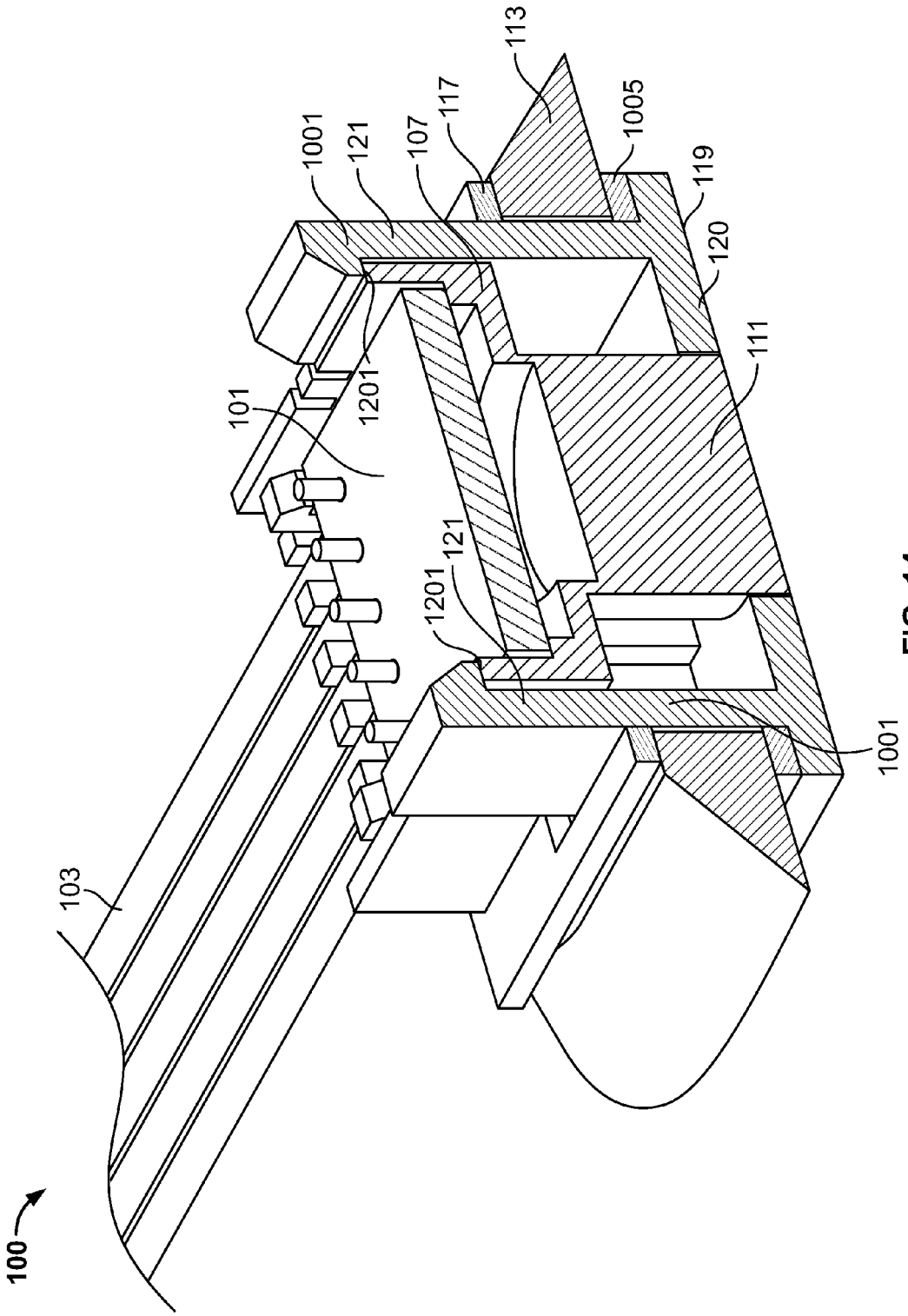
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FIG. 14

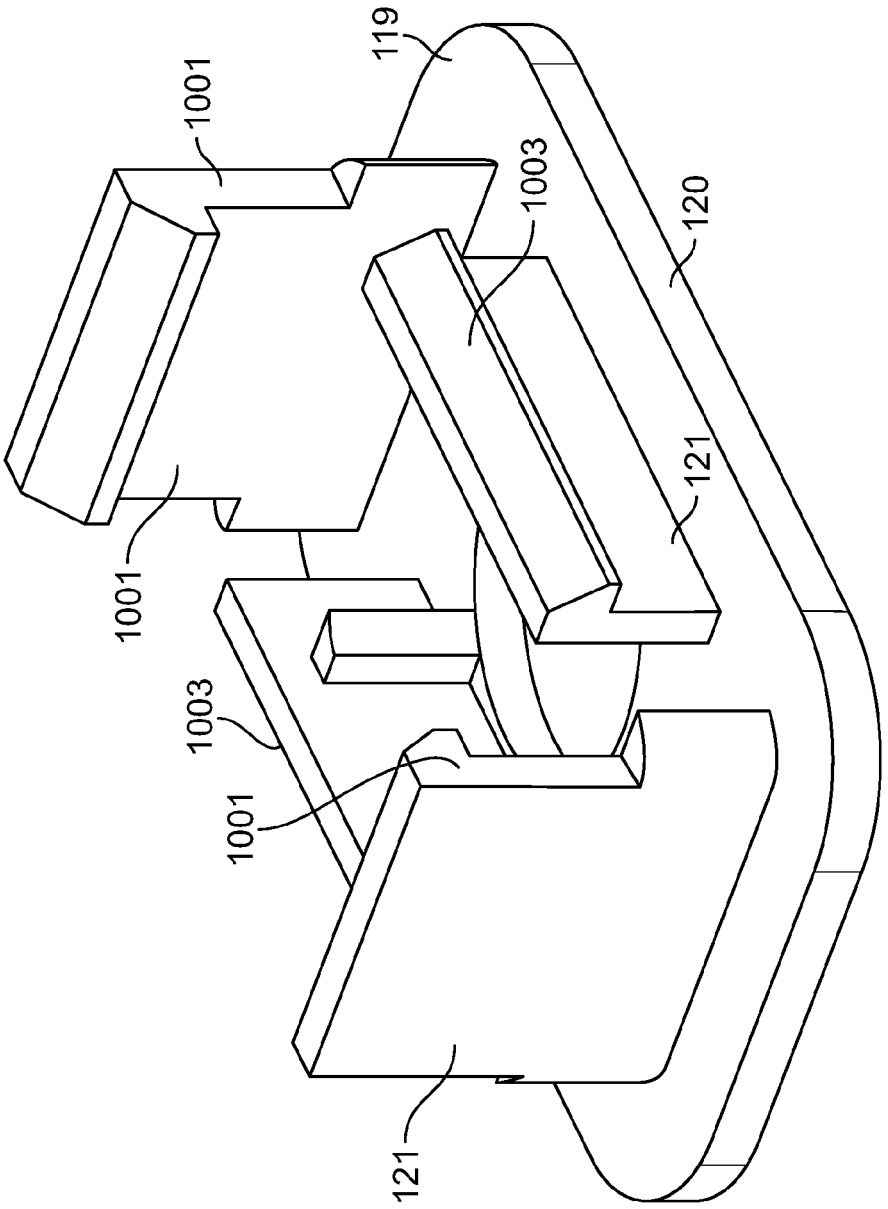

FIG. 15

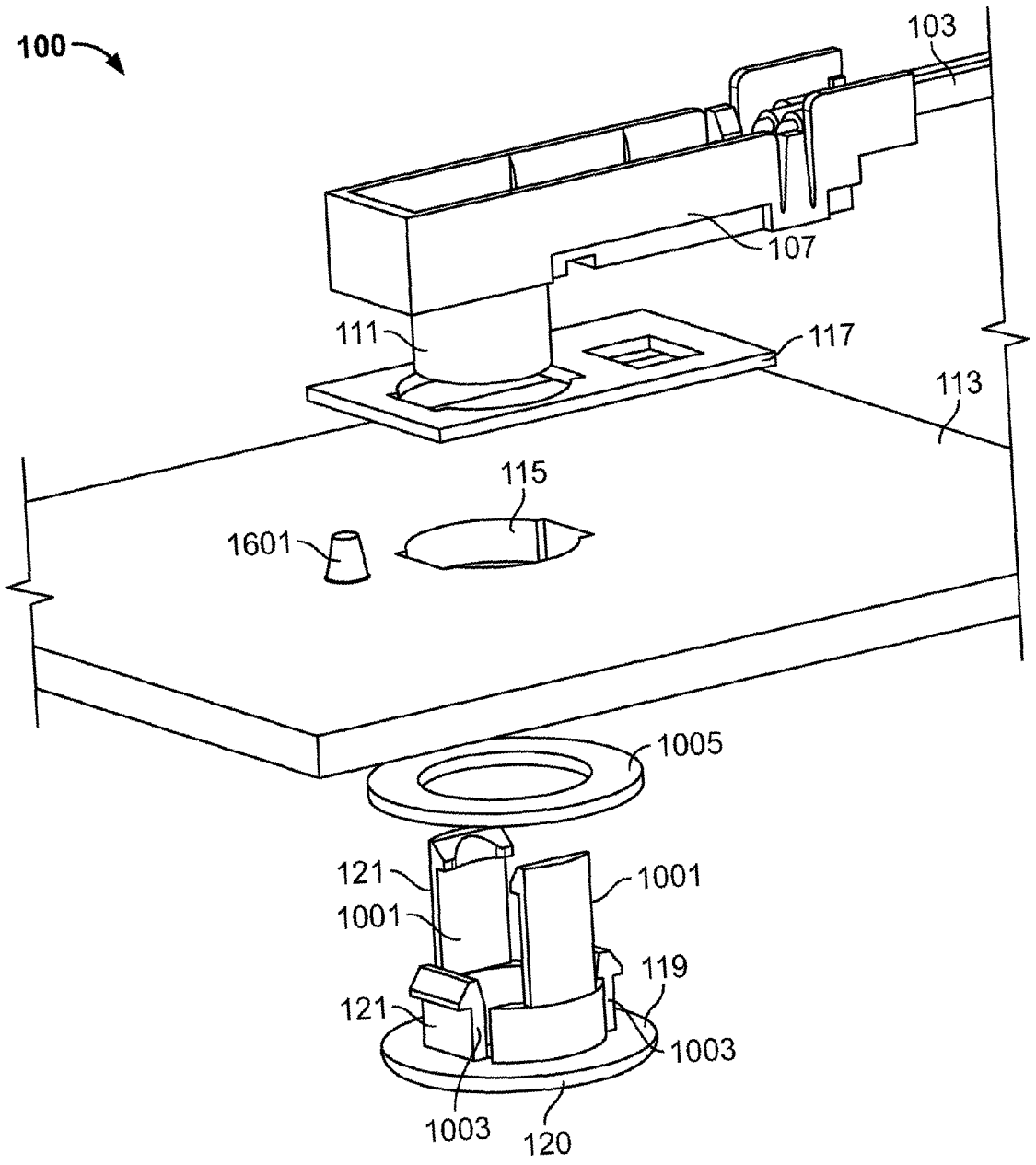
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FIG. 16

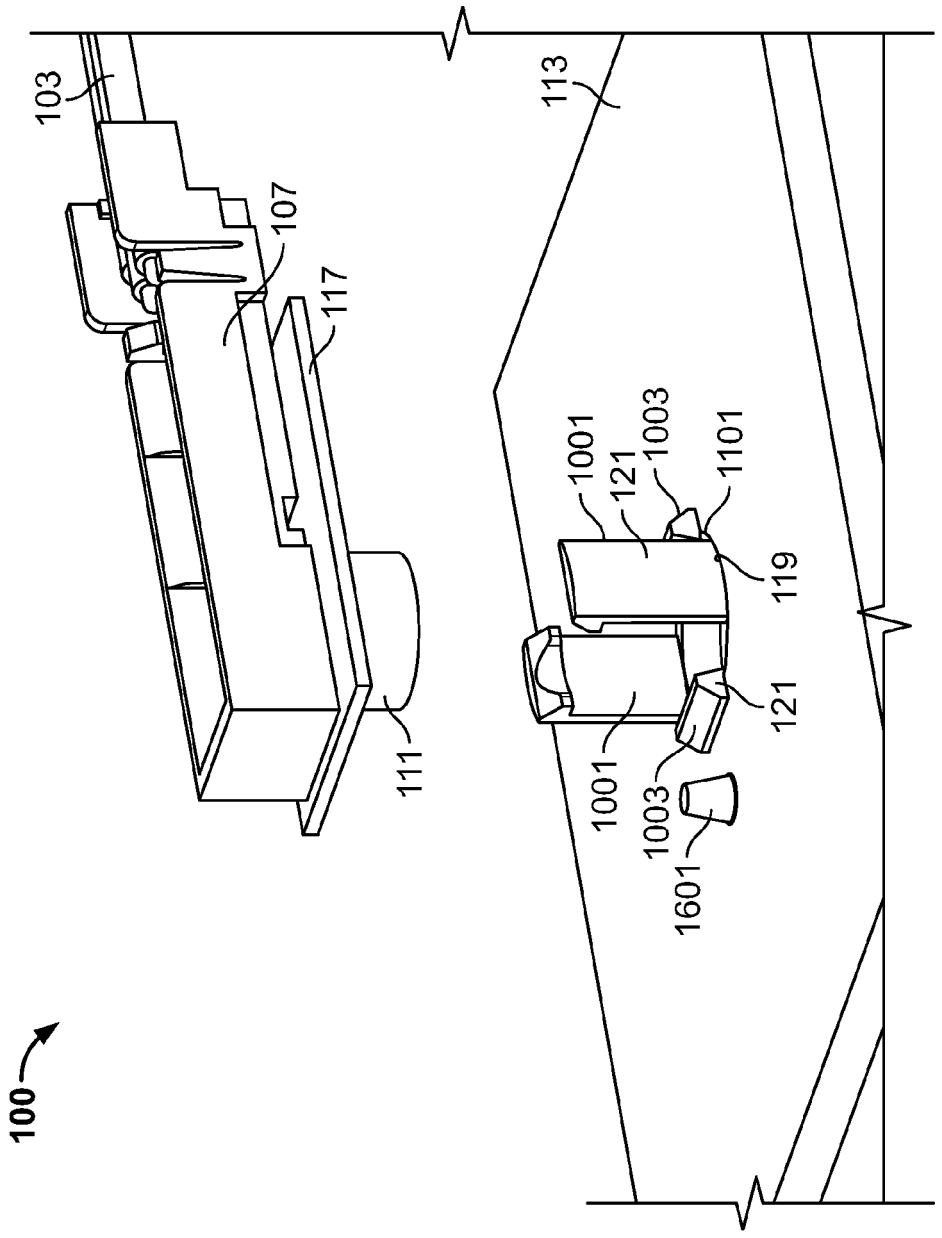
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FIG. 17

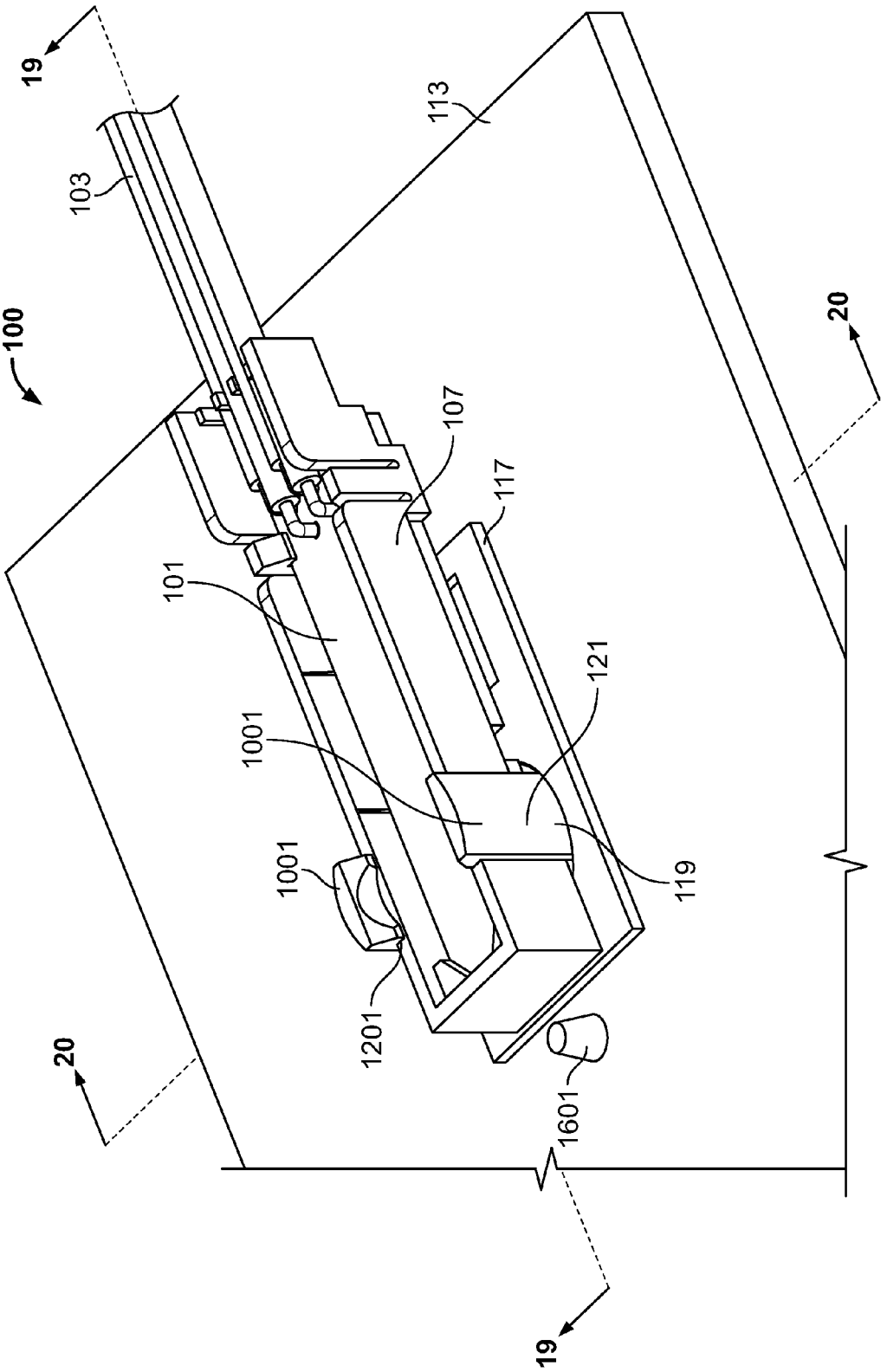

FIG. 18

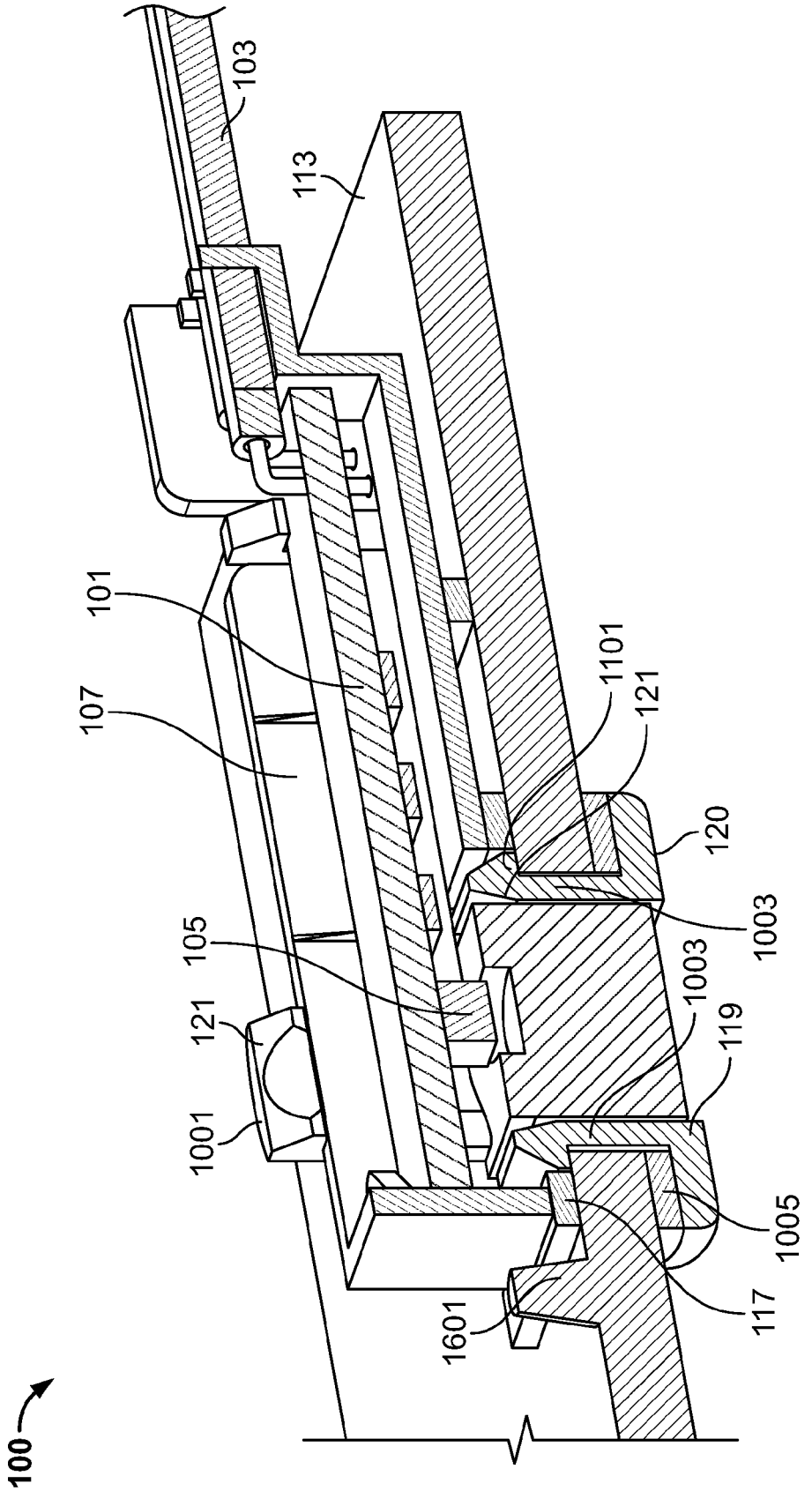
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FIG. 19

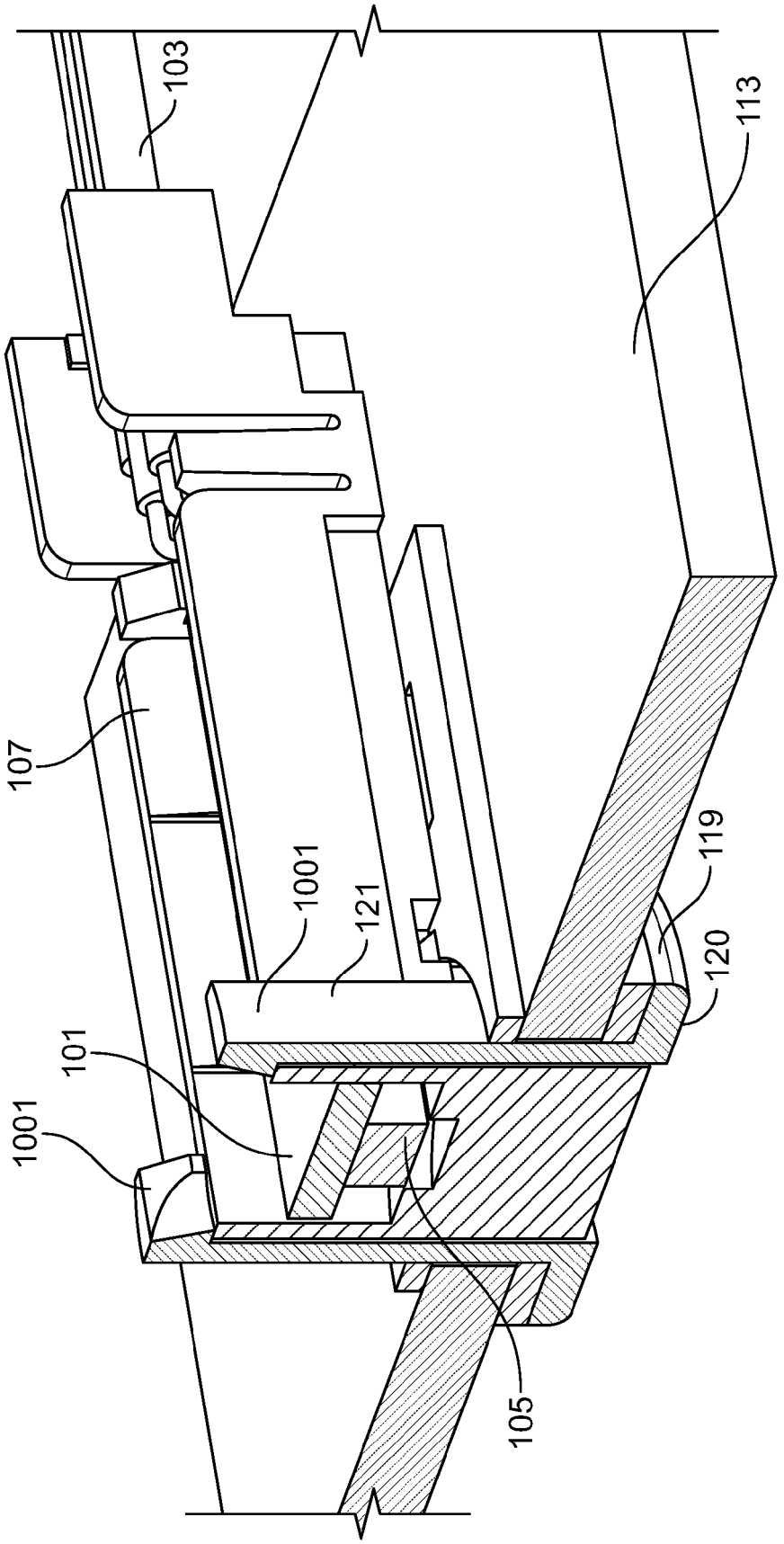

FIG. 20

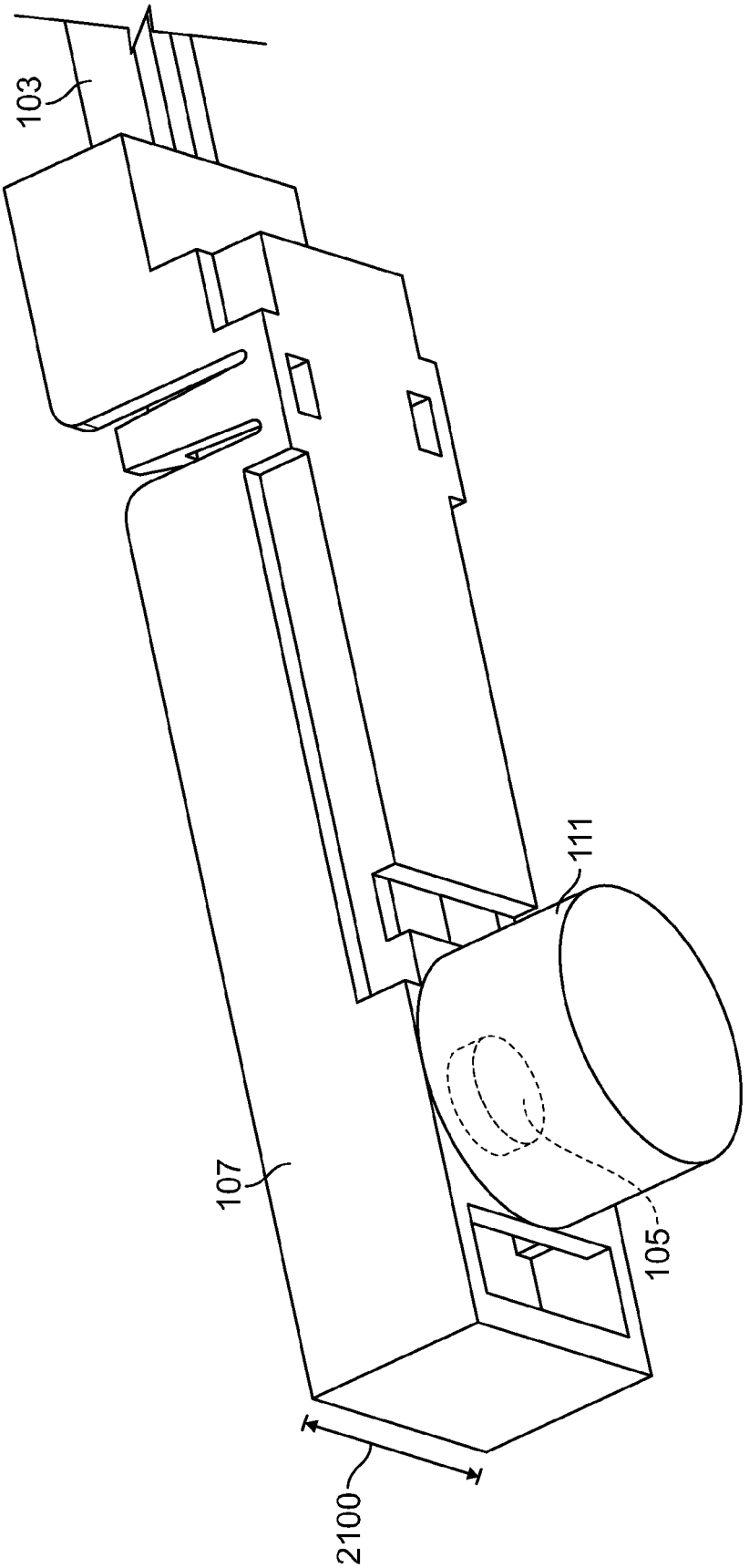

FIG. 21

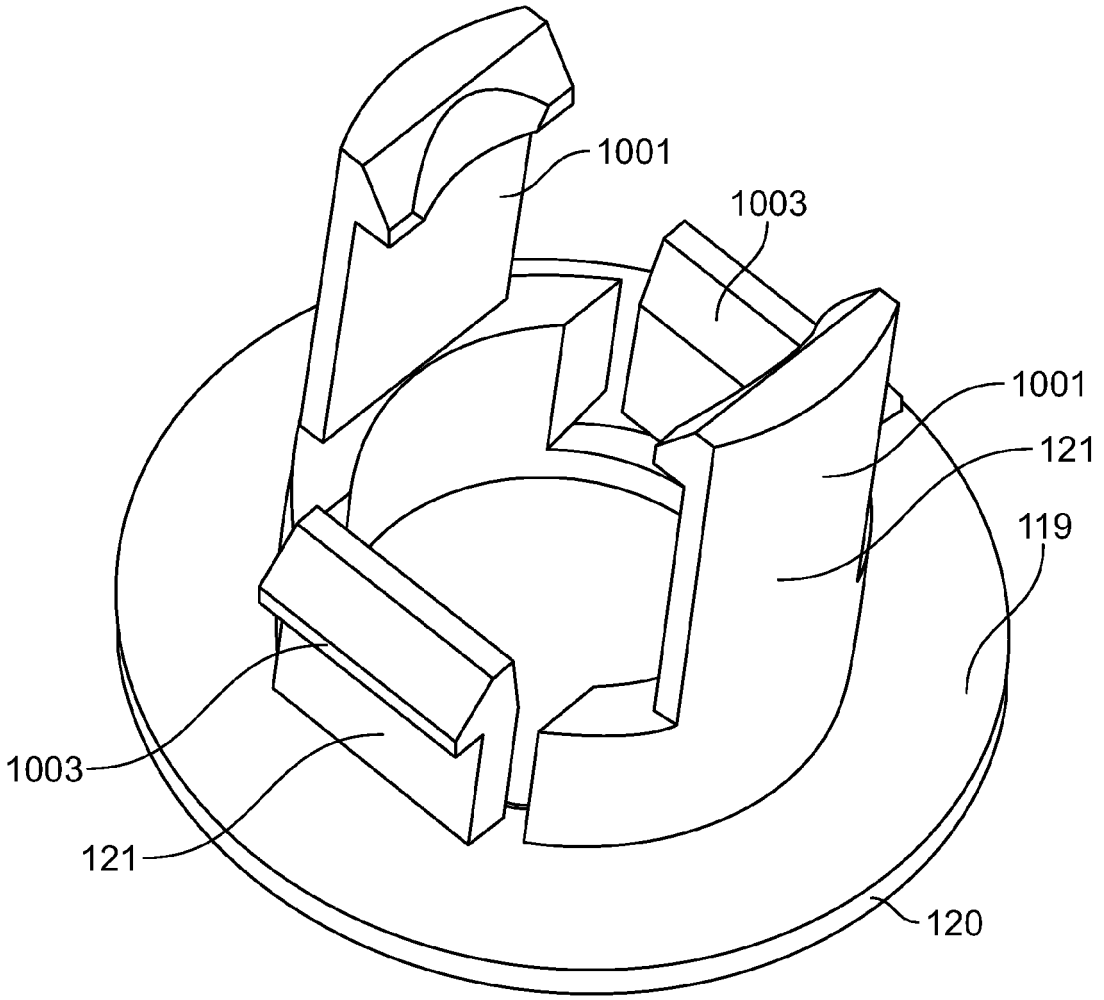

FIG. 22

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 09 15 2622

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	HARDARDT A T ET AL: "Plastic Component Housing" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 5, no. 2, 1 July 1962 (1962-07-01), page 46, XP001363781 ISSN: 0018-8689 * the whole document * -----	1-5,8-12	INV. F21S8/00 F21V17/16
A	US 3 641 481 A (FARRELL GUY M) 8 February 1972 (1972-02-08) * column 3, line 1 - line 25 * * figure 15 * -----	1-3,8-12	

TECHNICAL FIELDS SEARCHED (IPC)

F21S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 March 2009	Amerongen, Wim

CATEGORY OF CITED DOCUMENTS

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L : document cited for other reasons

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25-03-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3641481 A	08-02-1972	NONE	

EPO FORM P0459

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