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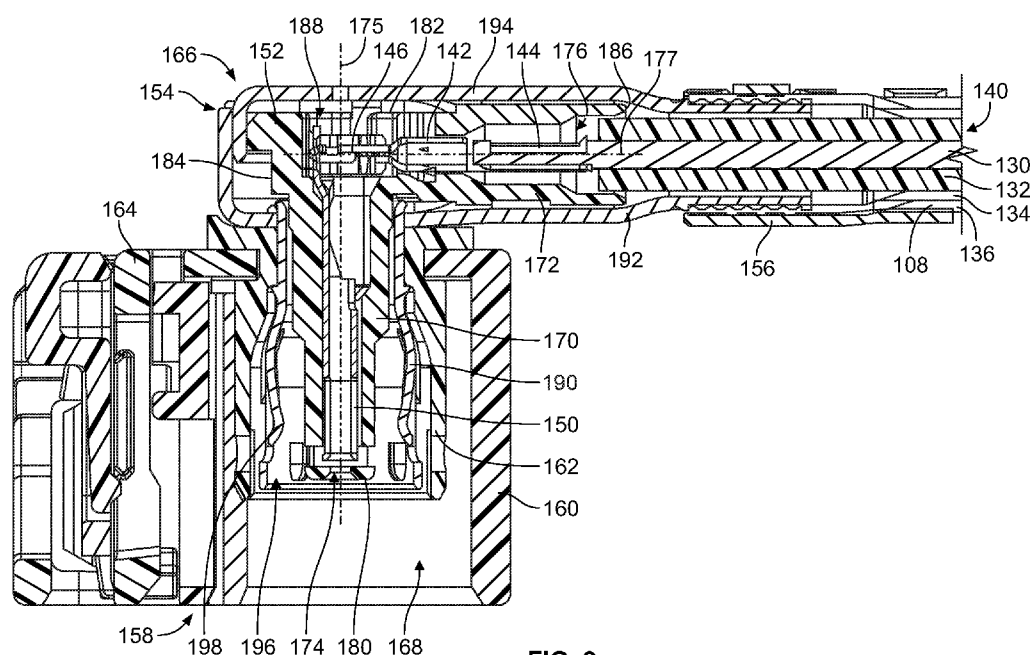


FIG. 2

(57) Abstract: A coaxial connector assembly includes a housing (158) holding an outer contact (154) and a dielectric holder (152) received in the outer contact. The dielectric holder has a mating segment (170) having a front cavity (174) and a cable segment (172) having a cable cavity (176) receiving a cable assembly (140). The cable assembly has a pin contact (142). A center contact (150) is received in the front cavity of the dielectric holder. The center contact has a base positioned in the dielectric holder generally at an intersection of the front cavity and the cable cavity. The center contact has deflatable pin beams extending from the base. The pin beams have flared lead-in tips at distal ends of the beams. The base and the pin beams are axially aligned with the cable axis to receive the pin contact.



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COAXIAL CONNECTOR ASSEMBLY

[0001] The subject matter herein relates generally to coaxial connector assemblies. Radio frequency (RF) coaxial connector assemblies have been used for numerous applications including military applications and automotive applications, such as global positioning systems (GPS), antennas, radios, mobile phones, multimedia devices, and the like. The connector assemblies are typically coaxial cable connectors that are provided at the end of coaxial cables.

[0002] In order to standardize various types of connector assemblies, particularly the interfaces for such connector assemblies, certain industry standards have been established. One of these standards is referred to as FAKRA. FAKRA is the Automotive Standards Committee in the German Institute for Standardization, representing international standardization interests in the automotive field. The FAKRA standard provides a system, based on keying and color coding, for proper connector attachment. Like jack keys can only be connected to like plug keyways in FAKRA connectors. Secure positioning and locking of connector housings is facilitated by way of a FAKRA defined catch on the jack housing and a cooperating latch on the plug housing.

[0003] The connector assemblies include a center contact and an outer contact that provides shielding for the center contact. The center contact is typically a socket that receives a pin contact. Conventional connector assemblies are typically linear or in-line with the cable extending parallel to the mating axis. However, some applications require one or both of the connector assemblies to be right-angle connectors having the cable 90° to the mating axis. Assembly of such right-angle coaxial connector assemblies is difficult. The right-angle coaxial connector assemblies typically include multiple contacts that are mated within the assembly. Reliable mating of the contacts is difficult due to tolerances and overstress. An unreliable electrical connection may occur in such situation. The contacts are susceptible to stubbing and damage.

[0004] A need remains for a coaxial connector assembly that may be manufactured in a cost effective and reliable manner.

[0005] The solution is provided by a coaxial connector assembly as disclosed herein including a housing holding an outer contact and a dielectric holder received in the outer contact. The dielectric holder has a mating segment and a cable segment orthogonal to the mating segment. The mating segment has a front cavity extending along a mating axis and the cable segment has a cable cavity extending along a cable axis. A cable assembly is received in the cable cavity of the dielectric holder. The cable assembly has a pin contact configured to be terminated to an end of a center conductor of a cable and a tip. A center contact is received in the front cavity of the dielectric holder. The center contact has a base and a mating portion extending forward of the base. The base is positioned in the dielectric holder generally at an intersection of the front cavity and the cable cavity. The center contact has deflectable pin beams extending from the base configured to deflect outward when mated with the pin contact. The pin beams have flared lead-in tips at distal ends of the beams. The base and the pin beams are axially aligned with the cable axis to receive the pin contact.

[0006] The invention will now be described by way of example with reference to the accompanying drawings in which:

[0007] Figure 1 illustrates a connector system having a coaxial connector assembly formed in accordance with an exemplary embodiment.

[0008] Figure 2 is a cross-sectional view of the coaxial connector assembly.

[0009] Figure 3 is a bottom perspective view of a center contact of the coaxial connector assembly in accordance with an exemplary embodiment.

[0010] Figure 4 illustrates a pin contact of the coaxial connector assembly mated with the center contact.

[0011] Figure 5 is a rear perspective view of a portion of a dielectric holder of the coaxial connector assembly formed in accordance with an exemplary embodiment.

[0012] Figure 6 is a rear perspective view of a portion of the dielectric holder.

[0013] Figure 1 illustrates a connector system 100 formed in accordance with an exemplary embodiment. The connector system 100 includes a first coaxial connector assembly 102 and a second coaxial connector assembly 104. In the illustrated embodiment, the first coaxial connector assembly 102 constitutes a jack assembly and may be referred to as a jack assembly 102. The second coaxial connector assembly 104 constitutes a plug assembly and may be referred to as a plug assembly 104. The jack assembly 102 and the plug assembly 104 are configured to be connected together to transmit electrical signals therebetween. The jack assembly 102 is terminated to a cable 106. The plug assembly 104 is terminated to a cable 108. In an exemplary embodiment, the cables 106, 108 are coaxial cables. Signals transmitted along the cables 106, 108 are transferred through the jack assembly 102 and plug assembly 104 when connected. The coaxial connector assemblies 102 and/or 104 may be terminated to a circuit board rather than a cable in alternative embodiments.

[0014] The jack assembly 102 has a mating end 110 and a terminating end or cable end 112. The jack assembly 102 is terminated to the cable 106 at the cable end 112. In an exemplary embodiment, the jack assembly 102 has a center contact, such as a pin contact that is configured for mating with a center contact of the plug assembly 104. The plug assembly 104 has a mating end 114 and a terminating end or a cable end 116. The plug assembly 104 is terminated to the cable 108 at the cable end 116. In an exemplary embodiment, the plug assembly 104 is a right angle assembly having the mating end 114 orthogonal to the cable end 116. The cable 108 extends perpendicular to the mating axis of the plug assembly 104. During mating, the mating end 110 of the jack assembly 102 is plugged into the mating end

114 of the plug assembly 104. Optionally, the jack assembly 102 may be a right angle assembly similar to the plug assembly 104.

[0015] In the illustrated embodiment, the jack assembly 102 and the plug assembly 104 constitute FAKRA connectors, which are RF connectors that have an interface that complies with the standard for a uniform connector system established by the FAKRA automobile expert group. The FAKRA connectors have a standardized keying system and locking system that fulfill the high functional and safety requirements of automotive applications. The FAKRA connectors are based on a subminiature version B connector (SMB connector) that feature snap-on coupling and are designed to operate at either 50 Ohm or 75 Ohm impedances. The connector system 100 may utilize other types of connectors other than the FAKRA connectors described herein.

[0016] The jack assembly 102 has one or more keying features 118 and the plug assembly 104 has corresponding keying features. In the illustrated embodiment, the keying features 118 are ribs and the keying features are channels that receive the ribs. Any number of keying features may be provided, and the keying features may be part of the standardized design of the FAKRA connector.

[0017] The jack assembly 102 has a latching feature 122 and the plug assembly 104 has a latching feature 124. The latching feature 122 is defined by a catch and the latching feature 124 is defined by a latch that engages the catch to hold the jack assembly 102 and the plug assembly 104 mated together.

[0018] Figure 2 is a cross-sectional view of the plug assembly 104 and the cable 108. The cable 108 is a coaxial cable having a center conductor 130 surrounded by a dielectric 132. A cable braid 134 surrounds the dielectric 132. The cable braid 134 provides shielding for the center conductor 130 along the length of the cable 108. A cable jacket 136 surrounds the cable braid 134. The cable 108 is part of a cable assembly 140. The cable assembly 140 also includes a pin contact 142. The pin contact 142 includes a cable barrel 144 configured to be terminated to the cable 108. For example, the cable barrel 144 may be crimped or soldered to the cable 108,

such as to the center conductor 130. The pin contact 142 extends to a tip 146 opposite the cable barrel 144.

[0019] The plug assembly 104 includes a center contact 150, a dielectric holder 152, an outer contact 154, an outer ferrule 156, and an outer housing 158. The center contact 150, dielectric holder 152, and outer contact 154 are configured to be received in and/or supported by the outer housing 158. The outer housing 158 is configured to be mated with the jack connector 102 (shown in Figure 1). In the illustrated embodiment, the center contact 150 constitutes a socket contact configured to be mated with the pin contact of the jack connector 102; however other types of contacts are possible in alternative embodiments. The center contact 150 is configured to be electrically connected to the pin contact 142 to electrically connect the center contact 150 to the cable 108. For example, the pin contact 142 may be plugged in to the center contact 150.

[0020] The dielectric holder 152 receives and holds the center contact 150 and the pin contact 142. The outer contact 154 receives the dielectric holder 152 therein. The outer contact 154 surrounds the dielectric holder 152 to provide electrical shielding for at least a portion of the center contact 150, at least a portion of the pin contact 142 and/or at least a portion of the cable 108. The outer contact 154 provides shielding from electromagnetic or radio frequency interference. The dielectric holder 152 electrically isolates the center contact 150 from the outer contact 154. The outer contact 154 is configured to be electrically connected to the cable braid 134. The outer contact 154 may be a multi-piece contact formed from multiple pieces being assembled together.

[0021] The outer ferrule 156 is configured to be crimped to the cable 108 and/or the outer contact 154. The outer ferrule 156 provides strain relief for the cable 108. In an exemplary embodiment, the outer ferrule 156 is configured to be crimped to the cable braid 134 and the cable jacket 136.

[0022] The outer housing 158 surrounds at least a portion of the outer contact 154 and is axially secured with respect to the outer contact 154 to hold

the outer contact 154 therein. In an exemplary embodiment, the outer housing 158 is a multi-piece housing having a front housing 160 and an insert 162. The insert 162 is received within the front housing 160 and is held therein by a lock 164. The insert 162 is used to hold the position of the outer contact 154 within the outer housing 158. In an exemplary embodiment, the insert 162 is a plastic molded part. Alternatively, the insert 162 may be a die-cast part or may be formed as part of the outer contact 154.

[0023] The center contact 150, dielectric holder 152, outer contact 154, and insert 162 define a plug subassembly 166 that is configured to be loaded into the front housing 160 as a unit. Other components may also be part of the plug subassembly 166. The front housing 160 includes a cavity 168 that receives the plug subassembly 166. The lock 164 holds plug subassembly 166 in the cavity 168. Optionally, at least a portion of the plug subassembly 166 may extend from the outer housing 158, such as rearward from the outer housing 158. In the illustrated embodiment, the outer housing 158 surrounds the front of the plug subassembly 166 for mating with the jack assembly 102.

[0024] The dielectric holder 152 has a mating segment 170 and a cable segment 172 extending from the mating segment 170. In the illustrated embodiment, the cable segment 172 is perpendicular to the mating segment 170. The mating segment 170 includes a front cavity 174 extending along a mating axis 175. The center contact 150 is received in the front cavity 174. The mating segment 170 is configured to extend into the insert 162 and the cavity 168 of the front housing 160. The cable segment 172 includes a cable cavity 176 extending along a cable axis 177. The cable axis 177 is orthogonal to the mating axis 175. The cable cavity 176 receives the cable assembly 140, such as the pin contact 142 and a portion of the cable 108. The cable cavity 176 is open to the front cavity 174 such that the pin contact 142 is able to mate with the center contact 150.

[0025] The dielectric holder 152 extends between a front 180 and a rear 182 and extends between a top 184 and a bottom 186. The mating segment 170 extends along the top 184 from the front 180 to the rear 182. The cable segment 172

extends along the rear 182 between the top 184 and the bottom 186. The front cavity 174 intersects with the cable cavity 176 at the corner near the top 184 and the rear 182. In an exemplary embodiment, the front cavity 174 includes an opening 188 at the rear 182. The center contact 150 is rear loaded into the dielectric holder 152 through the opening 188. The pin contact 142 is loaded into the cable cavity 176 through the bottom 186. The cable 108 extends from the dielectric holder 152 from the bottom 186.

[0026] The outer contact 154 may be a multi-piece contact formed from multiple pieces being assembled together. For example, in the illustrated embodiment, the outer contact 154 includes a mating contact 190, a front ground shield 192 and a rear ground shield 194 connected to the front ground shield 192. The mating contact 190 is electrically connected to the front ground shield 192. Optionally, the mating contact 190 may be integral with the front ground shield 192, such as stamped and formed from the same part. Optionally, the rear ground shield 194 may be integral with the front ground shield 192, such as stamped and formed from the same part. The mating contact 190 surrounds the center contact 150. The front ground shield 192 and the rear ground shield 194 surround the pin contact 142 and a portion of the cable 108. The front ground shield 192 and the rear ground shield 194 may be electrically connected to the cable braid 134. The outer contact 154 has a cavity 196 and a plurality of contact beams 198 at the mating end thereof. The contact beams 198 are deflectable and are configured to be spring loaded against a corresponding outer contact (not shown) of the jack assembly 102 (shown in Figure 1). Each of the individual contact beams 198 are separately deflectable and exert a normal force on the outer contact of the jack assembly 102 to ensure engagement therewith.

[0027] Figure 3 is a bottom perspective view of the center contact 150 in accordance with an exemplary embodiment. Figure 4 illustrates the pin contact 142 mated with the center contact 150. The center contact 150 extends along a longitudinal axis 200 between a mating end 202 at a front thereof and a terminating end 204 at a rear thereof. The terminating end 204 is configured to be terminated to the pin contact 142.

[0028] The center contact 150 includes a base 206 at the terminating end, such as at or near the rear of the center contact 150. Deflectable pin beams 208 extend from the base 206, such as below a bottom of the base 206. In an exemplary embodiment, the pin beams 208 extend toward the cable assembly 140 from the base 206. The pin beams 208 are configured to engage the pin contact 142 prior to the base 206 engaging the pin contact 142. The electrical signal path flows from the pin contact 142 into the pin beams 208 and then into the base 206 without creating a series current loop as compared to an inverted embodiment having a base below the pin beams. The amount of inductive electrical stubbing is thus reduced as compared to an inverted embodiment having a base below the pin beams. The impedance along the signal path at the interface between the contacts 150, 142 may more closely match the target impedance as compared to an inverted embodiment having a base below the pin beams.

[0029] The deflectable pin beams 208 have flared lead-in tips 210 at distal ends 211 thereof. The base 206 and deflectable pin beams 208 form a socket 212 at the terminating end 204 that is configured to receive the pin contact 142. The deflectable pin beams 208 have long beam lengths to accommodate a range of deflection, such as to avoid overstressing and/or plastic deformation. The deflectable pin beams 208 maintain a normal or spring force against the pin contact 142 to ensure good electrical contact between the center contact 150 and the pin contact 142. In the illustrated embodiment, the center contact 150 includes two deflectable pin beams 208, however any number of deflectable pin beams 208 may be provided in alternative embodiments. The deflectable pin beams 208 are configured to be deflected outward when mated with the pin contact 142. For example, when the pin contact 142 is plugged into the socket 212 defined between the pin beams 208, the pin beams 208 are deflected outward and resiliently engage the pin contact 142 to create an electrical connection between the center contact 150 and the pin contact 142.

[0030] The flared lead-in tips 210 form a gathering window or funnel into the socket 212. For example, the flared lead-in tips 210 are flared outward to provide lead-in into the space between the pin beams 208. The lead-in tips 210 are flared outward away from the pin contact 142. The deflectable pin beams 208 have

mating interfaces 214 above the flared lead-in tips 210. The mating interfaces 214 are configured to engage the pin contact 142 when the pin contact 142 is mated with the center contact 150. The flared lead-in tips 210 define a catch circle that is larger than the tip 146 of the pin contact 142 to ensure that the center contact 150 catches the pin contact 142 as the pin contact 142 is loaded into the socket. The flared lead-in tips 210 guide the pin contact 142 to the mating interfaces 214. The pin beams 208 have a first separation distance between the mating interfaces 214 and a second separation distance between the distal ends 211 that is greater than the first separation distance. The funnel shaped terminating end 204 accommodates for mis-alignment of the pin contact 142 and reduces stubbing during mating of the pin contact 142 with the center contact 150.

[0031] The pin beams 208 include folded portions 216 extending from the base 206, such as from both sides of the base 206. The folded portions 216 accommodate deflection of the pin beams 208. The folded portions 216 may be bent back over the base 206 such that portions thereof are parallel to the base 206. The pin beams 208 include extensions 218 extending from the folded portions 216 to the mating interfaces 214. The extensions 218 are bent or angled relative to the folded portions 216. The extensions 218 extend generally away from the base 206. The folded portions 216 and the extensions 218 increase the overall beam length of the pin beams 208.

[0032] In an exemplary embodiment, the pin beams 208 include slots 220 surrounded on both sides by beam arms 222. The pin beams 208 are flexed at the beam arms 222. The beam arms 222 may transition between the folded portions 216 and the extensions 218. The beam arms 222 may include bends or curves at the transition between the folded portions 216 and the extensions 218. The pin beams 208 are deflectable at the beam arms 222. The slots 220 make the pin beams 208 more flexible. The beam arms 222 distribute stresses in the pin beams 208 through the radiused area at the transition between the folded portions 216 and the extensions 218.

[0033] In an exemplary embodiment, the pin beams 208 have a thickness 224 that is thinner than a thickness 226 of the base 206. For example, the

pin beams 208 may be coined making the material of the pin beams 208 thinner than the base 206. Having the pin beams 208 thinner allows the pin beams 208 to be more flexible, while the rest of the center contact 150 is thicker and thus more robust, such as for mating with the mating contact of the mating connector.

[0034] The base 206 includes an opening 228 configured to receive the tip 146 of the pin contact 142. The opening 228 is aligned with the cable axis 177. The opening 228 may have a diameter that is slightly larger than the tip 146 of the pin contact 142 to accommodate offset or misalignment of the pin contact 142 during assembly. The opening 228 defines a catch radius configured to catch the tip 146 of the pin contact 142 and center the pin contact 142 relative to the base 206. The opening 228 may have a lead-in to guide the pin contact 142 into the opening 228. The lead-in to the opening 228 defines a strain relief surface 230 for the pin beams 208 of the center contact 150. As such, the opening 228 provides overstress protection for the pin beams 208. For example, the strain relief surface 230 forces the pin contact 142 to a generally centered position between the pin beams 208, not allowing the pin contact 142 to shift in one direction or the other, which can cause overstress and/or plastic deformation of the pin beam 208 in such offset direction. The opening 228 receives the pin contact 142 to allow the pin contact 142 to pass through the base 206. As such, the opening 228 accommodates a large amount of contact wipe of the pin contacts 142 along the pin beams 208. For example, the pin contact 142 does not bottom out against the base 206, but rather passes through the base 206 during assembly. As such, the pin beams 208 may be made shorter and/or remain closer to the base 206 reducing the overall height of the center contact 150.

[0035] The mating end 202 of the center contact 150 extends forward of the base 206. In the illustrated embodiment, the mating end 202 defines a socket 232 configured to receive the pin contact of the jack assembly 102. The mating end 202 may be formed by wrapping the ends of the center contact 150 to form the socket 232. In an exemplary embodiment, the center contact 150 is a stamped and formed contact, which may be manufactured rather inexpensively.

[0036] Figure 5 is a rear perspective view of a portion of the dielectric holder 152 formed in accordance with an exemplary embodiment. Figure 6 is a rear perspective view of a portion of the dielectric holder 152 formed in accordance with an exemplary embodiment. The dielectric holder 152 includes the opening 188 at the rear 182 that is open to the front cavity 174. The front cavity 174 is defined by a cavity wall 242 along an interior of the dielectric holder 152. The front cavity 174 is sized and shaped to receive the center contact 150.

[0037] In an exemplary embodiment, the dielectric holder 152 includes an expansion slot 244 formed in the cavity wall 242, such as below the front cavity 174. The expansion slot 244 may extend into the cable cavity 176. The expansion slot 244 defines a space or area that is sized and shaped to receive the flared lead-in tips 210 of the center contact 150. The expansion slot 244 forms part of the front cavity 174. The expansion slot 244 is an enlarged area around the center contact 150. The expansion slot 244 widens or increases the size of the front cavity 174 to receive the flared lead-in tips 210 when the flared lead-in tips 210 are deflected outward during mating with the pin contact 142. Optionally, the walls defining the expansion slot 244 (e.g., outside of the flared lead-in tips 210) may provide overstress protection for the pin beams 208. For example, the walls may limit deflection of the pin beams 208 to one side or the other, which may force the pin contact 142 to a generally centered position between the pin beams 208, not allowing the pin contact 142 to shift in one direction or the other, which can cause overstress and/or plastic deformation of the pin beam 208 in such offset direction. Optionally, the expansion slot 244 may be open at the rear 182.

[0038] In an exemplary embodiment, the dielectric holder 152 includes a guide wall 250 in the cable cavity 176. The guide wall 250 is positioned below the expansion slot 244. The guide wall 250 may be provided at or near the top of the cable cavity 176. The guide wall 250 includes a guide opening 252, which may open to the front cavity 174 and the center contact 150. The pin contact 142 is loaded into the front cavity 174 through the guide opening 252. In an exemplary embodiment, the guide opening 252 includes chamfered lead-in surfaces 254 that guide the pin contact 142 into the center contact 150. The guide opening 252 may be

aligned with the socket 212 of the center contact 150 to direct the pin contact 142 into a mated position with the center contact 150. The guide opening 252 may be aligned with the cable axis 177. Optionally, the guide opening 252 may have a smaller diameter 256 than the expansion slot 244. The guide opening 252 may have a smaller diameter than a catch area of the flared lead-in tips 210 to align the pin contact 142 with the socket 212 and to reduce stubbing. . As such, the guide opening 252 directs the pin contact 142 into the socket 212 without stubbing on the pin beams 208. The lead-in tips 210 may further direct the pin contact 142 into the socket 212.

[0039] The dielectric holder 152 includes a pocket 260 formed in the cavity wall 242, such as above the base 206. The pocket 260 may be open to the front cavity 174. The pocket 260 defines a space or area that is sized and shaped to receive the tip 146 of the pin contact 142 when the pin contact 142 is plugged into the center contact 150. The pocket 260 is aligned with the cable axis 177.

[0040] It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described embodiments (and/or aspects thereof) may be used in combination with each other. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from its scope. Dimensions, types of materials, orientations of the various components, and the number and positions of the various components described herein are intended to define parameters of certain embodiments, and are by no means limiting and are merely exemplary embodiments. Many other embodiments and modifications within the spirit and scope of the claims will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims.

WHAT IS CLAIMED IS:

1. A coaxial connector assembly (104) comprising:

a housing (158) holding an outer contact (154);

a dielectric holder (152) received in the outer contact, the dielectric holder having a mating segment (170) and a cable segment (172) orthogonal to the mating segment, the mating segment having a front cavity (174) extending along a mating axis (175), the cable segment having a cable cavity (176) extending along a cable axis (177);

a cable assembly (140) received in the cable cavity (176) of the dielectric holder, the cable assembly having a pin contact (142) configured to be terminated to an end of a center conductor (130) of a cable (108), the pin contact having a tip (146); and

a center contact (150) received in the front cavity of the dielectric holder, the center contact having a base (206) and a mating portion extending forward of the base, the base positioned in the dielectric holder generally at an intersection of the front cavity and the cable cavity, the center contact having deflectable pin beams (208) extending from the base configured to deflect outward when mated with the pin contact, the pin beams having flared lead-in tips (210) at distal ends (211) of the beams, the base and the pin beams being axially aligned with the cable axis to receive the pin contact.

2. The coaxial connector assembly (104) of claim 1, wherein the pin beams (208) extend toward the cable assembly (140) from the base (206).

3. The coaxial connector assembly (104) of claim 1, wherein the pin beams (208) include separable mating interfaces (214) configured to engage and electrically connect to the pin contact (142).

4. The coaxial connector assembly (104) of claim 1, wherein the lead-in tips (210) are flared outward away from the pin contact (142).

5. The coaxial connector assembly (104) of claim 1, wherein the pin beams (208) include mating segments, the lead-in tips (210) being flared outward from the mating segments such that the pin beams have a first separation distance between the mating segments (214) and a second separation distance between the distal ends (211) greater than the first separation distance.

6. The coaxial connector assembly (104) of claim 1, wherein the base (206) has a first thickness (226), the pin beams (208) having a second thickness (224) less than the first thickness.

7. The coaxial connector assembly (104) of claim 1, wherein the pin beams (208) include slots (220) with beam arms (222) on both sides of the slots, the pin beams being flexed at the beam arms.

8. The coaxial connector assembly (104) of claim 1, wherein the base (206) has an opening axially aligned with the cable axis (177), the opening receiving the tip of the pin contact.

9. The coaxial connector assembly (104) of claim 8, wherein the opening (228) is bounded by a strain relief surface (230), the strain relief surface configured to engage and locate the pin contact (142) to prevent overstress of the pin beams (208).

10. The coaxial connector assembly (104) of claim 1, wherein the dielectric holder (152) includes an expansion slot (244) that receives the base (206) and the pin beams (208) of the center contact (150), the pin beams being deflectable into the expansion slot, the dielectric holder including a guide opening (252) in the cable cavity (176) open to the expansion slot, the guide opening receiving the pin contact (142) and guiding the pin contact into mating with the pin beams.

11. The coaxial connector assembly (104) of claim 10, wherein the lead-in tips (210) having a wider catch area than the guide opening (252) to receive the pin contact (142).

12. The coaxial connector assembly (104) of claim 1, wherein the dielectric holder (152) includes a pocket (260) above the base (206), the pocket receiving the tip (146) of the pin contact (142) when the pin contact is plugged into the center contact (150).

13. The coaxial connector assembly (104) of claim 1, wherein the front cavity (172) is open at a rear (182) of the dielectric holder (152) to receive the center contact (150) through the rear of the dielectric holder.

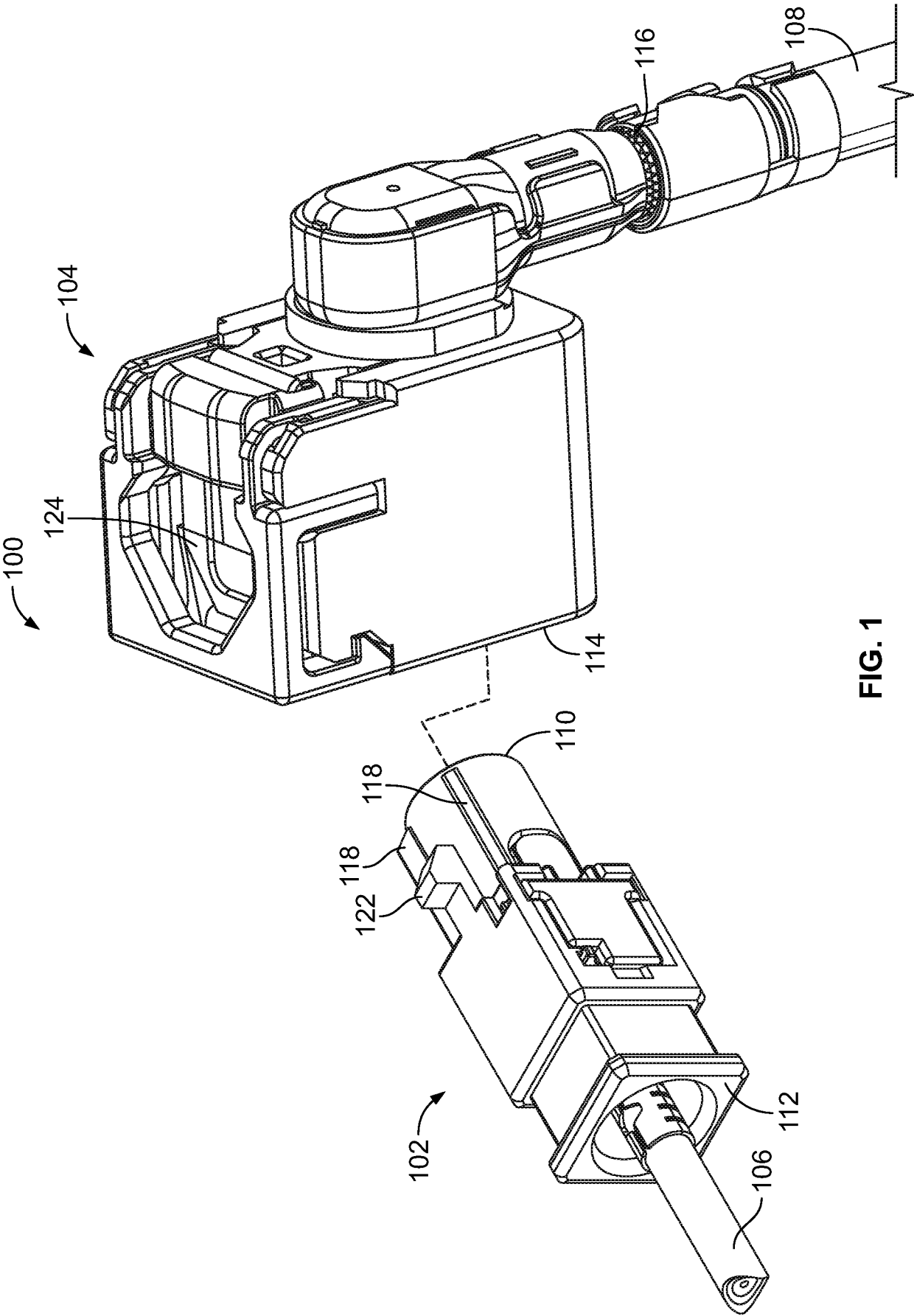


FIG. 1

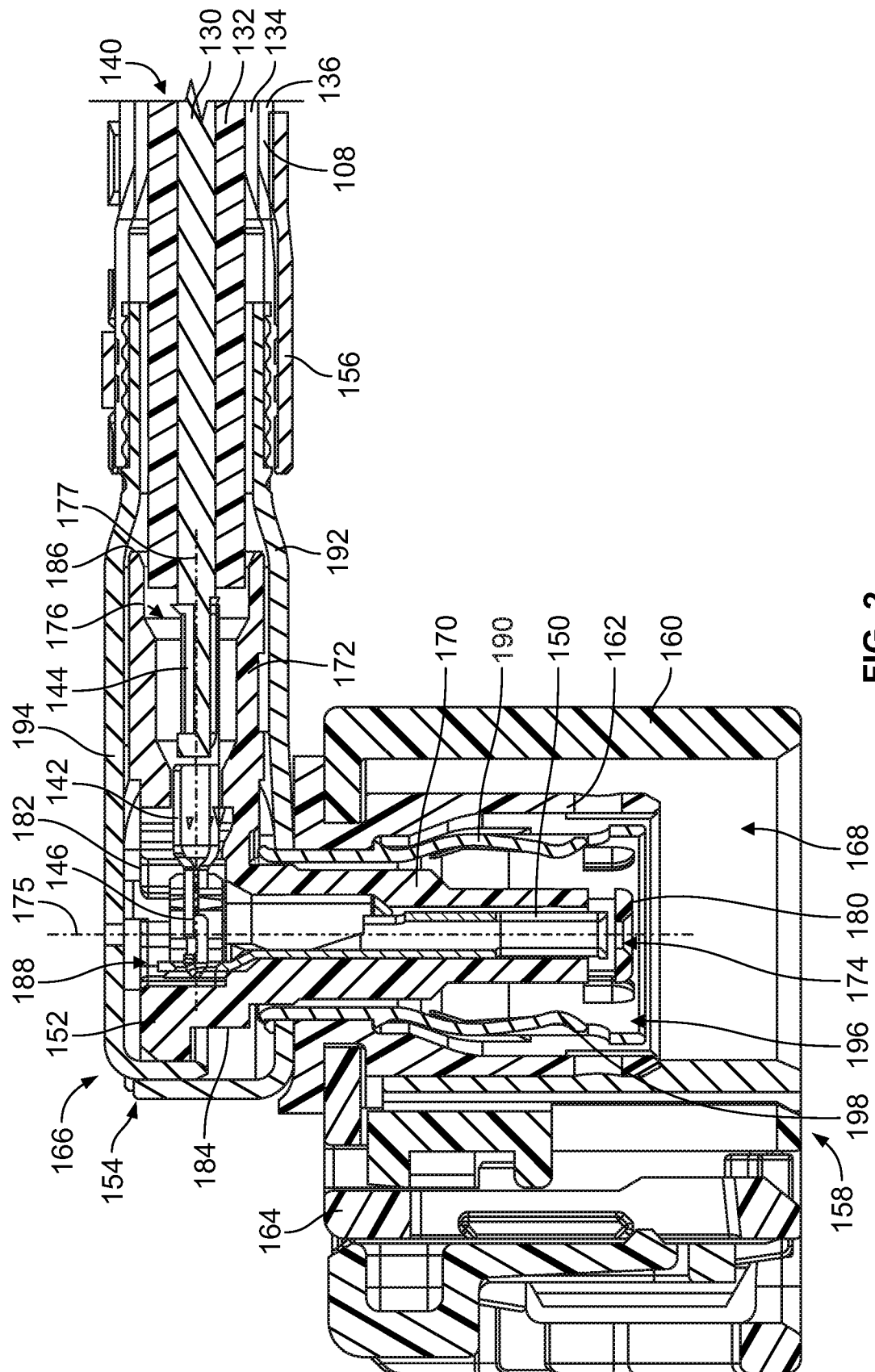


FIG. 2

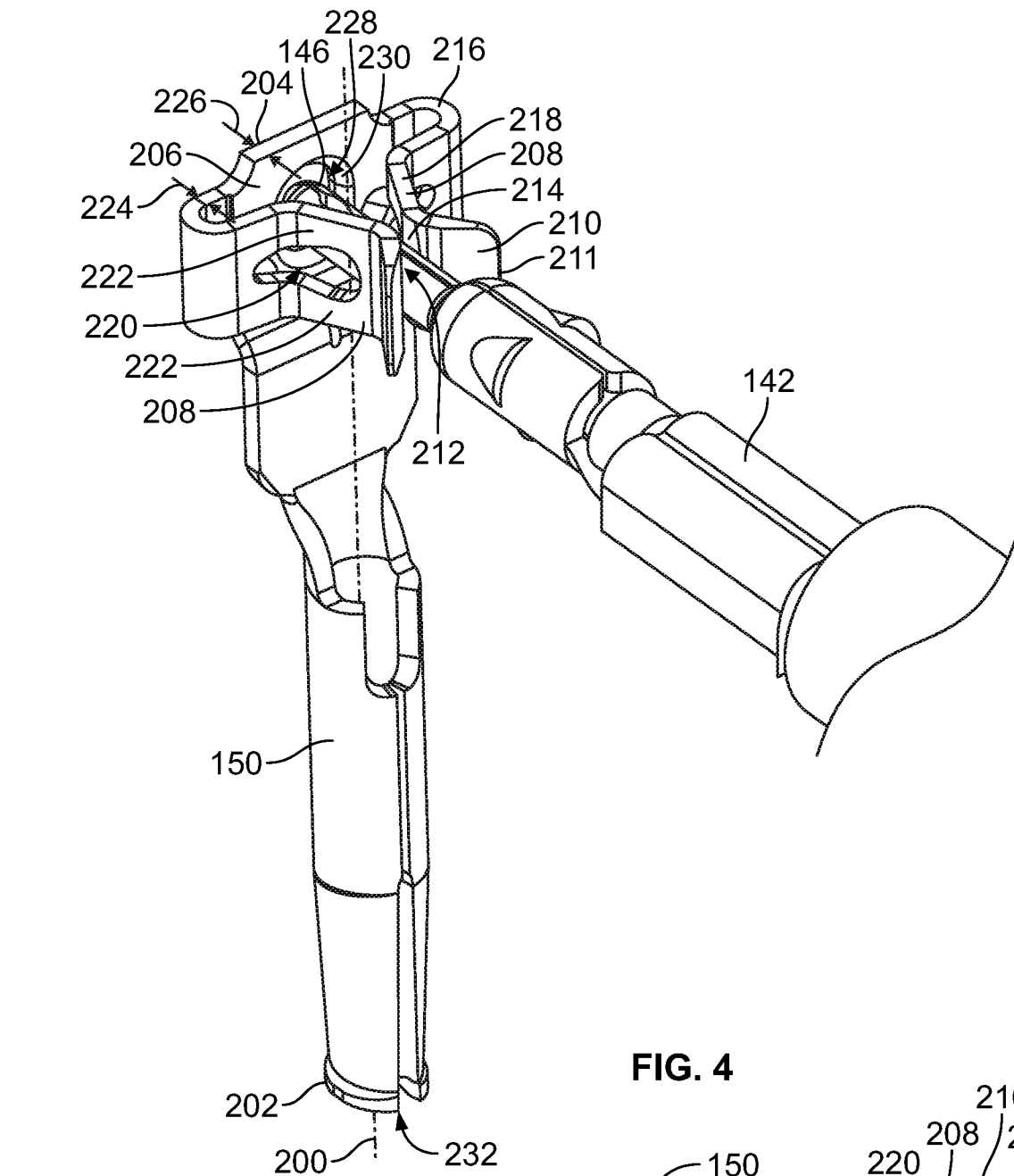


FIG. 4

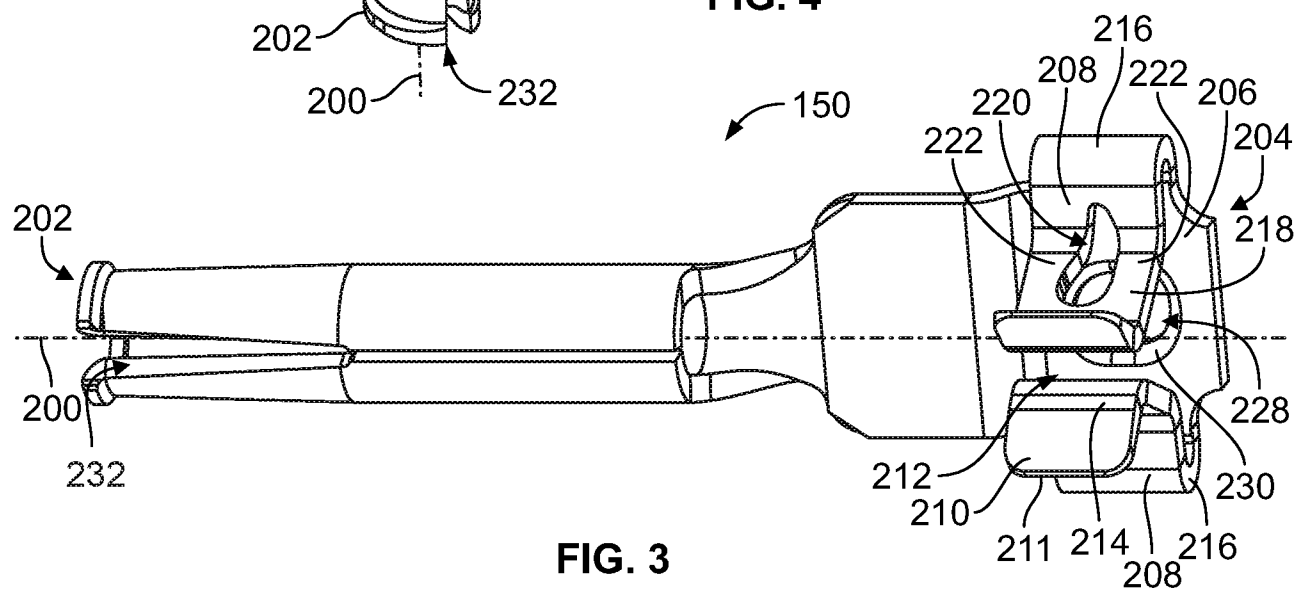


FIG. 3

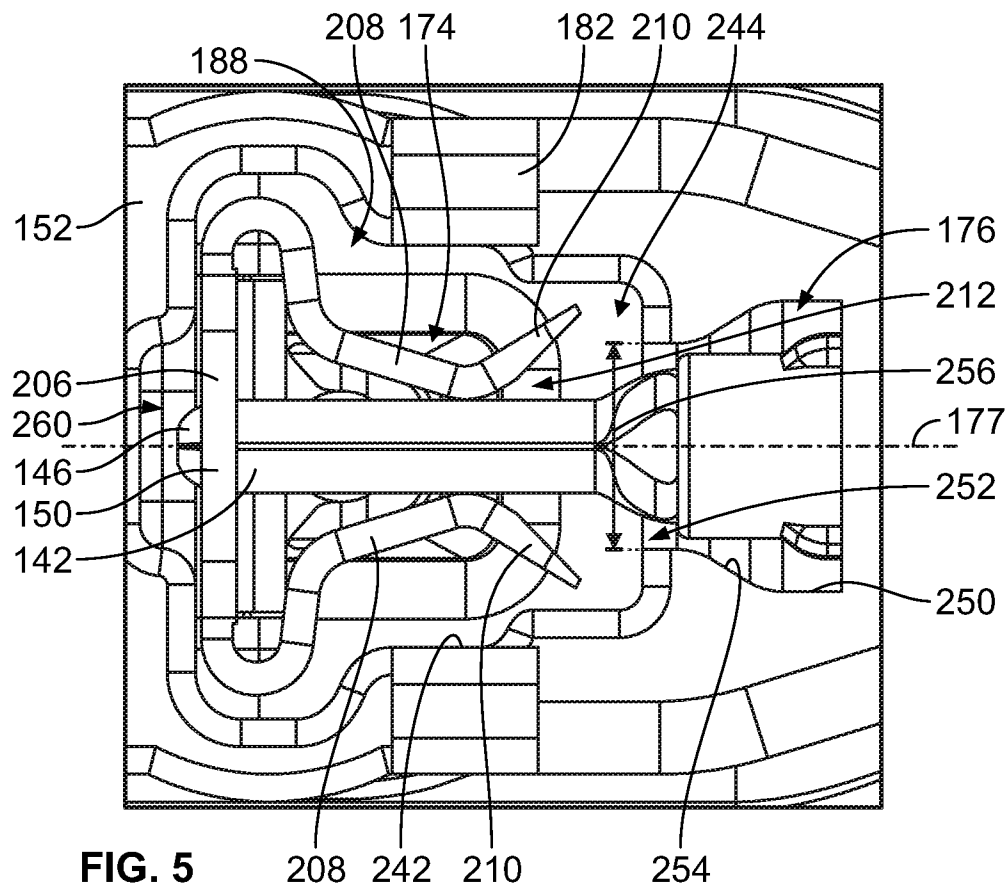


FIG. 5

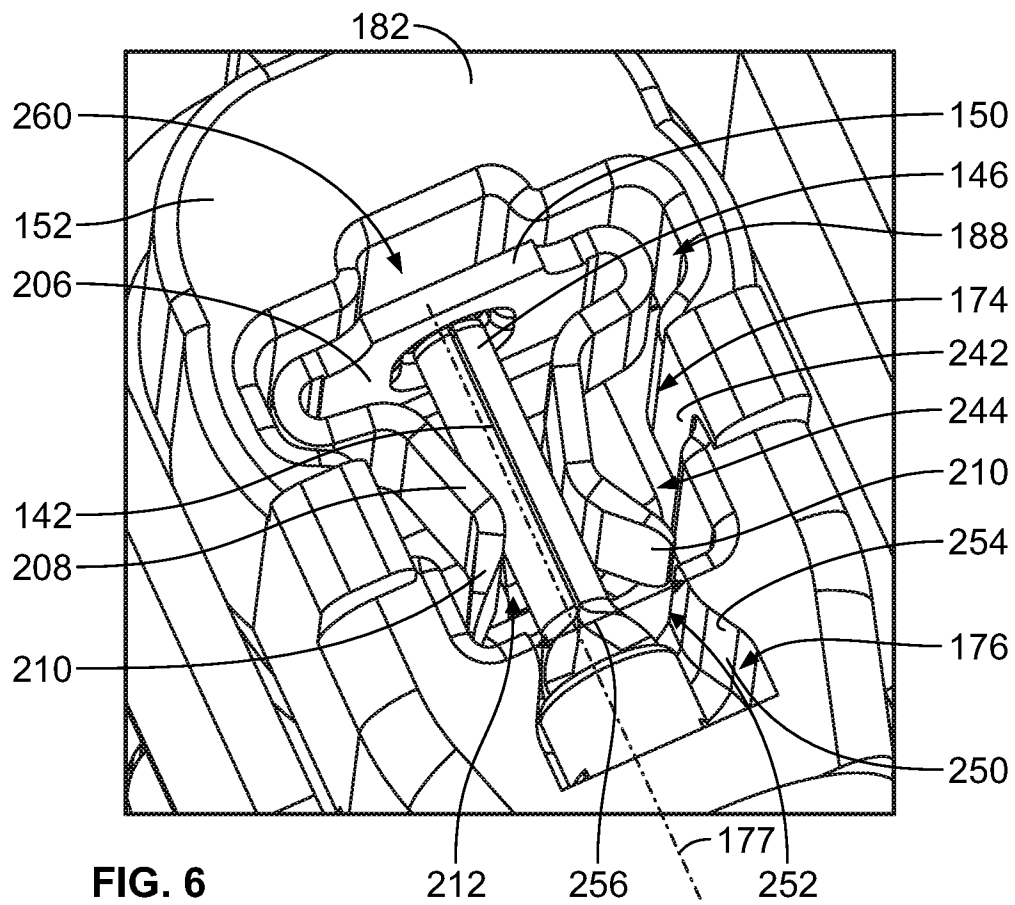


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/055891

A. CLASSIFICATION OF SUBJECT MATTER

INV. H01R13/115 H01R13/6593 H01R24/54 H01R4/48 H01R13/631
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2015/164090 A2 (TYCO ELECTRONICS CORP [US]) 29 October 2015 (2015-10-29)	1-8, 10-13
Y	the whole document	9

Y	US 2008/261445 A1 (MALLOY ALLEN L [US] ET AL) 23 October 2008 (2008-10-23) paragraph [0040] - paragraph [0041] figures 1-4	9



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/055891

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015164090 A2	29-10-2015	CN 106233544 A	14-12-2016
		DE 112015002005 T5	02-02-2017
		US 2015311602 A1	29-10-2015
		WO 2015164090 A2	29-10-2015

US 2008261445 A1	23-10-2008	AR 067303 A1	07-10-2009
		BR PI0801199 A2	02-12-2008
		CA 2628726 A1	17-10-2008
		GB 2448595 A	22-10-2008
		TW 200843262 A	01-11-2008
		US 2008261445 A1	23-10-2008
