



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
30.12.2015 Bulletin 2015/53

(51) Int Cl.:
H01R 13/627^(2006.01) H01R 13/639^(2006.01)

(21) Application number: **14753640.3**

(86) International application number:
PCT/CN2014/072054

(22) Date of filing: **13.02.2014**

(87) International publication number:
WO 2014/127708 (28.08.2014 Gazette 2014/35)

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

(72) Inventors:
• **YU, Guilong**
Shanghai 200331 (CN)
• **SHAO, Jiwu**
Shanghai 200331 (CN)

(30) Priority: **21.02.2013 CN 201310055102**

(74) Representative: **Mittler, Enrico et al**
Mittler & C. S.r.l.
Viale Lombardia, 20
20131 Milano (IT)

(71) Applicant: **Shanghai Aerospace Science & Industry Appliance Co. Ltd.**
Shanghai 200331 (CN)

(54) **RADIO-FREQUENCY COAXIAL ELECTRIC CONNECTOR WITH CONTACT ELEMENT**

(57) Disclosed is a radio-frequency coaxial electric connector with a contact element. The contact element (14) is arranged between a plug outer conductor (11) and a socket outer conductor (22), the contact element (14) is cylindrical, the front part of the contact element (14) is divided into a plurality of elastic cantilever beams through axial cut grooves (142), and an annular contact ring (143) is formed at the rear part of the contact element (14); a radial outward raised annular contact (141) is arranged at the front end of each cantilever beam; and the contact element (14) is fixed in a plug first step hole (113) in the plug outer conductor (11) in an interference fit manner through the contact ring (143) at the rear part, and is tightly in elastic contact with the inner wall of a socket first step hole (221) through the annular contacts (141) of the elastic cantilever beams at the front part. The radio-frequency coaxial electric connector can improve the passive intermodulation or three-order intermodulation performance of radio-frequency coaxial connection, reduce the space occupied in the length direction of the connector, improve the impedance matching performance, reduce the standing-wave ratio and improve the sealing performance. (Fig. 1)

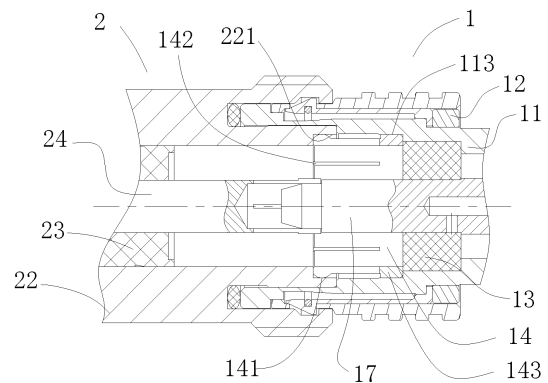


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a radio-frequency coaxial connector, particularly a radio-frequency coaxial electric connector with a contact element, and its passive intermodulation, impedance matching, and hermetic sealing.

PRIOR ART

[0002] ZL200810068882.X and ZL03103882.4 disclose solutions to improve passive intermodulation of radio-frequency coaxial connector.

[0003] In ZL200810068882.X, no so called contact element is arranged between outer conductors of a plug and a socket. Instead, an additional auxiliary nut and an elastic washer are used to keep contact surfaces of the outer conductors of the plug and the socket tightly contact with each other, so as to improve the passive intermodulation between the plug and the socket.

[0004] In ZL03103882.4, an elastic contact element shaped as an annular sleeve is provided between outer conductors of the plug and the socket, the plug and the socket tightly contact with a spiral continuous contact curve of the elastic contact element, so as to improve the passive intermodulation between the plug and the socket.

[0005] In order to improve the passive intermodulation of a contactor, above patents take different solutions to keep the outer conductors of the plug and the socket tightly and steady contact with each other, so as to improve the passive intermodulation of the coaxial connector.

[0006] WO2013/104590A1 discloses a radio-frequency coaxial electric connector, its spring loaded contact elements 26 are integrated with an outer conductor of its plug, resulting in a complex structure and shape of the outer conductor of the plug, so that it is difficult to make and install the elastic contact element 26. Moreover, the elastic contact element 26 has to be made in just the same material as the outer conductor of the plug, and it is difficult to make the elastic contact element 26 in a different material to other portion of the outer conductor of the plug. Therefore, it is hard to lower the manufacturing cost of the outer conductor of the plug while keeping enough elastic and liable contact.

SUMMARY OF THE INVENTION

[0007] The object of the present invention is to provide a radio-frequency coaxial electric connector, which comprises a plug and a socket, in which one of the plug and the socket is provided with an independent contact element, so as to improve the passive or the third order intermodulation when the plug is inserted into the socket.

[0008] Another object of the present invention is to pro-

vide a radio-frequency coaxial electric connector with a contact element, which can make the contactor shorter, make impedance matching better, and make standing wave ratio smaller.

5 [0009] Another object of the present invention is to provide a radio-frequency coaxial electric connector with a contact element, which can improve a sealing effect, so as to prevent any outer gas state or liquid state particulate or dust from entering into the contactor to make the contactor worse in electricity communication.

10 [0010] Thus, according to the first aspect of the present invention, there is provided a radio-frequency coaxial electric connector with a contact element, comprising a plug (1) and a socket (2), in which the plug (1) comprises an outer conductor (11) of the plug, an insulator (13) of the plug and an inner conductor (17) of the plug, the socket (2) comprises an outer conductor (22) of the socket, a socket dielectric body (23) and an inner conductor (24) of the socket, characterized in that a contact element (14) is provided between the plug outer conductor (11) and the socket outer conductor (22), the contact element (14) is cylindrical; at a front part of the contact element (14), a plurality of elastic cantilever beams are formed by dividing the contact element (14) with axial splits (142); at a rear part of the contact element (14), an annular contact ring (143) is formed; the cantilever beams of the contact element (14) are axially elongated from the contact ring (143), a radial outward annular contact (141) is provided at a front end of each one of the cantilever beams; the contact ring (143) at the rear part of the contact element (14) is fixed into a plug first step hole (113) provided in the plug outer conductor (11) in an interference fit manner; the annular contacts (141) at the front part of the elastic cantilever beams are inserted into the socket outer conductor (22) and are tightly in elastic contact with an inner wall of a socket first step hole (221) of the socket outer conductor (22).

[0011] Preferably, the contact element (14) is made of elastic copper alloy.

40 [0012] Preferably, the annular contacts (141) are with lineal or surface contact with the inner wall of socket first step hole (221).

[0013] Preferably, at the rear of the plug first step hole (113), there is provided with a plug second step hole (114); at the front of the plug first step hole (113), there are provided with a plug third step hole (112) and a plug fourth step hole (111) one after another; an outer diameter of the plug fourth step hole (111) is greater than an outer diameter of the plug third step hole (112); the outer diameter of the plug third step hole (112) is greater than an outer diameter of the plug first step hole (113); the outer diameter of the first step hole (113) is greater than an outer diameter of the plug second step hole (114); and the plug second step hole (114) contains and fixes the plug insulator (13).

55 [0014] According to the second aspect of the present invention, there is provided a radio-frequency coaxial electric connector, characterized in that at least a part of

said plug insulator (13) is provided within the contact element (14); and on the plug inner conductor (17), between the two ends of the plug insulator (13), there is provided with an annular inner conductor groove (171).

[0015] Preferably, a part of the plug inner conductor (17), which is enclosed by said inner conductor groove (171), is fusiform.

[0016] According to the third aspect of the present invention, there is provided a radio-frequency coaxial electric connector, characterized in that a sealing cap (3) is threaded on the socket outer conductor (22); the sealing cap (3) is tubular, a socket sealing groove (224) is provided on the socket outer conductor (22); a second sealing ring (5) is provided within the socket sealing groove (224); a plug sealing groove (119) is provided on the plug outer conductor (11), a third sealing ring (4) is provided within the plug sealing groove (119); when said plug (1) is in engagement with said socket (2), an inner surface at one end of the sealing cap (3) presses the second sealing ring (5), while an inner surface at the other end of the sealing cap (3) presses the third sealing ring (4), so that the connector is sealed.

[0017] Compared with ZL200820096613.X, by means of providing the sealing cap (3), the socket sealing groove (224), the plug sealing groove (112), the second sealing ring (5) provided within the socket sealing groove (224), and the third sealing ring (4) provided within the plug sealing groove (119), the connector is sealed.

[0018] According to the present invention, a very different structure is used with respect to prior art, so as to improve the passive intermodulation or the third order intermodulation of the radio-frequency coaxial electric connector. Moreover, according to a detailed solution of the present invention, the impedance matching of the contactor can be made better, the contactor can be made shorter, the standing wave ratio can be made smaller, and even the sealing effect of the contactor can be improved.

[0019] Compared with ZL03103882.4, the annular contact (141) is tightly and radially in elastic contact with the inner surface of the first step hole (221) of the socket outer conductor. As shown in Fig. 2 and Fig. 5, in a cross section passing through a central axis of the contact element (14), when an outer profile of the annular contact (141) is an arc, the annular contact (141) is tightly in elastic contact with the first step hole (221) with a circle, so that the passive intermodulation or the third order intermodulation of the radio-frequency coaxial electric connector can be greatly improved. As shown in Fig. 4, in a cross section passing through a central axis of the contact element (14), when an outer profile of the annular contact (141) is a line, the annular contact (141) is tightly in elastic contact with the first step hole (221) with a sleeve, so that a greater power can be transmitted by means of the contactor.

[0020] According to one embodiment of the present invention, the plug insulator (13) is located at the rear of the contact element (14). Moreover, according to a de-

tailed solution of the present invention, at least a part of the plug insulator (13) is contained in the contact element (14), so that the plug insulator (13) used to position the plug inner conductor (17) can be moved forward, so that the contactor can be made shorter. Moreover, the annular inner conductor groove (171) are provided on the plug inner conductor (17) between the two ends of the plug insulator (13), it is good to compensate the impedance matching and make standing wave ratio smaller. Preferably, the annular inner conductor groove (171) of the inner conductor (17) of the plug has a greater diameter in a middle portion of the inner conductor (17) of the plug than at two ends of the inner conductor (17) of the plug, it is better to improve the impedance matching and make standing wave ratio smaller.

[0021] Compared to WO2013/104590A1, the contact element of the present invention is an independent part, and is fixed on the plug inner conductor by means of in an interference fit manner. Therefore, in the present invention, both the contact element and the plug inner conductor have a simple structure and shape, the contact element and the plug inner conductor can be made separately. Especially, the contact element can be modularized and applied. Optionally, the contact element and the plug outer conductor can be made in different materials, so it is possible to lower the manufacturing cost of the outer conductor of the plug while keeping enough elastic and liable contact.

BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

[0022]

Fig. 1 shows a radio-frequency coaxial electric connector with a contact element when a plug and a socket are connected according to one embodiment of the present invention.

Fig. 2 shows a structure of a contact element of the radio-frequency coaxial electric connector with a contact element according to the present invention. Fig. 3 shows a socket of a radio-frequency coaxial electric connector with a contact element according to one embodiment of the present invention.

Fig. 4 shows a plug of a radio-frequency coaxial electric connector with a contact element according to one embodiment of the present invention.

Fig. 5 shows a plug of a radio-frequency coaxial electric connector with a contact element according to another embodiment of the present invention.

Fig. 6 shows a sealing structure of a radio-frequency coaxial electric connector with a contact element according to the present invention.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0023] Embodiments of a radio-frequency coaxial elec-

tric connector with a contact element according to the present invention will be described in detail together with Figs. 1-6.

[0024] In prior art of the radio-frequency coaxial electric connector, there are every kinds of quick connecting ways, to make a plug quickly lock or quickly separate from a socket, such as disclosure in ZL03103882.4. With such kinds of quick connecting way, when the plug is inserted and locked into the socket, it cannot absolutely make sure whether the plug outer conductor directly and tightly with the socket outer conductor. Therefore, for such a kind of a radio-frequency coaxial electric connector, it cannot guarantee a good enough passive intermodulation or a good enough third order intermodulation.

[0025] As shown in Fig. 1, according to a radio-frequency coaxial electric connector with a contact element of the present invention, when a plug mates with a socket, a similar quick connecting mechanism works. In order to overcome those defects of the prior art, keep the outer conductors of the plug and the socket contact with each other very well, and improve the passive intermodulation of the radio-frequency coaxial electric connector, the present invention has the same idea as ZL03103882.4, i.e., an additional elastic contact element is provided between the plug outer conductor and the socket outer conductor.

[0026] As shown in Fig. 2, according to the radio-frequency coaxial electric connector with a contact element of the present invention, the contact element 14 is shaped as a cylinder; by means of axial splits 142, a front part of the cylinder is divided into a plurality of elastic cantilever beams, and a rear part of the contact element 14 is an annular contact ring 143. The cantilever beams of the contact element 14 are axially elongated from the contact ring 143. At a front end of each cantilever beam, there is provided an annular contact 141 which projects radially outward.

[0027] As shown in Fig. 1, the contact element 14 is axially provided between the plug outer conductor 11 and the socket outer conductor 22. The contact ring 143 located at rear of the contact element 14 is fixed in an interference fit manner within the plug first step hole 113 of the plug outer conductor 11. The annular contacts 141 arranged at front part of the elastic cantilever beams are inserted into the socket first step hole 221 of the socket outer conductor 22, and are in tightly elastic contact with an inner wall of the socket first step hole 221. The contact element 14 can be made of a metal, such as a suitable kind of copper alloy.

[0028] As shown in Fig. 3, a socket 3 of a radio-frequency coaxial electric connector with a contact element according to the present invention comprises an outer conductor 22 of the socket, a dielectric body 23 of the socket, and an inner conductor 24 of the socket. As shown in Fig. 4, a plug 1 of a radio-frequency coaxial electric connector with a contact element according to the present invention comprises an outer conductor 11 of the plug, an insulator 13 of the plug, and an inner con-

ductor 17 of the plug. In the present embodiment, except the plug first step hole 113 is provided in the plug outer conductor 11, a plug second step hole 114 is provided at rear of the plug first step hole 113. At front of the plug first step hole 113, a plug third step hole 112 and a plug fourth step hole 111 are provided one after another. An outer diameter of the plug fourth step hole 111 is greater than that of the plug third step hole 112. An outer diameter of the plug third step hole 112 is greater than that of the plug first step hole 113. An outer diameter of the plug first step hole 113 is greater than that of the plug second step hole 114. The plug first step hole 113 is used for fixing the contact element 14, and keeping the contact element 14 in tight and steady electric contact with the plug outer conductor 11. The plug second step hole 114 is used for containing and fixing the plug insulator 13. The plug third step hole 112 is used for contacting the contact ring 143 of the contact element 14 in an interference fit manner. The plug fourth step hole 111 is used for receiving a part of the socket outer conductor 22.

[0029] As shown in Fig. 5, in order to make the contactor shorter, make the impedance matching better, and make the standing wave ratio smaller, in the present invention, according to another embodiment of the plug of the radio-frequency coaxial electric connector with a contact element, the plug insulator 13 is at least partially contained within the contact element 14, instead of at rear of the contact element 14 as shown in Fig. 4. At the same time, an annular inner conductor groove 171 is provided on plug inner conductor 17 and between the two ends of the plug insulator 13. Moreover, a portion of the plug inner conductor 17 which is enclosed by the inner conductor groove 171 has greater diameter in a middle and smaller diameter at two ends, so as to make impedance matching better.

[0030] In order to improve a sealing effect of the radio-frequency coaxial electric connector with a contact element, so as to prevent any outer gas state or liquid state particulate or dust from entering into the contactor to make the contactor electrically worse, as shown in Fig. 6, there is provided a sealing structure of the radio-frequency coaxial electric connector, in which a sealing cap 3 is threaded on the socket outer conductor 22; the sealing cap 3 is tubular, a socket sealing groove 224 is provided on the socket outer conductor 22; a second sealing ring 5 is provided within the socket sealing groove 224; a plug sealing groove 119 is provided on the plug outer conductor 11, a third sealing ring 4 is provided within the plug sealing groove 119; when said plug 1 locks said socket 2, an inner surface at one end of the sealing cap 3 presses the second sealing ring 5, while an inner surface at the other end of the sealing cap 3 presses the third sealing ring 4, so that the connector is sealed.

Claims

1. A radio-frequency coaxial electric connector with a

- contact element, comprising a plug (1) and a socket (2), in which the plug (1) comprises a plug outer conductor (11), a plug insulator (13) and a plug inner conductor (17), the socket (2) comprises a socket outer conductor (22), a socket dielectric body (23) and a socket inner conductor (24), **characterized in that** a contact element (14) is provided between the plug outer conductor (11) and the socket outer conductor (22), the contact element (14) is cylindrical; at a front part of the contact element (14), the contact element (14) is divided into a plurality of elastic cantilever beams with axial cut grooves (142); at a rear part of the contact element (14), an annular contact ring (143) is formed; the cantilever beams of the contact element (14) are axially elongated from the contact ring (143), a radial outward annular contact (141) is provided at a front end of each one of the cantilever beams; the contact ring (143) at the rear part of the contact element (14) is fixed into a plug first step hole (113) provided in the plug outer conductor (11) in an interference fit manner; the annular contacts (141) at the front part of the elastic cantilever beams are inserted into the socket outer conductor (22) and are tightly in elastic contact with an inner wall of a socket first step hole (221) of the socket outer conductor (22).
2. The radio-frequency coaxial electric connector according to Claim 1, **characterized in that** the contact element (14) is made of elastic copper alloy.
 3. The radio-frequency coaxial electric connector according to Claim 1, **characterized in that** the annular contacts (141) are with lineal or surface contact with the inner wall of socket first step hole (221).
 4. The radio-frequency coaxial electric connector according to anyone of Claims 1 to 3, **characterized in that** at the rear of the plug first step hole (113), there is provided with a plug second step hole (114); at the front of the plug first step hole (113), there are provided with a plug third step hole (112) and a plug fourth step hole (111) one after another; an outer diameter of the plug fourth step hole (111) is greater than an outer diameter of the plug third step hole (112); the outer diameter of the plug third step hole (112) is greater than an outer diameter of the plug first step hole (113); the outer diameter of the first step hole (113) is greater than an outer diameter of the plug second step hole (114); and the plug second step hole (114) contains and fixes the plug insulator (13).
 5. The radio-frequency coaxial electric connector according to anyone of Claims 1 to 3, **characterized in that** at least a part of said plug insulator (13) is provided within the contact element (14); and on the plug inner conductor (17), between the two ends of the plug insulator (13), there is provided with an annular inner conductor groove (171).
 6. The radio-frequency coaxial electric connector according to Claim 5, **characterized in that** a part of the plug inner conductor (17), which is enclosed by said inner conductor groove (171), is fusiform.
 7. The radio-frequency coaxial electric connector according to anyone of Claims 1 to 3, **characterized in that** a sealing cap (3) is threaded on the socket outer conductor (22); the sealing cap (3) is tubular, a socket sealing groove (224) is provided on the socket outer conductor (22); a second sealing ring (5) is provided within the socket sealing groove (224); a plug sealing groove (119) is provided on the plug outer conductor (11), a third sealing ring (4) is provided within the plug sealing groove (119); when said plug (1) is in engagement with said socket (2), an inner surface at one end of the sealing cap (3) presses the second sealing ring (5), while an inner surface at the other end of the sealing cap (3) presses the third sealing ring (4), so that the connector is sealed.
 8. A radio-frequency coaxial electric connector, **characterized in that** a contact element which is substantially cylindrical is axially provided between a plug outer conductor and a socket outer conductor, one end of a side wall of the contact element is divided into a plurality of elastic cantilever beams by means of axial splits; the other end of the contact element is provided with a radial contact ring (preferably a flange); the cantilever beams are axially extended from the radial contact ring along the side wall, the free end of each cantilever beam is provided with a radially convex annular contact; said radial contact ring is in engagement within a first hole (preferably a step hole) of one of the plug outer conductor and the socket outer conductor in an interference fit manner; the annular contacts of the cantilever beams are tightly in elastic contact with an inner surface of a second hole (preferably another step hole) of the other one of the plug outer conductor and the socket outer conductor (preferably, the connector further comprises at least one of the following features: said annular contact is with a lineal contact circle or surface contact hoop; the outer axial outline of a radial cross section of said annular contact is a line, an arc, or several curves smoothly connected together; said contact element is a single elastic piece; said contact element is made of copper alloy; said radial contact ring is radially convex; said first hole is a plug first step hole (113) provided within a plug outer conductor (11); said second hole is a socket first step hole (221) provided within a socket outer conductor (22); an annular inner conductor groove is provided on a plug inner conductor (17) or a socket

inner conductor (24); an insulator is contained within at least a part of said contact element; an annular inner conductor groove is provided within the plug inner conductor (17) or the socket inner conductor (24) between the two ends of the insulator; and the portion enclosed by the inner conductor groove of the plug inner conductor (17) or the socket inner conductor (24) is fusiform).

9. A plug of a radio-frequency coaxial electric connector, **characterized in that**, a contact element generally shaped as a cylinder is axially provided within an outer conductor of the plug and located in radial direction of the outer conductor of the plug; a plurality of elastic cantilever beams are formed by means of axial grooves provided on a side wall at one end of the contact element, while a radial contact ring is provided at the other end of the contact element; the cantilever beams are axially extended from the radial contact ring along a surface of said side wall, an annular contact which is radially convex is provided at a free end of each cantilever beam; said radial contact ring is in engagement in an interference fit manner with a hole of the outer conductor of the plug (preferably, the plug further comprises at least one features as follows: said annular contact is provided with an annular contact line or contact area; said annular contact has a radially outer profile which is in a section passing through an axis of the contact element, and the profile is a line, an arc, or several curves smoothly connected with one another; said contact element is a single elastic means; said contact element is made of copper alloy; said radial contact ring is radially convex; said hole is a first step hole (113) provided within the outer conductor (11) of the plug; an insulator is contained within at least a part of the contact element, an annular groove is formed on an inner conductor (17) of the plug between the two ends of the insulator; and the annular groove of the inner conductor (17) of the plug has a greater diameter in a middle portion of the inner conductor (17) of the plug than at two ends of the inner conductor (17) of the plug).

10. A socket of a radio-frequency coaxial electric connector, **characterized in that** another hole is correspondingly provided within an outer conductor of the socket, so as to be tightly in elastic contact with the annular contact of the plug of the radio-frequency coaxial electric connector as claimed in Claim 9 (preferably, said another hole is a first step hole (221) of the outer conductor (22) of the socket).

11. A socket of a radio-frequency coaxial electric connector, **characterized in that** a contact element generally shaped as a cylinder is axially and radially provided within an outer conductor of the socket; a plurality of elastic cantilever beams are formed on a

side wall at one end of the contact element by means of axial grooves, while a radial contact ring is formed at the other end of the contact element; the cantilever beams are axially extended from the radial contact ring along a surface of said side wall, an annular contact radially convex is provided at a free end of each cantilever beam; said radial contact ring is in engagement with a hole of an outer conductor of a plug in an interference fit manner (preferably, said socket is with at least one of features as follows: said annular contact is with a contact arc or contact sleeve; said annular contact has a generatrix which is a line, an arc, or several curves smoothly connected to one another; said contact element is a single elastic means; said contact element is made of copper alloy; said radial contact ring is radially convex; an insulator is at least partially provided within said contact element, an annular groove is provided between two ends of the inner conductor (24) of the socket; and the annular groove of the inner conductor (24) of the socket has a greater diameter in a middle portion of the inner conductor (24) of the socket than at two ends of the inner conductor (24) of the socket).

12. A plug of a radio-frequency coaxial electric connector, **characterized in that** another hole is provided within an outer conductor of the plug, so as to be correspondingly tightly in elastic contact with an annular contact of the socket of the radio-frequency coaxial electric connector as claimed in Claim 11.

13. A plug of a radio-frequency coaxial electric connector, at least comprising:

an inner conductor (17) of the plug, which defines an central axis of the radio-frequency coaxial electric connector;

an outer conductor (11) of the plug, which is coaxial with the inner conductor (17) of the plug, and within which a contact element (14) as claimed in Claim 8 is radially provided, or a hole is provided to contact with an annular contact (141) of a contact element (14) as claimed in Claim 8;

a mechanical contact surface, which is perpendicular to the axis of the inner conductor (17) of the plug, and is separated from the annular contact (141) of the contact element (14) as claimed in Claim 8 or is separated from the hole to contact with the annular contact (141) of the contact element (14) as claimed in Claim 8, when the plug is inserted into the socket, the mechanical contact surface limits an axial orientation of the plug and the socket; and

coaxial positioning means, which is an inner cylindrical surface (or an inner conical surface) or an outer cylindrical surface (or an outer conical

surface) which is precisely machined on the outer conductor (11) of the plug (or a part thereof), so as to guarantee the plug and the socket to be in alignment with each other.

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- 14.** A socket of a radio-frequency coaxial electric connector, at least comprising:

an inner conductor (24) of the socket, which defines an central axis of the radio-frequency coaxial electric connector;

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an outer conductor (22) of the socket, which is coaxial with the inner conductor (24) of the socket, within which a contact element (14) as claimed in Claim 8 is radially provided, or a hole is provided to contact with an annular contact (141) of a contact element (14) as claimed in Claim 8;

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a mechanical contact surface, which is perpendicular to the axis of the inner conductor (24) of the socket, and is separated from the annular contact (141) of the contact element (14) as claimed in Claim 8 or is separated from the hole to contact with the annular contact (141) of the contact element (14) as claimed in Claim 8,

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when the plug is inserted into the socket, the mechanical contact surface limits an axial orientation of the plug and the socket; and coaxial positioning means, which is an outer cylindrical surface (or an outer conical surface) or an inner cylindrical surface (or an inner conical surface) which is precisely machined on the outer conductor (22) of the plug (or a part thereof), so as to guarantee the plug and the socket to be in alignment with each other.

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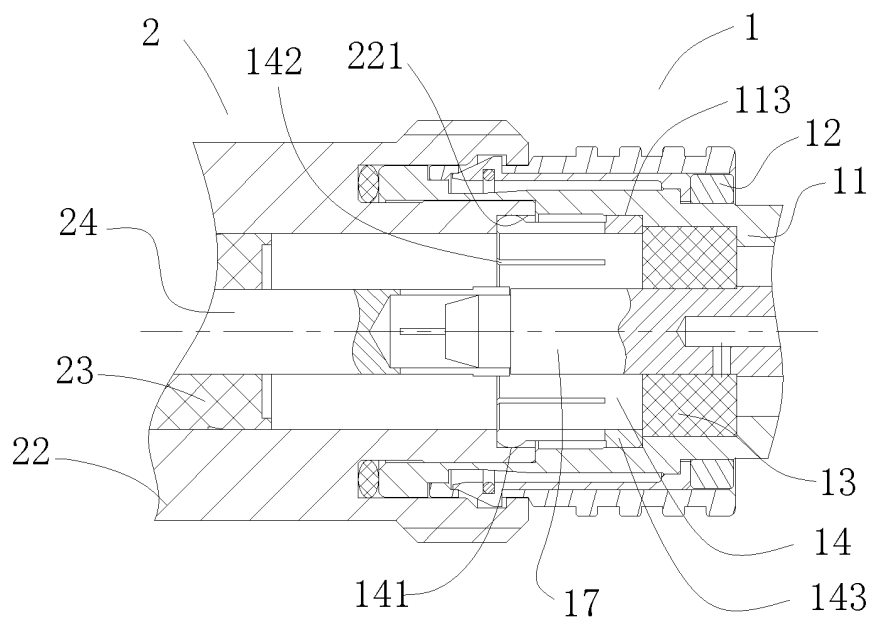


Fig. 1

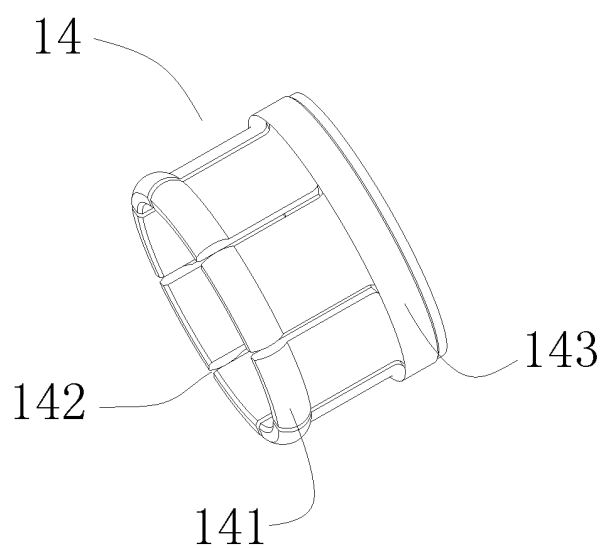


Fig. 2

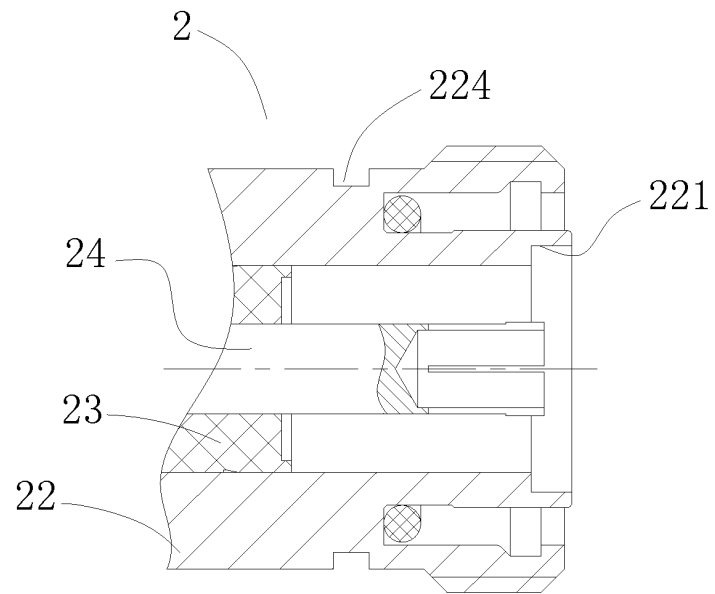


Fig. 3

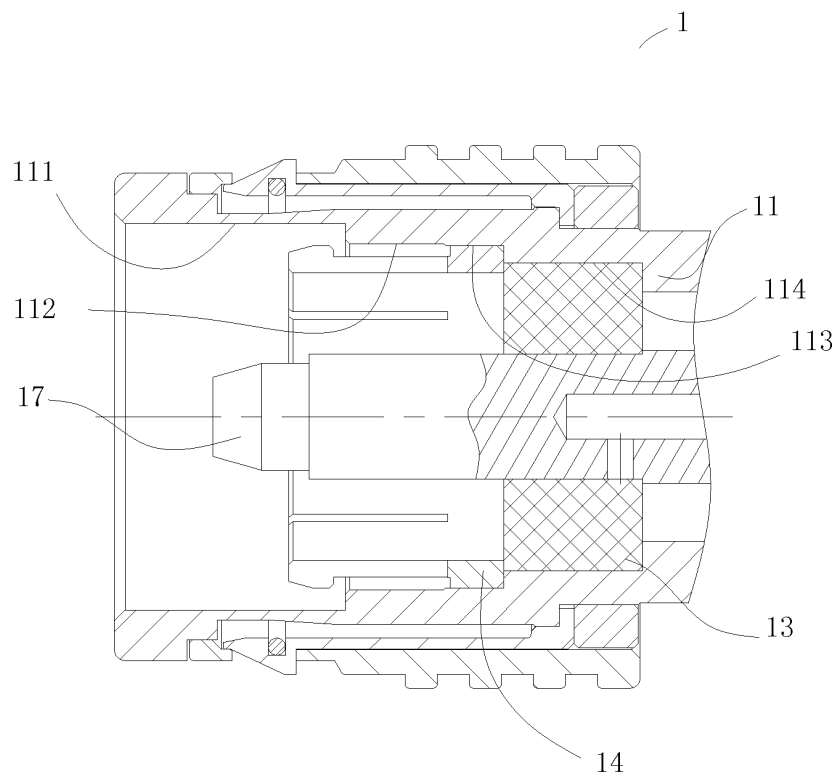


Fig. 4

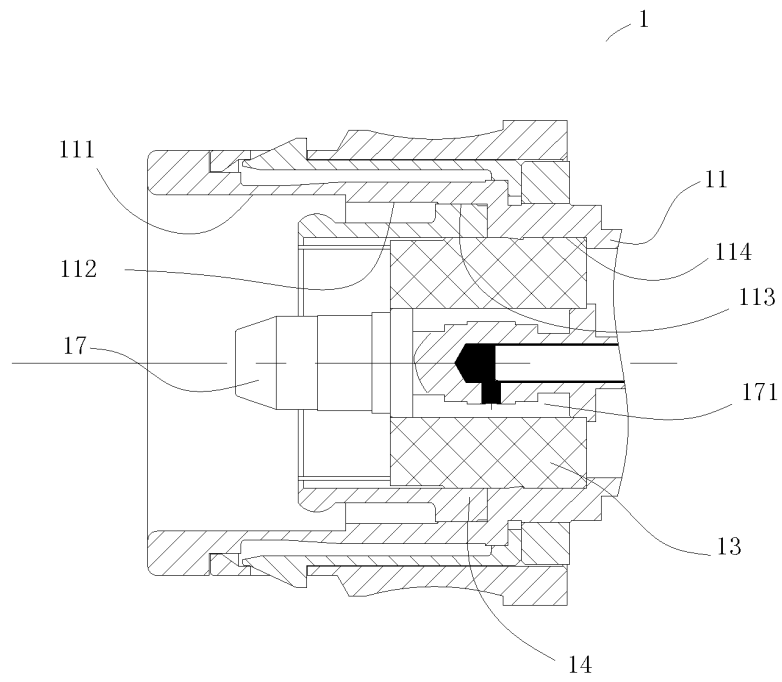


Fig. 5

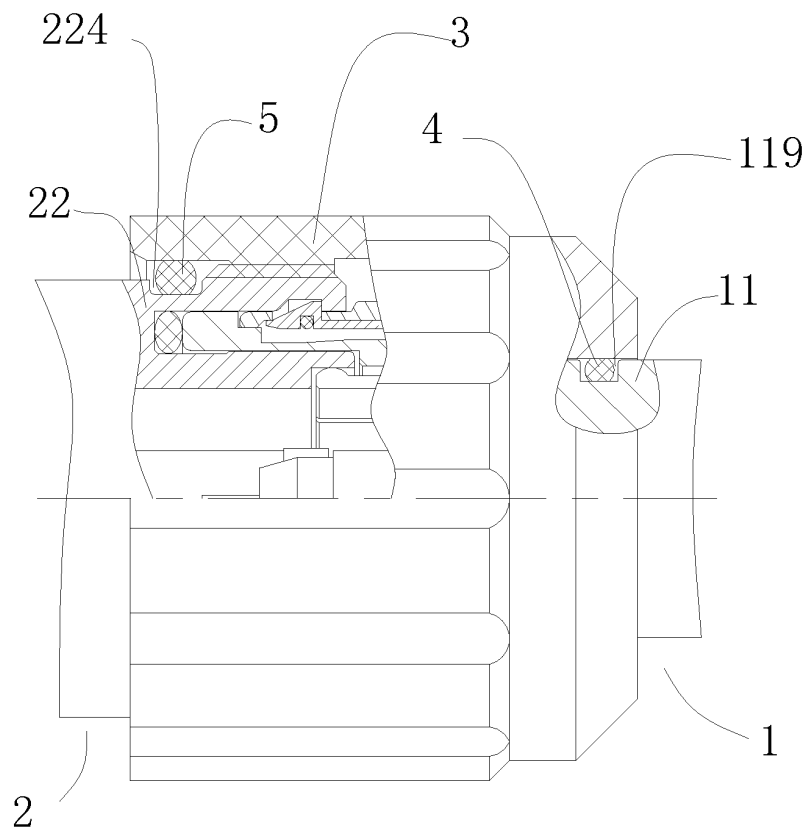


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2014/072054

A. CLASSIFICATION OF SUBJECT MATTER

H01R 13/627 (2006.01) i; H01R 13/639 (2006.01) n; H01R 24/02 (2006.01) n
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 13/-; H01R 24/-

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)

WPI, EPODOC, CNABS, CNTXT, CNKI: connector, plug, socket, coaxial, contact+, ring, elastic+, outer 2d conduct+, inner 2d conduct+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 1988285 A (NO.41 INST., CHINA ELECTRONIC SCIENCE AND TECHNOLOGY GROUP CO.) 27 June 2007 (27.06.2007) description, page 1, paragraph [0002] of background art, page 2, lines 5 to 7, page 3, paragraphs [0001] and [0002], and figures 1 to 5	1-3, 8-14
Y	CN 1988285 A (NO.41 INST., CHINA ELECTRONIC SCIENCE AND TECHNOLOGY GROUP CO.) 27 June 2007 (27.06.2007) description, page 1, paragraph [0002] of background art, page 2, lines 5 to 7, page 3, paragraphs [0001] and [0002], and figures 1 to 5	4-7
Y	CN 101552386 A (TYCO ELECTRONICS CORP.) 07 October 2009 (07.10.2009) description, page 4, paragraph [0003], and figures 3B and 3D	4
Y	GB 909129 A (BURNDY CORP.) 24 October 1962 (24.10.1962) figure 2	5, 6

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
18 April 2014

Date of mailing of the international search report
19 May 2014

Name and mailing address of the ISA
State Intellectual Property Office of the P. R. China
No. 6, Xitucheng Road, Jimenqiao
Haidian District, Beijing 100088, China
Facsimile No. (86-10) 62019451

Authorized officer

XIAO, Jia

Telephone No. (86-10) 62413367

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2014/072054

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