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(54) **FLEXIBLE TUBE CONNECTING STRUCTURE, AND VACUUM CLEANER EMPLOYING SAME**

(57) Provided are a hose connecting structure and a vacuum cleaner employing the same. The hose connecting structure includes a hose coupler (2) fixedly provided at an end portion of a hose (1), and an collar (3) rotatably connected with the hose (1) under a limitation of the hose coupler (2), wherein the collar (3) includes a collar body (31) and an elastic limiting portion (32) provided at one end of the collar body (31), and an inner diameter of the collar body (31) is not smaller than an outer diameter of the hose coupler (2). When the collar (3) passes into the hose (1) through the hose coupler (2), the elastic limiting portion (32) is elastically deformed to expand outward. After the collar (3) passes through the hose coupler (2), the elastic limiting portion (32) restores to an original state and is matched with the hose coupler (2) to limit the collar (3). Also provided is a vacuum cleaner employing a hose connecting structure. By disposing the elastic limiting portion (32) at one end of the collar body (31) of the collar (3), the collar (3) is covered around the hose (1) and is limited in cooperation with the hose coupler (2).

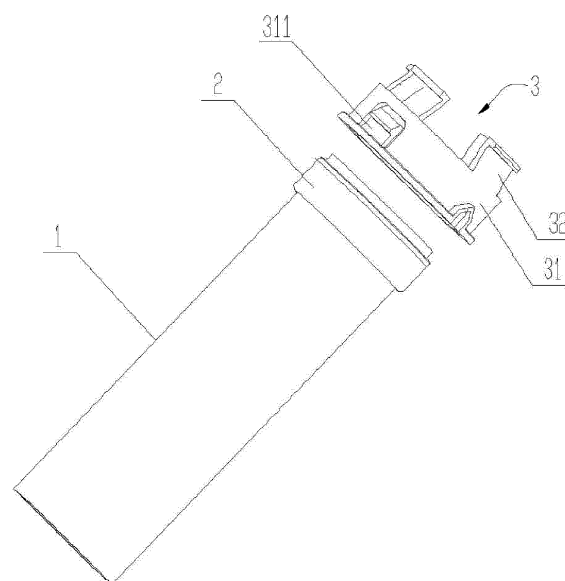


Fig. 1

Description

Cross-reference to related applications

[0001] The present application claims benefit of China Patent Application No. 201610074135.1, filed on February 02, 2016 and entitled "Hose connecting structure, and vacuum cleaner employing same", the contents of which are hereby incorporated by reference in its entirety.

Technical Field

[0002] The present disclosure relates to a technical field of connectors, and more particularly to a hose connecting structure and a vacuum cleaner employing the same.

Background

[0003] A main unit and handle of a vacuum cleaner are connected by a hose, and the hose can be rotated by providing a collar at an end portion of the hose. Meanwhile, for most vacuum cleaners, only the hose at the handle end can be rotated while the hose at an end connected with the main unit cannot be rotated.

[0004] In the related art, a structure for realizing a rotation of the hose is: before an end portion of the hose is glued to fix a hose coupler, a collar having an elastic buckle is sleeved, wherein the collar may be rotated relative to the hose. Then, the elastic buckle is matched with a buckle position on a handle body to realize the mounting of the collar on the handle body. Because the hose and the collar are rotatably connected, the hose and the hose structure can be rotated in the handle body.

[0005] The above-mentioned structure for realizing the rotation of the hose has the following problems: the first problem is that because only the hose at the handle body can be rotated, the hose is still twisted when a user uses the vacuum cleaner; the second problem is that because the hose is sleeved with the collar having the elastic buckle before the hose coupler is fixed, if a user forget to assemble the collar before the hose coupler is fixed, due to structural factors of the collar, the hose having the hose coupler cannot be matched with the collar.

[0006] For the above-mentioned problem, a hose connecting structure and a vacuum cleaner employing the same are provided, which can solve a problem in the related art that a hose cannot be sleeved with a collar after a hose coupler is mounted at an end portion of the hose.

Summary

[0007] Some embodiments of the present disclosure provide a hose connecting structure, which may solve the problem in the related art that a hose cannot be sleeved with a collar after a hose coupler is mounted at an end portion of the hose.

[0008] Some embodiments of the present disclosure also provide a vacuum cleaner, employing the above-mentioned hose connecting structure.

[0009] According to the embodiments of the present disclosure, the following technical solution is adopted:

A hose connecting structure includes a hose coupler fixedly disposed at an end portion of a hose, and a collar rotatably connected with the hose under limiting limitation of the hose coupler, wherein the collar includes a collar body and an elastic limiting portion provided at one end of the collar body, and an inner diameter of the collar body is not smaller than an outer diameter of the hose coupler.

[0010] When the collar passes into the hose through the hose coupler, the elastic limiting portion is elastically deformed to expand outward. After the collar passes through the hose coupler, the elastic limiting portion restores to an original state and is matched with the hose coupler to limit the collar.

[0011] In an exemplary embodiment, the elastic limiting portion is a plurality of elastic arm structures evenly distributed at one end of the collar body, and a circumference surrounded by inner walls of the elastic arm structures is larger than an outer diameter of the hose coupler in the presence of elastic deformation and is smaller than the outer diameter of the hose coupler in the absence of elastic deformation.

[0012] In an exemplary embodiment, each of the elastic arm structures includes an elastic arm main body inclined toward a center of the collar.

[0013] In an exemplary embodiment, a free end of the elastic arm main body is provided with a baffle structure perpendicular to an end portion thereof.

[0014] In an exemplary embodiment, an inner side of a junction between the elastic arm main body and the baffle structure is an arc-shaped structure.

[0015] In an exemplary embodiment, the hose coupler is fixedly connected with the hose through glue.

[0016] A vacuum cleaner includes a hose, wherein at least one end of the hose is provided with the above-mentioned hose connecting structure.

[0017] In an exemplary embodiment, the vacuum cleaner further includes a handle and a main unit. Both ends of the hose are provided with the hose connecting structure separately. The hose is connected with the handle and the main unit through the hose connecting structures respectively.

[0018] In an exemplary embodiment, the main unit and the handle are provided with a connector separately, and the connector is fixedly connected with a collar body of a collar.

[0019] In an exemplary embodiment, the connector is fixedly connected with the collar body of the collar through the cooperation of an elastic buckle and a limiting hole.

[0020] The beneficial effects of some embodiments of the present disclosure are: in some embodiments of the present disclosure, the elastic limiting portion is provided at one end of the collar body of the collar, and when the

hose having the hose coupler needs to be sleeved with the collar, the collar is covered around the hose and is limited in cooperation with the hose coupler by means of the deformation and restoration of the elastic limiting portion. Therefore, the hose having the hose coupler can be sleeved with the collar.

Brief Description of the Drawings

[0021]

Fig. 1 is a structural schematic view of a hose connecting structure provided by an exemplary embodiment of the present disclosure;

Fig. 2 is a structural schematic view of a hose connecting structure provided by an exemplary embodiment of the present disclosure in cooperation with a connector;

Fig. 3 is a structural schematic view of a hose assembly provided by an exemplary embodiment of the present disclosure; and

Fig. 4 is a local enlarged view of a part "I" in Fig. 3.

[0022] In the drawings,

1: hose; 2: hose coupler; 3: collar; 4: handle; 5: connector;

31: collar body; 32: elastic limiting portion;

51: limiting hole;

311: elastic buckle;

321: elastic arm main body; 322: baffle structure.

Detailed Description of the Embodiments

[0023] The technical solutions of the present disclosure will be further described below with reference to the accompanying drawings and exemplary implementation manners.

[0024] As shown in Fig. 1 to Fig. 4, the present implementation manner provides a hose connecting structure, comprising a hose coupler 2 fixedly provided at an end portion of a hose 1, and a collar 3 rotatably connected with the hose 1 under a limitation of the hose coupler 2, wherein the collar 3 includes a collar body 31 and an elastic limiting portion 32 provided at one end of the collar body 31, and an inner diameter of the collar body 31 is not smaller than an outer diameter of the hose coupler 2. When the collar 3 passes into the hose 1 through the hose coupler 2, the elastic limiting portion is elastically deformed to expand outward. After the collar 3 passes through the hose coupler 2, the elastic limiting portion 32 restores to an original state and is matched with the hose coupler 2 to limit the collar 3.

[0025] In the present implementation manner, the elastic limiting portion 32 is provided at one end of the collar body 31 of the collar 3, and when the hose having the hose coupler 2 needs to be sleeved with the collar 3, the collar 3 sleeves the hose 1 and is limited in cooperation

with the hose coupler 2 under the deformation and restoration of the elastic limiting portion 32. Therefore, the hose 1 having the hose coupler 2 can be sleeved with the collar 3.

[0026] In an exemplary embodiment, the elastic limiting portion 32 is a plurality of elastic arm structures evenly distributed at one end of the collar body 31, and a circumference surrounded by inner walls of the elastic arm structures is larger than an outer diameter of the hose coupler 2 in the presence of elastic deformation and is smaller than the outer diameter of the hose coupler 2 in the absence of elastic deformation.

[0027] The circumference is larger than the outer diameter of the hose coupler 2 in the presence of elastic deformation and is smaller than the outer diameter of the hose coupler 2 in the absence of elastic deformation. By means of the elastic deformation of the elastic arm structure, the hose 1 having the hose coupler 2 can be sleeved with the collar 3. By means of the restoration of the elastic arm structure, the collar 3 can be limited in cooperation with the hose coupler 2.

[0028] The presence of elastic deformation refers to that the elastic limiting portion 32 is opened under an action of the hose coupler 2. The absence of elastic deformation refers to that the elastic limiting portion 32 is restored to an original state after passing through the hose coupler 2. The original state here refers to a state where the elastic limiting portion 32 is located usually.

[0029] In an exemplary implementation, the elastic arm structure includes an elastic arm main body 321 inclined toward a center of the collar 3. By using the simple structure, the above-mentioned elastic deformation and restoration functions can be achieved.

[0030] A free end of the elastic arm main body 321 is provided with a baffle structure 322 perpendicular to an end portion thereof. By providing the baffle structure 322, a contact area between the elastic arm and the hose coupler 2 can be increased, thereby improving the structural strength of the elastic arm and the rotation stability of the collar 3.

[0031] The inner side of a junction between the elastic arm main body 321 and the baffle structure 322 is an arc-shaped structure. The inner side here refers to one side of the collar 3 contacted with the hose coupler 2. By setting the part as the arc-shaped structure, the rotation stability of the collar 3 can be further improved.

[0032] The hose coupler 2 is fixedly connected with the hose 1 through glue. The hose coupler 2 and the hose 1 are fixedly connected through glue, so that the convenience, firmness and sealing property of connection therebetween can be improved. Of course, it does not rule out the use of other connection manners such as threaded connection.

[0033] In the present implementation manner, a vacuum cleaner is also provided. The vacuum cleaner includes a hose 1, wherein at least one end of the hose 1 is provided with the above-mentioned hose connecting structure.

[0034] In an exemplary implementation, the vacuum cleaner further includes a handle 4 and a main unit. Both ends of the hose 1 are provided with the hose connecting structure separately. The hose is connected with the handle 4 and the main unit through the hose connecting structures respectively. The hose 1 is connected with the main unit and the handle 4 through the hose connecting structures respectively, and therefore the handle end and main unit end of the hose 1 may be rotated. Thus, in the process of using the vacuum cleaner, the problem of hose winding can be prevented.

[0035] An exemplary manner of cooperation of the hose connecting structure with the main unit and the handle 4 is that: the main unit and the handle 4 are provided with a connector 5 separately, wherein the connector 5 on the handle 4 and the handle 4 are connected together and form a whole structure, and the connector 5 on the main unit is an independent connecting member. The connector 5 is fixedly connected with a collar body 31 of a collar 3. In an exemplary implementation, the connector 5 is fixedly connected with the collar body 31 of the collar 3 through the cooperation of an elastic buckle 311 and a limiting hole 5. By means of the cooperation of the elastic buckle 311 and the limiting hole 5, the connector 5 and the collar 3 can be conveniently connected and detached. Further preferably, an operation button connected with the elastic buckle 311 is also comprised. By pressing the operation button, the elastic buckle 311 and the limiting hole 5 can be disengaged, thereby further facilitating detaching of the connector 5 and the collar 3. As a preferred manner, the elastic buckle 311 is provided on the collar body 31, and the limiting hole is provided on the connector 5.

[0036] The technical principle of the present disclosure has been described above with reference to exemplary embodiments. These descriptions are only for explaining the principle of the present disclosure, and cannot be interpreted in any way as limiting the scope of the present disclosure. Based on the explanation herein, those skilled in the art may associate other exemplary embodiments of the present disclosure with no creative work, and these modes all fall within the scope of protection of the present disclosure.

Claims

1. A hose connecting structure, comprising a hose coupler (2) fixedly provided at an end portion of a hose (1), and a collar (3) rotatably connected with the hose (1) under a limitation of the hose coupler (2), wherein the collar (3) comprises a collar body (31) and an elastic limiting portion (32) provided at one end of the collar body (31), and an inner diameter of the collar body (31) is not smaller than an outer diameter of the hose coupler (2); and when the collar (3) passes into the hose (1) through the hose coupler (2), the elastic limiting portion (32) is elastically deformed to expand outward, and after the collar (3) passes through the hose coupler (2), the elastic limiting portion (32) restores to an original state and is matched with the hose coupler (2) to limit the collar (3).
2. The hose connecting structure as claimed in claim 1, wherein the elastic limiting portion (32) is a plurality of elastic arm structures evenly distributed at one end of the collar body (31), and a circumference surrounded by inner walls of the elastic arm structures is larger than an outer diameter of the hose coupler (2) in the presence of elastic deformation and is smaller than the outer diameter of the hose coupler (2) in the absence of elastic deformation.
3. The hose connecting structure as claimed in claim 2, wherein each of the elastic arm structures comprises an elastic arm main body (321) inclined toward a center of the collar.
4. The hose connecting structure as claimed in claim 3, wherein a free end of the elastic arm main body (321) is provided with a baffle structure (322) perpendicular to an end portion of the elastic arm main body (321).
5. The hose connecting structure as claimed in claim 4, wherein an inner side of a junction between the elastic arm main body (321) and the baffle structure (322) is of an arc-shaped structure.
6. The hose connecting structure as claimed in claim 1, wherein the hose coupler (2) is fixedly connected with the hose (1) through glue.
7. A vacuum cleaner, comprising a hose, wherein at least one end of the hose (1) is provided with the hose connecting structure as claimed in any one of claims 1 to 6.
8. The vacuum cleaner as claimed in claim 7, further comprising a handle (4) and a main unit, wherein both ends of the hose (1) are provided with the hose connecting structure separately, and the hose is connected with the handle (4) and the main unit through the hose connecting structures respectively.
9. The vacuum cleaner as claimed in claim 8, wherein the main unit and the handle (4) are provided with a connector (5) separately, and the connector (5) is fixedly connected with a collar body (31) of a collar (3).
10. The vacuum cleaner as claimed in claim 9, wherein the connector (5) is fixedly connected with the collar body (31) of the collar (3) through a cooperation of an elastic buckle (311) and a limiting hole (51).

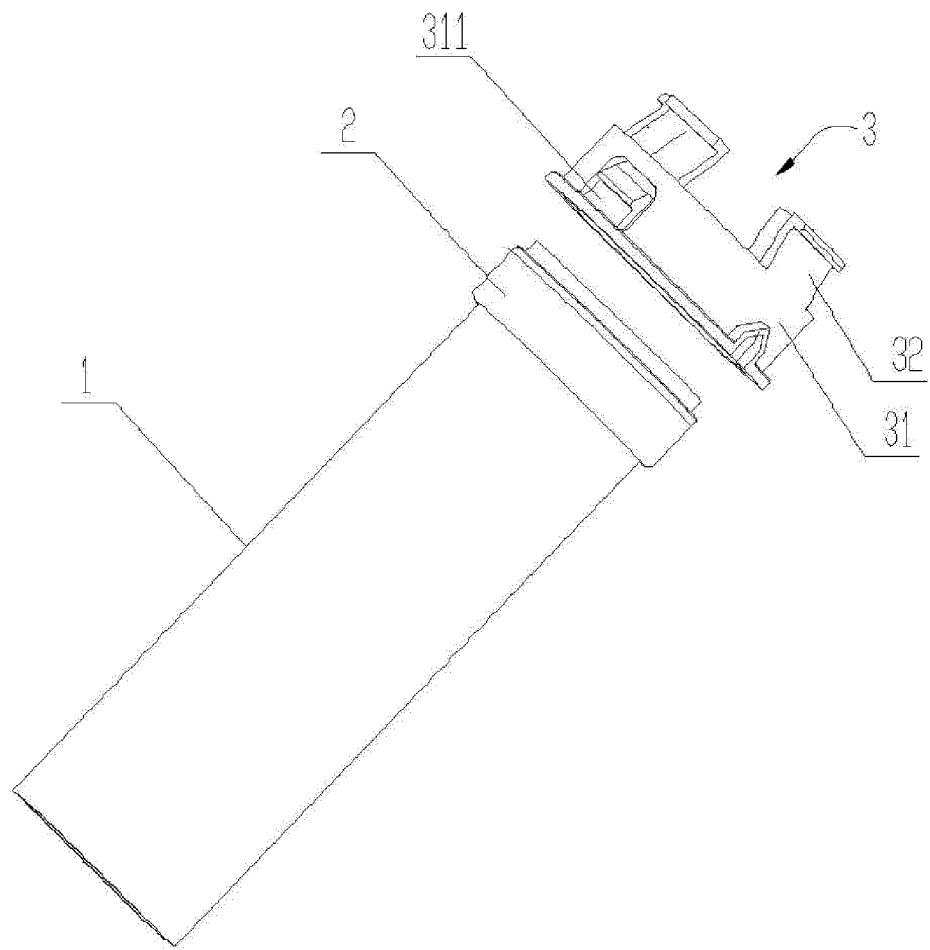


Fig. 1

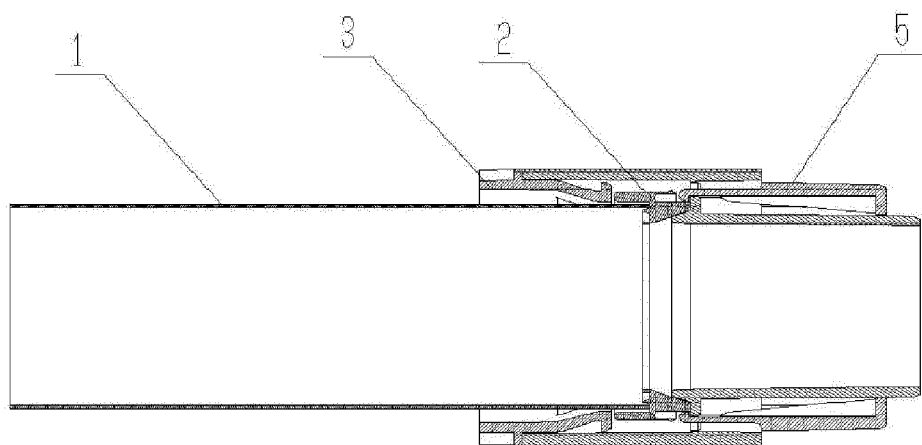


Fig. 2

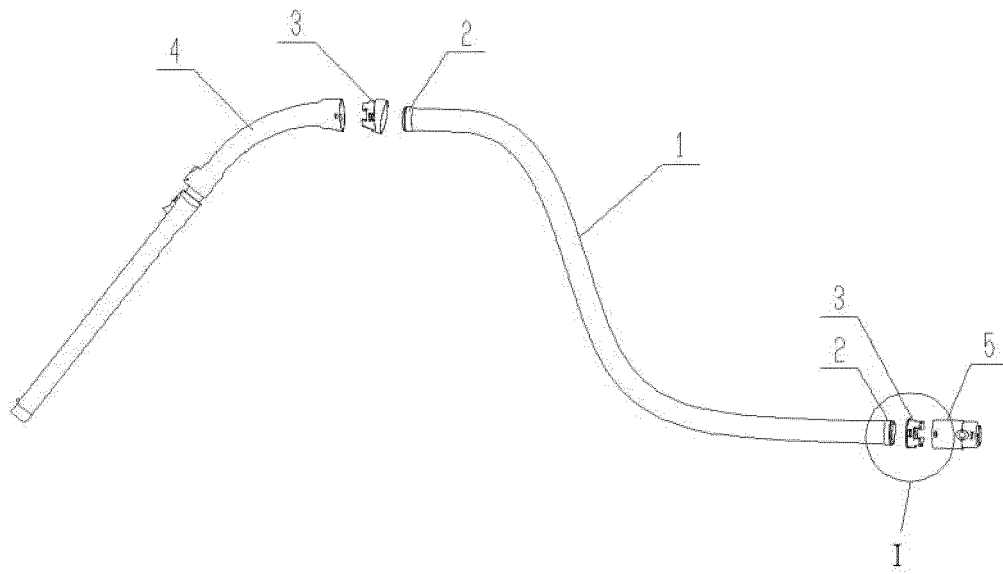


Fig. 3

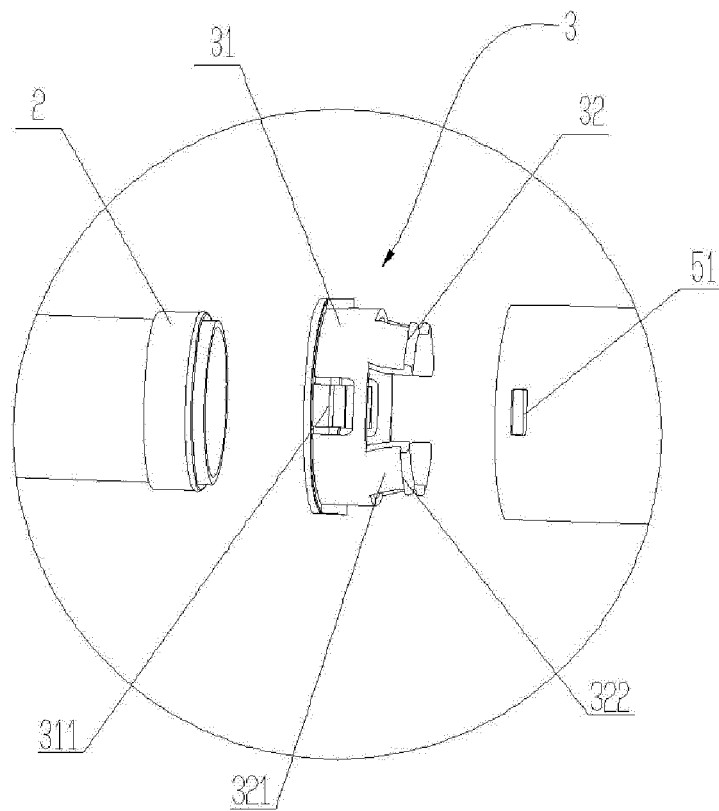


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2017/072845

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/24 (2006.01) i

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)

A47L 9/-, A47L 5/-

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)

CNKI, CNPAT, WPI, EPODOC: dust collector, connector, retainer ring, reply, inside diameter, outer diameter, hose, hosepipe, soft, flexible, tube, pipe, conduit, duct, cleaner, dust, dirt, collector, catcher, junction, connection, joint, collar, ring, elastic, limit+, spacing, fix, mount+, deform+, recovery, reinstate, restor+, inner, inside, outer, outside, diameter

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 105534411 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 04 May 2016 (04.05.2016), claims 1-10	1-10
PX	CN 205849392 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 04 January 2017 (04.01.2017), claims 1-10	1-10
A	CN 202950613 U (NINGBO DAHUA ELECTRIC APPLIANCE CO., LTD.), 29 May 2013 (29.05.2013), description, paragraphs [0027]-[0031], and figures 1-5	1-10
A	CN 103486373 A (FOSHAN RIFENG ENTERPRISE CO., LTD. et al.), 01 January 2014 (01.01.2014), the whole document	1-10
A	CN 2320193 Y (SUZHOU NEW DISTRICT WEIER ELECTRICAL EQUIPMENT CO., LTD.), 26 May 1999 (26.05.1999), the whole document	1-10
A	CN 202950612 U (NINGBO DAHUA ELECTRIC APPLIANCE CO., LTD.), 29 May 2013 (29.05.2013), the whole document	1-10

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 12 April 2017 (12.04.2017)	Date of mailing of the international search report 04 May 2017 (04.05.2017)
Name and mailing address of the ISA/CN: 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 WANG, Ning Telephone No.: (86-10) 52871187

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/072845

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2017/072845

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CN 105534411 A	04 May 2016	None	
CN 205849392 U	04 January 2017	None	
CN 202950613 U	29 May 2013	None	
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CN 202950612 U	29 May 2013	None	
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Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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