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(54) SEALED TERMINAL BLOCK

(57) A sealed connection terminal comprises a body, the body is provided with at least one conductive post mounting hole penetrating through the body, and the conductive post mounting hole comprises a first port; each conductive post is installed in the corresponding conductive post installation hole, and each first insulation part is located between the corresponding conductive post and the body and used for connecting the conductive post to the body in an insulation mode. Wherein the diameter of the conductive post is within the range of 5mm to 7mm. The conductive post of the sealed wiring terminal has a large diameter, so that the sealed wiring terminal has a large cross section, and the sealed wiring terminal is suitable for operating conditions with low voltage and high working current.

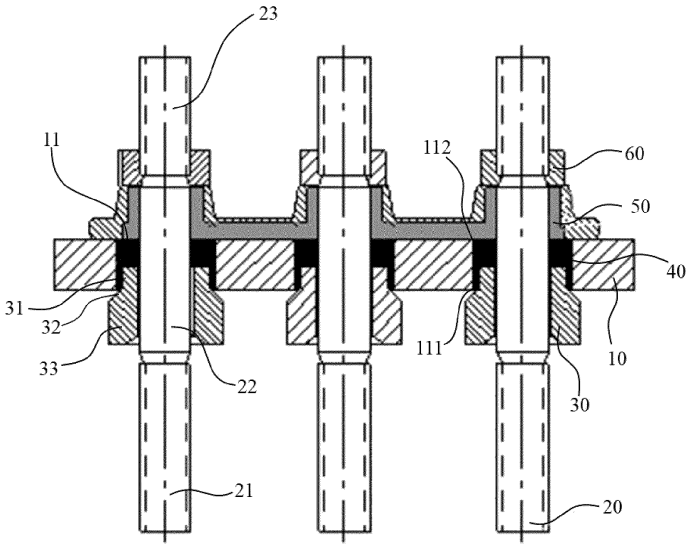

Figure 2

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Description

Technical field

[0001] The disclosure relates to the field of electrical terminals, in particular to a sealed connection terminal.

Background Technique

[0002] Sealed terminal blocks are widely used in the current industrial market. With the development of the electric vehicle industry, the use of sealed terminal blocks is becoming more and more extensive, and there are more and more types of sealed terminal blocks. FIG. 1 is a sealed connection terminal used in the prior art, which includes a base 1, a conductive core 2 and a glass body 3 sealing the base 1 and the conductive core 2. The conductive core of the sealed connection terminal in the prior art has a relatively small diameter (usually about 3.2mm), and therefore has a small cross-section. Therefore, the sealed connection terminal can only be used in high-voltage and low-current conditions, and cannot satisfy the current electric vehicle industry which requires low voltage and high operating current. In addition, since the sealing terminal in the prior art has a small diameter, it is not conducive to tapping the outer peripheral portion of the conductive core to form a screw thread, and therefore is not conducive to the easy connection or disassembly of the sealed connection terminal with other components (such as another sealed connection terminal or nuts).

[0003] Therefore, it is necessary to improve the sealed connection terminal in the prior art, so that the sealed connection terminal is suitable for low-voltage and high-current applications, and the sealed connection terminal can be easily connected to or disassembled from other components.

Summary

[0004] In order to solve the above problems, an object of the present disclosure is to provide a sealed connection terminal, which can be applied to operating conditions with low voltage and high working current.

[0005] Another object of the present disclosure is to provide a sealed connection terminal that can be easily connected to or disassembled from other components.

[0006] The sealed connection terminal according to the present disclosure comprises: a body, the body is provided with at least one conductive post installation hole penetrating through the body, and the conductive post installation hole includes a first port; at least one conductive post, each of the conductive posts are all installed in the corresponding conductive post mounting holes, and at least one first insulating part, each of the first insulating parts is located between the corresponding conductive post and the body, so that the conductive post is insulatedly connected to the body; wherein, the diameter of the conductive post is in the range of 5mm-7mm.

[0007] The sealed connection terminal as described above, wherein the outer peripheral portion of at least one end portion of the conductive post is provided with threads.

[0008] The sealed connection terminal as described above, wherein the first insulating component includes a ceramic ring, and the ceramic ring is sleeved on the outside of the conductive post and sealed to the first port.

[0009] The above-mentioned sealed terminal, wherein the conductive post includes: a first end, a second end, and an intermediate portion connecting the first end and the second end, and the first end of the conductive post and the second end of the conductive post each having a peripheral portion provided with threads, the intermediate portion of the conductive post has a substantially flat outer surface, and the ceramic ring is sleeved over the outer surface of the intermediate portion of the conductive post.

[0010] The sealed connection terminal as described above, wherein the first insulating component further includes a glass seal, and the glass seal is located between the body, the conductive post and the ceramic ring and connects the body, the conductive post and the ceramic ring are insulatedly connected.

[0011] The sealed connection terminal as described above, wherein the ceramic ring includes a narrowed portion at an end close to the body, and the outer diameter of the narrowed portion is smaller than the diameter of a first port of the conductive post installation hole, so that the narrowing part is inserted into the installation hole of the conductive post through the first port.

[0012] The sealed connection terminal as described above, wherein the conductive post installation hole further includes a second port located at the other end of the conductive post installation hole relative to the first port, and the sealed connection terminal further includes a second insulating, the second insulating component connects the conductive post to the body in an insulating manner and seals it to the second port of the conductive post installation hole.

[0013] The sealed connection terminal as described above, wherein the second insulating component includes an epoxy resin member, and the epoxy resin member covers at least a part of the second port of the conductive post installation hole and the conductive post at least a portion of the exterior surface.

[0014] The sealed connection terminal as described above, wherein, the second insulating part includes a cover sheet, and the cover sheet covers the epoxy resin part and completely seals the second port.

[0015] According to the above-mentioned sealed connection terminal, the numbers of the conductive posts, the installation holes of the conductive posts and the first insulating parts are three respectively.

[0016] The sealed terminal as described above, wherein the sealed terminal further includes at least one

nut, each nut is sleeved on the outside of the corresponding conductive post and screwed to the conductive post, and each nut is located above the second insulating part and fixed relative to the second insulating part.

[0017] Since the diameter of the conductive post of the sealed connection terminal of the present disclosure is much larger than that of the conductive core of the prior art, the conductive post of the present disclosure has a larger cross section, so that the sealed connection terminal of the present disclosure is suitable for low voltage and high working current conditions; the outer periphery of at least one end of the conductive post is provided with a screw thread, so that the sealed connection terminal of the present disclosure can be easily threaded with other components such as another sealed connection terminal or nut or easily removed. The first port of the conductive post installation hole is completely sealed by the ceramic ring, which improves the sealing of the sealed connection terminal; and the second port of the conductive post installation hole is completely sealed by the second insulating part, which further improves the airtightness of the sealed connection terminal. At least a part of the outer surface of the conductive post is covered by the second insulating component, so that the insulating area of the end face of the conductive post is increased, and the insulating performance of the sealed connection terminal is greatly improved.

Description of Drawings

[0018]

FIG. 1 is a schematic diagram of a sealed connection terminal in the prior art;

Fig. 2 is a schematic diagram of a sealed connection terminal according to the present disclosure.

Detailed Description

[0019] Hereinafter, the sealed connection terminal of the present disclosure will be described with reference to the accompanying drawings.

[0020] Although the terms first, second, third, etc. may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be referred to by these terminology restrictions. These terms may be only used to distinguish one element, component, region, layer or section from another region, layer or section. Terms such as "first," "second," and other numerical terms when used herein do not imply a sequence or order unless clearly indicated by the context. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the example embodiments.

[0021] FIG. 1 is a schematic diagram of a sealed connection terminal in the prior art; FIG. 2 is a schematic diagram of a sealed connection terminal according to the present disclosure. Referring to FIG. 2 , the sealed connection terminal of the present disclosure includes a body 10 , at least one conductive post 20 and at least one first insulating component. The body 10 is made of metal and is provided with at least one conductive post installation hole 11 passing through the body 10, each conductive post installation hole 11 includes a first port 111 and a second port 112 located in the conductive post installation hole 11 at the opposite end relative to the first port 111. The number of the conductive posts 20 corresponds to the number of the conductive post installation holes 11, that is, each conductive post 20 is installed in the corresponding conductive post installation hole 11. Each first insulating component is located between the corresponding conductive post 20 and the body 10 for insulatingly connecting the conductive post 20 to the body 10. Further, the number of the conductive posts 20 also corresponds to the number of the first insulating components.

[0022] In this embodiment, the diameter of the conductive post 20 is in the range of 5mm-7mm, preferably in the range of 5.5mm-6.5mm, more preferably about 6.35mm. The diameter of the conductive column of the sealed terminal of the present invention is much larger than that of the conductive core (usually about 3.2mm) of the prior art, so it has a larger cross section, so that the sealed terminal of the present invention is suitable for low voltage and high operating current conditions.

[0023] Referring to FIG. 2 , the conductive post 20 includes a first end portion 21 , a second end portion 23 and a middle or intermediate portion 22 connecting the first end portion 21 and the second end portion 23 . The outer periphery of at least one of the first end 21 and the second end 23 of the conductive post 20 is provided with a screw thread, so that the sealed connection terminal can be easily threaded with other components such as another sealed connection terminal or nut or conveniently disassembled from other components. In this embodiment, the outer peripheral portions of the first end portion 21 and the second end portion 23 of the conductive post 20 are provided with threads, while the middle portion 22 of the conductive post 20 has a substantially flat outer surface. However, it is conceivable that the outer periphery of only one of the first end 21 and the second end 23 of the conductive post 20 is threaded and that the middle portion 22 of the conductive post 20 has a substantially flat outer surface, or that the entire outer periphery of the conductive post 20 , that is, the outer periphery of the first end 21 , the second end 23 and the middle portion 22 are all provided with threads.

[0024] Referring to FIG. 2 , each conductive post 20 is installed into the body 10 through a corresponding first insulating part. The first insulating part includes a ceramic ring 30 and a glass seal 40 . The ceramic ring 30 is sleeved on the outside of the conductive post 20, preferably on the outside of the middle part 22 of the con-

ductive post 20, and then the conductive post 20 and one end of the ceramic ring 30 are inserted into the conductive post mounting hole 11 of the body 10, Specifically inserted into the first port 111 of the conductive post installation hole 11, so that the ceramic ring 30 is sealed to the first port 111, and then the glass seal 40 is formed between the outer wall of the conductive post 20, the ceramic ring 30 and the body 10 and allowed to cure so that the three are connected together insulatively. Referring to FIG. 2, the middle part 22 of the conductive post 20 is fixed in the center of the conductive post installation hole 11 through the ceramic ring 30 and the glass seal 40 , and the first end 21 and the second end 23 of the conductive post 20 are exposed on upper and lower sides of the body 10 respectively.

[0025] Preferably, referring to FIG. 2, the ceramic ring 30 includes a narrowing portion 31 at an end close to the body 10, an extension portion 33 at an end far from the body 10, and the ceramic ring 30 includes a tapered portion 32 connecting the extension portion 33 and the narrowing portion 31. The outer diameter of the extension part 33 is larger than the diameter of the first port 111 of the conductive post installation hole 11, the outer diameter of the tapered part 32 gradually decreases in the direction from the extension part 33 to the narrowing part 31, and the outer diameter of the narrowing part 31 is smaller than the diameter of the first port 111 such that the narrowing part 31 is inserted into the conductive post installation hole 11 through the first port 111, the tapered part 32 is against the edge of the first port 111 of the conductive post installation hole 11, and the extension part 31 is arranged outside the first port 111 of the conductive post installation hole 11, which makes the first port 111 of the conductive post installation hole 11 completely sealed by the ceramic ring 30, improving the sealing performance of the sealed connection terminal.

[0026] Preferably, referring to FIG. 2 , the sealed connection terminal further includes a second insulating part disposed outside the conductive post 20 and used for insulatingly connecting the conductive post 20 to the body 10 . Specifically, the second insulating component includes an epoxy resin part 50 and a cover sheet 60, the epoxy resin part 50 covers at least a part of the second port 112 of the conductive post mounting hole 11 and at least part of the outer surface of the conductive post 20, and the cover sheet 60 overlies the epoxy resin member 50 and completely seals the second port 112. Preferably, the sealed connection terminal further includes at least one nut 70, each nut 70 is sleeved on the outside of the corresponding conductive post 20 and screwed to the conductive post 20, and each nut 70 is located above the second insulating member and fixed relative to the second insulating part. If the nut 70 is not provided, a torsion force will be generated on the conductive column 20 when the sealed terminal of the present disclosure is threadedly connected with the terminal at the user end and tightened. The nut 70 is used to prevent the generation of this torque, thereby preventing damage to the glass seal. Specifically, when the sealed connection terminal of the present disclosure is screwed and fastened to the terminal at the user end, the user can clamp the nut 70 to counteract the generated torque. The second port 112 of the conductive post installation hole 11 is completely sealed by the second insulating part, which improves the sealing performance of the sealed insulated terminal, and at least a part of the outer surface of the conductive post 20 is covered by the second insulating part, so that the insulated area at the end face of the conductive post is increased, which greatly improves the insulation performance of the sealed terminal.

[0027] In the sealed connection terminal of this embodiment, the numbers of the conductive posts 20 , the conductive post installation holes 11 , the nuts 70 and the first insulating components are three respectively. It is contemplated, however, that there may be any number of conductive posts 20.

[0028] Since the diameter of the conductive post of the sealed terminal of the present dislosure is much larger than that of the conductive core of the prior art, the conductive post of the present disclosure has a larger cross section, so that the sealed connection terminal of the present disclosure is suitable for low voltage and high working current conditions; the outer circumference of at least one end of the conductive column is provided with a screw thread, so that the sealed terminal of the present invention can be easily threaded with other components such as another sealed connection terminal or nut or easily removed. The first port of the conductive post installation hole is completely sealed by the ceramic ring, which improves the sealing of the sealed insulated terminal; and the second port of the conductive post installation hole is completely sealed by the second insulating part, which further improves the airtightness of the sealed connection terminal, at least a part of the outer surface of the conductive post is covered by the second insulating component, so that the insulating area of the end face of the conductive post is increased, and the insulating performance of the sealed terminal is greatly improved.

[0029] The preferred embodiments of the present disclosure have been described above as examples, but the protection scope of the present disclosure is not limited thereto. Variations and modifications made within the spirit and principles of the disclosure all fall within the scope of the disclosure.

Claims

1. A sealed terminal, comprising:

   a body, the body is provided with at least one conductive post mounting hole penetrating the body, and the conductive post installation hole includes a first port;

   at least one conductive post, each conductive post is installed in a corresponding conductive

post mounting hole, and
at least one first insulating component, each first insulating component is located between the corresponding conductive post and the body, for insulatingly connecting the conductive post to the body;
characterized in that a diameter of the conductive post is in the range of 5mm-7mm.

2. The sealed terminal according to claim 1, wherein an outer peripheral portion of at least one end of the conductive post is provided with a screw thread.

3. The sealed terminal according to claim 1, wherein the first insulating component comprises a ceramic ring, and the ceramic ring is sleeved on the outside of the conductive post and sealed to the first port.

4. The sealed terminal according to claim 3, wherein the conductive post comprises: a first end, a second end, and an intermediate portion connecting the first end and the second end, the first end and the second end of the conductive post having outer peripheral portions that are threaded, the intermediate portion of the conductive post has a substantially flat outer surface, and the ceramic ring is sleeved on the conductive post over the outer surface of the intermediate portion of the conductive post.

5. The sealed terminal according to claim 3, wherein the first insulating component further comprises a glass seal, the glass seal is located between the body, the conductive post and the ceramic ring and wherein the glass seal insulatingly connects the body, the conductive post and the ceramic ring.

6. The sealed terminal according to any one of claims 3 to 5, wherein the ceramic ring includes a narrowed portion at an end close to the body, and the outer diameter of the narrowed portion is smaller than the diameter of the conductive post, wherein a diameter of the first port of the post mounting hole is such that the narrowing portion is inserted into the conductive post mounting hole through the first port.

7. The sealed terminal according to claim 1, wherein the conductive post installation hole further includes a second port located at the other end of the conductive post installation hole relative to the first port, and the sealed terminal further includes a second insulating component, the second insulating component insulatingly connects the conductive post to the body i and seals the conductive post to the second port of the conductive post installation hole.

8. The sealed terminal according to claim 7, wherein the second insulating component comprises an epoxy resin component, and the epoxy resin component covers at least the second port of the conductive post mounting hole and at least a portion of the outer surface of the conductive post.

9. The sealed terminal according to claim 8, wherein the second insulating member comprises a cover sheet, and the cover sheet covers the epoxy resin component and completely seals the second port.

10. The sealed terminal according to any one of claims 1 to 5, **characterized in that**, the number of the conductive posts, the installation holes of the conductive posts and the first insulating parts is three, respectively.

11. The sealed terminal according to any one of claims 7 to 9, **characterized in that** the sealed terminal further comprises at least one nut, each of which is sleeved on the corresponding conductive post and threadedly connected with the conductive post, and each of the nuts is located above the second insulating component and fixed relative to the second insulating component.

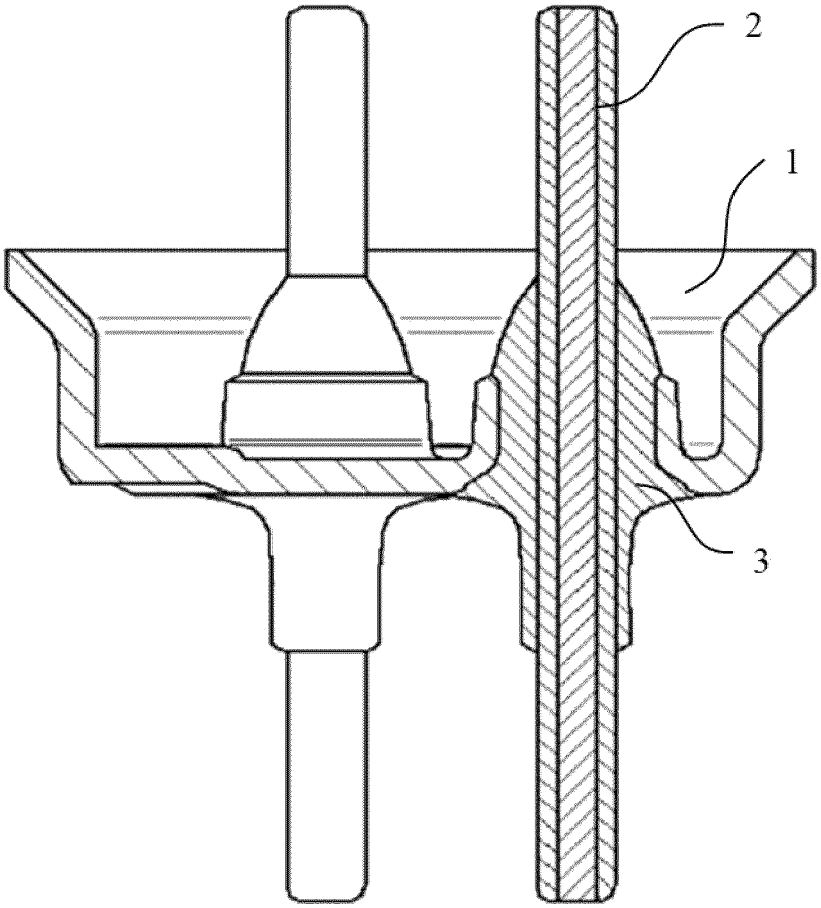

Figure 1

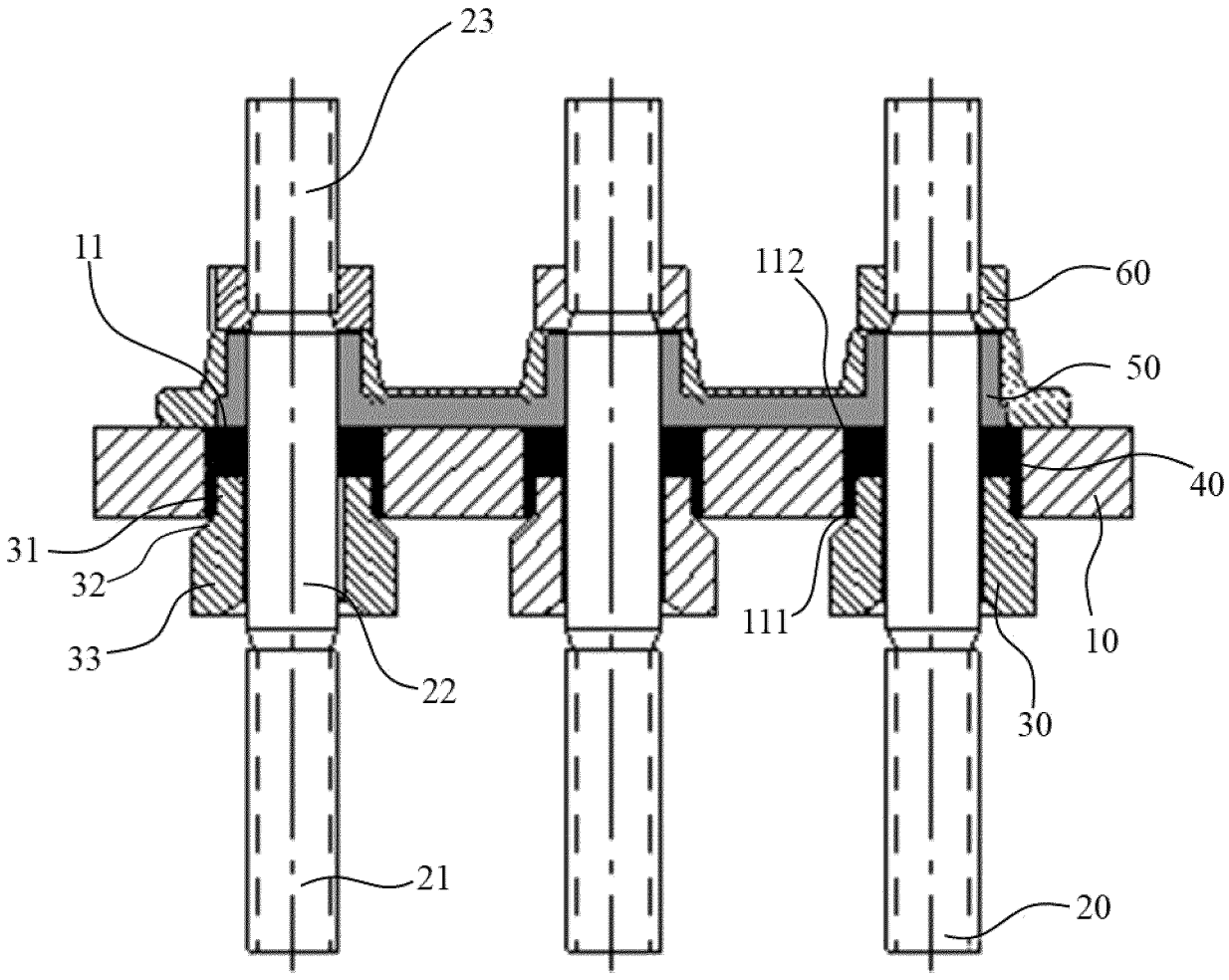

Figure 2

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EUROPEAN SEARCH REPORT

Application Number
EP 24 15 1483

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* column 10, line 35 - line 36; figure 4 *	6	
X	CN 211 404 863 U (SHANDONG ZHONGCHENG NEW ENERGY CO LTD) 1 September 2020 (2020-09-01) * abstract; figures 1,3 *	1,2,4,7, 10,11	
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Y	US 2016/020547 A1 (KHADKIKAR PRASAD S [US] ET AL) 21 January 2016 (2016-01-21) * figure 2 *	6	

TECHNICAL FIELDS SEARCHED (IPC)

H01B
H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	31 May 2024	Corrales, Daniel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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