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(54) **FLAT MOP**

(57) Disclosed is a flat mop, including a mop rod assembly and a mop head assembly arranged at one end of the mop rod assembly. Moving members available for synchronously opening outwards or closing inwards are slidably mounted at two sides of the mop head assembly. The mop head assembly includes a mounting housing and a cloth clamping plate for clamping a wiping cloth; sliding chambers for sliding of the moving members are formed between the mounting housing and the cloth clamping plate, and side plates for cooperating with the cloth clamping plate to clamp the wiping cloth are arranged at lower ends of the moving members. The mounting housing is provided with guiding convex edges inclined downward, and the moving members are provided with avoiding grooves corresponding to the guiding convex edges. When the wiping cloth is replaced, the moving members drive the side plates to move outwards, and the guiding convex edges guide the moving members and the side plates to make oblique motion downward, so as to allow lower edges of the side plates to be lower than the cloth clamping plate, so that a cloth clamping space is formed by inner side ends of the side plates and an outer side end of the cloth clamping plate. The present disclosure provides a flat mop, which makes it easier for the side plates and the cloth clamping plate to clamp the wiping cloth, thus ensuring the wiping cloth to be clamped more firmly.

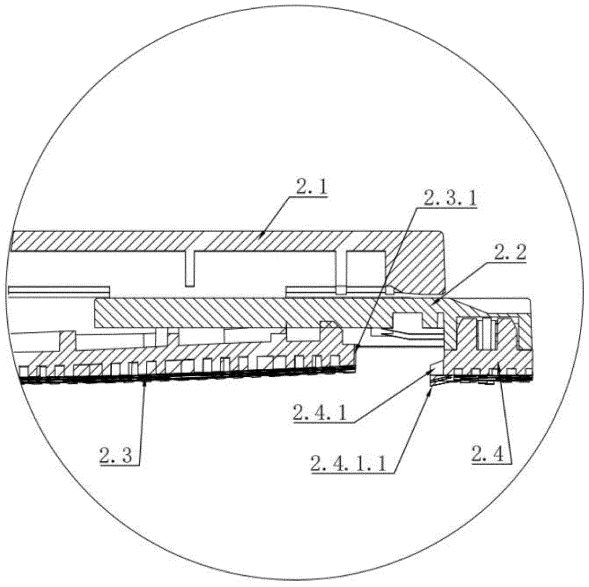

FIG. 2

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Description

Technical Field

[0001] The present disclosure relates to the technical field of cleaning supplies, and in particular to a flat mop.

Background

[0002] A flat mop is a commonly used cleaning tool, which includes a mop rod and a flat mop head, the mop rod is hinged to the mop head, and a wiping cloth is arranged on a bottom surface of the mop head. The flat mops on the market now fix the wiping cloth by clamping same. When the wiping cloth is removed, the clamping of the wiping cloth is released by the mop head, thereby allowing the wiping cloth to detach from the mop head. However, the problem is that the existing mop head on the market moves horizontally through side plates thereof to realize the clamping and mounting of the wiping cloth. Such mounting method is not easy to clamp the wiping cloth, and the wiping cloth is prone to detach from the mop head during work, which is time-consuming and labor-consuming.

Summary

(I) Technical problem to be solved

[0003] In view of this, the embodiments of this description provide a flat mop, making it easier to clamp wiping cloth.

(II) Technical solution

[0004] In order to realize the above purpose, the present disclosure provides the following technical solutions: a flat mop includes a mop rod assembly and a mop head assembly arranged at one end of the mop rod assembly, where the mop head assembly includes a mounting housing, a cloth clamping plate for clamping a wiping cloth, and moving members slidably mounted at two sides of the mop head assembly, wherein the moving members are able to synchronously move outwards to be opened or move inwards to be closed; a cloth clamping space is formed by inner side ends of the moving members and an outer side end of the cloth clamping plate.

[0005] In some embodiments, when the wiping cloth is clamped, the moving members can be opened obliquely downward to the outside; and after the wiping cloth is driven, the moving members are retracted obliquely upward and inward to allow the wiping cloth to be clamped.

[0006] In some embodiments, sliding chambers for sliding of the moving members are formed between the mounting housing and the cloth clamping plate, and side plates for cooperating with the cloth clamping plate to clamp the wiping cloth are arranged at lower ends of the moving members; the mounting housing is provided with guiding convex edges downward, and the moving members are provided with avoiding grooves corresponding to the guiding convex edges; when the wiping cloth is replaced, the moving members drive the side plates to move outwards, the guiding convex edges are detached from the avoiding grooves, and the guide convex edges press against the moving members to tilt the side plates, so as to allow lower edges of the side plates to be lower than the cloth clamping plate, so that a cloth clamping space is formed by inner side ends of the side plates and the outer side end of the cloth clamping plate; and when the wiping cloth is clamped, the side plates have a greater friction with the wiping cloth, so as to cause the wiping cloth to contract inward and be clamped.

[0007] Compared with the prior art, the present disclosure has the advantages that: when the wiping cloth is clamped, the moving members drive the side plates to move outwards, and the guiding convex edges guide the moving members and the side plates to make oblique motion downward, so as to allow lower edges of the side plates to be lower than the cloth clamping plate, so that the cloth clamping space is formed by the inner side ends of the side plates and the outer side end of the cloth clamping plate, and an edge of the wiping cloth is disposed in the cloth clamping space; the moving members drive the side plates to are retracted inwards, realizing the clamping of the wiping cloth; the guiding convex edges guide the moving members and the side plates to move obliquely downwards, which forms the cloth clamping space with volume larger than a cloth clamping space formed by the conventional horizontal movement of the side plates, so that more parts of the wiping cloth can be clamped, the friction between the side plates and the wiping cloth is increased, and the wiping cloth is more easily clamped accordingly.

[0008] In some embodiments, the mop rod assembly includes a universal joint, a straight rod and a protective casing sleeved on a lower end of the straight rod, an upper end of the universal joint is hinged to the protective casing, and a lower end of the universal joint is hinged to the mounting housing; a lower end of the protective casing is provided with first positioning protrusion blocks for left-right centering positioning; and the lower end of the universal joint is provided with second positioning protrusion blocks for front-rear centering positioning.

[0009] Compared with the prior art, the present disclosure has the advantages that: when the first positioning protrusion blocks achieve left-right centering positioning relative to the universal joint, the straight rod will not shake left-right during the working process of the flat mop moving forward and backward; when the second positioning protrusion blocks achieve front-rear centering positioning relative to the protective casing, the straight rod will not shake back and forth during the working process of the flat mop moving left-right; and therefore, the flat mop is enabled to be more stable during working. Moreover, when the wiping cloth is clamped, the

moving members can be opened obliquely downward to the outside, which forms the cloth clamping space with volume larger than a cloth clamping space formed by the conventional horizontal movement of the moving members, so that more parts of the wiping cloth can be clamped, the friction between the moving members and the wiping cloth is increased, and the wiping cloth is more easily clamped accordingly.

[0010] In some embodiments, the universal joint is provided with first positioning grooves matched with the first positioning protrusion blocks; when the universal joint and the protective casing are coaxially arranged, the first positioning protrusion blocks are accommodated in the first positioning grooves; an upper end face of the mounting housing is provided with second positioning grooves matched with the second positioning protrusion blocks; and when the universal joint and the mounting housing are coaxially arranged, the second positioning protrusion blocks are accommodated in the second positioning grooves. Through the improvement described above, when the universal joint and the protective casing are coaxially arranged, the first positioning protrusion blocks are accommodated in the first positioning grooves; the lower end of the universal joint is provided with the second positioning protrusion blocks, and the upper end face of the mounting housing is provided with the second positioning grooves matched with the second positioning protrusion blocks; when the universal joint and the mounting housing are coaxially arranged, the second positioning protrusion blocks are accommodated in the second positioning grooves; when the first positioning protrusion blocks achieve left-right centering positioning relative to the universal joint, the straight rod will not shake left-right during the working process of the flat mop moving forward and backward; when the second positioning protrusion blocks achieve front-rear centering positioning relative to the protective casing, the straight rod will not shake back and forth during the working process of the flat mop moving left-right; and therefore, the flat mop is enabled to be more stable during working.

[0011] In some embodiments, the rotating gear includes a connecting portion connected to the mop rod assembly, the mounting housing is provided with a connecting hole for allowing the connecting portion to pass through, buckling pieces are arranged on a side wall of the connecting portion, and an edge of the connecting hole is provided with buckling grooves for allowing the buckling pieces to pass through; when the positions of the buckling pieces are aligned with those of the buckling grooves, the connecting portion passes through the connecting hole, and the rotating gear is rotated to make the buckling pieces deviate from the buckling grooves; and lower end faces of the buckling pieces abut against the upper end face of the mounting housing. Through the improvement described above, when the buckling pieces deviate from the buckling grooves, the lower end faces of the buckling pieces abut against the upper end face of the mounting housing, thus limiting the rotating gear and preventing the rotating gear from moving downward.

[0012] In some embodiments, the mop rod assembly includes a rotating drive mechanism for connecting the moving members, and the rotating drive mechanism includes a rotating gear connected to the mop rod assembly, and racks arranged on the side plates, the racks being engaged with the rotating gear. Through the improvement, by controlling the rotating drive mechanism, the rotating gear is controlled to rotate and drive the racks to perform reciprocating motion, realizing the movement of the moving members.

[0013] In some embodiments, the mop rod assembly includes a straight rod, a twist rod, and a connecting piece; the twist rod drives the rotating gear to rotate, and the twist rod is fitted in the straight rod of the mop rod assembly; and a lower end of the twist rod is hinged to the rotating gear by way of the connecting piece, and the rotating gear is driven to rotate by an up and down movement of the straight rod of the mop rod assembly. Through the improvement, the up and down movement of the straight rod drives the twist rod to rotate, which drives the rotating gear to rotate, and realizes the opening and closing of the side plates, thus being more labor-saving and convenient.

[0014] In some embodiments, the mop rod assembly includes a straight rod and a connecting piece; the straight rod is directly hinged to the rotating gear by way of the connecting piece; and the rotating gear is driven to rotate by rotating the straight rod. Through the improvement, the rotating gear is driven to rotate by rotating the straight rod, thus realizing the opening and closing of the side plates. This simple mechanical transmission has a higher fault-tolerant rate and thus is more convenient and efficient.

[0015] In some embodiments, the moving members include transverse guide grooves, and guide protrusion blocks cooperating with the transverse guide grooves; and the guide protrusion block of the adjacent moving member is arranged in the transverse guide groove of the other moving member. Through the improvement, the guide protrusion blocks are arranged in the transverse guide grooves to guide the movement of the adjacent moving members, thus preventing the movement trajectory of the adjacent moving members from deviating, and making the device operate more stably.

[0016] In some embodiments, a reset slot is provided inside each of the guide protrusion blocks, the mop head assembly includes elastic members, the mounting housing includes limit blocks, the elastic members are arranged inside the reset slots, one end of the elastic member abuts against an inner side wall surface of the reset slot, and the other end of the elastic member abuts against a wall surface of the limit block. Through the improvement, when the moving members move outward, the elastic members are compressed, and at this time continuous work needs to be done on the straight rod to prevent the gear from rotating due to the force generated

by restoration of deformation of the elastic members; the moving members move inwards, and the cloth clamping plate cooperates with the side plates in the process of continuous work on the straight rod; and in the case where no work is done on the straight rod, the force generated by restoration of deformation of the elastic members makes the moving members move inwards to realize the clamping of the wiping cloth. Moreover, due to the relatively large force required to overcome the deformation of the elastic members, it can better ensure that the wiping cloth will not easily detach from the clamping of the cloth clamping plate and the side plates due to external forces during the working process.

[0017] In some embodiments, the limit blocks include first positioning columns arranged on the wall surfaces of the limit blocks, the guide protrusion blocks include second positioning columns arranged on inner side end faces of the reset slots, and the two ends of the elastic members are sleeved on the first positioning columns and the second positioning columns respectively. Through the improvement, the elastic members are prevented from moving during compression or restoration of deformation; and the two ends of the elastic members are sleeved on the first positioning columns and the second positioning columns, so that the two ends of the elastic members are limited, and the elastic members are enabled to be more stable during operation.

[0018] In some embodiments, first tooth portions are respectively provided at two opposite sides of the cloth clamping plate, second tooth portions cooperating with the first tooth portions are provided on the side plates, and the second tooth portions include bulge portions protruding downwards, and the bulge portions are inclined from inner sides to outer sides. Through the improvement, since the first tooth portions are cooperated with the second tooth portions, when the wiping cloth is clamped, the meshing arrangement of the first tooth portions and the second tooth portions increases the contact areas and friction forces of the first tooth portions and the second tooth portions on the wiping cloth, making it difficult for the wiping cloth to detach from the clamping of the cloth clamping plate and the side plates, and ensuring that the wiping cloth is clamped more firmly; and the bulge portions are inclined from inner sides to outer sides, which increases the contact areas between the second tooth portions and the wiping cloth to obtain a greater clamping force, making it easier to clamp the wiping cloth.

(III) Beneficial effects

[0019] The present disclosure provides a flat mop, which makes it easier to clamp wiping cloth. When the wiping cloth is replaced, the moving members drive the side plates to move outwards, and the guiding convex edges guide the moving members and the side plates to make oblique motion downward, so as to allow lower edges of the side plates to be lower than the cloth clamping plate, so that the cloth clamping space is formed by the inner side ends of the side plates and the outer side end of the cloth clamping plate, and the edge of the wiping cloth is disposed in the cloth clamping space; the moving members drive the side plates to are retracted inwards, realizing the clamping of the wiping cloth; the guiding convex edges guide the moving members and the side plates to move obliquely downwards, which forms the cloth clamping space with volume larger than a cloth clamping space formed by the conventional horizontal movement of the side plates, so that more parts of the wiping cloth can be clamped, the friction between the side plates and the wiping cloth is increased, and the wiping cloth is more easily clamped accordingly. By controlling the rotating drive mechanism, the rotating gear is controlled to rotate and drive the racks to perform reciprocating motion, realizing the movement of the moving members. When the moving members move outward, the elastic members are compressed, and at this time continuous work needs to be done on the straight rod to prevent the gear from rotating due to the force generated by restoration of deformation of the elastic members; the moving members move inwards, and the cloth clamping plate cooperates with the side plates in the process of continuous work on the straight rod; and in the case where no work is done on the straight rod, the force generated by restoration of deformation of the elastic members makes the moving members move inwards to realize the clamping of the wiping cloth. Moreover, due to the relatively large force required to overcome the deformation of the elastic members, it can better ensure that the wiping cloth will not easily detach from the clamping of the cloth clamping plate and the side plates due to external forces during the working process. Since the first tooth portions are cooperated with the second tooth portions, when the wiping cloth is clamped, the meshing arrangement of the first tooth portions and the second tooth portions increases the contact areas and friction forces of the first tooth portions and the second tooth portions on the wiping cloth, making it difficult for the wiping cloth to detach from the clamping of the cloth clamping plate and the side plates, and ensuring that the wiping cloth is clamped more firmly; the bulge portions are inclined from inner sides to outer sides, which increases the contact areas between the second tooth portions and the wiping cloth to obtain a greater clamping force, making it easier to clamp the wiping cloth; when the first positioning protrusion blocks achieve left-right centering positioning relative to the universal joint, the straight rod will not shake left-right during the working process of the flat mop moving forward and backward; when the second positioning protrusion blocks achieve front-rear centering positioning relative to the protective casing, the straight rod will not shake back and forth during the working process of the flat mop moving left-right; and therefore, the flat mop is enabled to be more stable during working.

Brief Description of Figures

[0020]

FIG. 1 is a schematic structural diagram of the present disclosure;
FIG. 2 is a schematic diagram of the cross-sectional structure of a moving member of the present disclosure when clamping a wiping cloth;
FIG. 3 is a schematic structural diagram of a mounting housing of the present disclosure;
FIG. 4 is a schematic structural diagram showing the cooperation of moving members, a straight rod, and elastic members of the present disclosure;
FIG. 5 is a schematic structural diagram of the moving member of the present disclosure;
FIG. 6 is a schematic structural diagram of the moving member of the present disclosure from another perspective;
FIG. 7 is a schematic structural diagram of a partial sectional view of the present disclosure;
FIG. 8 is a schematic structural diagram of a side plate of the present disclosure;
FIG. 9 is a schematic diagram of the cross-sectional structure of an interior of a straight rod of the present disclosure;
FIG. 10 is a schematic structural diagram of a cloth clamping plate of the present disclosure;
FIG. 11 is a schematic structural diagram showing the cooperation between the straight rod and a rotating gear in Embodiment II of the present disclosure;
FIG. 12 is a schematic structural diagram of first positioning protrusion blocks, first positioning grooves, and buckling pieces according to the present disclosure;
FIG. 13 is a schematic structural diagram of a protective casing according to the present disclosure;
FIG. 14 is a schematic structural diagram of a universal joint according to the present disclosure;
FIG. 15 is a schematic structural diagram of the mounting housing according to the present disclosure from another perspective; and
FIG. 16 is a schematic structural diagram of a rotating gear according to the present disclosure.

[0021] In figures: 1 denotes a mop rod assembly; 1.1 denotes a straight rod; 1.2 denotes a rotating gear; 1.2.1 denotes a connecting portion; 1.2.2 denotes buckling pieces; 1.3 denotes a universal joint; 1.4 denotes a protective casing; 1.4.1 denotes first positioning protrusion blocks; 1.5 denotes a twist rod; 1.6 denotes a connecting piece; 1.7 denotes first positioning grooves; 1.8 denotes second positioning protrusion blocks; 2 denotes a mop head assembly; 2.1 denotes a mounting housing; 2.1.1 denotes guiding convex edges; 2.1.2 denotes limit blocks; 2.1.2.1 denotes first positioning columns; 2.1.3 denotes lug plates; 2.1.4 denotes second positioning grooves; 2.1.5 denotes a connecting hole; 2.1.6 denotes buckling grooves; 2.2 denotes moving members; 2.2.1 denotes racks; 2.2.2 denotes avoiding grooves; 2.2.3 denotes transverse guide grooves; 2.2.4 denotes guide protrusion blocks; 2.2.4.1 denotes reset slots; 2.2.4.2 denotes second positioning columns; 2.2.5 denotes mounting cavities; 2.2.5.1 denotes dismounting openings; 2.2.5.2 denotes limit strips; 2.2.5.2.1 denotes mounting openings; 2.3 denotes a cloth clamping plate; 2.3.1 denotes first tooth portions; 2.4 denotes side plates; 2.4.1 denotes second tooth portions; 2.4.1.1 denotes bulge portions; 2.4.2 denotes mounting strips; 2.4.2.1 denotes limiting protrusion blocks; and 2.5 denotes elastic members.

Detailed Description

[0022] The present application will be described in detail below in conjunction with accompanying drawings and specific embodiments.

[0023] The implementation manners of the present application will be described below with reference to specific examples. Those skilled in the art may easily understand other advantages and effects of the present application by the contents disclosed in the present specification. Apparently, the described embodiments are merely a part of embodiments of the present application and are not all the embodiments. The present application may also be implemented or applied through other different specific implementation manners. Various modifications or changes may also be made on the details in the present specification without departing from the spirit of the present application based on different viewpoints and applications. It should be noted that in the absence of conflicts, the following embodiments and features in the embodiments may be combined mutually. All other embodiments obtained by those of ordinary skill in the art based on the embodiments of the present application without making creative efforts shall fall within the protection scope of the present application.

[0024] Additionally, in the following description, specific details are provided to facilitate a thorough understanding of examples. However, it will be understood by those skilled in the art that it may be practiced without these specific details.

[0025] The technical solution provided by the embodiments of the present application will be described with reference to the accompanying drawings.

Embodiment I:

[0026] Referring to FIG. 1 to FIG. 11 and FIG. 13 to FIG. 16, in this embodiment, a flat mop includes a mop rod assembly 1 and a mop head assembly 2 arranged at one end of the mop rod assembly 1. Moving members 2.2 available for synchronously moving outwards or moving inwards are slidably mounted at two sides of the mop head assembly 2; the mop head assembly 2 includes a mounting housing 2.1 and a cloth clamping plate 2.3 for

clamping a wiping cloth, sliding chambers for sliding of the moving members 2.2 are formed between the mounting housing 2.1 and the cloth clamping plate 2.3, and side plates 2.4 for cooperating with the cloth clamping plate 2.3 to clamp the wiping cloth are arranged at lower ends of the moving members 2.2; the mounting housing 2.1 is provided with guiding convex edges 2.1.1 downward, and the moving members 2.2 are provided with avoiding grooves 2.2.2 corresponding to the guiding convex edges 2.1.1; when the wiping cloth is replaced, the moving members 2.2 drive the side plates 2.4 to move outwards, the guiding convex edges 2.1.1 are detached from the avoiding grooves 2.2.2, and the guide convex edges 2.1.1 press against the moving members 2.2 to tilt the side plates 2.4, so as to allow lower edges of the side plates 2.4 to be lower than the cloth clamping plate 2.3, so that a cloth clamping space is formed by inner side ends of the side plates 2.4 and an outer side end of the cloth clamping plate 2.3; and when the wiping cloth is clamped, the side plates have a greater friction with the wiping cloth, so as to cause the wiping cloth to contract inward and be clamped.

[0027] When the wiping cloth is clamped, the moving members 2.2 drive the side plates 2.4 to move outwards, and the guiding convex edges 2.1.1 guide the moving members 2.2 and the side plates 2.4 to make oblique motion downward, so as to allow lower edges of the side plates 2.4 to be lower than the cloth clamping plate 2.3, so that the cloth clamping space is formed by the inner side ends of the side plates 2.4 and the outer side end of the cloth clamping plate 2.3, and an edge of the wiping cloth is disposed in the cloth clamping space; the moving members 2.2 drive the side plates 2.4 to are retracted inwards, realizing the clamping of the wiping cloth; the guiding convex edges 2.1.1 guide the moving members 2.2 and the side plates 2.4 to move obliquely downwards, which forms the cloth clamping space with volume larger than a cloth clamping space formed by the conventional horizontal movement of the side plates 2.4, so that more parts of the wiping cloth can be clamped, the friction between the side plates 2.4 and the wiping cloth is increased, and the wiping cloth is more easily clamped accordingly.

[0028] In some embodiments, as shown in FIG. 12 to FIG. 16, the mop rod assembly 1 includes a universal joint 1.3, a straight rod 1.1 and, a protective casing 1.4 sleeved on a lower end of the straight rod 1.1. An upper end of the universal joint 1.3 is hinged to the protective casing 1.4, and a lower end of the universal joint 1.3 is hinged to the mounting housing 2.1; a lower end of the protective casing 1.4 is provided with first positioning protrusion blocks 1.4.1, and the universal joint 1.3 is provided with first positioning grooves 1.7 matched with the first positioning protrusion blocks 1.4.1; when the universal joint 1.3 and the protective casing 1.4 are coaxially arranged, the first positioning protrusion blocks 1.4.1 are accommodated in the first positioning grooves 1.7; the lower end of the universal joint 1.3 is provided with second positioning protrusion blocks 1.8, and an upper end face of the mounting housing 2.1 is provided with second positioning grooves 2.1.4 matched with the second positioning protrusion blocks 1.8; and when the universal joint 1.3 and the mounting housing 2.1 are coaxially arranged, the second positioning protrusion blocks 1.8 are accommodated in the second positioning grooves 2.1.4. When the universal joint 1.3 and the protective casing 1.4 are coaxially arranged, the first positioning protrusion blocks 1.4.1 are accommodated in the first positioning grooves 1.7; the lower end of the universal joint 1.3 is provided with the second positioning protrusion blocks 1.8, and the upper end face of the mounting housing 2.1 is provided with the second positioning grooves 2.1.4 matched with the second positioning protrusion blocks 1.8; and when the universal joint 1.3 and the mounting housing 2.1 are coaxially arranged, the second positioning protrusion blocks 1.8 are accommodated in the second positioning grooves 2.1.4. Therefore, in the working process of the flat mop, the straight rod 1.1 is prevented from shaking, so that the flat mop is more stable.

[0029] In some embodiments, as shown in FIG. 10, the mop rod assembly 1 includes a rotating drive mechanism for connecting the moving members 2.2, and the rotating drive mechanism includes a rotating gear 1.2 connected to the mop rod assembly 1, and racks 2.2.1 arranged on the side plates 2.4, the racks 2.2.1 being engaged with the rotating gear 1.2. By controlling the rotating drive mechanism, the rotating gear 1.2 is controlled to rotate and drive the racks 2.2.1 to perform reciprocating motion, realizing the movement of the moving members 2.2.

[0030] In some embodiments, as shown in FIG. 10, the mop rod assembly 1 includes a straight rod 1.1, a twist rod 1.5, and a connecting piece 1.6; the twist rod 1.5 drives the rotating gear 1.2 to rotate, and the twist rod 1.5 is fitted in the straight rod 1.1 of the mop rod assembly 1; and a lower end of the twist rod 1.5 is hinged to the rotating gear 1.2 by way of the connecting piece 1.6, and the rotating gear 1.2 is driven to rotate by an up and down movement of the straight rod 1.1 of the mop rod assembly 1. The up and down movement of the straight rod 1.1 drives the twist rod 1.5 to rotate, which drives the rotating gear 1.2 to rotate, and realizes the opening and closing of the side plates 2.4, thus being more labor-saving and convenient.

[0031] In some embodiments, as shown in FIG. 1 to FIG. 2, the mop rod assembly 1 includes a mounting seat (such as universal joint) 1.3 and a protective casing 1.4. The mounting housing 2.1 includes two lug plates 2.1.3 arranged opposite to each other on an upper end face of the mounting housing 2.1, a lower end of the mounting seat (such as universal joint) 1.3 is hinged to the lug plates 2.1.3, and an upper end of the mounting seat (such as universal joint) 1.3 is hinged to the protective casing 1.4. Moreover, the straight rod 1.1 is inserted into the protective casing 1.4, and a central axis where the mounting seat (such as universal joint) 1.3 is hinged to the lug plates 2.1.3 is perpendicular to a central axis where the mounting seat (such as universal joint) 1.3 is hinged to the protective casing 1.4. The protective casing 1.4 is

configured to protect the straight rod 1.1, and the straight rod 1.1 can rotate in the protective casing 1.4, thereby controlling the movement of the rotating gear 1.2. The central axis where the mounting seat (such as universal joint) 1.3 is hinged to the lug plates 2.1.3 is perpendicular to the central axis where the universal joint 1.3 is hinged to the protective casing 1.4, so that the straight rod 1.1 can rotate in the direction of the central axis where the mounting seat (such as universal joint) 1.3 is hinged to the lug plates 2.1.3, and the straight rod 1.1 can also rotate in the direction of the central axis where the mounting seat (such as universal joint) 1.3 is hinged to the protective casing 1.4, making the mop better adapted to different usage and storage scenarios.

[0032] In some embodiments, as shown in FIG. 12 to FIG. 16, the rotating gear 1.2 includes a connecting portion 1.2.1 connected to the mop rod assembly 1, the mounting housing 2.1 is provided with a connecting hole 2.1.5 for allowing the connecting portion 1.2.1 to pass through, buckling pieces 1.2.2 are arranged on a side wall of the connecting portion 1.2.1, and an edge of the connecting hole 2.1.5 is provided with buckling grooves 2.1.6 for allowing the buckling pieces 1.2.2 to pass through; when the positions of the buckling pieces 1.2.2 are aligned with those of the buckling grooves 2.1.6, the connecting portion 1.2.1 passes through the connecting hole 2.1.5, and the rotating gear 1.2 is rotated to make the buckling pieces 1.2.2 deviate from the buckling grooves 2.1.6; and lower end faces of the buckling pieces 1.2.2 abut against the upper end face of the mounting housing 2.1. When the buckling pieces 1.2.2 deviate from the buckling grooves 2.1.6, the lower end faces of the buckling pieces 1.2.2 abut against the upper end face of the mounting housing 2.1, thus limiting the rotating gear 1.2 and preventing the rotating gear 1.2 from moving downward. The moving members 2.2 include transverse guide grooves 2.2.3, and guide protrusion blocks 2.2.4 cooperating with the transverse guide grooves 2.2.3; and the guide protrusion block 2.2.4 of the adjacent moving member 2.2 is arranged in the transverse guide groove 2.2.3 of the other moving member 2.2. The guide protrusion blocks 2.2.4 are arranged in the transverse guide grooves 2.2.3 to guide the movement of the adjacent moving members 2.2, thus preventing the movement trajectory of the adjacent moving members 2.2 from deviating, and making the device operate more stably.

[0033] In some embodiments, as shown in FIG. 3 to FIG. 6, the moving members 2.2 include transverse guide grooves 2.2.3, and guide protrusion blocks 2.2.4 cooperating with the transverse guide grooves 2.2.3; and the guide protrusion block 2.2.4 of the adjacent moving member 2.2 is arranged in the transverse guide groove 2.2.3 of the other moving member 2.2. The guide protrusion blocks 2.2.4 are arranged in the transverse guide grooves 2.2.3 to guide the movement of the adjacent moving members 2.2, thus preventing the movement trajectory of the adjacent moving members 2.2 from deviating, and making the device operate more stably.

[0034] In some embodiments, as shown in FIG. 3 to FIG. 6, a reset slot 2.2.4.1 is provided inside each of the guide protrusion blocks 2.2.4, the mop head assembly 2 includes elastic members 2.5, the mounting housing 2.1 includes limit blocks 2.1.2, the elastic members 2.5 are arranged inside the reset slots 2.2.4.1, one end of the elastic member 2.5 abuts against an inner side wall surface of the reset slot 2.2.4.1, and the other end of the elastic member 2.5 abuts against a wall surface of the limit blocks 2.1.2. When the moving members 2.2 move outward, the elastic members 2.5 are compressed, and at this time continuous work needs to be done on the straight rod 1.1 to prevent the gear from rotating due to the force generated by restoration of deformation of the elastic members 2.5; the moving members 2.2 move inwards, and the cloth clamping plate 2.3 cooperates with the side plates 2.4 in the process of continuous work on the straight rod 1.1; and in the case where no work is done on the straight rod 1.1, the force generated by restoration of deformation of the elastic members 2.5 makes the moving members 2.2 move inwards to realize the clamping of the wiping cloth. Moreover, due to the relatively large force required to overcome the deformation of the elastic members 2.5, it can better ensure that the wiping cloth will not easily detach from the clamping of the cloth clamping plate 2.3 and the side plates 2.4 due to external forces during the working process.

[0035] In some embodiments, as shown in FIG. 3 to FIG. 6, the limit blocks 2.1.2 include first positioning columns 2.1.2.1 arranged on the wall surfaces of the limit blocks 2.1.2, the guide protrusion blocks 2.2.4 include second positioning columns 2.2.4.2 arranged on inner side end faces of the reset slots 2.2.4.1, and the two ends of the elastic members 2.5 are sleeved on the first positioning columns 2.1.2.1 and the second positioning columns 2.2.4.2 respectively. The elastic members 2.5 are prevented from moving during compression or restoration of deformation; and the two ends of the elastic members 2.5 are sleeved on the first positioning columns 2.1.2.1 and the second positioning columns 2.2.4.2, so that the two ends of the elastic members 2.5 are limited, and the elastic members 2.5 are enabled to be more stable during operation.

[0036] In some embodiments, as shown in FIG. 7 to FIG. 9, first tooth portions 2.3.1 are respectively provided at two opposite sides of the cloth clamping plate 2.3, second tooth portions 2.4.1 cooperating with the first tooth portions 2.3.1 are provided on the side plates 2.4, the second tooth portions 2.4.1 include bulge portions 2.4.1.1 protruding downwards, and the bulge portions 2.4.1.1 are inclined from inner sides to outer sides. Through the improvement, since the first tooth portions 2.3.1 are cooperated with the second tooth portions 2.4.1, when the wiping cloth is clamped, the meshing arrangement of the first tooth portions 2.3.1 and the second tooth portions 2.4.1 increases the contact areas and friction forces of the first tooth portions 2.3.1 and the second tooth portions 2.4.1 on the wiping cloth, making it

difficult for the wiping cloth to detach from the clamping of the cloth clamping plate 2.3 and the side plates 2.4, and ensuring that the wiping cloth is clamped more firmly; and the bulge portions 2.4.1.1 are inclined from inner sides to outer sides, which increases the contact areas between the second tooth portions 2.4.1 and the wiping cloth to obtain a greater clamping force, making it easier to clamp the wiping cloth.

[0037] In some embodiments, as shown in FIG. 7 to FIG. 9, the side plates 2.4 include two mounting strips 2.4.2 arranged on upper end faces of the side plates 2.4 and along the length directions of the side plates 2.4. There is an interstice between the two mounting strips 2.4.2, and a plurality of limiting protrusion blocks 2.4.2.1 are arranged on wall surfaces at two sides of each of the mounting strips 2.4.2. Mounting cavities 2.2.5 used for accommodating the mounting strips 2.4.2 are provided in lower end faces of the moving members 2.2. The mounting cavities 2.2.5 are internally provided with limit strips 2.2.5.2, and the limit strips 2.2.5.2 are arranged inside the interstice between the two mounting strips 2.4.2. The limit strips 2.2.5.2 are provided with mounting openings 2.2.5.2.1 cooperating the limiting protrusion blocks 2.4.2.1 located between the two mounting strips 2.4.2. Wall surfaces of the mounting openings 2.2.5.2.1 abut against bottom wall surfaces of the limiting protrusion blocks 2.4.2.1 located between the two mounting strips 2.4.2. Outer side wall surfaces of the limiting protrusion blocks 2.4.2.1 on outer sides of the two mounting strips 2.4.2 abut against inner side wall surfaces of the mounting cavities 2.2.5. When the side plates 2.4 are mounted on the moving members 2.2, by pressing the side plates 2.4, the mounting strips 2.4.2 are enabled to be arranged in the mounting cavities 2.2.5, and the limit strips 2.2.5.2 are enabled to be arranged between the two mounting strips 2.4.2, so as to realize positioning. By arranging the limiting protrusion blocks 2.4.2.1 on the mounting strips 2.4.2 onto the mounting openings 2.2.5.2.1, the wall surfaces of the mounting openings 2.2.5.2.1 abut against the bottom wall surfaces of the limiting protrusion blocks 2.4.2.1 located between the two mounting strips 2.4.2, and the outer side wall surfaces of the limiting protrusion blocks 2.4.2.1 on the outer sides of the two mounting strips 2.4.2 abut against the inner side wall surfaces of the mounting cavities 2.2.5, so as to realize limiting, thus preventing the side plates 2.4 from detaching from the moving members 2.2, and making the side plates 2.4 and the moving members 2.2 connected more closely.

[0038] In some embodiments, as shown in FIG. 7 to FIG. 9, the plurality of limiting protrusion blocks 2.4.2.1 on the same mounting strip 2.4.2 are arranged in a staggered manner along the length direction of the mounting strip 2.4.2, and the limiting protrusion blocks 2.4.2.1 on the adjacent mounting strips 2.4.2 are arranged opposite to each other. The plurality of limiting protrusion blocks 2.4.2.1 are arranged in a staggered manner along the length direction of the mounting strip 2.4.2, and the plurality of limiting protrusion blocks 2.4.2.1 jointly generate acting forces to maximize the limiting effect, so that the side plates 2.4 are more firmly mounted on the moving members 2.2. Moreover, the limiting protrusion blocks 2.4.2.1 are arranged opposite to each other, which makes the acting forces generated by the limiting protrusion blocks 2.4.2.1 symmetrical, so that the side plates 2.4 will not sway left-right and be enabled to keep horizontal, and the stability of the side plates 2.4 is improved.

[0039] In some embodiments, as shown in FIG. 7 to FIG. 9, dismounting openings 2.2.5.1 are formed in upper end faces of the moving members 2.2, and positions of the dismounting openings 2.2.5.1 correspond to positions of the mounting openings 2.2.5.2.1. Through the dismounting openings 2.2.5.1, the abutment between the limiting protrusion blocks 2.4.2.1 and the wall surfaces of the mounting openings 2.2.5.2.1 is released from the dismounting openings 2.2.5.1, making it more convenient and efficient to remove the side plates 2.4 from the moving members 2.2.

Embodiment II:

[0040] This embodiment is only different from Embodiment I in the connection manner of the straight rod and the rotating gear.

[0041] Please refer to FIG. 11. In this embodiment, the mop rod assembly 1 includes a straight rod 1.1 and a connecting piece 1.6. The straight rod 1.1 is directly hinged to the rotating gear 1.2 by way of the connecting piece 1.6; and the rotating gear 1.2 is driven to rotate by rotating the straight rod 1.1. The straight rod 1.1 is rotated to drive the rotating gear 1.2 to rotate, thus realizing the opening and closing of the side plates 2.4. This simple mechanical transmission has a higher fault-tolerant rate and thus is more convenient and efficient.

[0042] For the same or similar parts between the embodiments in the specification, reference may be made to each other. Each embodiment focuses on differences from other embodiments.

[0043] The foregoing descriptions are merely specific embodiments of the present application, but the protection scope of the present application is not limited thereto. Any changes or replacements within the technical scope disclosed in the present application made by those skilled in the art should fall within the scope of protection of the present application. Therefore, the scope of protection of this application shall take the scope of protection of the claims as final.

Claims

1. A flat mop, comprising a mop rod assembly (1) and a mop head assembly (2) arranged at one end of the mop rod assembly (1), wherein the mop head assembly (2) comprises a mounting housing (2.1), a cloth clamping plate (2.3) for clamping a wiping cloth, and moving members (2.2) slidably mounted at two

sides of the mop head assembly (2), wherein the moving members (2.2) are able to synchronously move outwards to be opened or move inwards to be closed; a cloth clamping space is formed by inner side ends of the moving members (2.2) and an outer side end of the cloth clamping plate (2.3); when the wiping cloth is clamped, the moving members (2.2) can be opened obliquely downward to the outside; and after the wiping cloth is driven, the moving members (2.2) are retracted obliquely upward and inward to allow the wiping cloth to be clamped.

2. The flat mop according to claim 1, wherein the mop rod assembly (1) comprises a universal joint (1.3), a straight rod (1.1), and a protective casing (1.4) sleeved on a lower end of the straight rod (1.1), an upper end of the universal joint (1.3) is hinged to the protective casing (1.4), and a lower end of the universal joint (1.3) is hinged to the mounting housing (2.1); a lower end of the protective casing (1.4) is provided with first positioning protrusion blocks (1.4.1) for left-right centering positioning; and the lower end of the universal joint (1.3) is provided with second positioning protrusion blocks (1.8) for front-rear centering positioning.

3. The flat mop according to claim 1 or 2, wherein sliding chambers for sliding of the moving members (2.2) are formed between the mounting housing (2.1) and the cloth clamping plate (2.3), and side plates (2.4) for cooperating with the cloth clamping plate (2.3) to clamp the wiping cloth are arranged at lower ends of the moving members (2.2); the mounting housing (2.1) is provided with guiding convex edges (2.1.1) downward; when the wiping cloth is clamped, the moving members (2.2) drive the side plates (2.4) to move outwards, and the guide convex edges (2.1.1) press against the moving members (2.2) to tilt the side plates (2.4), so as to allow lower edges of the side plates (2.4) to be lower than the cloth clamping plate (2.3), so that the cloth clamping space is formed by inner side ends of the side plates (2.4) and the outer side end of the cloth clamping plate (2.3).

4. The flat mop according to claim 3, wherein the moving members (2.2) are provided with avoiding grooves (2.2.2) corresponding to the guiding convex edges (2.1.1); and when the wiping cloth is clamped, the moving members (2.2) drive the side plates (2.4) to move outwards, and the guiding convex edges (2.1.1) are detached from the avoiding grooves (2.2.2).

5. The flat mop according to claim 3 or 4, wherein the mop rod assembly (1) comprises a rotating drive mechanism for connecting the moving members (2.2), and the rotating drive mechanism comprises a rotating gear (1.2) connected to the mop rod assembly (1), and racks (2.2.1) arranged on the moving members (2.2), the racks (2.2.1) being engaged with the rotating gear (1.2).

6. The flat mop according to claim 5, wherein the mop rod assembly (1) comprises a twist rod (1.5) and a connecting piece (1.6); the twist rod (1.5) drives the rotating gear (1.2) to rotate, and the twist rod (1.5) is fitted in the straight rod (1.1) of the mop rod assembly (1); and a lower end of the twist rod (1.5) is hinged to the rotating gear (1.2) through the connecting piece (1.6), and the rotating gear (1.2) is driven to rotate by an up and down movement of the straight rod (1.1) of the mop rod assembly (1).

7. The flat mop according to claim 5, wherein the mop rod assembly (1) comprises a connecting piece (1.6); the straight rod (1.1) is directly hinged to the rotating gear (1.2) through the connecting piece (1.6); and the rotating gear (1.2) is driven to rotate by rotating the straight rod (1.1).

8. The flat mop according to any of claims 1 to 7, wherein the moving members (2.2) comprise transverse guide grooves (2.2.3), and guide protrusion blocks (2.2.4) cooperating with the transverse guide grooves (2.2.3); and the guide protrusion block (2.2.4) of an adjacent moving member (2.2) is arranged in the transverse guide groove (2.2.3) of the other moving member (2.2).

9. The flat mop according to claim 8, wherein a reset slot (2.2.4.1) is provided inside each of the guide protrusion blocks (2.2.4), the mop head assembly (2) comprises elastic members (2.5), the mounting housing (2.1) comprises limit blocks (2.1.2), the elastic members (2.5) are arranged inside the reset slots (2.2.4.1), one end of the elastic member (2.5) abuts against an inner side wall surface of the reset slot (2.2.4.1), and the other end of the elastic member (2.5) abuts against a wall surface of the limit block (2.1.2).

10. The flat mop according to claim 9, wherein the limit blocks (2.1.2) comprise first positioning columns (2.1.2.1) arranged on the wall surfaces of the limit blocks (2.1.2), the guide protrusion blocks (2.2.4) comprise second positioning columns (2.2.4.2) arranged on inner side end faces of the reset slots (2.2.4.1), and the two ends of the elastic members (2.5) are sleeved on the first positioning columns (2.1.2.1) and the second positioning columns (2.2.4.2) respectively.

11. The flat mop according to any of claims 1 to 10, wherein first tooth portions (2.3.1) are respectively provided at two opposite sides of the cloth clamping plate (2.3), and second tooth portions (2.4.1) coop-

erating with the first tooth portions (2.3.1) are provided on the side plates (2.4).

12. The flat mop according to claim 11, wherein the second tooth portions (2.4.1) comprise bulge portions (2.4.1.1) protruding downwards, and the bulge portions (2.4.1.1) are inclined from inner sides to outer sides.

13. The flat mop according to claim 2, wherein the universal joint (1.3) is provided with first positioning grooves (1.7) matched with the first positioning protrusion blocks (1.4.1); when the universal joint (1.3) and the protective casing (1.4) are coaxially arranged, the first positioning protrusion blocks (1.4.1) are accommodated in the first positioning grooves (1.7); an upper end face of the mounting housing (2.1) is provided with second positioning grooves (2.1.4) matched with the second positioning protrusion blocks (1.8); and when the universal joint (1.3) and the mounting housing (2.1) are coaxially arranged, the second positioning protrusion blocks (1.8) are accommodated in the second positioning grooves (2.1.4).

14. The flat mop according to claim 5, wherein the rotating gear (1.2) comprises a connecting portion (1.2.1) connected to the mop rod assembly (1), the mounting housing (2.1) is provided with a connecting hole (2.1.5) for allowing the connecting portion (1.2.1) to pass through, buckling pieces (1.2.2) are arranged on a side wall of the connecting portion (1.2.1), and an edge of the connecting hole (2.1.5) is provided with buckling grooves (2.1.6) for allowing the buckling pieces (1.2.2) to pass through; when the positions of the buckling pieces (1.2.2) are aligned with those of the buckling grooves (2.1.6), the connecting portion (1.2.1) passes through the connecting hole (2.1.5), and the rotating gear (1.2) is rotated to make the buckling pieces (1.2.2) deviate from the buckling grooves (2.1.6); and lower end faces of the buckling pieces (1.2.2) abut against the upper end face of the mounting housing (2.1).

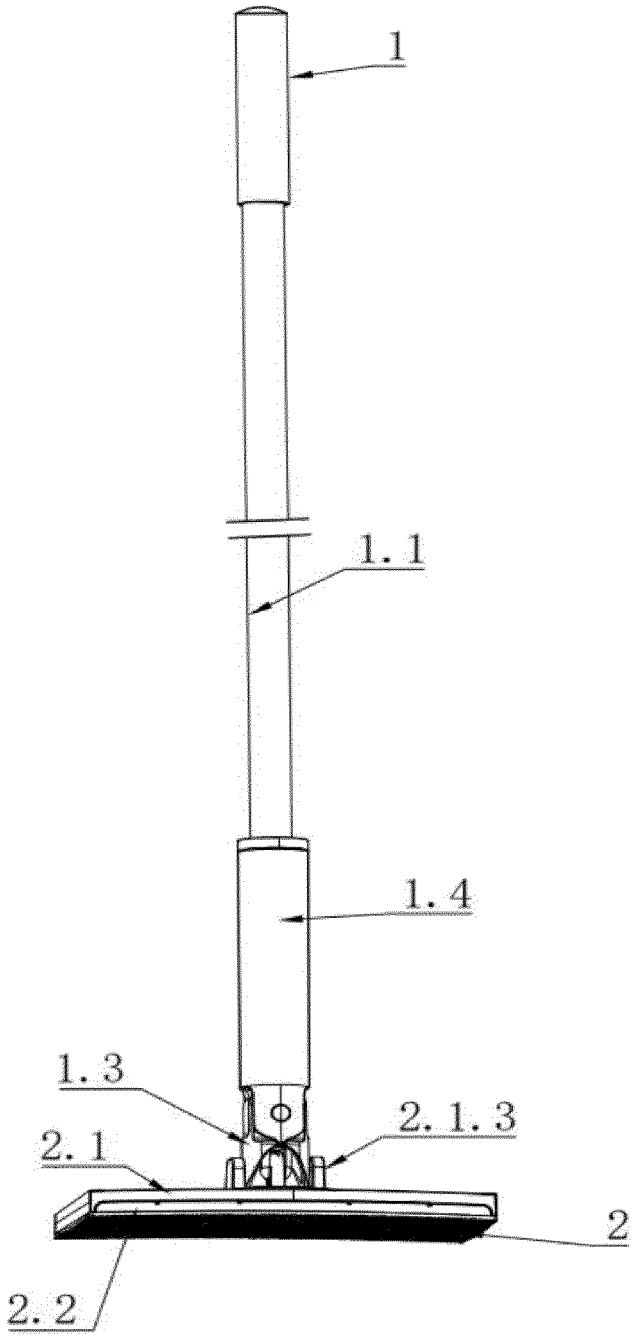

FIG. 1

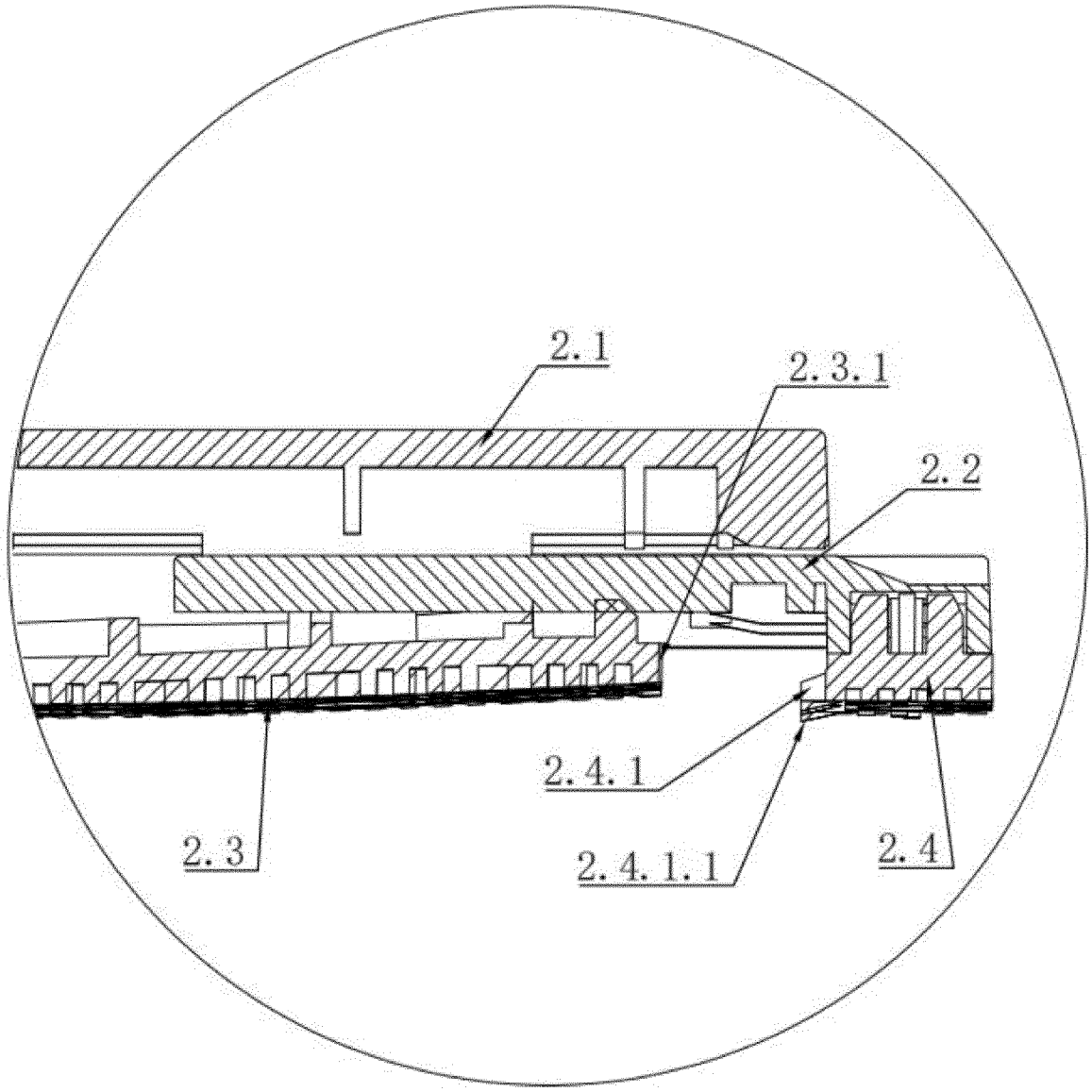

FIG. 2

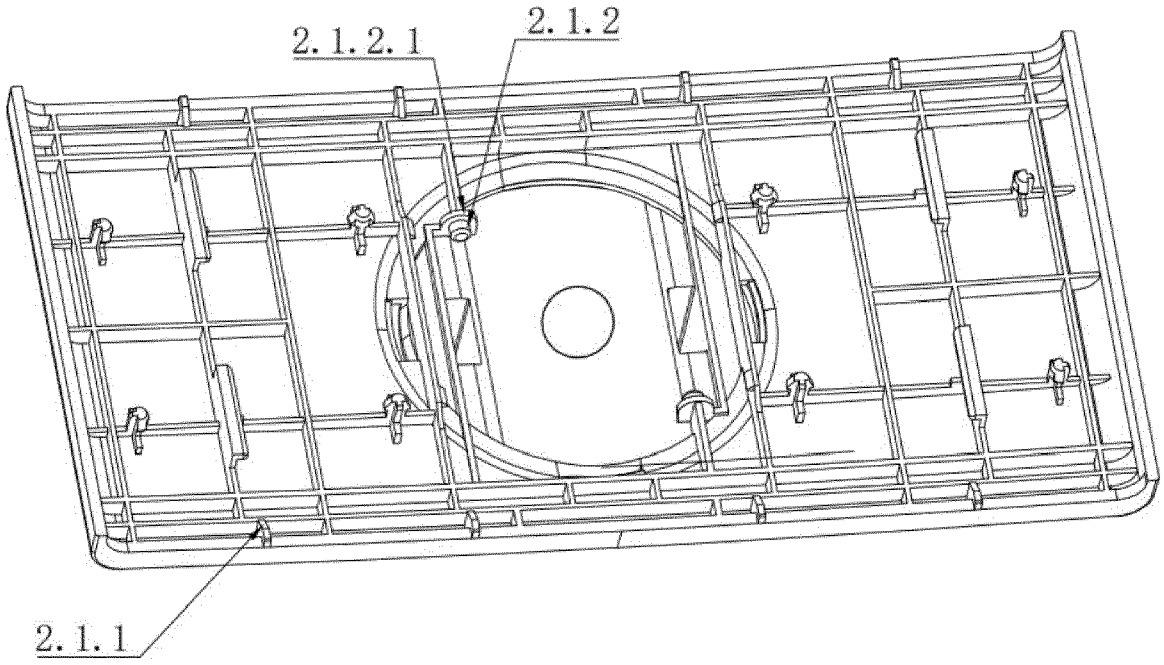

FIG. 3

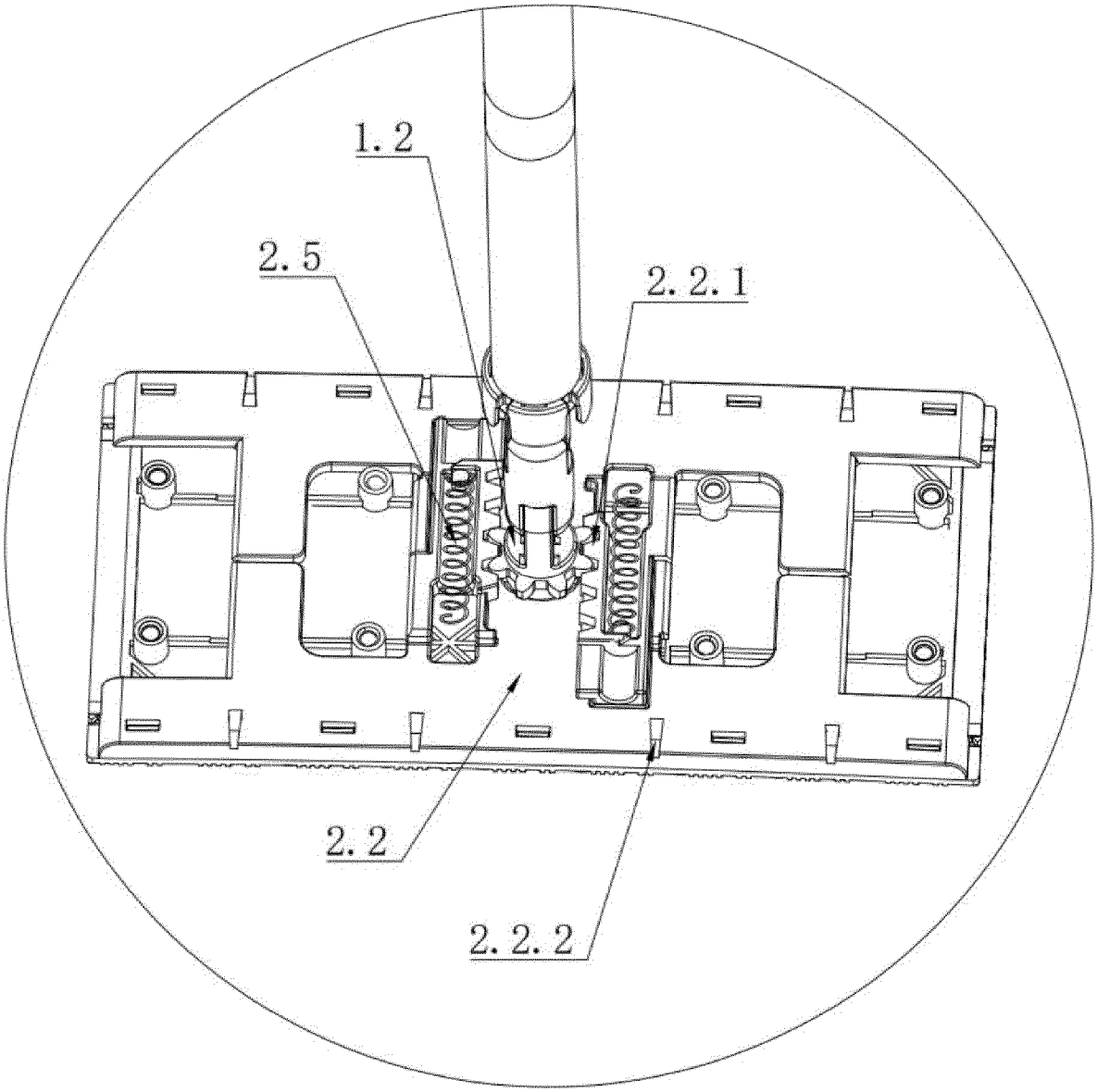

FIG. 4

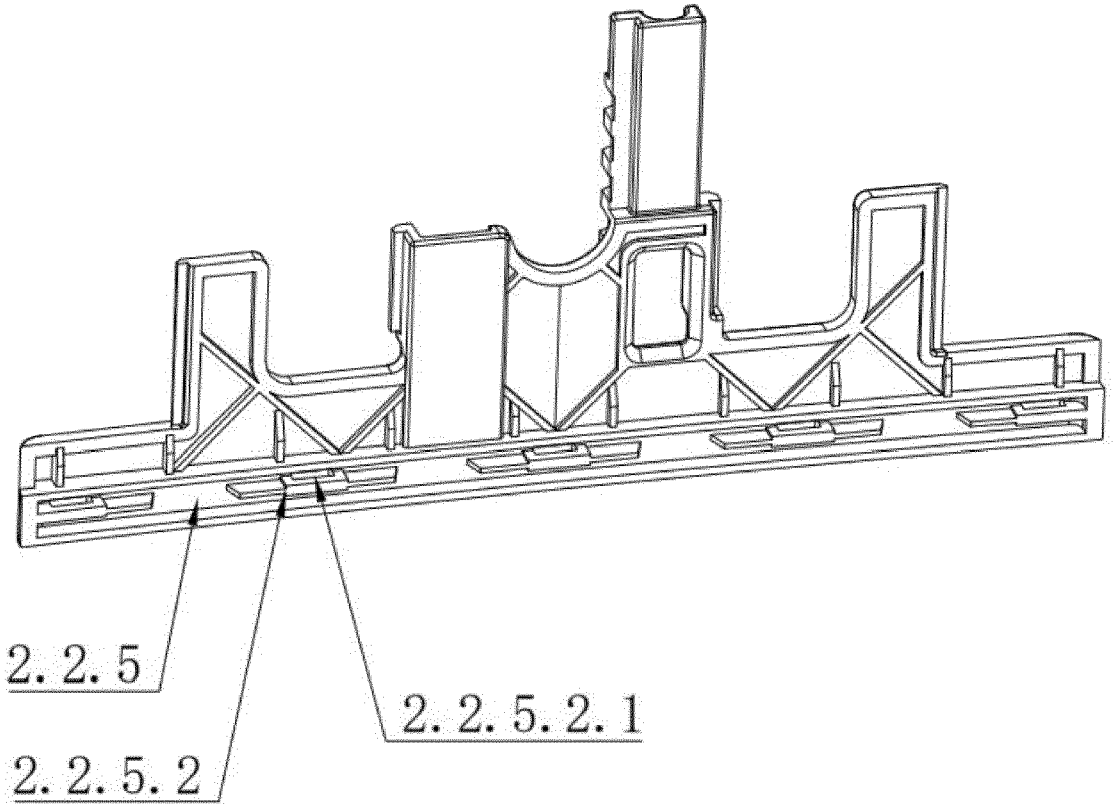

FIG. 5

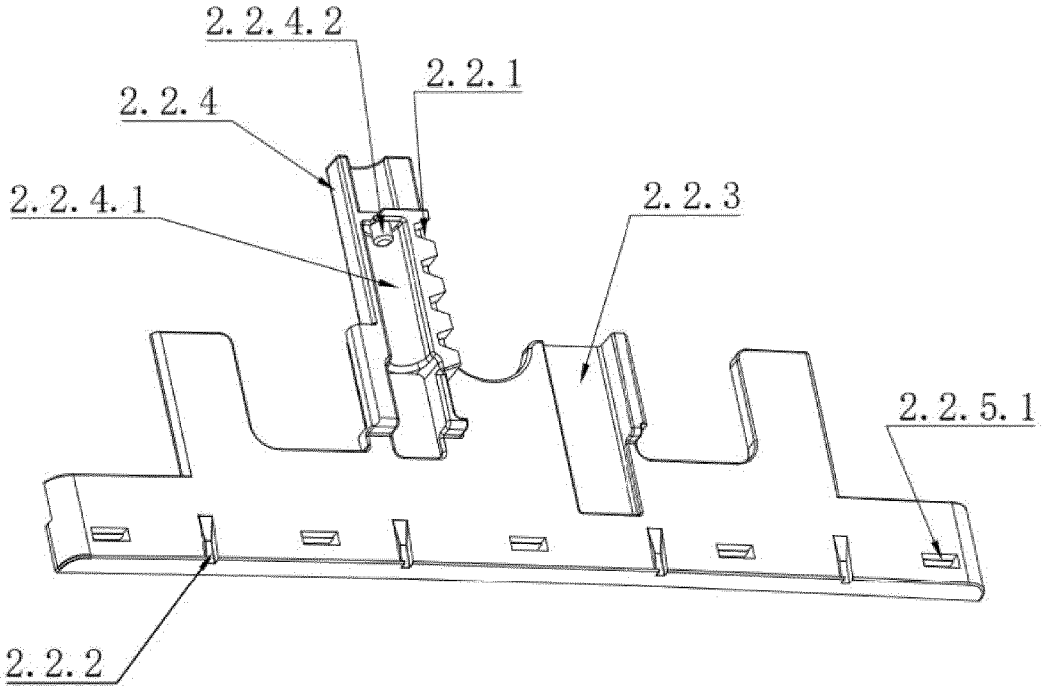

FIG. 6

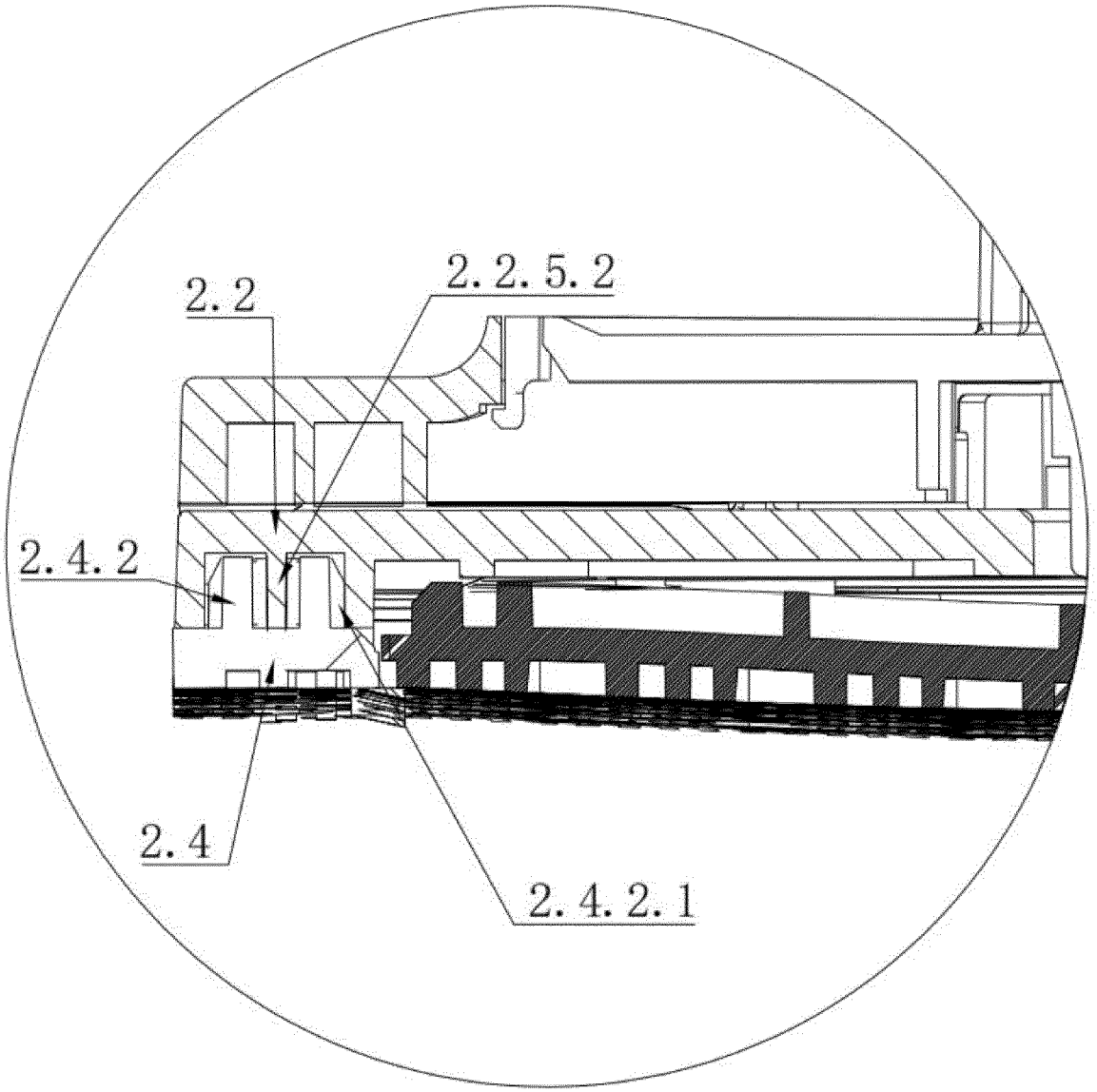

FIG. 7

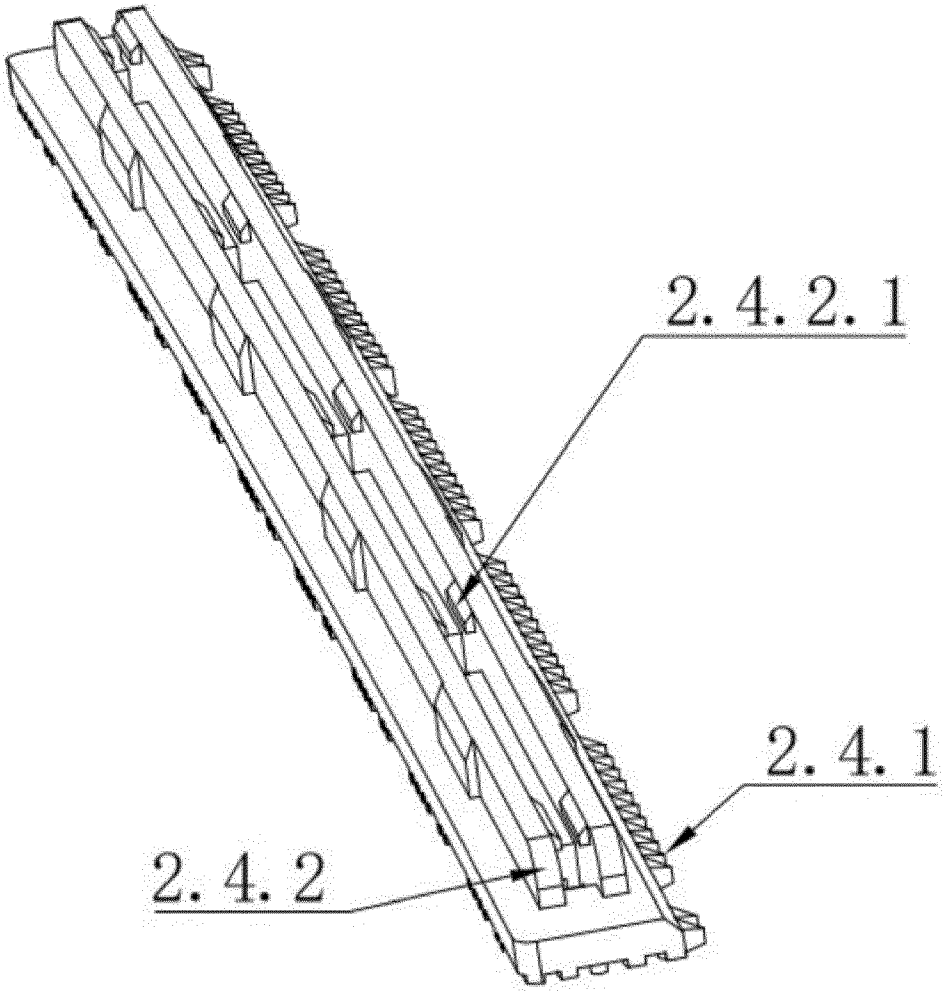

FIG. 8

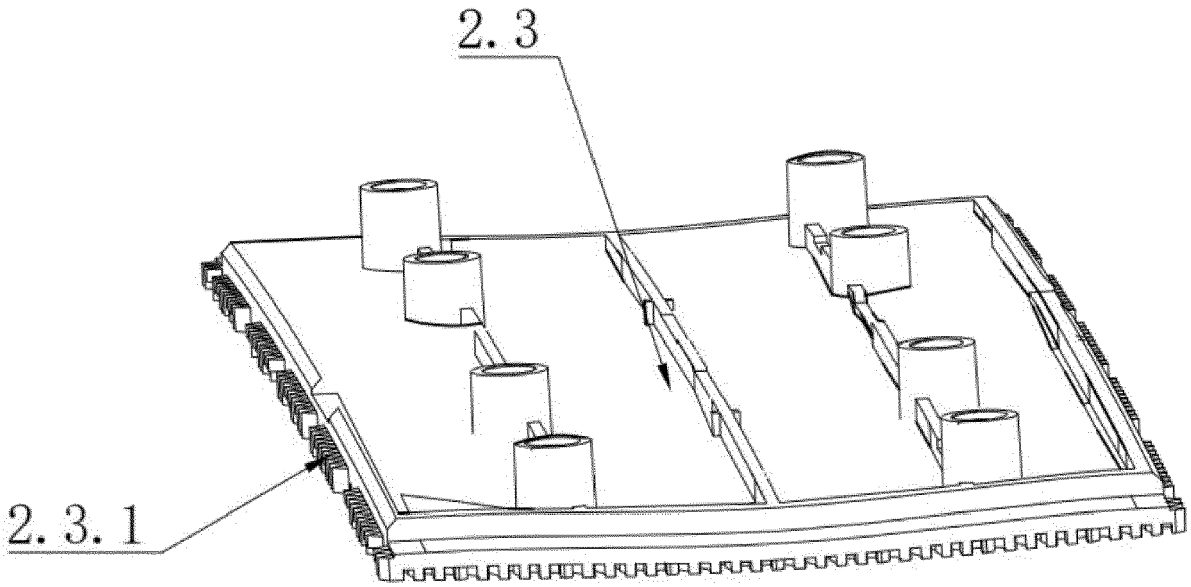

FIG. 9

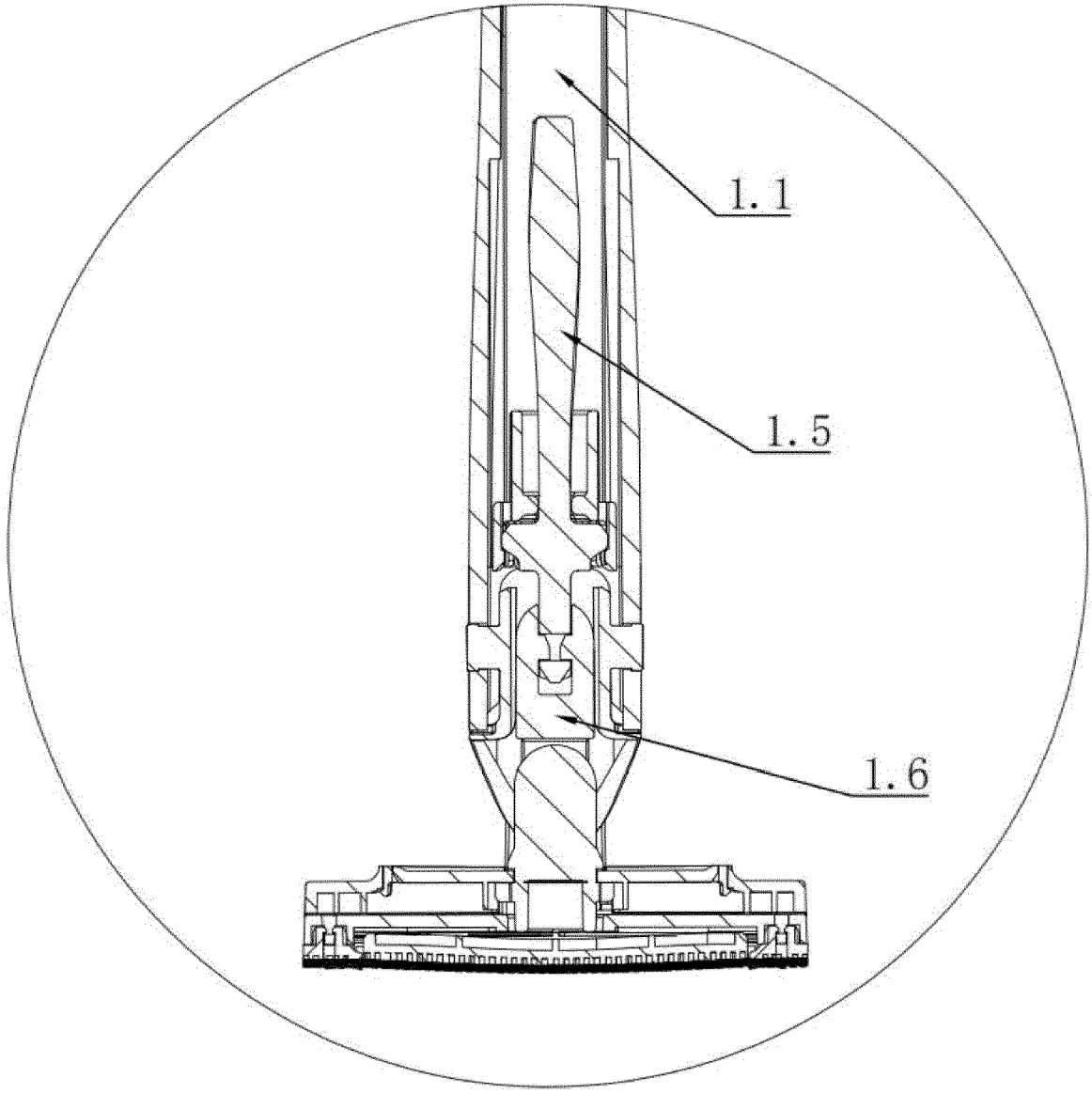

FIG. 10

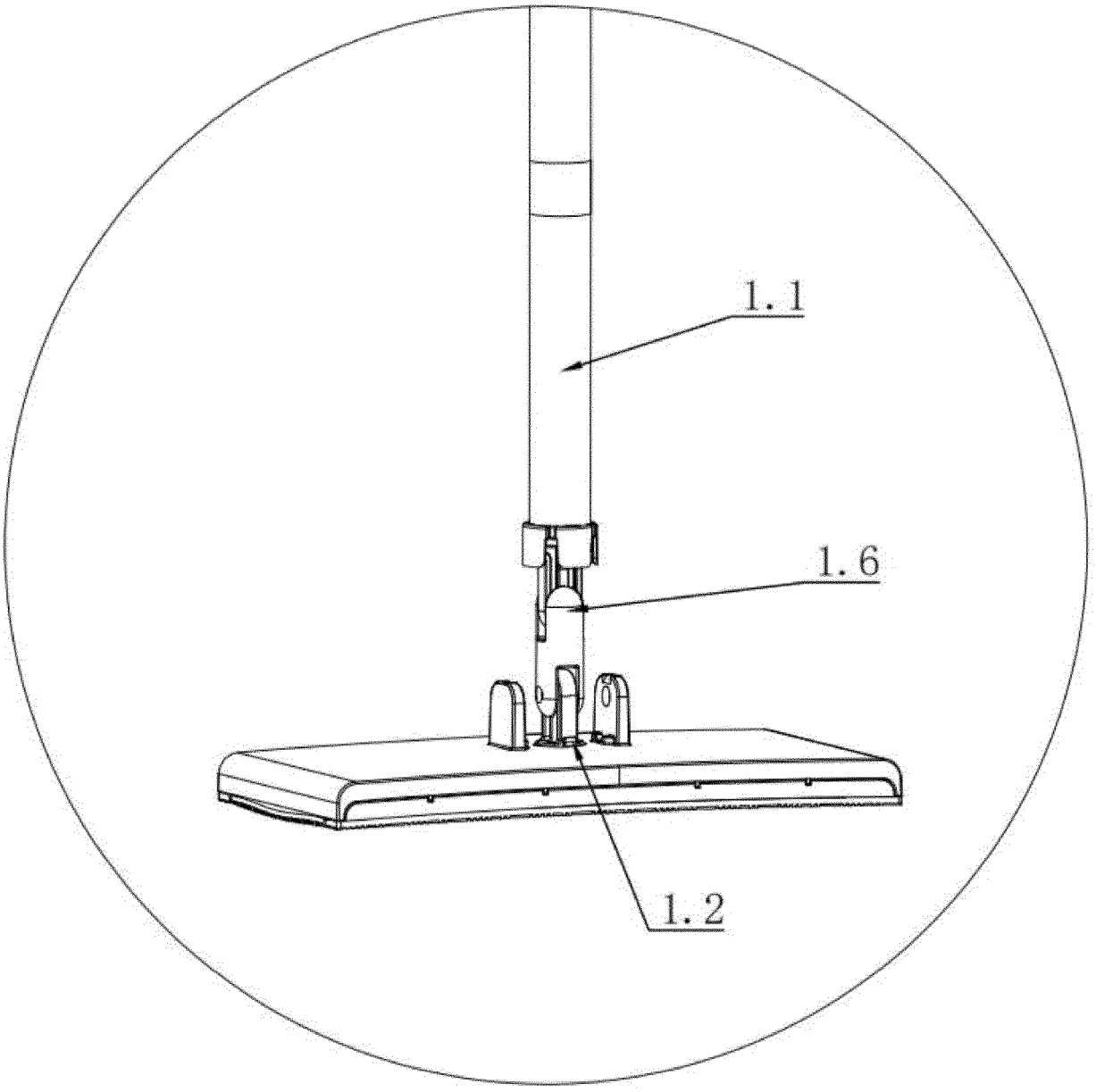

FIG. 11

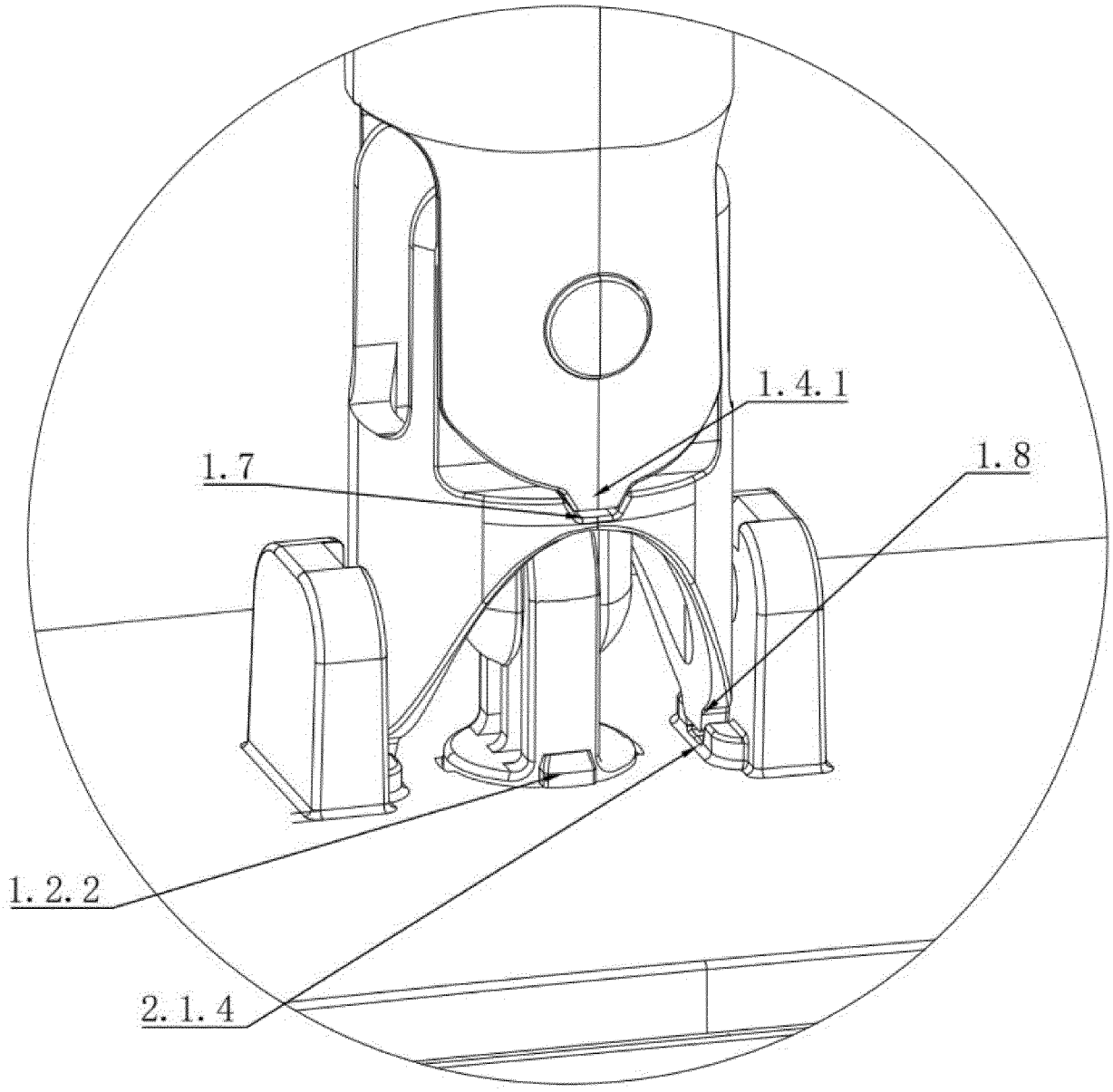

FIG. 12

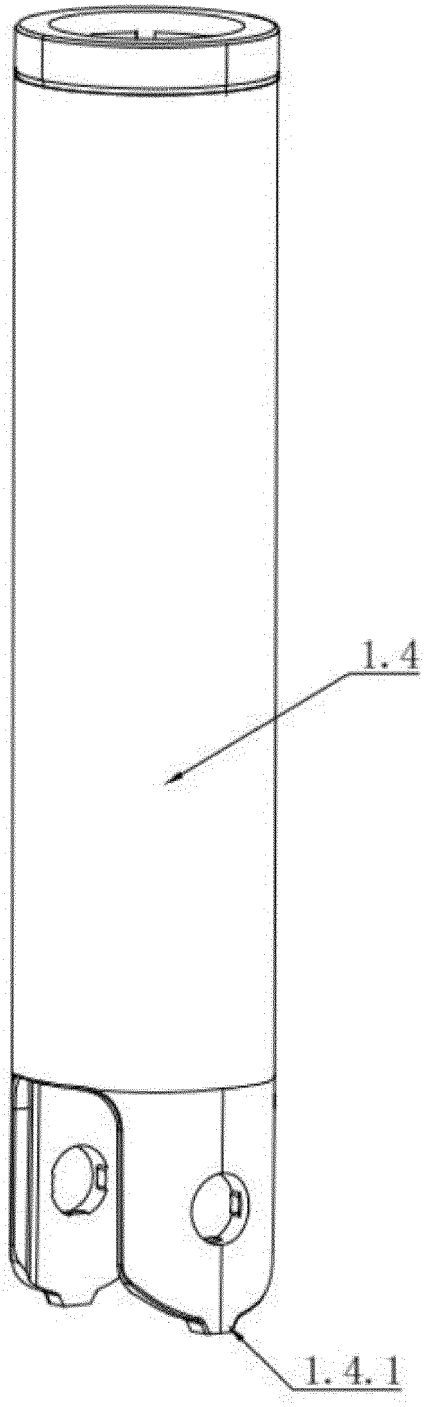

FIG. 13

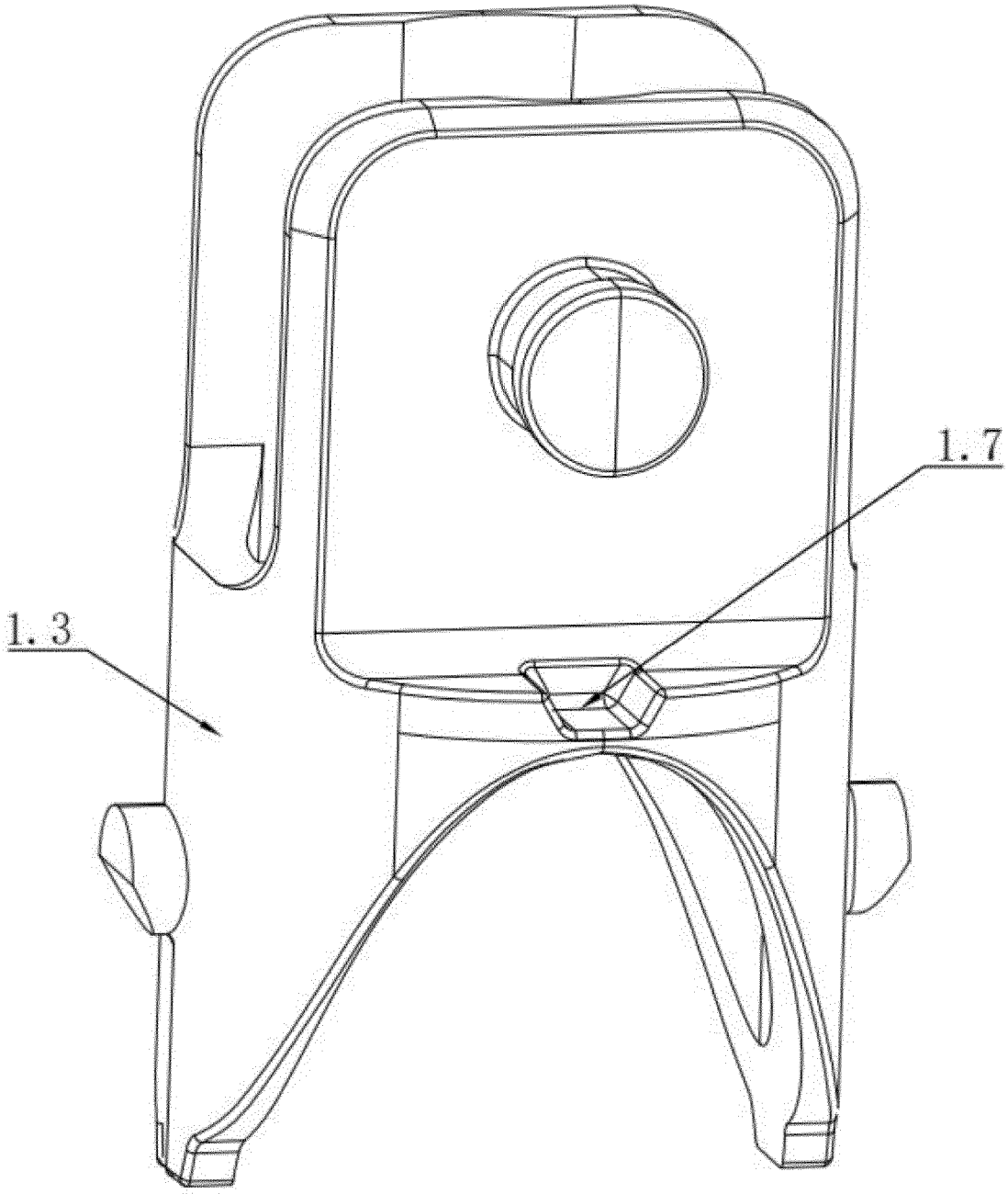

FIG. 14

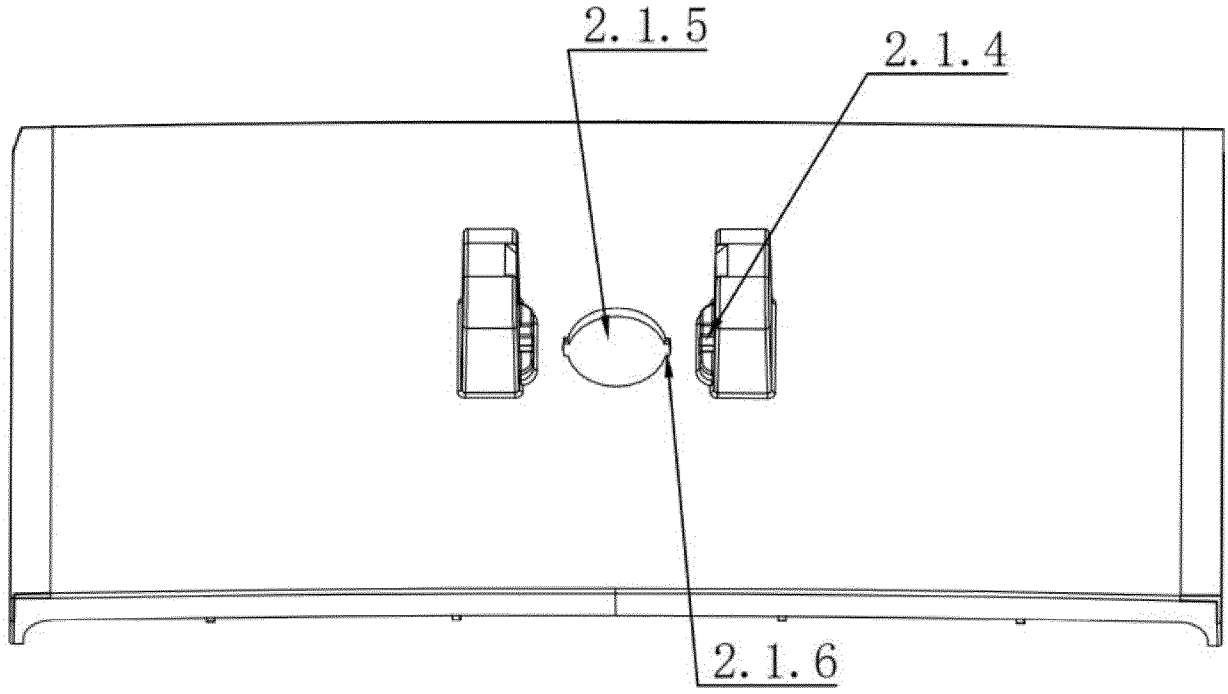

FIG. 15

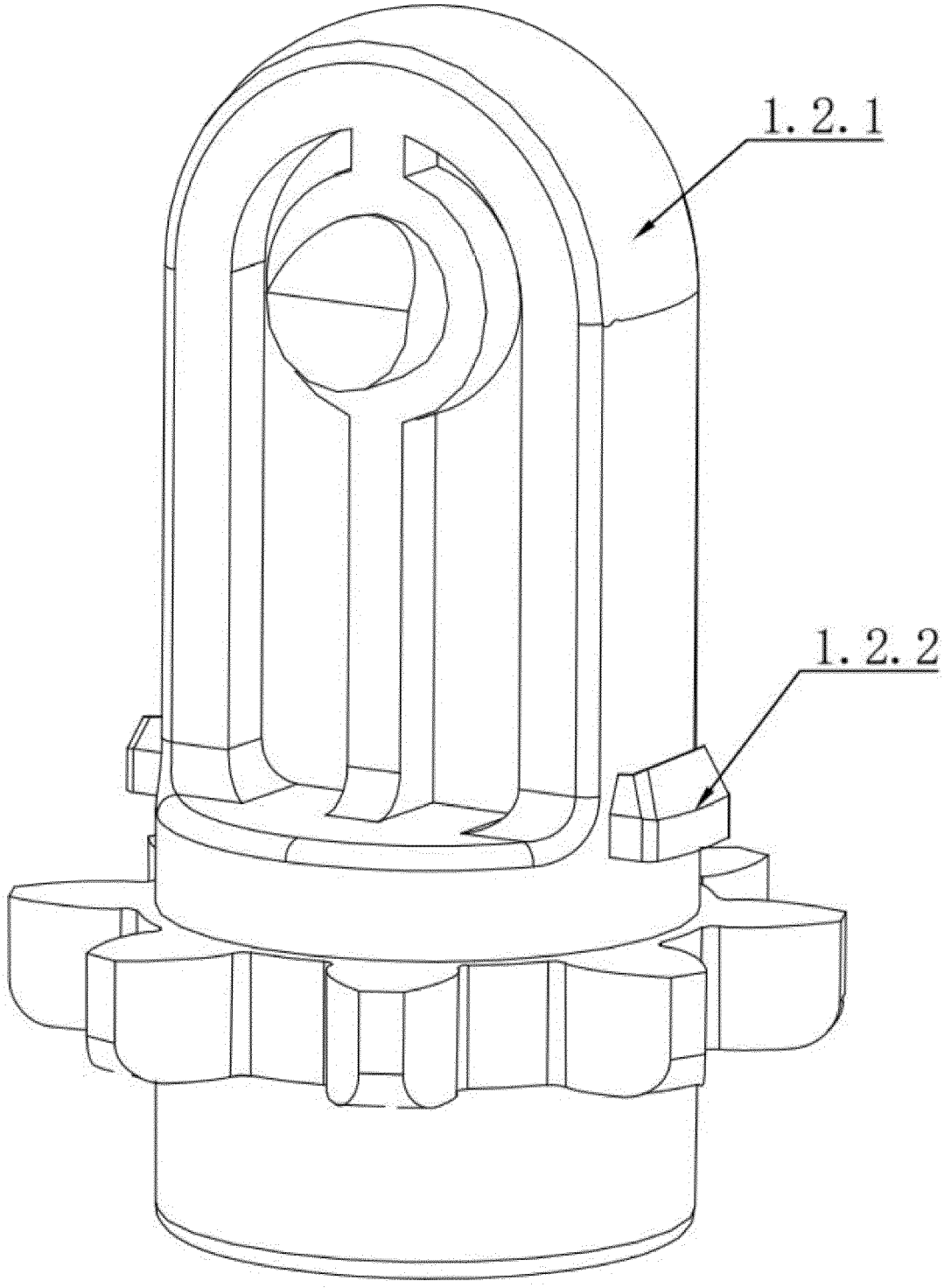

FIG. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 25 15 0588

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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A	* paragraphs [0047] - [0076]; claims; figures *	6,7	
X	CN 219 270 827 U (XIAN AICHUANG XINJIA BANGSHOU INTELLIGENT TECH CO LTD) 30 June 2023 (2023-06-30)	1-4,8-14	
A	* paragraphs [0047] - [0078]; claims; figures *	5-7	
X	CN 2 776 276 Y (XIA YAMING [CN]) 3 May 2006 (2006-05-03)	1-5,8-14	
A	* paragraphs [0032] - [0057]; claims; figures *	6,7	
X	CN 212 066 639 U (HEBEI JIESHIBAO COMMODITY PLASTICS PRODUCTS CO LTD) 4 December 2020 (2020-12-04)	1-5,8-14	
A	* the whole document *	6,7	TECHNICAL FIELDS SEARCHED (IPC)
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A	* pages 6,7; claims; figures *	6,7	
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A	* paragraphs [0008] - [0031]; claims; figures *	6,7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 May 2025	Lopez Vega, Javier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 25 15 0588

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-05-2025

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		JP 2004358123 A	24-12-2004

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