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(54) **ADVANCED HOLDING APPARATUS**

FORTSCHRITTLICHE HALTEVORRICHTUNG

APPAREIL DE SUPPORT AVANCÉ

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Description

FIELD OF THE INVENTION

[0001] The present invention generally relates to various tools designed for tightening or loosening fasteners, in particular bolts and nuts. More specifically, the present invention is an anti-slip multidirectional driver bit, designed to prevent damaging or stripping fasteners during the extraction or tightening process.

BACKGROUND OF THE INVENTION

[0002] Hex bolts, nuts, screws, and other similar threaded devices are used to secure and hold multiple components together by being engaged to a complimentary thread, known as a female thread. The general structure of these types of fasteners is a cylindrical shaft with an external thread and a head at one end of the shaft. The external thread engages a complimentary female thread tapped into a hole or a nut and secures the fastener in place, fastening the associated components together. The head receives an external torque force and is the means by which the fastener is turned, or driven, into the female threading. The head is shaped specifically to allow an external tool like a wrench to apply a torque to the fastener in order to rotate the fastener and engage the complimentary female threading to a certain degree. This type of fastener is simple, extremely effective, cheap, and highly popular in modern construction.

[0003] One of the most common problems in using these types of fasteners, whether male or female, is the tool slipping in the head portion, or slipping on the head portion. This is generally caused by either a worn fastener or tool, corrosion, overtightening, or damage to the head portion of the fastener. Examples of known tools with the purpose of reducing slippage during torque include WO 2015/050942 (Asymmetric Fastener Key and Recess) disclosing the preamble of claim 1,

[0004] WO 2017/069953 (Methods and Apparatus for an Enhanced Driving Bit), US 2017/312897 (Multi-Grip Socket Bit), and WO 98/12982 (Arrangement for Use in a System with a Range of Dental Screws, and the Range of Dental Screws). The present invention is defined in claim 1. The present invention is a driving bit design that virtually eliminates slippage. The design uses a series of segmented portions that bite into the head of the fastener and allow for efficient torque transfer between the driving bit and the head portion of the fastener. The present invention eliminates the need for the common bolt extractors as they require unnecessary drilling and tools. With the development of electric screwdrivers, and drills, people have been using, power tools to apply the required torsional forces and remove various fasteners. The present invention provides a double-sided driver end bit, thus allowing for torque to applied to the fastener in both clockwise and counterclockwise directions, thus tightening or loosening the fastener. Most driver end bits have a standardized one fourth inch hex holder and come in various configurations including but not limited to, square end, hex end, or star end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005]

FIG. **1** is a perspective view of an embodiment to understand the present invention.
FIG. **2** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **3** is a front view of the alternative embodiment to understand the present invention in FIG. **2.**
FIG. **4** is a rear view of the alternative embodiment to understand the present invention in FIG. **2.**
FIG. **5** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **6** is a bottom perspective of an embodiment to understand the present invention.
FIG. **7** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **8** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **9** is a front view of the alternative embodiment to understand the present invention in FIG. **8.**
FIG. **10** is a perspective view of anaiter nati v embodiment according to the present invention.
FIG. **11** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **12** is a perspective view of an alternative embodiment to understand the present invention.
FIG. **13** is a front view of a separate alternative embodiment to understand the present invention in FIG. **2** where an entire cross-section of the engagement cavity as a triangular profile.
FIG. **14** is a rear view of the separate alternative embodiment to understand the present invention in FIG. **2** where an entire cross-section of the engagement cavity as a triangular profile.

DETAIL DESCRIPTIONS OF THE INVENTION

[0006] The present invention generally related to torque tool accessories. More specifically, the present invention is a multi-grip screw bit, also known as a screw bit or driver. The present invention allows for a higher torque to be applied to a fastener than a similarly sized conventional driver bit without damaging the head of the fastener or the bit tool. This is achieved through the use of a multitude of engagement features which effectively grip the head of the fastener. The present invention is a screw bit that is compatible with a variety of torque tools including, but not limited to, traditional drills, bit-receiving screwdrivers, socket wrenches, and socket drivers.

[0007] While all figures describe embodiments of aspects of the present invention, only the embodiment according to figure 10 is an embodiment according to the

invention claimed in claim 1. In its simplest embodiment, referring to FIG. **1,** a tool comprises an at least one screw bit body **1** and an attachment body **19.** The screw bit body **1** is a shank which engages the socket fastener, such as a socket screw or a socket bolt, in order to apply a torque force onto the socket faster. The screw bit body **1** comprises a plurality of laterally-bracing sidewalls **2,** a first base **14,** and a second base **15.** In general, the screw bit body **1** is a prism composed of a strong metal. Each of the plurality of laterally-bracing sidewalls **2** engage within and grip the socket fastener in order to efficiently transfer torque from a torque tool to the socket fastener. The first base **14** and the second base **15** are positioned opposite to each other along the plurality of laterally-bracing sidewalls **2.** Additionally, the first base **14,** and thus second base **15,** is preferably oriented perpendicular to each of the plurality of laterally-bracing sidewalls and thus enclose/complete the prism shape of the screw bit body **1.** More specifically, it is preferred that the first base **14** comprises a first base surface **26,** wherein the first base surface **26** is flat and is oriented perpendicular to the bracing surface **5** of each of the plurality of laterally-bracing sidewalls **2.**

[0008] The attachment body **19** allows the present invention to be attached to an external torque tool and, thus, allow torque force to be applied to the socket fastener through the screw bit body 1. The attachment body **19** is centrally positioned around and along a rotation axis **16** of the screw bit body **1** such that the rotation axis of the attachment body **19** and the rotation axis **16** of the screw bit body **1** are coincidentally aligned. Additionally, the attachment body **19** is connected adjacent to the second base **15.** The attachment body **19** preferably has a hexagonal cross-section in order to fit within a female attachment member of the external torque tool. External torque tools include, but are not limited to, electric drills, torque wrenches, pneumatic drills, socket screw drivers, and other similar torque tools.

[0009] Referring to FIG. **3** and FIG. **4,** each of the laterally-bracing sidewalls comprises a first lateral edge **3,** a second lateral edge **4,** a bracing surface **5,** and an at least one engagement cavity **8.** The plurality of laterally-bracing sidewalls **2** is radially positioned about the rotation axis **16** of the screw bit body **1** in order to yield a geometric profile complimentary to that of the socket fastener. The number within the plurality of laterally-bracing sidewalls **2** is subject to change to compliment the shape and profile of a variety of socket fasteners. In one embodiment of the present invention, the number within the plurality of laterally-bracing sidewalls **2** is six and the resulting geometric profile of the screw bit body **1** is a hexagon. In an alternative embodiment of the present invention, the number within the plurality of laterally-bracing sidewalls **2** is four.

[0010] The bracing surface **5** physically presses against the socket fastener, specifically against the lateral sidewall of a head portion from the socket fastener. The first lateral edge **3** and the second lateral edge **4** are positioned opposite to each other across the bracing surface **5.** When viewed from either the top perspective or the bottom perspective, the first lateral edge **3** and the second lateral edge **4** from each of the plurality of laterally-bracing sidewalls **2** make up the corners of the screw bit body **1.** The engagement cavity **8** extends normal and into the bracing surface **5** and creates an additional gripping point/tooth on the bracing surface **5.** The engagement cavity **8** may not make contact with fastener sidewall and may remain void. The engagement cavity **8** may accept material from the fastener when the bracing surface **5** adjacent to the engagement cavity **8** bites in the fastener sidewall. Additionally, the engagement cavity **8** is positioned offset from the first lateral edge **3** by a first distance **21.** Resultantly, the gripping point is created by the engagement cavity **8** and the bracing surface **5.** In another embodiment, the gripping point is created by the engagement cavity **8** and an adjacent edge, wherein the adjacent edge is either the first lateral edge **3** or the second lateral edge **4;** in particular, the adjacent edge is the edge closest to the engagement cavity **8.** Additionally, the engagement cavity **8** extends into the screw bit body **1** from the first base **14** towards the second base **15.** This ensures that the additional gripping point extends along the length of the screw bit body **1** for maximum grip engagement between the screw bit body **1** and the socket fastener. To further accomplish this, it is preferred that an entire cross-section **9** of the engagement cavity **8** is parallel to the first base **14** and the second base **15.** In one embodiment of the present invention, the engagement cavity **8** also tapers from the first base **14** to the second base **15** such that the partially circular profile adjacent to the first base **14** is larger than the partially circular profile adjacent to the second base **15.** as seen in FIG. **11.** Referring to FIG. **3,** according to the present invention, the entire cross-section **9** of the engagement cavity **8** is a partially-circular profile. Additionally, the partially-circular profile is concave along a direction from the first lateral edge **3** to the second lateral edge **4.** The partially-circular profile ensures that there are little to no high stress points in the screw bit body **1,** thus increasing the overall longevity of the tool. Referring to FIG. **13** and FIG. **14,** in an embodiment not according to the present invention, the entire cross-section **9** of the engagement cavity **8** is a triangular profile. Additionally, the triangular profile is concave along a direction from the first lateral edge **3** to the second lateral edge **4.** Alternative profiles may be used for the engagement cavity **8** including, but not limited to, a semi-square profile, a semi-rectangular profile, and a semi-oval profile.

[0011] In one embodiment of the present invention, referring to FIG. **8** and FIG. **9,** the entire cross-section **9** of the engagement cavity **8** comprises a curved portion **10** and a straight portion **11.** In this embodiment, the present invention is implemented as an extraction bit, wherein the present invention is designed to extract damaged or broken fasteners, damaged rods, broken studs, and other similar items. The engagement cavity **8** is uniquely

shaped in order to form a sharp engagement tooth that grips in the corners of the socket fastener, allowing material from the internal sides of the fastener socket into the engagement cavity **8** and thus yielding a superior grip over traditional tools which are simply designed to push material away. This is especially true for worn or damaged fastener socket. More specifically, the curved portion **10** is a semi-circular curve that is positioned adjacent to the first lateral edge **3.** The straight portion **11** is positioned adjacent to the curved portion **10,** opposite the first lateral edge **3.** The straight portion **11** guides a portion of the socket fastener to press against the engagement tooth. As such, the straight portion **11** extends from the curved portion **10** to the second lateral edge **4.** Specifically, the straight portion **11** starts at the curved portion **10** and ends at the second lateral edge **4.**

[0012] In another embodiment not according to the claimed invention, referring to FIG. **11,** the engagement cavity **8** is centrally position on the bracing surface **5.** In particular, the engagement cavity **8** is positioned offset from the second lateral edge **4** by a second distance **22.** For central positioning, the first distance **21** is equal to the second distance **22.** This positions the engagement cavity **8** to engage the internal lateral sidewall of the socket fastener for the most efficient transfer of torque with the least possibility of slippage. Additionally, this embodiment may be used to rotate the socket fastener in either the clockwise or the counter-clockwise direction.

[0013] In another embodiment not according to the claimed invention, the proportion between the first distance **21,** the second distance **22,** and the width of the engagement cavity **8** may be altered in order to achieve a dedicated clockwise or counterclockwise design. In one embodiment, the present invention is configured to be a clockwise drive bit. For this embodiment, the first distance **21** is greater than the second distance **22.** In particular, the proportion between the first distance **21,** the second distance **22,** and the width of the engagement cavity **8** is 1:5:4, thus yielding a design which grips and applies torque to the socket fastener in the clockwise direction. This design is used to screw in and secure the socket fastener. In another embodiment, the present invention is configured to be a counter-clockwise screw bit. For this embodiment, the first distance **21** is greater than the second distance **22.** In particular, the proportion between the first distance **21,** the second distance **22,** and the width of the engagement cavity **8** is 5:1:4, thus yielding a design which grips and applies torque to the socket fastener in the counter-clockwise direction. This design is used to release and extract the socket fastener.

[0014] Referring to FIG. **10,** the present invention is implemented in a spline bit design. In this embodiment, the screw bit body **1** is a spline-type bit body that transfers torque to the socket fastener through a multitude of protrusions. Specifically, the screw bit body **1** further comprises a plurality of intermittent sidewalls **24.** Each of the plurality of intermittent sidewalls **24** is a flat surface which engages the socket fastener like a traditional screw bit design. The plurality of intermittent sidewalls **24** is radially positioned about the rotation axis **16.** Additionally, the plurality of intermittent sidewalls **24** is interspersed amongst the plurality of laterally-bracing sidewalls **2.** The ratio between the plurality of laterally-bracing sidewalls **2** and the plurality of intermittent sidewalls **24** is subject to change to yield a variety of different screw bit designs. In one embodiment, the plurality of intermittent sidewalls **24** and the plurality of laterally-bracing sidewalls **2** radially alternate between each other. In another embodiment, there are three sidewalls from the plurality of intermittent sidewalls **24** in between each of the plurality of laterally-bracing sidewalls **2.** Resultantly, this configuration places an engagement feature/tooth at every other protrusion of the screw bit body **1.**

[0015] In another embodiment, referring to FIG. **6,** the present invention further comprises an engagement bore **20.** The engagement bore **20** allows the present invention to be attached to a male attachment member of an external torque tool, such as a socket wrench or a screw driver. The engagement bore **20** extends into the attachment body **19** along the rotation axis, opposite the screw bit body **1.** The engagement bore **20** is shaped to receive a male attachment member of a socket wrench; the preferred shape is square as the majority of socket wrenches utilize a square attachment member. In this embodiment, the preferred attachment body **19** is cylindrical shaped. In alternative embodiments, the shape and design of the engagement bore **20** and the attachment body **19** may vary to be adaptable to different torque tool designs and different attachment means.

[0016] In one embodiment, referring to FIG. **2,** the present invention is implemented as a dual sided screw bit, thus providing both a clockwise and a counter-clockwise configuration simultaneously in a single tool. In this embodiment, the at least one screw bit body **1** comprises a first screw bit body **17** and a second screw bit body **18.** The attachment body **19** preferably has a hexagonal cross-section. The attachment body **19** is centrally positioned around and along the rotation axis **16** of the first screw bit body **17** such that the rotation axis of the attachment body **19** and the rotation axis **16** of the first screw bit body **17 1** are coincidentally aligned. Additionally, the attachment body **19** is connected adjacent to the second base **15** of the first screw bit body **17.** The second screw bit body **18** shares the attachment body **19** with the first screw bit body **17.** Thus, the second screw bit body **18 1** is concentrically positioned with the first screw bit body **17.** Additionally, the second screw bit body **18** is positioned adjacent to the attachment body **19,** opposite the first screw bit body **17,** similar to traditional double-sided screw bit designs. Similar to the first screw bit body **17,** the attachment body **19** is connected to the second base **15** of the second screw bit body **18.** The first screw bit body **17** is designed to screw in a socket fastener, the clockwise configuration. For this, referring to FIG. **3,** the second distance **22** of the first screw bit body **17** is greater than the first distance **21** of the first

screw bit body **17.** This positions the additional gripping point of the first screw bit body **17** adjacent to the first lateral edge **3** of the first screw bit body **17.** The second screw bit body **18** is designed to unscrew/extract the socket fastener, i.e. the counter-clockwise configuration. Referring to FIG. **4,** the first distance **21** of the second screw bit body **18** is greater than the second distance **22** of the second screw bit body **18 1.** This positions the additional gripping point of the second screw bit body **18** adjacent to the second lateral edge **4** of the second screw bit body **18.**

[0017] In another embodiment not acccording to the claimed invention, referring to FIG. **5,** the at least one engagement cavity **8** comprises a first cavity **12** and a second cavity **13.** This embodiment is an alternative configuration which yields a clockwise and counter-clockwise configuration. In particular, the first cavity **12** and the second cavity **13** are oriented parallel and offset to each other. The first cavity **12** is positioned adjacent and offset to the first lateral edge **3** and the second cavity **13** is positioned adjacent and offset to the second lateral edge **4.** This allows the user to rotate the tool either in the clockwise or counter-clockwise rotation without removing the present teachings from the torque tool while still taking advantage of the additional gripping point(s). In this embodiment, it is preferred that the tool further comprises the plurality of intermittent sidewalls **24,** wherein the plurality of intermittent sidewalls **24** is interspersed amongst the plurality of laterally-bracing sidewalls **2.**

[0018] Referring to FIG. **7,** in an alternative embodiment not according to the claimed invention, the tool is implemented as a ball-end screw bit. In this embodiment, the bracing surface **5** for each of the plurality of laterally-bracing sidewalls **2** comprises a convex portion **6** and a concave portion **7.** The convex portion **6** and the concave portion **7** delineate a curved surface such that, overall, the plurality of laterally-bracing sidewalls **2** forms a ball-like shape. The convex portion **6** is positioned adjacent to the first base **14** such that the convex portion **6** from each of the plurality of laterally-bracing sidewalls **2** forms the body of the ball-like shape. The concave portion **7** is positioned adjacent to the convex portion **6,** opposite to the first base **14** such that the concave portion **7** from each of the plurality of laterally-bracing sidewalls **2** further forms the ball-like shape and provides clearance for when the screw bit body **1** is engaged to the socket fastener at an angle. The convex portion **6** and the concave portion **7** are oriented along the rotation axis **16** of the screw bit body **1,** and thus the length of the screw bit body **1,** to position the ball-like shaped terminally on the screw bit body **1.** It is preferred that the curvature, length, and height of the concave portion **7** and the convex portion **6** is identical. Additionally, it is preferred that the engagement cavity **8** extends along the whole length of the convex portion **6** and the concave portion **7.** Thus, additional gripping is provided along the screw bit body **1,** regardless of the angle between the socket fastener and the screw bit body **1.**

[0019] Referring to FIG. **10,** in one embodiment, the present invention is implemented as a tamper-resistant screw bit. In particular, the present invention further comprises a pin-in security hole **23** which interlocks with a complimentary post within a unique socket fastener. Thus, a set of unique socket fasteners and a unique-key screw bit may be sold, utilized, or manufactured to ensure tamper proof design. This type of interlocking design is used for security reasons, preventing unauthorized personnel from accessing certain socket fasteners. The pin-in security hole **23** is concentrically positioned with the rotation axis **16** of the screw bit body **1.** Additionally, the pin-in security hole **23** extends into the screw bit body **1** from the first base **14.** The size, depth, and profile of the pin-in security is subject to change to meet the needs and specifications of the user.

[0020] In one embodiment, referring to FIG. **11,** the present invention includes additional features in order to guide the screw bit body **1** into the socket fastener. In particular, a lateral edge **25** between the first base **14** and each of the plurality of laterally-bracing sidewalls **2** is chamfered which aids the user in interlocking the screw bit body **1** within the socket fastener. Referring to FIG. **12,** in another embodiment, the present invention is implemented in a screwdriver design. In this embodiment, the screw bit body **1** is tapered from the second base **15** towards the first base **14,** similar to traditional screwdrivers. The degree of tapering is subject to change to meet the needs and requirements of the user.

[0021] In other embodiments, the tool may be implemented in the form of a socket for tightening or loosening of bolts and other similar fasteners. For this, the screw bit body **1** is implemented as a cavity traversing into a cylinder, similar to traditional socket designs.

Claims

1. An advanced holding apparatus, comprising:

at least one screw bit body (1);
an attachment body (19);
the at least one screw bit body (1) comprising a plurality of laterally-bracing sidewalls (2), a first base (14), and a second base (15);
each of the plurality of laterally-bracing sidewalls (2) comprising a first lateral edge (3), a second lateral edge (4), a bracing surface (5), and at least one engagement cavity (8);
the plurality of laterally-bracing sidewalls (2) being radially positioned about a rotation axis (16) of the at least one screw bit body (1);
the first lateral edge (3) and the second lateral edge (4) being positioned opposite each other across the bracing surface (5);
the at least one engagement cavity (8) extending into the bracing surface (5);

the at least one engagement cavity (8) extending into the at least one screw bit body (1) from the first base (14) towards the second base (15);
the at least one engagement cavity (8) being positioned offset from the first lateral edge (3) by a first distance (21);
an entire cross-section (9) of the at least one engagement cavity (8) being parallel to the first base (14) and the second base (15);
the attachment body (19) being centrally positioned around and along the rotation axis (16);
the attachment body (19) being connected adjacent to the second base (15);
the at least one screw bit body (1) is a spline-type bit body comprising a multitude of protrusions;
the entire cross section (9) of the at least one engagement cavity (8) is a partially-circular profile;
the partially-circular profile being concave along a direction from the first lateral edge (3) to the second lateral edge (4);
characterized in that:
the spline-type bit body further comprises a plurality of intermittent sidewalls (24);
the plurality of intermittent sidewalls (24) is radially positioned about the rotation axis (16);
the plurality of intermittent sidewalls (24) is interspersed amongst the plurality of laterally-bracing sidewalls (2); and
each of the plurality of intermittent sidewalls (24) is a flat surface.

2. The advanced holding apparatus as claimed in claim 1 comprises:

a pin-in security hole (23);
the pin-in security hole (23) being concentrically positioned with the rotation axis (16) of the screw bit body (1); and
the pin-in security hole (23) normally extending into the screw bit body (1) from the first base (14).

3. The advanced holding apparatus as claimed in claim 1, wherein a lateral edge (25) between the first base (14) and each of the plurality of laterally-bracing sidewalls (2) is chamfered.

4. The advanced holding apparatus as claimed in claim 1 comprises:

the first base (14) comprising a first base surface (26);
the first base surface (26) and the bracing surface (5) each being flat; and
the first base surface (26) and the bracing surface (5) being oriented perpendicular to each other.

5. The advanced holding apparatus as claimed in claim 1, wherein the at least one engagement cavity (8) tapers from the first base (14) to the second base (15).

6. The advanced holding apparatus as claimed in claim 1 comprises:

an engagement bore (20); and
the engagement bore (20) extending into the attachment body (19) along the rotation axis (16), opposite the at least one screw bit body (1).

Patentansprüche

1. Weiterentwickelte Haltevorrichtung, umfassend:

mindestens einen Schraubeinsatzkörper (1);
einen Anbringungskörper (19);
wobei der mindestens eine Schraubeinsatzkörper (1) eine Vielzahl von seitlich verstrebenden Seitenwänden (2), eine erste Basis (14) und eine zweite Basis (15) umfasst;
jede der Vielzahl von seitlich verstrebenden Seitenwänden (2) eine erste Seitenkante (3), eine zweite Seitenkante (4), eine Verstrebungsfläche (5) und mindestens eine Eingriffsvertiefung (8) umfasst;
die Vielzahl von seitlich verstrebenden Seitenwänden (2) radial um eine Drehachse (16) des mindestens einen Schraubeinsatzkörpers (1) positioniert ist;
die erste Seitenkante (3) und die zweite Seitenkante (4) über die Verstrebungsfläche (5) einander gegenüberliegend positioniert sind;
die mindestens eine Eingriffsvertiefung (8) sich in die Verstrebungsfläche (5) erstreckt;
die mindestens eine Eingriffsvertiefung (8) sich von der ersten Base (14) zu der zweiten Base (15) hin in den mindestens einen Schraubeinsatzkörper (1) erstreckt;
die mindestens eine Eingriffsvertiefung (8) um einen ersten Abstand (21) versetzt von der ersten Seitenkante (3) positioniert ist;
ein gesamter Querschnitt (9) der mindestens einen Eingriffsvertiefung (8) parallel zu der ersten Basis (14) und der zweiten Basis (15) ist;
der Anbringungskörper (19) zentral um die und entlang der Drehachse (16) positioniert ist;
der Anbringungskörper (19) angrenzend an die zweite Basis (15) verbunden ist;
der mindestens einen Schraubeinsatzkörper (1) ein Einsatzkörper vom Keil-Typ ist, der eine Menge von Vorsprüngen umfasst;
der gesamte Querschnitt (9) der mindestens ei-

nen Eingriffsvertiefung (8) ein partiell kreisförmiges Profil ist;
das partiell kreisförmige Profil entlang einer Richtung von der ersten Seitenkante (3) zu der zweiten Seitenkante (4) konkav ist;
dadurch gekennzeichnet, dass:

der Einsatzkörper vom Keil-Typ weiterhin eine Vielzahl von intermittierenden Seitenwänden (24) umfasst;
die Vielzahl von intermittierenden Seitenwänden (24) radial um die Drehachse (16) positioniert ist;
die Vielzahl von intermittierenden Seitenwänden (24) unter der Vielzahl von seitlich verstrebenden Seitenwänden (2) eingefügt ist und
jede der Vielzahl von intermittierenden Seitenwänden (24) eine flache Oberfläche ist.

2. Weiterentwickelte Haltevorrichtung nach Anspruch 1, die umfasst:

ein Durchstecksicherheitsloch (23);
wobei das Durchstecksicherheitsloch (23) konzentrisch mit der Drehachse (16) des Schraubeinsatzkörpers (1) positioniert ist und
das Durchstecksicherheitsloch (23) sich von der ersten Basis (14) lotrecht in den Schraubeinsatzkörper (1) erstreckt.

3. Weiterentwickelte Haltevorrichtung nach Anspruch 1, wobei eine Seitenkante (25) zwischen der ersten Basis (14) und jeder der Vielzahl von seitlich verstrebenden Seitenwänden (2) abgefast ist.

4. Weiterentwickelte Haltevorrichtung nach Anspruch 1, die umfasst:

die erste Basis (14) umfasst eine erste Basisfläche (26);
die erste Basisfläche (26) und die Verstrebungsfläche (5) sind jeweils flach und
die erste Basisfläche (26) und die Verstrebungsfläche (5) sind senkrecht zueinander ausgerichtet.

5. Weiterentwickelte Haltevorrichtung nach Anspruch 1, wobei die mindestens eine Eingriffsvertiefung (8) sich von der ersten Basis (14) zu der zweiten Basis (15) verjüngt.

6. Weiterentwickelte Haltevorrichtung nach Anspruch 1, die umfasst:

eine Eingriffsbohrung (20); und
wobei die Eingriffsbohrung (20) sich in den Anbringungskörper (19) entlang der Drehachse (16) entgegengesetzt zu dem mindestens einen Schraubeinsatzkörper (1) erstreckt.

Revendications

1. Un appareil de maintien avancé, comprenant :

au moins un corps d'embout de vis (l) ;
un corps de fixation (19) ;
le ou au moins un corps d'embout de vis (l) comprenant une pluralité de parois latérales de renfort latéral (2), une première base (14) et une seconde base (15) ;
chacune de la pluralité de parois latérales de renfort latéral (2) comprenant un premier bord latéral (3), un second bord latéral (4), une surface de renfort (5) et au moins une cavité d'engagement (8) ;
la pluralité de parois latérales de renfort latéral (2) étant positionnées radialement autour d'un axe de rotation (16) de ou au moins un corps d'embout de vis (l) ;
le premier bord latéral (3) et le second bord latéral (4) étant positionnés l'un en face de l'autre sur la surface de renfort (5) ;
la ou au moins une cavité d'engagement (8) s'étendant dans la surface de renfort (5) ;
la ou au moins une cavité d'engagement (8) s'étendant dans au moins un corps d'embout de vis (l) depuis la première base (14) vers la seconde base (15) ;
la ou au moins une cavité d'engagement (8) étant positionnée de façon à être décalée par rapport au premier bord latéral (3) d'une première distance (21) ;
une section transversale entière (9) de ou au moins une cavité d'engagement (8) étant parallèle à la première base (14) et à la seconde base (15) ;
le corps de fixation (19) étant positionné centralement autour et le long de l'axe de rotation (16) ;
le corps de fixation (19) étant connecté de manière adjacente à la seconde base (15) ;
le ou au moins un corps d'embout de vis (1) est un corps d'embout de vis de type cannelé comprenant une multitude de saillies ;
la totalité de la section transversale (9) de la ou au moins une cavité d'engagement (8) est un profil partiellement circulaire ;
le profil partiellement circulaire étant concave le long d'une direction allant du premier bord latéral (3) au second bord latéral (4) ;
caractérisé en ce que :

le corps d'embout de vis de type cannelé comprend en outre une pluralité de parois latérales intermittentes (24) ;

la pluralité de parois latérales intermittentes (24) est positionnée radialement autour de l'axe de rotation (16) ;
la pluralité de parois latérales intermittentes (24) est intercalée parmi la pluralité de parois latérales de renfort latéral (2) ; et
chacune des multiples parois latérales intermittentes (24) est une surface plane.

2. L'appareil de maintien avancé selon la revendication 1, comprenant :

un trou de sécurité à goupille (23) ;
le trou de sécurité à goupille (23) étant positionné de manière concentrique avec l'axe de rotation (16) du corps de l'embout de vis (I) ; et
le trou de sécurité à goupille (23) s'étendant normalement dans le corps de l'embout de vis (I) à partir de la première base (14).

3. L'appareil de maintien avancé selon la revendication 1, dans lequel un bord latéral (25) entre la première base (14) et chacune de la pluralité de parois latérales de renfort latéral (2) est chanfreiné.

4. L'appareil de maintien avancé selon la revendication 1, comprenant :

la première base (14) comprenant une première surface de base (26) ;
la première surface de base (26) et la surface de renfort (5) étant chacune plates ; et
la première surface de base (26) et la surface de renfort (5) étant orientées perpendiculairement l'une à l'autre.

5. L'appareil de maintien avancé selon la revendication 1, dans lequel la ou au moins une cavité d'engagement (8) se rétrécit à partir de la première base (14) à la seconde base (15).

6. L'appareil de maintien avancé selon la revendication 1, comprenant :

un alésage d'engagement (20) ; et
l'alésage d'engagement (20) s'étendant dans le corps de fixation (19) le long de l'axe de rotation (16), à l'opposé de ou au moins un corps d'embout de vis (1).

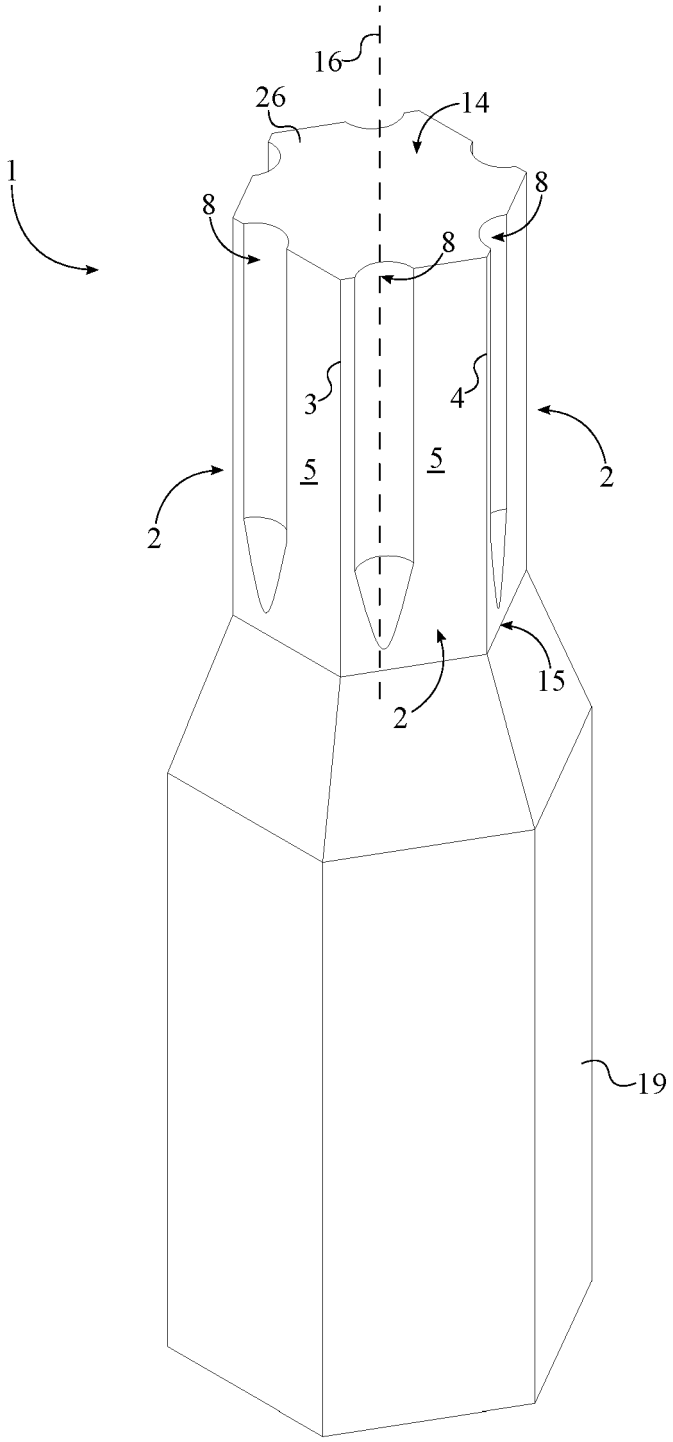

FIG. 1

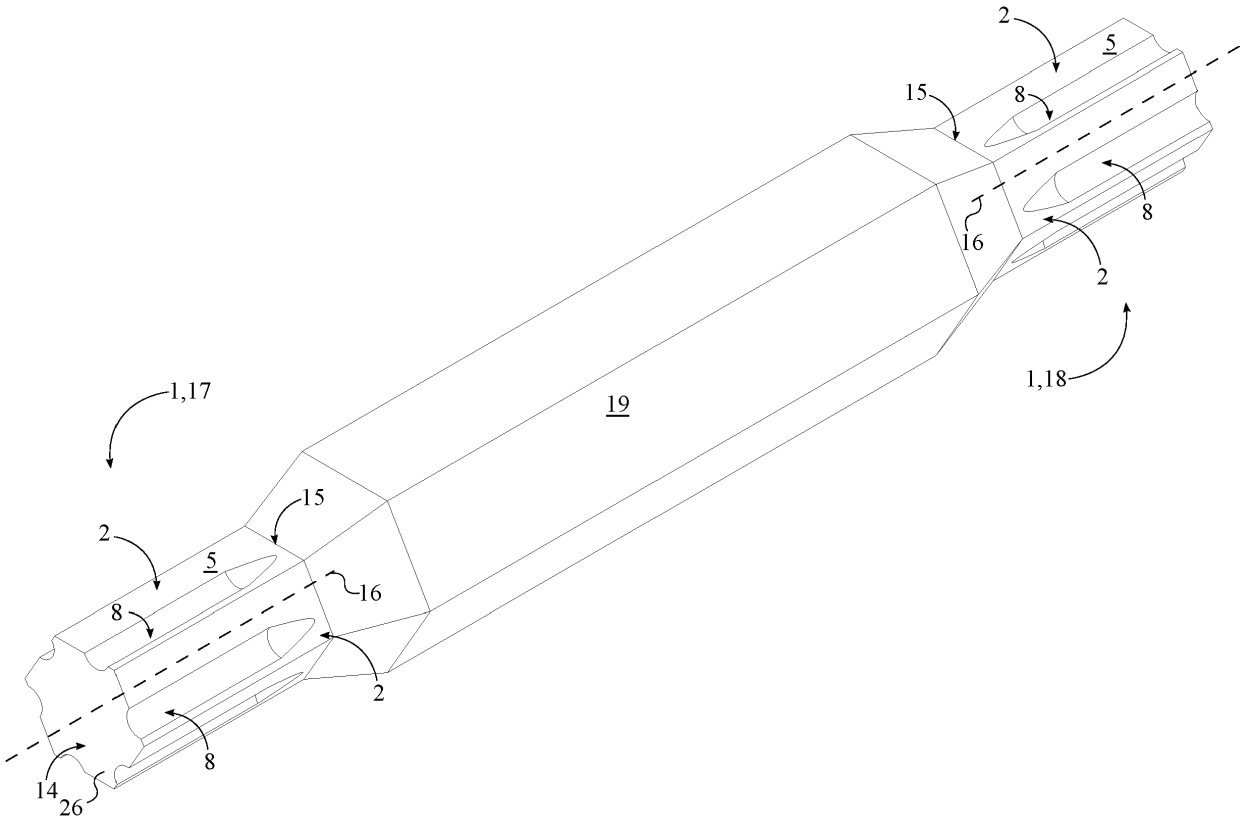

FIG. 2

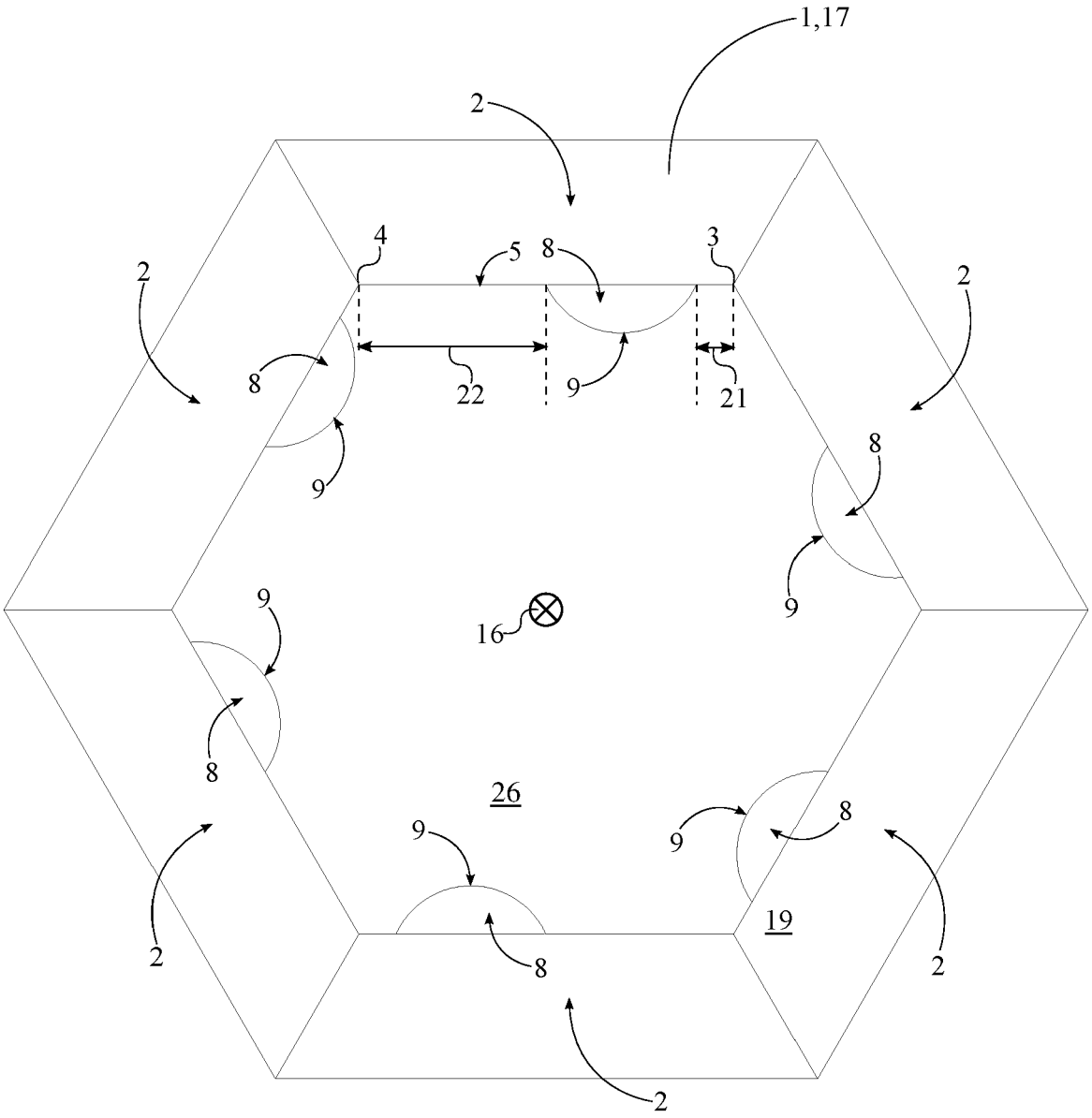

FIG. 3

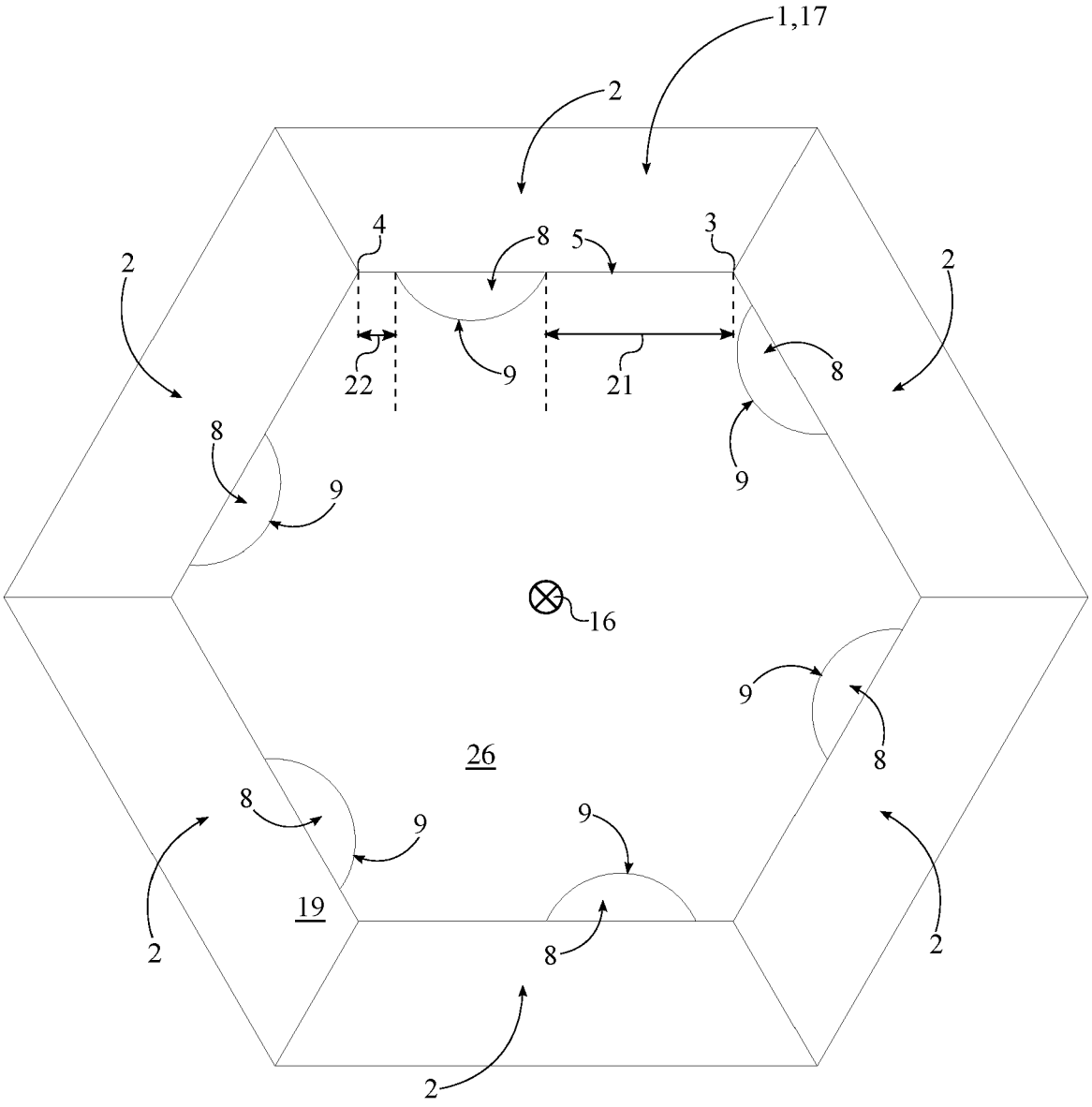

FIG. 4

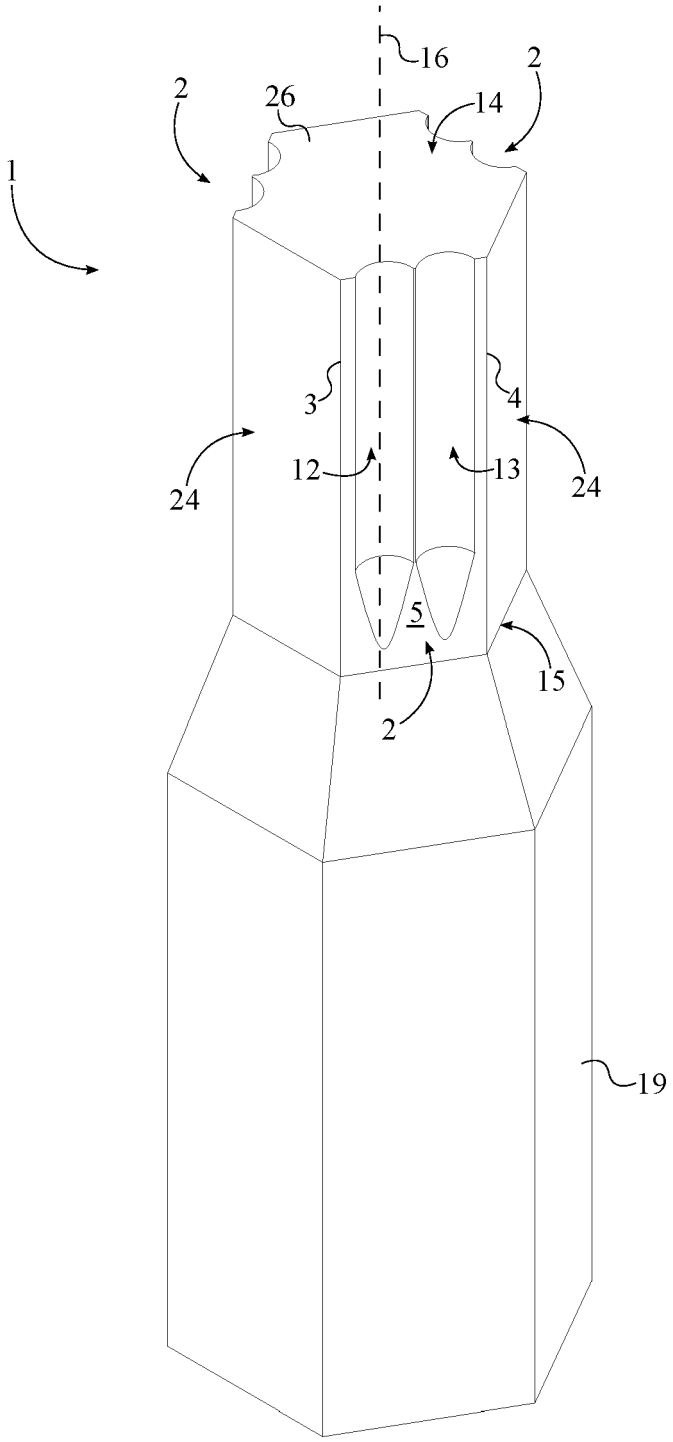

FIG. 5

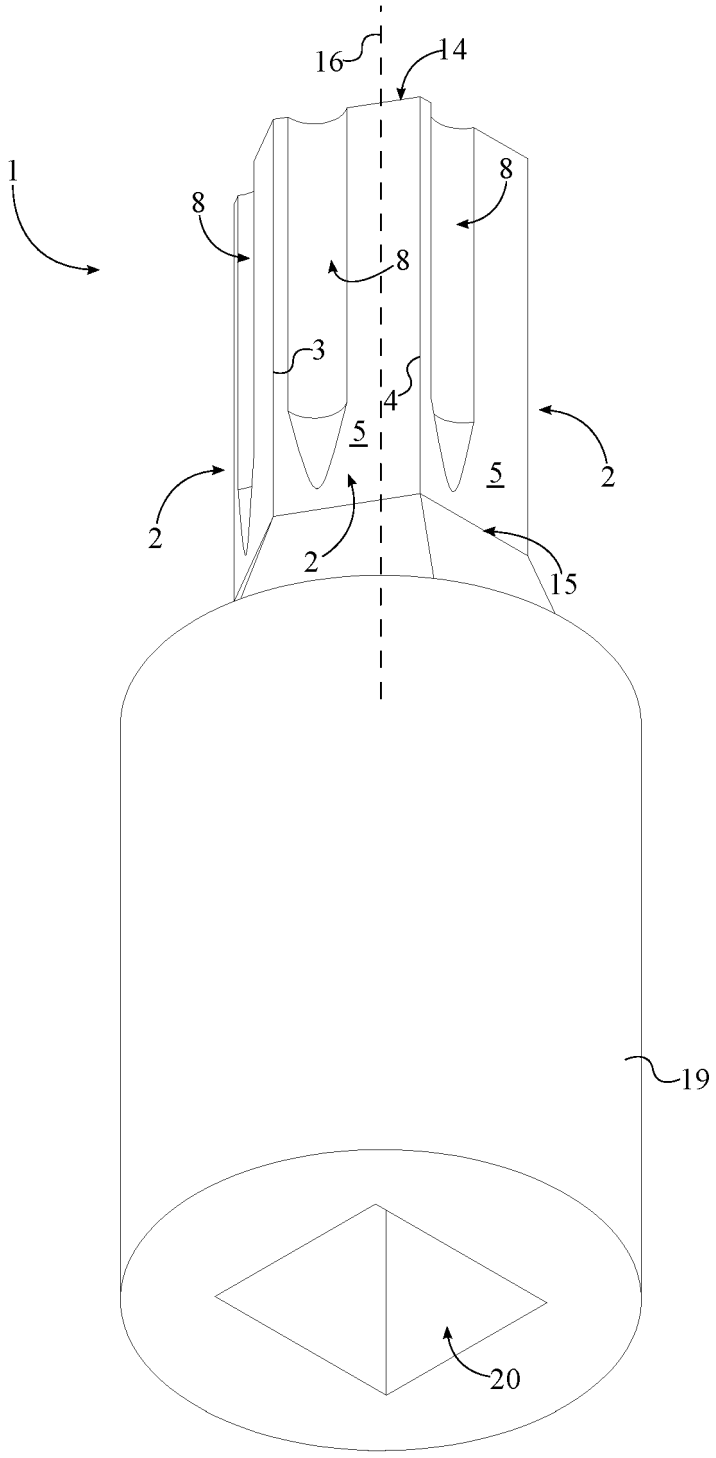

FIG. 6

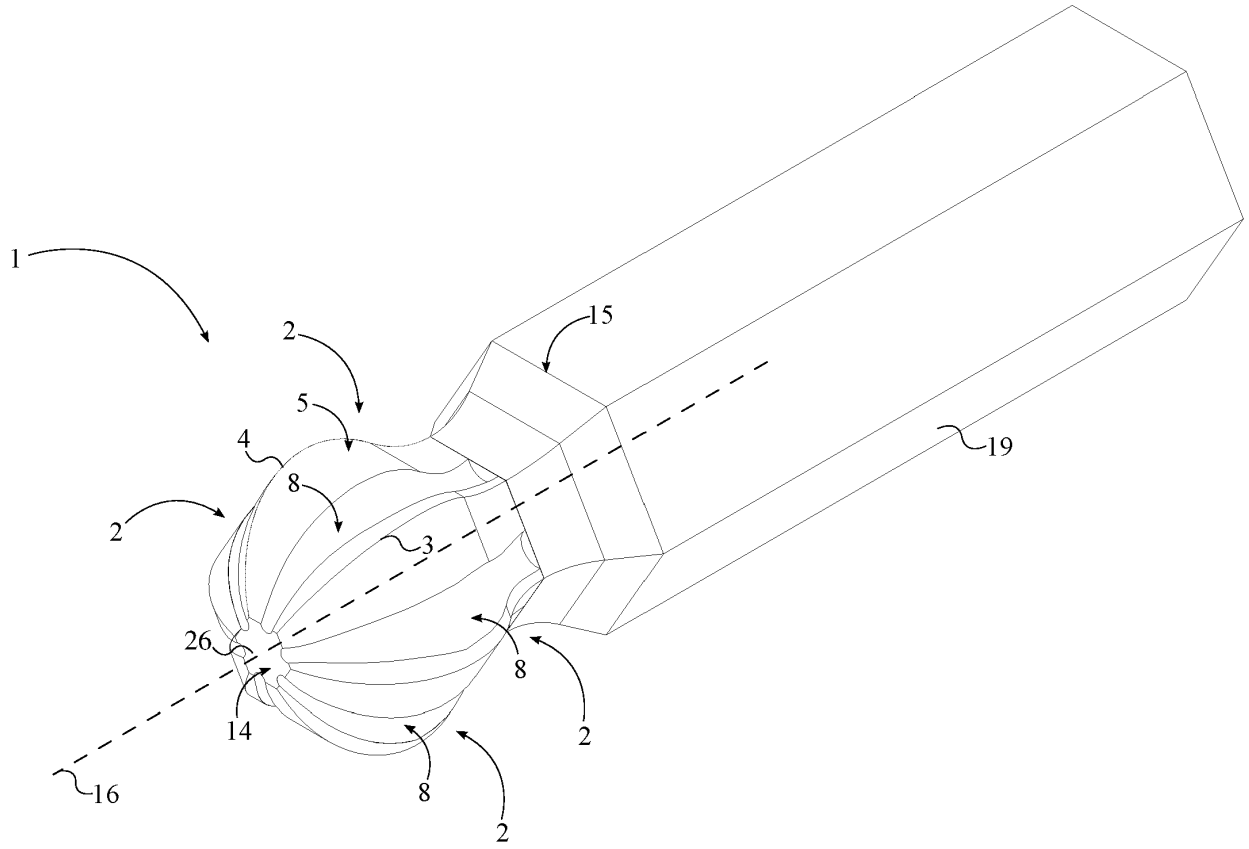

FIG. 7

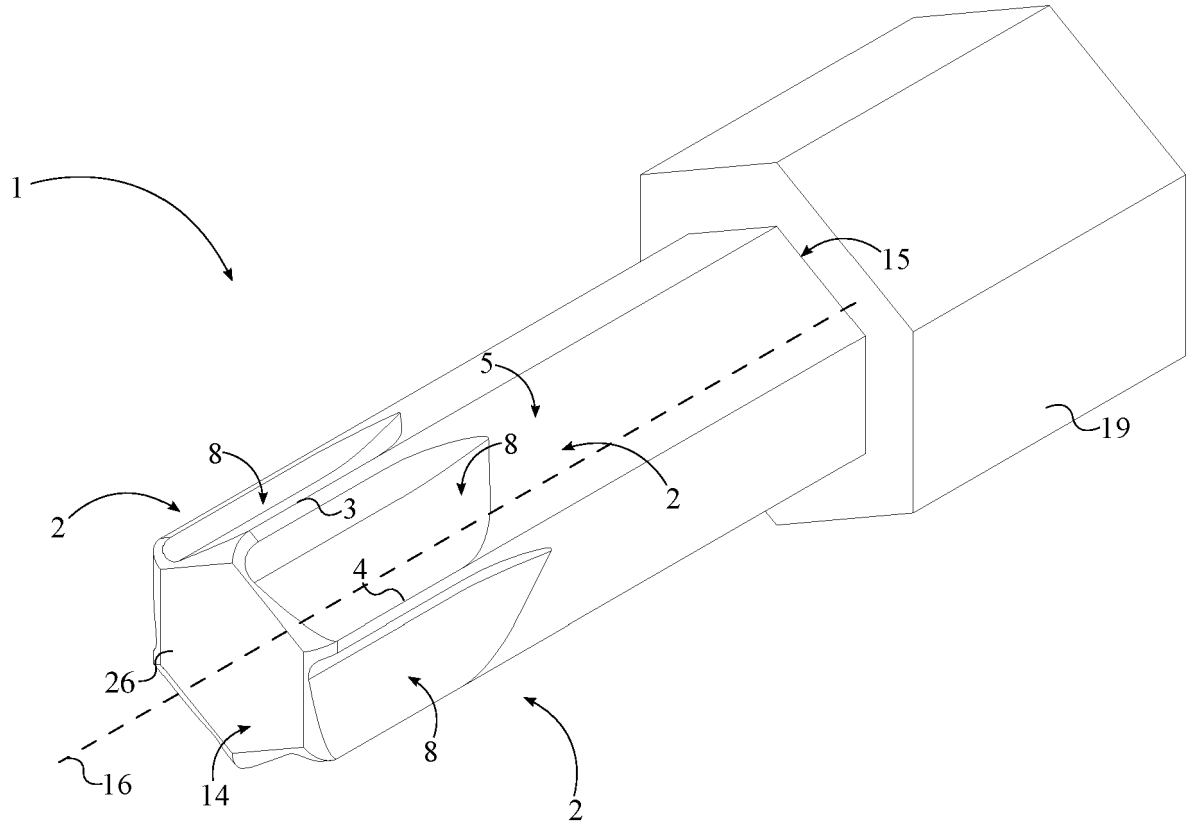

FIG. 8

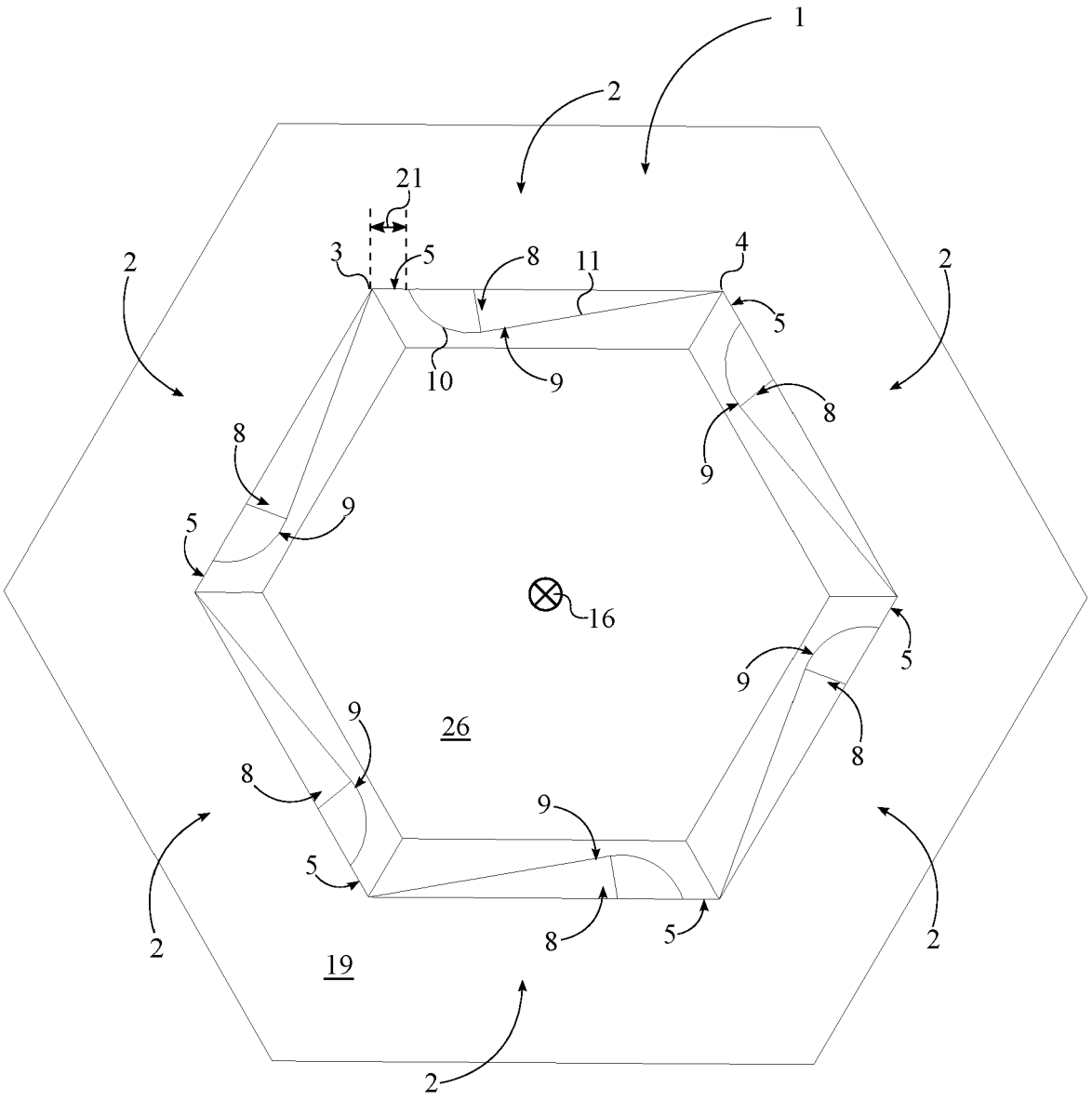

FIG. 9

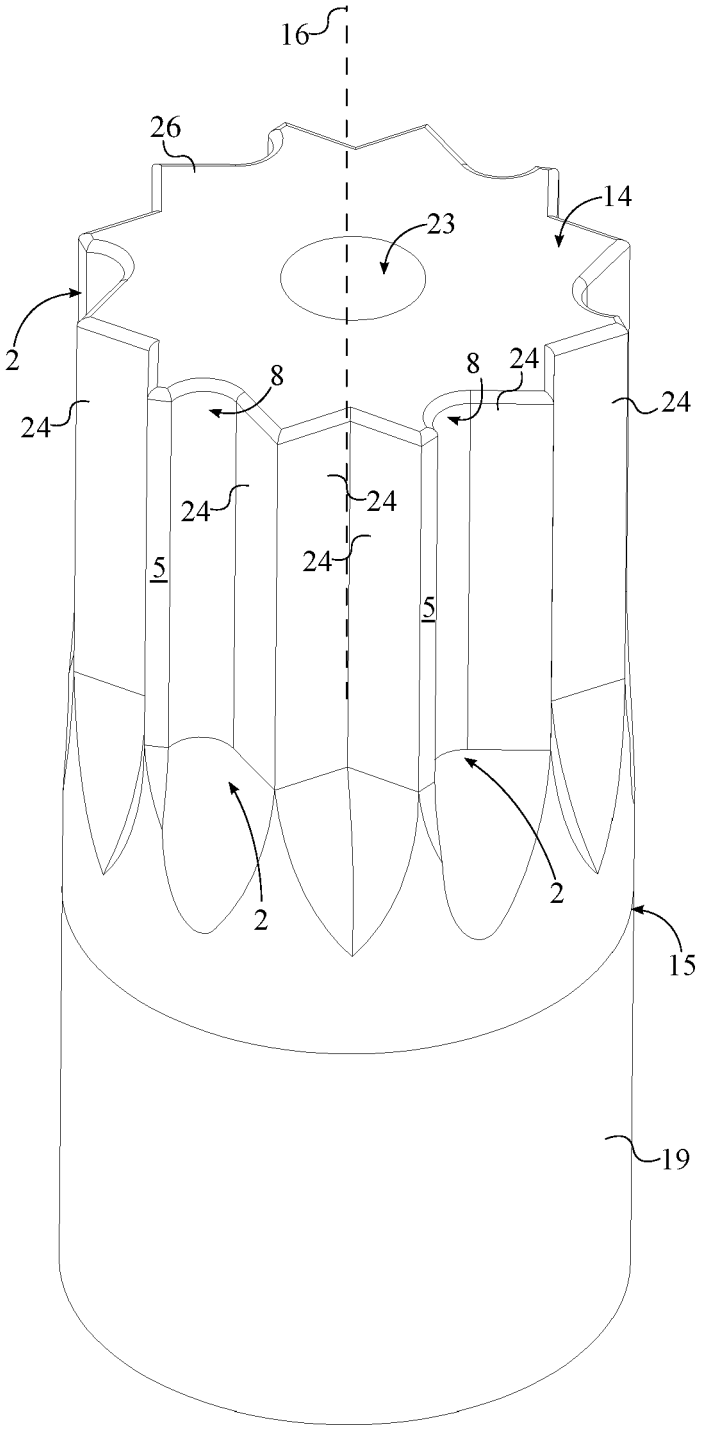

FIG. 10

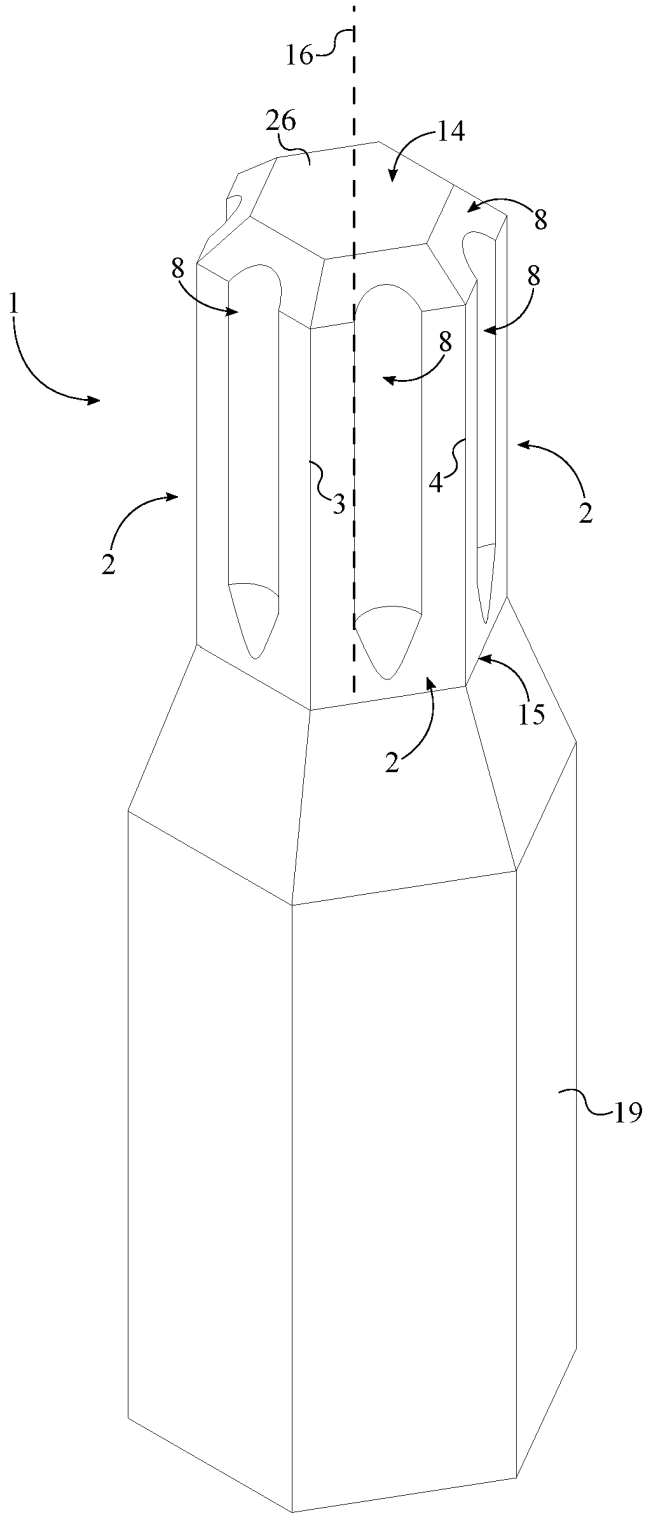

FIG. 11

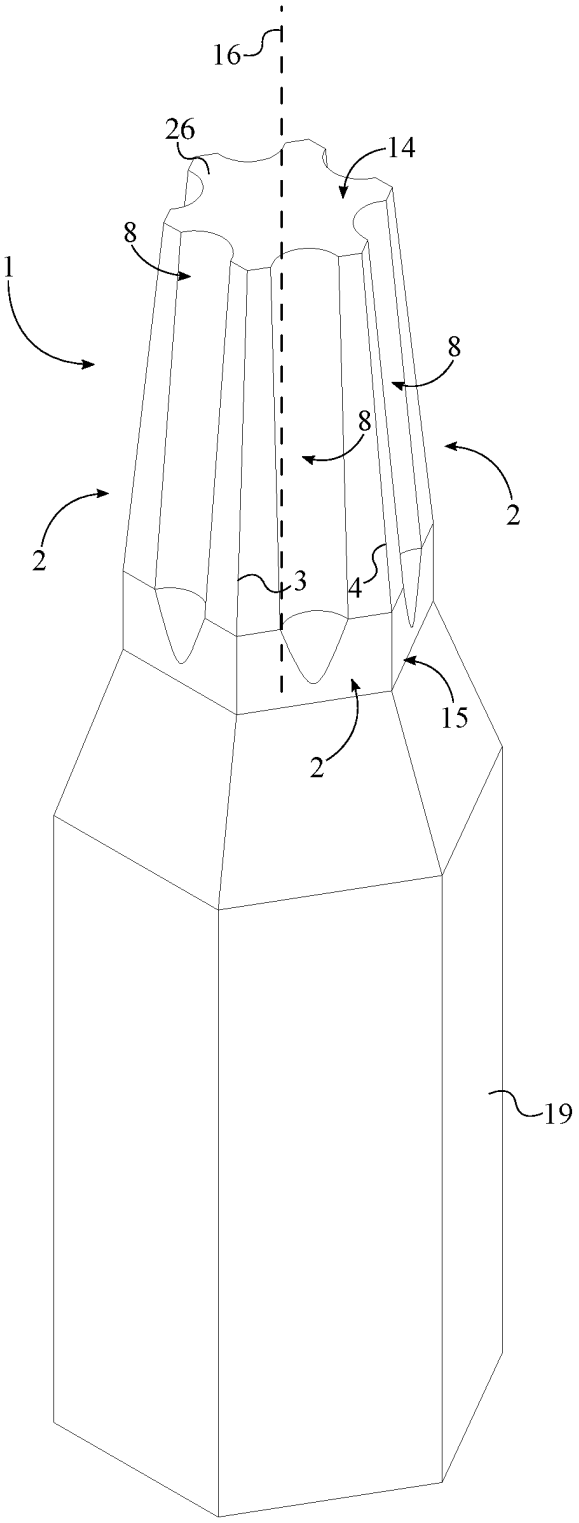

FIG. 12

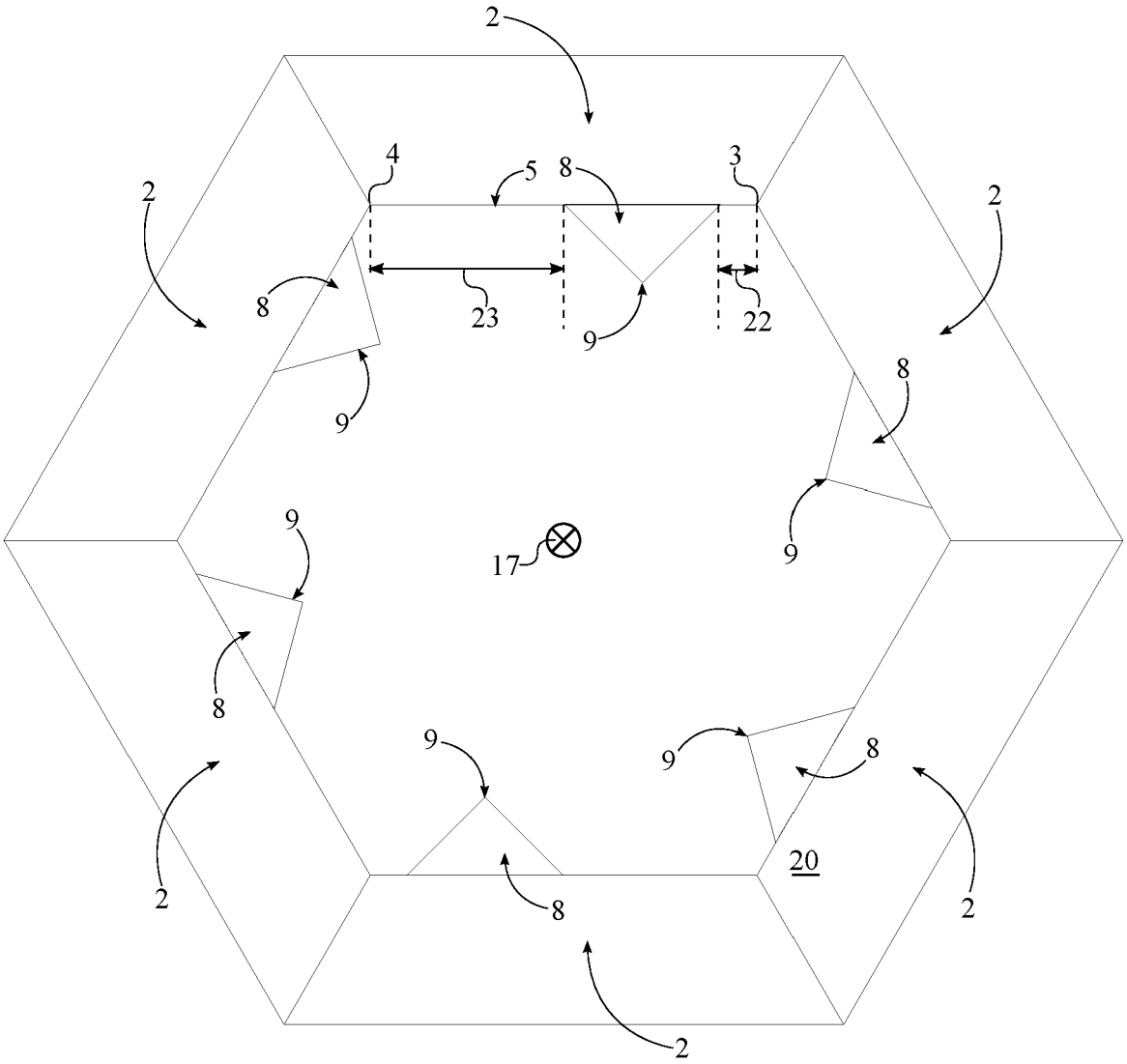

FIG. 13

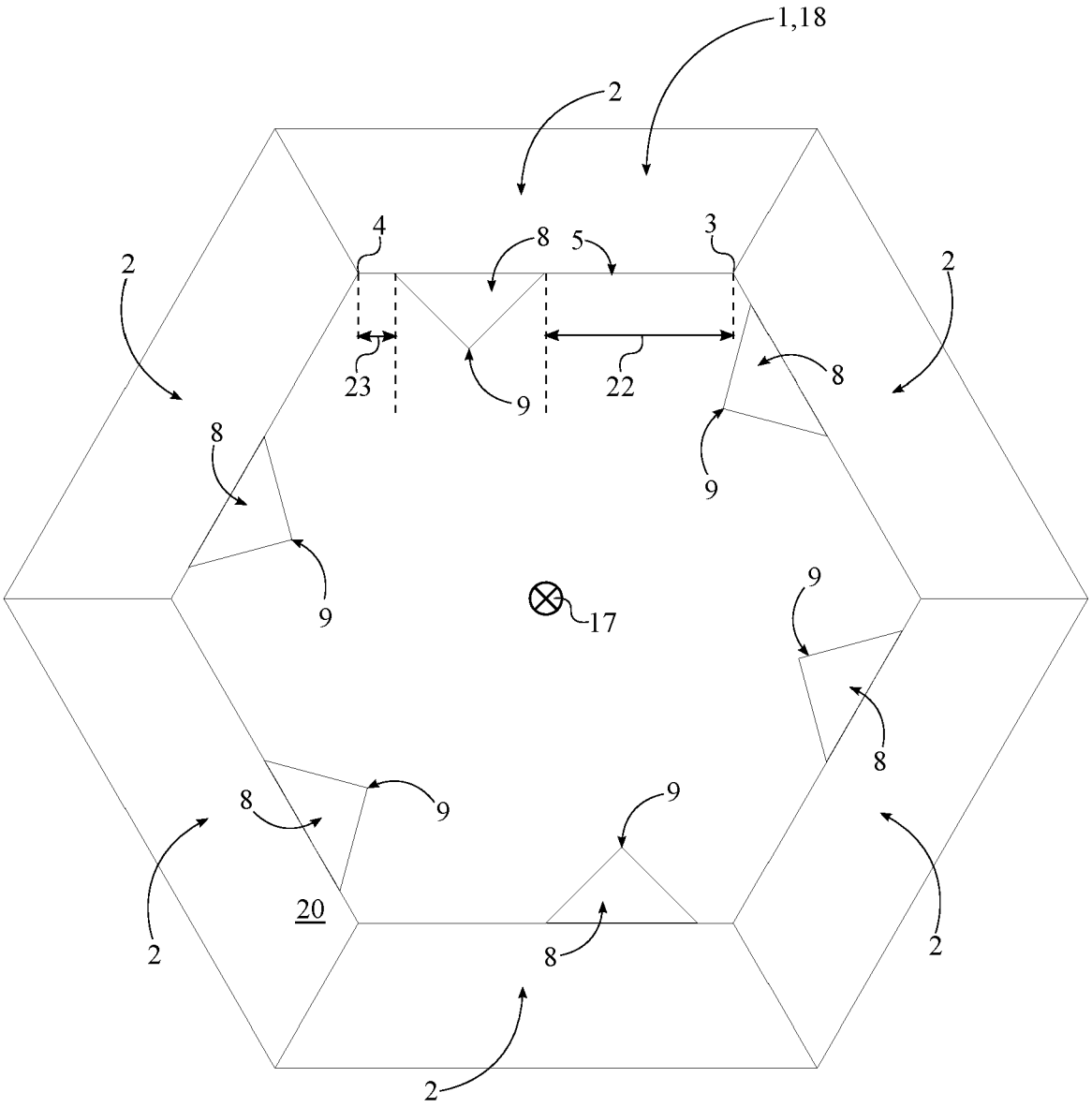

FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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