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(54) **Quick fastening and unfastening system of a visor for a protecting helmet**

Schnellschluss- und -öffnungssystem eines Visiers für einen Schutzhelm

Système de montage et démontage rapide pour visière de casque de protection

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(56) References cited:
EP-A- 1 323 361
FR-A- 2 785 505
GB-A- 2 300 346
US-A- 4 718 127
US-A- 4 794 652
US-A1- 2003 088 907

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Description

[0001] The present invention refers to a quick fastening and unfastening system of a visor for a protecting helmet.

[0002] As known, some helmets, above all for motorcycle use, comprise a basic body shaped as a dome to which a visor or protection screen is fastened on both sides, respectively through two rotation axes, such visor rotating around such axes in order to be raised and lowered as protection of eyes and faces of a user.

[0003] Due to its use, however, it is possible that the visor becomes, at least partially, opaque due to the action of dust, insects or the like: in such cases, therefore, it can be necessary to remove the visor from the helmet in order to make its cleaning easier. In other circumstances, since, as known, driving conditions can change a lot in terms of environmental illumination, it can be necessary to replace a visor with another one that is more suitable to current conditions: for example, in caso of shining sun, it can be useful or necessary to replace a completely transparent visor with a darkened visor for protecting eyes from sun rays.

[0004] In some cases, the connection between helmet and visor is substantially of a permanent type and therefore the visor itself can be removed from the helmet only after having disassembled numerous screws or other more or less complex fastening systems.

[0005] In general, anyway, it is foreseen that the visor can be removable in such a way as to allow its maintenance or its possible replacement. Therefore, in order to allow their removal, some visors have at their two side ends a hole or a housing within which a respective rotation pin is inserted, integral with the helmet body. The side ends of the visor are kept in position through different fastening means capable of being disassembled: for example, such known fastening means consist in a screw that crosses an eyelet axially arranged in the rotation pins to tighten the visor against the helmet body, possibly by interposing an external casing suitable for covering the visor fastening system. Also this type of fastening however requires the use of a tool, such as a screwdriver, or a coin, in order to disassemble and reassemble the visor from/onto the helmet.

[0006] The prior art has then proposed quick fastening and unfastening systems that allow removing and assembling the helmet visor, manually without requiring the use of particular tools: examples of such systems are disclosed in patents n. GB-A-2416478, FR-A-2759869, GB-A-2300346 and EP-A-0685177. US-A1-2003/088907 discloses a system according to the preamble of Claim 1.

[0007] Object of the present invention is solving the above prior art problems by providing another quick fastening and unfastening system of a helmet visor that allows disassembling and assembling such visor from the helmet in a quick and easy way, without using tools, through a simple manual pressure of suitable actuating push-buttons arranged on the visor itself.

[0008] The above and other objects and advantages of the invention, as will result from the following description, are obtained with a quick fastening and unfastening system of a visor of a protecting helmet as described in claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0009] It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as appears from the enclosed claims.

[0010] The present invention will be better described by some preferred embodiments thereof, provided as a nonlimiting example, with reference to the enclosed drawings, in which:

- Figure 1 shows a side view of a preferred embodiment of the quick fastening and unfastening system of a visor according to the present invention in an operating position thereof;
- Figure 2 shows a sectional view of the quick fastening and unfastening system of FIG. 1;
- Figure 3 shows a side view of the quick fastening and unfastening system of a visor according to the present invention in another operating position thereof;
- Figure 4 shows a sectional view of the quick fastening and unfastening system of Figure 3;
- Figure 5 shows a side view of the quick fastening and unfastening system of a visor according to the present invention in another operating position thereof;
- Figure 6 shows a sectional view of the quick fastening and unfastening system of FIG. 5;
- Figure 7 shows another sectional view of the fastening and unfastening system according to the present invention; and
- Figure 8 shows a sectional view of the quick fastening and unfastening system of Figure 7.

[0011] With reference to the Figures, it is possible to note a visor 30 connected to a helmet (not shown) at each one of its two opposite side fastening ends through a respective quick fastening and unfastening system 1 according to the present invention, through which the visor 30 can rotate around a rotation axis R-R in order to be able to be lowered or lifted. In brief, in the following description of the present invention, the system 1 will be described as applied to a side fastening end of the visor 30.

[0012] In particular, the quick fastening and unfastening system 1 of the visor 30 according to the present invention is placed next to each fastening end of the visor 30 itself and comprises a bayonet-type connection system 31 without end of stroke between visor 30 and at least one supporting portion 2 integral with the helmet,

such bayonet-type connection system 31 operatively cooperating with at least one actuating push-button 5 adapted to allow fastening and unfastening the visor 30 from the helmet: it is wholly evident that the other end of the visor 30 is equipped with a. system 1 wholly similar to the one described below.

[0013] The bayonet-type connection system 31 comprises at least one circular fastening seat 15 integral with the supporting portion 5 and coaxial with the rotation axis R-R to make the bayonet-type connection system 31; such circular seat 15 is equipped on its perimeter with at least two radial wings 4, preferably shaped as a circular sector, spaced in such a way as to define, between a radial wing 4 and the following one, a free radial sector with suitable sizes; moreover, on the perimeter of the circular seat 15, and concentrically with the rotation axis R-R, at least one groove 10, mentioned below, is arranged. In parallel, to make the bayonet-type connection system 31, next to such circular seat 15, each side fastening end of the visor 30 is equipped with a respective circular fastening portion 16 equipped on its perimeter with at least two fastening wings 3, also preferably shaped as a circular sector, each one of which adapted to be inserted inside a respective free radial sector included between two radial wings 4 of the circular seat 15; the partial fastening between visor 30 and supporting portion 2 of the helmet then occurs through the bayonet-type connection system 31 by inserting the fastening wings 3 of the circular fastening portion 16 inside the respective free radial sectors included between the radial wings 4 of the circular seat 15: then, by rotating the visor 30 around the rotation axis R-R with respect to the supporting portion 2, the fastening wings 3 are taken to be inserted below the radial wings 4 which, when overlapping, perform the bayonet-type connection and, consequently, make the circular seat 15 and the circular fastening portion 16 of the visor 30 mutually integral. Concentrically to such circular fastening portion 16, and preferably coaxially to the rotation axis R-R, the actuating push-button 5 is arranged; the actuating push-button 5 is composed of an external pressing shell 17, that can be actuated by a user through the pressure of a finger, inside which at least one neck 18 is concentrically arranged on its perimeter, upstream of such neck 18a at least one circular and perimeter edge 20 of at least one cup-shaped element 21 being in abutment: between the external pressing shell 17 and the cup-shaped element 21, at least one elastic means 19 is arranged, such as for example at least one helical spring, operating in compression along the rotation axis R-R: in particular, as can be noted from Figures 2, 4, 6, 7 and 8, the elastic means 19, and in particular the helical spring, exert their own pressure, spacing the external pressing shell 17 from the external surface of the circular seat 15 through the cup-shaped element 21 that, abutting with its own edge 20 against the neck 18 inside the external pressing shell 17, contains the elastic means 19, and in particular the helical spring, inside the actuating push-button 5 allowing its operation according to the modes that will be described below.

[0014] Moreover, the external pressing shell 17 comprises in its own lower ends at least two projections 9 substantially shaped as a "L", adapted to be inserted, under the below-described circumstances, inside the groove 10 concentric to the circular seat 15 when the actuating push-button 5 is pressed by the user.

[0015] The complete fastening of the visor 30 to the helmet, and in particular to the respective supporting portions 2, through the system 1 according to the present invention then occurs by connecting the bayonet-type connection system 31 by overlapping the fastening wings 3 of the visor 30 onto the radial wings 4 of the circular seat 15, simultaneously pressing the actuating push-button 5. In fact, by pressing the actuating push-button 5, the projections 9 of the external pressing shell 17 enter inside the groove 10 of the circular seat 15 with their own lower part: instead, the base 11 of the projections 9, namely the shorter part, allows the fastening wings 3 of the visor 30 to fasten themselves with the radial wings 4 of the circular seat 15 since, once having rotated the visor 30, its own fastening wings 3 go out of the trajectory of the base 11 of the projection 9 and allow the actuating push-button 5 to trigger, allowing each projection 9 to be inserted inside a respective free sector 12 included between two fastening wings 3 of the circular fastening portion 16 of the visor 30. In fact, in order to prevent a rotation around the rotation axis R-R of the visor 30, obviously necessary to be able to lift and lower the visor 30, from generating the disconnection of the bayonet-type connection system 31, and namely the disengagement of the fastening wings 3 from the radial wings 4 being next to the free radial sectors, the insertion of the projections inside the free sectors 12 of the circular fastening portion 16 of the visor 30, obviously under the action of the elastic means 19 of the actuating push-button 5, free in compression once the projections 9 are freed, by rotating the visor 30, from the obstacle represented by the radial wings 4, creates a sectorial continuity between radial wings 4 and projections 9 that prevents the visor 30, and in particular the circular fastening portion 16, from going out of the circular seat 15.

[0016] Instead, in order to remove the visor 30 from the helmet (such as shown, for example, in particular in Figures 5, 6 and 7), it is necessary to completely lift the visor 30, arriving at its end-of-stroke that corresponds with the groove 10 for the projections 9 in the circular seat 15, and press the actuating push-button 5 thereby interrupting the above sectorial continuity: in fact, by rotating the visor 30 from the extra stroke (Figures 5 and 6) provided by the pressure of the actuating push-button 5 (according, for example, the direction of arrow P in Fisure 7), the fastening wings 3 rotate till they are inserted in the base 11 of the projection, going out of the overlapping of the radial wings 4 of the circular seat 15, consequently allowing to unfasten the visor 30 (arrow S in FIG. 8).

[0017] In addition, to allow adjusting the opening angle of the visor 30, the system 1 according to the present invention comprises at least one angular adjusting system composed of a plurality of small ball-shaped teeth 13 radially on the supporting portion 5 concentrically with the rotation axis R-R, and of at least one small ball-shaped tooth 14 placed on the visor 30 next to such small ball-shaped teeth 13: then, by rotating the visor 30 around the rotation axis R-R, the small ball-shaped tooth 14 is taken to rotate along a circular trajectory also concentric with such axis R-R that implies, within the rotation, the alternative engagement of the small ball-shaped tooth 14 in at least one of the small ball-shaped teeth 13, keeping the visor 30 in a distinct angular position determined by the angular distance defined between the different small ball-shaped teeth 13.

[0018] Though the system 1 has been described as an example as applied to a protecting helmet for motorcycle use, it is wholly evident for a skilled person in the art that nothing prevents from applying the same teachings to a protecting helmet for any other professional activity (helmets for yards, welders, etc.) or sports activity (motor vehicles, motored or free flight, cycling, winter sports such as ski, bob, etc.) without thereby departing from the scope of the present invention as defined by the enclosed claims.

Claims

1. System (1) for quickly fastening and unfastening each one of two side fastening ends of a visor (30) to/from a protecting helmet, said visor (30) rotating around a rotation axis (R-R) through said system (1) in order to be able to be lifted or lowered, said system (1) comprising a bayonet-type connection system (31) without end-of-stroke between said visor (30) and at least one supporting portion (2) integral with said helmet, said bayonet-type connection system (31) operatively cooperating with at least one actuating push-button (5) adapted to allow fastening and unfastening said visor (30) to/from said helmet, **characterised in that**:

   - said bayonet-type connection system (31) comprises at least one circular fastening seat (15) integral with said supporting portion (5) and coaxial with said rotation axis (R-R) and at least one respective and corresponding circular fastening portion (16) integral with a respective one of said side fastening ends of said visor (30);
   - said circular seat (15) is equipped on its perimeter with at least two radial wings (4) spaced in order to define, between one of said radial wings (4) and a following wing (4), a free radial sector, and said circular fastening portion (16) is equipped on its perimeter with at least two fastening wings (3), each one of which being adapted to be inserted inside a respective free radial sector of said circular seat (15) and to be overlapped to said radial wings (4) following a rotation of said visor (30) around said rotation axis (R-R); and
   - said actuating push-button (5) is composed of an external pressing shell (17) inside which at least one neck (18) is concentrically arranged on its perimeter, upstream of said neck (18) at least one circular and perimeter edge (20) of at least one cup-shaped element (21) being abutted, between said external pressing shell (17) and said cup-shaped element (21) at least one elastic means (19) being interposed and operating in compression along said rotation axis (R-R).

2. System (1) according to claim 1, **characterised in that** said circular seat (15) is equipped on its perimeter and concentrically to said rotation axis (R-R) with at least one groove (10).

3. System (1) according to claim 2, **characterised in that** said fastening wings (3) and said radial wings (4) are shaped as a circular sector.

4. System (1) according to claim 1, **characterised in that** said actuating push-button (5) is arranged concentrically to said circular fastening portion (16) and coaxially to said rotation axis (R-R).

5. System (1) according to claim 1, **characterised in that** said elastic means (19) is at least one helical spring.

6. System (1) according to any one of the previous claims, **characterised in that** said external pressing shell (17) comprises in its lower ends at least two projections (9), substantially shaped as a "L", adapted to be inserted inside said groove (10) when said actuating push-button (5) is pressed and to be inserted inside a respective free sector (12) included between two of said fastening wings (3), creating a sectorial continuity between said radial wings (4) and said projections (9).

7. System (1) according to any one of the previous claims, **characterised in that** it comprises at least one angular adjusting system composed of a plurality of small ball-shaped teeth (13) radially on said supporting portion (5) concentrically with said rotation axis (R-R) and of at least one small ball-shaped tooth (14) placed on said visor (30) next to said small ball-shaped teeth (13).

Patentansprüche

1. Schnellbefestigungs- und -freigabesystem (1) von jedem der beiden seitlichen Befestigungsenden eines Schirms (30) an einem/eines Schutzhelm/s, der genannte Schirm (30) dreht sich durch das genannte System (1) um eine Drehachse (R-R), um nach unten oder oben verschoben zu werden, das genannte System (1) schließt ein Bajonett-Verbindungssystem (31) ohne Anschlag zwischen dem genannten Schirm (30) und mindestens einem Trägerteil (2), das ein Stück mit dem Helm bildet, am genannten Helm ein, das genannte Bajonett-Verbindungssystem (31) arbeitet operativ mit mindestens einem Auslöseknopf (5) zusammen, der dazu dient, die Befestigung und Freigabe des genanten Schirms (30) am/des genannten Helm/s zu ermöglichen, und ist **dadurch gekennzeichnet dass**:

   - das genannte Bajonett-Verbindungssystem (31) mindestens eine kreisförmige Aufnahme (15) zur Befestigung am genannten Trägerteil (5) hat, mit dem es ein Stück bildet, und koaxial zur genannten Drehachse (R-R) liegt, und mindestens ein entsprechendes und übereinstimmendes kreisförmiges Befestigungsteil (16) an einem entsprechenden dieser seitlichen Befestigungsenden des genannten Helms (30) hat;
   - die genannte kreisförmige Aufnahme (15) am Umfang mit mindestens zwei radialen Rippen (4) ausgestattet ist, die abwechselnd angeordnet sind, um zwischen einer der genannten radialen Rippen (4) und einer folgenden Rippe (4) einen freien radialen Sektor zu zeichnen, und dass das genannte kreisförmige Befestigungsteil (16) am Umfang mit mindestens zwei Befestigungsrippen (3) ausgestattet ist, die jeweils dazu dienen, sich in einen entsprechenden freien radialen Sektor der genannten kreisförmigen Aufnahme (15) einzufügen und sich nach einer Drehung des genannten Schirms (30) um die genannte Drehachse (R-R) auf die genannten radialen Rippen (4) zu legen; und
   - der genannte Auslöseknopf (5) aus einer äußeren Druckhülle (17) besteht, in der konzentrisch und am Umfang mindestens ein Bund (18) angeordnet ist, über dem mindestens ein kreisförmiger Rand (20) des Umfangs aus mindestens einem Tellerelement (21) am Anschlag vorhanden ist, und dass sich zwischen der genannten äußeren Druckhülle (17) und dem genannten Tellerelement (21) mindestens eine elastische Vorrichtung (19) befindet, die mit Druckspannung längs der genannten Drehachse (R-R) wirkt.

2. System (1) gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist, dass** die genannte kreisförmige Aufnahme (15) am Umfang und konzentrisch zur genannten Drehachse (R-R) mit mindestens einer Rille (10) ausgestattet ist.

3. System (1) gemäß Patentanspruch 2, das **dadurch gekennzeichnet ist, dass** die genannten Befestigungsrippen (3) und die genannten radialen Rippen (4) die Form eines kreisförmigen Sektors haben.

4. System (1) gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist, dass** der genannte Auslöseknopf (5) konzentrisch zum genannten kreisförmigen Befestigungsteil (16) und koaxial zur genannten Drehachse (R-R) angeordnet ist.

5. System (1) gemäß Patentanspruch 1, das **dadurch gekennzeichnet ist, dass** die genannten elastischen Vorrichtungen (19) aus mindestens einer Schraubenfeder bestehen.

6. System (1) gemäß einem beliebigen der vorhergehenden Patentansprüche, das **dadurch gekennzeichnet ist, dass** die genannte äußere Druckhülle (17) an den unteren Enden mindestens zwei Träger (9) einschließt, die grundlegend "L-förmig" sind, und dazu dienen, sich in die genannte Rille (10) einzufügen, wenn der genannte Auslöseknopf (5) gedrückt wird, und sich in einen entsprechenden freien Sektor (12) einzufügen, der zwischen den genannten Befestigungsrippen (3) enthalten ist, sodass eine sektorielle Stetigkeit zwischen den radialen Rippen (4) und den genannten Trägem (9) erzeugt wird.

7. System (1) gemäß einem beliebigen der vorhergehenden Patentansprüche, das **dadurch gekennzeichnet ist, dass** es mindestens ein Winkeleinstellungssystem einschließt, das aus mehreren kugelförmigen Zähnchen (13), die radial zum genannten Trägerteil (5) und konzentrisch zur genannten Drehachse (R-R) angeordnet sind, und aus mindestens einem kugelförmigen Zähnchen (14) besteht, das am genannten Schirm (30) an den genannten kugelförmigen Zähnchen (13) positioniert ist.

Revendications

1. Système (1) d'accrochage et de décrochage rapide de chacune de deux extrémités d'accrochage latérales d'une visière (30) au/d'un casque de protection, ladite visière (30) tournant autour d'un axe de rotation (R-R) au moyen dudit système (1) pour pouvoir être abaissée ou relevée, ledit système (1) comprend un système de raccordement à baïonnette (31) sans fin de course entre ladite visière (30) et au moins une portion de support (2) solidaire audit casque, ledit système de raccordement à baïonnette (31) en coopérant en mode opératif avec au moins

un bouton-poussoir d'actionnement (5) apte à permettre l'accrochage et le décrochage de ladite visière (30) au/du dit casque, **caractérisé par le fait que**:

- ledit système de raccordement à baïonnette (31) comprend au moins un logement circulaire (15) d'accrochage solidaire à ladite portion de support (5) et coaxial audit axe de rotation (R-R) et au moins une portion respective et correspondante d'accrochage circulaire (16) solidaire à une des dites extrémités respectives d'accrochage latéral de ladite visière (30);
- ledit logement circulaire (15) est doté sur le périmètre d'au moins deux ailettes radiales (4) espacées pour définir, entre une des dites ailettes radiales (4) et une ailette (4) successive, un secteur radial libre, et ladite portion d'accrochage circulaire (16) est dotée sur le périmètre d'au moins deux ailettes d'accrochage (3), chacune desquelles étant apte à s'insérer à l'intérieur d'un secteur radial respectif libre dudit logement circulaire (15) et à se superposer aux dites ailettes radiales (4) suite à une rotation de ladite visière (30) autour dudit axe de rotation (R-R); et
- ledit bouton-poussoir d'actionnement (5) est composé d'une coque externe de pression (17) à l'intérieur de laquelle est disposé concentriquement et sur le périmètre au moins un col (18), en amont duquel est en butée au moins un bord (20) circulaire et sur le périmètre d'au moins un élément en forme cave (21), entre ladite coque externe de pression (17) et ledit élément en forme cave (21) étant interposé au moins un moyen élastique (19) agissant en compression le long dudit axe de rotation (R-R).

2. Système (1) selon la revendication 1, **caractérisé par le fait que** ledit logement circulaire (15) est doté sur le périmètre et concentriquement audit axe de rotation (R-R) d'au moins une rainure (10).

3. Système (1) selon la revendication 2, **caractérisé par le fait que** lesdites ailettes d'accrochage (3) et lesdites ailettes radiales (4) ont une forme à secteur circulaire.

4. Système (1) selon la revendication 1, **caractérisé par le fait que** ledit bouton-poussoir d'actionnement (5) est disposé concentriquement à ladite portion d'accrochage circulaire (16) et en mode coaxial audit axe de rotation (R-R).

5. Système (1) selon la revendication 1, **caractérisé par le fait que** ledit moyen élastique (19) est au moins un ressort hélicoïdal.

6. Système (1) selon une quelconque des revendications précédentes, **caractérisé par le fait que** ladite coque externe de pression (17) comprend aux extrémités inférieures au moins deux pédoncules (9), substantiellement en forme en "L", aptes à s'insérer à l'intérieur de ladite rainure (10) quand ledit bouton-poussoir d'actionnement (5) est appuyé et à s'insérer à l'intérieur d'un secteur libre respectif (12) compris entre deux des dites ailettes d'accrochage (3), en créant une continuité sectorielle entre lesdites ailettes radiales (4) et lesdits pédoncules (9).

7. Système (1) selon une quelconque des revendications précédentes, **caractérisé par** le fait de comprendre au moins un système de réglage angulaire composé d'une pluralité de petites dents sphériques (13) radialement sur ladite portion de support (5) concentriquement audit axe de rotation (R-R) et d'au moins une petite dent sphérique (14) positionnée sur ladite visière (30) en correspondance desdites petites dents sphériques (13).

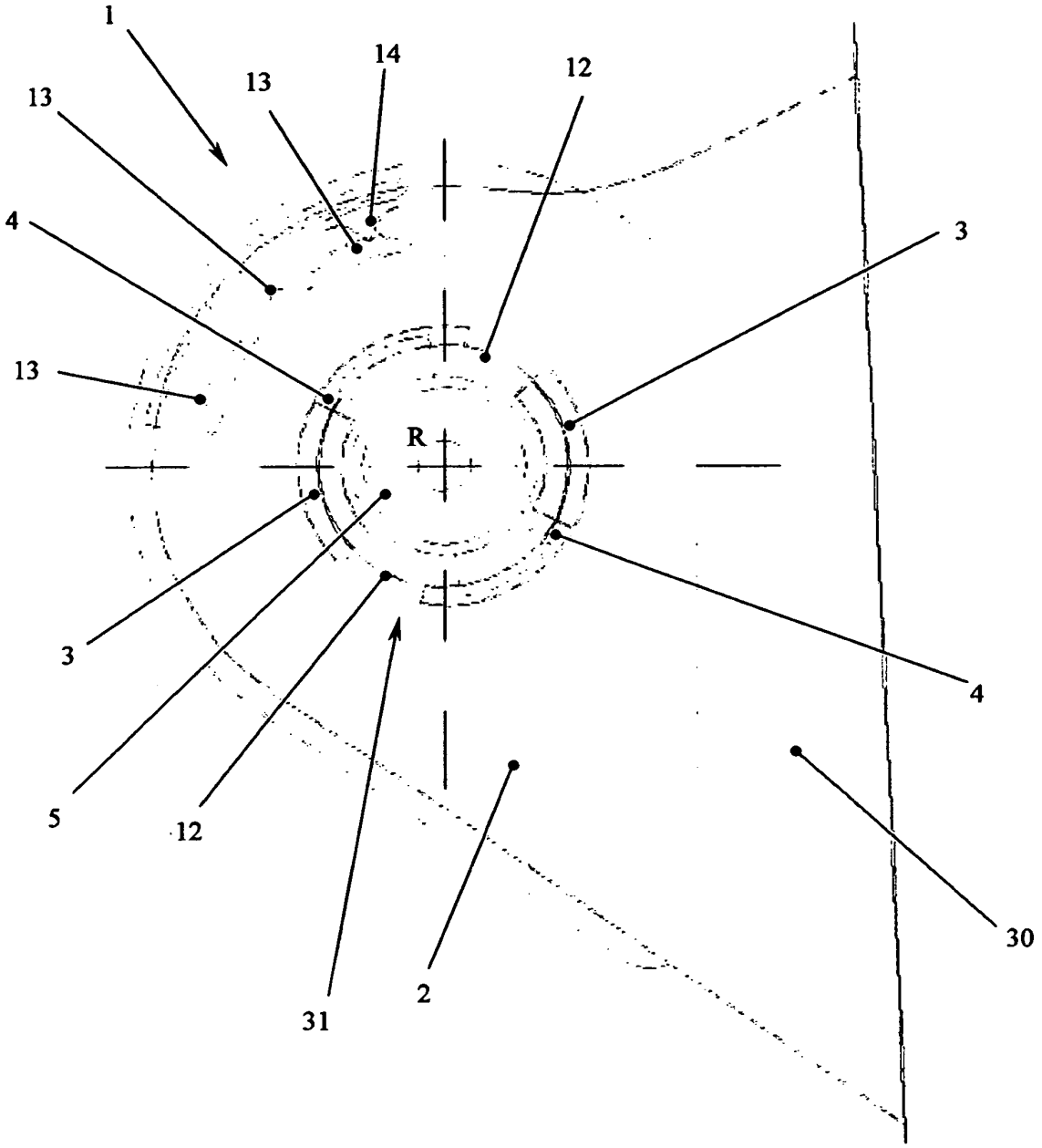


FIG. 1

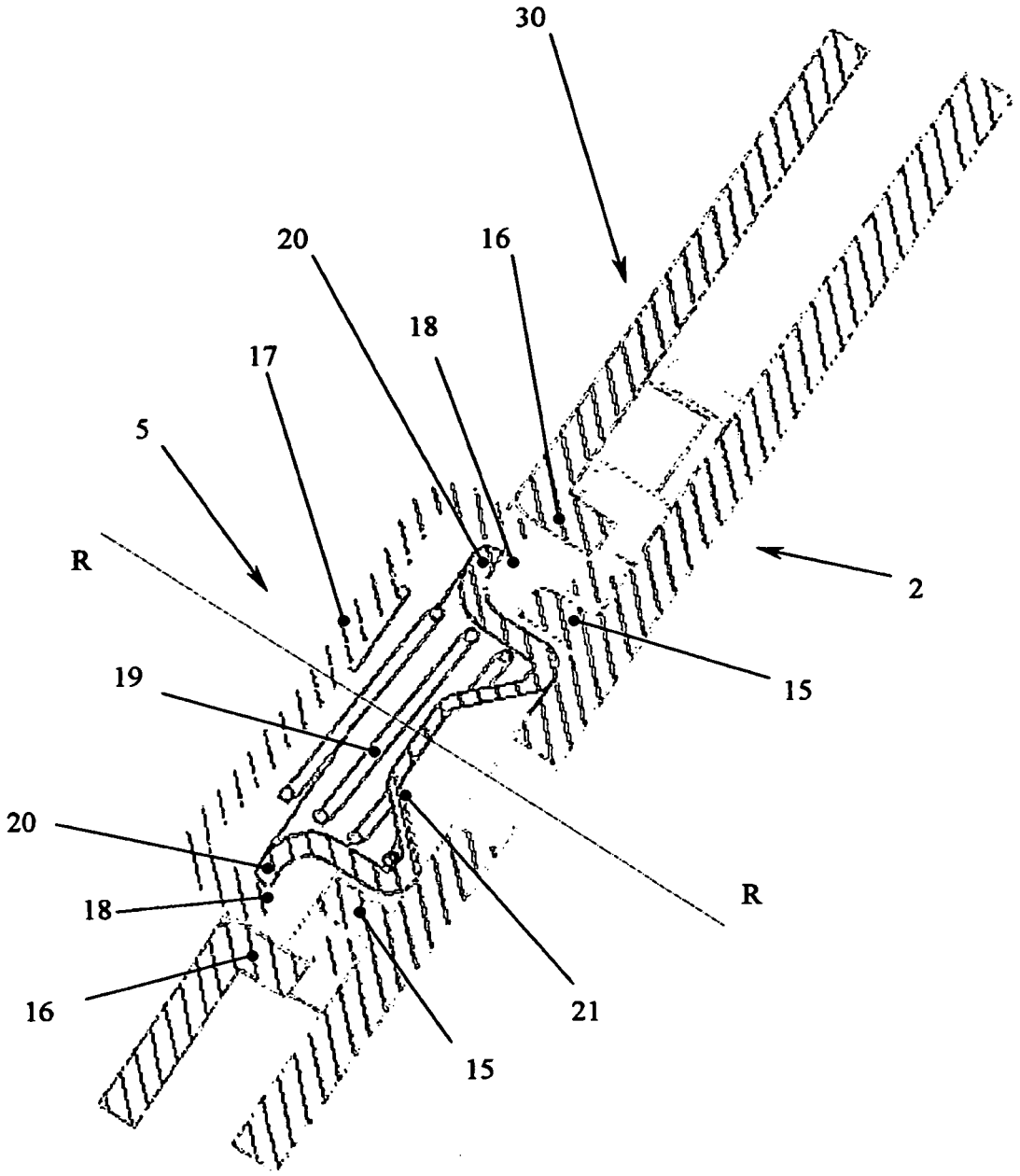


FIG. 2

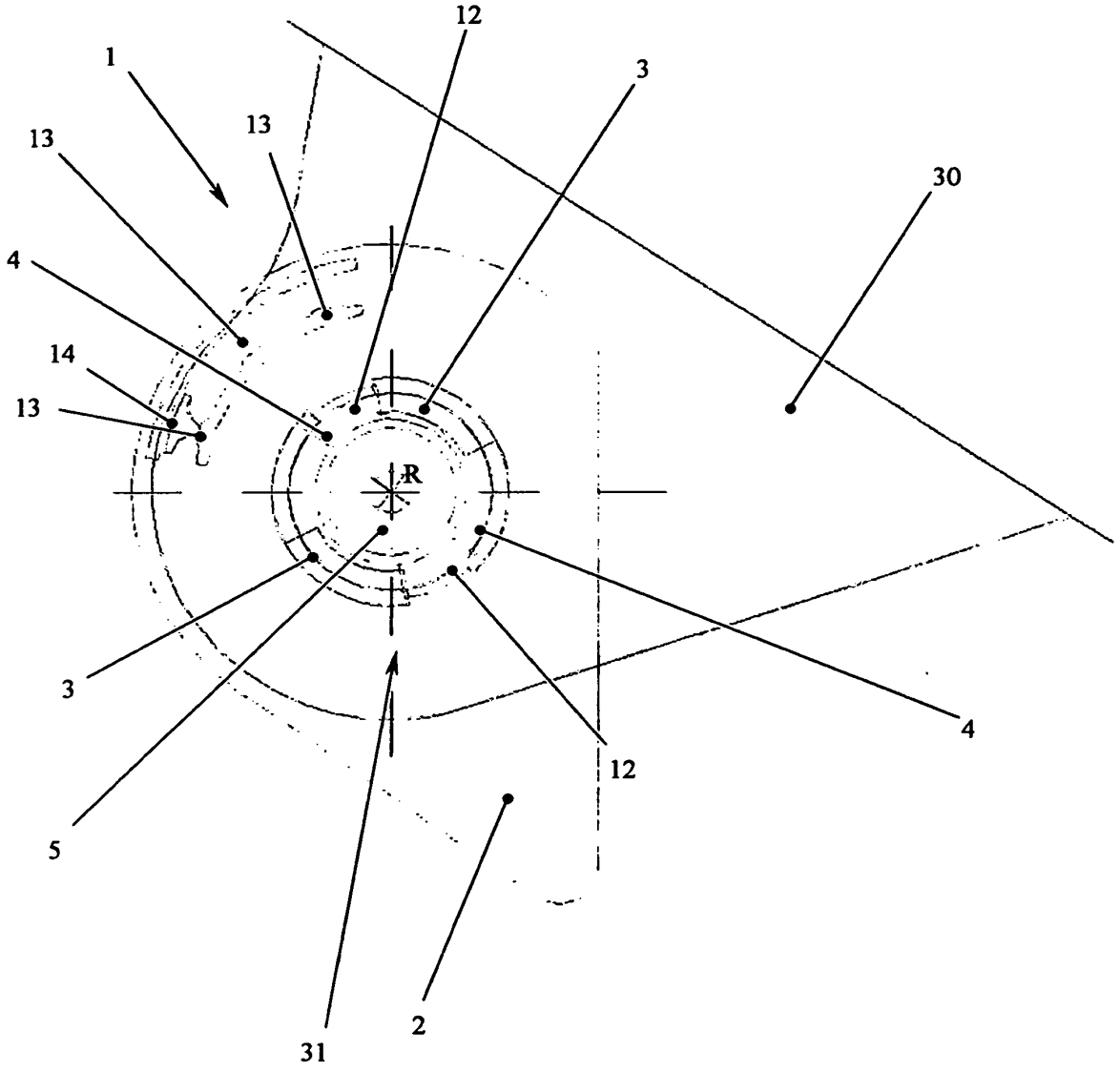


FIG. 3

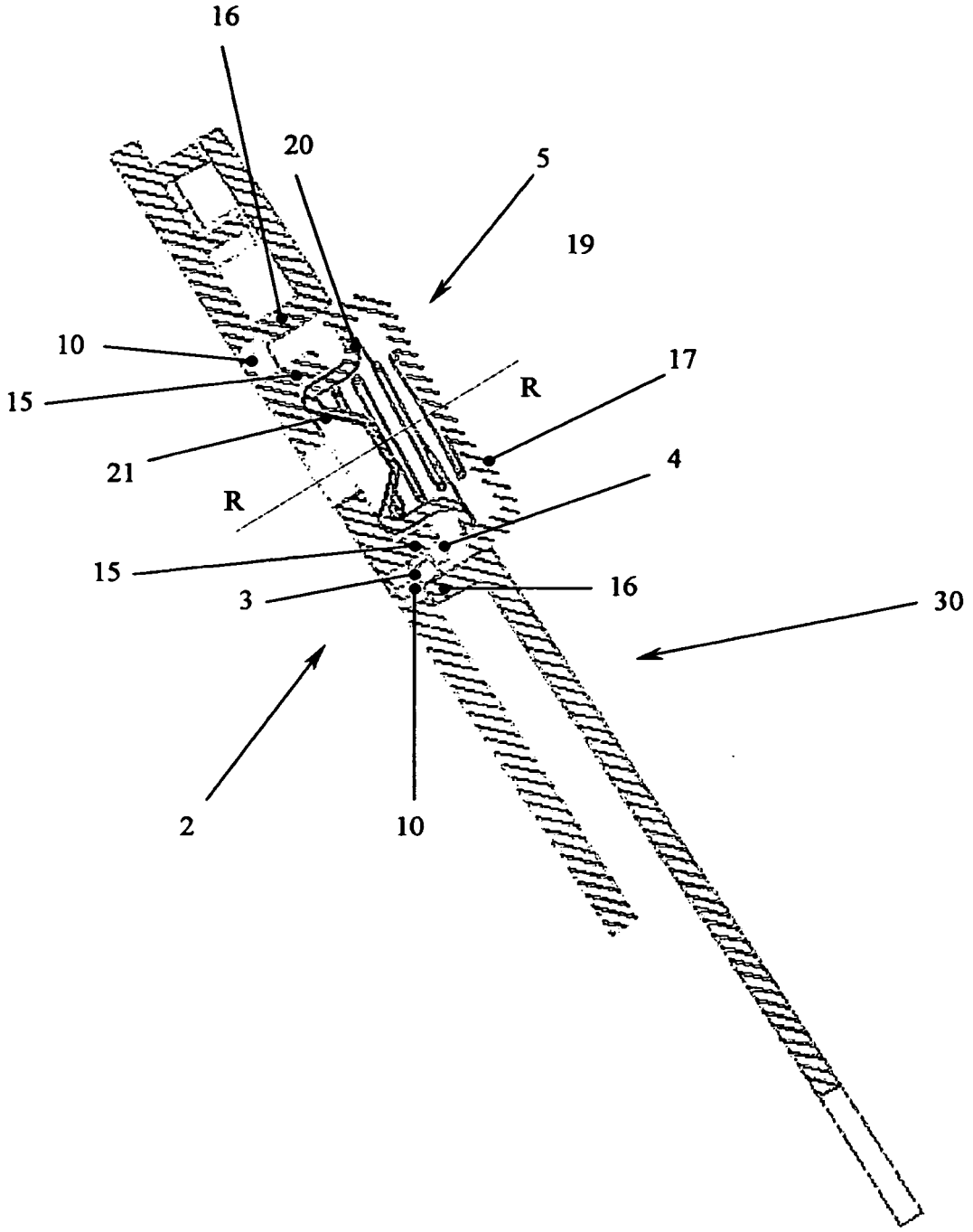


FIG. 4

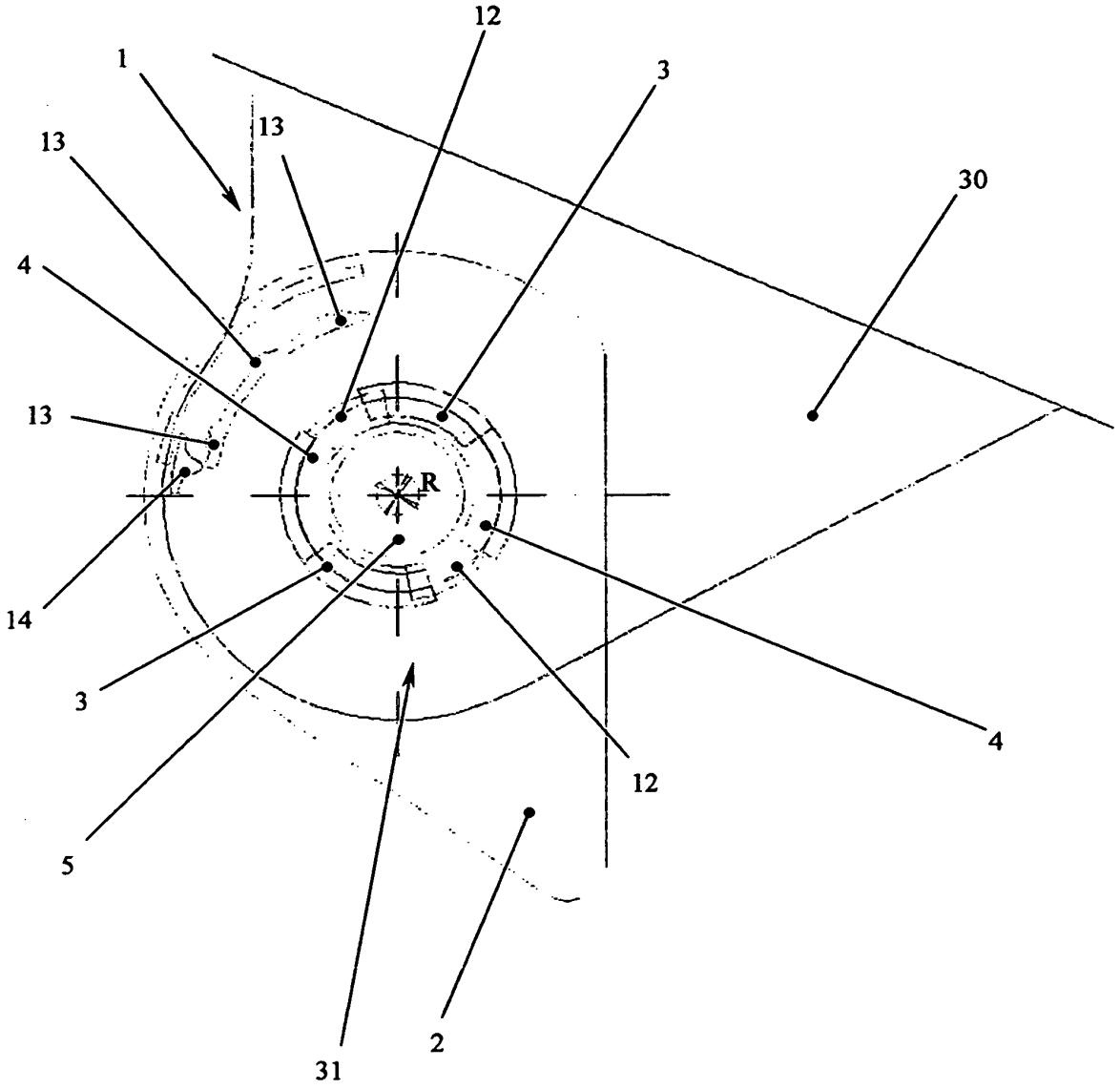


FIG. 5

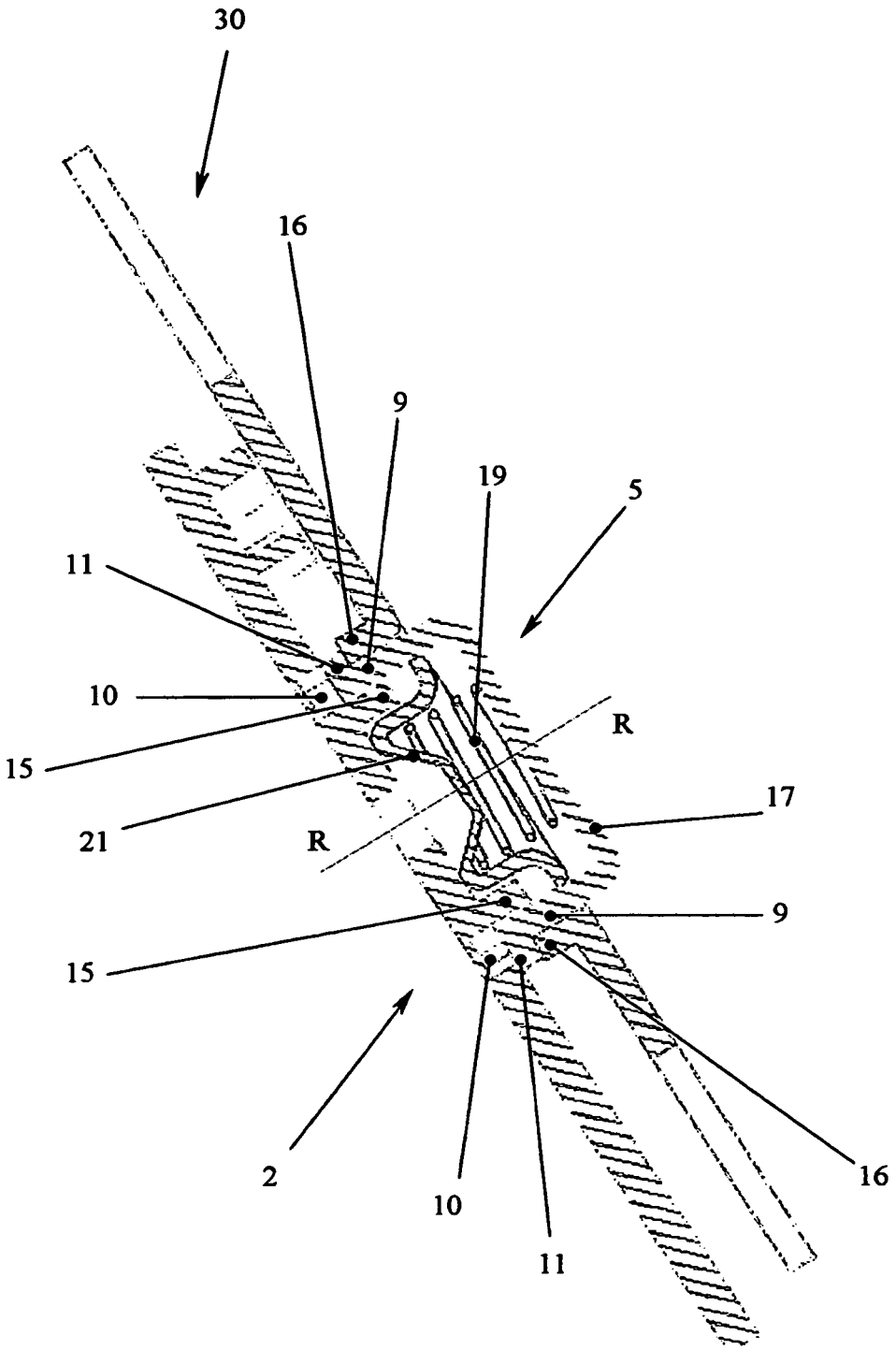


FIG. 6

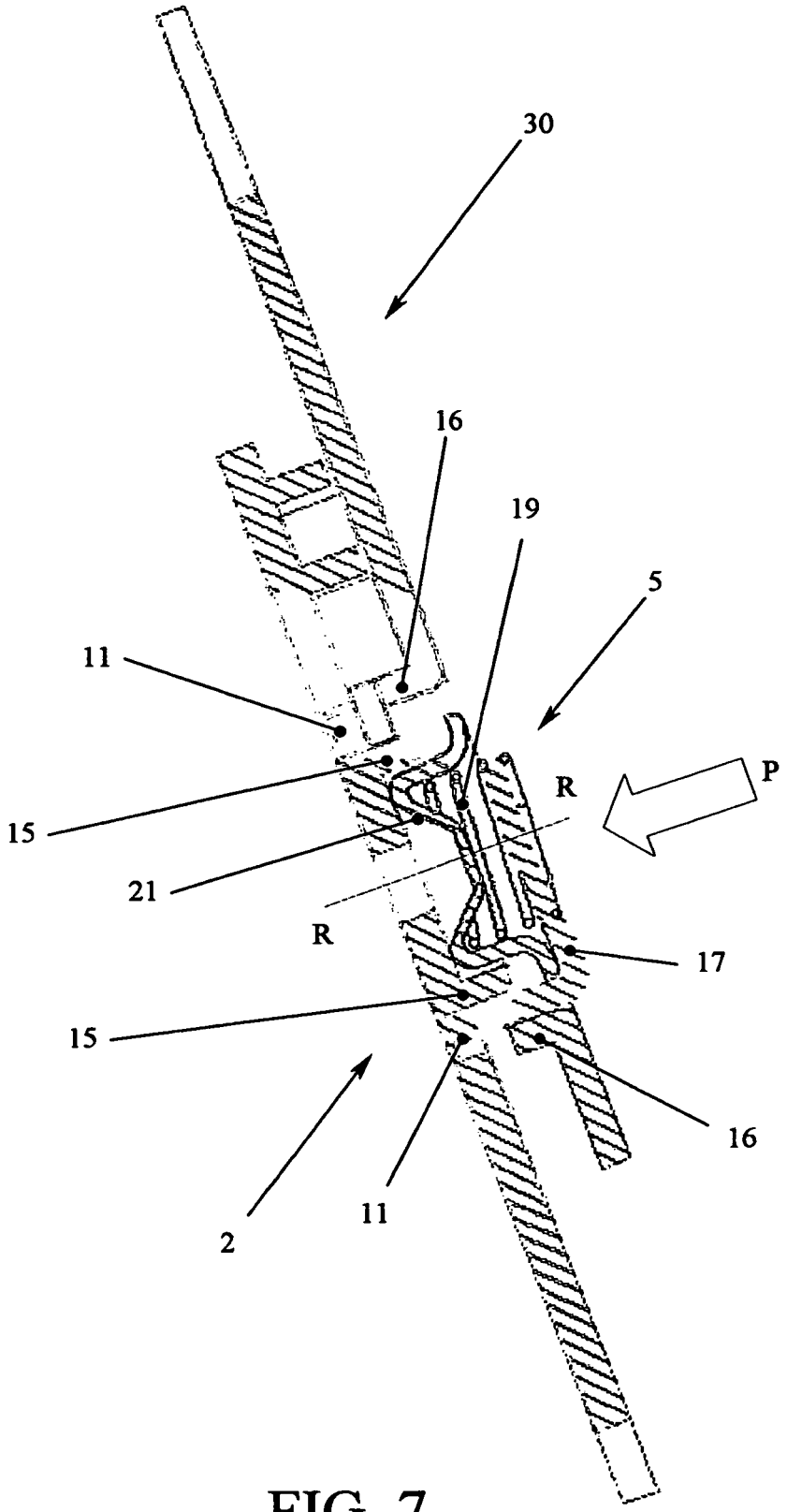


FIG. 7

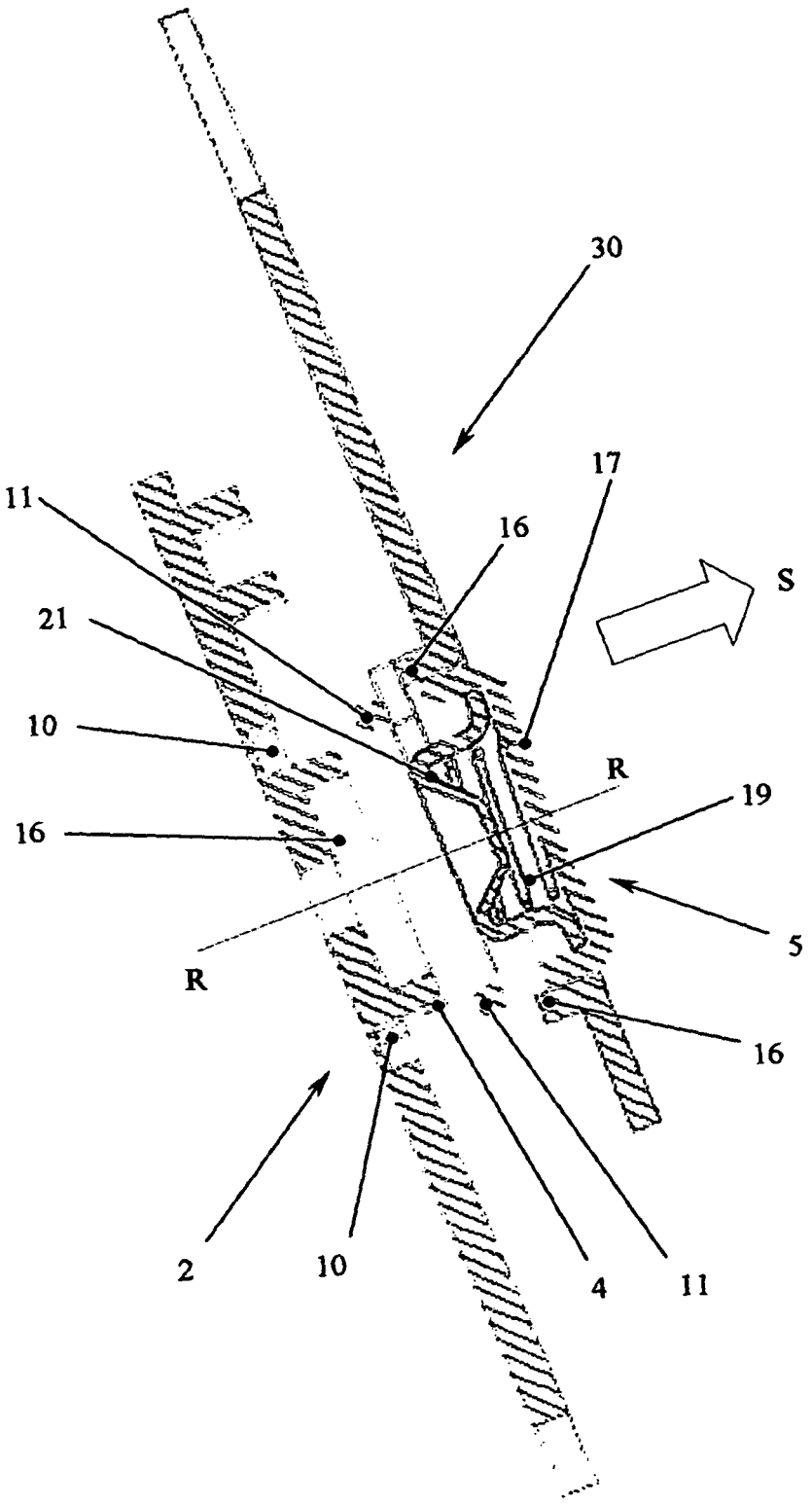


FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2416478 A **[0006]**
- FR 2759869 A **[0006]**
- GB 2300346 A **[0006]**
- EP 0685177 A **[0006]**
- US 2003088907 A1 **[0006]**