



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.08.2010 Bulletin 2010/33

(51) Int Cl.:
A42B 3/22 (2006.01)

(21) Application number: **09425053.7**

(22) Date of filing: **13.02.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(72) Inventor: **Dellavalle, Mauro**
10060 None (TO) (IT)

(74) Representative: **Garavelli, Paolo**
A.Bre.Mar. s.r.l.
Consulenza in Proprietà Industriale
Via Servais 27
10146 Torino (IT)

(71) Applicant: **DSG Helmet S.r.l.**
10060 None (TO) (IT)

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

(57) A system (1) is described for quickly fastening and unfastening each one of two side fastening ends of a visor (30) to/from a protecting helmet, such visor (30) rotating around a rotation axis (R-R) through such system (1) to be able to be lifted or lowered, comprising a bay-

onet-type connection system (31) without end-of-stroke between the 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) to/from the helmet.

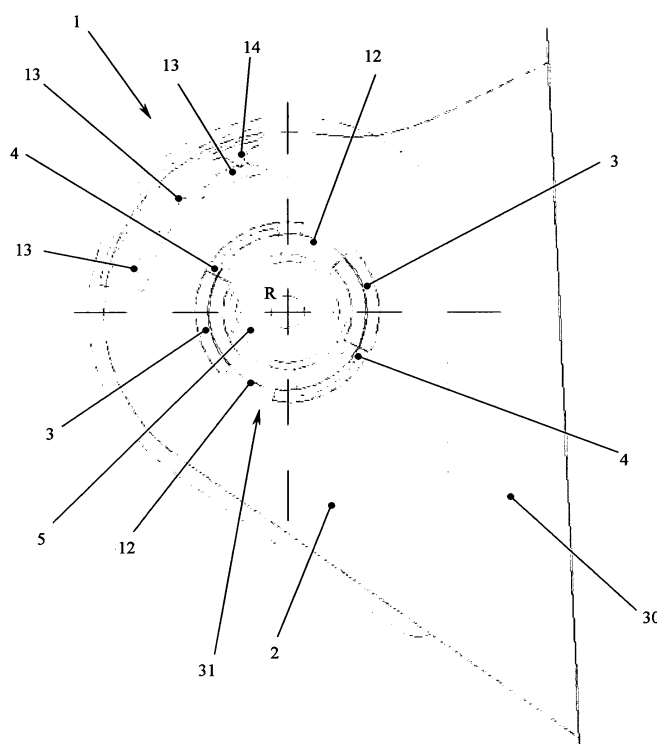


FIG. 1

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 case 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.

[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 descrip-

tion, 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 adapt-

ed 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 Figure 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, **characterised in that** it comprises 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.
2. System (1) according to claim 1, **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).
3. System (1) according to claim 2, **characterised in that** 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).

4. System (1) according to claim 2, **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).
5. System (1) according to claim 3, **characterised in that** said fastening wings (3) and said radial wings (4) are shaped as a circular sector.
6. 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).
7. System (1) according to claim 1, **characterised in that** 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).
8. System (1) according to claim 7, **characterised in that** said elastic means (19) is at least one helical spring.
9. 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).
10. 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).

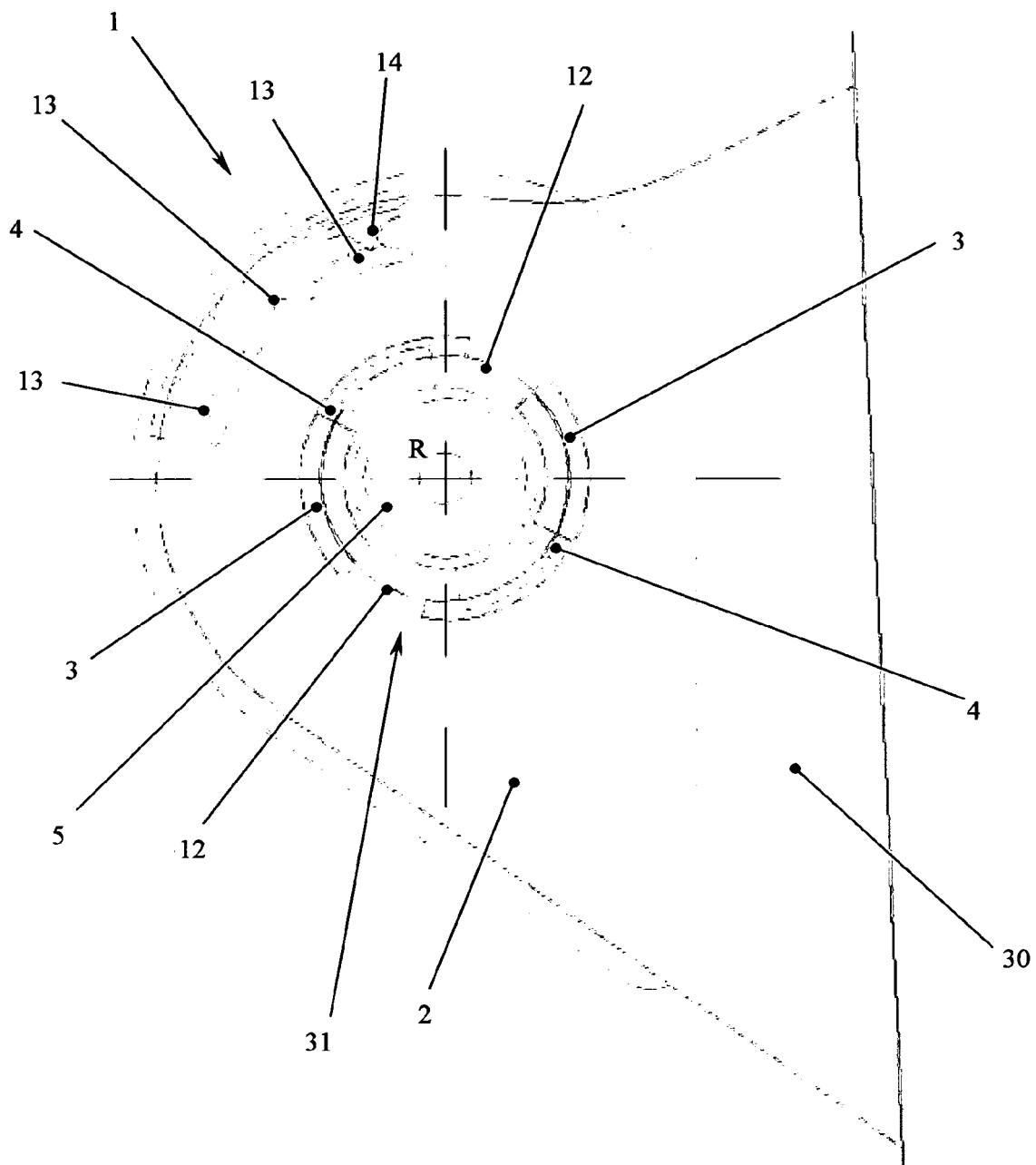


FIG. 1

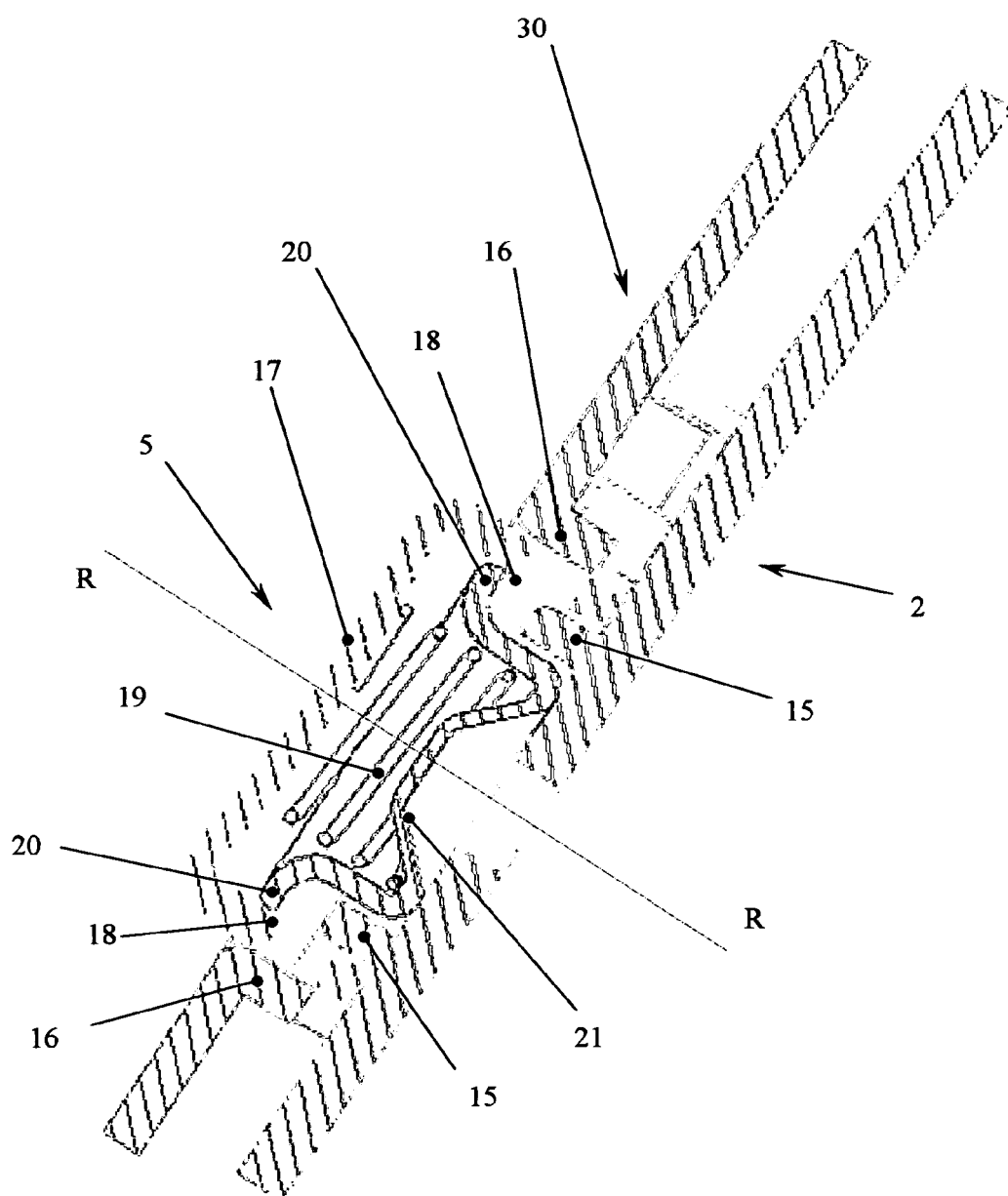


FIG. 2

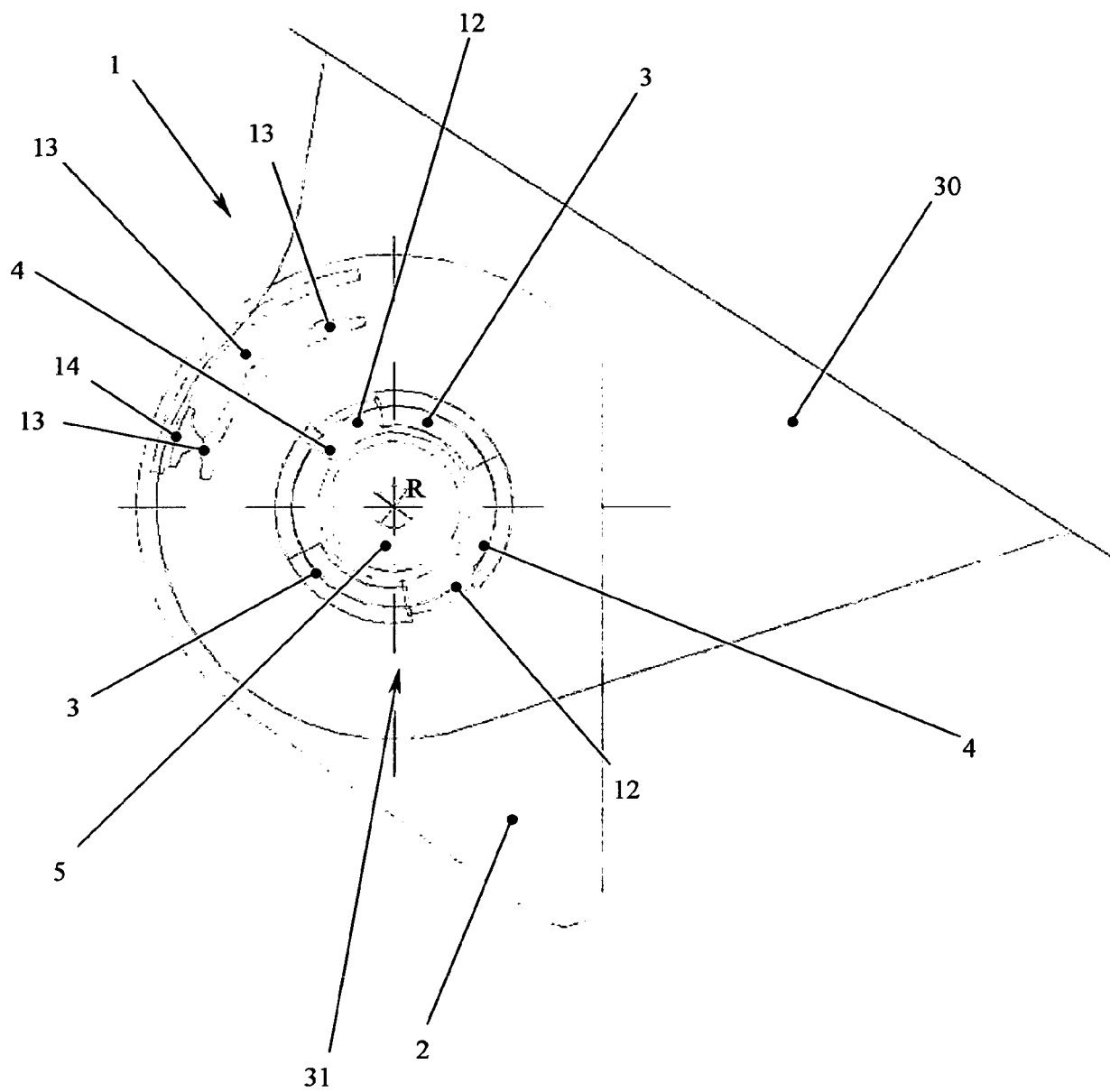


FIG. 3

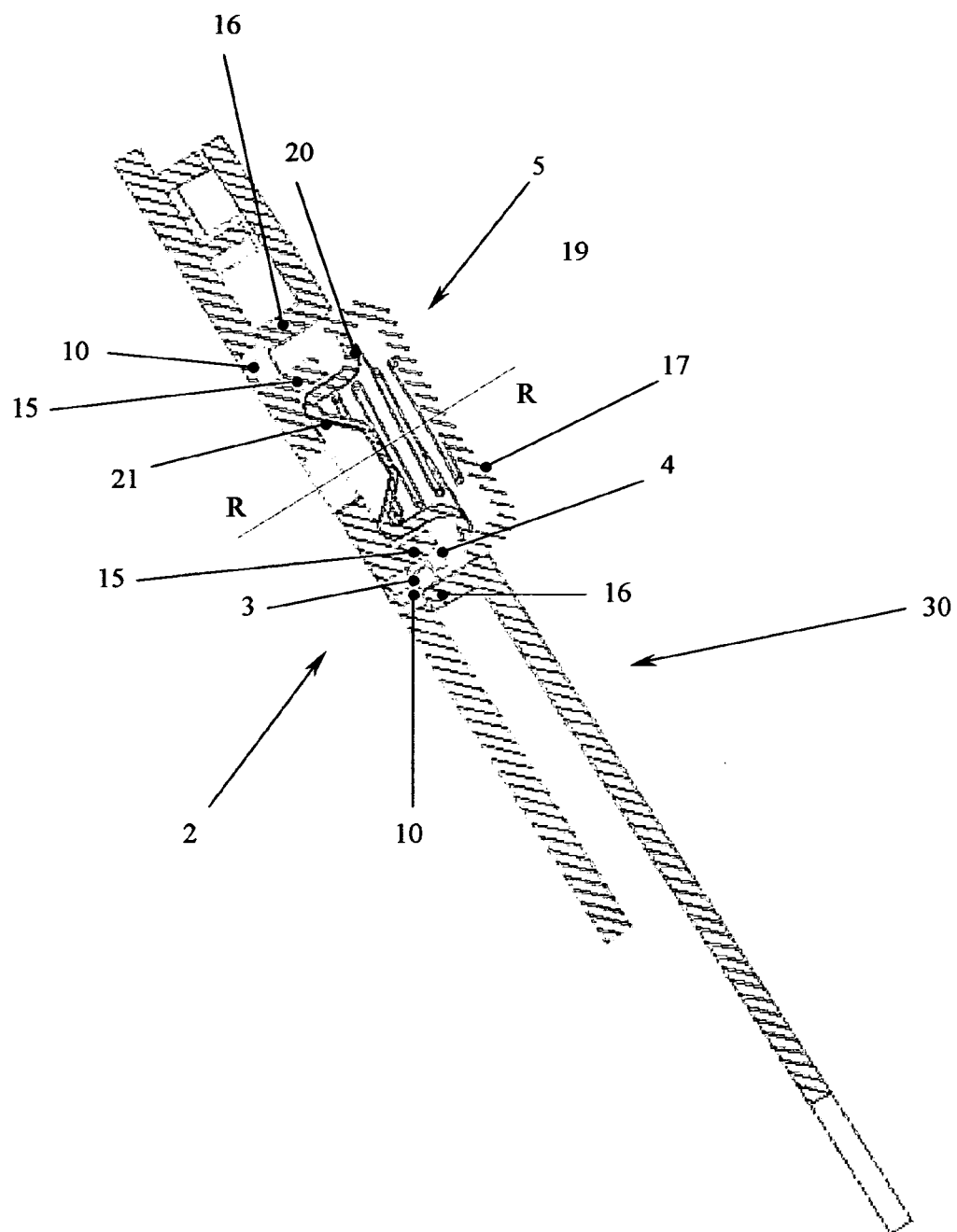


FIG. 4

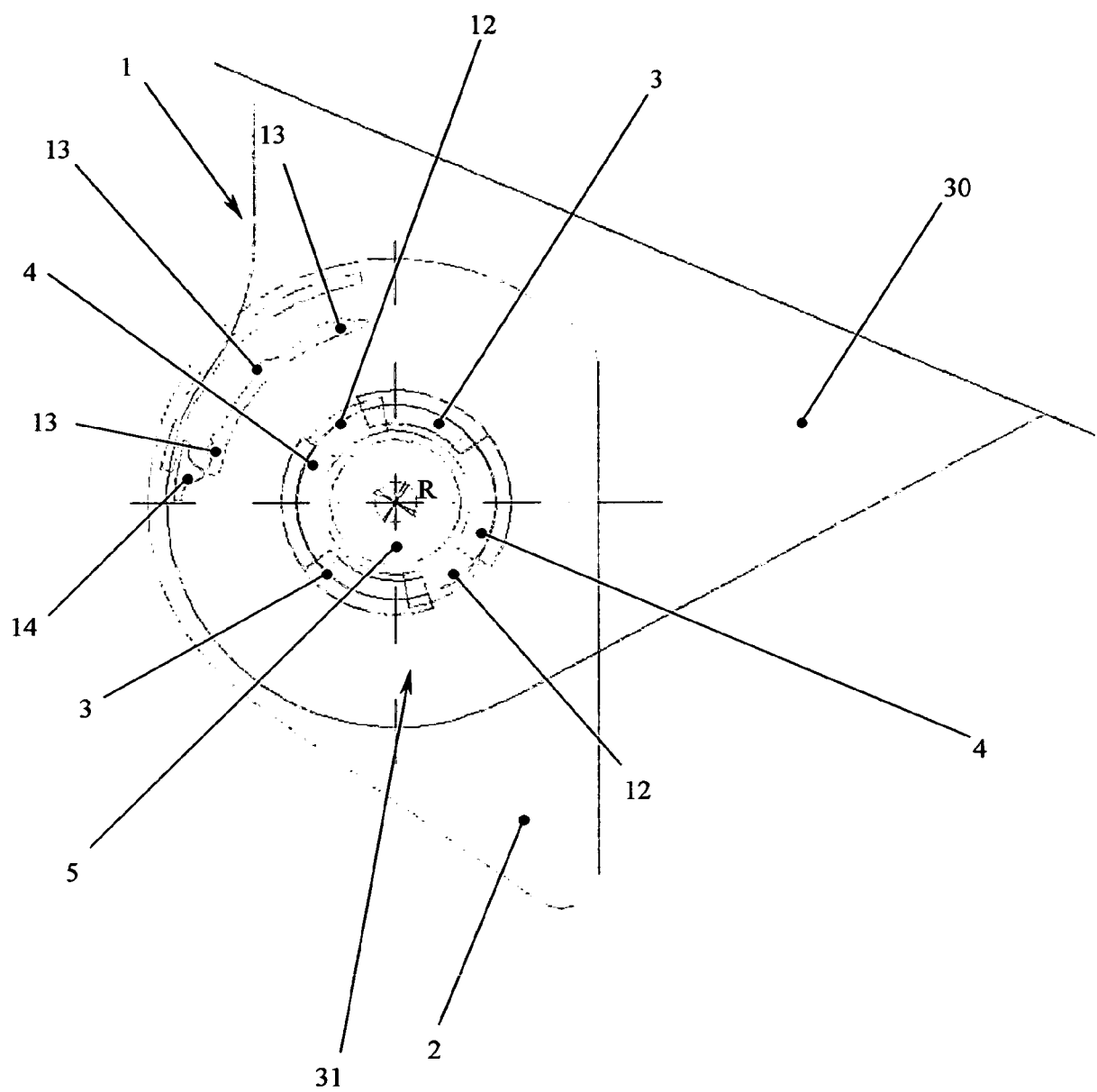


FIG. 5

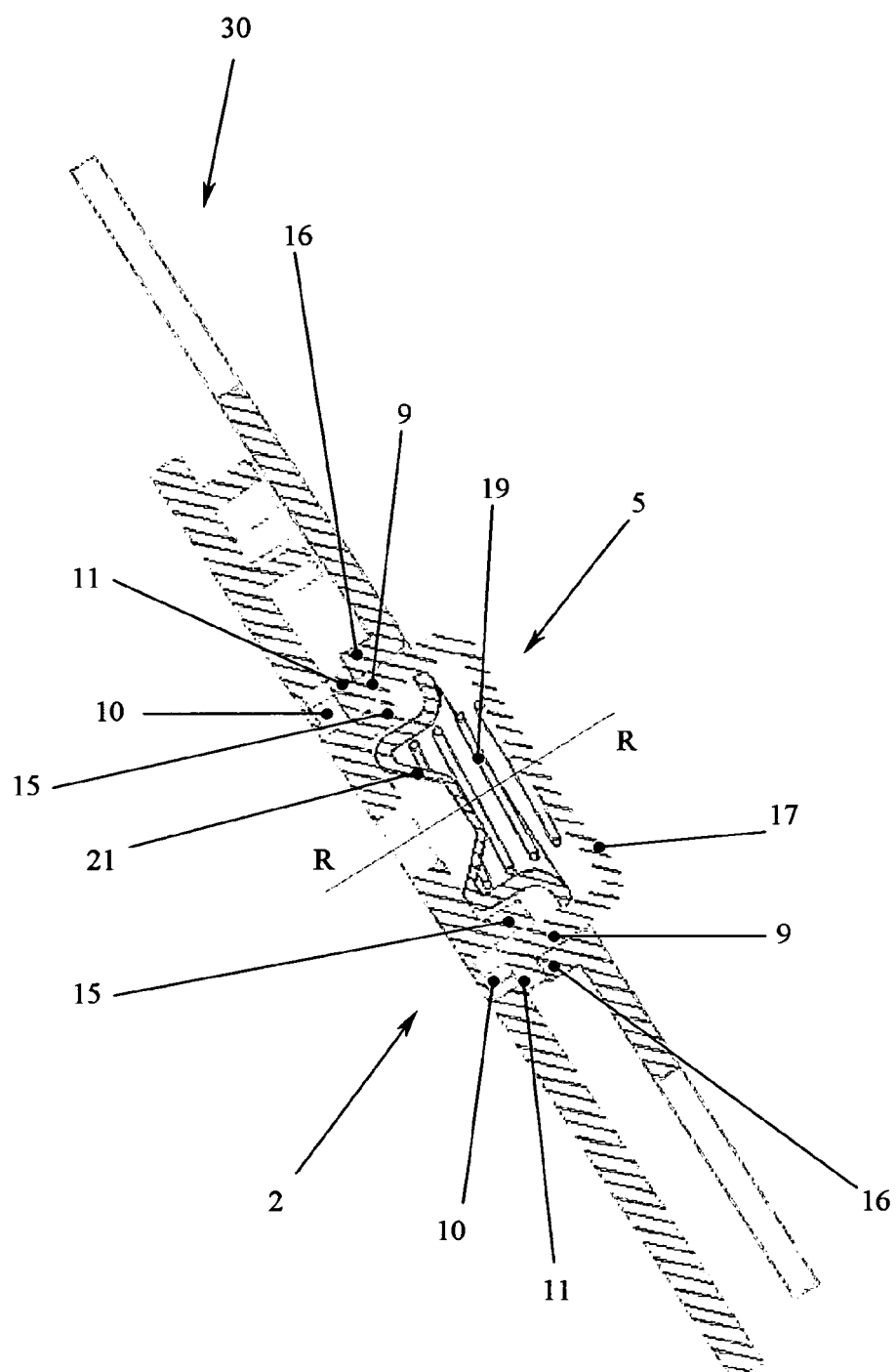
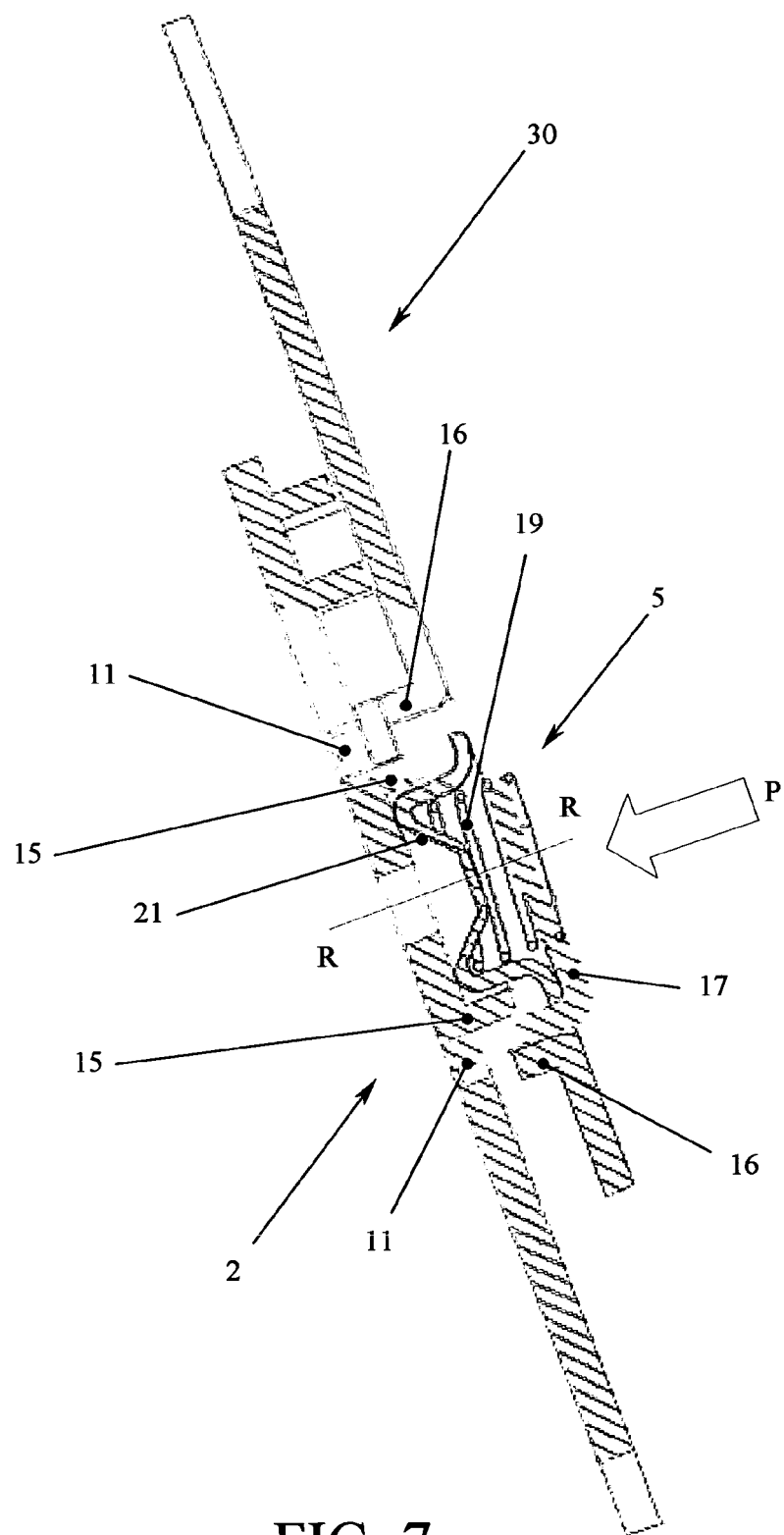


FIG. 6



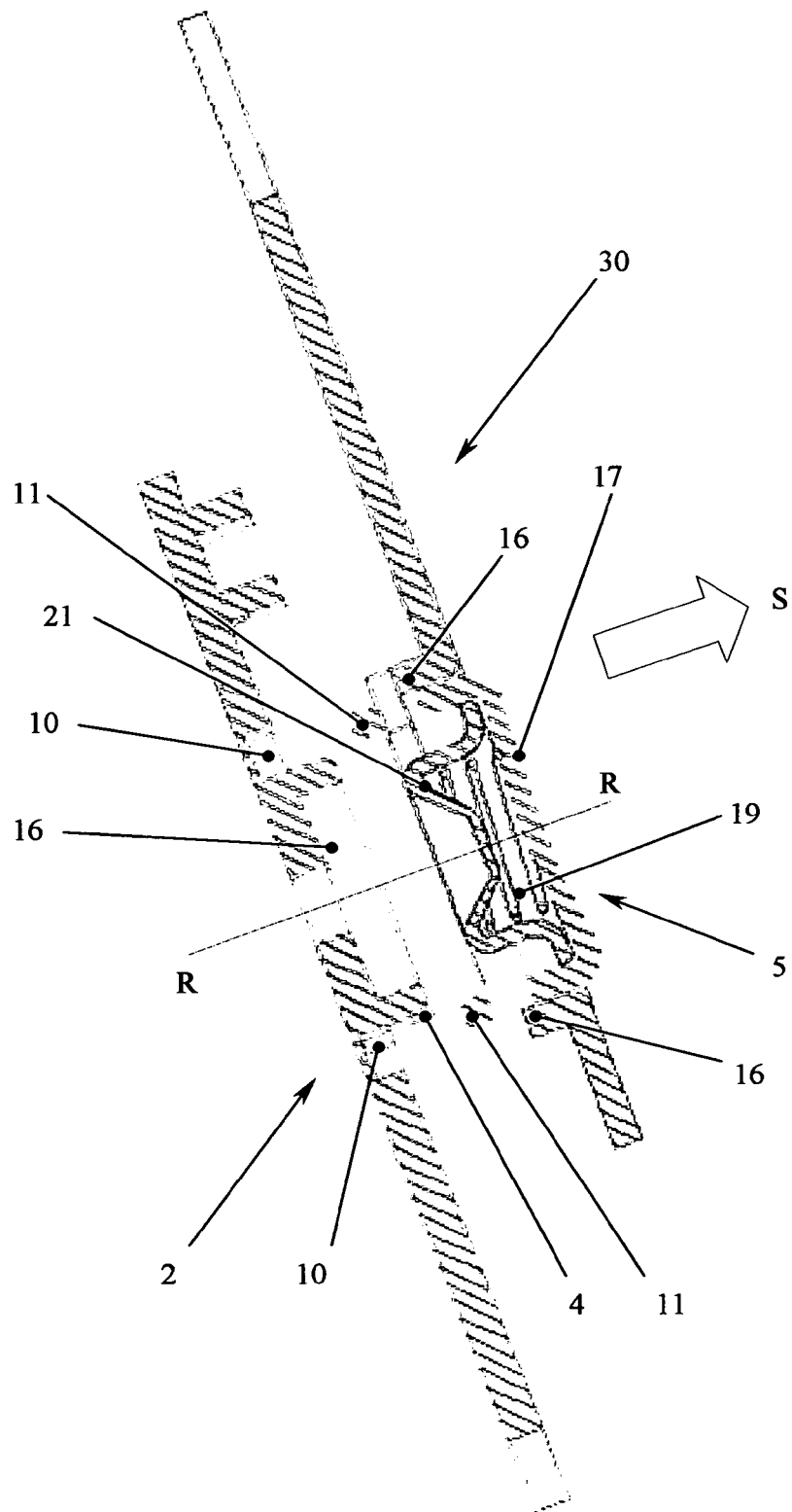


FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5053

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2003/088907 A1 (GAFFORIO LUCA [IT] ET AL) 15 May 2003 (2003-05-15) * paragraph [0035] - paragraph [0037]; figure 2 *	1-10	INV. A42B3/22
A	FR 2 785 505 A (SHARK SA [FR]) 12 May 2000 (2000-05-12) * claims 1-4; figures 6-13 *	1	
D,A	GB 2 300 346 A (BARRY NICHOLA [GB]) 6 November 1996 (1996-11-06) * page 3 - page 4; figure 2 *	1	
A	US 4 794 652 A (PIECH VON PLANTA CORINA [DE] ET AL) 3 January 1989 (1989-01-03) * column 5, line 43 - line 60; claims 1,4,7; figures 1,4,5 *	1	
A	US 4 718 127 A (RITTMANN NANCY C [US] ET AL) 12 January 1988 (1988-01-12) * column 3, line 36 - line 65; figures 3,7 *	1	
A	EP 1 323 361 A (HELM INTERNAT S P A [IT] HELMET ENGINEERING S R L [IT]) 2 July 2003 (2003-07-02) * paragraph [0037]; claim 1; figure 1 *	1	TECHNICAL FIELDS SEARCHED (IPC) A42B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 July 2009	Examiner D'Souza, Jennifer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 42 5053

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-07-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003088907 A1	15-05-2003	EP 1293139 A1 JP 2003183925 A	19-03-2003 03-07-2003
FR 2785505 A	12-05-2000	NONE	
GB 2300346 A	06-11-1996	NONE	
US 4794652 A	03-01-1989	DE 3607483 A1 EP 0236912 A1 FR 2595212 A1	10-09-1987 16-09-1987 11-09-1987
US 4718127 A	12-01-1988	NONE	
EP 1323361 A	02-07-2003	IT MI20012833 A1	30-06-2003

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 2416478 A [0006]
- FR 2759869 A [0006]
- GB 2300346 A [0006]
- EP 0685177 A [0006]