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(54) **Helmet with adjustable inner visor**

Helm mit einstellbarem Innenvisier

Casque avec visière interne réglable

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(56) References cited:
**US-A1- 2005 273 912**
**US-A1- 2008 072 364**
**US-A1- 2010 132 097**

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## Description

**[0001]** The invention relates to a helmet of the type with adjustable internal visor, normally used as a protection while riding motor cycles.

**[0002]** The helmets normally used as protection devices for riding comprise a stiff protection cap internally padded, a first transparent external visor for wind and insect protection, and an internal visor generally with the function of sun ray screening.

**[0003]** Said first transparent external visor is turnably associated with said cap by hinges, and the same user decides the position and inclination thereof relative to the helmet.

**[0004]** Likewise, the internal visor is also turnably associated with said cap, and the same user decides, through a sliding button moving device, whether to keep the visor in a totally hidden position into the cap or in a front position of total extraction from the same cap.

**[0005]** According to the prior art, the button of said moving device controls the sliding movement of a pin associated thereto, within two end seats of a guide, which correspond to the positions of total hiding of the visor and of total front extraction.

**[0006]** In fact, the visor is hinged on the helmet so as to form a first order lever. If we consider a median vertical plane, the lever fulcrum consists of the fixing point of the visor to the helmet, the first arm is the visor and the second arm comprises a slot wherein the pin connected to the button is inserted, so that a movement of the same button causes a corresponding amplified movement of the visor.

**[0007]** Such helmets have some limits or drawbacks.

**[0008]** The total front extraction position of the internal visor is not changeable, since the end seats, i.e. the fixed end points of the guide whereon the button slides, are predetermined by the manufacturer, therefore it cannot be adjusted by the user according to his/her needs and especially according to his/her face shape.

**[0009]** Disadvantageously, the visor may go too low on the user's face and press on his/her nasal septum, creating problems, or on the other hand it may remain slightly lifted and thus hinder the view on the horizon.

**[0010]** In order to obviate such drawbacks, some helmets provide the use of an internal visor provided with a discrete micro-step adjustment system.

**[0011]** In this case, thanks to a series of teeth provided on the guide, the visor can occupy a plurality of intermediate positions between the totally hidden position thereof and that of total front extraction, see for example US 2010/0132097.

**[0012]** However, also this micro-step adjustment system has some limits and drawbacks: in fact, it is very dangerous and uncomfortable for the user, for example to release one hand for a sufficient time for moving the visor to find the right intermediate position between those proposed, while he/she is riding a motor cycle.

**[0013]** Even more disadvantageously, with said adjustment system the solution is not permanent: in fact, it is not possible to store the favoured position of the visor, but each time the user, starting from the totally hidden position, needs to adjust the visor and operate by attempts, remaining for an extended time in an unsafe position on the motor cycle.

**[0014]** The invention aims to overcome these limits by providing a helmet with internal visor, the total front extraction position whereof is adjustable and determined in advance to better adjust to the user's face shape and requirements and the visor actuation is in any case quick.

**[0015]** Further aim of the invention is that such prior adjustment of the total front extraction position of the visor is easy and practical, and once done, remains stored in the helmet.

**[0016]** Such aims are achieved by a helmet with adjustable internal visor, comprising:

- a protection cap suitable for use;
- a transparent external visor turnably associated with said cap;
- an internal hiding visor turnably associated with said cap;
- a device for moving said visor arranged for causing the rotation thereof about an axis, for moving from an end initial position of total hiding, to an end final position of total front extraction of the visor;
- a button arranged for controlling such moving device taking on and keeping two end positions defined by two working seats corresponding to the two end final positions taken by said internal visor, wherein

said moving device comprises means for moving said two working seats corresponding to the end positions taken on by said button, for adjusting and predetermining in a permanent manner at least the end final position of total front extraction of said visor.

**[0017]** According to a first aspect of the invention, said moving device comprises a pin, associated with said button, turnably connected to an end of said visor, and an elastically deformable undulated guide, comprising the two working seats arranged for keeping said pin into position.

**[0018]** In particular, said pin cooperates with said two seats corresponding to the two end positions that can be taken on by said button, for allowing said visor to take on the two positions of total hiding and total front extraction.

**[0019]** According to further aspects of the invention, said moving means comprise:

- a plate fixed to said cap, provided with a rectangular seat wherein said undulated guide is insertable and sliding, and with a position stop arranged for determining the fixing of said guide into said seat in a selectively predetermined position;
- an elastic structure, associated with said undulated guide, provided with suitable grooves and with a slot;
- an adjustment screw provided with an eccentric pin,

wherein said eccentric pin is arranged for sliding within said slot so as to move said elastic structure and the guide connected thereto, allowing the position stop to engage one of said grooves and as a consequence, fix the end final position of total front extraction of said visor.

**[0020]** The invention has several advantages.

**[0021]** The main advantage consists in that the total front extraction position of the visor can be adjusted in advance by the user, who can set it before wearing the helmet at the first use thereof, according to his/her face shape and his/her needs.

**[0022]** Said means for moving the elastic undulated guide whereon the pin associated to the button slides, in fact, allow the user to make the visor take on one among the different possible positions of total front extraction , each one corresponding to a groove of the elastic structure engaged by said position stop.

**[0023]** Once the best position of total front extraction of the visor has been defined, the user can advantageously change multiple times from this position to that of total hiding of the same visor, and vice versa, without losing the adjustment made at the beginning.

**[0024]** Advantageously, said adjustment means are practical and easy to use by the user, without using tools and in a very intuitive manner.

**[0025]** Even more advantageously, the entire helmet ensures a high comfort to the user.

**[0026]** The advantages of the invention shall appear more clearly hereinafter, where preferred embodiments are described by way of a non-limiting example and with the aid of the annexed figures, wherein:

Fig. 1 shows a partially cutaway side view of a helmet with internal visor according to the invention;

Figs. 2 and 3 show an exploded perspective view of a detail of the helmet shown in Fig. 1;

Figs. 4 and 5 respectively show a perspective view and a front view of the detail of Fig. 2 according to a possible usage position;

Figs. 6 and 7 respectively show a perspective view and a front view of the detail of Fig. 2 according to a further possible usage position.

**[0027]** With reference to the Figures, there is shown a helmet 1, to be worn as protection device, essentially consisting of a protection cap 2 suitable for use, stiff and padded inside, a first transparent external visor 3, turnably associated with said cap 2, and an internal hiding visor 4, also turnably associated with said cap 2.

**[0028]** Said visor 4 is associated with a moving device 5 arranged for causing the rotation thereof about an axis, for moving from an end initial position of total hiding underneath said cap 2 to an end final position of total front extraction of the visor 4.

**[0029]** In fact, visor 4 is hinged on helmet 1 so as to form a first order lever, if a median vertical plane is considered for the helmet. The lever fulcrum consists of the fixing point of the visor to the helmet, the first arm is the visor 4 and the second arm is the opposite end 4', connected to said moving device 5, so that the movement of the latter causes a corresponding amplified movement of the visor 4.

**[0030]** A button 6 is provided on said cap 2 arranged for controlling such moving device 5.

**[0031]** Said button 6 is of the sliding type and is arranged for taking on, shifting under the thrust of the user's fingers, two end positions corresponding to the two end final positions that may be taken on by said internal visor 4.

**[0032]** With particular reference to Figures 2 and 3, said moving device 5 comprises a pin 8, associated with said button 6, sliding within an elastically deformable undulated guide 9, associated with said cap 2.

**[0033]** The undulated guide 9 forms two working seats 9' and 9" for said pin 8.

**[0034]** Said pin 8 is turnably associated with end 4' of said visor 4, it being inserted in a slot 18, and cooperates with the undulated guide 9 so as to engage said working seats 9' and 9" for making visor 4 take on the two end positions of total hiding and total front extraction.

**[0035]** Said undulated guide 9 is in fact made by an elastically deformable dual cusp profile that defines the two working seats 9' and 9" for said pin 8.

**[0036]** Upon the passage of said pin 8 associated with button 6, said cusps are squeezed for allowing the insertion thereof into one of said two working seats 9' and 9", but then they regain their configuration and serve as retaining system, preventing any spontaneous movement thereof.

**[0037]** Said moving device 5 is associated with means 7 for moving the undulated guide 9 and as a consequence, for moving the two working seats 9' and 9" that may be engaged by pin 8 of button 6.

**[0038]** Said moving means 7 essentially comprise a plate 10 fixed on said cap 2, an elastic structure 13 associated with said undulated guide 9, and an adjustment screw 16.

**[0039]** Said plate 10 is provided with a position stop 11 and with a rectangular seat 12 wherein said undulated guide 9 may be slidingly inserted in use.

**[0040]** Said elastic structure 13 is provided with suitable grooves 14 of the rack type, and with a slot 15.

**[0041]** Said position stop 11 engages within said grooves 14.

**[0042]** Said adjustment screw 16, visible on the cap and accessible from the outside next to said button 6, is provided with an eccentric pin 17, arranged for sliding within said slot 15.

**[0043]** With particular reference to Figures 4-7, there is shown the operation of said moving means 7 and the cooperation thereof with said moving means 5.

**[0044]** The rotation of the adjustment screw 16 made by the user causes the sliding of the eccentric pin 17 thereof within slot 15 provided on the elastic structure 13.

**[0045]** Automatically, said elastic structure 13 shifts so that one of the grooves 14 thereof is engaged by the

position stop 11 provided on plate 10 fixed on cap 2. In this way, the undulated guide 9 associated with said elastic structure 13 shifts therewith within seat 12 of plate 10 and by the two seats 9' and 9" it defines the two end positions that pin 8 provided on button 6 may occupy when it shall be moved by the user for moving from the totally hidden position of the visor to that of total front extraction of the same.

**[0046]** The use of the helmet with adjustable internal visor is described hereinafter.

**[0047]** Upon the first use of helmet 1, before wearing it the user adjusts the adjustment screw 6 and with a simple rotation of the same, he/she moves the undulated guide 9, selecting the most suitable position of total front extraction of visor 4 for his/her face so as to not create problems and pains and to ensure good visibility.

**[0048]** Afterwards, the user wears the helmet and with a simple movement of shifting of button 6 he/she allows the dropping of the visor from the totally hidden position to the predetermined one of total front extraction.

**[0049]** Said position remains stored thanks to the cooperation between the position stop 11 and the elastic structure 13. In this way, the visor shall always reach it upon use.

**[0050]** Whenever the user wants to change said predetermined position he/she may simply adjust said adjustment screw as described above.

**[0051]** Of course, the construction details, the dimensions, the materials and the embodiments may widely vary with respect to what described and illustrated, without however departing from the scope of the present invention as claimed.

## Claims

1. Helmet (1) with adjustable internal visor, comprising:

   - a protection cap (2) suitable for use;
   - a transparent external visor (3) turnably associated with said cap (2);
   - an internal hiding visor (4) turnably associated with said cap (2);
   - a device (5) for moving said visor (4) arranged for causing the rotation thereof about an axis, for moving from an end initial position of total hiding, to an end final position of total front extraction of the visor (4);
   - a button (6) arranged for controlling such moving device (5) taking on and keeping two end positions defined by two working seats corresponding to the two end positions taken by said internal visor, **characterized in that** said moving device (5) comprises means (7) for moving said two working seats corresponding to the end positions taken on by said button (6), for adjusting and predetermining in a permanent manner at least the end final position of total front extraction of said visor (4).

2. Helmet (1) according to claim 1, **characterized in that** said moving device (5) comprises:

   - a pin (8) associated with said button (6), wherein said pin is turnably connected to an end (4') of said visor;
   - an elastically deformable undulated guide (9) comprising two working seats (9', 9"), arranged for keeping said pin into position, wherein said pin (8) cooperates with said two working seats (9', 9") corresponding to the two end positions that can be taken on by said button, for allowing said visor (4) to take on the two positions of total hiding and total front extraction.

3. Helmet (1) according to claims 1 and 2, **characterized in that** said undulated guide (9) is movable among a plurality of positions that can be selectively predetermined through said moving means (7).

4. Helmet (1) according to claim 1, **characterized in that** said moving means (7) comprise a plate (10) fixed to said cap (2), provided with a rectangular seat (12) wherein said undulated guide (9) is insertable and sliding, and with a position stop (11) arranged for determining the fixing of said guide into said seat in a selectively predetermined position.

5. Helmet (1) according to claim 4, **characterized in that** said moving means (7) further comprise:

   - an elastic structure (13), associated with said undulated guide (9), provided with suitable grooves (14) and with a slot (15);
   - an adjustment screw (16) provided with an eccentric pin (17),

   wherein said eccentric pin (17) is arranged for sliding within said slot (15) so as to move said elastic structure (13) and the guide (9) connected thereto, allowing the stop (11) to engage one of the grooves (14) and as a consequence, fix the preferred end final position of total front extraction of said visor (4).

## Patentansprüche

1. Helm (1) mit regulierbarem internem Visier, umfassend:

   - eine Schutzschale (2), die zum Gebrauch geeignet ist;
   - ein transparentes externes Visier (3), das mit der besagten Schale (2) drehbar verbunden ist;
   - ein internes versteckbares Visier (4), das mit der besagten Schale (2) drehbar verbunden ist;

- eine Vorrichtung (5) zum Bewegen des besagten Visiers (4), eingerichtet, um seine Rotation um eine Achse zu bewirken, damit eine Schluss-Anfangsposition des totalen Versteckens zu einer Schluss-Endposition des totalen Frontauszugs des Visiers (4) bewegt wird;
- ein Knopf (6), eingerichtet, um eine derartige Bewegungsvorrichtung (5) zu kontrollieren, die zwei Schluss-Positionen übernimmt und festhält, die durch zwei Arbeitssitze definiert werden, die den beiden von dem besagten Visier eingenommenen Schluss-Positionen entsprechen, **gekennzeichnet dadurch, dass** besagte Bewegungsvorrichtung (5) Mittel (7) zum Bewegen der besagten zwei Arbeitssitze umfasst, die den Schluss-Positionen entsprechen, die von dem besagten Knopf (6) zur Regulierung und vorherigen Festlegung von mindestens der Schluss-Endposition des totalen Frontauszugs des besagten Visiers (4) dauerhaft übernommen werden.

**2.** Helm (1) gemäß Anspruch 1, **gekennzeichnet dadurch, dass** die besagte Bewegungsvorrichtung (5) Folgendes umfasst:

- einen Stift (8), der mit dem besagten Knopf (6) verbunden ist, wobei der besagte Stift drehbar an einem Ende (4') des besagten Visiers befestigt ist;
- ein elastisch biegsames, gewelltes Führungsstück (9), umfassend zwei Arbeitssitze (9', 9"), eingerichtet, um den besagten Stift in seiner Lage zu halten, wobei besagter Stift (8) mit den besagten zwei Arbeitssitzen (9', 9") kooperiert, die den beiden Schluss-Positionen entsprechen, die von dem besagten Knopf übernommen werden können, damit erlaubt wird, dass das besagte Visier (4) die beiden Positionen des totalen Versteckens und des totalen Frontauszugs übernimmt.

**3.** Helm (1) gemäß Anspruch 1 und 2, **gekennzeichnet dadurch, dass** das besagte gewellte Führungsstück (9) beweglich ist unter einer Vielzahl von Positionen, die durch die besagten beweglichen Mittel (7) wahlweise vorher festgelegt werden können.

**4.** Helm (1) gemäß Anspruch 1, **gekennzeichnet dadurch, dass** die besagten beweglichen Mittel (7) eine Platte (10) umfassen, die an besagter Schutzschale (2) befestigt ist, ausgestattet mit einem rechteckigen Sitz (12), in den das besagte gewellte Führungsstück (9) eingesetzt wird und hineinrutscht, und mit einem Positionsstopp (11), der eingerichtet ist, um das Befestigen des besagten Führungsstücks in dem besagten Sitz in einer wahlweise vorherbestimmten Position festzulegen.

**5.** Helm (1) gemäß Anspruch 4, **gekennzeichnet dadurch, dass** die besagten beweglichen Mittel (7) weiterhin Folgendes umfassen:

- eine elastische Struktur (13), die mit dem besagten gewellten Führungsstück (9) verbunden ist, ausgestattet mit angemessenen Kerben (14) und mit einem Schlitz (15);
- eine Stellschraube (16), ausgestattet mit einem exzentrischen Stift (17), wobei dieser exzentrische Stift (17) eingerichtet ist, um in den besagten Schlitz (15) zu gleiten, damit die besagte elastische Struktur (13) und das damit verbundene Führungsstück (9) bewegt werden, und den Stopp (11) erlauben, damit eine der Kerben (14) einrastet und folglich die bevorzugte Schluss-Endposition des totalen Frontauszugs des besagten Visiers (4) festlegt.

**Revendications**

**1.** Casque (1) avec visière interne réglable, comprenant :

- une calotte de protection (2) adaptée à l'usage ;
- une visière externe transparente (3) associée de manière pivotante à ladite calotte (2) ;
- une visière interne escamotable (4) associée de manière pivotante à ladite calotte (2) ;
- un dispositif (5) pour déplacer ladite visière (4) disposé de manière à causer la rotation de celle-ci autour d'un axe, pour le déplacement entre une position d'extrémité initiale pour l'escamoter complètement et une position d'extrémité finale d'extraction avant complète de la visière (4) ;
- un bouton (6) disposé de manière à contrôler ce dispositif de déplacement (5) adoptant et conservant deux positions d'extrémité définies par deux sièges fonctionnels correspondant aux deux positions d'extrémité adoptées par ladite visière interne,

**caractérisé par le fait que** ledit dispositif mobile (5) comprend des moyens (7) pour déplacer lesdits deux sièges fonctionnels correspondant aux positions d'extrémité adoptées par ledit bouton (6), pour régler et prédéterminer de manière permanente au moins la position d'extrémité finale d'extraction avant complète de ladite visière (4).

**2.** Casque (1) selon la revendication 1, **caractérisé par le fait que** ledit dispositif mobile (5) comprend :

- une goupille (8) associée audit bouton (6), où ladite goupille est raccordée de manière pivotante à une extrémité (4') de ladite visière ;

- une glissière ondulée déformable élastiquement (9) comprenant deux sièges fonctionnels (9', 9"), disposés pour maintenir ladite goupille en position, où ladite goupille (8) coopère avec lesdits deux sièges fonctionnels (9', 9") correspondant aux deux positions d'extrémité pouvant être adoptées par ledit bouton, pour permettre à ladite visière (4) d'adopter les deux positions d'escamotage complet et d'extraction avant complète.

**3.** Casque (1) selon les revendications 1 et 2, **caractérisé par le fait que** ladite glissière ondulée (9) peut se déplacer dans une multitude de positions qui peuvent être sélectivement prédéterminées grâce auxdits moyens mobiles (7).

**4.** Casque (1) selon la revendication 1, **caractérisé par le fait que** lesdits moyens mobiles (7) comprennent une plaque (10) fixée à ladite calotte (2), dotée d'un siège rectangulaire (12) où ladite glissière ondulée (9) peut être insérée et coulisser, et avec une butée de position (11) disposée de manière à déterminer la fixation de ladite glissière dans ledit siège dans une position sélectivement prédéterminée.

**5.** Casque (1) selon la revendication 4, **caractérisé par le fait que** lesdits moyens mobiles (7) comprennent également :

- une structure élastique (13), associée à ladite glissière ondulée (9), dotée de rainures appropriées (14) et d'une fente (15) ;
- une vis de réglage (16) dotée d'une goupille excentrique (17),

où ladite goupille excentrique (17) est disposée de manière à coulisser dans ladite fente (15) de manière à déplacer ladite structure élastique (13) et la glissière (9) qui y est raccordée, permettant à la butée (11) de s'engager dans l'une des rainures (14) et par conséquent de fixer la position d'extrémité finale préférée d'extraction avant complète de ladite visière (4).

*Fig. 1*

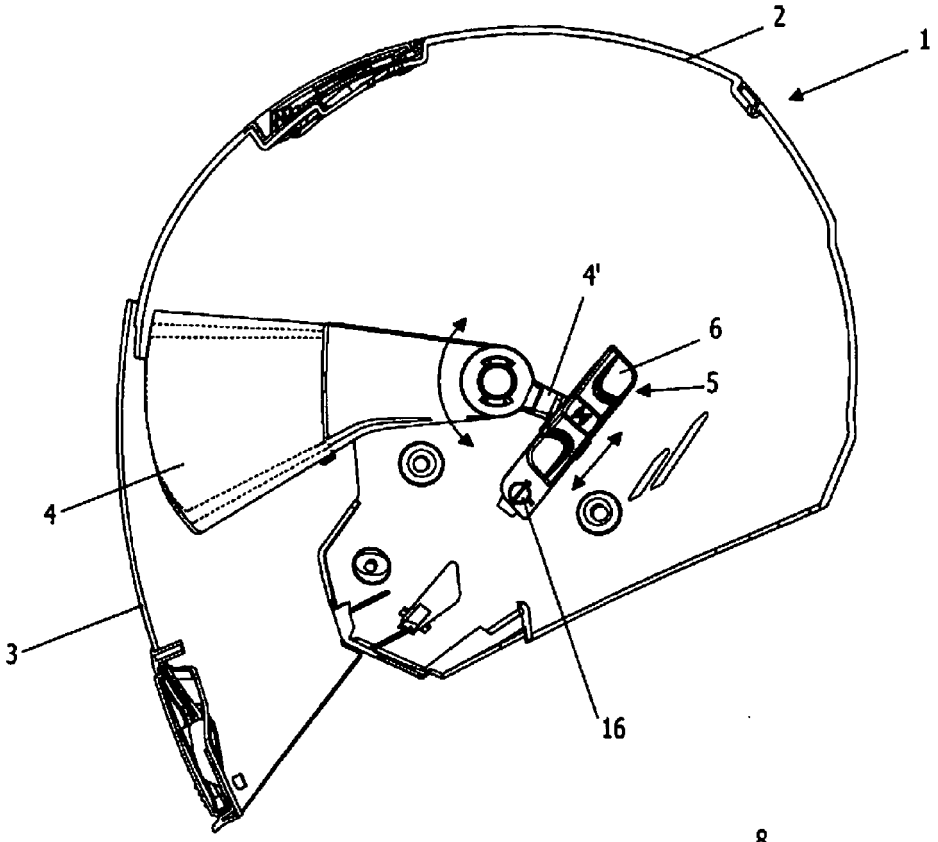



*Fig. 2*

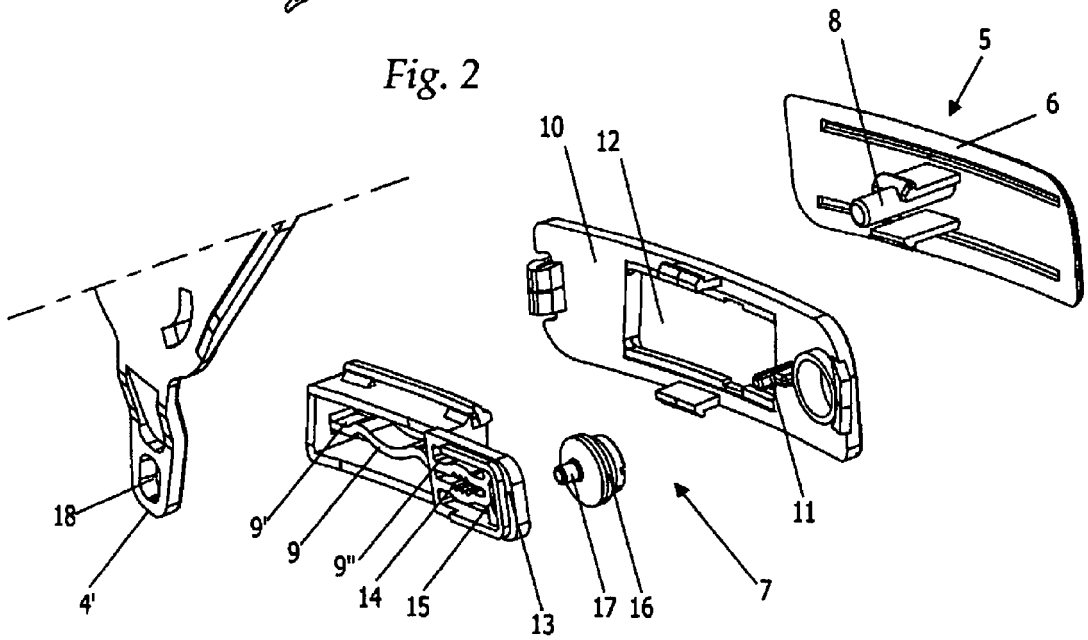


*Fig. 3*

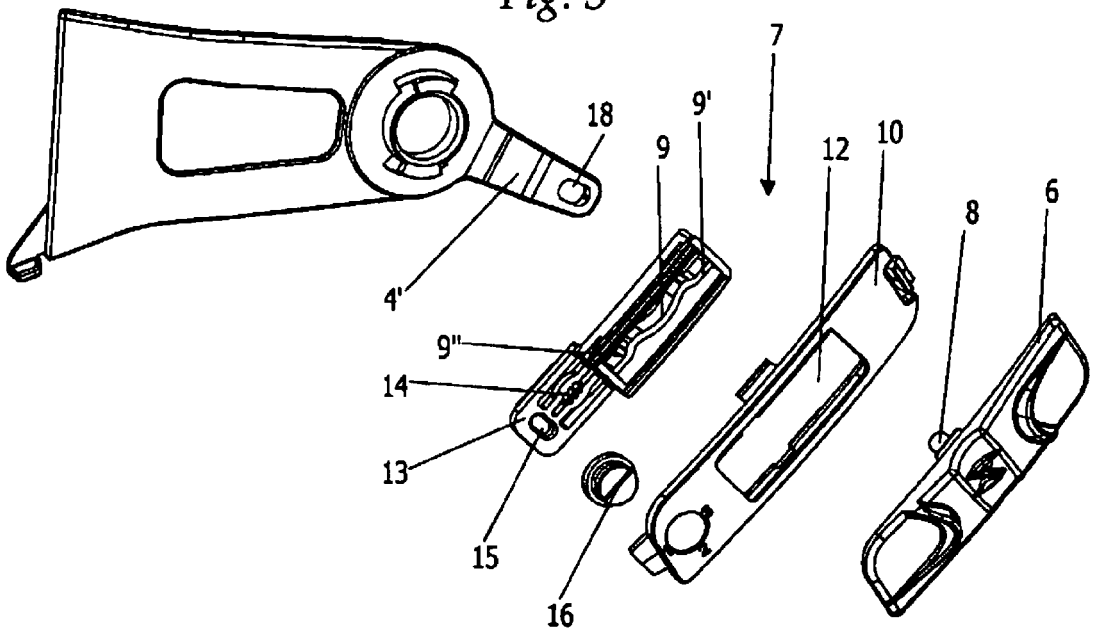



*Fig. 4*

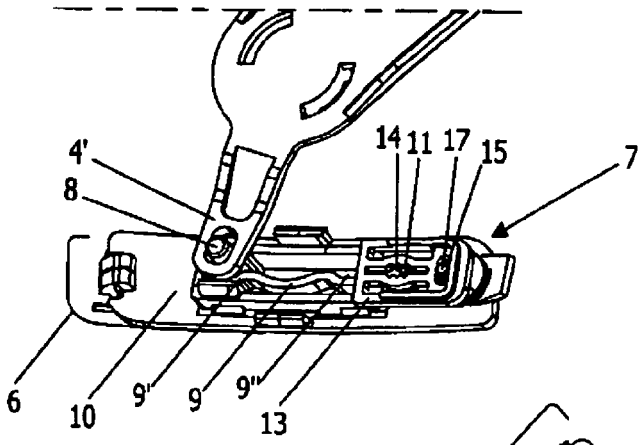



*Fig. 5*

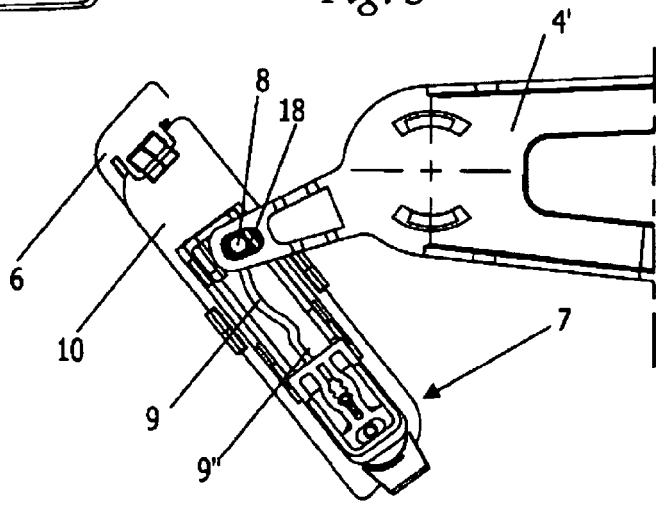


*Fig. 6*

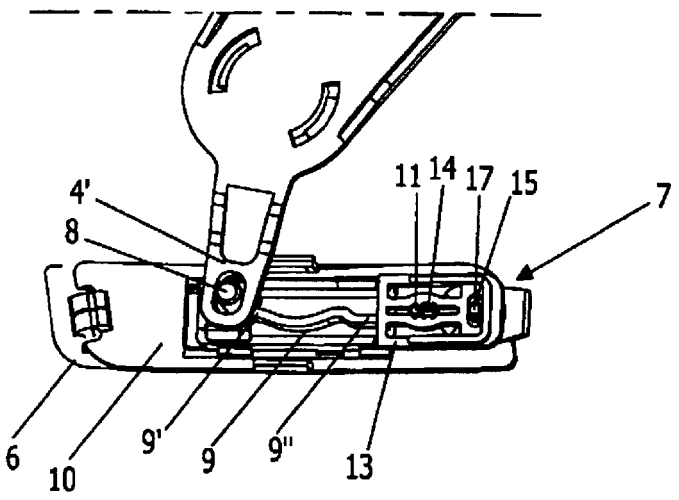
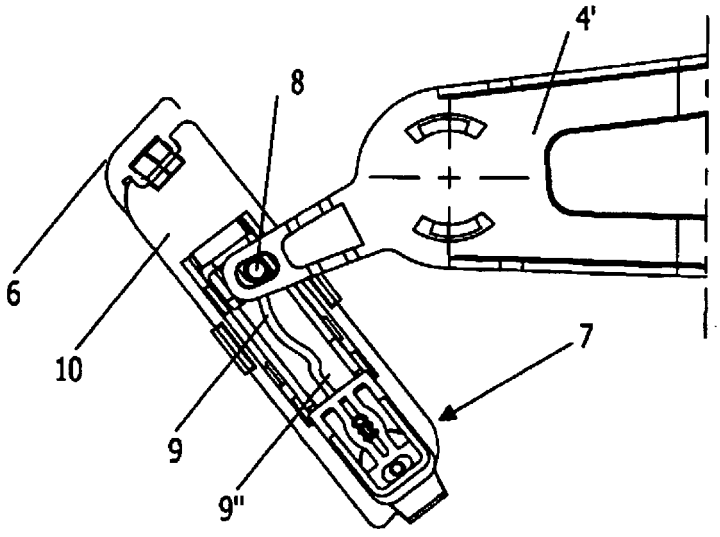



*Fig. 7*



## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- US 20100132097 A **[0011]**