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(71) Applicant: **IVECO S.p.A.**
10156 Torino (IT)

(72) Inventor: **Lago, Renzo**
10020 Brusasco (IT)

(74) Representative: **Borsano, Corrado et al**
Notarbartolo & Gervasi S.p.A.
Corso di Porta Vittoria, 9
20122 Milano (IT)

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(54) **Cremone bolt**

(57) A cremone bolt comprising:
at least one rod (17,17') and a control (10) adapted to be applied to a door wing (16), said control being connected to said rod and adapted to displace it, under the effect of an external action, from a closed position to an open one; a catch (1,3,1',3') adapted to be applied to a fixed part (14) of said door, adapted to engage one end of said rod in closed position;

return means (11) adapted to return said rod to closed position ceasing said external action and that said catch comprises a receding element (3,3') adapted to assume a normal position (3,3a') and a retracted one (3b,3b') and pushed into the normal position by elastic means (5,5'), said receding element adapted to be pushed towards the retracted position by said rod during the closing movement of the door wing.

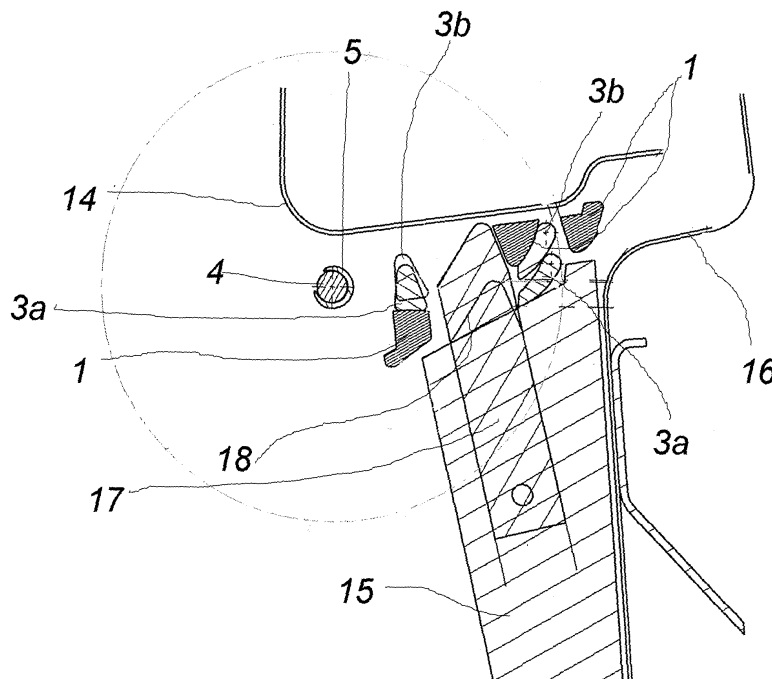


Fig. 8

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to cremone type bolt for doors, and specifically a cremone bolt for vehicle doors. According to a particular embodiment, the invention relates to a cremone bolt for vehicle doors, more specifically for rear doors of vans.

PRIOR ART

[0002] Various types of bolts are available for vehicle doors. Various closing systems are used in the specific case of rear van doors, generally with two door leaves. Generally, one of the door leaves is provided with a lock capable of locking it in closed position to the chassis, the second door wing is commonly provided with a lock capable of locking it to the first door wing, even if it is possible to have an independent lock similar to the first. Some locks comprise two snapping bolts, an upper one and a lower one, fixed to the first door wing, capable of engaging two corresponding catches fixed to the edge of the opening in the body. Each of the snapping bolts is provided with its own return spring, which maintains it in closed position. A central control, generally comprising a handle, operable by the user, pulls the bolts to open position, to allow the release of the catches and consequently the opening of the door wing. In general, the central control is connected to each bolt by means of a cable, because the return of the bolt to closed position is due to the spring and occurs without needing the action of the central control. As known, the closing of the door wing is possible without acting on the central control. The action of the catches on the bolts, in view of the suitable shape, allows to overcome the bias of the spring, until the closed position of the door wing is reached, in which the bolt is free to return to closed position to which it is pushed by the spring again. The opening of the wing door is prevented by the interference between bolt and catch. This type of bolt is indeed appreciated for the fact that no action on the central control is required for closing. The bolts are either sliding or may turn about a pin. Sometimes, however, the incomplete closing of the door wing prevents the snapping of the bolt to closed position, a condition which often may go unnoticed and may even concern only one of the bolts, in virtue of the deformability of the door wing.

[0003] Another system commonly adopted is the door wing cremone bolt type. In this system, two mobile rods, an upper one and a lower one, are connected to the central control adapted to engage the catches on the body. The presence of rigid rods, which may be accommodated within the door wing, is appreciated for the robustness which is conferred to the bolt and to its precision which tends to correct even imperfect alignments and does not conceal possible imperfect closures. On the other hand, the bolt is not snapping. The positions of the central con-

trol and of both the closing and the opening rods are stable. The closing of the door wing thus requires the user to operate the central control each time, which may be inconvenient in vehicles, such as vans, when the loading and unloading of goods may be frequent.

[0004] It would be desirable to combine the advantages of a cremone bolt with those of a snapping bolt.

SUMMARY

[0005] The problems identified above have been solved according to the present invention by a cremone bolt for a door, said bolt comprising:

at least one rod and one control adapted to be applied to a wing of said door, said control being connected to said rod and adapted to displace it, under the effect of an external action, from a closed position to an open one;

a catch adapted to be applied to a fixed part of said door, adapted to engage an end of said rod in closed position;

characterised in that it comprises return means adapted to return said rod to closed position once said external action has ceased, and in that said catch comprises a receding element adapted to assume a normal position and a retracted one and pushed into the normal position by elastic means, said receding element adapted to be pushed towards the retracted position by said rod during the closing movement of the door wing.

[0006] Said elastic means may be a spring. The receding element may be either sliding or preferably hinged to a support belonging to the catch.

[0007] Said return means may comprise an elastic element, preferably a spring mounted on said control.

[0008] Preferably, when the rod is in closed position, the receding element is adapted to withhold it in the closed position of the door wing, preventing the opening of the latter.

[0009] According to a preferred embodiment, in closed position, the rod may also be partially pushed by the receding element towards the open position during the closing operation of the door wing.

[0010] Preferably, the bolt comprises two rods connected to said control, arranged in opposite position and adapted to translate in the opposite direction under the action of said control. Preferably, the rods may be vertically arranged near one end of the door wing opposite to the hinged end, as in the case of the common cremone bolts.

[0011] The invention further relates to a door, preferably a vehicle door, comprising a door wing, hinged to a fixed part, which in the case of a vehicle may be the body, having said rod or said rods and said control being secured to said door wing, said catch or catches being fixed to said fixed part.

[0012] According to a particular embodiment of the in-

vention, this is the rear door of a van, and may be a door with two leaves the first of which is provided with a bolt as specified above and the second with a bolt adapted to fix it to the first door wing when closed.

[0013] The invention further relates to a vehicle, specifically a van provided with a door as described above.

[0014] it is a particular object of the invention what defined in the accompanying claims.

LIST OF FIGURES

[0015] The present invention will now be illustrated by means of the detailed description of preferred, but not exclusive, embodiments provided by way of example only, with the aid of the accompanying figures, in which:

figure 1 schematically shows an upper catch of a bolt, specifically for the rear door of a van, according to the present invention;

figure 2 schematically shows a support, adapted to be fixed to the body, belonging to the catch of figure 1 ;

figure 3 schematically shows the receding element belonging to the catch of figure 1 ;

figure 4 shows another view of the catch of figure 1 ;

figure 5 schematically shows a lower catch of the abovementioned bolt;

figure 6 schematically shows a support, adapted to be fixed to the body, belonging to the catch of figure 5;

figure 7 schematically shows the receding element belonging to the catch of figure 5 ;

figures 8 and 9 schematically show, in section taken along a vertical plane perpendicular to the door wing, two details respectively comprising the upper and lower catches of the abovementioned bolt in which the rods and the receding elements are shown in the different positions which they assume during the closing operation of the door wing;

figure 10 schematically shows the central control of the bolt;

figure 11 schematically shows the end of a rod of the abovementioned bolt.

DETAILED DESCRIPTION OF AN EMBODIMENT

[0016] Figures 1, 2, 3 and 4 show an upper catch of a bolt of a door wing of the rear door of a van, the lower catch being shown in figures 5, 6 and 7. Each comprise a support 1 and 1' respectively adapted to be fixed in suitable position to the vehicle body, for example to the door ring, by means of screws through holes 2 and 2'. The upper catch shown in figures from 1 to 4 is adapted to be fixed to an essentially horizontal wall and facing downwards, the lower catch in figures from 5 to 7 being fixed to a vertical wall, opposite to the side on which the door wing is received by the catch; the illustrated solution is due to the structure of a particular type of vehicle for which the bolt was designed, but a person skilled in the

art will know how to adapt the structure of the support and of the catch in general to needs, i.e. to the structure of the door to which the bolt is applied. Receding elements 3, 3' may be suitably hinged to the supports, e.g. by means of pins 4 and 4'. In figures 1 and 5, the receding elements are shown in their normal position, to which they are pushed by respective springs 5 and 5'. The ends of the springs, which may be inserted on the pivoting pins themselves, act on the support and the receding element to obtain such effect. During the closing operation of the door wing, the rods, as described in better detail below, arrive from the opposite side with respect to pins 4 and 4', in the direction of arrows A and A'. Lead-in portions 6 and 6' are shaped so as to allow the movement of the door wing, without causing the ends of the rods to jam. During closing, the ends of the rods push the receding elements to the retracted position. When the position corresponding to complete closure of the door wing is reached by the rods, their ends are accommodated in cavities 7 and 7', leaving the receding element free to return to normal position. The ends of the rods also retract under the pressure of the receding element during the closing of the door wing, overcoming the return means which may be a spring mounted on the control, means which return the rod to closed position as soon as the door wing is completely closed. Once the rod is accommodated in cavities 7 or 7', the door wing cannot be opened until the rod is retracted to open position by acting on the control, in virtue of the shape of the receding elements and of the catches in general. Figure 10 schematically shows control 10, which is fixed in suitable position to the door wing, e.g. centrally near the side opposite to the hinged side of the door wing, with return means 11, e.g. a spring, which maintains it in closed position. The rods are connected (hinged) to holes 13 and 13'. The rotation in one direction, clockwise in the example shown, of element 12, by means of a handle, as commonly occurs in cremone bolts, causes a translation of the rods in the direction of the arrows B and B' retracting them to open position. By ceasing the action on the handle, the system returns to closed position, a condition in which it normally remains.

[0017] Figures 8 and 9 show longitudinal sections of the bolt at the upper and lower catches. The section plane is perpendicular to pivoting pins 4 and 4' of receding elements 3 and 3'.

[0018] Supports 1 and 1' are fixed to the fixed part, vehicle body 14.

[0019] Numerals 3a and 3a' indicate the normal position of receding elements, numerals 3b and 3b' indicating their retracted position. Door wing 16 displays guides 15 and 15' of rods, whose ends are indicated by numerals 17 and 17', the completely closed condition of the door wing is shown in the figures. When closing the door wing, ends 17 and 17' press the receding elements to the retracted position and in turn are partially pushed towards the opening position. The tip of the ends is taken to the condition shown by lines 18 and 18'. Having reached a

complete closing of the door wing, the rods return to the closed position and the elements to the normal position. As seen, a snapping bolt is made and it is not possible to open the door again without retracting the ends of the rods even more with respect to the condition shown by lines 18 and 18', which is possible by acting on the control of figure 10 as mentioned above.

[0020] The rods comprise shaped ends, as suitably inferred by the drawings. They may be made in a known manner, being adapting to the door wing structure. As commonly occurs, they may be contained within the door wing. They may be made of one part or several parts.

[0021] The described receding elements are of the hinged type. It is however possible to make them sliding or mobile in other manner.

[0022] By way of example, figure 11 shows a possible embodiment in which end 17 of the rod is fitted on the body of rod 19 and fixed to the latter by a pin 20. Other solutions are however possible.

[0023] It has been found that, by equipping the rods and/or the return mechanical control with a catch free from the receding element, in order to obtain a secure closing (i.e. a sufficiently long stroke of the rod before releasing the door wing), the snapping bolt would require a considerable force, which given the length of the rods and the distance of the control from the catches, could generate jamming and however low operative comfort, making the missed closing of the door frequent if the door wing is not sufficiently pushed. A dimensioning of the return spring of the control such to reduce the effort by a sufficient length is also difficult due to dimensions. The present invention, by distributing the forces to be overcome and the total stroke of receding element and rod during the closing operation, allows to obtain a secure, convenient snapping bolt. A longer stroke of the rod is contemplated for opening, by acting on the control. There are no problems for this because instinctively one acts on the control until it is unlocked and there are no problems of jamming when the rods are pulled by the control.

Claims

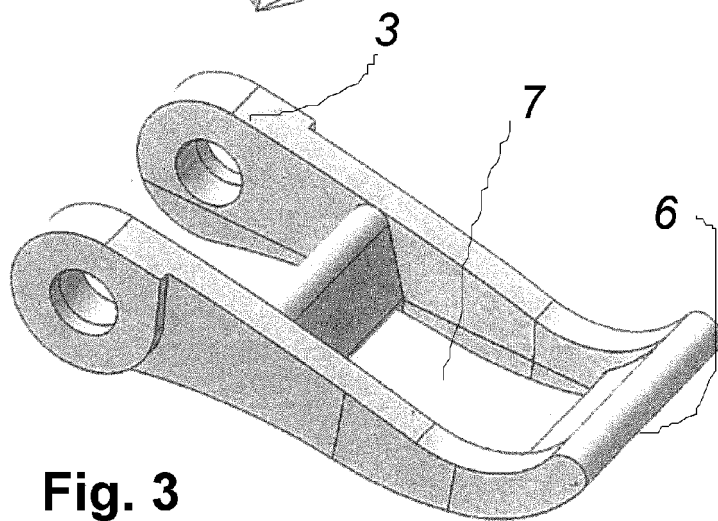
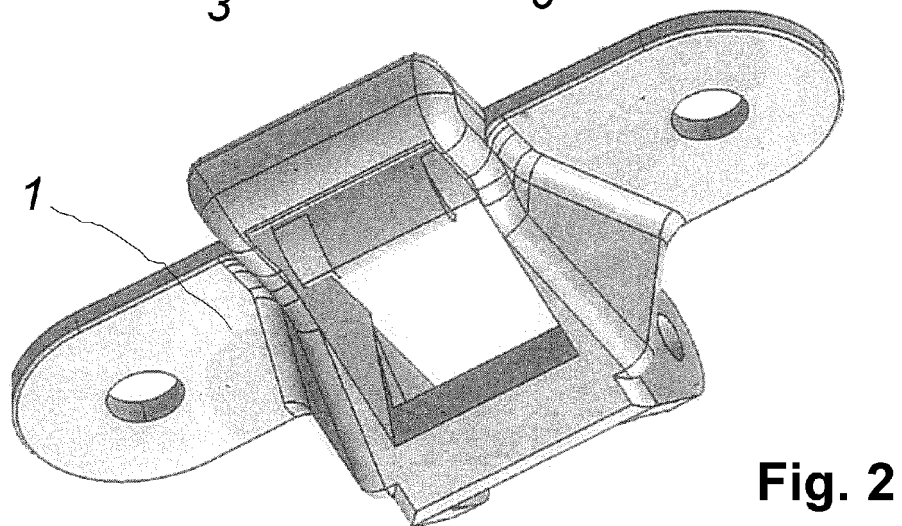
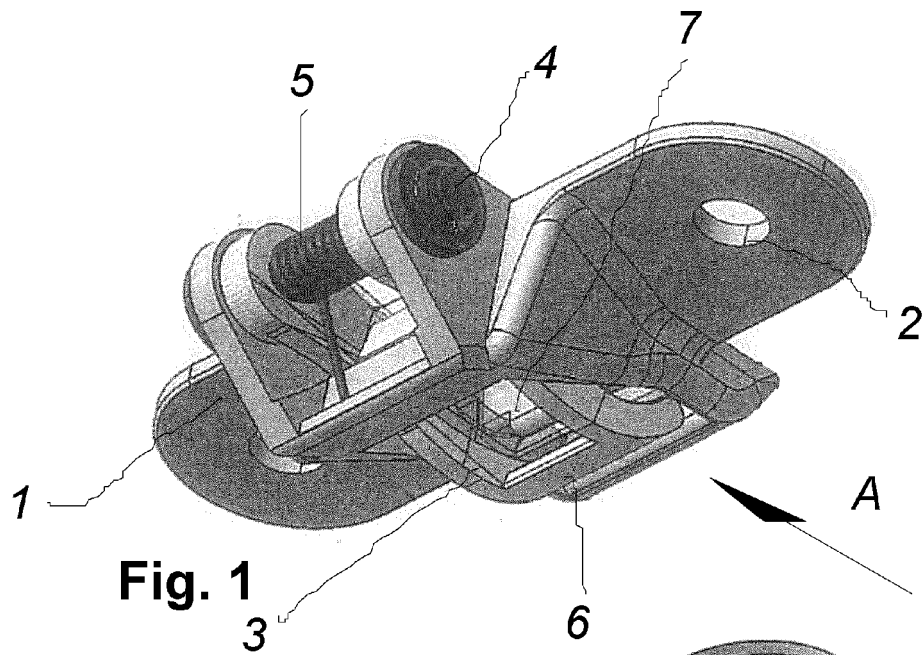
1. A cremone bolt for a door, said bolt comprising:

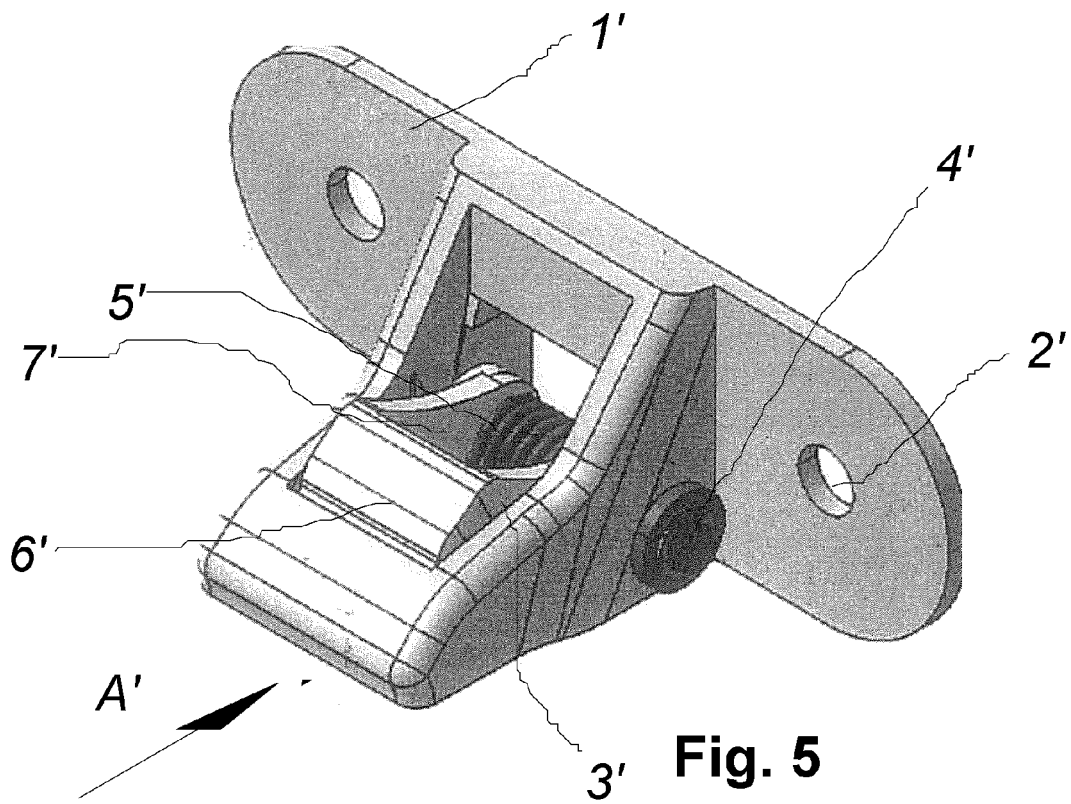
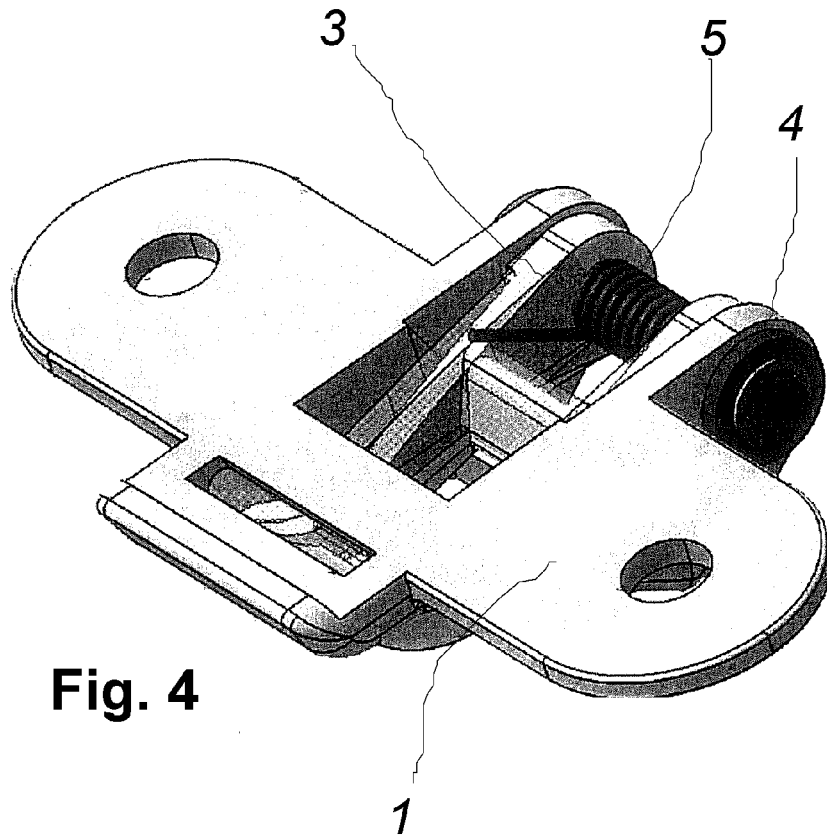
at least one rod (17, 17') and a control (10) adapted to be applied onto a wing (16) of said door, said control being connected to said rod and adapted to displace it, under the effect of an external action, from a closed position to an open one;
a catch (1, 3, 1', 3') adapted to be applied to a fixed part (14) of said door, adapted to engage an end of said rod in closed position;

characterised in that it comprises return means (11) adapted to return said rod to closed position once said external action has ceased, and **in that**

said catch comprises a receding element (3, 3') adapted to assume a normal position (3a, 3a') and a retracted one (3b, 3b') and pushed into the normal position by elastic means (5, 5'), said receding element adapted to be pushed towards the retracted position by said rod during the closing movement of the door wing.

2. A bolt according to claim 1, wherein said rod, in its closed position, is adapted to be partially pushed by the receding element towards the opening position during the closing manoeuvre of the door wing, overcoming said return means.
3. A bolt according to any of the preceding claims, wherein said elastic means are a spring (5, 5').
4. A bolt according to any of the preceding claims, wherein said return means are a spring (11) mounted on said command.
5. A bolt according to any of the preceding claims, wherein, when the rod is in closed position, the receding element is adapted to withhold it in the closed position of the door wing, preventing the opening of the latter.
6. A bolt according to any of the preceding claims, comprising two rods connected to said control, arranged in opposite position and adapted to translate in opposite direction (B, B') under the action of said control and two catches as specified above.
7. A door, comprising at least one wing (16), hinged to a fixed part (14), having said rod or said rods and said control being secured to said door wing, said catch or catches being fixed to said fixed part.
8. A door according to claim 7, wherein, preferably, the rods are vertically arranged near one side of the door wing opposite to the hinged side.
9. A door according to claim 7 or 8, comprising a second door wing provided with a bolt capable of fixing it to said at least one door wing.
10. A vehicle door, specifically of a van, according to any of the claims from 7 to 9, wherein said fixed part is the vehicle body.
11. A vehicle provided with a door according to claim 10.





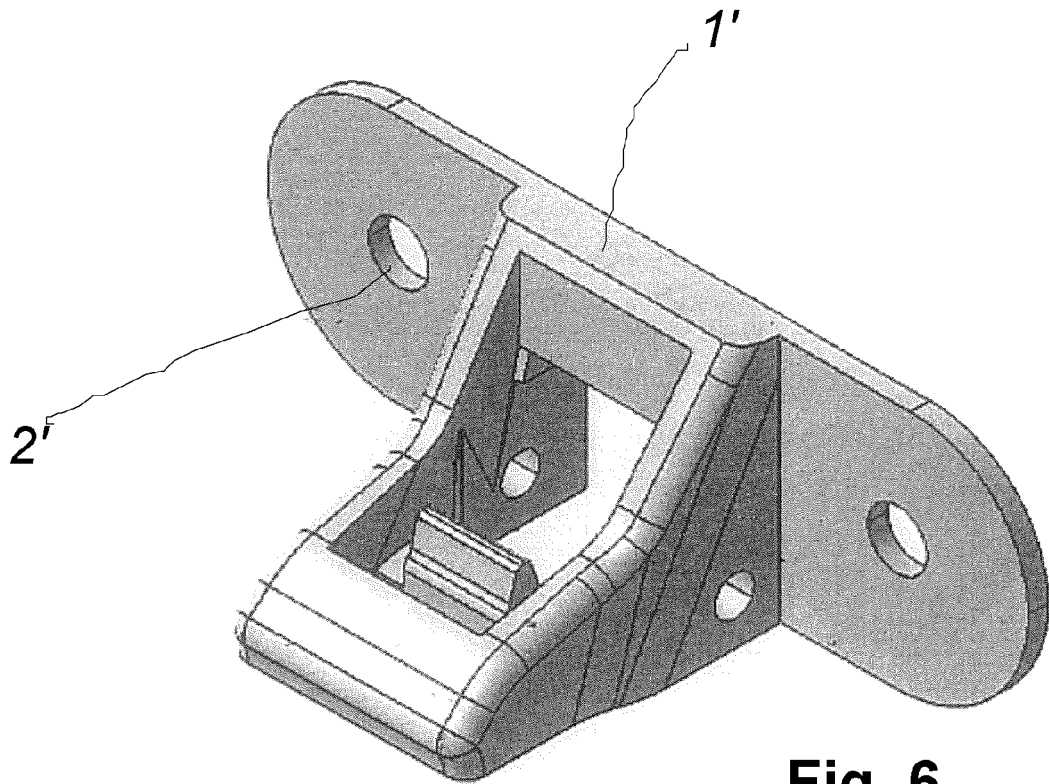


Fig. 6

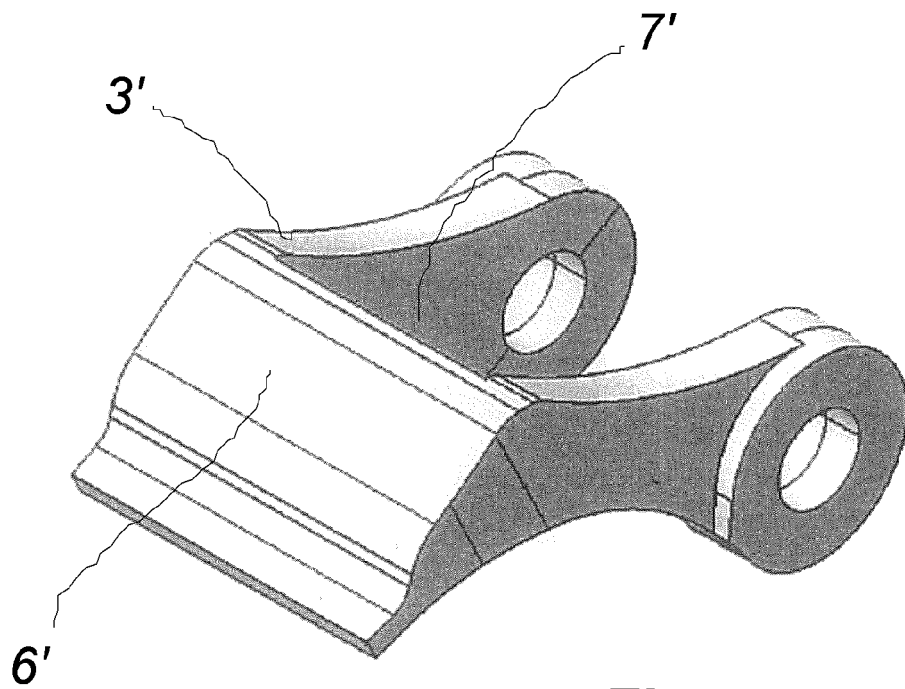


Fig. 7

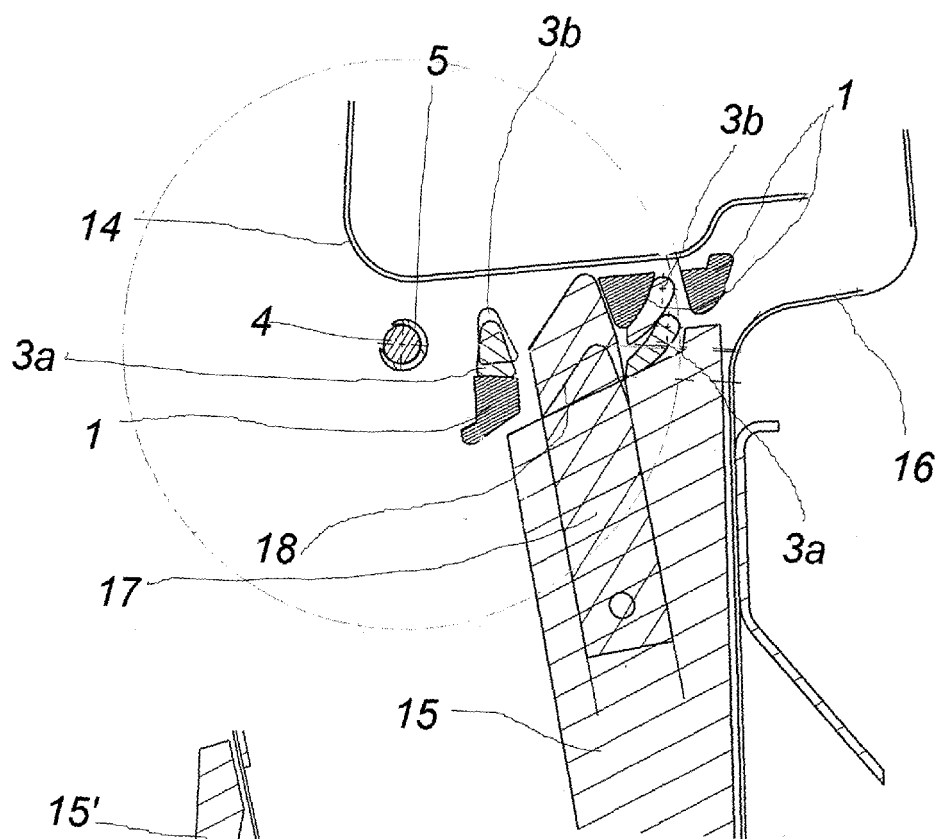


Fig. 8

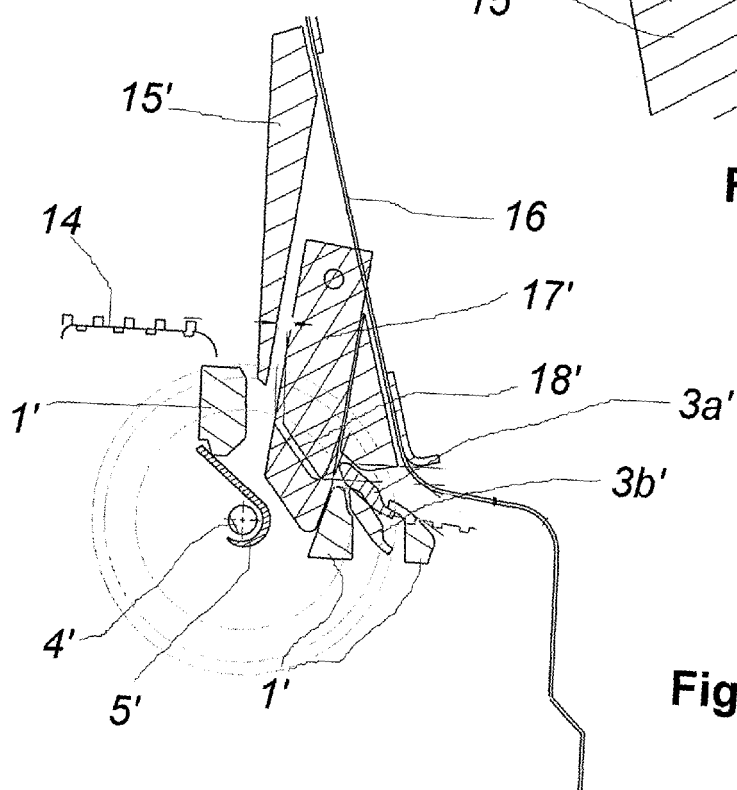


Fig. 9

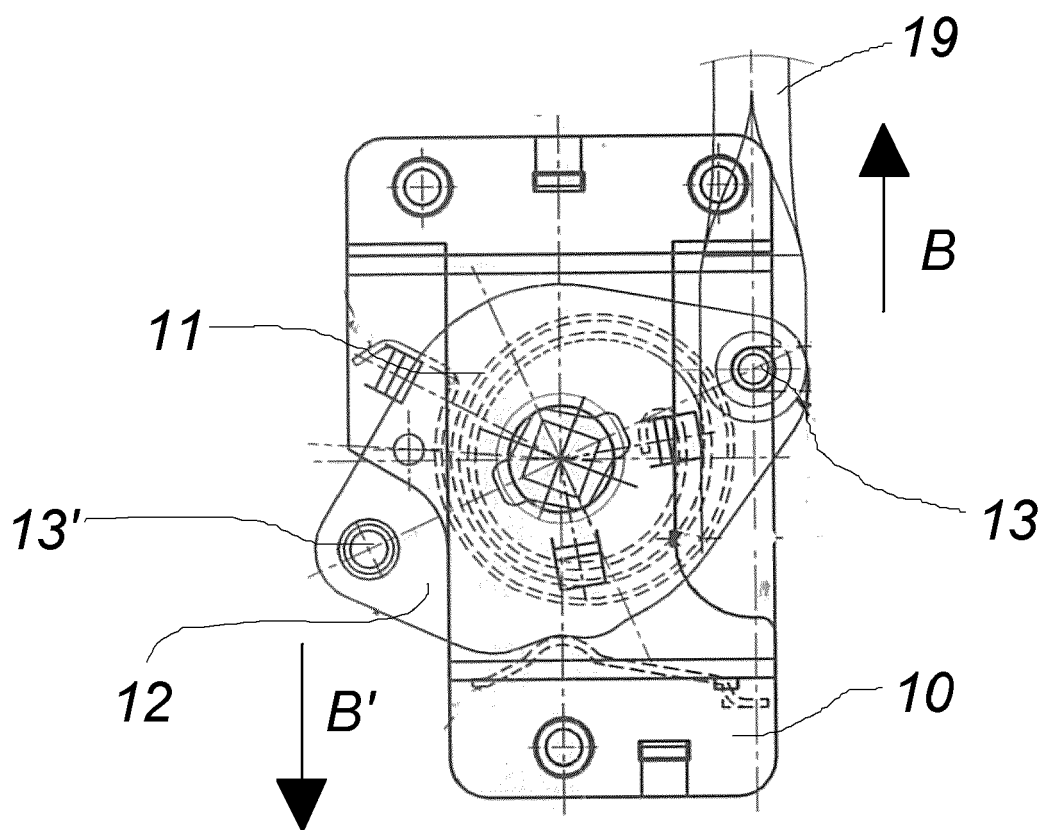


Fig. 10

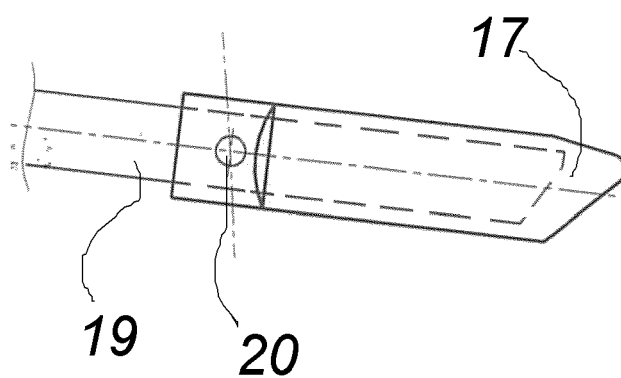


Fig.11



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 12 1393

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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	* the whole document *		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 March 2008	Examiner PEREZ MENDEZ, J
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			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 12 1393

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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04-03-2008

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