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(54) **Integral helmet for motorcyclists and the like provided with a device for opening - closing the chin-strap**

(57) Integral helmet for motorcyclists, racing-motorists and the like provided with a device for opening-closing the chin protector, comprising a cap (2), a visor (8) and a chin-protector (3) openable by raising the same with a rotatory-translatory motion according to a substantially elliptic trajectory, which provides for a forwards movement at the start of the raising, so as to release it from the cap (2), and a subsequent backwards movement, so as to cause it to substantially mate, in position of complete opening, the top of the cap (2).

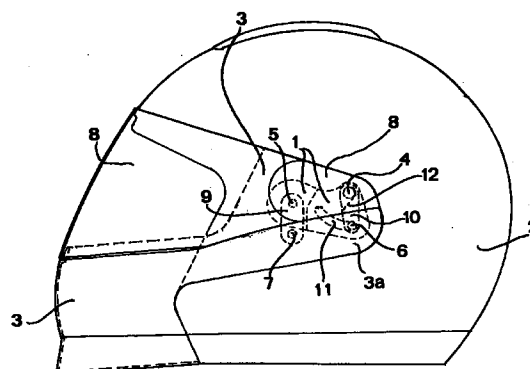


FIG.1

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Description

This invention relates to an integral helmet for motor-cyclists, racing motorists and sports-people in general, provided with a device for realizing the opening-closing of the chin-protector of the chin-protector/visor unit in a reliable manner and with a reduced vertical space occupied in the the same helmet, when the chin-protector or the chin-protector/visor unit is in a position of complete opening.

As is known, the so-called integral helmets have, unlike those of the jet-type, a part of the front cap in correspondence of the zone of the user's chin, which part, in some solutions, is integral with the cap, while in other solutions it is separately realized, removable or rotatably connected with the cap, so as to be raisable, in some cases together with the visor.

Usually, this front part, commonly called "chin-protector", when it is realized in a raisable manner, is so shaped as to have on its opposite sides, a part arched substantially like the side zone of the cap, and is so sized as to form, together with the chin-protector, an arched arm or flange such that it can be hinged on a pin integral with the cap. More precisely, in the present solutions where the chin-protector is openable and raisable, both the visor and the chin-protector can rotate about pins integral with the opposite faces of the cap, and various types of means are provided for locking the chin-protector and/or the visor in closed position.

The present realizations which provide for the raising of the chin-protector or the chin-protector-group/unit to cause its opening by rotation about pins fastened to the cap, have in the practice some drawbacks, the most relevant of which is by the great space occupied by the chin-protector when it is in a complete opening position; in fact, as the chin-protector is usually in an advanced position relatively to the cap, the rotation of the chin-protector about a fixed pin (one for each side face of the cap) and its tilting on the cap top, involve for the chin-protector or the chin-protector/visor unit the open positioning at a great distance from the same cap and therefore a high vertical space occupied for the cap, with the related aero-dynamic as well as aesthetic problems.

Another drawback of the present chin-protector opening systems lies in that they require special devices in order to ensure in any case a stable stop of the chin-protector in open position, in order to prevent unsuitable spontaneous unwished closings, which devices may also require a sequence of operations to be performed by the user which may distract him from driving and even create, in special situations, discomfort conditions.

Object of this invention is therefore to realize an integral helmet provided with a chin-protector opening device, so designed as to eliminate the drawbacks of the present mechanisms of opening and rotation of the chin-protector and the related visor, with obvious advantages of both practical and aesthetic nature.

Another object of the invention is to realize an integral helmet with a chin-protector opening device so

structured as to be highly reliable and to ensure, both in the opening and the closing, the utmost stability of the chin-protector in the wished position, without risks of involuntary shiftings of the same position.

Still another object is to realize an integral helmet for motorcyclists provided with an openable and tiltable chin-protector, such as to fully comply with the resistance requirements provided for such types of helmets by the most recente international norms.

These and still other objects, which will be more clearly stressed by the following description are achieved by an integral helmet for motorcyclists, racing-motorists and sports-people in general, comprising a cap, a visor and a chin-protector openable by lifting, which chin-protector, according to this invention, is raised and opened with a rotatory-translatory motion according to a substantially elliptic trajectory which comprises a forwards movement of said chin-protector at the start of the raising, so as to release it from the cap, and a subsequent backwards movement, in order to cause it to substantially mate, in position of complete opening, the cap top.

More particularly, according to this invention, said helmet comprises:

- a cap;
- a raisable and rotatably openable visor;
- a raisable chin-protector, provided with two side flanges for the attachment at the opposite sides of said cap;
- a device for opening and closing said chin-protector, formed by two articulated structures placed at the sides of said cap, in correspondence of said side flanges, each of which comprises:

a first pin and a second pin integral with the cap,
a third pin and a fourth pin integral with the side flange of said chin-protector,
a support plate integral with said cap, provided with an upwards arched guide-slit, said first pin being connected to said third pin through a first balance rod freely rotating on said first and said third pin, said second pin being connected to said fourth pin through a second balance rod freely rotating on said second and said fourth pin, said fourth pin being also inserted in a sliding translatable manner in said guide slit provided in said support plate,
the sizing of said balance rods, the mutual position of said pins, the position and bending of said guide slit being such as to realize said rotatory-translatory motion according to said substantially elliptic trajectory.

According to the invention, a spiral- or laminar spring acts on at least one of said balance rods, which spring is suitable to cause the return of said balance rod and therefore said chin-protector or the chin-protector

tor/visor unit to a closed position, to spur its downwards back movement, and the locking in the position of complete opening in mating position with the cap top.

Always according to this invention, said liftable visor is rotatably connected with said chin-protector, being hinged on the side flanges of said chin-protector; it is therefore integral with the chin-protector, but raisable and openable relatively to the latter, when the chin-protector is in closed position.

When the chin-protector is raised, the visor is dragged or pushed by the same up to the resting position, in position of complete opening, so as to substantially mate the cap top following the chin-protector with which, as said, it is integral.

When, on the contrary the chin-protector is lowered, the visor can be left in open position on the cap top, mating the latter or, if so wished, it may be also lowered, fastening it suitably to the chin-protector with one only movement.

Further characteristics and advantages of this invention will appear more clearly from the following detailed description, made with reference to the enclosed drawings, attached only by way of non limitative indication, wherein:

- Fig. 1 shows a side view of the integral helmet according to this invention, provided with an opening device for the chin-protector in closed position;
- Fig. 2 shows a side view of the helmet of Fig. 1, in the configuration of open chin-protector and open visor;
- Fig. 3 shows, separately from a helmet, the only device for opening and closing the chin-protector, while
- Fig. 4 shows five subsequent relative positions of the various components of the device of Fig. 3, assumed during the opening movement of the chin-protector.

With reference to the above figures, and in particular to Figs. 1 and 3, the opening device according to the invention is substantially formed by a support plate 1, stably anchored on both side faces of cap 2 of a conventional helmet of the type with an openable chin-protector 3; on each of said plates are stably anchored a first pin 5 and a second pin 4, apart from one another and at a slightly different level (relatively to the helmet base); said pins, therefore, are integral also with the helmet cap.

Two analogous third pin 7 and fourth pin 6 are anchored on the internal face of the end of flange 3a of the chin-protector 3.

Pin 5 fixed to plate 1 and therefore to the cap 2 and pin 7 fixed to flange 3a of the chin protector are connected to one another by a balance rod 9 freely rotating on said two pins; in the same way, pins 4 and 6 are connected by an balance rod 10, also freely rotatable on said pins.

Besides, the fourth pin 6, integral with arm 3a of the

chin-protector, is translatable, during the raising of the chin-protector (as will be better clarified in the following), along a guide 11 arched upwards and obtained in the support plate 1.

A spiral- or laminar return spring 12 is provided on at least the balance rod 10, with the function of causing the return of said balance rod in the position of closed chin-protector, as shown in Fig. 1 and in Fig. 4A and in the position of fully open chin-protector, as shown in Fig. 2 and in Fig. 4E; in fact, in the last part of the rotatory-translatory motion, during the backwards movement (Fig. 4D), while the balance rod 10 lowers once it has overcome the upper dead centre (Fig. 4C), spring 12 helps the movement and locks also the chin-protector in open position.

Hence, the device for opening the above described chin-protector is substantially a flat articulated structure wherein the two balance rods 9 and 10, of a fixed length, rotate around the fixed pins 5 and 4, integral with the cap, dragging the chin-protector hinged on centres 7 and 6 (whose relative distance remains unchanged during the movement of the same chin-protector) forming the connecting rod.

As the pins fixed to the cap are located near to one another, during the opening movement (performed by pushing upwards the chin-protector) of chin-protector 3, the chin-protector/visor unit follows trajectories which cannot be circular but substantially elliptic 13-13a, as indicated for the two points M and N respectively in the chin-protector of Fig. 2.

In other words, the opening-closing movement of the chin-protector, and in the case in point of the chin-protector/visor unit, is a rotatory-translatory motion which offers the advantage of reducing the space occupied vertically when the chin-protector is open, to facilitate the return when closing the same, and its locking in position of full opening.

In order to better clarify the rotatory-translatory motion of the chin-protector/visor unit, Fig. 4 shows the various positions assumed by balance rods 9 and 10 during the movement of the unit, starting from the closed position up to the fully open position, i.e. the positions illustrated respectively in Figs. 1 and 2.

In the position indicated by A in Fig. 4, the chin-protector/visor unit is in closed position (as in Fig. 1) and in this position the balance rods 9-10 are arranged almost parallelly to one another and vertically oriented. By pushing the unit upwards, balance rod 9 shifts as in the position indicated by B and at the same time balance rod 10 shifts in the same direction as balance rod 9, while pin 6 integral with the chin-protector remains guided in the arched guide 11. Keeping on pushing the unit upwards, balance rod 9 and balance rod 10 shift in the position indicated by C, and then in the subsequent positions indicated by D and E during the return and the backward movement. Near the travel end, in position of complete opening of the unit, the balance rod 9 shifts to the maximum opening position E and in this position pin 6 of the chin-protector is pushed backwards by the very

weight of the chin-protector. Spring 12, laminar or the like, contributes to the downwards shifting of the unit, as said spring causes the return of balance rod 10 towards the bottom end of guide 11.

The position of the system shown in Fig. 4C is particularly significant, as balance rod 10 is in the upper dead centre: after such position, it starts lowering, even if the chin-protector is not at the end of the opening travel. Now (Figs. 4D and 4E) spring 12 starts working as end-of-travel stop of the opening of the chin-protector, as, by pulling balance rod 10 downwards, it facilitates the end of the opening travel, reducing the possibility of an unwished closing of the chin-protector.

The backwards movement of pin 6, together with the special elliptic trajectory of the chin-protector, involves a downwards shifting of the chin-protector/visor unit, causing it to substantially adhere to the cap, reducing in this way the space occupied vertically.

Obviously, in the practical realization, structurally and functionally equivalent changes and variants may be made to the above described invention, without falling outside the protection scope of the same invention.

Claims

1. An integral helmet for motorcyclists, racing-motorists, sports-people and the like comprising a cap, a visor and a chin-protector openable by lifting, characterized in that said chin protector is raised and opened with a rotatory-translatory motion according to a substantially elliptic trajectory, which provides for a forwards movement at the start of the raising, so as to release it from the cap, and a subsequent backwards movement, so as to cause it to substantially mate, in position of complete opening, the top of the cap.
2. The integral helmet according to claim 1, characterized in that it comprises:
 - a cap (2);
 - a raisable and rotatably openable visor (8);
 - a raisable chin-protector (3), provided with two side flanges (3a) for the attachment at the opposite sides of said cap (2);
 - a device for opening and closing said chin-protector, formed by two articulated structures placed at the sides of said cap, in correspondence of said side flanges (3a), each of which comprises:

a first pin (5) and a second pin (4) integral with cap (2),
 a third pin (7) and a fourth pin (6) integral with the side flange (3a) of said chin-protector,
 a support plate (1) integral with said cap (2), provided with an upwards arched guide-slit (11),

said first pin (5) being connected to said third pin (7) through a first balance rod (9) freely rotating on said first and said third pin, said second pin (4) being connected to said fourth pin (6) through a second balance rod (10) freely rotating on said second and said fourth pin, said fourth pin (6) being also inserted in a sliding translatable manner in said guide slit (11) provided in said support plate (1),

the sizing of said balance rods, the mutual position of said pins, the position and bending of said guide slit being such as to realize said rotatory-translatory motion according to said substantially elliptic trajectory.

3. The integral helmet according to claim 2, characterized in that a spiral- or laminar spring (12) acts on at least one of said balance rods (9, 10), which spring is suitable to cause the return of said balance rod and therefore said chin-protector or chin-protector/visor unit to a closed position, to spur its downwards back movement after the overcoming of the upper dead centre and the locking in the position of complete opening in mating position with the cap top.
4. The integral helmet according to claim 2, characterized in that said raisable visor (8) is rotatably connected to said chin protection (3), being hinged on the side flanges (3a) of said chin-protector.
5. The integral helmet according to claim 2, characterized in that said first pin (5) and said second pin (6) provided on the two faces of cap (2) are anchored to a support plate (1), in its turn stably anchored to the cap.

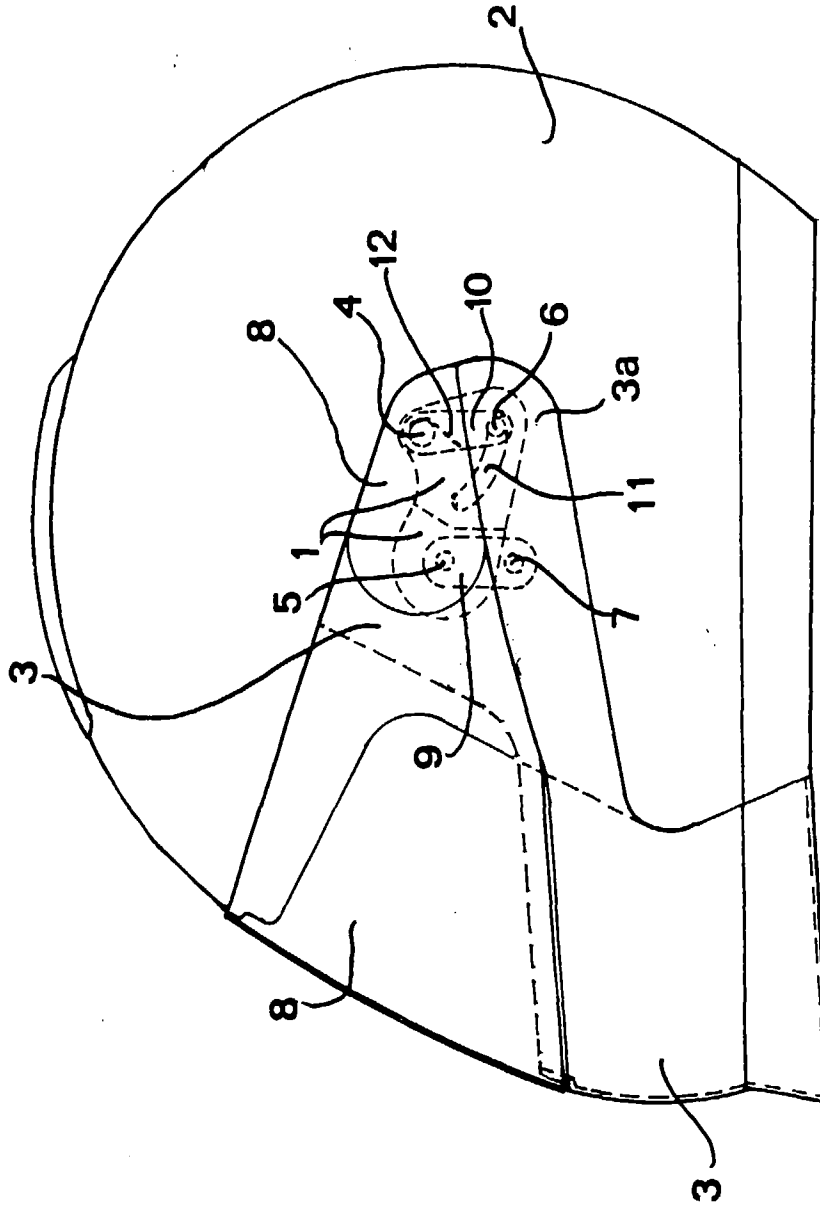


FIG.1

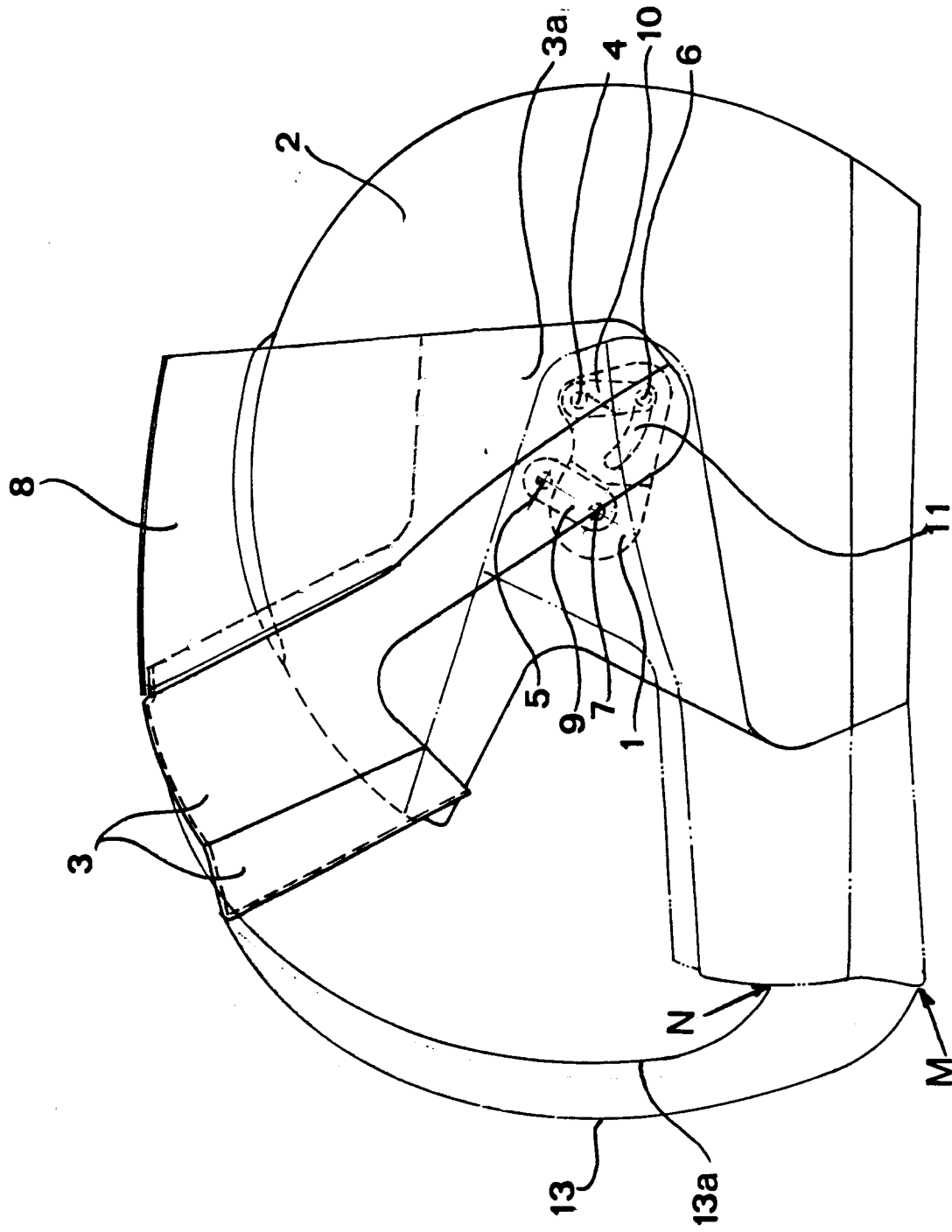


FIG. 2

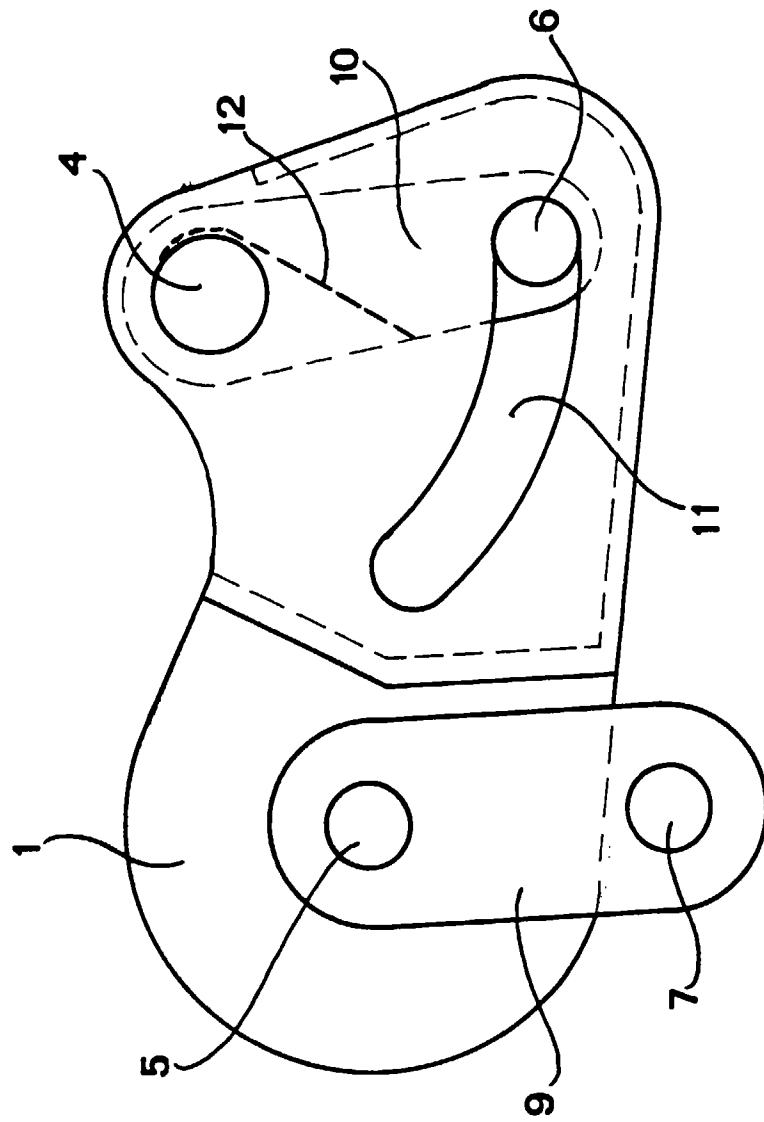


FIG. 3

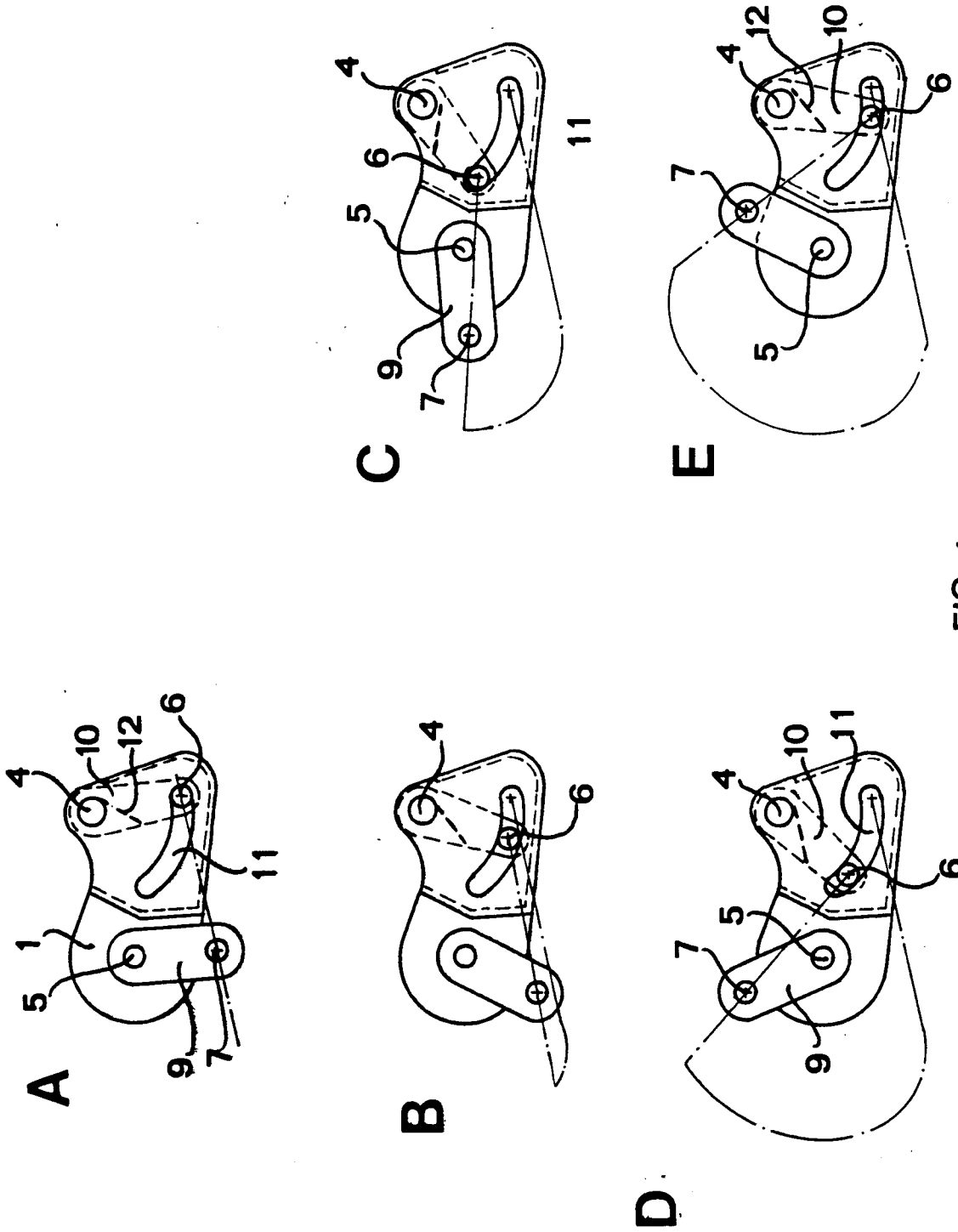


FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0116

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 258 496 (T.A.C.) * column 1, line 22 - column 2, line 43 * * column 3, line 36 - column 6, line 43 * * figures 1-7 *	1,2,5	A42B3/32 A42B3/22
A	EP-A-0 258 552 (M. CIANFANELLI, A. LAPUCCI & C. SORDI) * page 4, line 11 - page 5, line 21 * * page 7, line 20 - page 8, line 8 * * page 8, line 14 - page 9, line 2 * * figures 1-4 *	1,2	
A	EP-A-0 334 773 (F. CHAISE) * the whole document *	1-3,5	
A	EP-A-0 395 845 (AGV S.P.A.) * column 2, line 50 - column 3, line 40 * * column 4, line 40 - line 55 * * figures 1-4 *	1	
A	FR-A-2 312 979 (A. GALLET) * page 4, line 23 - page 5, line 20 * * figures 7-9 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) A42B
A	FR-A-2 717 046 (F. A. SUIF)		
A	FR-A-2 541 874 (ETABLISSEMENTS JEAN GALLET & FILS S.A.)		
A	EP-A-0 080 202 (ESSEPI S. R. L.)		
A	US-A-2 729 820 (M. N. ANDERSON)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 August 1996	Examiner Bourseau, A-M
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