(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 141 785**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **84830286.5**

(22) Date of filing: **23.10.84**

(51) Int. Cl.⁴: **E 05 C 17/02**

(30) Priority: **28.10.83 IT 360083**
20.04.84 IT 344084

(43) Date of publication of application: **15.05.85**
Bulletin 85/20

(84) Designated Contracting States: **AT BE CH DE FR GB LI**

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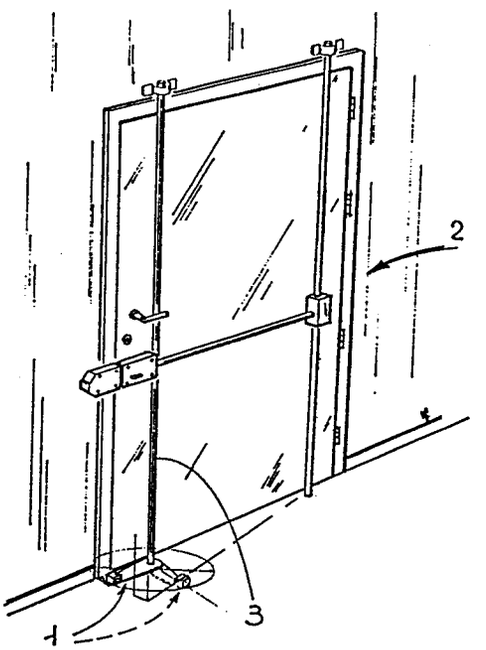
(54) Device for blocking doors, particulary armour plated doors, in a partly open position.

(57) The invention belongs to the technical field of accessories for doors and, in particular, relates to a device for blocking doors, particularly armour plated doors, in a partly open position with the certainty of any possibility being prevented of the blocking of the door being overcome through action taken on the outside thereof.

The solution to the problem is obtained with a device 1 having an arm able to be oscillated and comprising at least one pin 4 that fits rotatably in a housing 1a placed in the floor; a thin part 5 that extends perpendicularly to the said pin and is integral there with; and a projecting stop 6 integral with the said thin part and jutting out there from, the said projecting stop being connected to the said thin part through means able to fix, along the said thin part, the said projecting stop in a plurality of positions.



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Device for blocking doors, particularly armour plated doors, in a partly open position

The invention relates to a device for blocking doors, particularly armour plated doors, in a partly open position.

The problems connected with the safety of private dwellings and offices have, as is known, recently assumed ever greater importance. This has lead, amongst other things, to the generalized adoption of doors that provide security, known as armour plated doors. These differ from doors of the conventional type on account of having reinforcing elements or steel plates that cover the entire area of the door, and devices for locking the door to the ground or to the wall, based on the use of solid rods that fit into housings provided for the purpose in the said floors and walls.

The housings made in the floor are, in particular, defined by a cylindrical hole in which, tightly in the hole, a hollow element is sunk.

The corresponding rod of the door generally fits into the said hollow element with a certain play in order to avoid the rod having to be forced or the installation operations having to be too exact.

Doors provided to give security normally answer the specific protection function in a satisfactory way but are efficacious only in the closed position. The said doors cannot, in fact, be blocked efficiently in a partly open position whereby one is able to make a visual check or to perform operations (for example receiving the post) for which the

door does not have to be opened fully. This is because the devices that allow a door to be put ajar for the purposes stated are contrivances of a conventional type with poor resistance, inadequate, therefore, to give proper security. There are, for example, chain devices and means based on the use of a long slot that can be oscillated, with everything being fixed just by screws that can be torn out immediately when force is applied.

Furthermore, the said known devices cause considerable practical problems when it is wished to fit them to an armour plated door : the penetration of the metal facing necessitates the use of highly efficient drills and of connection elements which, though continuing to be relatively weak, cannot be found readily on the market. The installation difficulty is particularly acute when the fact is taken into consideration that the said devices are generally mounted by the users themselves.

Continuing to be unsolved is, therefore, the technical problem of creating a device for blocking doors in a partly open position that, on one hand, offers characteristics of reliability such as to be suitable also for armour plated doors and, on the other, can be fitted easily also by the users themselves.

The general fundamental object of the invention is to solve the said technical problem.

Within the framework of the said general object, one important object of the invention is to devise a device of extremely simple structure and of low cost able, therefore,

to be adopted on a general scale by people who own armour plated doors.

Another important object of the invention is to devise a device that does not require any specific installation operation since it can be fitted immediately to a door.

A further object still of the invention is to devise a device that has obvious universal use characteristics, that is to say, a device that can be adapted to various types of doors or armour plated doors, is possible to include at the time a door is being installed or to fit thereto at a later date, and the purpose of which is to prevent any possibility of the blocking of the door being overcome by force applied to the outside of the door.

The foregoing objects and others too that will become more apparent hereinafter are attained by the device according to the invention for blocking doors, particularly armour plated doors, in a partly open position, characterized by the fact of consisting in an arm able to be oscillated, defined by at least one pin that fits rotatably, in a way in which it is virtually invisible, in a housing fixed in the floor at the base of the said door, the said pin being placed at the side of the jamb of the said door; by a thin part inserted loosely between the base of the said door and the floor there under, that extends perpendicularly to and is integral with the said pin; and by a projecting stop that is integral with the said thin part and juts out from this spaced a distance away from the said pin such as to allow it to hit against the said door when this is partly open. Advantageously, the said projecting stop is connected

to the said thin movable part through means that allow the former to be fixed along the latter in a plurality of positions.

Further characteristics and advantages of the invention will become more apparent from the description of the preferred embodiments, illustrated by way of examples on the accompanying drawings, in which :

- Figure 1 shows, in a diagrammatic perspective view, a device according to the invention, fitted to a door provided with a lock operated bolting system;
- Figure 2 shows, in a perspective view from the bottom, the device depicted in Figure 1 in an isolated position;
- Figure 3 shows, in a view from the top, the said device;
- Figure 4 shows, in a view from the top similar to that depicted in Figure 3, a device according to the invention shaped in one specific way;
- Figure 5 shows, in a diagrammatic plan view, a device according to the invention fitted to a door, the closed position of which is indicated with unbroken lines, and the partly open position of which is indicated with broken lines;
- Figure 6 shows, in a perspective partially exploded view, a device according to the invention;
- Figures 7 to 11 show, in further perspective and non perspective views, five devices according to the invention, each of which shaped in a particular way.

With reference to Figures 1 to 4 above, the device according to the invention is shown globally at 1. The said device can be fitted to any type of door, though preferably the use thereof is envisaged on armour plated doors, shown at

2 in Figure 1. The said doors differ from others because of being, amongst other things, provided with locks equipped with rods or bolts 3 that are inserted in housings in the floor, placed at the base of the said doors. Though the actual location of the said bolts 3 can vary, the positioning thereof is always at least at points corresponding to the jamb of the door 2.

The device 1 is constituted by an arm that is able to be oscillated and, in essence, comprises a pin 4, a thin blade part 5 that juts out perpendicular to and integral with the said pin 4, and a projecting stop 6 integral with the thin part 5, on the opposite side to the pin 4.

In greater detail, the pin 4 is of the type that fits rotatably, in a way in which invisible, in a housing 1a of the said type that is placed in the floor at the base of the door 2. The overall volume of the pin 4 has to be less than the area of the said housing so that free rotation be possible. When housings are made expressly for the pin 4, provision will obviously be made for an external protection ring in order to prevent the pin 4 from coming into direct contact with the material used in the laying of the floor under the door 2.

When, instead, prior made housings for the insertion of the bolts 3 are provided already with a metal facing, the pin 4 can be inserted directly therein without additional intermediate elements.

For doors of a conventional type, it is envisaged that the pin 4 can be solid or closed in at the top by the blade

part 5. In the preferred case of armour plated doors, the pin 4 will, instead, be hollow (Figures 2, 3 and 4), while the internal hole will be of sufficient a diameter to permit the bolt 3 to be inserted easily.

It is also possible to envisage a completely cylindrical pin 4 (Figure 2) or one that is closed at the bottom shaped like a porringer. Thus the said pin can be suited to all situations, the sole condition being that it be sunk completely in the said housing and be rotatable therein.

From the pin 4 extends the blade part 5 which has essentially to be thin so as to be able to be inserted between the base of the door 2 and the floor there under, without hindering the door. The blade part 5 has to be of a length, jutting out from the pin 4, directly proportional to the degree of opening required for the door to which the device is fitted.

The projecting stop 6 is integral with the blade part 5 and is placed in the region of the furthermost extremity of the latter from the pin 4. Furthermore, the projecting stop 6 extends along the opposite side of the blade part 5 to that integral with the pin 4.

As is obvious from the figures to which reference has been made, the projecting stop 6 can assume a wide variety of shapes, as can, in the same way, the profile of the blade part 5. It can be seen, for example, in Figure 3 that the projecting stop 6 is defined by a folded back section of the blade part 5, while in Figure 4 the said projecting stop 6 is a block integral with the blade part 5 and pro-

vided with an abutment element 66. In addition, the device depicted in Figure 4 has the blade part 5 not directly connecting the pin 4 to the projecting stop 6 but extending in a direction at the side of the said stop. It is envisaged, in fact, that the device depicted in Figure 4 be fitted to double doors, with the blade part 5 placed beneath the part of the door that is kept closed, when in the non operative position.

Referring now to Figures 5 to 11, it can be seen in Figure 6 that the projecting stop 6 is defined by a fixed part constituted by locator surfaces 3a integral with the thin part 5 and made in one piece there with, and by a movable slot-in slide 3b. The said slide 3b is provided with abutment surfaces 4a destined to engage in a removable fashion with the locator surfaces 3a, and also has sliding surfaces 5a destined to permit the said slide 3b to move forward easily, following a thrust applied to a terminal surface 6a.

In Figure 7, the projecting stop 6 is defined, similarly to what has been described previously, by two parts that are removable one from the other, namely a central vertical tooth 7a integral with the thin part 5, and a grooved insert 7b. The latter is provided with a longitudinal slot 7c destined to couple with the tooth 7a that has in the centre, a housing 7d with a plurality of stop grooves 7e designed to couple with a pair of locking pins 7f.

The projecting stop in Figure 8, again given overall the number 6, is defined by an extremity block 9a integral with the thin part 5 and such as to assume a wide variety of shapes, and by a frame 9b. The latter is connected to the

thin part 5 by means of a pivot 9c that enables the said frame 9b to adopt two positions, namely a position above the thin part 5 and a position external thereto.

In Figure 9, the projecting stop 6 is constituted by a fixed part 10a integral with the thin part 5, and by a hinged block 10b. The latter is connected to the fixed part 10a through a supporting pivot 10c that enables the said block 10b to adopt two positions, namely a position above the thin part 5 and a position external thereto. Furthermore, the block 10b is provided with surfaces 11 that aid and render easy the overturning thereof under the control of a foot.

Shown in Figure 10 is a projecting stop 6 constituted by a vertical pin 12a integral with the thin part 5, and by a shaped rotatable block 12b pivotally connected in an eccentric fashion to the vertical pin 12a. The said shaped block is able to be fashioned in a wide variety of forms and to be placed in a plurality of angular positions. It can be abutted with a stop 12c integral with the thin part 5. The said shaped block 12b is held in the working position by means of a spring 13 that is able to encourage the correct positioning thereof.

Innumerable other embodiments for the invention are obviously possible, based on the technical solutions outlined above. The said further embodiments can also be in association with elastic restraint, cam and lever operated devices and the like.

One particular solution of this type is illustrated diagram-

matically in Figure 11 and this envisages, integral with the thin part 5, a front raised part 20 provided with a circular protrusion 21 in which there are two vertical housings 22. To the said protrusion 21 is coupled a movable element 23, the shape of which matches that of the said protrusion, and this is pivoted at 24 to the said raised part 20 via an arm 25 that is integral with the movable element 23 and can be distorted elastically when subjected to upward stress as shown with the arrow F. The element 23, thus acting as a raised stop, is provided with two projections 26 in positions complementary to the vertical housings 22, and it can adopt two distinct stable configurations illustrated in Figure 11 with an unbroken and a broken line, respectively, by simply raising and rotating the said element 23 by approximately 90°, the raising causing a disengagement between the projections 26 and the vertical housings 22.

From what has been described above in a prevalently structural way, how the device according to the invention operates is quite apparent.

As shown in Figure 1, the projecting stop 6 is normally placed outside the area swept by the bottom of the door at the time the stop is in the non-operative position. Furthermore, in the said position the blade part 5 extends in a direction identical to the development direction of the door when in the closed position.

The said non-operative position corresponds to a free space equal to L between the pin 4 and the projecting stop 6, greater than the length L_2 between the pin 4 and the edge

of the door (see Figure 5).

When the device is rotated into the operative position virtually perpendicular to the door to be blocked, it is possible to fix the projecting stop 6 in a new position along the thin part 5 such that the new length L_1 between the pin 4 and the projecting stop 6 be less than the distance L_2 between the said pin and the edge of the door.

In this way, there is no longer any possibility of overcoming the blocking of the door through action on the outside part thereof. The new position of the projecting stop 6 is, in fact, such as to always remain within the area swept by the opening of the door, and thus no rotation given from the outside will be able to unblock the door.

For all round greater security, in order to prevent the possible withdrawal of the pin 4 from the corresponding housing 1a, steps can be taken to couple the two through a thread (see Figure 6) by giving the pin 4 a vertical axis pivotal coupling 1b and providing a plurality of gaps 1e reached, for example, through an upper hole 1d for blocking, for example using an external tool, the pin 4 and the thin part 5 one to the other during the screwing in phase.

In practice it has been seen how, using extremely simple elements of a low cost, the device described herein fulfils every one of the proposed objects of security, robustness and reliability.

The invention is liable to undergo numerous modifications and variants and, depending upon the requirements, the

shapes and sizes of the parts, as also the materials used, can be of any type.

Claims:

1. Device for blocking doors, particularly armour plated doors, in a partly open position, characterized by the fact of consisting of an arm 1 able to be oscillated, defined by at least one pin 4 that fits rotatably, in a way in which it is virtually invisible, in a housing 1a fixed in the floor at the base of the said door 2, the said pin 4 being placed at the side of the jamb of the said door; by a thin part 5 inserted loosely between the base of the said door 2 and the floor there under, that extends perpendicularly to and is integral with the said pin; and by a projecting stop 6 that is integral with the said thin part 5 and juts out from this spaced a distance away from the said pin such as to allow it to hit against the said door when this is partly open.

2. Device according to Claim 1, characterized by the fact that the said pin 4 is hollow and able to house coaxially a substantially vertical rod 3 for closing securely the said door.

3. Device according to Claim 2, characterized by the fact that the said hollow pin 4 itself defines the housing for the said rod 3.

4. Device according to Claim 2, characterized by the fact that the said hollow pin 4 is inserted in a prior made housing for the said rod 3.

5. Device according to Claim 1, characterized by the fact that the said thin part 5 is of blade conformation.

6. Device according to Claims 1 and 5, characterized by the fact that the said projecting stop 6 is defined by a folded back section of the said blade part 5.

7. Device according to Claims 1 and 5, characterized by the fact that the said projecting stop 6 is positioned displaced laterally with respect to the said blade part.

8. Device according to Claim 1, characterized by the fact that the said projecting stop 6 is connected to the said thin part 5 through means able to fix, along the said thin part, the said projecting stop in a plurality of positions.

9. Device according to Claim 8, characterized by the fact that the said projecting stop 6 is constituted by a pair of shaped elements 3a-3b that slot perpendicularly one into the other, and by the fact that the said element 3a is integral with the said thin part 5, while the element 3b has abutment surfaces 4a for blocking the door.

10. Device according to Claim 8, characterized by the fact that the said means able to fix the said projecting stop 6 in a plurality of positions are constituted by one or more teeth 7f that can be inserted in a removable fashion inside a plurality of shaped housings 7e.

11. Device according to Claim 9, characterized by the fact that the said shaped housings are provided with inclined sliding surfaces 5a for rendering easy the displacement of the said projecting stop 6 along the said thin part 5, and with surfaces 4a transverse with respect to the said thin part, for preventing the reverse direction displacement of

the said projecting stop 6.

12. Device according to Claim 8, characterized by the fact that the said projecting stop 6 is constituted by a shaped element 9b-10b connected to the said thin part 5 by means of a virtually horizontal axis pivot 9c-10c.

13. Device according to Claim 12, characterized by the fact that the said shaped element 10b is provided with surfaces 11 that render easy the rotatory movement around the said pivot 10c under the control of a foot.

14. Device according to Claim 8, characterized by the fact that the said projecting stop 6 is constituted by a shaped element 12b connected to the thin part 5 by means of a coupling constituted by a vertical axis pin 12a passing inside a hole made in the body of the said shaped element.

15. Device according to Claim 8, characterized by the fact that the said pin 4 and the said housing 1a are provided with a thread for coupling one to the other, and that the said pin 4 is fixed to the said thin part 5 by means of a vertical pivot 1b, means 1c-1d being provided for blocking the rotation, one with respect to the other, of the said pin 4 and the said thin part 5.

16. Device according to Claim 8, characterized by the fact that the said projecting stop 6 is constituted by a movable element 23 connected to the said thin part 5, via a vertical axis pivot 24, by means of an arm 25 that can be distorted elastically; the said movable element and the said fixed part being provided with frontal teeth and housings 26-22

for effecting the stable positioning of the two elements in at least two different positions achieved by rotating one with respect to the other.

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FIG1

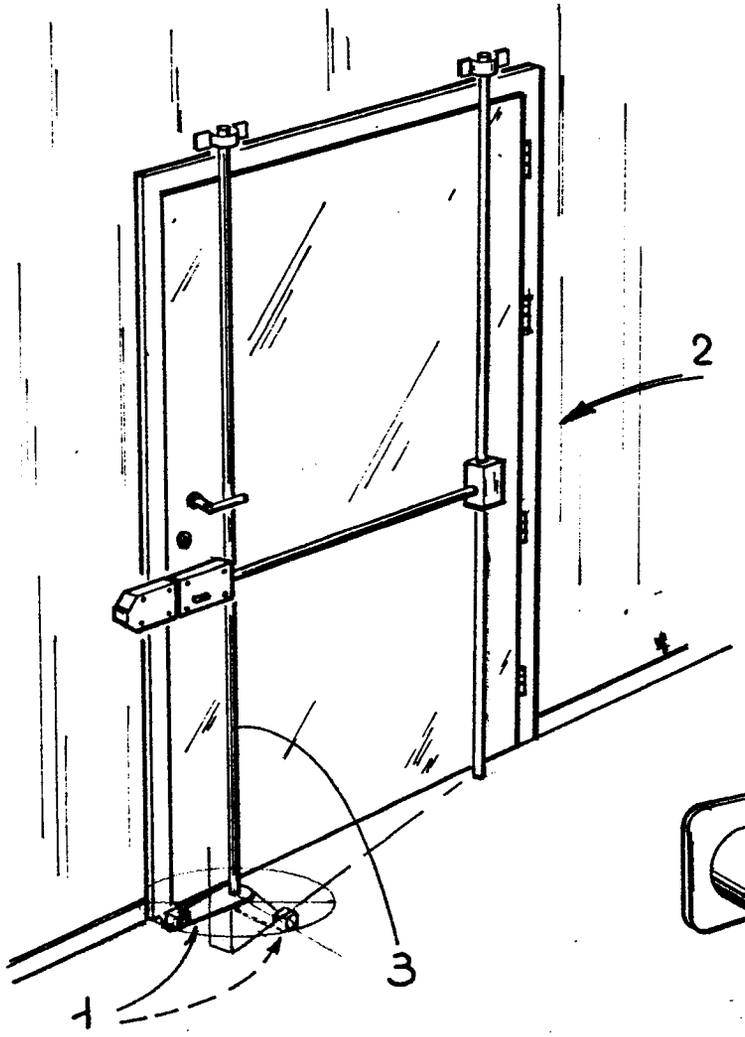

FIG2

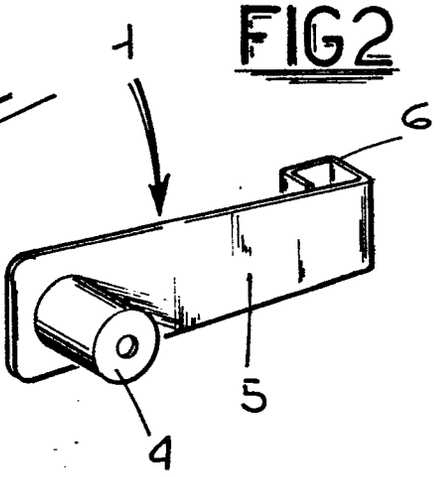

FIG4

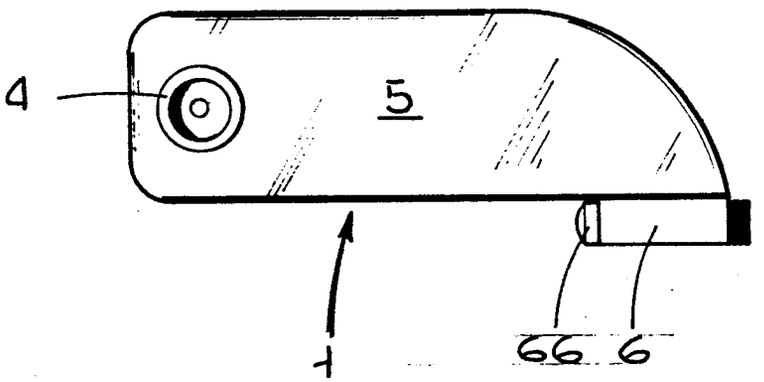

FIG3

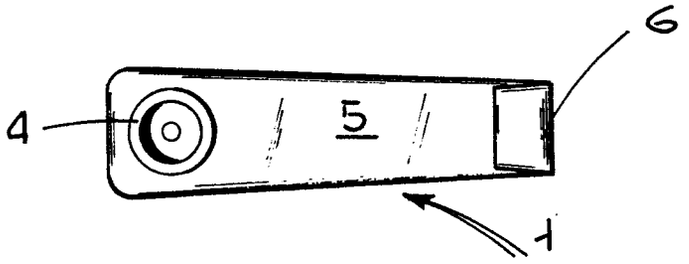

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FIG5

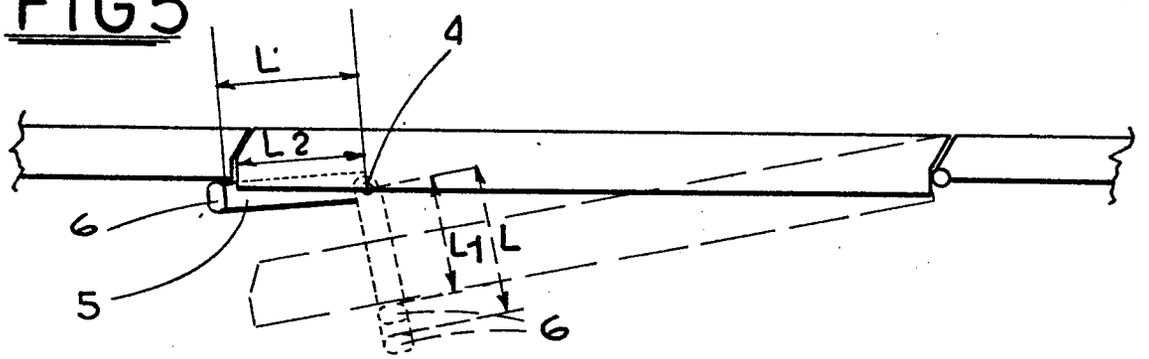

FIG6

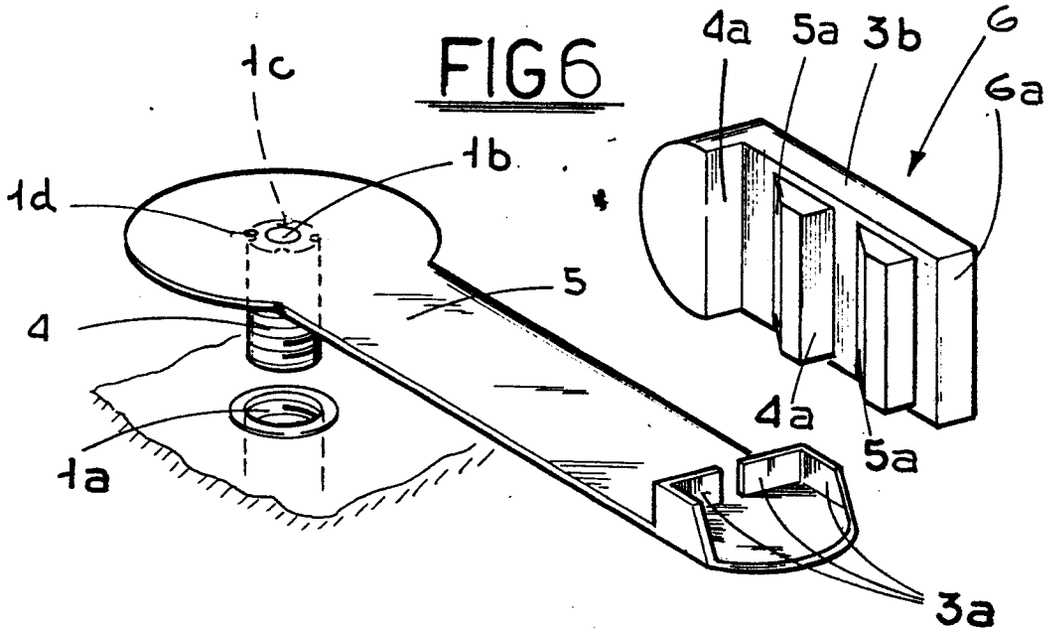

FIG7

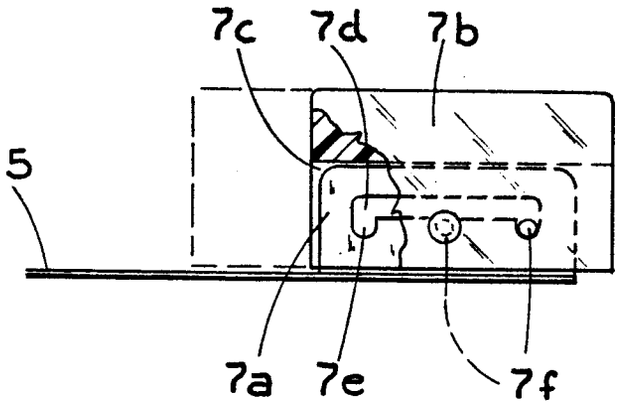

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FIG 8

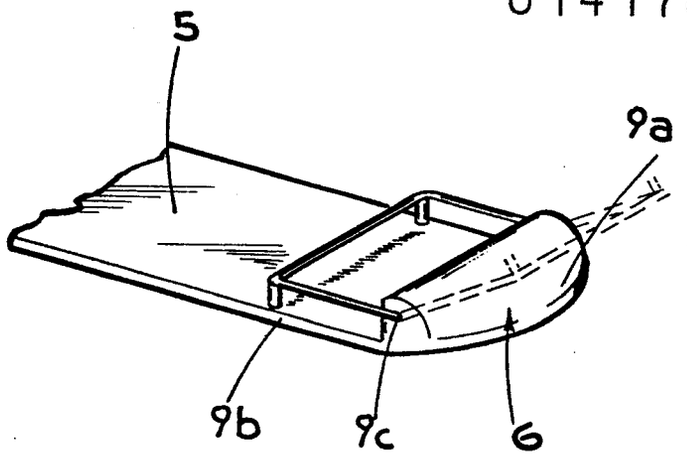

FIG 9

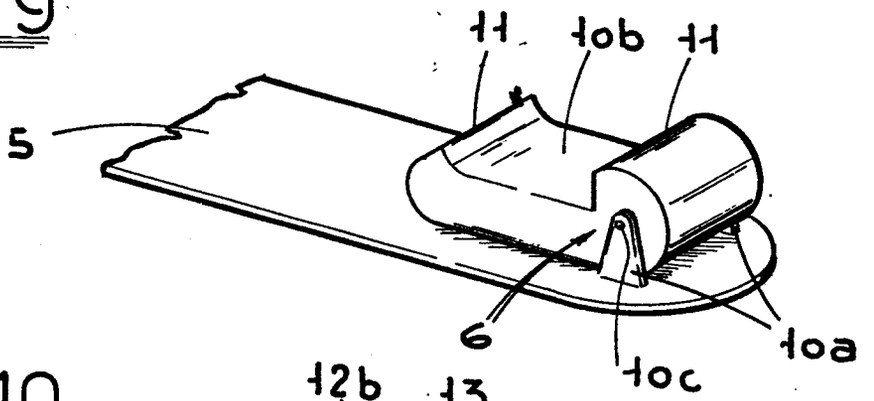

FIG 10

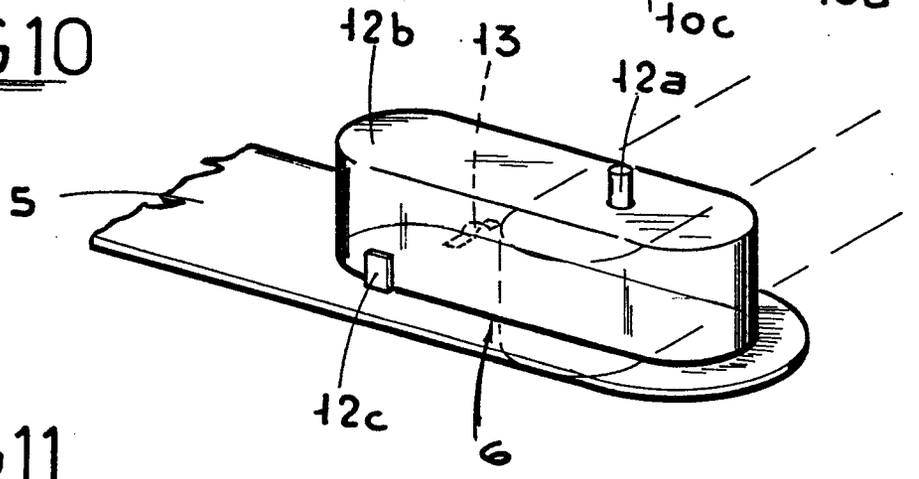

FIG 11