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(54) **Lock for doors and the like**

(57) Lock for doors and the like, which comprises a case (1) in which is housed a plate (2) carrying locking bolts (3), displaceable by means of a pawl of the cylinder, and a guard (4) for blocking the plate, reversibly displaceable in a direction perpendicular to that of displacement of the plate, which plate (2) has on its upper edge teeth (8) between which is engaged, after each advancement of said plate through the action of the pawl of the cylinder, a flange (12) for interlocking the guard (4). The guard (4) has additional means of interlocking (17) the plate (2), defined by butts (16-18) against which rests the rear edge of the last tooth (9) of the plate, when the latter is in the limiting position of throw.

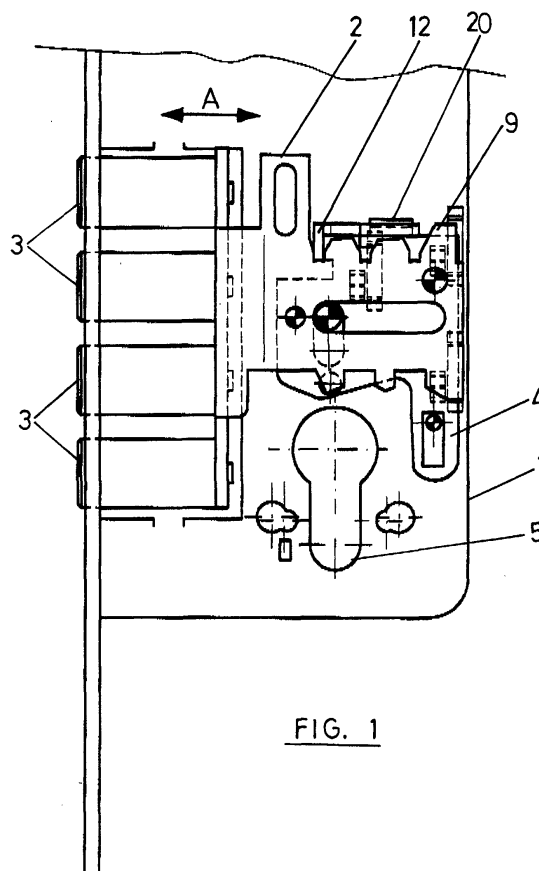


FIG. 1

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Description

[0001] The present invention relates to a lock for doors and the like, of the type which comprises a case or casing in which is mounted a cylinder operated by a key, as well as some mechanisms comprising plate carrying locking bolts, displaceable by means of a cylinder pawl, and a guard for blocking the plate.

[0002] In the locks of the kind described, the plate can be displaced linearly, in the thrown or withdrawn direction of the bolts, on actuating the pawl of the cylinder, in one direction or the other by turning the key, on some teeth which said plate has on its lower edge.

[0003] At the same time, the guard is displaceable reversibly in a direction perpendicular to the displacement of the plate, through the actuation of the same pawl of the cylinder on the guard itself. This guard has an interlocking flange which is introduced, when it is in its lower position, between teeth which the plate has originating in its upper edge, to prevent the displacement of said plate, unless this is by means of the key. That is, it acts as a means against violation of the lock, in the event that it was desired to introduce the bolts by acting with violence on the same.

[0004] Whatever the position of the plate, the blocking thereof against violent action, that is against the return of the plate, is determined by the introduction of the interlocking flange of the guard between the upper teeth of the plate.

[0005] The problem with traditional locks, having the constitution described, is that the lock can be violated with relative ease by acting on the bolts. For example, if a crowbar or similar tool is introduced between the frame and the door and the bolts and plate are forced, the breakage or bending of the interlocking flange of the guard can be produced and with this the return of the retraction of plate and bolts, the door being thereby released.

[0006] The object of the present invention is to overcome the problem described, providing the lock with additional means for blocking the plate, which impede the retraction thereof by violent means, it being possible therefore to have a lock offering greater safety and all this without introducing additional pieces which could complicate the lock or increase its cost.

[0007] The objective declared is achieved by fitting the guard with additional means of interlocking with the plate, which are defined by butts against which rests the rear edge of the last tooth of the plate, when the latter is in its fully extracted position, so offering total safety when the bolts are shot to the maximum.

[0008] To this end, according to one aspect of the invention, the last tooth of the plate is of greater height than the remaining teeth, the purpose being to obtain a greater supporting surface against the butts which define the additional means of interlocking.

[0009] According to a characteristic of the invention, the butts of the guard consists of a window which is prac-

ticed in an bracket which limits the guard at the top, after the interlocking flange. This window is of a size and occupies a position so that it receives the end of the last tooth of the plate, when said plate is in its fully extracted position, in order to configure thereby an interlock against its return through violation. This window could also be constituted by a recess of sufficient depth formed in the bracket mentioned.

[0010] According to a further characteristic of the invention, the butts of the guard consist of a protuberance which project from the internal surface of said guard and which has a straight chamfered edge opposing the return direction of the plate, against which rests the rear edge of the last tooth of said plate, when the same is in its fully extracted position in order to define an additional interlock against its return through violation.

[0011] In this manner, two additional interlocks or supports of the plate are achieved, when the same is in its fully extracted position.

[0012] The upper bracket of the guard has, behind the aforementioned window, a recess, window or groove, into which the last tooth of the plate penetrates partially, when said plate is in the position prior to that of maximum throw, so that the greater height of this tooth does not constitute an obstacle for the positioning of the guard in the intermediate positions of throw of the plate.

[0013] According to another characteristic of the invention, the guard and the opposing wall of the case have non-coinciding butts, which have flat opposing side surfaces, through which they rest and slide on each other in each displacement of said guard. These opposing side surfaces will preferably be arranged so that they constitute elements which impede the sliding of the guard, when this is in its lower limiting position, with the flange introduced between the upper teeth of the plate.

[0014] All the characteristics and benefits of the invention are disclosed below in greater detail, with the help of the drawings attached, wherein by way of illustration and not restrictively, an example of embodiment is shown.

[0015] Figure 1 shows a partial front elevation of a lock constituted according to the invention, with the bolts withdrawn and in which the front cover of the case has been removed for the purpose of showing the lock mechanisms.

[0016] Figure 2 is a view similar to that of figure 1, with the bolts in their fully shot position.

[0017] Figures 3 to 5 are a front elevation, a top plan and a bottom plan, respectively, of the guard of the lock shown in figures 1 and 2.

[0018] Figure 6 is a vertical cross section of the guard, taken on the cutting line VI-VI of figure 3.

[0019] Figure 7 is a front elevation of the plate which constitutes part of the locks of figures 1 and 2.

[0020] Figure 8 is a partial cross section of the guard and rear wall of the case or casing, taken on the cutting line VIII-VIII of figure 2.

[0021] In figure 1 a lock is shown which includes a

case or casing 1 from which the front wall has been removed, so that the internal mechanisms can be observed.

[0022] Within this case a plate 2 is housed, which can be displaced reversibly in the direction of arrow A and which carries blocking bolts 3, as well as a guard 4 which will serve as blocking element of the plate 2, in the position selected thereof. Also mounted in the case or casing 1 is a cylinder 5, capable of being operated by a key, which cylinder has a pawl not shown, for acting on the plate 2 and guard 4.

[0023] The plate 2, as can be better appreciated in figure 7, carries the bolts 3 and has guiding holes 6. Starting from the lower edge it has a number of teeth 7 on which acts the pawl of the cylinder 5 of the lock in order to displace it, by means of one or two turns, in the throwing or withdrawal direction.

[0024] The number of teeth 7 can be greater than that shown in the drawings, in which case their total displacement would require more than two turns of the cylinder 5.

[0025] In figure 1 the plate 2 is shown in its internal position, with the bolts 3 withdrawn, whilst in figure 2 the plate is in the most external position, with the bolts 3 fully shot.

[0026] Starting from the upper edge the plate 2 has teeth 8 and 9, between which intermediate notches 10 are defined. Up to this point the constitution of the plate 2 corresponds to that of a traditional lock. In the lock of the invention this plate is characterised in that the last of the upper teeth, the last tooth 9 is of greater height than the teeth 8.

[0027] With respect to the guard 4, as can be best appreciated in figures 3 to 6, it is constituted by a resistant plate which is delimited at the top by a bracket 11, appreciably perpendicular to said plate. In front of this bracket a flange 12 projects perpendicularly. This guard also has guide holes 13 and a lower edge 14 with a profile on which the pawl of the cylinder 5 acts, when the key is turned, producing its displacement in an upward direction, being driven in the downward direction by a spring not shown in the drawings, so that when the key is turned the guard 4 is displaced reversibly in the upward and downward direction and on reaching the lower position the flange 12 is introduced in the notches 10 delimited between the upper teeth 8 and 9 of the plate 2, in order to act as an interlocking element which prevents the accidental return of said plate. Up to this point the constitution described of the guard corresponds to that of a traditional lock.

[0028] In accordance with the present invention, the upper bracket 11 of the guard, has window 16 in a position and of a size so that when the plate 2 is in its position of maximum throw, figure 2, the last upper tooth 9 penetrates through the window 16, thereby defining an additional means of interlocking the plate 2, against its return, when the lock is in the rest position.

[0029] Moreover, immediately behind the position which this window 16 occupies, from the internal surface

of the plate 2 a projection 17 stands out, which projection has an edge 18, figure 3, opposing the return direction of the plate which is straight and against which rests the rear edge of the last tooth 9 of the plate 2, when said plate is in its position of maximum throw, defining thereby a third means of interlocking against the return of said plate through violation.

[0030] With the purpose that the last tooth 9 of the plate does not constitute an obstacle when said plate is in its intermediate position of throw, the bracket 11 of the guard has, behind the window 16, a recess 20 which delimits a lower cavity in which the upper end of said tooth 9 can be introduced. This recess could be replaced by a slot or window, in a position and of a size so that it could receive the upper end of the tooth 9, when said tooth is facing this recess, through the plate occupying an intermediate position of throw.

[0031] According to a further characteristic of the invention, the guard 4 and the facing wall of the case 1 have, as can be observed in figures 2 and 8, butts 21 and 22 not coincident, close to each other, which have planar facing side surfaces, through which they rest and slide on each other in each displacement of the guard in a direction perpendicular to that of displacement of the plate. These butts facilitate the sliding of the guard 4 on the facing cover of the case and also act as stops for preventing the lateral displacement of said guard, when the latter is in its lower limiting position.

[0032] In brief, in accordance with the invention, without introducing new pieces or mechanisms, with respect to the traditional construction of a lock, additional means are achieved of interlocking the plate, which offer greater security against violation of the lock, these means being defined by the upper last tooth 9 of the plate, of greater height than the remaining teeth, the window 16 and the recess 20 of the bracket 11 of the guard, the butt 18 of said guard, and the additional butts 21 and 22 of the guard and facing cover of the case.

Claims

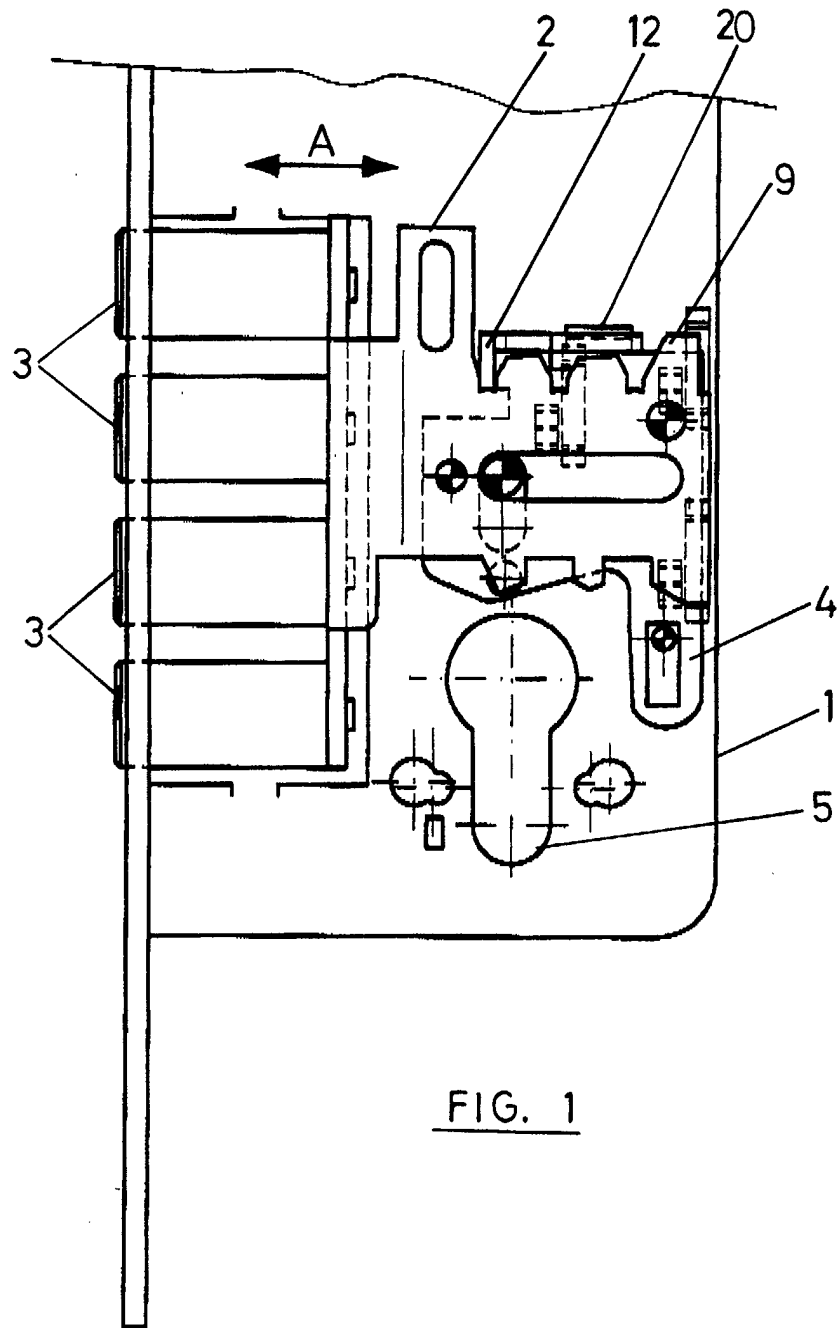
1. Lock for doors and the like, which comprises a case (1) in which is housed a plate (2) carrying locking bolts (3), displaceable by means of a pawl of the cylinder, and a guard (4) for blocking the plate, reversibly displaceable in a direction perpendicular to that of displacement of the plate, which plate (2) has on its upper edge teeth (8) between which is engaged, after each advancement of said plate by the action of the pawl of the cylinder, a flange (12) for interlocking the guard (4), **characterised in that** the guard (4) has additional means of interlocking (17) the plate (2), defined by butts (16-18) against which rests the rear edge of the last tooth (9) of the plate, when the latter is in the limiting position of throw.

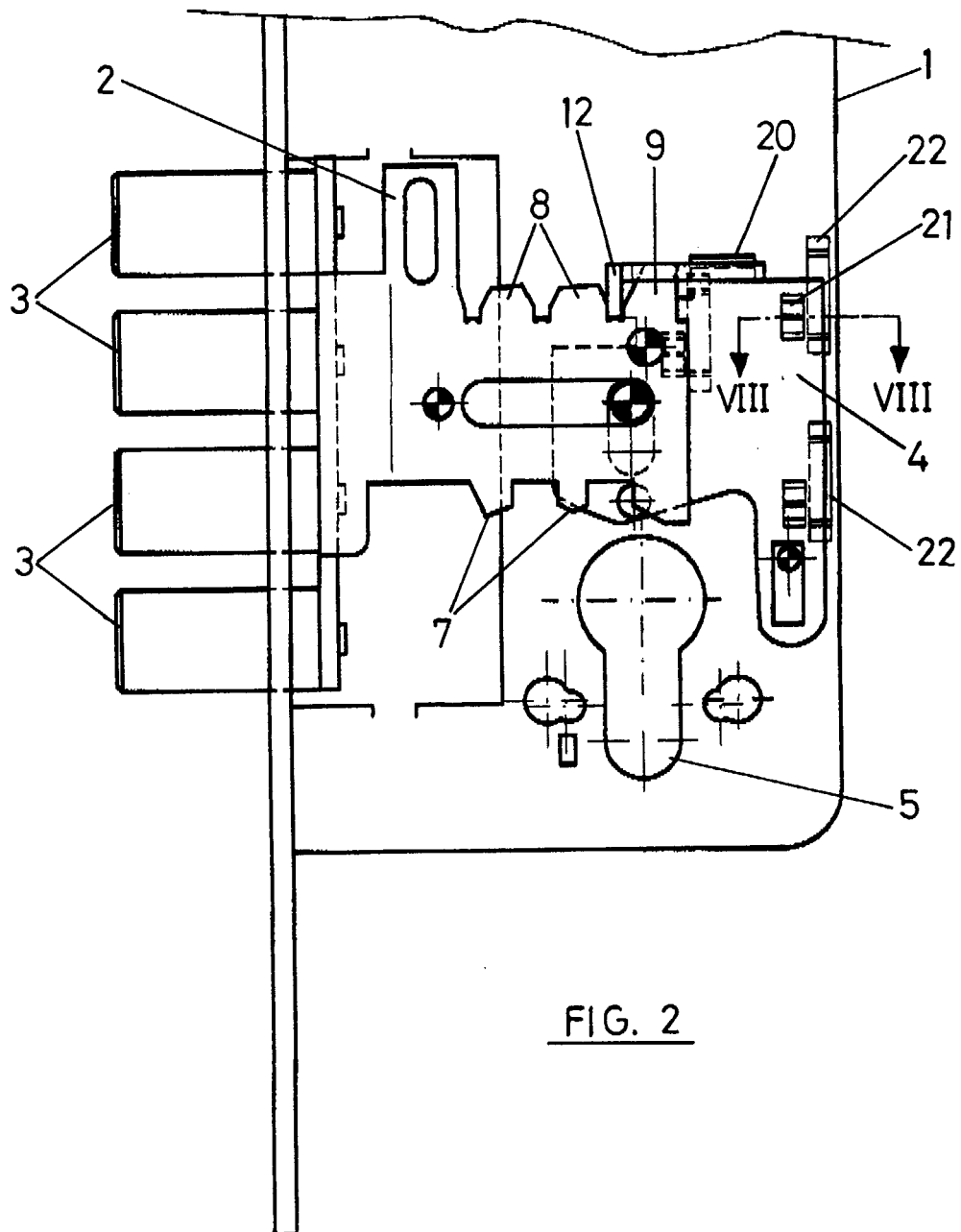
2. Lock according to claim 1, **characterised in that** the upper last tooth (9) of the plate (2) is of greater height than the upper remaining teeth (8), in order to rest against the butts (16-18) which define the additional means of interlocking. 5
3. Lock according to claims 1 and 2, **characterised in that** the aforementioned butts of the guard consist of a window (16) practiced in an bracket (11) which limits the guard at the top, as from the interlocking flange (12), which window is of a size and in a position so that it receives the end of the last tooth (9) of the plate, when said plate is in its limiting position of throw, in order to define an interlock against its return through violation. 10 15
4. Lock according to claim 1, **characterised in that** the aforementioned butts of the guard (4) consist also of a projection (17) which stands out from the internal surface of said guard and has a straight edge (18) opposing the direction of return of the plate (2), against which rests the rear edge of the last tooth (9) of said plate, in its position of maximum throw, in order to define an interlock against its return through violation. 20 25
5. Lock according to claims 2 and 3, **characterised in that** the upper bracket (11) of the guard (4) has, behind the window mentioned, a recess or window (20) into which the last tooth (9) of the plate partially penetrates, when said plate is in the position prior to that of maximum throw. 30
6. Lock according to claim 1, **characterised in that** the guard (4) and the facing wall of the case have butts (21) near and not coincident, which have planar facing side surfaces, which rest and slide on each other in each displacement of said guard (4) and act as stops to prevent the lateral displacement of said guard. 35 40

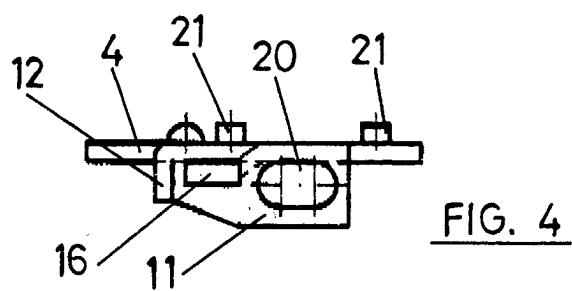
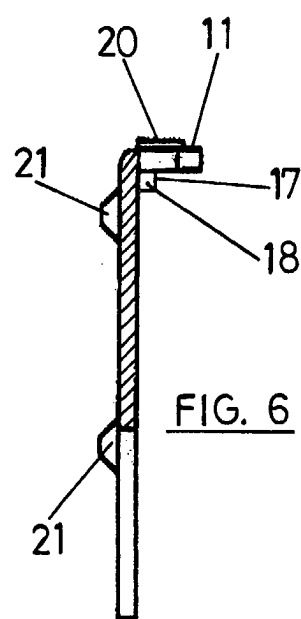
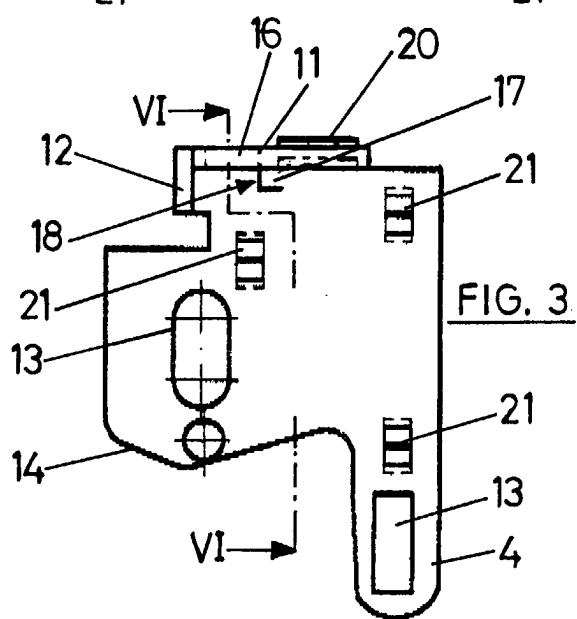
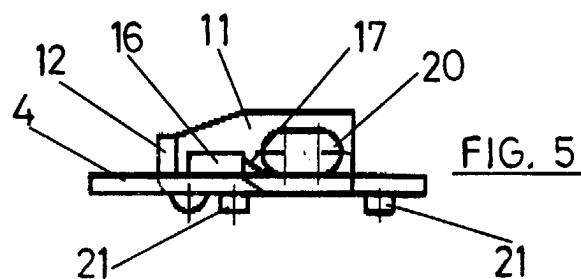
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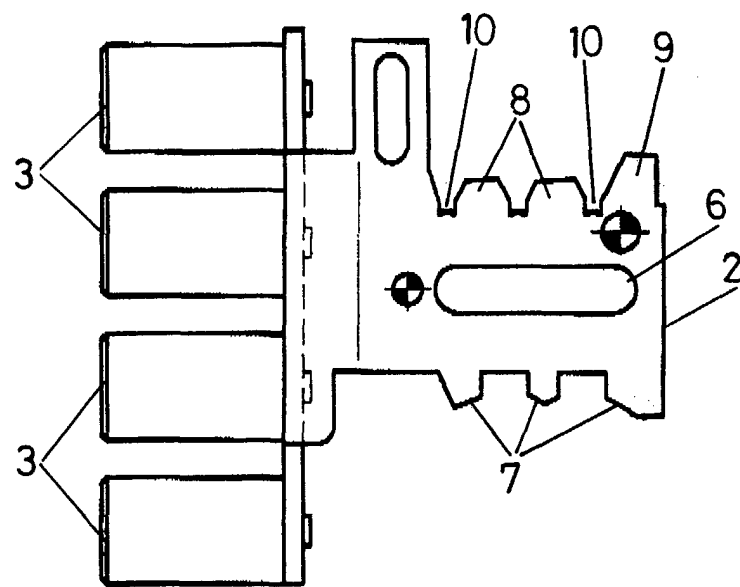


FIG. 7

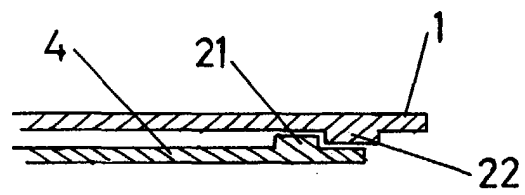


FIG. 8



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Application Number
EP 03 38 0153

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| Place of search MUNICH | | Date of completion of the search 29 September 2003 | Examiner Friedrich, A |
| <div>CATEGORY OF CITED DOCUMENTS</div> <div> 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 </div> | | | |

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