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(71) Applicant: **Di Natale S.r.l.**
95100 Catania (IT)

(72) Inventor: **Di Natale, Camillo**
97018 Scicli (RG) (IT)

(74) Representative: **Sarpi, Maurizio**
Studio FERRARIO
Via Collina, 36
00187 Roma (IT)

(54) Shutter with perfected rotating louvers and mechanisms designed to guarantee closure to sunlight

(57) Consisting of a shutter with adjustable louvers equipped with suitable mechanisms that guarantee total blockage of light by the adjustable louvers when they are closed, intervening on all critical zones where light usually filters in.

The mechanisms that allow achievement of this result basically consist of both special longitudinal grooves (6) machined on the top exterior side and bottom interior side of each louver (3) that allow horizontal jointed coupling of each louver with the adjacent louvers and of two profiled sections (7) that can be positioned between the internal side part of the two frame jambs and the most exterior side segment of louvers (3).

It is also forecast that the louvers rest laterally on a profiled extension present on the jambs made in the same shape as the louvers and against which extension they strike when they are closed.

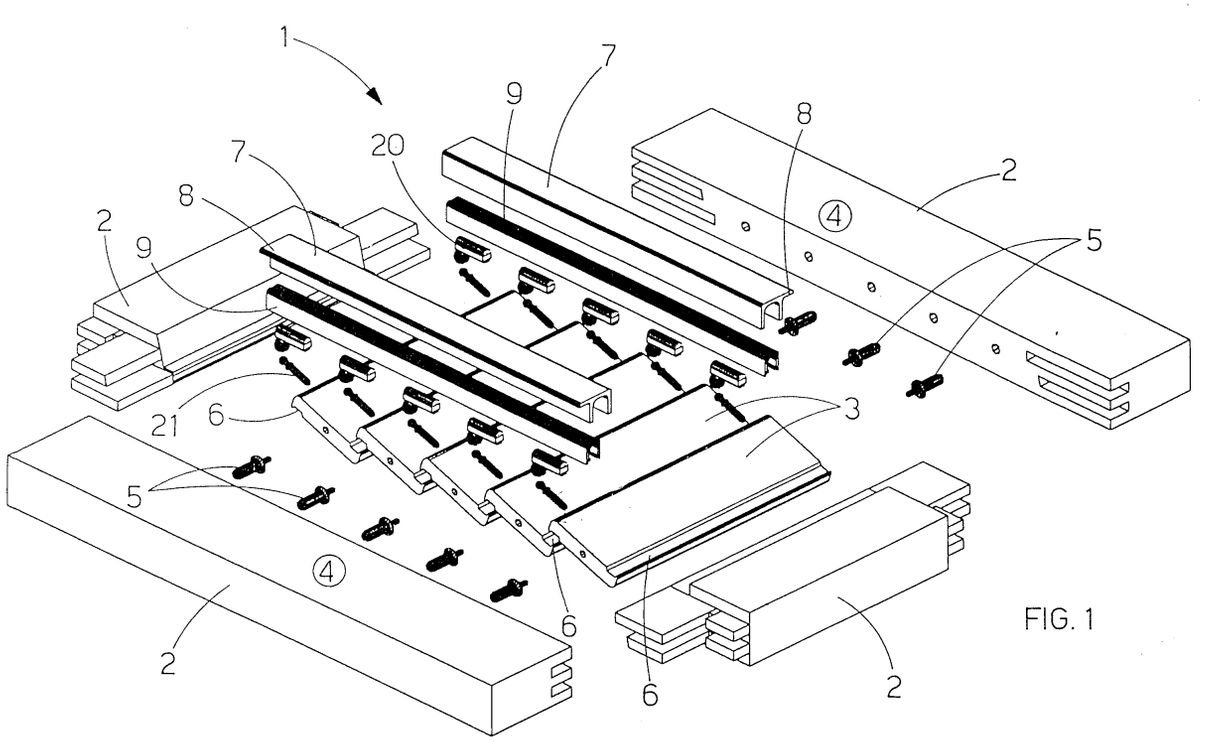

FIG. 1

EP 1 074 690 A1

Description

[0001] The object of this innovation is a shutter with the special feature of having adjustable louvers rotating along the horizontal axis which collaborate with mechanisms that ensure perfect closure to penetration by light.

[0002] These, in particular, are mechanisms which, combined with a suitable profile of the adjustable louvers in the shutter, occupy the two side strips present between the zone occupied by the louvers and the outer edges of the frame. These mechanisms function to eliminate any possible penetration by light.

[0003] As is known in the window shutter sector in many cases shutters are composed of a series of louvers or fins placed crosswise to a frame and inclined with respect to it.

[0004] Currently louvers for shutters are installed on their frame in both fixed and adjustable manners. Adjustable louvers, contrary to fixed louvers which are blocked on the frame in a predetermined inclination, make it possible for the user to adjust the inclination of the louvers on their horizontal axis in a combined manner because their ends are mounted on the frame by means of pins that allow them to rotate, using a lever hinged inside each of them.

[0005] The adjustable louvers made according to currently known technology, which offer the great advantage of being able to adjust the intensity penetration by exterior light, have the problem that they cannot ensure perfect closure to light because light can filter in through lateral cracks between louvers and the frame as well as between the horizontal cracks between one louver and another.

[0006] This problem is even more evident if we consider bothersome infiltration of sunlight during the morning which, especially in the summer, can take place very early in the day and cause substantial disturbance to sleep.

[0007] The object of this innovation is to eliminate the aforementioned problems by use of suitable means that guarantee total closure to light of the shutter with adjustable louvers when this is being closed, acting on all those critical zones where infiltration by light can take place.

[0008] Part of the general object of the innovation in question is that these mechanisms, in addition to ensuring perfect exclusion of light when the shutter is closed, can also be made in an extremely simple manner without being a burden for production costs and which is a presupposition for easy and large-scale diffusion of the innovation.

[0009] These objects and special advantages are all achieved, according to the innovation, by a shutter with adjustable louvers equipped with mechanisms suitable for ensuring total closure to light which basically consists of a frame with a series of hinged louvers hinged on their middle or lower sides to the two lateral jambs of the frame, characterized by the fact that the two side ends of these louvers are intercepted by at least two profiled vertical sections, hinged to the edge of each louver in order to synchronize with louver movement, which have profiled sections that overlap the two side edges of the frame for a certain length and by the fact that these louvers have horizontal grooves that allow their mutual and horizontal coupling with the adjacent louvers during closure. It is also forecast that, in substitution of these profiles, the inner edge of the two lateral jambs of the frame be profiled with concave and convex zones where the ends of the louvers strike when they are closed.

[0010] Other special and particular characteristics of this innovation may better appear from the following description of a preferential form, illustrated in an indicative but not limiting manner, in the attached drawings where:

drawing 1 illustrates an exploded schematic perspective view of the shutter according to the innovation;
drawing 2 illustrates an exploded perspective view according to a possible variation;
drawings 3 and 4 illustrate details of the shutter according to the variant in drawing 2.

[0011] With reference to the attached drawings number 1 indicates the adjustable louver shutter according to this innovation which basically consists of frame 2, made by joining the profiled ends of four slats of wood or metal or similar materials and a series of adjustable fins or louvers 3.

[0012] Louvers 3 consist of elongated slats placed parallel one over the other in a specific inclination and which are hinged, at their ends, to two vertical jambs 4 of the frame using elastic pins 5.

[0013] These pins can be applied, according to the case, both in the mid part of the two end sides of each louver, as in figure 1, and in the lower part of the sides. In the first case the louvers rotate symmetrically with respect to their center of rotation. In the second case they perform a rocking motion with the part facing up rotating along an axis positioned along the lower side.

[0014] The special feature of the innovation consists in having provided mechanisms that prevent infiltration of light between louvers 3 and the frame structure to guarantee perfect exclusion of light by the shutter when the louvers are in their closed position.

[0015] The means that allow achievement of these results consist both of special longitudinal grooves 6 machined on the upper exterior and lower interior side of each louver, that allow a jointed horizontal coupling between each louver and the adjacent louver, and of two profiled sections 7 which can be positioned between the inner sides of the two frame jambs and the most external lateral sector of louvers 3.

[0016] More specifically the two profiled sections 7, which are used to synchronize rotating motion by the louvers because they are hinged to the upper side sec-

tors of the louvers by jointed elements 20 which engage with pins 21 fastened to the upper edge of each louver, have two parallel strips facing the inside and where the interior coupling section extends laterally with wing 8 that overlaps the inner edge of the jamb. Another section 9 is applied in the two parallel strips and constitutes the connection element with the adjustable louvers.

[0017] Sections 7 and 9 can also be made of different materials, one for example in wood and the other in metal or vice-versa, or out of the same material. Use of section 9 can also be eliminated since its internal profile, made to block joint elements 20, can also be machined in section 7.

[0018] One of the two profiled sections also connects with an operating mechanism, not illustrated, which could, for example, be the lever type and which allows the louvers to be closed and/or opened.

[0019] When louvers 3 are in their closed positions the two profiled sections 7 perfectly cover the two sectors of the shutter where light could filter in, positioning themselves between the inside edge of each jamb and the outer side part of the louvers.

[0020] According to the solution illustrated in figure 2 the louvers, in this case hinged at their lower edges, rest laterally on jambs 10 equipped with profiled extension 11, made with the same shape as the blades, against which the louvers themselves mesh and strike when they are closed.

[0021] The profiled extension can consist of a metal or wooden element applied to and fastened to jambs 10 or can be carved in the inner edge of the jamb itself.

[0022] In the case illustrated in figure 2, illustrated in the cross-sections shown in figures 3 and 4, the mechanism that allows the louvers to be opened and closed consists of section 12 positioned in the middle of the louvers.

[0023] Use of the mechanisms as described evidently and completely eliminates all possibility of infiltration by light and consequently the shutter is perfectly and totally finished in all details and able to ensure perfect closure of the window opening to light when it is closed.

[0024] The adjustable louver shutter in question has been illustrated and described according to a preferential solution but several variants can be forecast, technically equivalent to the aforementioned parts and components, which solutions are to be held to be comprised in the extent of protection of the innovation.

Claims

1. Adjustable louver shutter equipped with mechanisms suitable for ensuring total closure to light, basically consisting of a frame with a series of louvers, hinged at the middle or bottom of their sides to the two jambs of the frame, characterized by the fact that the two lateral ends of these louvers are intercepted by at least two profiled vertical sections hinged to the edge of each louver in order to synchronize their inclination, sections designed to overlap the two lateral edges of the frame for a certain distance, and by the fact that these louvers have longitudinal profiled grooves for mutual horizontal coupling of the louvers when they are closed. It is also provided that these sections may be replaced by profiling of the inner edge of the frame's jambs with concave and convex sections where the ends of the louvers mesh and strike when they are closed.

2. Adjustable louver shutter according to the previous claim and characterized by the fact that these longitudinal grooves, practiced on the upper exterior and lower interior side of each louver, allow horizontal coupling of each louver with the adjacent louver.

3. Adjustable louver shutter according to the previous claims and characterized by the fact that these profiled sections, used to synchronize rotary motion by the louvers because they are hinged to the upper side sectors of the louvers, have two parallel strips facing the interior, the inner joining section of which extends laterally with a wing that overlaps with the inner edge of the jamb.

4. Adjustable louver shutter according to the previous claims and characterized by the fact that the parallel strips of these sections are profiled to include means for hinging and coupling with each of the louvers.

5. Adjustable louver shutter according to the previous claims characterized by the fact that these sections can be made in a single piece or can be made in two parts which can even be made of different materials, at least one of which is suited for coupling through hinge mechanisms with the shutter louvers.

6. Adjustable louver shutter according to the previous claims characterized by the fact that the louvers can be hinged at their lower edge and rest laterally on the jambs equipped with a profiled extension made in the same shape as the louvers and on which extension the louvers themselves rest and strike when they are closed.

7. Adjustable louver shutter according to previous claim 5 characterized by the fact that this profiled extension can consist of a metal or wooden element applied and fastened to the inner edge of each jamb or which can even be made by carving the inner edge of the jamb itself.

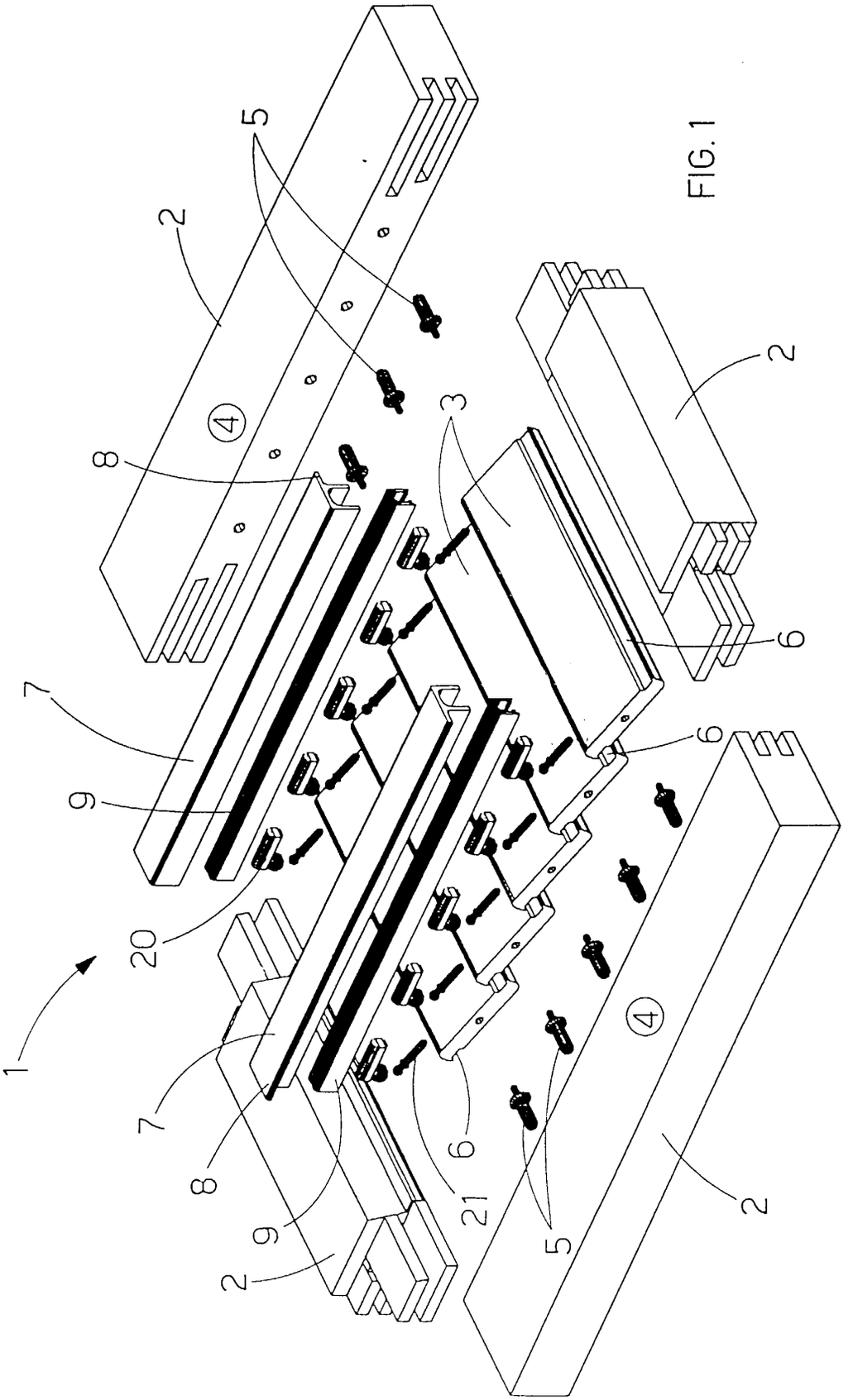

FIG. 1

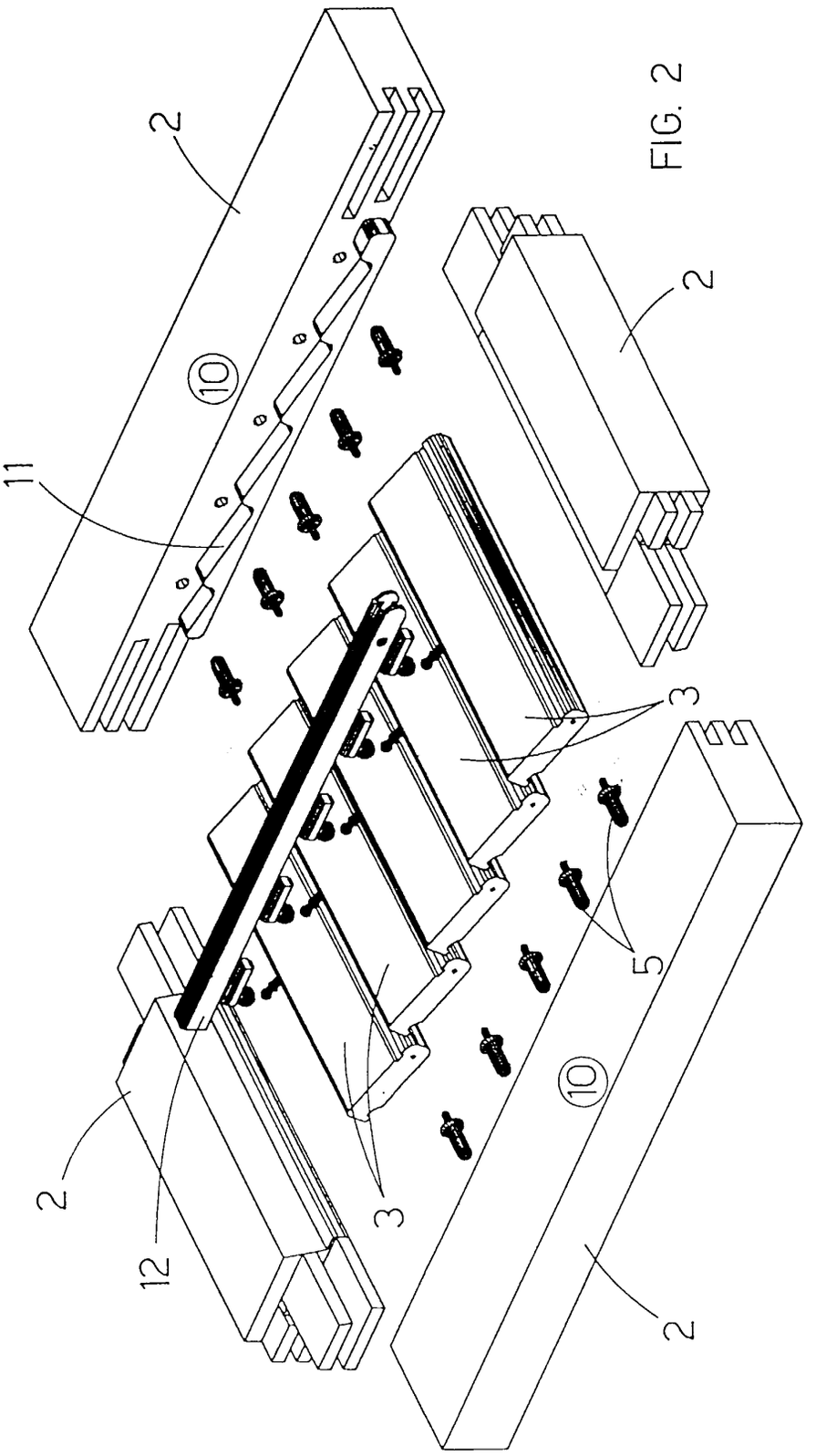

FIG. 2

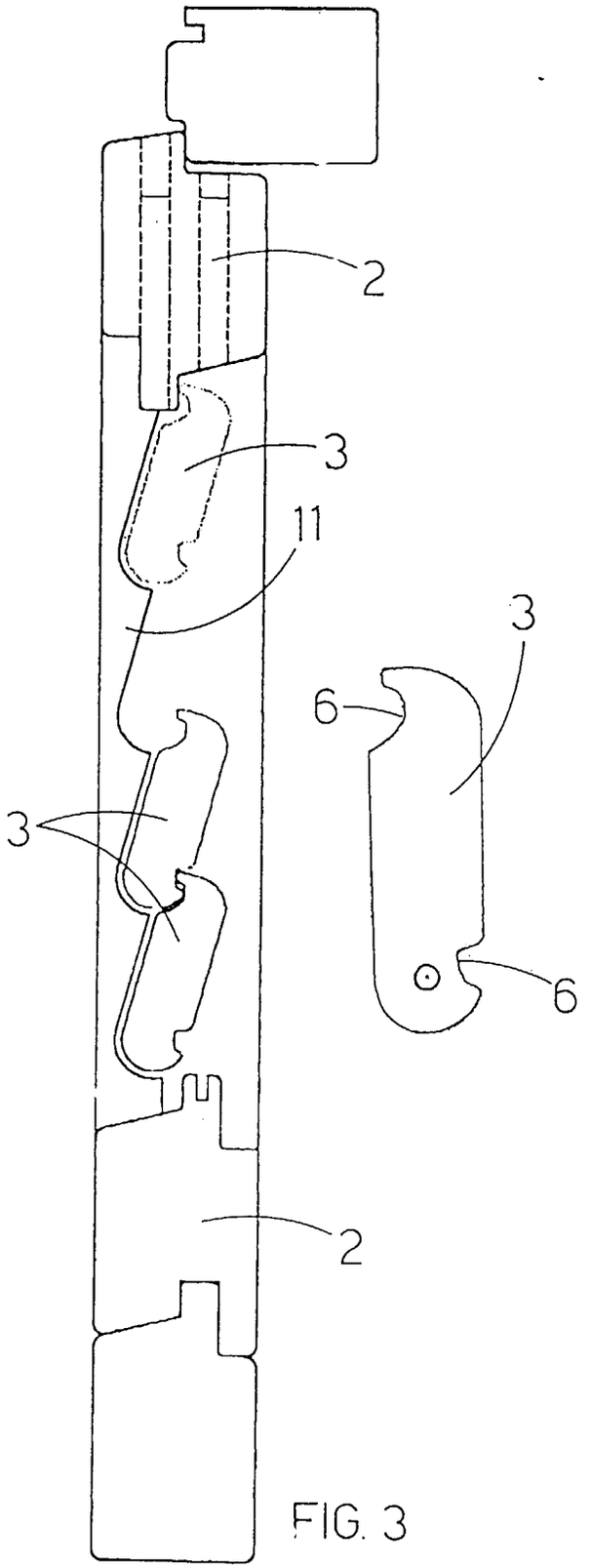

FIG. 3

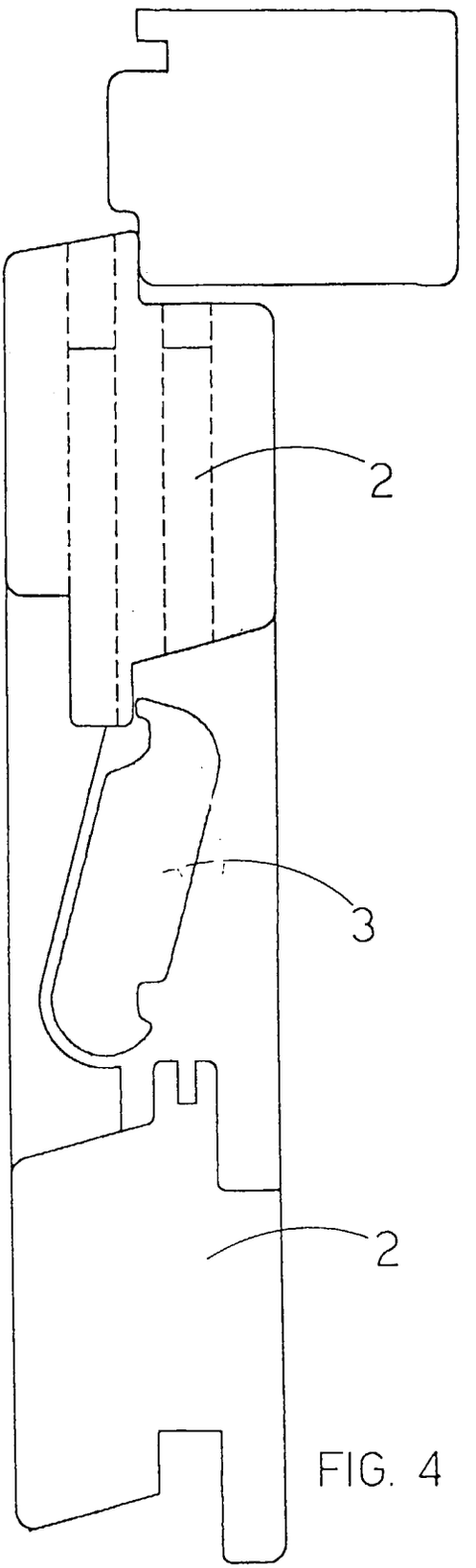

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 99 83 0516

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.7)
Y	US 4 509 290 A (STANFIELD JR ALVIN M) 9 April 1985 (1985-04-09) * abstract; figures 1,2 *	1-7	E06B7/086 E06B7/096
Y	FR 2 002 211 A (MILANI RESINE SPA) 17 October 1969 (1969-10-17) * page 1, line 28 - line 32 * * page 4, paragraph 2; figure 1 *	1-7	
A	DE 15 09 924 A (STEINER) 30 October 1969 (1969-10-30) * page 5, paragraph 3 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 January 2000	Peschel, G

CATEGORY OF CITED DOCUMENTS

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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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10-01-2000

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