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(54) **Folding door or window having a plurality of leaves with hinges affixed to the edges**

(57) A folding door or window (10) is described, formed by two or more adjacent leaves (2, 3) connected to each other by hinges (4, 5) consisting of two parts (4', 4'', 5', 5'') each fixed to one of said adjacent leaves (2, 3) and connected to each other by means of a rotary

coupling member (6) which permits relative rotation thereof, wherein said hinges (4, 5) are fixed to the edges (2s, 3s, 2i, 3i) of said adjacent leaves (2, 3) perpendicular to the edges (2e, 3e) relative to which said leaves (2, 3) perform said relative rotation.

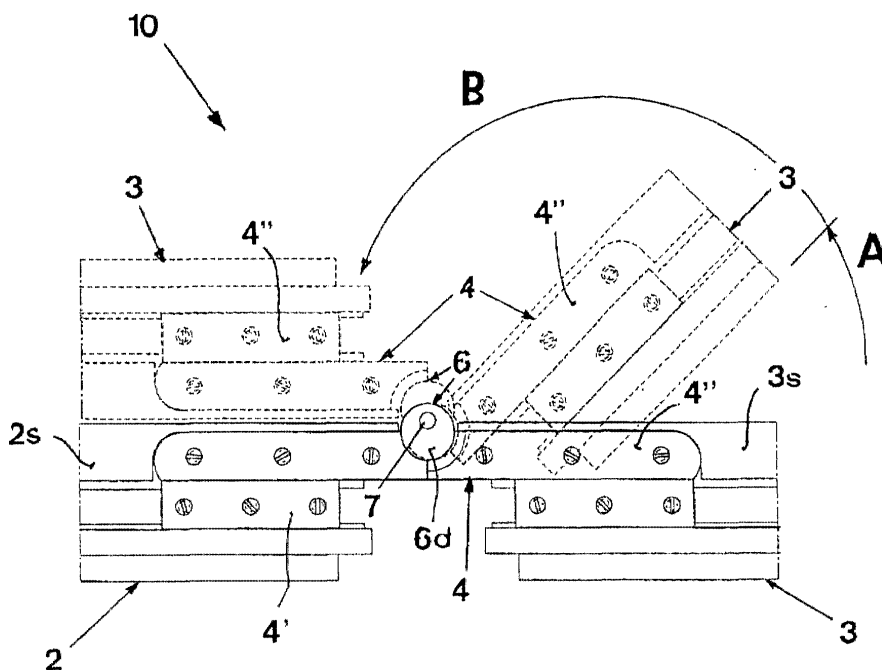


FIG. 3

Description

[0001] The present invention relates to the technical field of doors and windows, and more particularly relates to the type of such doors or windows which comprises two or more mutually adjacent leaves connected by hinges in a manner such as to be able to rotate relative to one another during the operations of opening and closing of said doors or windows.

[0002] At present, said hinges have vertical pins and are affixed to the edges of the leaves relative to which the leaves perform their rotation, in other words, customarily, to their adjacent vertical edges.

[0003] This entails, first and foremost, the aesthetically displeasing disadvantage of the fact that, at least on one of the two faces of the door or window, the various parts constituting the hinges are necessarily visible.

[0004] Secondly, but not in order of importance, it is very difficult to produce a door or window such that the two or more hinges affixed thereto support the said load. Usually, one of the hinges, which cannot settle under the load because of the rigidity of the system, bears said load almost entirely alone, with adverse effects in terms of its service life and its quietness during the operations of opening and closing of the door or window.

[0005] The inventor of the present invention has conceived the idea that said disadvantages can be eliminated by producing the hinges in a particular shape capable of being fixed to those edges of two adjacent leaves which are perpendicular to the edges of said leaves relative to which their relative rotation takes place.

[0006] In the most common cases, this amounts to saying that, in a door or window according to the invention in which two adjacent leaves rotate relative to their vertical edges, said hinges are affixed to the upper and lower horizontal edges of said leaves.

[0007] In a door or window according to the invention, the parts constituting a hinge which serve for the fixing thereof on the horizontal edges of the leaves can be partially or (preferably) totally recessed into said edges, without in the least impairing the functional efficiency of the door or window, and thus becoming much less visible than the parts constituting the hinges in traditional doors or windows. Above all, for each type of application, the hinges, if appropriately designed, may be only two in number and, by virtue of their flexural elasticity, albeit limited, automatically position themselves in a manner such as to spread the load acting thereon in a substantially equal manner.

[0008] The subject of the present invention therefore comprises a folding door or window as described in the preamble of the attached Claim 1, characterized by the features stated in the characterizing clause of said claim.

[0009] A more detailed description will now be given of a preferred embodiment of a door or window according to the invention, selected from among the numerous

embodiments achievable by a person skilled in the art following the teachings contained in the abovementioned Claim 1.

[0010] In the course of said description, reference will also be made to the attached drawings, which show:

- in Figure 1, a frontal view of said embodiment of a door or window according to the invention;
- in Figure 2, a cross section of the door or window shown in Figure 1;
- in Figure 3, a plan view of the door or window shown in Figures 1 and 2 in the closed position (continuous lines) and in the position in which one leaf has been rotated to create an opening (broken lines).

[0011] In Figures 1 and 2, a door or window 10 according to the invention can be seen wherein two adjacent leaves 2, 3 rotate, during the operations of opening and closing, relative to their vertical edges 2c, 3e.

[0012] Two hinges 4, 5 are composed, respectively, of two parts 4', 4'', 5', 5'' for the fixing thereof by means of screws to the leaves 2, 3, and by a rotary coupling member 6 which connects them, permitting them to rotate relative to one another.

[0013] Said hinges are affixed, respectively, to the upper 2s, 3s and lower 2i, 3i horizontal edges of each leaf 2, 3, in other words to the edges thereof which are perpendicular to said vertical edges 2e, 3e relative to which the leaves 2, 3 (and therefore the hinges 4, 5 also) rotate during the operations of opening and closing the door or window 10.

[0014] In the embodiment shown (see Figures 1, 2), said two parts 4', 4'', 5', 5'' constituting a hinge 4, 5 have a cross section of Z-shaped profile, with the two parallel sides perpendicular to the intermediate side.

[0015] Said profile is complementary to that of the horizontal edges 2s, 3s, 2i, 3i of the leaves to which the hinges 4, 5 are affixed, so that each individual part of a hinge is facing and parallel to an element of the profile of the leaf edge on which the hinge is fixed.

[0016] By making suitable cut-outs, it is possible to recess therein, partially or preferably totally as shown in the figures, each part of the hinges 4, 5 in a manner such as to render them almost invisible from outside.

[0017] Figure 3 shows the door or window 10 with the leaves 2, 3 closed and with one 3 of the leaves 2, 3 in the partially open and fully open positions (both cases being shown in broken lines), that is when the leaf 3 has performed a partial rotation and a 180° rotation (arrows A, B) relative to the rotary element 6 of the hinges 4, 5 of which only the hinge 4 is visible, disposed on the upper horizontal edges of the leaves 2, 3.

[0018] As is clearly apparent in Figures 2, 3, said rotary coupling member 6 is formed by two parallel discoidal elements 6d, 6e cut into or fixed on the ends of two parts 4', 4'', 5', 5'' connected thereby in a manner such as to be able to rotate. Said parallel discoidal elements 6d, 6e are disposed horizontally and are mutually facing,

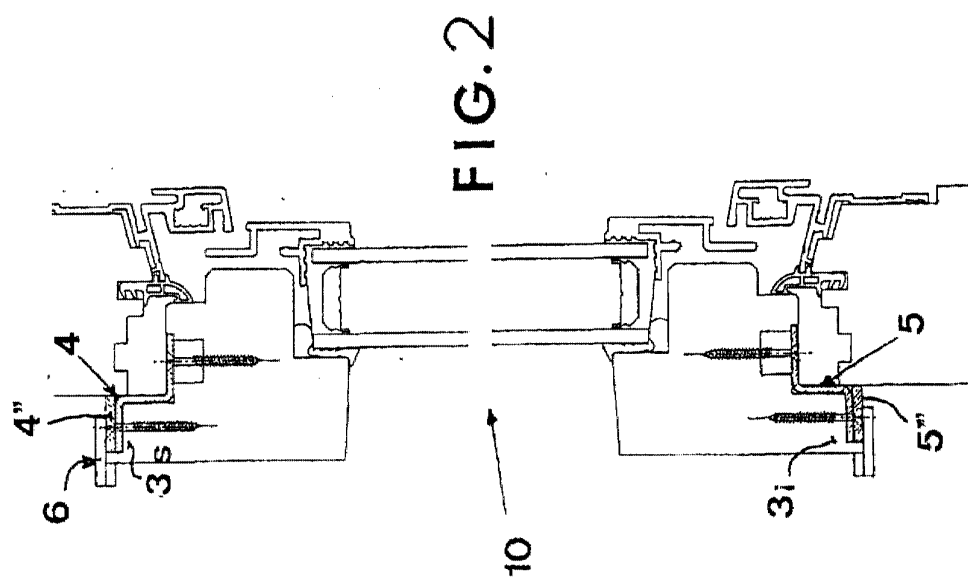
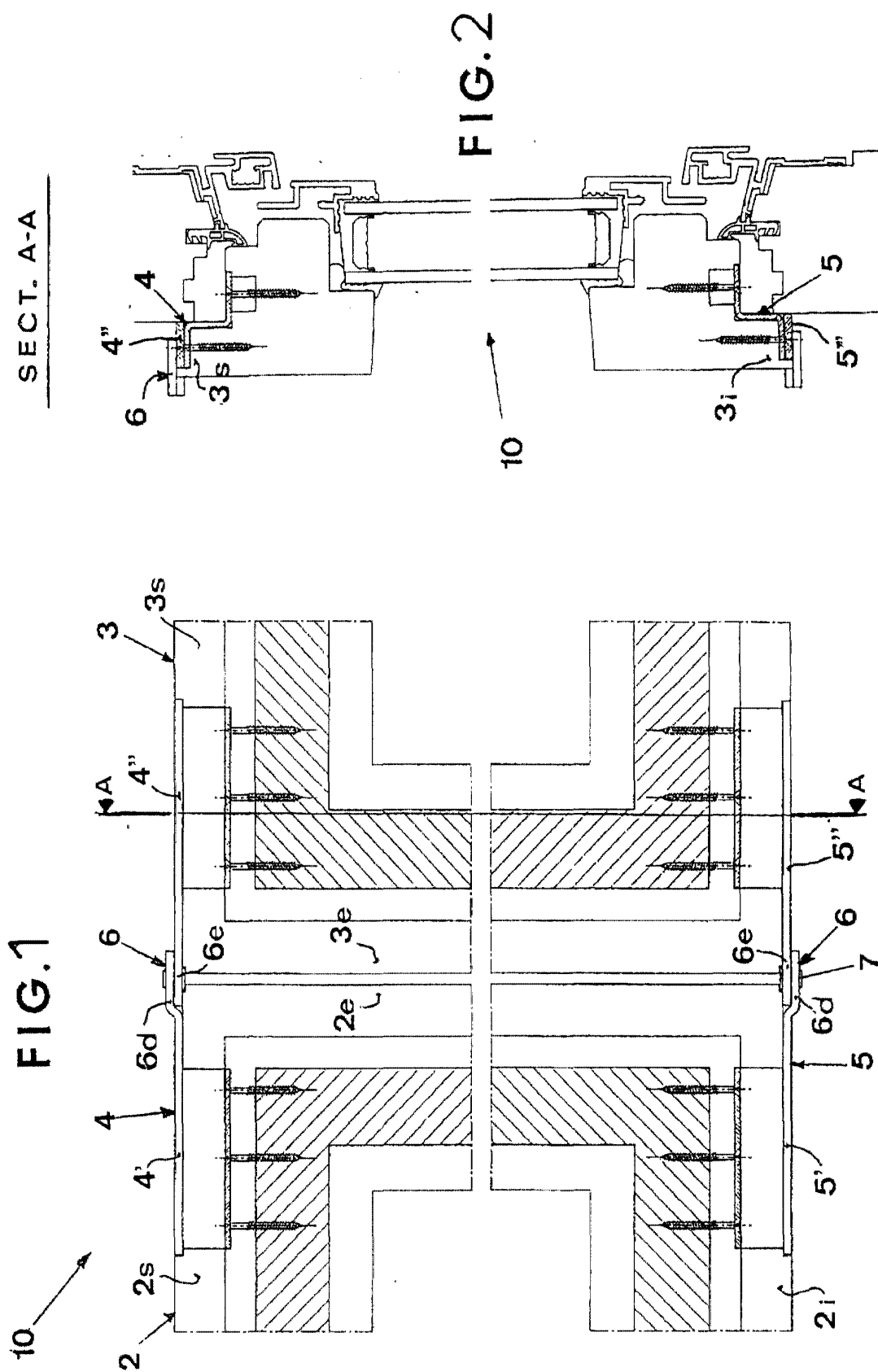
and the pin 7 about which they rotate is positioned eccentrically, as is more clearly visible in Fig. 3 in a manner such that a leaf 3, when it is rotated through 180° during opening thereof, is, at the end of the rotation, side by side and parallel with an adjacent leaf 2 which has remained stationary in the initial closed position.

[0019] Of course, the door or window according to the invention may comprise more than a mere two leaves, and the hinges may be differently shaped and positioned from those shown in the figures.

horizontally.

Claims

1. Folding door or window (10) formed by two or more adjacent leaves (2, 3) connected to each other by hinges (4, 5) consisting of two parts (4', 4'', 5', 5'') each fixed to one of said adjacent leaves (2, 3) and connected to each other by means of a rotary coupling member (6) which permits relative rotation thereof, **characterized in that** said hinges (4, 5) are fixed to the edges (2s, 3s, 2i, 3i) of said adjacent leaves (2, 3) perpendicular to the edges (2e, 3e) relative to which said leaves (2, 3) perform said relative rotation.
2. Folding door or window according to Claim 1, wherein the relative rotation of two adjacent leaves (2, 3) takes place relative to their vertical edges (2e, 3e) and said hinges (4, 5) are two in number and are fixed respectively on the upper horizontal edges (2s, 3s) and on the lower horizontal edges (2i, 3i) of said adjacent leaves (2, 3).
3. Folding door or window according to Claim 2, in which said two parts (4', 4'', 5', 5'') of the two hinges (4, 5) are partially or totally recessed into the upper (2s, 3s) and lower (2i, 3i) horizontal edges of said two adjacent leaves (2, 3) and said rotary coupling member (6) consists of two parallel horizontal discoidal elements (6d, 6e) facing each other, eccentrically pivoted relative to one another, and disposed parallel to said upper (2s, 3s) and lower (2i, 3i) horizontal edges of said adjacent leaves (2, 3).
4. Folding door or window according to one of the preceding claims, wherein the profile of the cross section of said two parts (4', 4'', 5', 5'') constituting the hinges (4, 5) is complementary to that of the lower (2i, 3i) and upper (2s, 3s) horizontal edges of the leaves (2, 3) whereon said two hinges (4, 5) are fixed.
5. Folding door or window according to Claim 4, wherein said profile of the cross section of the two parts (4', 4'', 5', 5'') composing said two hinges (4, 5) is Z-shaped, having the two parallel sides perpendicular to the intermediate side and disposed



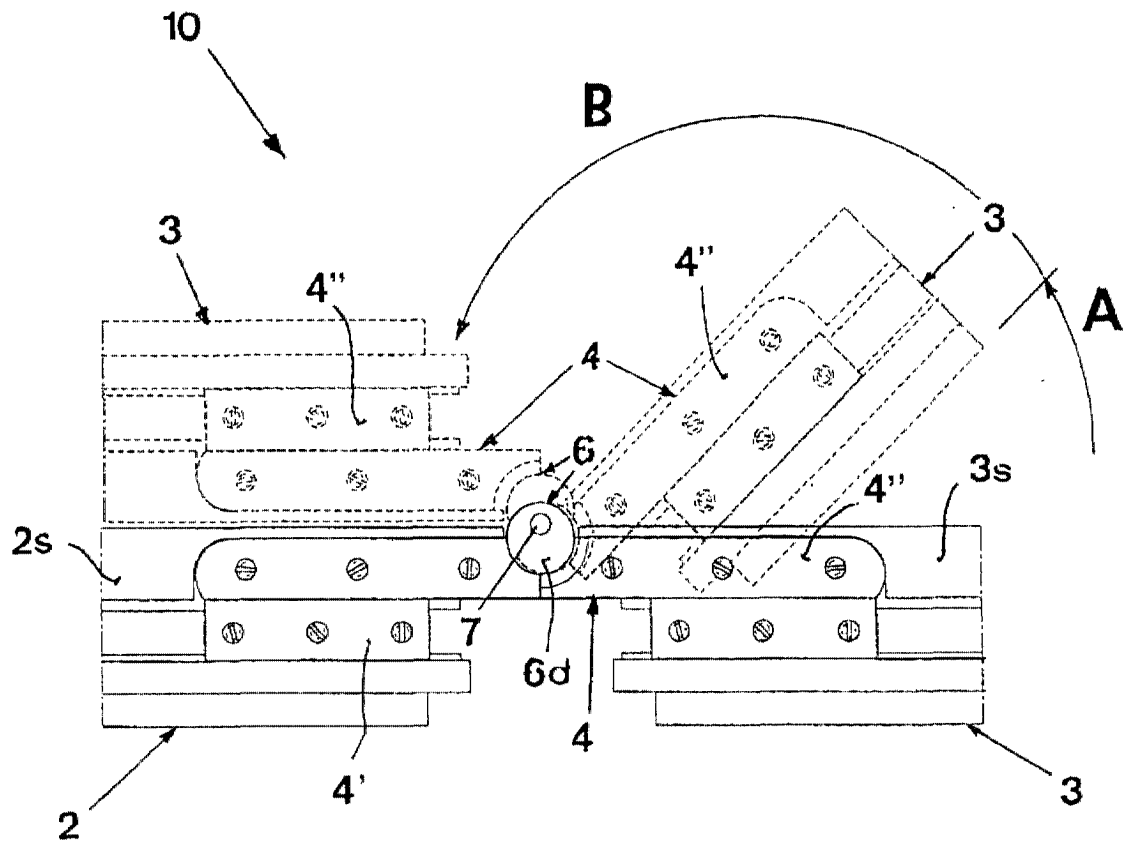


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 00 81 0946

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 807 739 A (KOBLENZ S R L) 19 November 1997 (1997-11-19)	1,2,4	E05D15/26
Y	* column 1, paragraphs 1,2 * * column 2, line 44 - column 3, line 21; figures 1-4 *	3,5	
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A	* the whole document *	1	
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			E05D
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 10 April 2001	Examiner Henkes, R
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 81 0946

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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