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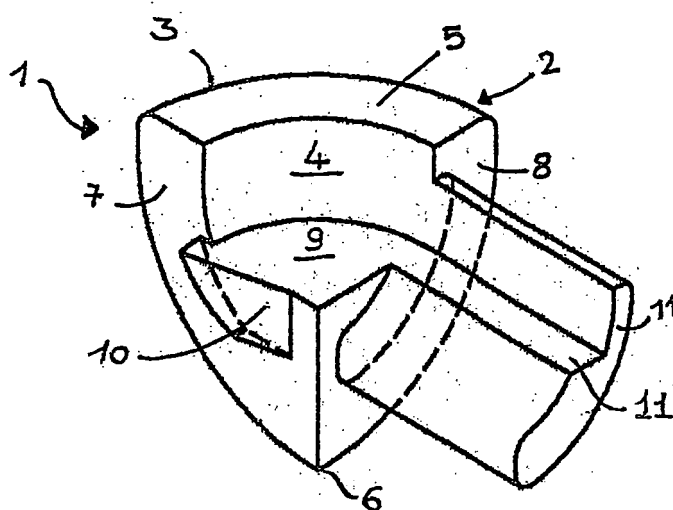
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(54) **Component for forming a rounded corner in a leaf of an aluminium door or window frame**

(57) A component suitable for forming a corner with a rounded edge in a leaf of a frame is described, the corner being formed by a first section and a second section, the component comprising: a round shell-like head with a curved external surface and an internal surface,

which is also preferably curved; a first side surface and a second side surface which are substantially perpendicular to each other; and a shank which extends from said second side surface, said shank being able to engage in a corresponding seat of the first section which forms the corner.



**Fig. 1**

## Description

**[0001]** The present invention relates to the sector of aluminium door or window frames and in particular relates to a component able to form a rounded corner in a leaf. The invention also relates to a leaf comprising such a component.

**[0002]** For decades aluminium door and window frames made by suitably assembling portions of sections have been known. Windows, doors or the like in particular are made by assembling together portions of sections so as to form a kind of rectangular or square frame. The section portions are generally cut at 45° so that, once assembled, they form a right-angled corner with a sharp edge.

**[0003]** Right-angled corners thus formed pose a problem for two main reasons.

**[0004]** Firstly, right-angled corners with a sharp edge are dangerous and may cause injury. In fact, in particular in the case of windows, it is quite frequent for persons to knock against the sharp edge formed by the right-angled corner and hurt themselves. Children are most exposed to this danger, but adults may also inadvertently bang their head or other part of the body against the corner when standing up from a bent down position.

**[0005]** The only solution to this problem known to the Applicant consists in an angular accessory which is glued to the frame at the sharp right-angled corner. This accessory is considered to be too voluminous, having dimensions of about 2.0 x 2.0 cm, is unattractive and in any case cannot ensure total safety. In fact, with time it tends to become detached from the leaf or is removed by the user precisely because it is considered to be unattractive.

**[0006]** Secondly, the contact seal, which ensures the sealing action between the frame and the leaf, is cut at the right-angled corner. Often the seal is not cut precisely. In any case, an undesirable gap forms between one section of the seal and the other one. A not insignificant amount of heat is lost through this gap.

**[0007]** EP 0 448 520 A discloses a process for making casings by means of metal structural shapes.

**[0008]** US 4 636 105 A discloses a corner pieces for frames.

**[0009]** The object of the present invention is to overcome the abovementioned problems and provide a component able to form a rounded corner in a leaf of a door or window frame, in particular in a leaf of an aluminium door or window frame.

**[0010]** According to a first aspect, a component suitable for forming a corner with a rounded edge in a leaf of a door or window frame is provided, said corner being formed by a first section and by a second section. The component comprises: a shell-like head with a rounded external surface and an internal surface; a first side surface and a second side surface which are substantially perpendicular to each other; and a shank which extends from said second side surface, wherein said shank is

configured for engaging in a corresponding seat of the first section which forms the corner. The component further comprises a snap-engaging tooth extending from said first side surface, said tooth being configured for engaging inside a corresponding seat of the second section which forms the corner.

**[0011]** The tooth has preferably a length which increases in the direction towards the external surface.

**[0012]** The internal surface is preferably concave and curved.

**[0013]** According to a preferred embodiment, the external surface is a portion of a spherical surface.

**[0014]** According to another aspect, a leaf of an aluminium door or window frame is provided, said leaf comprising at least two portions of a section assembled to form a corner and a component as described above.

**[0015]** Advantageously, the component according to the present invention has small dimensions and therefore is not very visible and does not affect significantly the aesthetic appearance of the door or window frame.

**[0016]** Advantageously it may be stably fixed to at least one section portion and may not be removed after assembly of the leaf.

**[0017]** Another important advantage of the component according to the present invention is that it enables a continuous and uninterrupted contact seal to be provided in the corner.

**[0018]** A detailed description of the invention is now provided, purely by way of a non-limiting example, to be read with reference to the accompanying illustrations in which:

- Figure 1 shows an enlarged axonometric view of the component for a rounded corner according to the present invention;
- Figures 2a, 2b and 2c are three plan views of the component according to Figure 1;
- Figure 3 shows a cross-sectional view of a section with which the component according to the invention may be associated;
- Figure 3a shows an enlarged detail of the section according to Figure 3, without the component according to the invention;
- Figure 3b shows an enlarged detail of the section according to Figure 3, with the component according to the invention;
- Figure 4 shows an axonometric view of a leaf corner on which the component according to the invention is being mounted; and
- Figure 5 shows the corner according to Figure 4 with the component according to the invention mounted and into which the contact seal is being inserted.

**[0019]** An embodiment of the component 1 able to form a rounded corner in a frame leaf, in particular in a leaf of an aluminium door or window frame, according to the invention, is shown in Figures 1, 2a, 2b and 2c. The component 1 comprises a rounded head 2. Conveniently, the

head 2 substantially is in the form of a hemisphere segment. In particular, it has the form of a quarter segment of a hemisphere. By way of example, the head 2 of the component 1 is substantially shaped as a quarter of a hemisphere having a radius of about 5.0 mm.

[0020] The head 2 is substantially shell-shaped and defines an external rounded surface 3, an internal rounded surface 4, an upper edge surface 5, a pointed end 6, a first side surface 7 and a second side surface 8. The first and the second side surfaces 7 and 8 are perpendicular to each other. Internally, a shelf 9 is provided between the upper surface 5 and the pointed end 6. The first and the second side surfaces 7 and 8, when the component 1 is mounted, rest against the two sections.

[0021] A snap-engaging tooth 10 projects from the first side surface 7, said tooth being able to lock the component 1 to one side of the corner of the door or window frame leaf. The snap-engaging tooth 10 forms an extension of the shelf 9. The snap-engaging tooth 10, in order to favour mounting of the component 1, has a length which increases from the pointed end 6 to the external surface 3. This can be clearly seen in Figure 2c. Basically, the tooth 10 defines an inclined surface.

[0022] An engaging connection shank 11 with a curved cross-section visible in Figures 1 and 2a projects from the second side surface 8. The engaging shank 11 defines a surface 11' which forms an extension of the shelf 9. In any case, the cross-sectional shape of the engaging shank 11 is determined by the shape of a corresponding seat 21 in the section 20 (Figure 3) with which the corner of a frame leaf will be formed.

[0023] Figure 3 shows, purely by way of example, a cross-section through a section 20 on which the component 1 of the invention may be mounted. Reference should also be made to Figures 3a, 3b, 4 and 5 in order to understand the steps for mounting the component 1 and its advantages.

[0024] In order to be able to mount the component 1 on the first and second section portion 20, recessing, shearing or milling of the corner is performed. This machining operation is performed in a known manner prior to assembling together the two section portions or after the two section portions have been assembled. The leaf corner according to Figure 4 is ready to receive the component 1 according to the invention. The triangular part to be eliminated (by means of shearing, milling or other similar machining operation) is indicated by the reference number 22 and is coloured grey in Figure 3a.

[0025] The component 1 is then introduced (arrow A in Figure 4) by inserting the engaging shank 11 into the associated seat 21 of the first section 20. The cross-section of the engaging shank 11 is also shown in black in Figure 3b. By further forcing the engaging shank 11 into its seat 21, the tooth 10 is forced to engage with the seat 21 of the second section 20. The shape of the tooth 10 prevents it from coming out.

[0026] The cavity 21 is designed so as to occupy only a small part of the seal-receiving seat 23, thus allowing

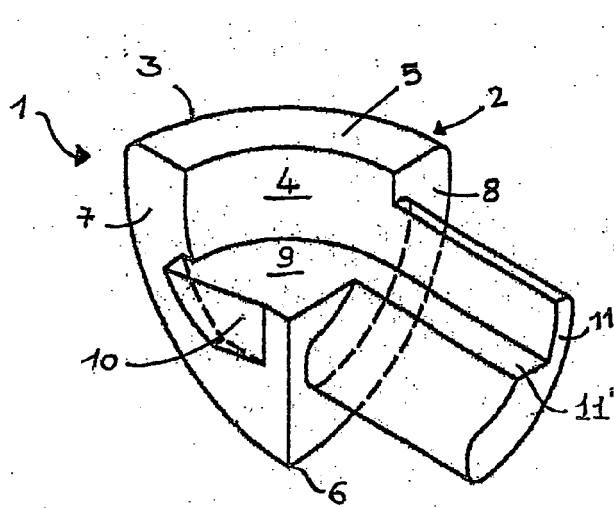
the simultaneous use of a continuous seal 25. In other words, conveniently, the shape of the component 1 allows the introduction of a continuous contact seal 25 which is not cut at the corner of the leaf. In particular, the person skilled in the art will recognize that this characteristic feature also arises from the fact that the head 2 of the component 1 is not a solid component, but forms a rounded internal surface and a shelf 9 which extends both towards the tooth 10 and towards the shank 11. The free seat 23 for the contact seal 25 is shown in Figure 3b. From Figure 3b it will also be understood that the shank 11 is relatively thin. Finally, the seal 25 is shown in Figure 5 before being inserted into its seat.

[0027] The component 1 according to the invention may be made of plastic, for example nylon or ABS. Alternatively, it may also advantageously be made of metallic material such as pressure-cast aluminium or zamak.

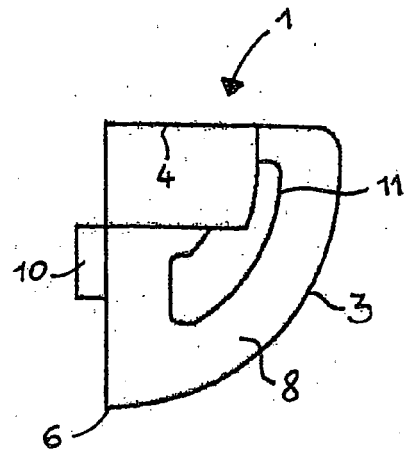
[0028] From an aesthetic point of view, it may also be coloured with one colour or so as to imitate the grain in wood or provide a marble effect.

## Claims

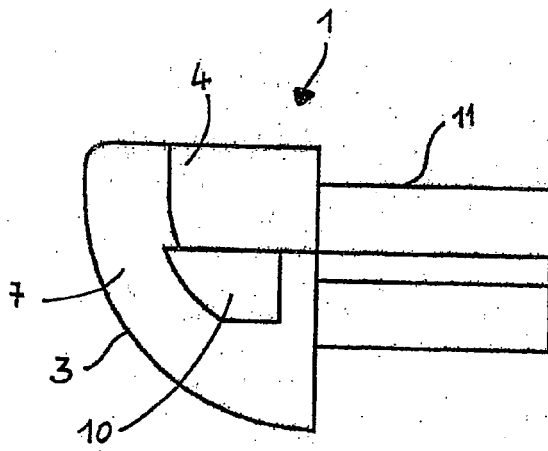
1. Component (1) configured for forming a corner with a rounded edge in a leaf of a door or window frame, said corner being formed by a first section (20) and by a second section (20), said component (1) comprising: a shell-like head (2) with a rounded external surface (3) and an internal surface (4); a first side surface (7) and a second side surface (8) which are substantially perpendicular to each other; and a shank (11) which extends from said second side surface (8), wherein said shank (11) is configured for engaging in a corresponding seat (21) of the first section (20) which forms the corner, **characterized in that** said component further comprises a snap-engaging tooth (10) extending from said first side surface (7), said tooth (10) being configured for engaging inside a corresponding seat (21) of the second section (20) which forms the corner.
2. Component (1) according to Claim 1, **characterized in that** said tooth (10) has a length which increases in the direction towards the external surface (3).
3. Component (1) according to any one of the preceding claims, **characterized in that** said internal surface (4) is concave and curved.
4. Component (1) according to any one of the preceding claims, **characterized in that** said external surface (3) is a portion of a spherical surface.
5. Leaf of an aluminium door or window frame comprising at least two portions of a section (20) which are assembled so as to form a corner, and a component (1) according to any one of the preceding claims.



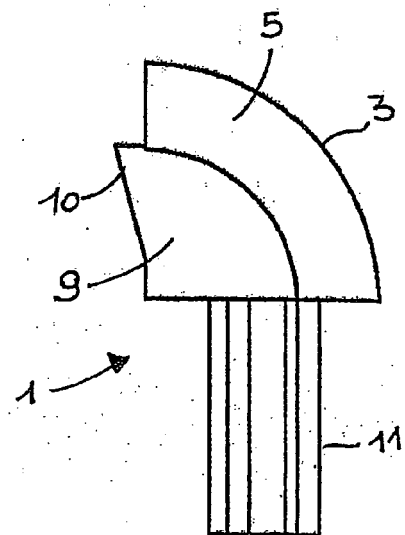
**Fig. 1**



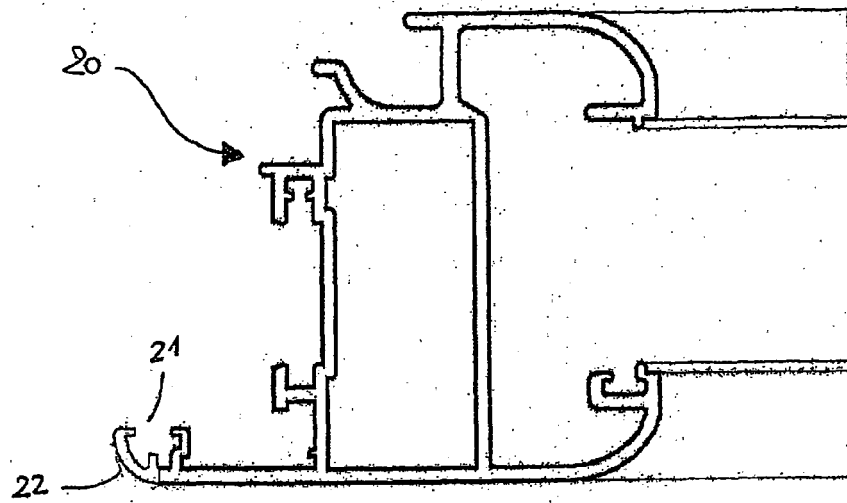
**Fig. 2a**



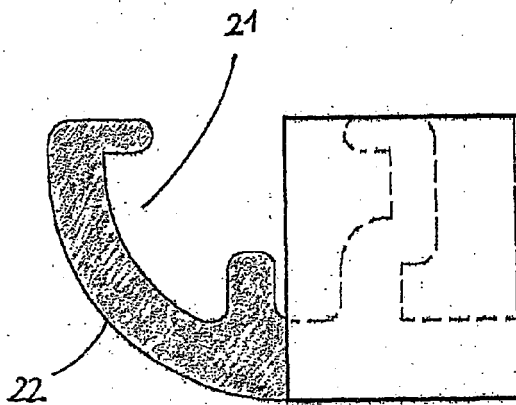
**Fig. 2b**



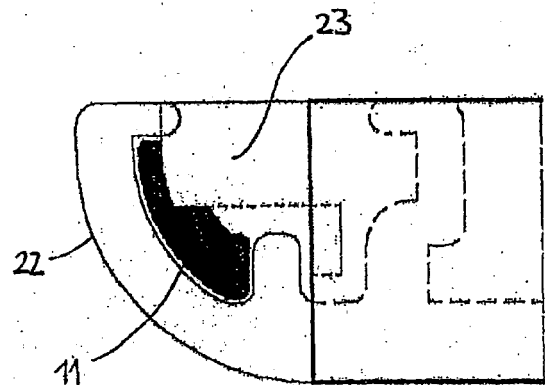
**Fig. 2c**



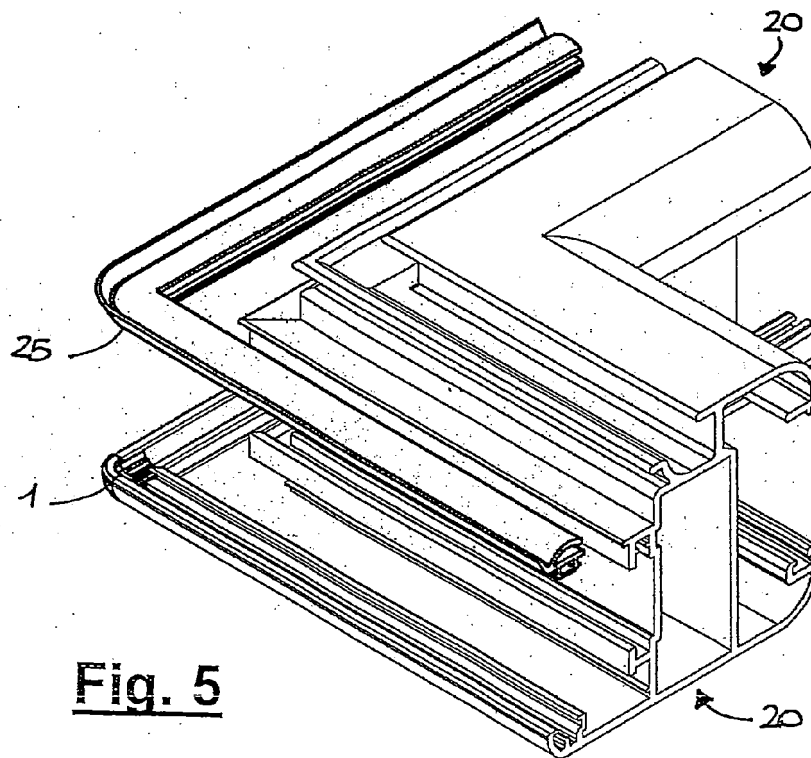
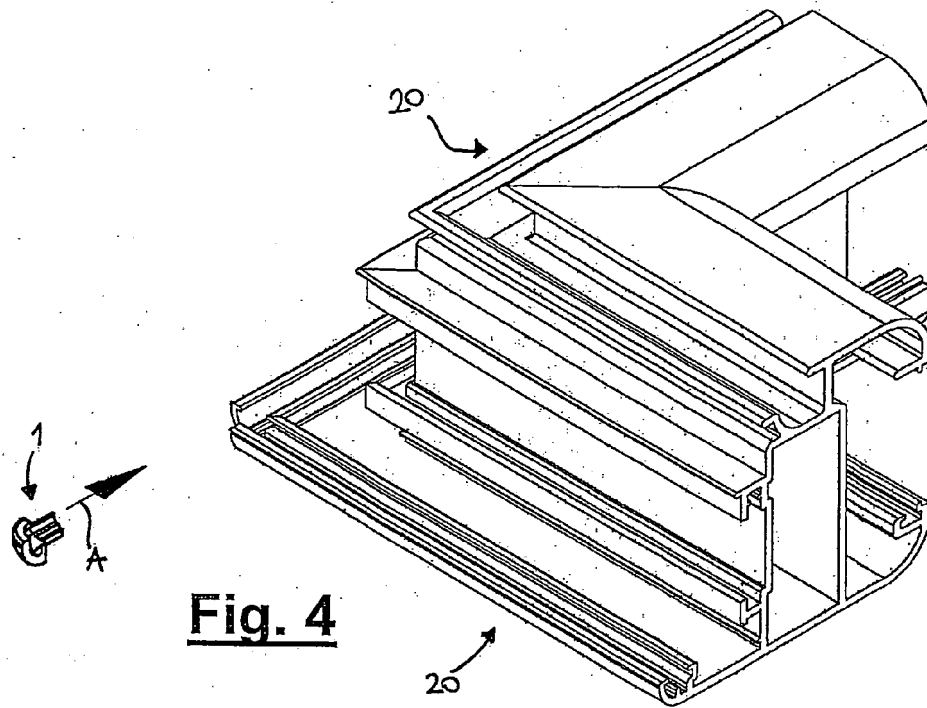
**Fig. 3**



**Fig. 3a**



**Fig. 3b**





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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 4 636 105 A (JOHANSSON ET AL) 13 January 1987 (1987-01-13) * column 2, line 55 - column 3, line 22; figures 1,2 *	1	
A	DE 92 07 308 U1 (MEMORY FOTOLABOR UND -VERTRIEBSGESELLSCHAFT MBH, 7174 ILSHOFEN, DE) 3 September 1992 (1992-09-03) * page 2, paragraph 2 - paragraph 5 * * page 7, paragraph 6 - page 9, paragraph 1 * * figures 1-6 *	1	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 May 2007	Examiner Verdonck, Benoit
CATEGORY OF CITED DOCUMENTS 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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