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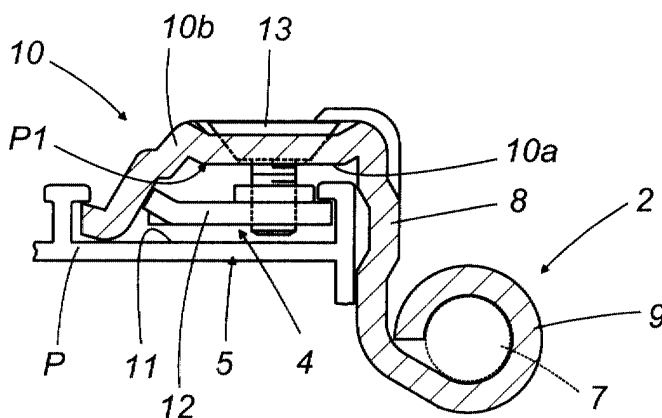
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(54) **A hinge for metal door and window frames**

(57) A hinge for door and window frames, in particular for metal door and window frames, comprises two half-bodies (2, 3) which can be connected, using means (4), to a fixed frame (5) and to a mobile frame (6), respectively, each frame consisting of a section (P); these half-bodies (2, 3) are attached to one another by a hinge pin (7) and each consists of a single element, made using plastic deformation, with a substantially flat first, cen-

tral portion (8), extending on one side without interruptions, in a second portion (9) deformed in such a way that it closes over itself like a cylinder in order to house the hinge pin (7), and, on the other side, in a third portion (10), angled relative to the first portion (8), and having a section (P1) designed to allow the third portion to be connected to a seat (11) in the section (P) which constitutes the frame; the third portion (10) also having means (4) for connection to the frame (5, 6).

FIG.3



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Description

[0001] The present invention relates to a hinge for door and window frames, in particular for metal door and window frames made from sets of aluminium sections. The above-mentioned hinges for metal door and window frames currently comprise two halves, each consisting of a hinge body with, on one side, a cylindrical portion for coaxially housing part of a hinge pin and, on the other, a tab fitted with means for connection to the part of the mobile frame or the fixed frame for which the hinge is intended.

[0002] This type of hinge is currently made by cutting an extruded section, also made of aluminium, into the individual halves which constitute the hinge. This step is followed by a series of processing operations on the parts for item completion, for example, chamfering, boring of some parts and coating or surface treatment.

[0003] The hinge product obtained in this way is certainly practical and very reliable, but has a high production cost in relation to the type of product represented, in addition to the fact that production cannot be highly automated by the manufacturer, since, as already indicated, production involves an extrusion process.

[0004] The above-mentioned disadvantages are added to by an aesthetic problem, which may be caused by such hinges if used on thin aluminium door and window frames: the combination of a thin aluminium frame and the extruded hinge, which is larger overall, creates a visible lack of continuity in the overall line of the frame which is not always acceptable for the end user.

[0005] For this reason, the Applicant has designed and made a hinge for door and window frames obtained and structured in such a way as to maintain the practicality and reliability of hinges used until now, but with reduced costs, by automating the manufacturing steps for the hinge, whose external appearance is more suited to the technical and aesthetic features of the frames currently used.

[0006] The technical features of the present invention, in accordance with the above-mentioned aims, are set out in the claims herein and the advantages more clearly illustrated in the detailed description which follows, with reference to the accompanying drawings, which illustrate a preferred embodiment without limiting the scope of application, and in which:

- Figure 1 is a schematic front view with some parts cut away to better illustrate others, of part of a frame with a hinge, in accordance with the present invention;
- Figure 2 is a perspective view with some parts cut away to better illustrate others, of a first half of the hinge, in accordance with the present invention;
- Figure 3 is cross-section of the first half illustrated in Figure 2, applied to a frame;
- Figure 4 is a perspective view with some parts cut away to better illustrate others, of a second half of

the hinge, in accordance with the present invention;

- Figure 5 is a cross-section of the second half illustrated in Figure 4, applied to a frame.

[0007] With reference to the accompanying drawings and in particular Figure 1, the hinge disclosed is fitted on frames such as those of doors, windows, and similar items. This solution is designed for aluminium frames in particular.

[0008] The hinge, labelled as a whole by the numeral 1, comprises two half-bodies 2 and 3, which can respectively be attached using relative means 4, to a fixed frame 5 and a mobile frame 6, each consisting of a section P. For rotation of the mobile frame 6, the two half-bodies 2 and 3 are attached to one another by a hinge pin 7.

[0009] As illustrated in Figures 2 and 4, each half-body 2 and 3 consists of a single element made using plastic deformation. In operation, this element (see also Figures 3 and 5) has a substantially flat first, central portion 8, extending on one side and without interruptions in a second portion 9, deformed in such a way that it closes over itself like a cylinder to house the hinge pin 7, and, on the other side, in a third portion 10 which is angled relative to the first portion 8. The third portion 10 has a section P1 designed to allow connection of the third portion to a seat 11 in the section P (see Figures 3 and 5) which constitutes the mobile or fixed frame 5 or 6.

[0010] In the specific embodiment of the present invention, the third portion 10 is fitted with means 4 for connection to the relative frame 5 or 6. In the embodiment illustrated in Figures 3 and 5, by way of example and without limiting the scope of the invention, the connecting means 4 consist of a plate 12 for each element, positioned opposite a surface of the third portion 10 and connected to said third portion by screw means 13 which pass through the third portion 10. The plate 12 may be connected to the section P1 of the relative frame 5 and 6, or inside the seat 11, and stably fixed there using the above-mentioned screw means 13. The shape of the plate 12 and the loose connection between the screws 13 and the third portion 10 preferably allows rapid insertion (and therefore hinge mounting) of the plate 12 in the seat 11. Each plate 12 is preferably at least partially made using plastic deformation on bars made of steel or, preferably, stainless steel.

[0011] In this embodiment with the plate 12, the third portion 10 may comprise (see Figures 2 and 3) a first, central part 10a, which is substantially flat and whose lower surface is the same shape as the connecting plate 12, and a second, extension part 10b, which is angled relative to the first part 10a and wrapped around part of the plate. This shape forms an element for rapid connection to the section P1 of the frame 5 or 6.

[0012] Alternatively (see Figures 4 and 5), the third portion 10 always comprises a substantially flat first, central part 10a whose lower surface is the same shape as the connecting plate 12, and a second and third part

10b and 10c, which are extensions of the first part 10a and are angled relative to the first part 10a and substantially wrapped around the plate 12 on opposite sides, forming respective elements for rapid connection to the section P1 of the frame 5 or 6.

[0013] Obviously, the third portion 10 or each half-body may be connected to the frame by screws which can be applied from the exterior and attached directly to the frame 5 or 6 (this embodiment is not illustrated).

[0014] The particular shape and design of each element forming a half-body 2 and 3 is possible because the element is made of steel. Each half-body 2 and 3 is, preferably, but without limiting the scope of the present invention, made of stainless steel.

[0015] As is clearly illustrated in Figures 3 and 5, each element forming a half-body 2 and 3 has the above-mentioned second portion 9 deformed in such a way as to constitute a closed cylinder for housing part of the hinge pin 7.

[0016] A hinge obtained in this way fulfils the stated aims thanks to an extremely simple and economical structure, which can be made using high levels of automation in the steps of folding, boring and forming the above-mentioned zones of the hinge, with consequent rapid and economical production. In addition, the strong aesthetic impact of the hinge must be considered, since the hinge is ideally suited to use on aluminium frames of any thickness, but still maintains the same reliability, precision and safety as aluminium hinges, in addition to the ease and simplicity of fitting which is typical of "quick fitting" solutions.

[0017] The invention described can be subject to numerous modifications and variations without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A hinge for door and window frames, in particular for metal door and window frames; the hinge (1) being of the type with two half-bodies (2, 3), which can be attached by relative means (4) to a fixed frame (5) and a mobile frame (6), respectively, each frame consisting of a section (P); the half-bodies (2, 3) being attached to one another by a hinge pin (7), the hinge being **characterised in that** each half-body (2, 3) consists of a single element made using plastic deformation and having a substantially flat first, central portion (8), extending on one side and without interruptions in a second portion (9) deformed in such a way that it closes over itself like a cylinder for housing the hinge pin (7) and, on the other side, in a third portion (10), being angled relative to the first portion (8) and having a section (P1) designed to allow connection of the third portion to a seat (11) in the section (P) which constitutes the frame; the

third portion (10) also having means(4) for connection to the frame (5, 6).

2. The hinge according to claim 1, **characterised in that** the connecting means (4) consist of a plate (12) positioned opposite a surface of the third portion (10) and attached to the latter by screw means (13) which pass through the third portion (10); it being possible to attach the plate (12) to the section (P1) of the frame (5, 6) and stably fix it to the frame using the screw means (13).
3. The hinge according to claim 1 or 2, **characterised in that** each element forming a half-body (2, 3) is made of steel.
4. The hinge according to claim 1 or 2, **characterised in that** each element forming a half-body (2, 3) is made of stainless steel.
5. The hinge according to any of the claims from 1 to 4, **characterised in that** each element forming a half-body (2, 3) has a second portion (9) which is deformed in such a way as to form a closed cylinder for housing part of the hinge pin (7).
6. The hinge according to claim 2, **characterised in that** the third portion (10) comprises a substantially flat first, central part (10a), the lower surface of the latter being the same shape as the connecting plate (12), and a second, extension part (10b), being angled relative to the first (10a) and wrapped around part of the plate to form an element for rapid connection to the section (P1) of the frame (5, 6).
7. The hinge according to claim 2, **characterised in that** the third portion (10) comprises a substantially flat first, central part (10a), the lower surface of the latter being the same shape as the connecting plate (12), and a second (10b) and third (10c) extension part, being angled relative to the first part (10a) and wrapped around opposite sides of the plate (12) to form respective elements for rapid connection to the section (P1) of the frame (5, 6).
8. The hinge according to claim 2, **characterised in that** each plate (12) of each half-body (2, 3) is made of steel.
9. The hinge according to claim 2, **characterised in that** each plate (12) of each half-body (2, 3) is made of stainless steel.

FIG.1

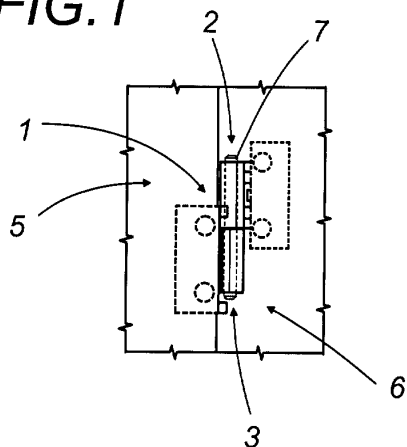


FIG.2

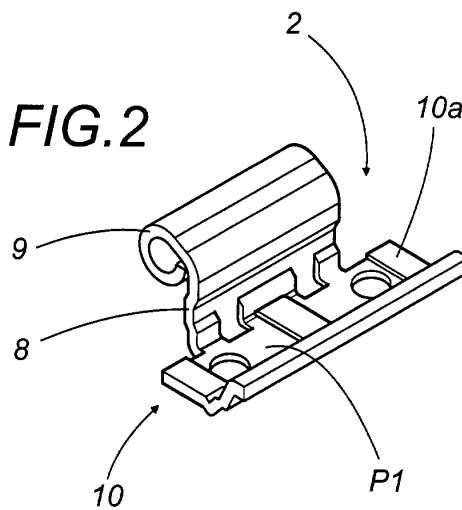


FIG.3

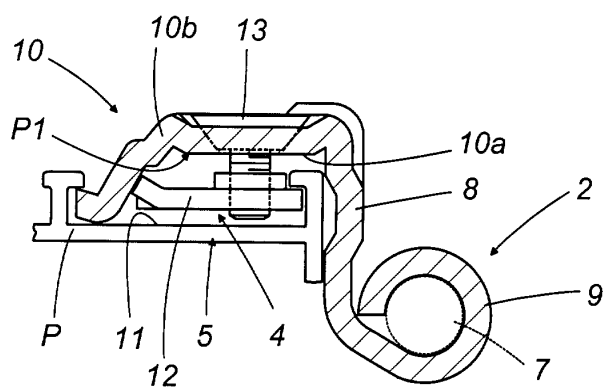


FIG.4

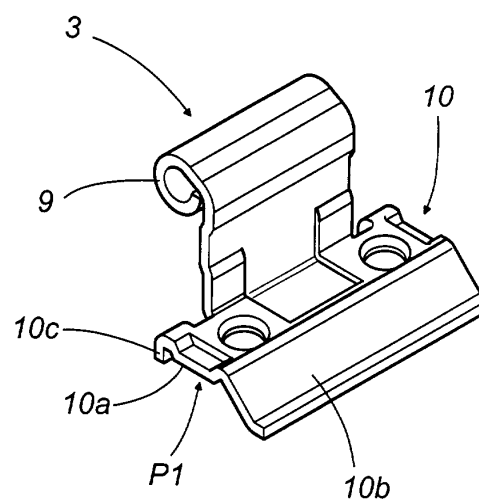


FIG.5

