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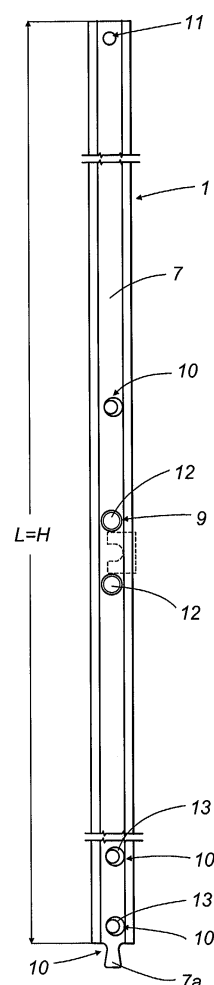
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(54) **An operating unit for doors and windows**

(57) Described is an operating unit for doors or windows of the type comprising a fixed frame (3) and a mobile frame (4) that opens in one or more configurations. The operating unit (1) has, slidably fitted within a channel (6) made in the profile constituting the mobile frame (4), at least one operating rod (7) for a handle assembly (8) which acts in conjunction with drive means (9) to make the operating rod (7) slide in both directions along the channel (6). The operating rod (7) is equipped with locking and/or operating elements (10) actuated by the handle (8) so as to enable the mobile frame (4) to be moved into the open and closed configurations. The operating rod (7) of the operating unit consists of a single profile made of a synthetic, plastic material with a high modulus of elasticity. The drive means (9) are applied to the rod (7) and comprise at least one pair of pins, and at least a part of the locking and operating means (10) are made on the rod (7).

FIG.2



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Description

[0001] The present invention relates to an operating unit for doors and windows.

[0002] At present, in the field of doors and windows with metal frames, especially but not restricted to, doors and windows that can be opened by tilting or turning, operation of the door or window requires a plurality of accessory elements applied to both the fixed frame and the mobile frame of the door or window.

[0003] One of the main accessories is the operating unit which enables the mobile frame of the door or window to be positioned in its different configurations (namely, turn opened, tilt opened or closed) upon actuation of a handle located on the outside surface of the mobile frame itself.

[0004] The operating unit usually consists of a pair of rod segments (each, in practice, being a length of flat metal profile) joined to each other by a connecting element, or "drive rod", as it is called in the jargon of the trade, positioned between the two segments and attached to them using pins which are normally present on the drive rod and which may be inserted in the holes in the corresponding ends of the segments.

[0005] The two metal segments also have other seats or holes, made close to the ends opposite those attached to the drive rod, for their connection, during frame assembly, to the moving parts which open and close the mobile frame (push bolts or lock terminals) and to drive elements (such as corner drives) for tilt opening of the mobile frame.

[0006] The operating unit structured in this way is obtained using a method according to which the rod segments are made by a special cutting machine from a metal profile, with a suitably shaped cross-section, which can be attached with a matching fit in a channel present on the frame profile.

[0007] The length of the segments depends on the dimensions (height) of the mobile frame in which they will be inserted. Once cut, the segments are further machined to create the seats and/or holes mentioned, which are needed in order to connect them to the drive rod and to the opening/closing and drive elements.

[0008] Following this machining, the segments are assembled in succession, each being attached to the operating elements until assembly on the frame profile is complete.

[0009] The rod segments are made from flat metal profiles of predetermined length (usually four to six metres) placed one at a time in the cutting machine which cuts them into a number of segments depending on the machine program and on the requirements of the frame assembler.

[0010] This procedure, however, has disadvantages due especially to the characteristics of the flat profile used, normally of predetermined standard length, and of the cutting machine, which together occupy a considerable amount of space and are not always easy for the

frame assembler to manage. In addition, for each flat profile, the rod segment cutting operations produce large amounts of waste that cannot be recycled, thus increasing the costs sustained by the assembler.

[0011] Further, the metal rods must be suitably lubricated so that they slide smoothly in the respective channels without jamming.

[0012] Moreover, the metal rods increase the overall weight of the door or window.

[0013] The present invention has for an aim to overcome the above mentioned disadvantages by providing an operating unit equipped with rods made of a light, low-friction material.

[0014] More specifically, the present invention provides an operating unit for doors or windows of the type comprising a fixed frame and a mobile frame that opens in one or more configurations; the operating unit having, slidably fitted within a channel made in the profile constituting the mobile frame, at least one operating rod for a handle assembly which acts in conjunction with drive means to make the operating rod slide in both directions along the channel; the operating rod being equipped with locking and/or operating elements actuated by the handle so as to enable the mobile frame to be moved into the open and closed configurations; the operating rod of the operating unit consisting of a single profile made of a synthetic, plastic material with a high modulus of elasticity, the drive means being applied to the rod and comprising at least one pair of pins, and at least a part of the locking and operating means being made on the rod.

[0015] The technical characteristics of the invention, with reference to the above aims, are clearly described in the claims below and its advantages are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is a schematic front view, with some parts cut away in order to better illustrate others, of a door or window frame equipped with the operating unit according to the present invention;
- Figure 2 is a schematic front view of an operating rod consisting of a single element.

[0016] With reference to the accompanying drawings, namely Figures 1 and 2, the operating unit according to the invention is denoted by the numeral 1.

[0017] The operating unit 1 is associated with a door or window 2 consisting of a fixed frame 3 and a mobile frame 4 of height H, which opens in one or more stable configurations (not illustrated).

[0018] The mobile frame 4 comprises a profile 5 defining a channel 6 in which an operating rod 7 for a handle assembly 8 slides and/or is coupled.

[0019] Figure 1 illustrates the preferred embodiment

of the invention, comprising a single rod 7 of length L equal to the height H of the mobile frame 4 and designed to be fitted in a single channel 6 extending along one vertical side of the mobile frame 4 itself.

[0020] The handle assembly 8 acts in conjunction with drive means 9 to make the operating rod 7 slide in both directions along the channel 6 so as to create one or more stable open configurations and one closed configuration.

[0021] The operating rod 7 is also associated with locking and/or operating elements 10 actuated by the handle 8 to be able to obtain the above mentioned stable open and closed configurations.

[0022] Advantageously, the operating rod 7 consists of a profile made of a synthetic plastic material with a high modulus of elasticity. In the preferred embodiment illustrated in the accompanying drawings, the rod 7 consists of a flattened T-profile shaped to match the shape of the channel in which it has to slide.

[0023] Preferably, the profile of the rod 7 is made by cutting a continuous profile rolled up on a cartridge in roll-like configuration. This configuration of the continuous profile is possible because the profile is made from a synthetic, plastic material with a high modulus of elasticity, that is to say, able to be elastically deformed.

[0024] Thus, the rod 7 can be made from a highly resistant material with all the physical properties required for the purpose, but also able to be deformed so that it occupies a minimum amount of space during its production and machining stages.

[0025] Advantageously, the drive means 9 and the locking or operating elements 10 are metal parts fitted to the synthetic plastic profiles. The drive means 9 and the locking or operating elements 10 may, however, also be made from any other type of material suitable for the purpose.

[0026] Looking in more detail, the drive means 9 and the locking or operating elements 10 are attached or joined to the rods 7 at seats 11 made in the rods 7 themselves and preferably consisting of holes made at the ends of each plastic profile (see Figure 2). As mentioned above, the operating unit 1 has, at a vertical member of the frame, a single rod 7 cut to a length L that is substantially the same as the height H of the mobile frame 4 (see Figure 2 again).

[0027] As shown by way of example in Figure 2, the plastic profile from which each rod is made may also have a tapered section at one end of it 7a, made, for example, by punching.

[0028] This tapered feature is designed to lock the mobile frame 4 in the tilt opened configuration and forms part of the operating elements 10. The tapered feature consists of two arch-shaped notches made opposite each other at the end of the rod 7 to form a sort of double pivoting area for the mobile frame 4.

[0029] Up to now, we have mentioned generic drive means 9 and locking and/or operating elements 10. Looking in more detail with reference to Figures 1 and

2, the drive means 9 may comprise a unit 12 comprising two metal pins 12, for intercepting the control levers 8a of the handle assembly 8, and the locking and/or operating elements 10 may consist of stop pins 13 located at specially shaped end areas, as described above, to enable the mobile frame 4 to be moved to and/or locked in its different configurations, or they may consist of corner drives 14 for transmitting control between the vertical and horizontal members of the mobile frame 4. The pins 13 and corner drives 14 may be coupled to the rod 7 by means of the aforementioned seats 11 made in the rod 7 itself. Preferably, the pins 13 are made of metal and fitted by interference or deformation into the holes 11 in the rod 7.

[0030] The operating unit thus made achieves the preset aims thanks to the machining of a continuous profile which, when fed, is configured in a form (that is to say, rolled up) such as to occupy a minimum amount of space and to permit the use of a large amount of material to make the rods in a small amount of space.

[0031] Moreover, the plastic material which the rods are made of is as resistant as the metal traditionally used to make the rods but, compared to metal, has the added advantage of being lighter in weight and having a lower friction coefficient allowing it to slide more smoothly.

[0032] It will be understood that the invention can be modified and adapted in several ways 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. An operating unit for doors or windows of the type comprising a fixed frame (3) and a mobile frame (4) that opens in one or more configurations; the operating unit (1) having, slidably fitted within a channel (6) made in the profile constituting the mobile frame (4), at least one operating rod (7) for a handle assembly (8) which acts in conjunction with drive means (9) to make the operating rod (7) slide in both directions along the channel (6); the operating rod (7) being equipped with locking and/or operating elements (10) actuated by the handle (8) so as to enable the mobile frame (4) to be moved into the open and closed configurations; the operating unit being **characterised in that:**

- it comprises at least one operating rod (7) consisting of a single profile made of a synthetic plastic material with a high modulus of elasticity;
- the drive means (9) are applied to the rod (7) and comprise at least one pair of pins; and
- at least one part of the locking and operating means (10) are made on the rod (7).

2. The unit according to claim 1, **characterised in that** the drive means (9) and at least one part of the locking and operating means (10) consist of pins made of metal fitted to the profile (7) made of synthetic, plastic material. 5
3. The unit according to claim 1, **characterised in that** the profile (7) is made by cutting a continuous profile rolled up in a cartridge-like configuration. 10
4. The unit according to claim 1, **characterised in that** the profile has a plurality of seats (11) for the drive means (9) and for the locking means (10).
5. The unit according to claim 4, **characterised in that** the seats (11) consist of holes made in the profile (7). 15
6. The unit according to claim 1, **characterised in that** the profile (7) has at least one tapered section at one end of it (7a) designed to lock the mobile frame (4) in the tilt opened configuration and forming part of the operating elements (10). 20
7. The unit according to claim 1, **characterised in that** the drive means (9) comprise a unit consisting of at least one pair of metal pins (12) for intercepting the control levers (8a) of the handle assembly (8). 25
8. The unit according to claim 1, **characterised in that** the locking or operating means (10) comprise a plurality of stop pins (13). 30
9. The unit according to claim 1, **characterised in that** the locking or operating means (10) comprise specially shaped end areas enabling the mobile frame (4) to be moved to and/or locked in its different configurations. 35
10. The unit according to claim 1, **characterised in that** the locking or operating means (10) comprise corner drives (14) for transmitting control between the vertical and horizontal members of the mobile frame (4). 40

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