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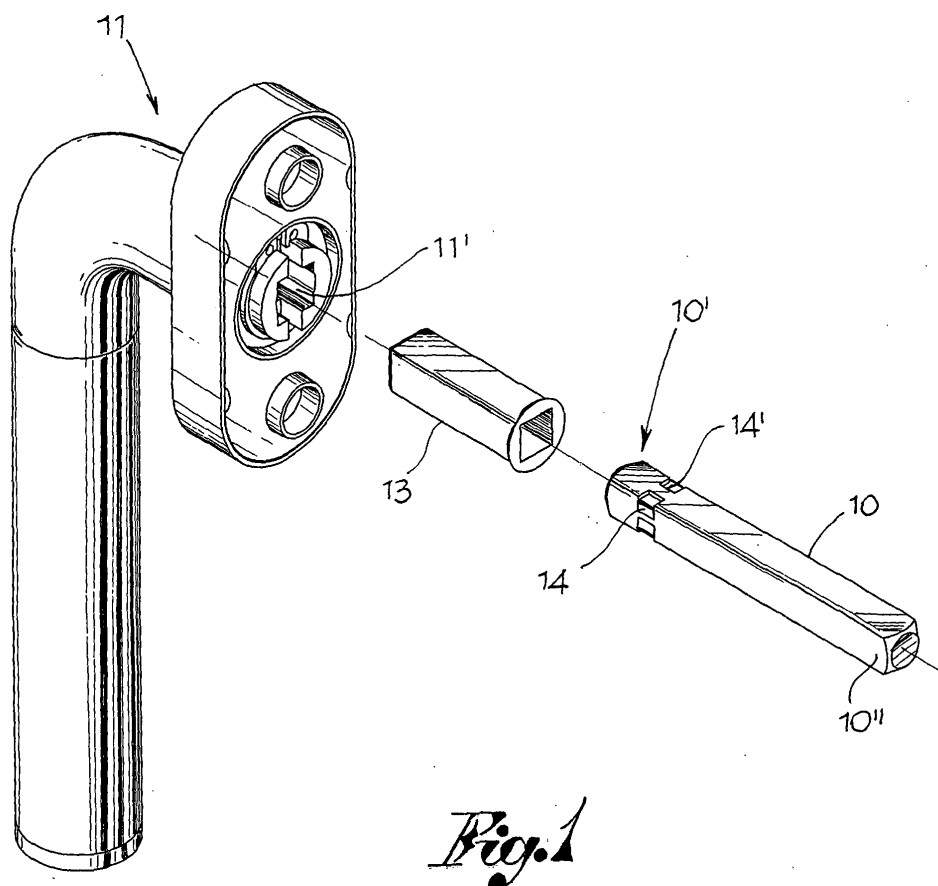
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(54) **Pin or rod for activating devices for opening and/or closing a door or window**

(57) The present invention regards a pin or rod (10) for activating devices for opening and/or closing doors and windows comprising an end section (10') destined to be inserted in a complementary adaptor (13) housed

in the device and provided with at least one radial projection (14) designed to achieve a forced fit between pin (10) and adaptor (13) to block the former inside the latter in a position determined on the basis of the thickness of the door or window.



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## Description

**[0001]** The present invention regards a pin or rod for activating devices for opening and/or closing of doors and windows, for example door or window handles.

**[0002]** As is known, a pin is inserted from one side in a seat in the handle and from the opposite side, protruding from the handle, in the door or window wherein this is applied. Since it may happen that the seats for the pin in the handle have different sizes, for example varying from country to country, certain manufacturers have decided to manufacture a single pin with the minimum section required involving the use of a capsule or adaptor destined to receive the pin and in turn to be housed in the seat of the handle.

**[0003]** However, if unification of the section of the pin has been obtained, the same thing may not be said for its length, as this depends on the thickness of the door or window which is not standardised. In practice, therefore, the handle manufacturers must in any case provide different pins depending on the applications, with obvious disadvantages for production, warehouse management, sales and assistance.

**[0004]** From the above it appears evident that a need has been perceived to be able to have a single pin available, which may be adapted not only in relation to its section but also in relation to the required length.

**[0005]** Starting from these premises, the aim of the present invention is to propose a pin or rod which has structural characteristics which are able to satisfy the abovementioned need in a simple, economic way.

**[0006]** This aim is obtained with a pin or rod described in claim 1, as well as with an adaptor described in claim 8 and with a device according to claim 10.

**[0007]** The idea behind the present invention is to achieve a calibrated interference or forced fit between the pin and the adaptor so that the former is forced into the latter and may be locked in a desired position depending on the thickness of the door or window. In other words, it is no longer necessary that the pin is inserted deep into the adaptor to obtain a solid assembly of the handle, but it may be stopped in any of the infinite intermediate positions. Thanks to the forced fit between the two pieces, the pin shall in any case be solidly fixed in its seat.

**[0008]** Then, the pin may be manufactured in a single length chosen so as to allow application to the entire range of doors and windows, from the thinnest, wherein, for example, the pin is pushed deep into the adaptor, to the thickest, wherein, for example, the pin is made to protrude to the maximum from the adaptor.

**[0009]** Further characteristics of the pin according to the present invention shall in any case be more evident from the following description of its preferred embodiment, provided by way of a non-limiting example, with reference to the attached drawings, wherein:

- figure 1 shows, in a perspective view, a square pin,

- an adaptor and a handle before assembly;
- figure 2 shows a view similar to figure 1, but from a different angle;
- figures 3 and 3a show only the square pin in a side and front view, respectively;
- figures 4 and 4a show only the adaptor in an axial section and in a frontal view, respectively;
- figure 5 shows, in a longitudinal section, the square pin inserted in an intermediate position into the adaptor; and
- figures 6 and 6a show, front view and an axial section, a buffer controlling the size of the square pin.

**[0010]** In said drawings, reference numeral 10 indicates a pin or rod, square for example, activating a handle 11 to be applied to the metal fitting 12 of a door or window. The pin 10 has an end section 10' destined to be inserted in a capsule or adaptor 13 in turn designed to be housed in a respective seat 11' formed in the handle 11. A part 10" of the pin 10 protruding from the adaptor 13 is inserted in a hole 12' of the metal fitting 12.

**[0011]** The adaptor or capsule 13 is manufactured from a plastic material, preferably the polyamide commercially known as PA66. This material is actually particularly resistant to wear, self-lubricating, rigid and resistant to traction and compression.

**[0012]** In accordance with the invention, the end section 10' of the pin 10 has, near to the end, at least one radial projection 14 which extends from the surface of the pin so as to realise a forced fit of the pin with the adaptor. In other words, the radial projection 14 determines an interference between the pin and the adaptor so as to still permit the insertion and sliding of the first into the second, but only exercising a certain pre-defined drive on the pin.

**[0013]** In a preferred embodiment of the invention, the pin 10 has a pair of radial projections 14 on each of its two opposing faces. Such radial projections 14 are in the form of teeth obtained by crushing or punching corresponding zones 14' of the faces of the pin near to the corners of the latter. Each tooth 14 is therefore oriented in parallel with the longitudinal axis of the pin and is of a height to realise the desired interference.

**[0014]** In figure 5 the pin 10 is shown as being partially inserted into the adaptor or capsule 13, with the teeth 14 touching the sides of the adaptor, slightly deforming them. In this condition, the pin 10 is securely fixed and blocked in the adaptor 13, without the need for it to be pushed to the bottom of the latter.

**[0015]** Since the height of the teeth 14 is decisive for the correct coupling of the pin-adaptor, it is advisable to use, after the operation of crushing or punching of the pin 10, a buffer 15 controlling the size of the teeth 14 of the type "go-no go". The buffer 15 is crossed axially by two coaxial openings 15', 15" of square section destined to receive the pin as a test, one (15') sized to determine the minimum height of the teeth 14, in other words the height below which a solid fit between the pin and adap-

tor will not be obtained, the other (15") designed however to establish the maximum height of the teeth, in other words the height above which the pin cannot be inserted and slid into the adaptor. In practice, the pin being tested must never enter the smaller opening 15', otherwise the teeth 14 are too low, while it must enter the larger opening 15", otherwise this means that the teeth are too high.

**[0016]** By way of a mere example, consider a square pin 10 with a side of 7 mm. If the handle has a seat with a side of 8 mm, the capsule or adaptor 13 will have an internal side of 7 mm and an external side of 8 mm, in other words a wall with a thickness of 0.5 mm. To obtain a correct interference between the pin and the adaptor, it is possible to manufacture teeth 14 0.25 mm high, so that the total space requirement for the pin is 7.5 mm. The "go/no go" buffer may have, for example, the opening 15' with a side of 7.45 mm and the opposite opening 15" with a side of 7.65 mm.

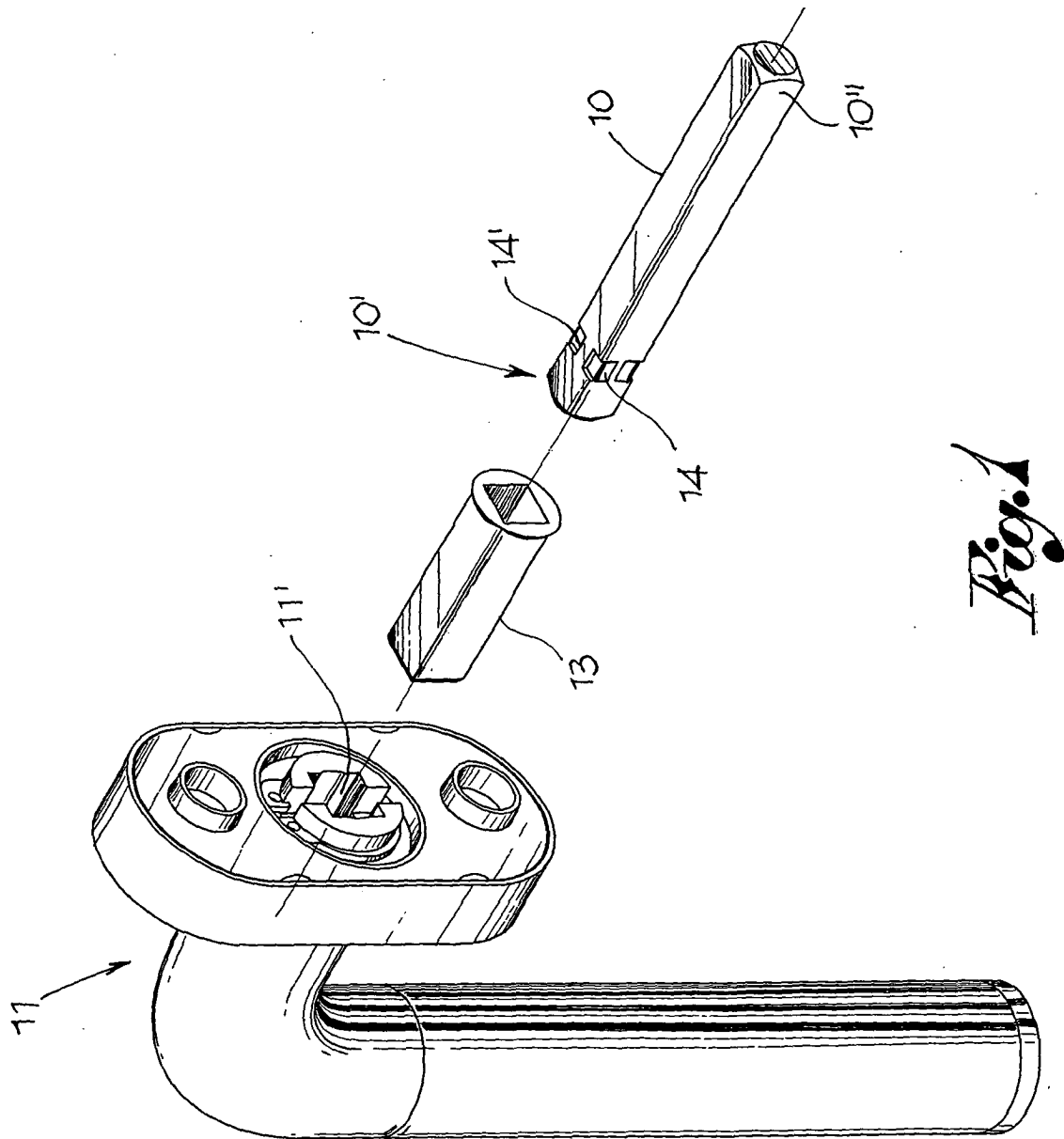
**[0017]** During the assembly stage, the end section 10' of the pin 10 with the radial projections is inserted into the capsule or adaptor 13, taking care to insert the pin 10 only slightly beyond said projections. The handle is then applied to the door or window 12, pushing the pin 10 into the relative hole 12' until the handle rests on the surface of the door or window itself. In this way, adjustment of the coupling between pin and adaptor takes place automatically.

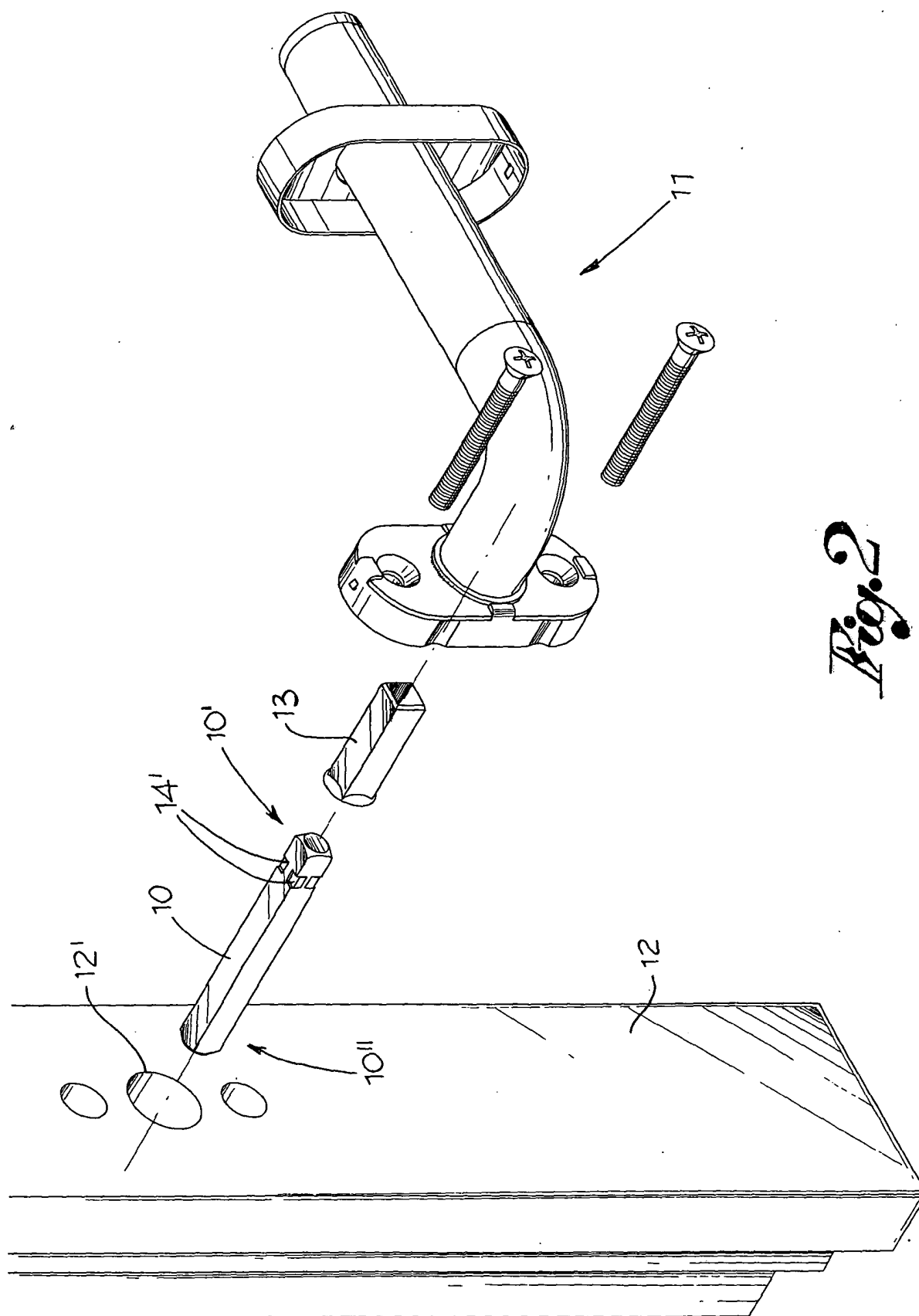
## Claims

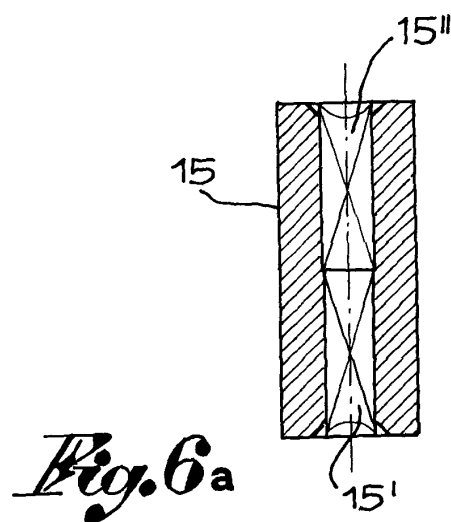
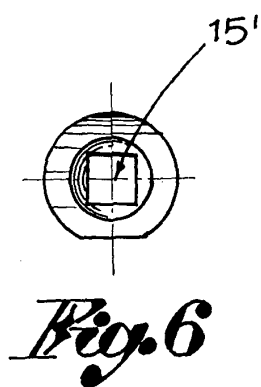
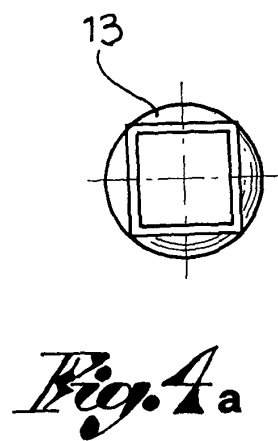
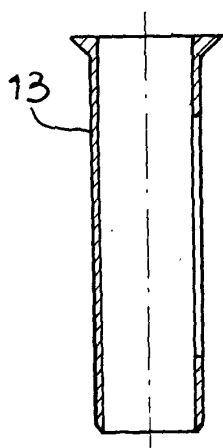
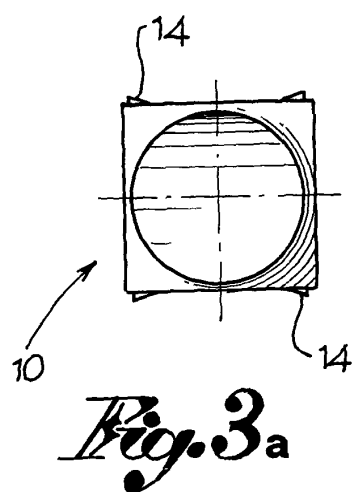
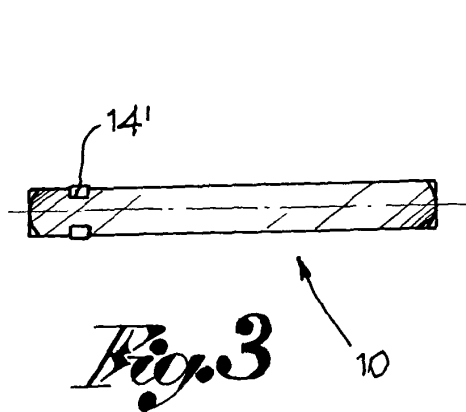
1. Pin activating devices for opening and/or closing doors and windows, comprising an end section intended to be inserted in a complementary adaptor housed in the device, the remaining portion protruding from said adaptor being intended to be inserted in a door or window wherein the device is applied, where said adaptor is manufactured in a crushable material, **characterised by** the fact that said end section has at least one radial projection designed to achieve a forced fit between the pin and adaptor to block the first inside the second in a position determined on the basis of the thickness of the door or window.
2. Pin according to claim 1, wherein at least one said projection extends from one face of the pin and comprises a tooth interfering with the adaptor.
3. Pin according to claim 2, wherein said tooth is oriented in parallel with the longitudinal axis of the pin.
4. Pin according to claim 3, wherein at least one projection is obtained by crushing or punching of a corresponding area of a face adjacent to the pin.
5. Pin according to claim 4, comprising at least one

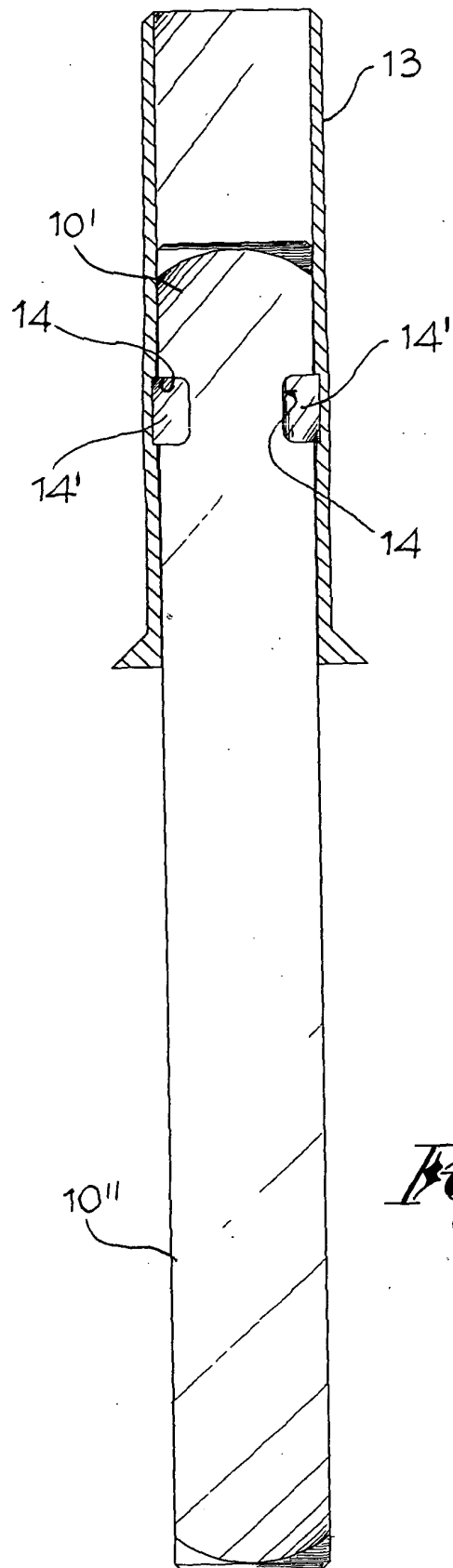
pair of projections protruding from one face of the pin, each pair of projections being obtained by crushing or punching two corresponding zones of the adjacent faces.

6. Pin according to claim 5, comprising two pairs of radial projections formed on opposite faces of the pin.
7. Pin according to any of the previous claims, **characterised by** the fact of having a square section.
8. Adaptor or capsule for devices for opening and/or closing of a door or window designed to receive a pin according to any of the previous claims, **characterised by** the fact of being manufactured in a plastic material.
9. Adaptor or capsule according to claim 8, wherein said plastic material is polyamide known commercially as PA66.
10. Device for opening and/or closing a door or window comprising a pin according to any of the claims from 1 to 7.
11. Device for opening and/or closing a door or window comprising an adaptor or capsule according to claim 8 or 9.
12. Device according to claim 10 or 11, comprising a handle designed to receive a pin or capsule according to claim 8 or 9 in turn designed to accommodate a pin according to any of the claims from 1 to 7.









*Fig. 5*



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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 42 5759

| 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) |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DE 299 07 745 U (HUWIL WERKE GMBH)<br>5 August 1999 (1999-08-05)<br>* page 1, paragraph 4; claims 1,9; figure 2 *                                                                                                            | 1-8,<br>10-12                                       | E05B3/00                                     |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                              |                                                     | E05B                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                              |                                                     |                                              |
| Place of search<br>Munich                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                              | Date of completion of the search<br>18 January 2005 | Examiner<br>Pieracci, A                      |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                                                                                              |                                                     |                                              |

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 42 5759

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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18-01-2005

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