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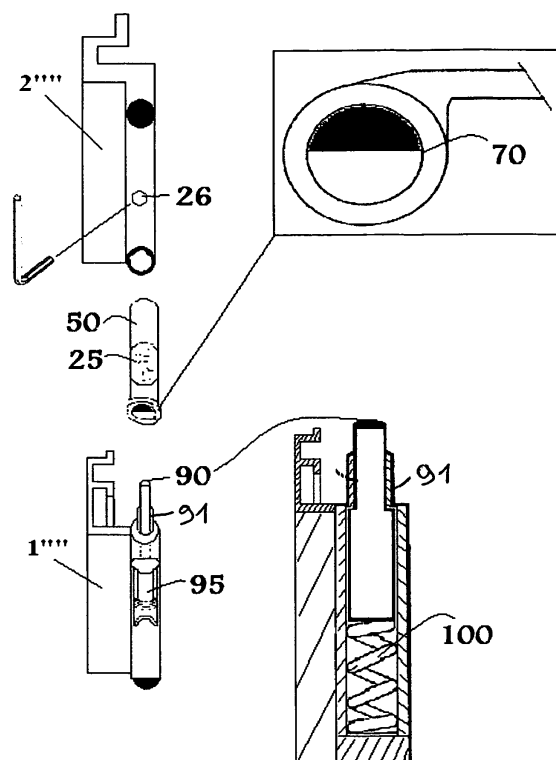
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This application was filed on 28-06-2011 as a divisional application to the application mentioned under INID code 62.

(54) **Locking hinge**

(57) A hinge is described, adapted to allow locking mobile frameworks and to operate as blind-stopper, window-stopper, opening restrictor, anti-theft device, door-stopper; the hinge is composed of a male hinge component (1, 1', 1'', 1''', 1''') and a female hinge component (2, 2', 2'', 2''', 2''') adapted to be operatively coupled with the male hinge component (1, 1', 1'', 1''', 1'''), that is equipped with a pin (6, 6', 6'', 6''', 90) that is partially shaped and partially smooth, while the female hinge component (2, 2', 2'', 2''', 2''') is equipped with a bush (1, 7', 7'', 7''', 70) shaped in order to allow, through the coupling with the shaped pin (6, 6', 6'', 6''', 90), an on-off latch movement of the hinge with consequent locking of the mobile framework in a plurality of positions in a range of rotation from 0° to 180° of the mobile framework around the hinge.

FIG. 5



Description

[0001] The present invention refers to a locking hinge, that is used in the field of frames for blinds, windows and doors.

[0002] Nowadays, several accessories of this type are marketed, but none of them has all requirements of this device of the "locking hinge" type.

[0003] The common, currently known blind-stopper frame has inconveniences such that it limits the opening block only at the 180-degrees position, with the consequent impossibility of locking the wing if there are possible obstacles present in the movement radius of the mobile framework. Other problems of known frames are those deriving from the scarcely safe assembly to be performed in the external wall of a building, with the additional risk of actuation by a user, that must project outwards in order to lock or unlock the wing.

[0004] Document US-A-4506408 filed on 26 March 1985 in the name of Dwight C. Brown discloses a hinge that comprises two main components, a female component with shaped bush and a male component with shaped pin. The relative movement of the female and male components generates a lock of the hinge by elastic interference of used materials: therefore, a clear limit of such disclosure is that the fastening device composed of such components operates by self-locking due to the thrust force exerted on the hinge. This implies that the hinge, once connected to the frame, has an effect of relative lock by interference of male and female components, and not an actual lock. It is therefore clear how such solution is particularly limiting.

[0005] Therefore, object of the present invention is providing an innovative device of the "locking hinge" type that solves the above-described inconveniences; in particular, object of the present invention is solving the complex operations during installation, since it can be easily applied from inside as a normal hinge in the framework and in the wing of the frame, and has the peculiarity that, upon need, it also acts as blind-stopper.

[0006] The inventive "locking hinge" is further able to be used as window-locker, thereby also acting as opening restrictor; moreover, when the internal window is closed, it can also operate as anti-theft lock, guaranteeing another safety at home. Precisely, when the internal frames are closed, it has the force of acting as side closing point.

[0007] The use of the "locking hinge" as blind-stopper allows locking the mobile framework in several positions, from 0° to 180°, thereby choosing the most functional and suitable position in a range from 0 to 32 points.

[0008] In particular, the "locking hinge" device is a set of components that, once joined, allow locking the mobile frameworks. Actually, the "locking hinge" device has an original final destination being an accessory with several applications: in the past, nobody ever thought of exploiting an hinge as blind-stopper but also, with further applications, such as window-stopper, opening restrictor, anti-

theft lock, internal food-locking device or swing-door stopper, that need to be stopped in one or several positions, making it an original and unique accessory when it operates.

[0009] The above and other objects and advantages of the invention, as will appear from the following description, are obtained with a locking hinge as claimed in Claim 1. Preferred embodiments and non-trivial variations of the present invention are claimed in the dependent Claims.

[0010] It is intended that all enclosed claims are an integral part of the present disclosure.

[0011] The present invention will be better described by some preferred embodiments thereof, given as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a schematic view of an example of the locking hinge of the present invention;
- Figure 2 is a perspective view of another example of the locking hinge of the invention with details of its operation;
- Figure 3 is an exploded perspective view of another example of the locking hinge of the invention applied to a frame;
- Figure 4 is a perspective view of another example of the locking hinge of the invention in its operating position; and
- Figure 5 is an exploded perspective view of a preferred embodiment of the locking hinge of the invention.

[0012] With reference to Figure 1, an example of the "locking hinge" system made of aluminium is of the type with two wings: therein the component 1 is called latch male hinge with star-type pin 6, the component 2 female hinge with star-type bush 7 that, in the shown embodiment, is with 32 positions, and the component 3 male hinge guide with on-off mechanism 5.

[0013] The functionalities that the example hinge allows obtaining are performed due to the particular arrangement of the pin 6, which, as can be well seen in Figure 1, is composed of a part with a shaped cross section (as a star with various tips, or with several geometric shapes, as shown) operating as lock and a part with circular cross section (namely with a smooth cylindrical pin, without tips or angles like in the lower part of the pin itself) operating as guide, as can be seen in all embodiments of Figures 1 to 5.

[0014] The component 3 is applied in the profile track without performing works, due to the quick fastening system 4; once locked, the component 1 is inserted inside the component 3, making the guide a single object with the latch male hinge. This allows performing the function of strongly supporting the hinge onto the profile, but with the function that, upon need, it can also operate as sliding latch through a spring-type ball that is inserted into one of the two holes 5' present in the component 3, thereby

allowing to keep the hinge open or closed.

[0015] In order to install the shown hinge, the mobile framework is then blocked by actuating the component 1 with recessed handle 8, guaranteeing an easy and comfortable use when operating for locking / unlocking the "locking hinge".

[0016] The system has the feature of acting as latch, with the purpose of actuating the male hinge 1 with start-type pin 6 that gets restrained inside the bush of the female hinge 2 with a star outline 7, in this case with 32 positions, thereby allowing to stop in several points, from 0 to 16, and therefore under different gradations, from 0 to 180 degrees, in the point deemed as most functional. The consequent locking of the mobile framework due to the shape of the pin 6 and the bush 2 composing the hinge can be made in several shapes: squared, hexagonal, octagonal and the like, or as a star with 16, 24 or other possible tips (as shown in part 7A of Figure 1) only aimed to set the most suitable positions.

[0017] With reference to Figure 2, another example of hinge with two wings is provided by a lever system where the component 1' is called lever-type latch male hinge 9 with star-type pin 6', the component 2' female hinge with star-type bush 7', and the component 10 hinge cover.

[0018] The components 1' and 9, once joined, are applied in the profile track without performing works due to the quick fastening system.

[0019] Also in this case, the functionalities that the example hinge allows obtaining are performed due to the particular arrangement of the pin 6', which, as can be well seen in Figure 2, is composed of a part with a shaped cross section (as a star with various tips, or with several geometric shapes, as shown) and a part with circular cross section (namely with a smooth cylindrical pin, without tips or angles like in the lower part of the pin itself). This different arrangement of the external surface of the pin 6' allows it to operate as described above.

[0020] The operating mechanism is different with respect to the first example, but, like the previous one, it has been devised in order to facilitate the end user in locking the mobile framework, by changing only the actuation with handling through a lever, by means of which, actually, a stronger thrust is obtained in the closing and opening movement of the "locking hinge" that, however, limits its use with open mobile framework. Therefore, this embodiment comprises only the functions of blind-stopper, window-stopper and internal doors stopper.

[0021] With reference to Figure 3, another example of the hinge with two wings is provided by a system of the cremone bolt type where the component 1'' is called male hinge with star-shaped pin 6'', the component 2'' female hinge with star-shaped bush 7'', the component 12 hinge-connecting plate, the component 13 cremone bolt or bush-hammer for handling band-type or rod-type ironmongery, and the component 10' hinge cover.

[0022] The components 1'' and 12 are applied in the profile track without performing works due to the quick fastening system.

[0023] Also in this embodiment, the functionalities that the example hinge allows obtaining are performed due to the particular arrangement of the pin 6'', which, as can be well seen in Figure 3, is composed of a part with a shaped cross section (as a star with various tips, or with several geometric shapes, as shown) and a part with circular cross section (namely with a smooth cylindrical pin, without tips or angles like in the lower part of the pin itself). This different arrangement of the external surface of the pin 6'' allows it to operate as described above.

[0024] The operating mechanism is different with respect to the first and the second examples. Also this has been devised in order to facilitate the end user in locking the mobile framework, and only the handling actuation changes, since it must be directly made by the bush-hammer or the cremone bolt 13 with which, actually, an easy use is made when locking the wing, thereby simplifying the on-off actuation operation.

[0025] With reference to Figure 4, another example is a hinge with three wings. This system allows two simultaneous solutions: the first one performs the function of a normal hinge, the second one performs the lock of the mobile framework.

[0026] The component 1''' is called latch hinge with star-shaped pin 6''', the component 14 on-off driving block, the component 15 male hinge, the component 2''' female hinge with star-shaped bush 7''', the component 16 rounded pin, and the component 17 socket head screw dowel.

[0027] The component 1''', once joined to the component 14, is applied in the profile track without performing works; once having obtained its position, the block 14 is fixed by acting on the pre-assembled dowel with a socket head screw key 2,5 thereby allowing the open/closed (on-off) operation of the latch mechanism. The component 15, male hinge, operates as a normal hinge keeping the framework strongly onto the wing 2'', while the component 6''', called "star-type pin", starts operating when the component 14 is closed (off), thereby allowing to block the wind through its engagement inside the component "female hinge" 2''' that, due to the star-shaped bush 7''', allows positions in different points, and therefore different degrees.

[0028] The component 17 called "socket head screw dowel" allows locking the pin 6''' making it an anti-theft device and, in case of need, allows separating the wing from the framework of the frame without disassembling the hinge, by simply withdrawing the pin 6'''.

[0029] Also in this case, the functionalities that the example hinge allows obtaining are performed due to the particular arrangement of the pin 6''', which, as can be well seen in Figure 4, is composed of a part with a shaped cross section (as a star with various tips, or with several geometric shapes, as shown) and a part with circular cross section (namely with a smooth cylindrical pin, without tips or angles like in the lower part of the pin itself). This different arrangement of the external surface of the pin 6''' allows it to operate as described above.

[0030] With reference to Figure 5, an embodiment is shown of the "locking hinge" device, in particular a self-locking system, in which the component 1^{'''} is called male hinge with half-moon shaped pin 90 of the latch type, equipped with an external concentric pin 91, that allows the hinge to operate as normal hinge. The component 2^{'''}, called female hinge, with independent bush 50 with a half-moon 70 inside that is recessed with respect thereto, is composed of a mechanism for adjusting the centre-distance 25 recessed therein, in order to allow the screw 26 placed on the neck of the hinge to lock the rotation of the bush 50.

[0031] The self-locking hinge device is actuated due to a spring 100 present inside the male hinge 1^{'''}: such spring 100 allows the pin 90 to be extended and locked inside the bush 70. This happens when the two halves are mutually axial, and therefore while the hinge performs the end of the rotation by being blocked. The hinge, and therefore also the wing, is unlocked, and this could also occur through a handle (not shown) connected to the pin 90, guaranteeing an easy and comfortable use in the unlocking actuation of the "locking hinge".

[0032] In this case, the functionalities that the inventive hinge allows obtaining are performed due to the particular arrangement of the pin 90, which, as can be well seen in Figure 5, is composed of a part with a half-moon shaped cross section and a part 91 with circular cross section (namely with a smooth cylindrical pin). This different arrangement of the external surface of the pin 90 allows it to operate as described above.

[0033] The system has the feature that the hinge pin automatically operates, with the function of actuating the half-moon shaped pin 90 of the male hinge 1^{'''}, that gets restrained inside the bush 70 of the female hinge 2^{'''} thereby allowing a stop in a certain point, but with the chance of adjusting the stop in different gradations from 0 to 180 degrees, in the point deemed as most functional due to the independent bush 50, adjustable inside the hinge 2^{'''} by the bush-screw 25, 26 device.

[0034] A different shape or position of the devices forming the self-locking hinge can anyway be found without departing from the present inventive concept of blind-, window- and door-stopper.

[0035] The various embodiments does not include specific measures and can be made for every family of profiles, with its specific characteristics, keeping unchanged the functions of the "locking hinge".

[0036] The inventive hinge is preferably made of aluminium, or steel, or iron, or plastics, or brass.

[0037] The listed embodiments show that the "locking hinge" system can be made with different geometric configurations and can be adapted, regarding both shape and sizes, to any swing-door opening but, according to claim 1, it is foreseen that the final concept always remains the same, namely being able to block and/or stop and/or lock the mobile framework in its preferred position.

Claims

1. Hinge adapted to allow locking mobile frameworks and to operate as blind-stopper, window-stopper, opening restrictor, anti-theft device, door-stopper, said hinge being composed of a male hinge component (1^{'''}) and a female hinge component (2^{'''}) adapted to be operatively coupled with said male hinge component (1^{'''}), said male hinge component (1^{'''}) being equipped with a pin (90) composed of a part with external shaped surface operating as lock, and a part with external smooth surface operating as guide, said female hinge component (2^{'''}) being equipped with a bush (70) shaped in order to allow, through coupling with the shaped part of said pin (90), an on-off latch-type movement of the hinge with consequent locking of the mobile framework in a plurality of positions in a rotation range from 0° to 180° of the mobile framework around the hinge, **characterised in that** said male hinge (1^{'''}) is equipped with a half-moon shaped pin (90) equipped with an external concentric pin (91) that allows the hinge to operate as normal hinge, said female hinge (2^{'''}) with independent bush (50) having a half-moon (70) inside that is recessed with respect thereto, and is composed of a mechanism for adjusting the centre-distance (25) recessed in the same bush (50) in order to allow a screw (26) placed on the neck of the hinge to block the rotation of the bush (50), the self-locking hinge being actuated due to a spring (100) present inside the male hinge (1^{'''}), such spring (100) allowing the pin (90) to be extended and blocked inside the bush (70) when the two halves are mutually axial, the hinge performing the end of the rotation being blocked since the hinge pin automatically operates, with the function of actuating the half-moon shaped pin (90) of the male hinge (1^{'''}) that gets restrained inside the bush (70) of the female hinge (2^{'''}) thereby allowing a stop in a certain point, but with the chance of adjusting the stop in different gradations from 0 to 180 degrees, in the point deemed as most functional due to the independent bush (50), adjustable inside the hinge (2^{'''}) by the bush-screw (25, 26) device.
2. Hinge according to claim 1, **characterised in that** it is made of aluminium, or steel, or iron, or plastics, or brass.
3. Hinge according to claim 1, **characterised in that** it is of the type with two wings (1^{'''}, 2^{'''}).
4. Hinge according to any one of the previous claims, **characterised in that** it is further equipped with a hinge cover (10).

FIG. 1

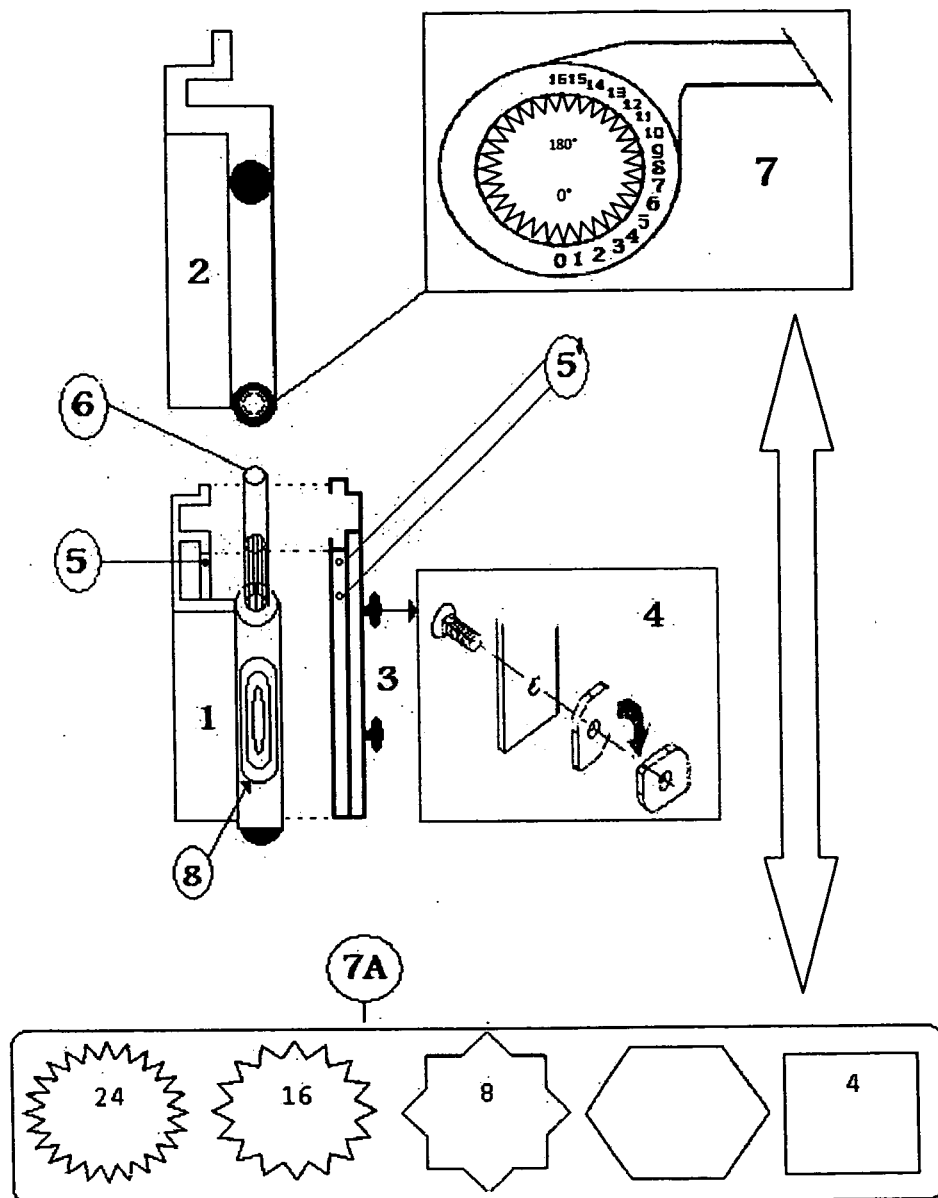


FIG. 2

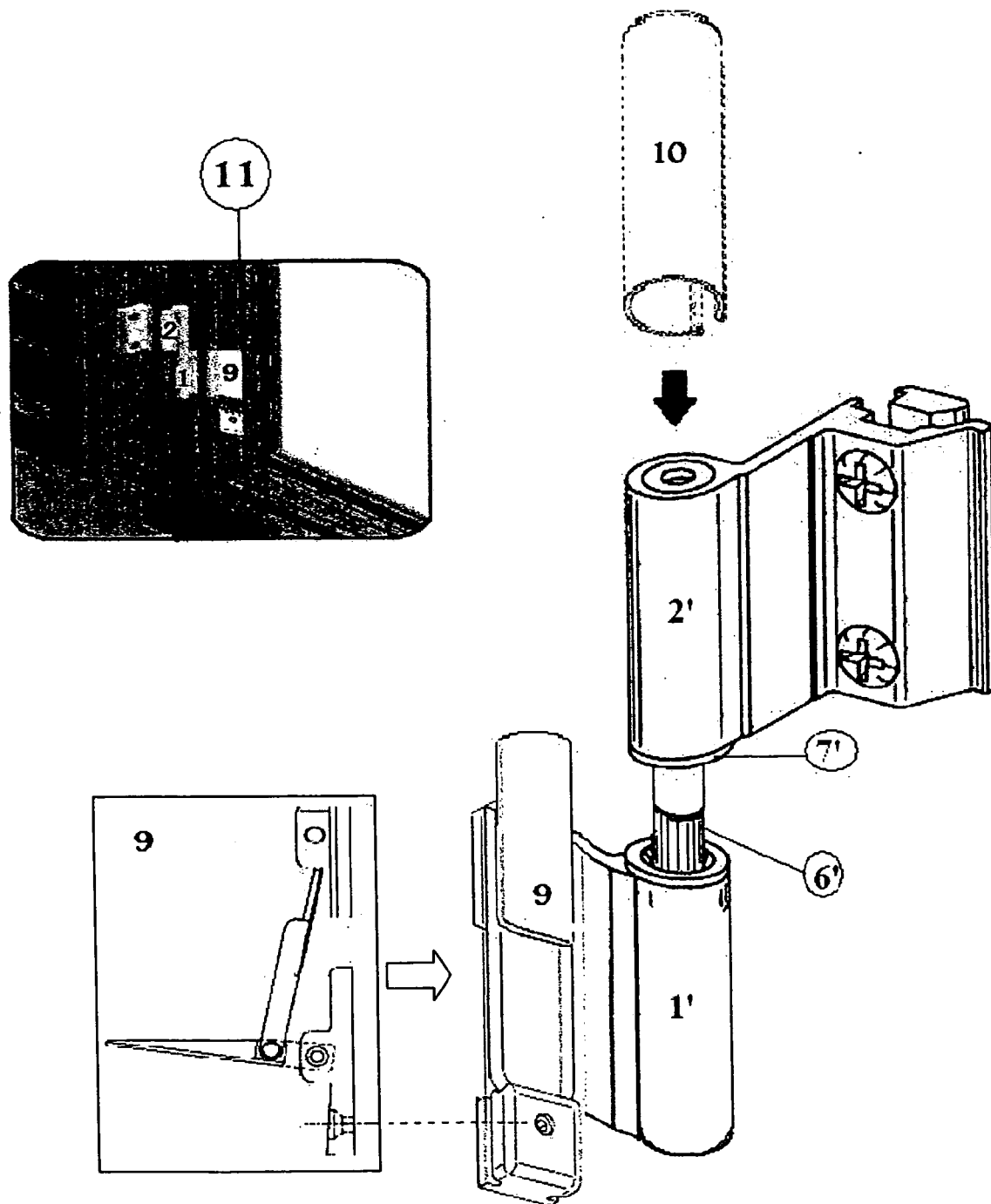


FIG. 3

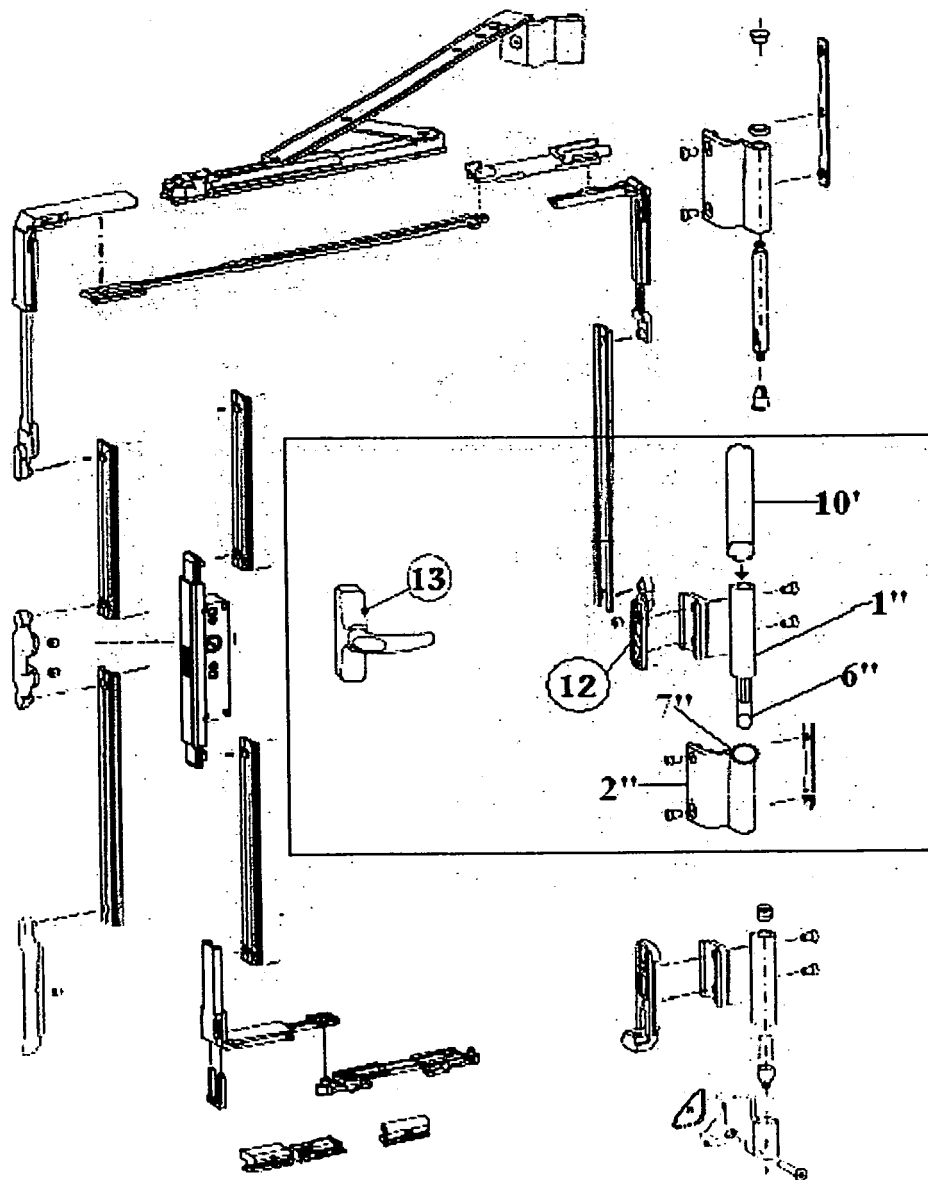


FIG. 4

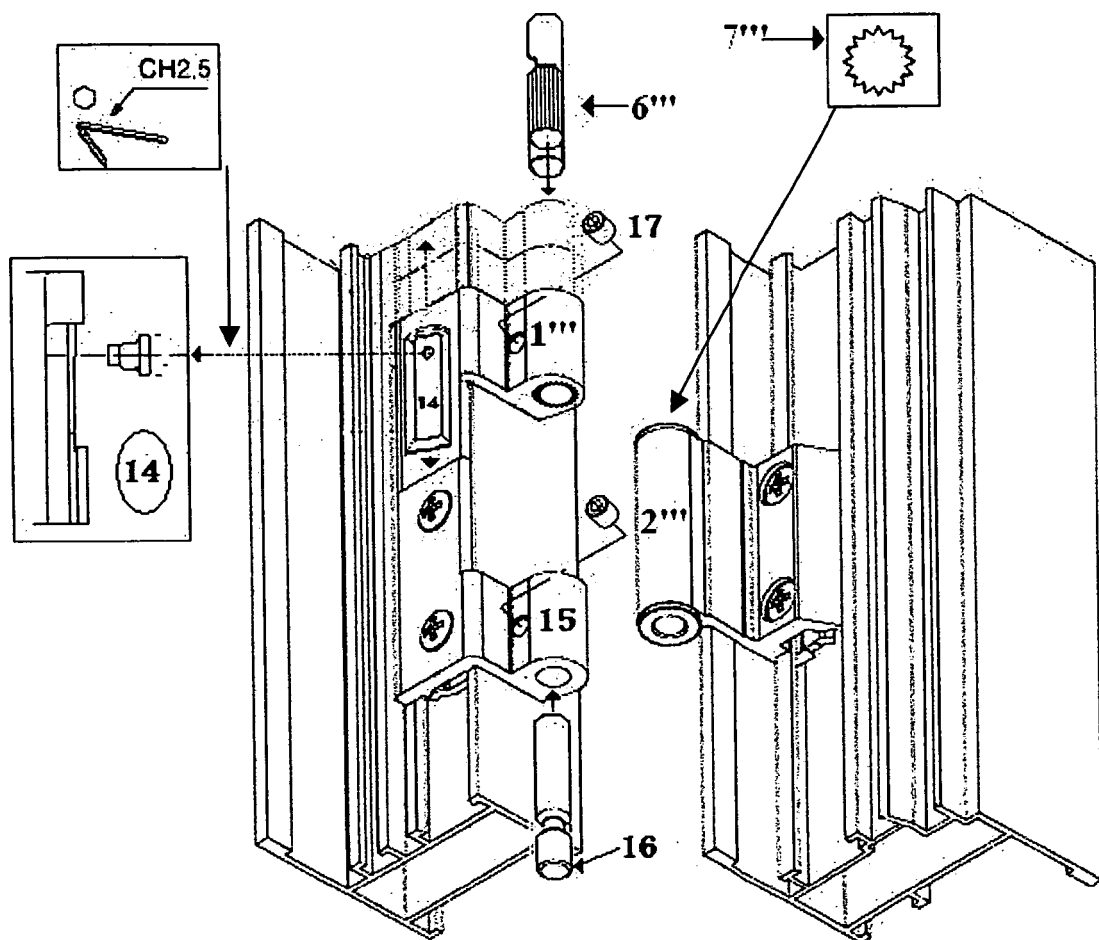
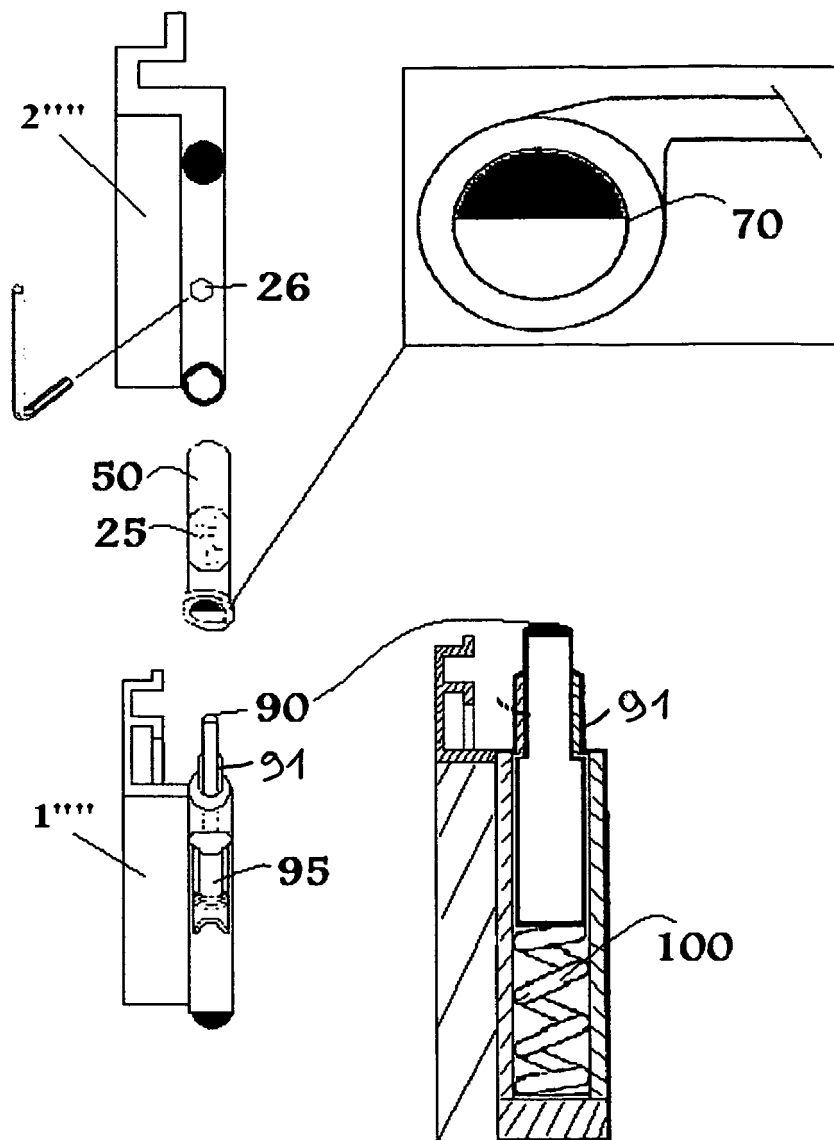


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 11 00 5229

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 468 660 C (KARL WEIER) 17 November 1928 (1928-11-17) * page 1, lines 37-73 * * figures 1,3 * -----	1-4	INV. E05D11/10 E05D7/00
A	CH 151 236 A (ACHERMANN JOSEF [CH]) 15 December 1931 (1931-12-15) * page 2, column 1, lines 7-30 * * figures 2-4 *	1-4	
A	DE 508 865 C (ALBERT BRUGGER; JOSEF FRITZ) 20 October 1930 (1930-10-20) * page 1, lines 35-80 * * figures 1,3,4 *	1-4	
A	DE 198 58 709 A1 (KERMI GMBH [DE]) 29 June 2000 (2000-06-29) * column 4, lines 49-59 * * figure 1 * -----	1-3	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
Place of search		Date of completion of the search	Examiner
The Hague		12 September 2011	Wagner, Andrea
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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EPO FORM 1503 03.82 (P04C01)

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

EP 11 00 5229

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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12-09-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 468660	C	17-11-1928	NONE
CH 151236	A	15-12-1931	NONE
DE 508865	C	20-10-1930	NONE
DE 19858709	A1	29-06-2000	NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4506408 A [0004]