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(54) **HINGE**

(57) Hinge for furniture elements, or window and door frames, with a fixed or substantially fixed structure (14) and a mobile element (12), the hinge comprising a first hinging unit (18) and a second hinging unit (20) suitable

to be associated respectively with the fixed structure (14) and with the mobile element (12), and articulated with respect to each other by means of an articulation member (22).

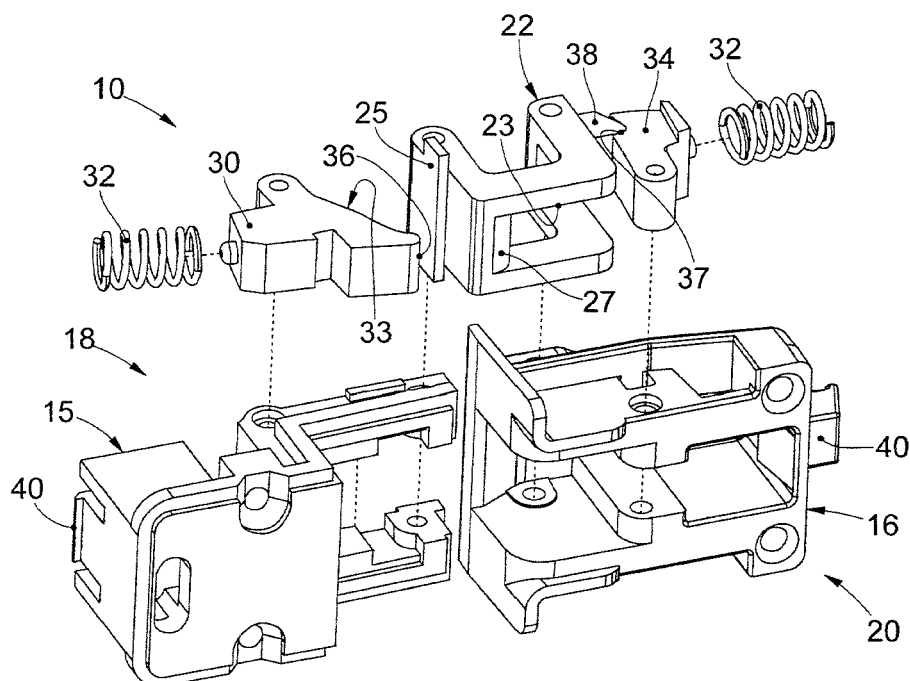


fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a hinge to connect a mobile element, for example a door, a panel or suchlike, to a fixed or substantially fixed structure.

BACKGROUND OF THE INVENTION

[0002] Hinges are known, used for furniture elements, for example rooms, wardrobes or other components able to constitute a containing compartment, made of a fixed, or substantially fixed structure, and at least one mobile element.

[0003] The hinges connect the mobile element to the fixed structure to make it possible to close or open the containing compartment.

[0004] It often happens that the operation to attach the hinges can be long and complicated, and may need to use specific tools.

[0005] It is known that in a furniture element the mobile element can be opened to an amplitude of 90°.

[0006] In particular, hinges usually subtract space inside the containing compartment when the mobile element is open.

[0007] Furthermore, when the containing compartment is in the closed position, the mobile element, if not closed by a lock, is easily opened by unwanted external agents, for example the wind, or by external subjects, for example animals.

[0008] Apart from this, known hinges are made of metal, thus increasing the production costs and the overall weight of the furniture element.

[0009] Furthermore, known hinges are made of several components that are coupled with each other, which makes it difficult to manage the storage and transport of said hinges.

[0010] One purpose of the present invention is to obtain a hinge that is easy to install and that can be repositioned over time in different positions.

[0011] Another purpose is to obtain a hinge that facilitates the management of storage and transport operations.

[0012] Another purpose of the present invention is to obtain a hinge that allows to open the mobile element by more than the amplitude of 90° and that when the containing compartment is closed the mobile element is closed in equilibrium.

[0013] Another purpose of the present invention is to obtain a hinge that when the mobile element is open at 90° remains stably in position.

[0014] Another purpose of the present invention is to obtain a hinge that in both the closed position and in the open position of the mobile element does not create encumbrance inside the containing compartment and is also stable.

[0015] Another purpose is to obtain a hinge that allows

selective access inside the containing compartment.

[0016] Another purpose is to obtain a hinge with limited cost.

[0017] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0018] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0019] In accordance with the above purposes, the present invention concerns a hinge for furniture elements, or window and door frames, with a fixed structure and a mobile element, the hinge comprising a first hinging unit and a second hinging unit cooperating with each other.

[0020] The first hinging unit and second hinging unit are respectively associated with the fixed structure and with the mobile element, and are articulated with respect to each other by means of an intermediate articulation member.

[0021] The hinge has a reduced thickness and is therefore suitable to be applied in the thickness of the mobile element and/or the wall of the fixed structure.

[0022] The first hinging unit and the second hinging unit are strictly connected to each other to define an inseparable unit. This renders the operations to store and transport the hinges particularly simple.

[0023] According to the invention, the hinge is structured to admit an opening of the mobile element of 90°.

[0024] According to one embodiment, the hinge has means to open at least up to 155°.

[0025] According to another aspect of the present invention, at least one hinging unit comprises cam means suitable to stabilize at least one position of the remaining hinging unit and/or of the mobile element.

[0026] According to one embodiment, the fixed structure and the mobile element have housing seatings inside which the first hinging unit and the second hinging unit are present, that is, contained.

[0027] Advantageously, the hinge, in the open position, is not protruding into the compartment and does not cause encumbrances.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is an exploded perspective view of a hinge;
- fig. 2 is a section view of a hinge in a first operating

- position;
- fig. 3 is a section view of the hinge in a second operating position;
- fig. 4 is a section view of the hinge in a transition position;
- fig. 5 is a section view of the hinge in a third operating position.

[0029] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0030] Embodiments described here in figs. 1-5 concern a hinge 10 that according to the present invention is suitable to be used to articulate a generic mobile element 12, such as for example a door or a panel of a furniture element, or a window or door frame, with respect to a fixed structure 14.

[0031] The fixed structure 14 consists of a frame of a door or window or furniture element, which defines a containing compartment, between a first position (fig. 2), or closed position, in which the mobile element 12 is closed with respect to the fixed structure 14, and at least one other position.

[0032] This other position is a second position (fig. 3), or position of first opening, in which the mobile element 12 is rotated around a first angle α with respect to the fixed structure 14, and possibly a third position (fig. 5), or position of further opening, in which the mobile element 12 is rotated with an amplitude equal to at least a second angle β with respect to the fixed structure 14.

[0033] According to one solution of the present invention, the angle α is around 90° , while the angle β can be up to around 155° or more.

[0034] The hinge 10 comprises a first hinging unit 18 and a second hinging unit 20 suitable to be respectively associated with the fixed structure 14 and with the mobile element 12.

[0035] In the case shown, the hinge 10 is located inside the wall of the fixed structure 14 and inside the wall of the mobile element 12, so as to not be seen, nor to create obstacles either in the closed position, that is when the compartment is closed, or in the open position.

[0036] In the cases shown, the fixed structure 14 and the mobile element 12 have the walls conformed with housing seatings 28 that are located inside the respective thicknesses; the housing seatings 28 are suitable to house, that is, contain inside them, the first hinging unit 18 and the second hinging unit 20. This means that the hinge 10 does not protrude into the compartment.

[0037] The first hinging unit 18 and the second hinging unit 20 comprise respectively a first containing body 15 and a second containing body 16.

[0038] The first hinging unit 18 and the second hinging unit 20 are articulated by means of an articulation member 22 that anchors in the respective hinging units 18, 20, in particular in the first containing body 15 and in the second containing body 16.

[0039] The first hinging unit 18 has a first pin 24 on which the articulation member 22 is hinged.

[0040] The second hinging unit 20 has a second pin 26 that cooperates with the articulation member 22.

[0041] The first pin 24 and the second pin 26 are located in practice on the same plane in proximity to one wall, which wall is in a position external to the hinge 10 in an assembled condition.

[0042] The articulation member 22 has a C-shaped, or arc shaped, cross section.

[0043] The first pin 24 cooperates with a contrast element 25, with which the articulation member 22 is provided, and which determines the final positioning of the articulation member 22 when the hinge 10 is open.

[0044] When the hinge 10 is normally completely open, it has a rotation of about 90° and the structure of the hinge 10 allows to obtain a further and greater opening.

[0045] There is also a first cam 30 in the first hinging unit 18, hinged to the first containing body 15 in the pin 31 and on the same side as the first pin 24.

[0046] The first cam 30 is elastically contrasted by a spring 32 toward the articulation member 22 and has a stop tooth 36 and a cam profile 33 which, operating on one portion 27 of the articulation member 22 and/or cooperating with the contrast element 25, control the movement of the first cam 30.

[0047] When the articulation member 22 is in abutment with the contrast element 25 on the first containing body 15, the first cam 30 holds it in position.

[0048] The articulation member 22 has a tooth 38 in association with the second pin 26 which extends substantially parallel to the wall of the second hinging unit 20 when this is open at the first angle α .

[0049] There is a second cam 34 present in the second hinging unit 20.

[0050] When the second hinging unit 20 is open at the first angle α , the tooth 38 is located in a shaped seating 37 of the second cam 34, elastically contrasted by another spring 32 toward the articulation member 22, determining the clamping of the mobile element 12 that does not move even if there are external agents present.

[0051] The second cam 34 is hinged with a pin 35 to the second containing body 16 located in the upper part of the second hinging unit 20, that is, in an opposite position with respect to the second pin 26.

[0052] In accordance with embodiments described here, the articulation member 22 can have a through cavity 23 configured to allow to house the first cam 30 while the articulation member 22 is inactive in the closed position or is sliding through the cavity 23 to determine the opening of the compartment.

[0053] In one embodiment, the hinge 10 can be at least partly made of plastic material suitable to resist the forces

in play.

[0054] The coherence of materials between the mobile element 12, the fixed structure 14 and the hinge 10 confer continuity to the surfaces, giving a certain esthetic value, for example, to a furniture element.

[0055] In accordance with embodiments described here, the first hinging unit 18 and the second hinging unit 20 have protruding elements 40 to determine a joint respectively with the fixed structure 14 and the mobile element 12 and advantageously facilitate the assembly of the hinge 10 in a removable way.

[0056] The hinge 10 as described heretofore functions as follows.

[0057] In the closed position the first cam 30 constrains the articulation member 22, and therefore also the mobile element 12, to remain fixed and stable in the closed position.

[0058] In the second hinging unit 20 the tooth 38 is inserted in the shaped seating 37 of the second cam 34.

[0059] In this way, advantageously, the hinge 10 does not rotate, thus preventing the mobile element 12 from opening accidentally.

[0060] By making the mobile element 12 rotate gradually by a first angle α with respect to the fixed structure 14 to bring it from the closed position to the first open position, shown in fig. 3, the second hinging unit 20 is integral with respect to the articulation member 22 and is rotated with respect to the first hinging unit 18 around the first pin 24.

[0061] The integral rotation of the second hinging unit 20 with the articulation member 22 is determined by the coupling of the tooth 38 with the shaped seating 37 of the second cam 34.

[0062] In this case it is necessary to exert a certain force to overcome the constraint exerted by the first cam 30 and determine the sliding of the articulation member 22 along the cam profile 33 until the stop tooth 36 is constrained.

[0063] In this way, the mobile element 12 reaches a position of first stabilized opening.

[0064] By making the mobile element 12 rotate further with respect to the fixed structure 14, that is, by an amplitude equal to a second angle β , the mobile element 12 is brought from the position of first opening to the position of further opening, shown in figs. 4 and 5.

[0065] By exerting a sufficient force to overcome the constraint exerted by the tooth 38, inserted in the shaped seating 37 of the second cam 34, it is possible to determine the rotation of the second hinging unit 20 around the second pin 26, while the articulation member 22 is integral in abutment with the first containing body 15 by means of the contrast element 25.

[0066] In this way, the tooth 38 is free to slide along the profile of the second cam 34 to an amplitude corresponding to the maximum value of the second angle β .

[0067] It is clear that modifications and/or additions of parts may be made to the hinge 10 as described heretofore, without departing from the field and scope of the

present invention.

[0068] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of hinge 10, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Hinge for furniture elements, or window and door frames, with a fixed or substantially fixed structure (14) and a mobile element (12), said hinge comprising a first hinging unit (18) and a second hinging unit (20) suitable to be associated respectively with said fixed structure (14) and with said mobile element (12), and articulated with respect to each other by means of an articulation member (22), **characterized in that** at least one of either the first hinging unit or the second hinging unit (18, 20) comprises a cam (30, 34) suitable to stabilize at least one position of the other hinging unit (20, 18) and/or said mobile element (12) and suitable to allow an opening of said mobile element (12) in a position of first opening around a first angle (α).
2. Hinge as in claim 1, **characterized in that** said hinge has means to open said other second hinging unit (20, 18) and/or said mobile element (12) in a position of further opening of at least a second angle (β).
3. Hinge as in claim 1 or 2, **characterized in that** said first angle (α) is about 90°.
4. Hinge as in claim 2 or 3, **characterized in that** said second angle (β) reaches about 155° or more.
5. Hinge as in any claim hereinbefore, **characterized in that** said first hinging unit (18) has a first pin (24) on which said articulation member (22) is hinged, having a contrast element (25), said articulation member (22) being substantially C-shaped and cooperating with a second pin (26) associated with said second hinging unit (20).
6. Hinge as in claim 5 **characterized in that** said articulation member (22) has a tooth (38) in association with said second pin (26).
7. Hinge as in claim 5, **characterized in that** said contrast element (25) cooperates with a first cam (30) elastically pressed toward said articulation member (22), said first cam (30) being present in said first hinging unit (18).
8. Hinge as claim 6, **characterized in that** said tooth

(38) cooperates with a second cam (34) elastically pressed toward said articulation member (22), said second cam (34) being present in said second hinging unit (20).

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9. Hinge as in any claim hereinbefore, **characterized in that** it is made at least partly of plastic material.

10. Hinge as in any claim hereinbefore, **characterized in that** said first hinging unit (18) and said second hinging unit (20) have protruding elements (40) to determine a joint respectively with said fixed structure (14) and with said mobile element (12) in a removable manner.

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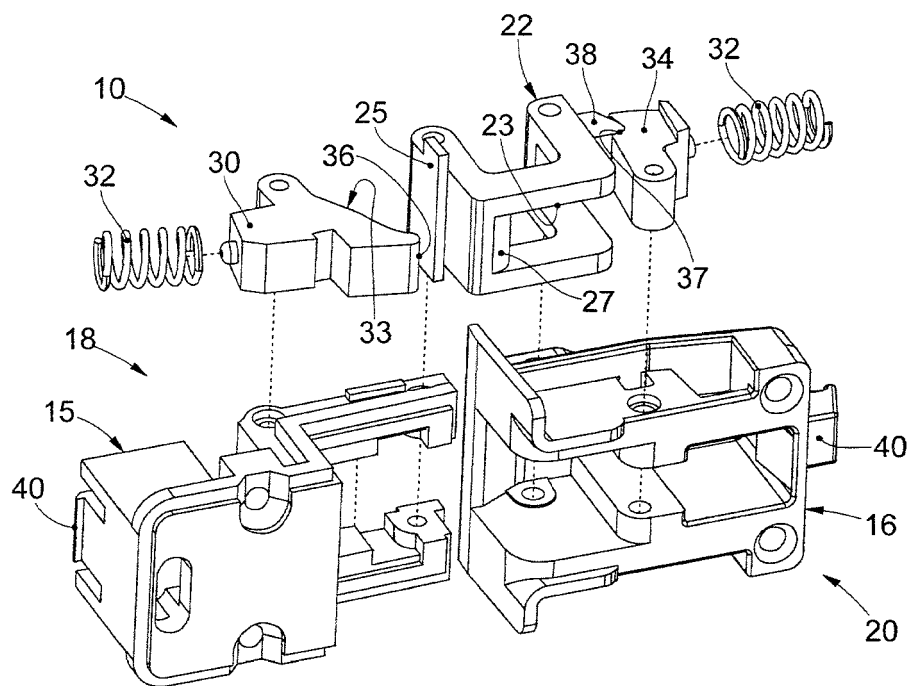


fig. 1

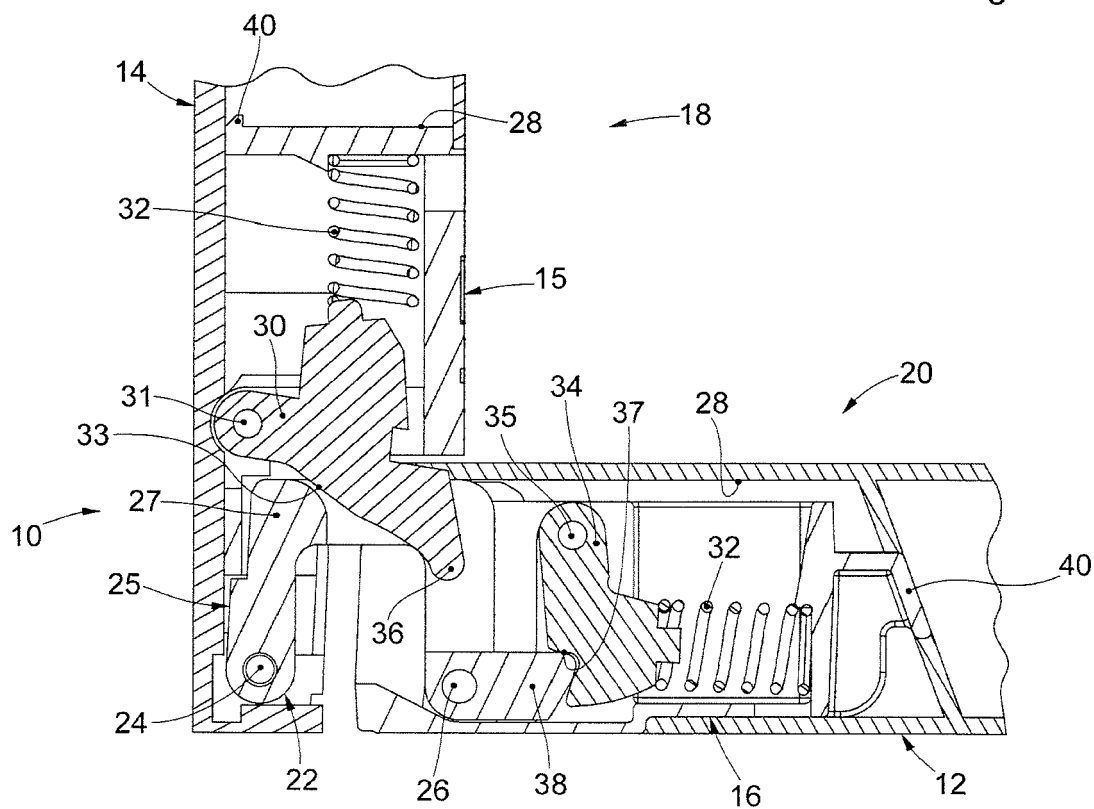


fig. 2

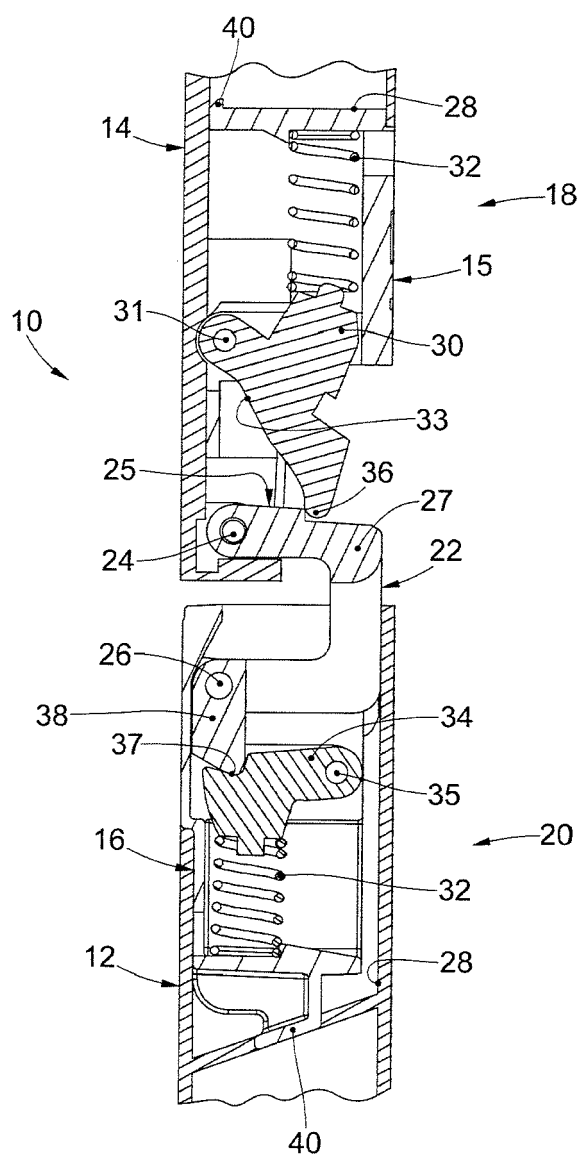


fig. 3

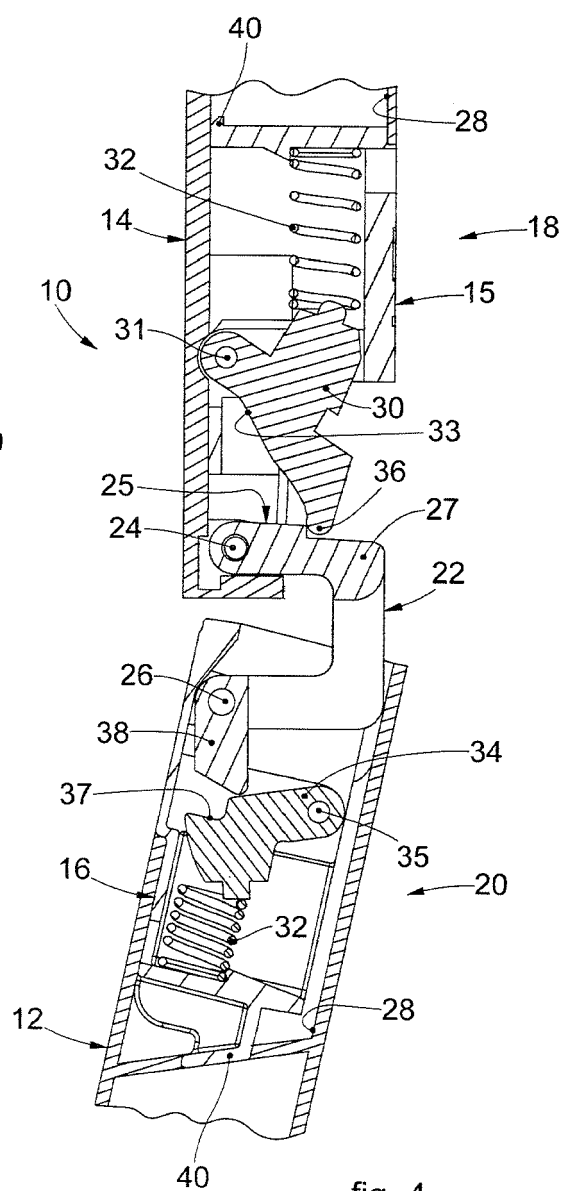


fig. 4

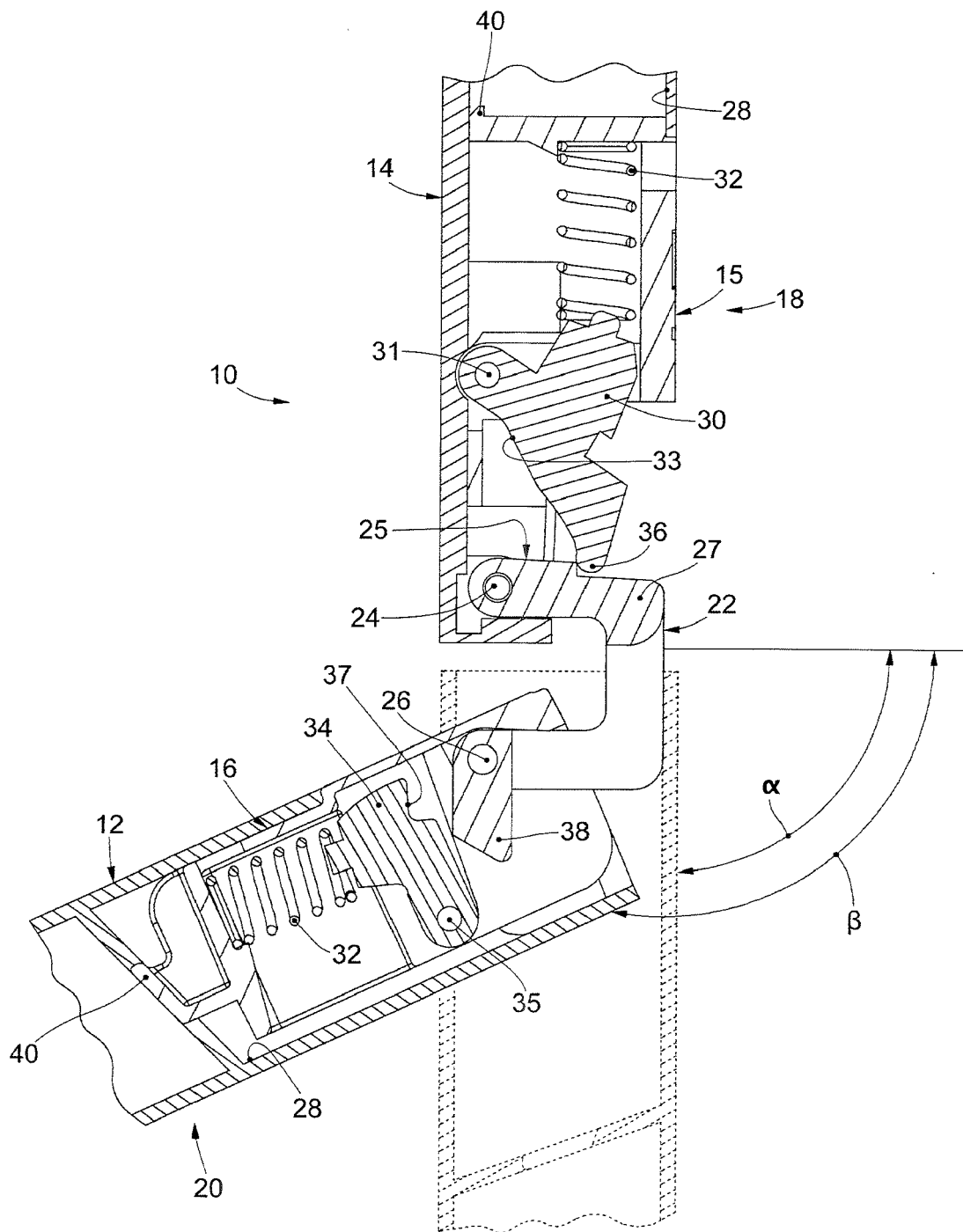


fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 17 17 2596

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 206 859 A1 (GUIDOTTI DANTE) 30 December 1986 (1986-12-30)	1-8,10	INV. E05D3/12 E05D11/10
A	* column 2, line 41 - column 4, line 4 * * figures 1,3,5-7 * * column 4, line 50 - column 5, line 3 *	9	
X	JP 2007 211577 A (NISHITANI HITOSHI) 23 August 2007 (2007-08-23)	1-6,9,10	
A	* abstract; figures 1-8 *	7,8	
X	DE 20 2005 000064 U1 (HAHN GMBH & CO KG DR [DE]) 24 May 2006 (2006-05-24)	1-6,9	TECHNICAL FIELDS SEARCHED (IPC) E05D
A	* paragraphs [0027], [0029], [0031] - [0034], [0037] - [0040] * * figures 1-4 *	7,8,10	
X	EP 2 628 992 A1 (HERBERT FRANCK [FR]; PROVOST JEAN-CLAUDE [FR]) 21 August 2013 (2013-08-21)	1-4,9	
A	* paragraphs [0001], [0020], [0021], [0023], [0024], [0037], [0043] - [0045] * * figures 1,6,12,14,19 *	5-8,10	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 27 September 2017	Examiner 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	

EPO FORM 1503 03.82 (P04C01)

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

EP 17 17 2596

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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27-09-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0206859 A1	30-12-1986	DE 3664657 D1 EP 0206859 A1 FR 2582342 A1	31-08-1989 30-12-1986 28-11-1986
JP 2007211577 A	23-08-2007	JP 4071262 B2 JP 2007211577 A	02-04-2008 23-08-2007
DE 202005000064 U1	24-05-2006	AT 424498 T CN 101076647 A DE 202005000064 U1 DK 1834059 T3 EP 1834059 A1 RU 2369710 C2 WO 2006072331 A1	15-03-2009 21-11-2007 24-05-2006 29-06-2009 19-09-2007 10-10-2009 13-07-2006
EP 2628992 A1	21-08-2013	EP 2628992 A1 FR 2986839 A1	21-08-2013 16-08-2013