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(54) **Clamping device for a covering element**

(57) Clamping device for a covering element (12), selectively movable between at least a closed position in which it is disposed folded back, and an open position in which it is disposed extended in order to protect a pre-determined surface from exposure to the sun or bad weather conditions, comprising first attachment means (13), associated with a lower terminal portion (17) of the covering element (12). The clamping device also comprises second attachment means (19), disposed on the ground or on a reference plane (P) associated with the surface, able to cooperate with the first attachment means (13) in order to keep the covering element (12) in the open position. The first and second attachment means (13, 19) comprise respective and mating magnetic attraction means able to achieve a mechanical coupling so as to keep the covering element (12) in its open position at a predetermined tension. The second attachment means (19) are provided with elastic means (29), able to allow a certain travel with respect to the ground or to said reference plane (P) on which they are mounted so as to compensate uncontrolled movements of the covering element (12).

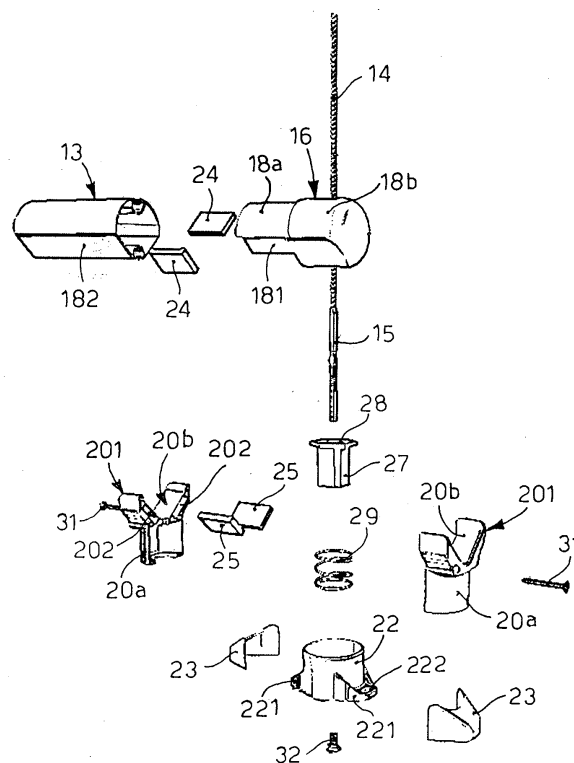


fig. 4

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a clamping device for a covering element.

[0002] In particular, the present invention concerns a clamping device applicable to a covering element for exteriors or interiors, such as an awning or sunshade or other, in order to maintain the covering element in a predetermined position to cover or protect a surface, such as a terrace, a portion of a garden, part of the deck of a boat or other, from exposure to the sun and/or from bad weather conditions, wind, rain or other.

BACKGROUND OF THE INVENTION

[0003] Covering elements are known, suitable to cover and/or protect an exposed surface, such as a terrace, a portion of a garden, a display area or other, from exposure to the sun or bad weather conditions. Covering elements are known which are disposed vertical or substantially vertical during use, and are associated with guide means, such as for example a pair of lateral steel cables, or a pair of aluminum profiles or steel round pieces, so as to be moved, automatically or manually, between a closed and wrapped position, or folded, and an open and extended position in which it covers and/or protects said surface. When the covering element is disposed in its open position, a terminal portion thereof, near the level of the ground, is at least partly constrained by means of the guide means.

[0004] One disadvantage of these known covering elements is that, when they are in their open position, the stresses produced by the wind generate unwanted movements and oscillations both of its terminal portion, even though it is partly constrained by the guide means, and also of other intermediate portions. These movements are also the source of annoying and continuous noises generated by the banging of the covering element.

[0005] In order to at least partly solve this disadvantage, it is known to weigh down the terminal portion of the covering element with one or more ballast elements, so as to reduce the stresses. However, this solution has proved to be ineffective, in particular in the event of strong winds.

[0006] It is also known to associate one or more hooks with the terminal portion of the awning. These are able to cooperate with one or more clamping elements attached to the ground, so as to keep under tension the covering element disposed in the open position and thus minimize the stresses.

[0007] One disadvantage of this solution is that the movement of the covering element together with the attachment of the hooks are laborious operations because, after disposing the covering element in the open position and manually fixing the hooks to the clamping elements, the covering element has to be moved partly in the return

direction toward its closed position so as to achieve a desired condition of tension, such as to avoid said stresses, or at least minimize them. Moreover, in the event of strong wind, the covering element disposed in the open position can suffer damage, such as rips or tears or other.

[0008] The document EP-A-1.523.246 concerns a rolling shutter for windows, in which a magnetic platelet is associated with a fixed base provided on a bottom surface of the window, and serves to hold the shutter in the closed position and prevent it from opening unexpectedly.

[0009] Purpose of the present invention is to achieve a clamping device for a covering element of the extending type, substantially vertical in its position of use, which allows to keep the covering element in its open position, preventing both unwanted oscillations and/or noises and also damage, rips or tears in conditions of atmospheric stresses, even intense.

[0010] 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

[0011] 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.

[0012] In accordance with the above purposes, a clamping device according to the present invention is used to clamp in a predetermined open position a covering element able to cover and/or protect an exposed surface, such as a terrace, a portion of a garden, a display area or other, from exposure to the sun or bad weather conditions. The covering element is of the type which in use has a substantially vertical development and is selectively movable between at least a closed position in which it is disposed folded back, and said open position in which it is disposed extended so as to cover and/or protect said surface.

[0013] The clamping device comprises first attachment means, associated with a lower terminal portion of the covering element. The clamping device also comprises second attachment means, disposed on the ground or in general on a reference plane associated with said surface, and suitable to cooperate with the first attachment means so as to keep the covering element in its open position.

[0014] According to one feature of the invention, the first and the second attachment means are equipped with respective and mating magnetic attraction means able to achieve a mechanical coupling so as to keep the covering element in its open position and at a predetermined tension, and at least the second attachment means are provided with elastic means, able to allow said second attachment means a certain travel with respect to the base on which they are mounted, so as to compensate

uncontrolled movements of the cover disposed in the closed position.

[0015] In particular, when the covering element, such as an awning or suchlike, is unwound from its closed and packed position, and progressively taken to its open position, in proximity with its position of maximum opening, the mating magnetic means, one of which is present in the terminal portion of the awning, the other on the second attachment means, determine the reciprocal attraction, reciprocal connection and maintenance in the connected position.

[0016] According to another feature of the invention, the second attachment means associated with the reference plane comprise a positioning element in which the lower terminal portion of the covering element is located in the open position. The positioning element is mobile with respect to the reference plane between at least a stable inactive position, suitable to keep the covering element in its open position, and one or more transitory positions obtained due to the effect of said magnetic attraction and contrasted by said elastic means. The elastic mobility of the positioning element, in the event of intense atmospheric stresses, allows to at least temporarily lift the terminal portion of the covering element disposed in its open position, so as to prevent damage such as rips and/or tears.

[0017] According to a variant of the present invention the clamping device is associated with guide means able to guide the movement of the covering element between its closed position and its open position.

[0018] According to another variant of the present invention, the first and second attachment means are suitable to cooperate with the guide means during the movement of the covering element between its open position and its closed position.

[0019] According to another variant, the first attachment means comprise elastic lateral compensation means that allow a certain elastic play that compensates possible lateral misalignments of the awning.

[0020] Another variant of the present invention provides that the second attachment means are slidingly mobile with respect to the guide means so as to be positioned at a desired height with respect to the ground or the reference plane.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a front schematic view of a clamping device according to the present invention applied to a covering element;
- fig. 2 is a perspective view of a detail of the device in a first working configuration;

- fig. 2A is a perspective view of a detail of the device in a second working configuration;
- fig. 3 is a sectioned lateral schematic view of the device in fig. 1;
- fig. 4 is an exploded view of the detail in fig. 2;
- fig. 5 is an enlarged exploded view of a variant of a detail of the clamping device in fig. 1;
- fig. 6 is an exploded view of a variant of the first attachment means of the clamping device according to the invention;
- fig. 7 is an exploded view of a variant of the second attachment means of the clamping device according to the invention;
- fig. 8 is an assembled view of a second variant of the second attachment means in fig. 7.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

[0022] With reference to the attached drawings, a clamping device 10 according to the present invention is used for clamping a covering element for exteriors, in this case a front awning 12. The awning 12 is selectively movable between a closed position, in which it is folded back, or rolled up, on a roller 40 of a known type attached to an upper bearing element for example a ceiling S, and an open position in which it is progressively unrolled until it is extended vertically. In the open position the awning 12 is disposed with one end 17 in proximity with the ground or floor P, to protect a determinate surface from atmospheric agents such as the wind or other. The awning 12 can be moved between said positions automatically by means of a drive unit, not shown, or moved manually by means of a winch, also not shown, associated with the roller 40.

[0023] The awning 12 is also associated with an oblong tubular support, attached in correspondence with said end 17, suitable to cooperate with two steel cables 14 disposed vertically between the ceiling S and the floor P and having substantially a guide function for the awning 12 during its movement.

[0024] The device 10 according to the present invention comprises attachment portions 16, disposed in correspondence with said ends of the tubular support 13 and a pair of clamping elements 19 stably attached to the floor P and suitable to cooperate with the attachment portions 16 so as to keep the awning 12 extended in its open position.

[0025] In particular, with reference to figs. 2, 3 and 4, each attachment portion 16 comprises a stopper 18b, suitable to be coupled with a relative end of the tubular support 13 so as to close it laterally. Each stopper 18b also comprises through holes 26 in each of which one of the cables 14 is made to pass, so as to allow the tubular support 13 to slide during the movement of the awning 12. The attachment portion 16 also comprises a neck portion 18a, made in a piece with the stopper portion 18b and having a shape mating with the inner shape of the

tubular support 13. The neck portion 18a is suitable to be inserted in each end of the support 13. The neck portion 18a also comprises first flat portions 181 able to cooperate with corresponding second flat portions 182 of the tubular support 13 so as to define, when the neck portion 18a is inserted into the corresponding end of the support 13, one or more compartments, disposed substantially inclined with respect to a horizontal plane and suitable to house one or more first magnets 24.

[0026] Each clamping element 19 comprises a base 22, suitable to be attached stably on the floor P and having a substantially cylindrical shape. The base 22 comprises two fins 221, made in a single piece, which extend horizontally and radially outside the base 22 and have one or more holes 222 to attach the base 22 to the floor P. The fins 221 are also advantageously connected to the cylindrical body of the base 22 by means of vertical portions suitable to increase the stable attachment of the fins 221. Once fixed to the floor P or a fixed portion thereof, the fins 221 are covered with covers 23 to hide the attachment screws, for aesthetic reasons.

[0027] The clamping element 19 also comprises a positioning element 20 suitable to cooperate with the attachment portion 16 and having a body with a cylindrical tubular portion 20a, suitable to be inserted axially into the base 22. The cylindrical portion 20a is connected to a saddle portion 20b able to define, at the upper part in the positioning element 20, a surface profile having a shape mating with the external shape of the stopper 18b and therefore of the support 13, so as to allow the stopper 18b to rest thereon and hence to dispose of the support 13 in a horizontal position as shown schematically in figs. 1 and 2.

[0028] In the upper profile of the saddle portion 20b, there is a through hole for the passage of the cable 14 or a threaded end 15 thereof. The saddle portion 20b also has a tubular inner structure in which a pair of compartments 202 are defined, disposed inclined with respect to a horizontal plane. The compartments 202 are suitable for the insertion of two second magnets 25, disposed with appropriate polarity so as to exert an action of mutual attraction with the first magnets 24 when the tubular support 13 with the relative stoppers 18b is disposed coupled with the clamping element 19.

[0029] The cylindrical portion 20a is also suitable to house in its inner tubular structure, with a substantially square shape, a bushing 27 having a mating shape and slightly smaller in size, having a threaded hole 28 passing axially through the whole height of the bushing 27. The threaded hole 28 is suitable for the threaded end 15 to be inserted and screwed in, so as to dispose each cable 14 in its vertical position and to keep it in a desired condition of tension. The portion of threaded hole 28 emerging from the lower base of the bushing 27, and not shown in the drawings, is suitable to clamp the bushing 27 to a bottom of the base 22 by means of a screw 32, so as to rigidly constrain the bushing 27 to the base 22. The rotation of the bushing 27 around a longitudinal axis, and

hence the undesired removal of the screw 32 or the threaded end 15, is in practice prevented by means of the coupling of the corresponding square shapes inside the cylindrical portion 20a.

[0030] The positioning element 20 is mobile axially in a vertical direction, according to the development of the cable 14, inside the base 22 between an inactive position, in which it is kept adjacent to the base 22 with the cylindrical portion 20a inserted in the base 22 (fig. 2), and an extended position in which it is disposed with said cylindrical portion 20a at least partly removed from the base 22 (fig. 2A).

[0031] The device 10 also comprises a helical spring 29 disposed coaxially inside the cylindrical portion 20a but outside the bushing 27. A first end of the spring 29 is constrained to the base 22 while a second end of the spring 29 is constrained to the positioning element 20. When the positioning element 20 is disposed in its inactive position, the spring 29 is substantially in an inactive condition. On the contrary, when the positioning element 20 is elastically deformed, generating an elastic contrasting force able to move the positioning element 20 toward its inactive position.

[0032] According to a preferential solution, the positioning element 20 is made by reciprocally coupling two semi portions 201, each of which has a corresponding semi-cylindrical portion and a corresponding saddle-shaped portion, not indicated with reference numbers in the attached drawings. The semi portions 201 are stably coupled so as to make the positioning element 20 by means of corresponding screws 31.

[0033] According to a variant shown in fig. 5, the neck portion 118a, substantially cylindrical in shape, is associated with a base 35, also substantially cylindrical, made in a piece or coupled along one edge. The base 35 comprises a first groove 37, oblong and rectilinear, disposed transverse with respect to the cylindrical development of the base 35. The groove 37 defines a housing and sliding seating for the cable 14. The base 35 also comprises a lower portion 38 on which attachment holes 39 are made, for the insertion of corresponding screws 31. The lower portion 38 comprises access mouths to two containing compartments 40 for the first magnets 24. The two compartments 40 extend in an axial direction of the attachment portion 161. The attachment portion 161 also comprises a cover 42 with a shape mating with the base 35 and suitable to be coupled with the base 35 so as to cover its lower portion 38. In this way it is possible to prevent the first magnets 24 from accidentally coming out of the corresponding compartments 40, at the same time providing a protection function for the magnets 24.

[0034] The cover 42 also comprises a second groove 43, disposed transverse and such as to cooperate with the first groove 37 when the cover 42 is disposed during use coupled with the base 35, to prevent the cable 14 from coming out of its sliding seating. The cover 42 comprises through holes 47 so as to attach it to the base 35,

using attachment screws 31 coupled with corresponding attachment holes 39 of the lower portion 38. Finally, the cover 42 is associated with a stopper 45 functioning as a cover for the screws 31. The stopper 45 is coupled, for example with snap-in attachment elements not shown in the drawings, with a circular or substantially circular portion 44 of the cover 42.

[0035] According to another variant shown in fig. 6, the attachment portion 16 comprises lateral compensation means, in this case a telescopic compensation element 50, provided with a relative spring 60 and able to cooperate at both sides (only one is shown) with the support 13, as described in more detail hereafter.

[0036] The compensation element 50 consists of a bushing, substantially cylindrical in shape, provided with an axial through hole 52, and a protruding head 50a made at one end thereof, which is suitable to cooperate in abutment with the edge of the support 13. The compensation element 50 can be partly inserted and can slide axially in the support 13, having on its lateral surface a pair of grooved guides 51 which slide during use along mating protrusions 56 made inside the support 13.

[0037] The compensation element 50 is attached solidly to the attachment portion 16 by means of an attachment pin 54, provided with a head 54a able to prevent it from coming out. The pin 54 is able to be inserted into the through hole 52 and the spring 60 so as then to be clamped at its end by means of an elastic ring 53. The elastic ring 53 couples operationally both with one end of the spring 60, disposed toward the inside of the support 13, and also with an annular groove, not shown, of the pin 54.

[0038] The spring 60 is therefore elastically contrasted at its ends by an inner portion, not shown, of the compensation element 50 and the elastic ring 53. In this way the compensation element 50 allows to compensate on both sides of the support 13, by means of the elastically contrasted sliding of the relative spring 60, possible lateral misalignments of the awning 12 due to a non-uniform unrolling thereof, and also due to unwanted lateral movements caused for example by the wind or other atmospheric agents.

[0039] According to another solution, shown in fig. 7, the base 22, attached to the floor P by a screw 32, is provided with an adjustment ring nut 62, which has a threaded external portion 64 able to be screwed into a corresponding threaded internal portion 65 of the base 22. The ring nut 62 is also suitable to house inside it both the bushing 27 and the spring 29.

[0040] In this way, by acting on the ring nut 62, it is possible to adjust vertically each positioning element 20 and to compensate possible plays in assembly. This allows to align the awning 12, that is, the support 13, also when the floor is not perfectly linear and/or horizontal, thus facilitating the steps of installation and/or the periodic maintenance operations.

[0041] According to another variant, shown in fig. 8, the clamping element 19 is slidingly mobile on the cable

14 and positionable at a predetermined height by means of corresponding clamping screws 66. The screws 66 are suitable, in a known manner, directly or indirectly, to exert a clamping action on the cable 14, clamping the clamping element and therefore the relative positioning element 20 at a desired height.

[0042] In this way it is possible to achieve an effective installation with floors or planes that are also partly inclined, allowing to define an open condition in which the support 13 is in any case disposed in the desired manner, for example horizontal.

[0043] The clamping device 10 as described heretofore functions as follows.

[0044] The movement of the awning 12, manual or automatic, from its closed position to its open condition, provides that the support 13 fixed at the end 17 of the awning 12 is progressively made to descend, making each cable 14 slide in the corresponding hole 26.

[0045] When the support 12, as it descends, finds itself in proximity with the floor P, that is, when the stoppers 18b are disposed near the saddle portions 20b, the first magnets 24 disposed in the compartments defined by the stopper 18b and the support 13 cooperate with the second magnets 25 of the saddle portion 20b, generating a force of attraction. By sizing the magnets 24, 25 and the spring 29 appropriately, the saddle portions 20b, due to the effect of said attraction force, are temporarily moved from their inactive position to their extended position, ascending toward the support 13 and making the saddle portions 20b adhere to the lower part of the support 13 or of the stoppers 18b. Subsequently, the elastic contrasting force exerted by the spring 29 attracts the saddle portions 20b, making them move back again to the inactive position, therefore keeping the awning 12 in a desired condition of tension even after the support 13 has definitively stopped, which determines the positioning of the awning 12 in its open position. In this way, by means of the elastic contrasting action of the springs 29 together with the action of the magnets 24, 25, the device 10 allows to achieve a cushioning effect.

[0046] Furthermore, in the case where the awning 12 is moved by a drive unit, the travel of the spring 29 allows to keep the awning 12 under tension in the initial step where the end-of-travel of the drive unit is adjusted.

[0047] Moreover, it is possible to guarantee that the awning 12 is kept under tension in the event that it dilates or shrinks, for example due to sudden and/or intense variations in temperature, or other.

[0048] The movement of the awning 12, manual or automatic, from its open position to its closed position, is effected by rolling the awning 12 in an inverse direction, for example by inverting the direction of activation of the drive unit. Therefore, by applying a force sufficient to overcome both the force of reciprocal attraction between the magnets 24, 25 and also the contrasting force of the springs 29, the attachment portion 16 and the positioning element 20 are separated, allowing the progressive re-winding of the awning 12 to its closed position.

[0049] On the contrary, when the awning 12 is in its open position, the attraction between the magnets 24, 25, together with the elastic contrasting force of the spring 29, maintain the awning in a desired condition of tension, so that possible stresses produced by the wind hitting the extended surface of the awning 12 are cancelled, or substantially absorbed. In this way it is possible to reduce or eliminate possible annoying noises produced by unwanted vibrations of the awning 12. On the contrary, in the event of strong stresses produced by the wind, the action of attraction between the magnets 24, 25 and the contrasting force of the spring 29 allow a temporary detachment of the attachment portion 16 from the positioning element 20. In this way the support 13 can at least temporarily be lifted, guided at its ends by the cables 14, functioning as a safety clutch mechanism which allows to absorb excessive stresses and prevents breakages or tears that could be produced in the awning 12 if it were kept tense at its ends by means of state-of-the-art clamping devices. At the end of the temporary stress that has caused the detachment of the support 13, the support 13, due to the effect of gravity and the attraction force of the magnets 24, 25, returns to be disposed on the positioning element 20.

[0050] Another advantage of the device 10 is that the coupling between the attachment portions 16, 19 does not need any intervention by an external user, and therefore the device can be used for an awning 12 both with manual movement and also with automatic movement by means of an associated drive unit.

[0051] It is clear that modifications and/or additions of parts may be made to the clamping device 10 as described heretofore, without departing from the field and scope of the present invention. For example, it comes within the field of the present invention to provide that the first magnets 24 can be replaced by ferromagnetic elements.

[0052] 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 clamping device, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Clamping device for a covering element (12), selectively movable between at least a closed position in which it is disposed folded back, and an open position in which it is disposed extended in order to protect a predetermined surface from exposure to the sun or bad weather conditions, comprising first attachment means (13), associated with a lower terminal portion (17) of said covering element (12), and second attachment means (19), disposed on the ground or on a reference plane (P) associated with

said surface, able to cooperate with said first attachment means (13) in order to keep said covering element (12) in said open position, **characterized in that** said first and second attachment means (13, 19) comprise respective and mating magnetic attraction means (24, 25) able to achieve a mechanical coupling so as to keep said covering element (12) in its open position at a predetermined tension, and **in that** at least the second attachment means (19) are provided with elastic means (29), able to allow a certain travel with respect to the ground or to said reference plane (P) on which they are mounted so as to compensate uncontrolled movements of the covering element (12).

2. Clamping device as in claim 1, **characterized in that** the second attachment means (19) comprises a positioning element (20), associated with the elastic means (29), in which the lower terminal portion (17) of the covering element (12) disposed in the open position is positioned, and **in that** the positioning element (20) is mobile with respect to the reference plane (P) between at least an inactive position, stable and able to keep the covering element (12) in its open position, and one or more transitory positions obtained by means of said magnetic attraction means (24, 25) and contrasted by the elastic means (29).

3. Clamping device as in claim 2, **characterized in that** the magnetic attraction means comprise first magnets (24) and **in that** said positioning element (20) comprises second magnets (25), reciprocally disposed with a polarity such as to produce a force of reciprocal mutual attraction between said first and second attachment means (13, 19), when said lower terminal portion (17) of said covering element (12) is positioned in the positioning element (20).

4. Clamping device as in any claim hereinbefore, **characterized in that** it is associated with guide means (14) able to guide the movement of said covering element (12) between said closed position and said open position.

5. Clamping device as in any claim hereinbefore, **characterized in that** the first and second attachment means (13, 19) are able to cooperate with the guide means (14) during the movement of the covering element (12) between said open and said closed position.

6. Clamping device as in any claim hereinbefore, **characterized in that** the covering element (12) is moved manually.

7. Clamping device as in any claim from 1 to 5, **characterized in that** the covering element (12) is moved

automatically by means of drive means.

8. Clamping device as in any claim hereinbefore, **characterized in that** the first attachment means (13) include elastic lateral compensation means (50, 60) that achieve an elastic play to compensate possible lateral misalignments of the covering element (12). 5
9. Clamping device as in claim 4, **characterized in that** the second attachment means (19) are slidingly mobile on the guide means (14) so as to be positioned at a desired height with respect to the ground or on a reference plane (P). 10
10. Covering element selectively movable between at least a closed position in which it is disposed folded back, and an open position in which it is disposed extended in order to protect a predetermined surface from exposure to the sun or bad weather conditions, comprising a clamping device (10) as in any claim from 1 to 9. 15 20

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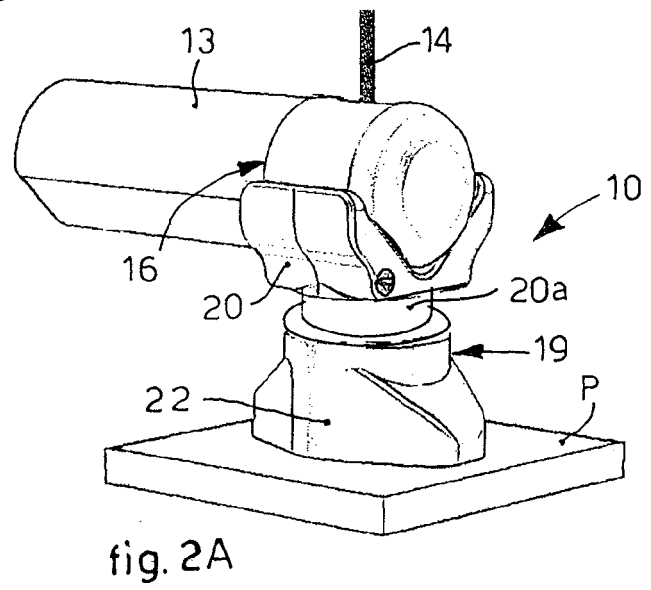
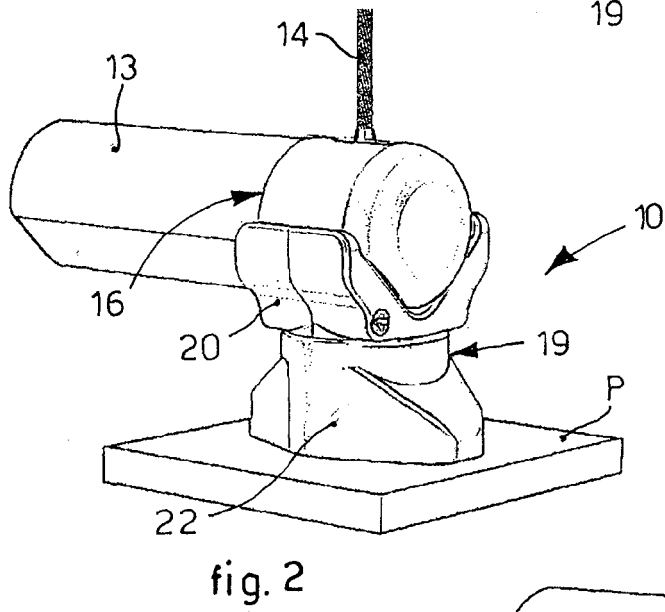
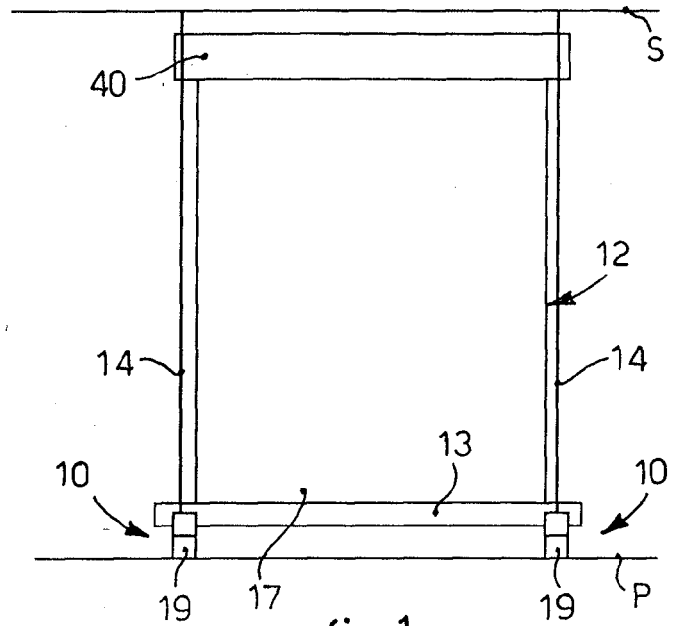
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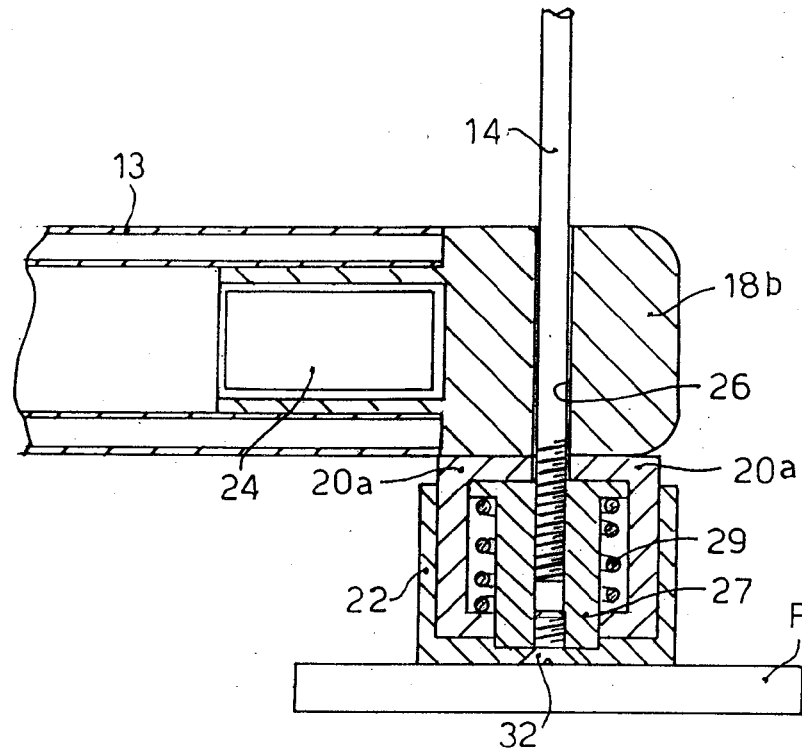


fig. 3

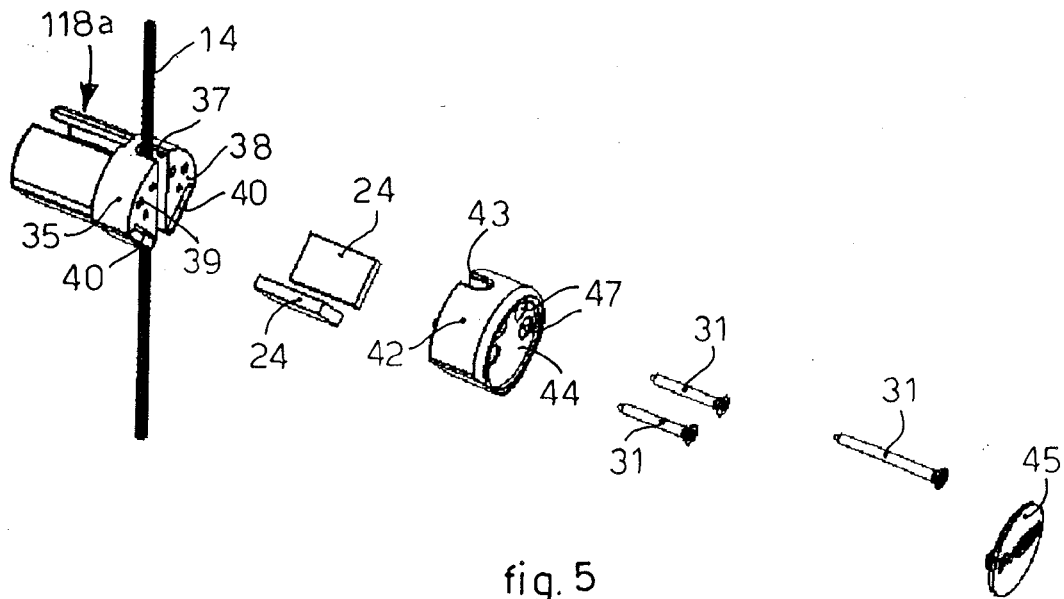


fig. 5

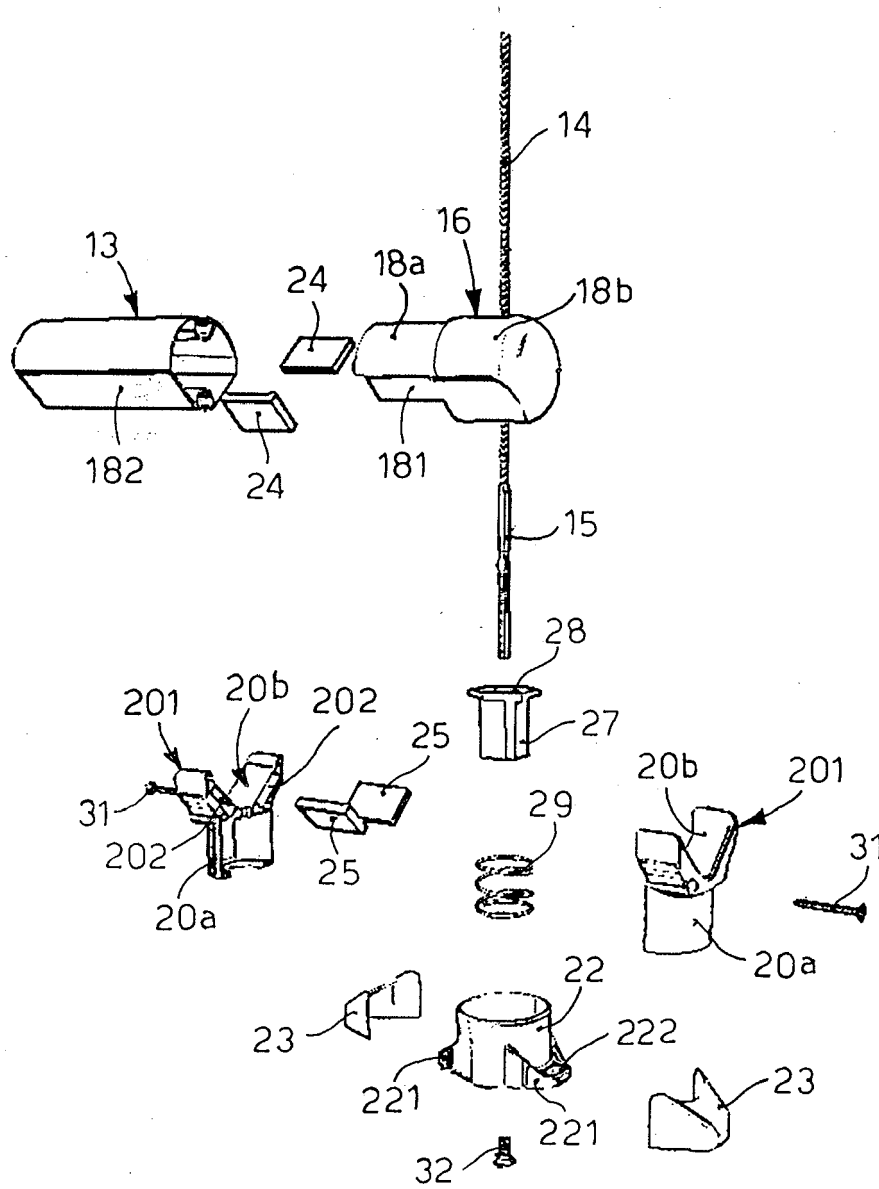


fig. 4

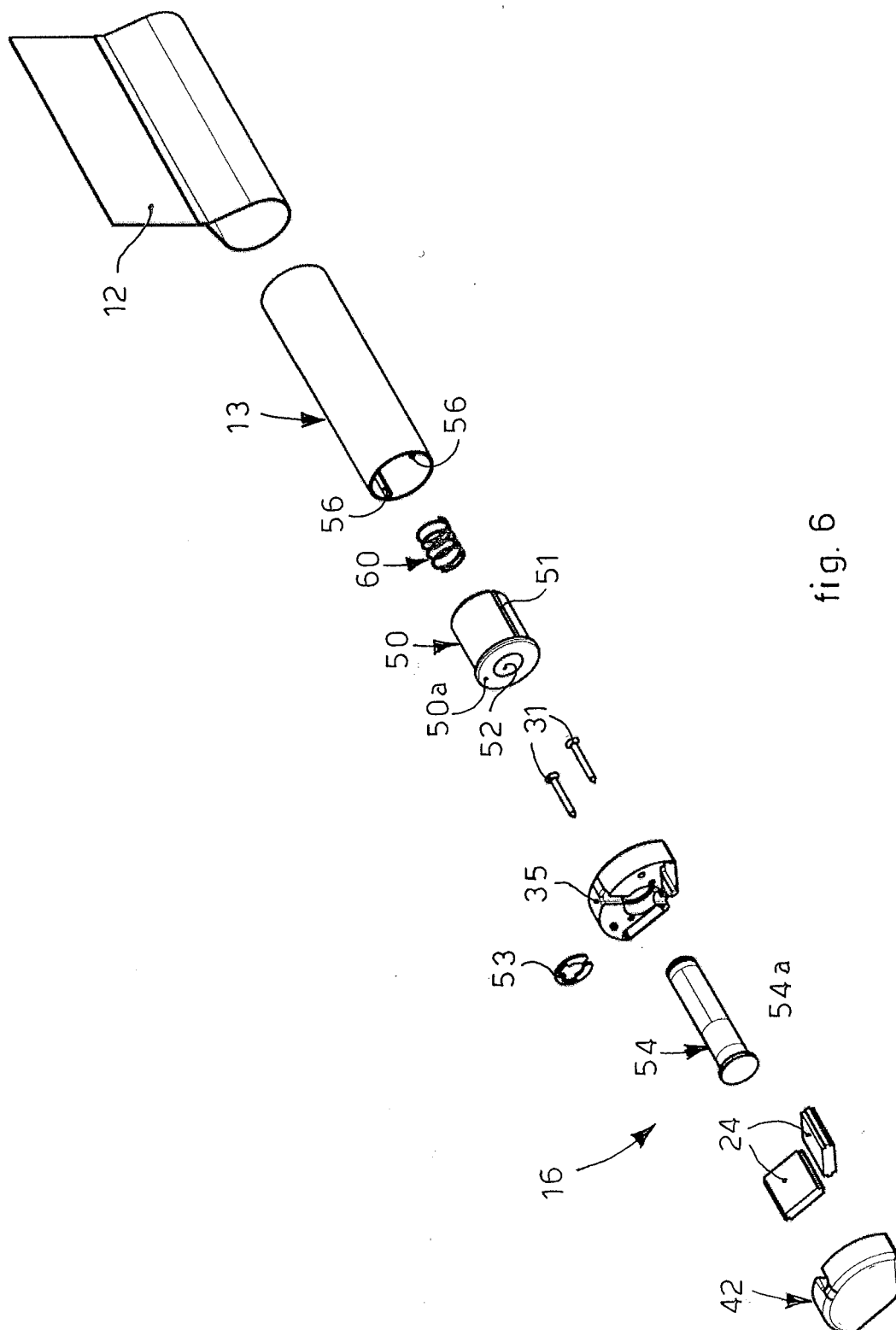


fig. 6

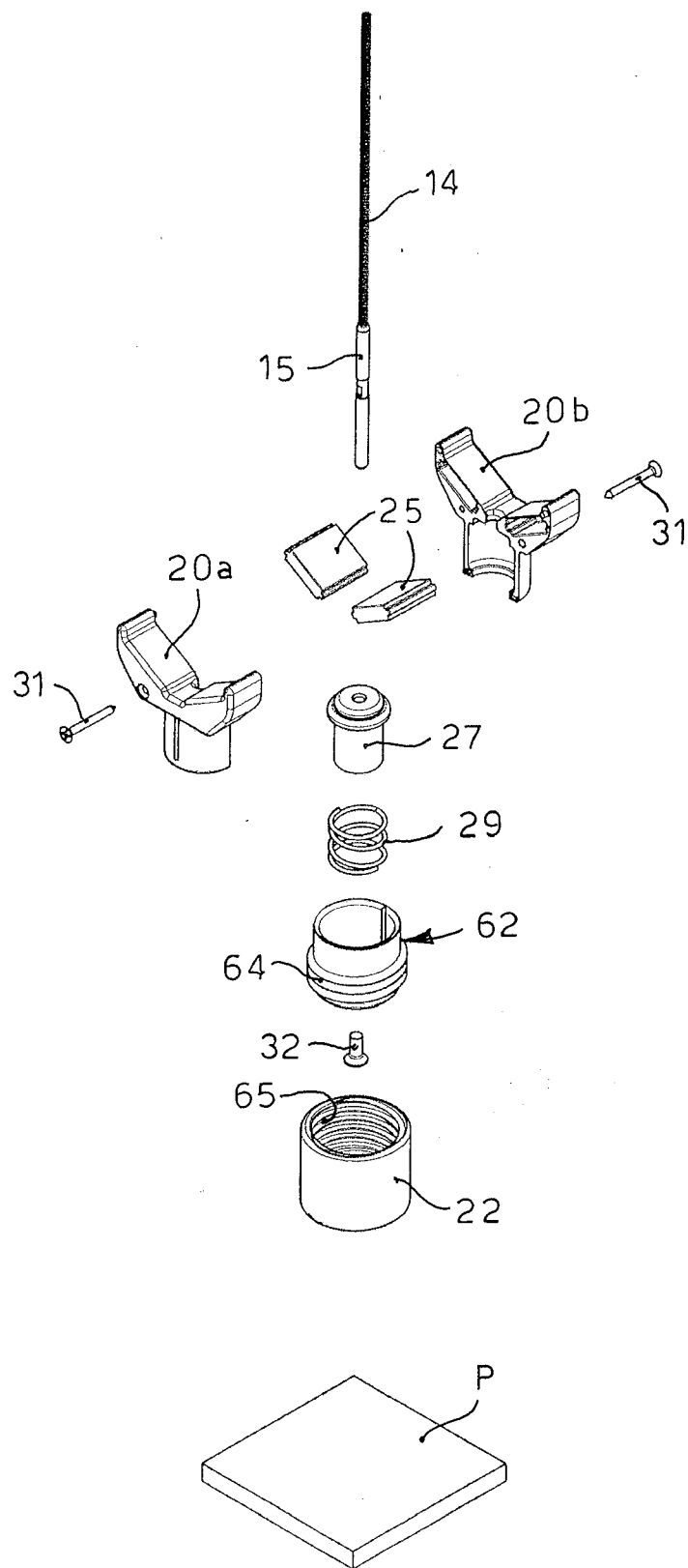


fig. 7

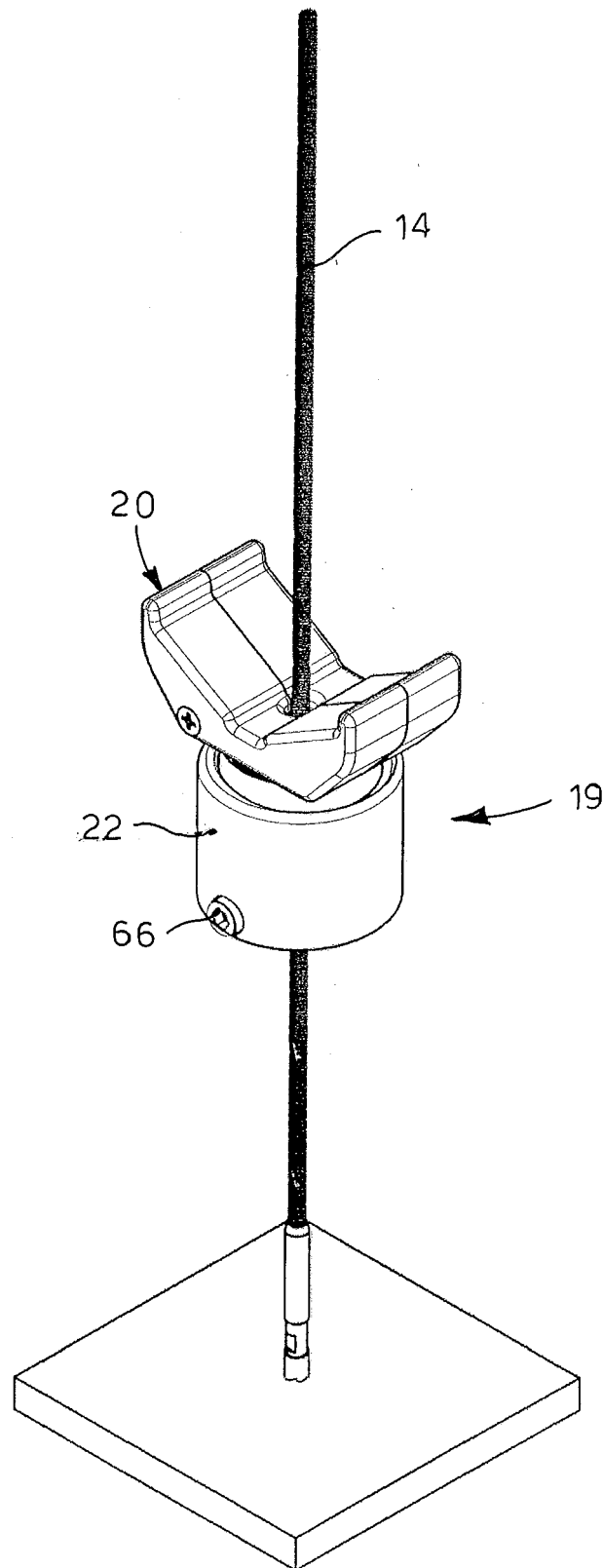


fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 09 17 3167

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	EP 1 526 246 A (HUNTER DOUGLAS IND BV [NL]) 27 April 2005 (2005-04-27) * the whole document * * paragraph [0018]; figure 4 * -----	1-10	INV. E06B9/42 E05C19/16
A	US 3 196 935 A (CHRISTENSEN ANDREW B) 27 July 1965 (1965-07-27) * the whole document * * column 2, line 50 - line 54 * -----	1,10	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E05C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 December 2009	Examiner Wagner, A
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 03.92 (P04C01)

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

EP 09 17 3167

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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10-12-2009

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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