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(54) **Support device for radiators, particularly of the type with radiant plates**

(57) A support device for radiators, particularly of the type with radiant plates, includes a supporting member constituted essentially by a tubular member that can be inserted between the radiant plates of a radiator and includes a floor resting means or a wall hanging means and a radiator fastening means. The radiator fastening means includes an oscillating member, which is pivoted to the free end of the supporting member and can be rotated from a disengagement position, in which it defines a longitudinal extension of the supporting member, to a position of engagement with the radiant plates, in which it is transverse to the supporting member and interacts with the radiator, preventing its accidental removal.

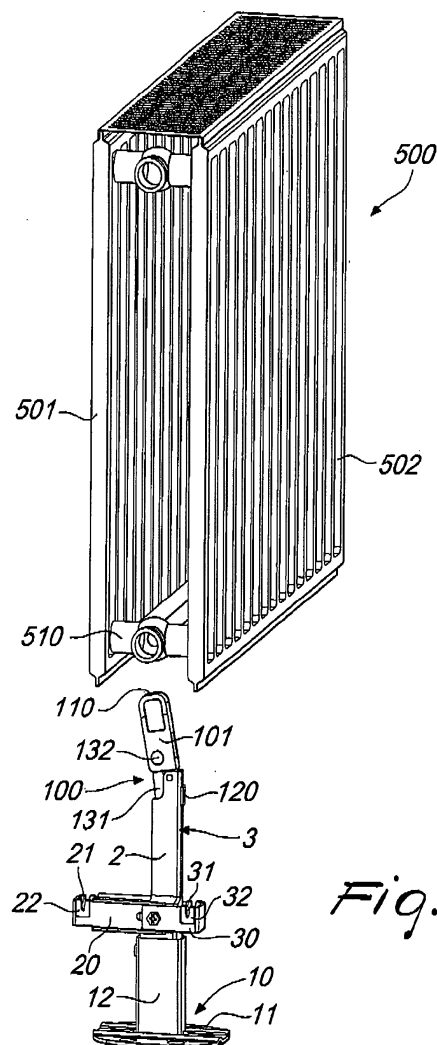


Fig. 7

Description

[0001] The present invention relates to a support device for radiators, particularly of the type with radiant plates.

[0002] As is known, devices for supporting radiators having radiant plates are generally constituted by an upright which is provided, at one end, with a ground resting foot or with a wall hanging means and is provided, at the opposite end, with a radiator fastening means.

[0003] There are many systems for fastening a radiator to a support, but generally speaking they can be classified into two large categories: the ones that are coupled to the connectors for connection to the hydraulic circuit and the ones that act on the radiant plates of the radiator, working on external brackets or directly on the fins of the convector heaters.

[0004] More particularly, the devices of the first type are generally equipped with U-bolts or with other similar fastening systems which couple the connectors.

[0005] It should be noted that the mechanical loads and deformations imposed by the mentioned devices on the connectors cause a considerable state of tension, which often is the source of damage to the connectors.

[0006] It should also be noted that those fasteners are conditioned by the shape and position of the connectors, and that limits their operating flexibility.

[0007] Fasteners of the second type are constituted by jaws that clamp the convection fins of the radiating plates, or by levers that, by extending symmetrically from the upright, tend to divaricate the convection fins.

[0008] The convection fins are made of rather thin metal plate, which is joined to the plate by means of small spot welds, which are provided without seeking to achieve significant strength. Accordingly, the stresses caused by those devices can easily lead to separation of the spot welds or cause deformations of the structure.

[0009] Other conventional fasteners clamp the entire radiant plate and remain partially visible, certainly worsening the aesthetics.

[0010] In addition to the above noted inconveniences, the fact should also be considered that the connectors for connection to the hydraulic circuit are often placed between the radiant plates in a central position, in order to allow to choose the dimensions of the radiator even after finishing the hydraulic system.

[0011] That entails that it is impossible to use the conventional fasteners described above, because in order to work correctly they must be inserted centrally between the radiant plates and would therefore interfere with the connectors.

[0012] The aim of the invention is to solve the problems described above, providing a support device for radiators, particularly of the radiant plate type, that can be used with all types of radiant plate radiator.

[0013] Within the scope of this aim, a particular object of the invention is to provide a device that can be used with radiant plate radiators provided with central connec-

tors.

[0014] Another object of the invention is to provide a device that can be used also with radiant plate radiators provided with convector heaters.

5 **[0015]** Another object of the invention is to provide a device that can be used also with radiant plate radiators equipped with external brackets.

10 **[0016]** Another object of the invention is to provide a device that is not conditioned by the different distance between the radiant plates and is capable of offering great operating flexibility without the need for auxiliary components.

15 **[0017]** A further object of the invention is to provide a device that does not stress the connectors and convector heaters of the radiator.

[0018] Another object of the invention is to provide a device that is simple and at the same time effective, so much that it can be produced at competitive costs and it is advantageous from a purely economic standpoint.

20 **[0019]** This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a support device for radiators, particularly of the type with radiant plates, comprising a supporting member constituted essentially by a tubular member to be inserted between the radiant plates of a radiator, said supporting member comprising a floor resting means or a wall hanging means and a radiator fastening means, characterized in that said radiator fastening means comprises at least one oscillating member, which is pivoted to the free end of said supporting member and can be rotated from a disengagement position, in which said oscillating member forms a longitudinal extension of said supporting member, to a position of engagement with said radiant plates, in which said oscillating member is transverse to said supporting member and interacts with said radiator, preventing its removal with respect to said support device for radiators.

30 **[0020]** Further characteristics and advantages will become better apparent from the description of preferred but not exclusive embodiments of a fastening device for radiators according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

45 Figure 1 is a side view of a support device for radiators according to the invention in the disengagement position;

Figure 2 is a side view of the device according to the invention in the engagement position;

50 Figure 3 is a perspective view of the device according to the invention in the engagement position;

Figure 4 is another perspective view of the device according to the invention in the engagement position;

55 Figure 5 is a side view of a radiator and of the device according to the invention in the disengagement position;

Figure 6 is a side view of the device according to the

invention, engaged with the radiant plates of the radiator;

Figure 7 is a perspective view of the radiator and of the device according to the invention in the disengagement position;

Figure 8 is a perspective view of the device according to the invention, engaged with the radiant plates of the radiator;

Figure 9 is a perspective view of a constructive variation of the device according to the invention in the engagement position;

Figure 10 is another perspective view of the constructive variation of the preceding figure;

Figure 11 is a side view of the constructive variation of Figure 9.

[0021] With reference to the cited Figures 1 to 8, a support device for radiators, particularly of the type with radiant panel, is generally designated by the reference numeral 1.

[0022] The device 1 includes a supporting member 2, which is constituted essentially by a tubular member that has a quadrangular cross-section and can be inserted between the radiant plates 501 and 502 of a radiator 500.

[0023] The supporting member 2 is provided with a means for resting on the ground or for wall hanging, generally designated by the reference numeral 10 and essentially constituted by a foot 11 welded to an upright 12.

[0024] The upright 12 is slidingly associated with a tang 5, which is provided at one end of the supporting member 2. This allows to adjust their relative position.

[0025] A fastening means, generally designated by the reference numeral 100, is provided on the opposite end of the supporting member 2 and allows to fasten the device 1 to the radiator 500.

[0026] According to the invention, an oscillating member 101 is hinged to the free end of the supporting member 2 and has a rotation axis 150 which is transverse to the longitudinal axis 50 of the supporting member 2.

[0027] The oscillating member 101 can rotate from a disengagement position, in which it is substantially aligned with the longitudinal axis 50 of the supporting member 2 and extends from the free end the axis 50, to a position of engagement with the radiant plates 501 and 502, in which the oscillating member 101 is arranged transversely to the longitudinal axis 50 of the supporting member 2.

[0028] In this second case, the oscillating member 101 interacts with the two radiant plates-501 and 502 so as to prevent removal of the radiator 500 with respect to the device 1.

[0029] The fastening means 100 operates by virtue of two abutments, designated by the reference numerals 110 and 120, for the radiant plates 501 and 502.

[0030] In the engagement position, the first abutment 110 and the second abutment 120 apply a diverging thrust between the radiant plates 501 and 502, divaricating them slightly. At same time, the abutments 110 and

120 push the radiant plates 501 and 502 toward the floor resting means or wall hanging means 10, preventing the removal of the radiator 500 from the device 1.

[0031] In practice, the first abutment 110 is constituted essentially by a rough surface provided substantially at the free end of the oscillating member 101.

[0032] The second abutment 120 is formed by an insulating block, which is substantially flat and preferably made of synthetic material and is joined to the free back 3 of the supporting member 2.

[0033] In the disengagement position, the lateral bulk of the fastening means 100 substantially corresponds to the lateral bulk of the supporting member 2. This feature allows to use the device 1 also when connecting blocks 510 are present between the radiant plates 501 and 502, as often occurs.

[0034] The transition of the oscillating member 101 from the disengagement position to the position of engagement with the radiant plates 501 and 502 is facilitated by a screw motion means 130 which can be actuated manually,

[0035] The screw motion means 130 includes a screw 131 which engages a diametrical through hole of a cylindrical pin 132 inserted in a seat. The seat is provided between the free end of the oscillating member 101 and the pivoting point with respect to the supporting member 2.

[0036] The screw 131 is accommodated inside the supporting member 2. The head 133 of the screw 131 abuts against a perforated plate 134, which is associated transversely with respect to the supporting member 2 with the possibility to oscillate.

[0037] The perforated plate 134 is accommodated in contoured slots 4 which are provided on the walls of the supporting member 2 and are perpendicular to the free back 3.

[0038] The device 1 also comprises a first cantilever portion 20 and a second cantilever portion 30, which protrude transversely from the supporting member 2 on mutually opposite sides with respect to the longitudinal axis 50 of the latter.

[0039] The cantilever portions 20 and 30 act as support for the lower edges of the radiant plates 501 and 502 and contrast the thrust toward the floor resting means or wall hanging means 10 applied to the radiator 500 by the abutments 110 and 120. The cantilever portions 20 and 30 also contrast the diverging thrust applied by the abutments to the radiant plates 501 and 502.

[0040] The cantilever portions 20 and 30 include respectively a first receptacle 21 and a second receptacle 31 which are essentially U-shaped and are shaped complementarily with respect to the shape of the lower edges of the radiant plates 501 and 502.

[0041] A first insulator 22 and a second insulator 32, which are preferably made of synthetic material, may be installed in the receptacles 21 and 31.

[0042] The two cantilever portions 20 and 30 are mutually associated so that they can slide and are provided

with a transverse locking means 40, which allows to adjust the distance between the two receptacles 21 and 31 as a function of the distance between the radiant plates 501 and 502.

[0043] The transverse locking means 40 comprises a threaded through member 41, which is arranged inside a first hole, not shown, provided in the supporting member 2, and corresponding slotted holes 23 and 33 provided in the cantilever portions 20 and 30.

[0044] According to a further embodiment of the invention, illustrated in Figures 9 to 11, in which the fastening device for radiators has been generally designated by the reference numeral 1001, the supporting member 1002 and the tang 1005 are mutually offset.

[0045] The longitudinal axis 1050 of the supporting member 1002 is substantially parallel to, but does not coincide with, the longitudinal axis 1250 of the tang 1005.

[0046] This arrangement allows to provide a base 1006 that connects the tang 1005 to the supporting member 1002, transversely to the two axes 1050 and 1250, and acts as abutment for the head 133 of the screw 131.

[0047] In this manner, the head 133 remains accessible from the outside even when the tang 1005 is inserted in the upright 1002 and the device 1 is inserted between the plates 501 and 502 of the radiator 500; this allows to actuate the oscillating member 1101 very easily.

[0048] This feature is particularly advantageous also in case the device 1001 is uninstalled.

[0049] It should also be noted that, in this embodiment, the oscillating member 1101 is essentially obtained from a tubular portion that has a quadrangular cross-section and forms the first abutment 1110 with the sharp edge of its lower edge.

[0050] In the embodiment shown in Figures 9 to 11, the members that corresponds to the members that have already been described with reference to the embodiment shown in Figures 1 to 8 have been designated by the same reference numerals.

[0051] The operation of the device according to the invention is as follows,

[0052] Starting from a disengagement position, in which the oscillating member 101 is substantially aligned with the longitudinal axis 50 of the supporting member 2 and extends its free end, the portion of the device 1 to be coupled to the radiator 500 is inserted between the radiant plates 501 and 502, avoiding the convectors, not shown, which are generally joined to the plates in order to increase heat exchange. This operation is performed taking care to make the lower edges of the radiant plates 501 and 502 interlock respectively in the receptacles 21 and 31. The distance between the receptacles 21 and 31 is set by acting on the two cantilever portions 20 and 30, which are subsequently fixed by the transverse locking means 40.

[0053] At a later time, one acts on the head 133 of the screw 131 which, by screwing onto the cylindrical pin 132, causes the rotation of the oscillating member 101, which passes from the disengagement position to the

position for engagement with the radiant plates 501 and 502.

[0054] As a consequence of the rotation of the oscillating member 101, the first abutment 110 and the second abutment 120 rest against the internal surface of the radiant plates 501 and 502, generating a divergent thrust between them as well as a thrust that would tend to move them toward the floor resting means or wall hanging means 10. These thrusts, however, are contrasted by the cantilever portions 20 and 30 and accordingly the radiator 500 is fastened to the device 1 by mechanical interference.

[0055] The supporting member 2 is then associated with the floor resting means or wall hanging means 10 previously prepared in the correct position.

[0056] The operations can be slightly different in the case of the device 1001, i.e., when the supporting member 1002 is offset with respect to the tang 1005 and the head 133 of the screw 131 remains constantly accessible from outside.

[0057] In this case it is in fact possible to reverse the order of some of the operations already described previously, performing the transition of the oscillating member 1101 from the disengagement position to the position for engagement with the radiant plates 501 and 502 after the supporting member 1002 has been associated with the floor resting means or wall hanging means 10 to complete the installation.

[0058] The portion of the device 1 or 1001 that can be coupled to the radiator 500 can be inserted between the radiant plates 501 and 502 even if connecting blocks 510 are present between the plates and are arranged in a central position with respect to the radiant plates 501 and 502. This circumstance in fact occurs increasingly often because it allows to choose the size of the radiator even after finishing the hydraulic system.

[0059] The transition from the disengagement position to the position for engagement with the radiant plates 501 and 502 occurs by virtue of a movement which already inherently tends to contrast the movement for removal of the radiator 500 from the device 1.

[0060] In practice it has been found that the support device for radiators, particularly of the type with radiant plate, according to the invention, fully achieves the intended aim. The device can be used substantially with all radiant plate radiators and in particular with those provided with central connectors.

[0061] Also, the device according to the invention can be used both with radiators provided with convector heaters and with radiators provided with external brackets.

[0062] Also, the device according to the invention is not conditioned by the different distance between the radiant plates and is able to offer high operating flexibility without the need for auxiliary components.

[0063] The device according to the invention does not apply stresses to the connectors and the convection members of the radiator.

[0064] This application claims the priority of Italian Pat-

ent Application No. VI2009A000256, filed on October 26, 2009, the subject matter of which is incorporated herein by reference.

Claims

1. A support device for radiators, particularly of the type with radiant plates, comprising a supporting member constituted essentially by a tubular member to be inserted between the radiant plates of a radiator, said supporting member comprising a floor resting means or a wall hanging means and a radiator fastening means, **characterized in that** said radiator fastening means comprises at least one oscillating member, which is pivoted to the free end of said supporting member and can be rotated from a disengagement position, in which said oscillating member forms a longitudinal extension of said supporting member, to a position of engagement with said radiant plates, in which said oscillating member is transverse to said supporting member and interacts with said radiator, preventing its removal with respect to said support device for radiators.
2. The support device for radiators according to the preceding claim, **characterized in that** in said disengagement position said radiator fastening means has a lateral size that substantially corresponds to the lateral size of said supporting member.
3. The support device for radiators according to one or more of the preceding claims, **characterized in that** said radiator fastening means comprises at least one first abutment for a first radiant plate, said abutment being formed substantially at the free end of said oscillating member, and at least one second abutment for a second radiant plate, said second abutment is formed substantially at the free back of said supporting member, in said engagement position said first abutment and said second abutment applying a divergent thrust between said radiant plates and a thrust for moving said radiator toward said floor resting means or said wall hanging means.
4. The support device for radiators according to one or more of the preceding claims, **characterized in that** said first abutment comprises a rough surface provided substantially at the free end of said oscillating member.
5. The support device for radiators according to one or more of the preceding claims, **characterized in that** said first abutment comprises a sharp edge that is formed substantially at the lower edge of said oscillating member.
6. The support device for radiators according to one or more of the preceding claims, **characterized in that** said second abutment comprises at least one substantially flat insulating block which is joined to the free back of said supporting member.
7. The support device for radiators according to one or more of the preceding claims, **characterized in that** said radiator fastening means comprises a screw motion means which acts on said oscillating member to make it pass from said disengagement position to said engagement position with respect to said radiant plates.
8. The support device for radiators according to one or more of the preceding claims, **characterized in that** said screw motion means comprises at least one screw which is accommodated inside said supporting member, said screw engaging in a diametrical threaded hole of a cylindrical pin that is inserted in a seat defined between the free end of said oscillating member and its hinge point with respect to said supporting member, the head of said screw abutting against a perforated plate which is associated transversely with said supporting member with the possibility to oscillate.
9. The support device for radiators according to one or more of the preceding claims, **characterized in that** it comprises at least one base which connects the free back of said supporting member to a tang provided at the end of said supporting member that can be associated with said floor resting means or said wall hanging means, said supporting member and said tang being mutually offset, the head of said screw abutting against said base and remaining always accessible from the outside.
10. The support device for radiators according to one or more of the preceding claims, **characterized in that** it comprises at least one first cantilever portion and at least one second cantilever portion for the resting contact of the lower edges of said radiant plates, said two cantilever portions being associated transversely with said supporting member, on mutually opposite sides, in order to contrast the thrust toward said floor resting means or wall hanging means applied to said radiator by said first abutment and said second abutment.
11. The support device for radiators according to one or more of the preceding claims, **characterized in that** said first cantilever portion and said second cantilever portion comprise respectively a first receptacle and a second receptacle which are substantially U-shaped, said receptacles accommodating the lower edges respectively of said first radiant plate and of said second radiant plate, in order to contrast the diverging thrust applied by said first abutment and

said second abutment to said first radiant plate and said second radiant plate.

12. The support device for radiators according to one or more of the preceding claims, **characterized in that** said first cantilever portion and said second cantilever portion comprise respectively a first insulator and a second insulator which are substantially U-shaped, said insulators being associated respectively with said first receptacle and with said second receptacle.
13. The support device for radiators according to one or more of the preceding claims, **characterized in that** said first cantilever portion and said second cantilever portion comprise a transverse locking means constituted by a through threaded member arranged inside a hole formed in said supporting member and inside corresponding slotted holes formed in said cantilever portions, the distance between said receptacles being adjustable.
14. The support device for radiators according to one or more of the preceding claims, **characterized in that** said floor resting means or wall hanging means comprises at least one plate-like base, which is connected to an upright, said upright being associable with said supporting member with the possibility to adjust its position.

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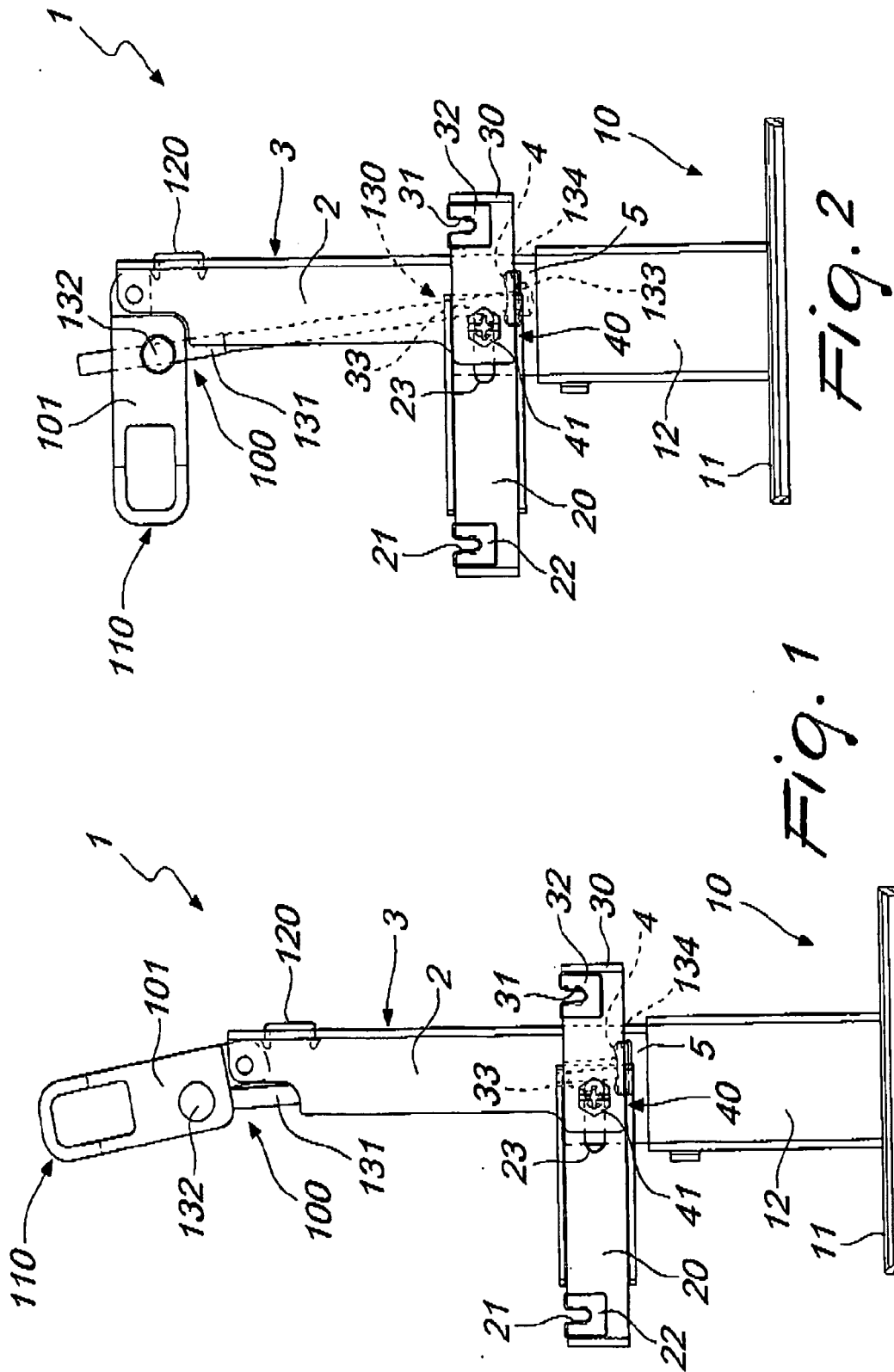
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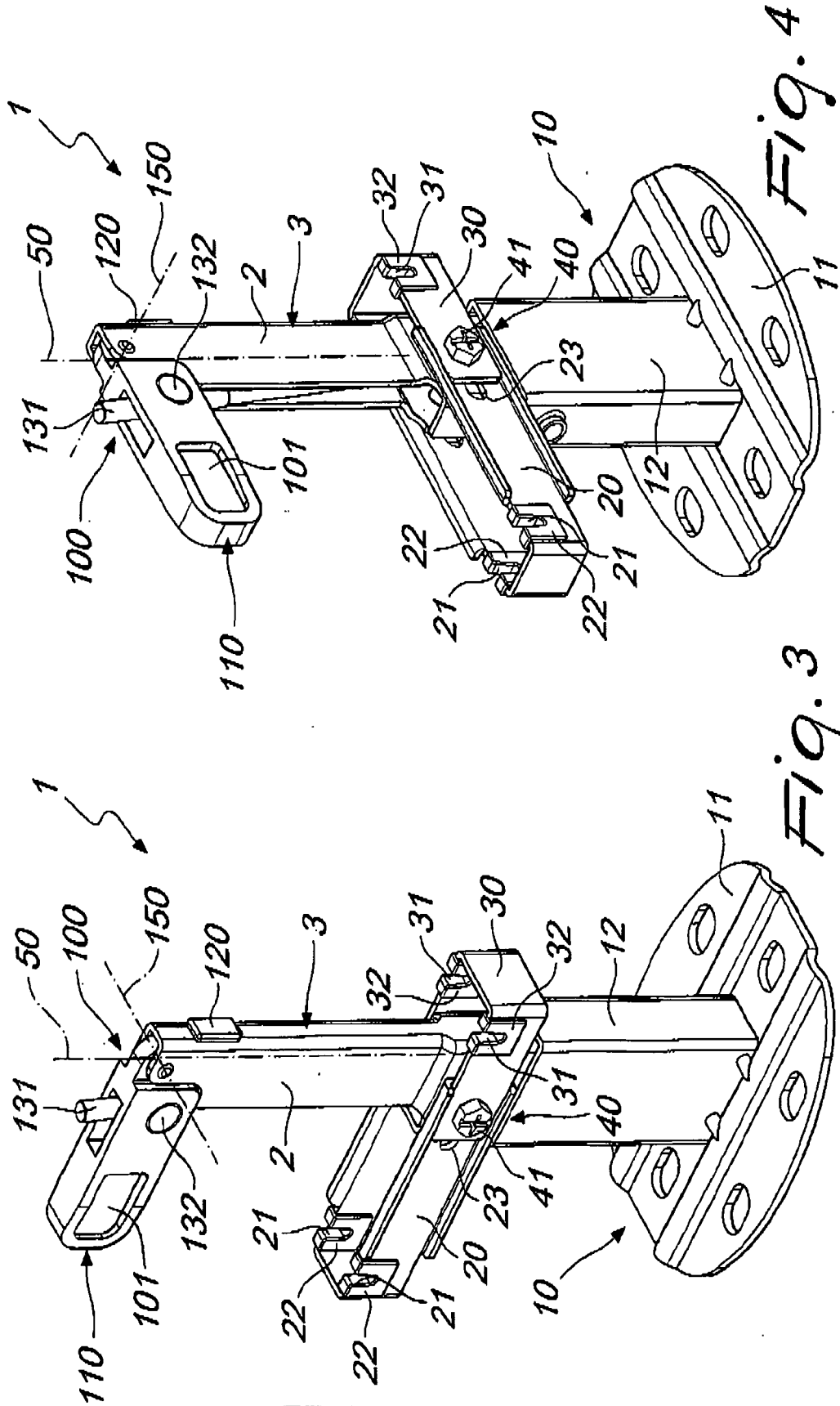
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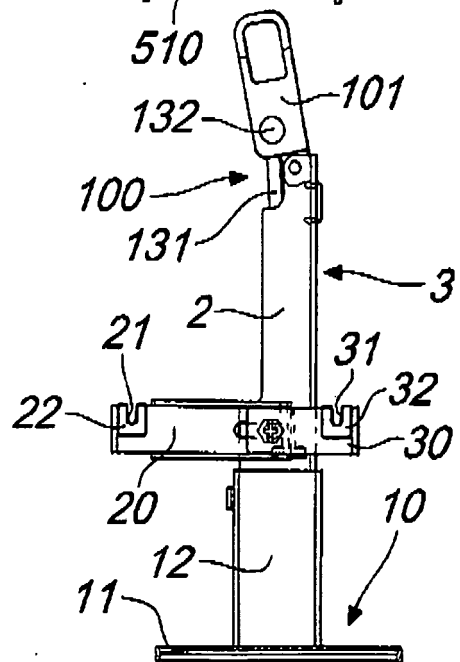
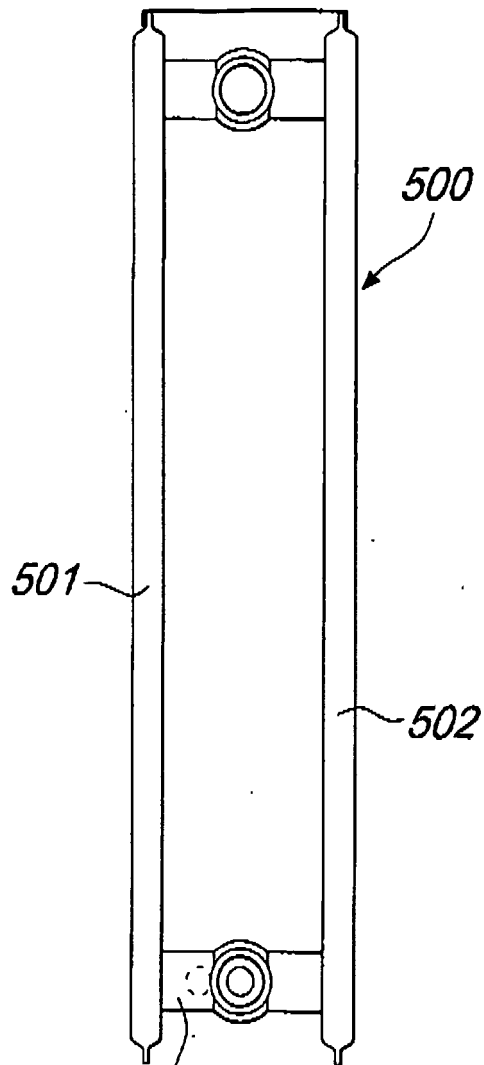


Fig. 5

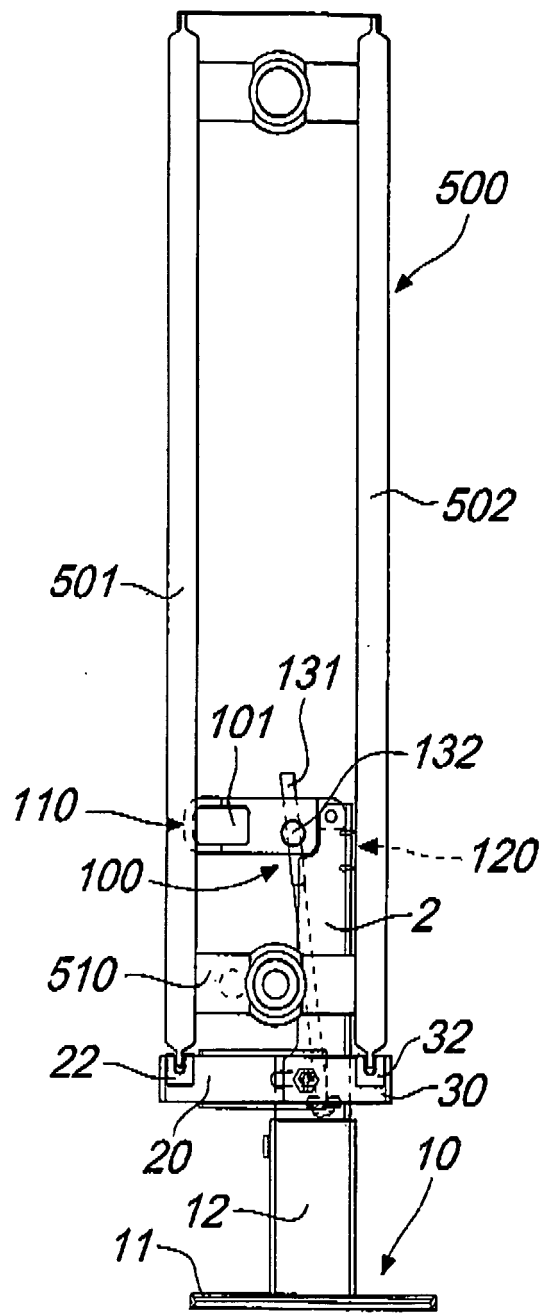


Fig. 6

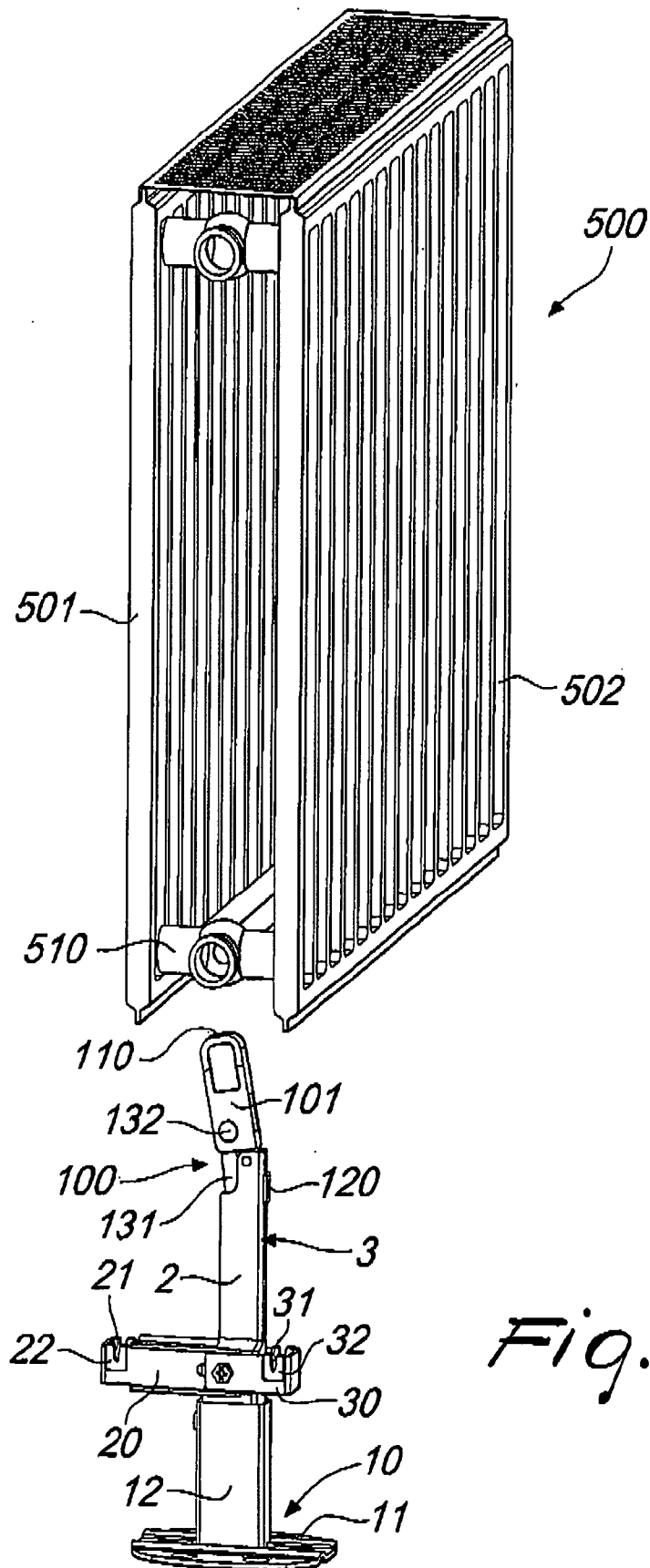
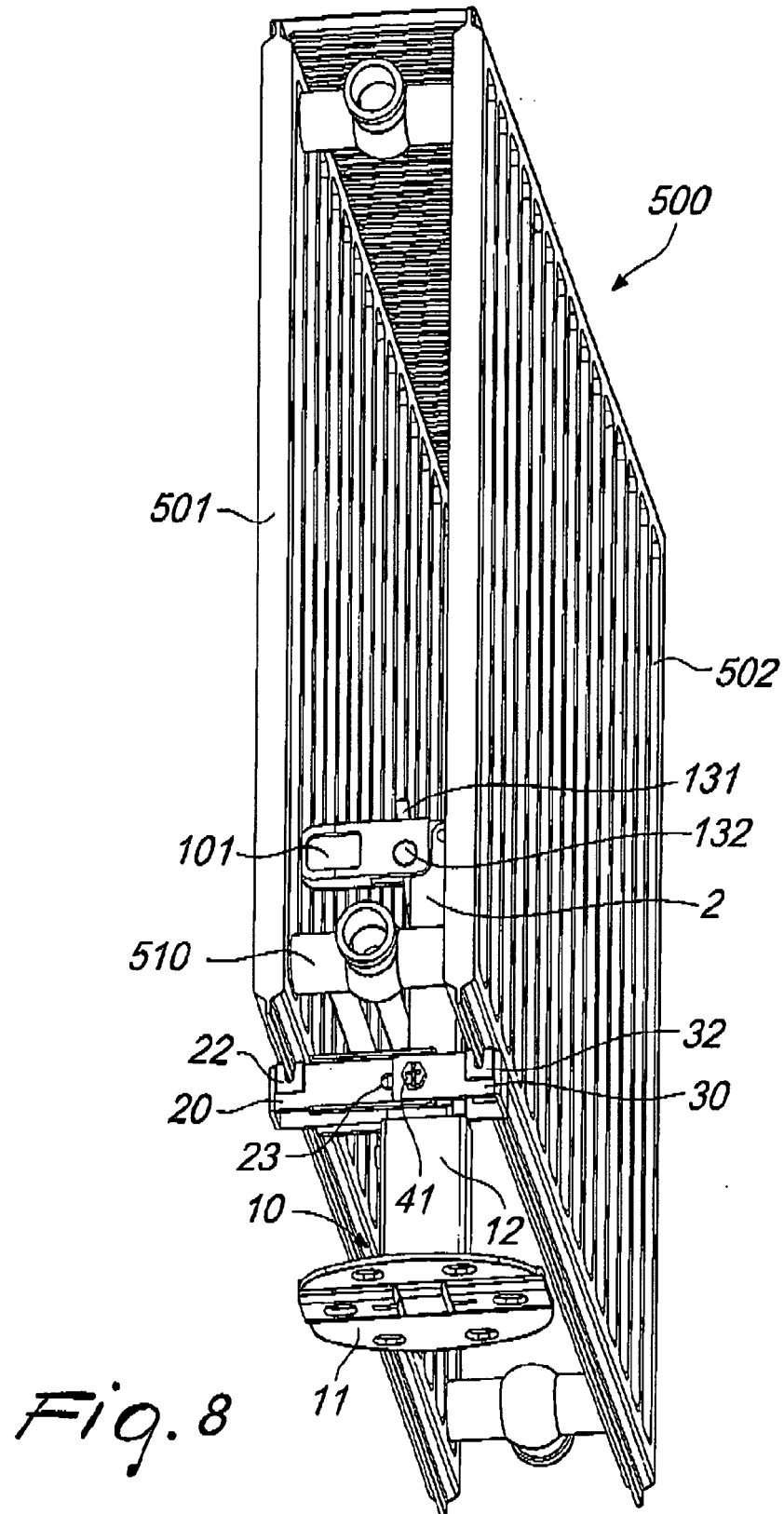


Fig. 7



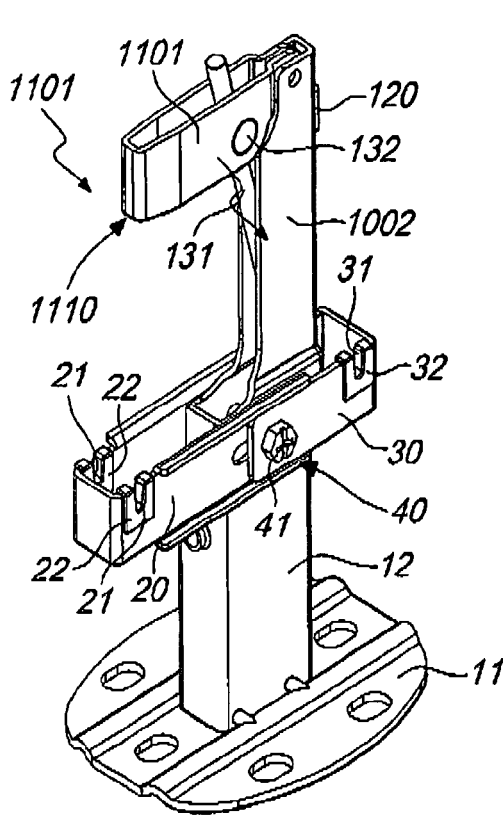


Fig. 9

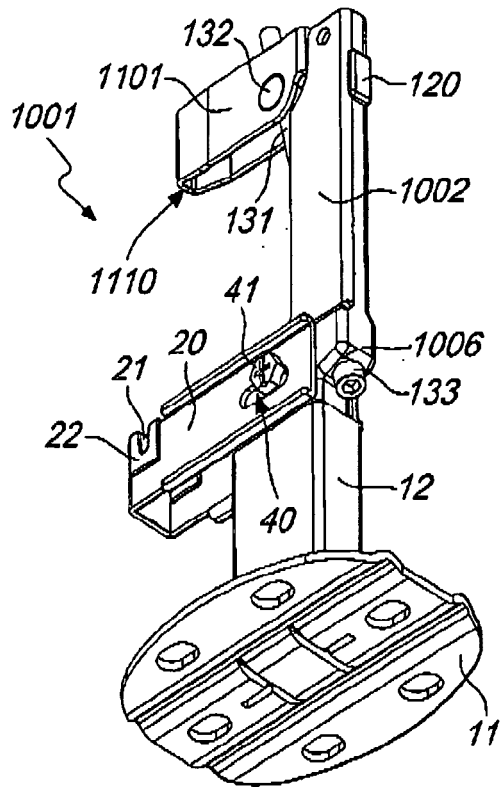


Fig. 10

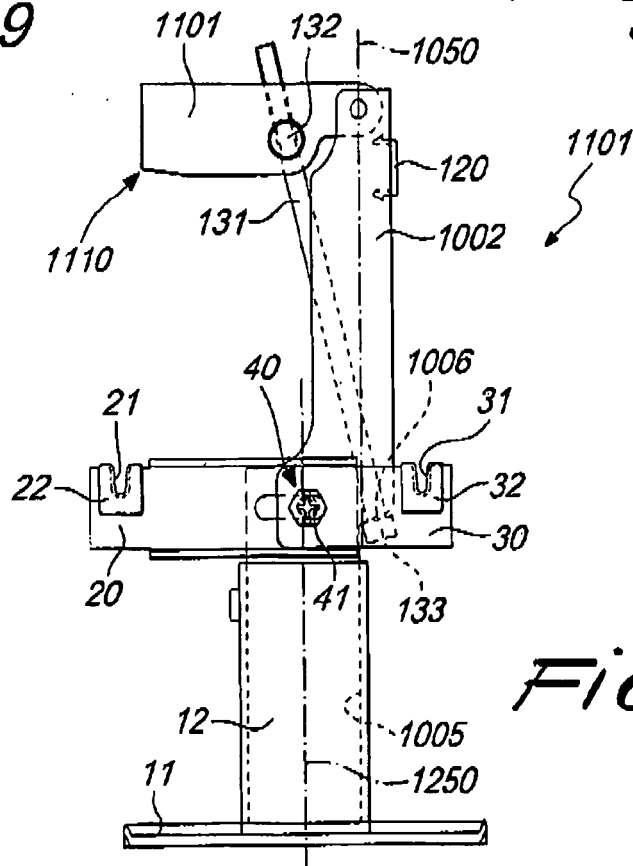


Fig. 11



EUROPEAN SEARCH REPORT

Application Number
EP 10 01 3965

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 1 821 040 A2 (ROFIX N V [BE]) 22 August 2007 (2007-08-22) * paragraph [0014] - paragraph [0016]; figures 1-5 * * paragraph [0020] - paragraph [0044] * -----	1-7,9,14	INV. F24D19/02
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			F24D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 February 2011	Examiner García Moncayo, 0
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 10 01 3965

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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09-02-2011

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REFERENCES CITED IN THE DESCRIPTION

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