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(54) Handle comprising two gripping bars with incorporated lock

(57) Handle comprising two gripping bars with incorporated lock, comprising an outer gripping bar and an inner gripping bar fastened to the two sides of the door by fixing and spacing means. The inner gripping bar houses a toothed wheel which engages with a rack portion of at least one locking rod so as to move it vertically between a closed position and an open position. The outer gripping bar has a lock associated with it, while the inner gripping bar has an associated knob. The lock and knob act on the locking rod via transmission means which pass inside the spacers and comprise a transmission shaft which extends continuously through the toothed wheel. The lock has an actuating member rotatably connected to the transmission shaft and able to receive the movement from the lock cylinder via a coupling system so that the cylinder is rotatably connected to the transmission shaft only when the key is inserted.

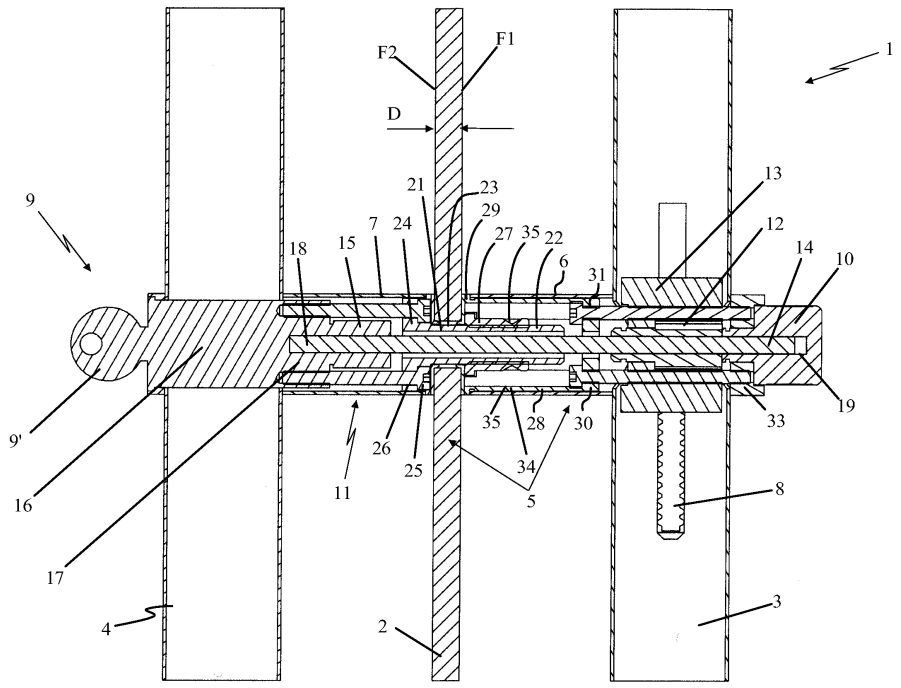

Fig. 1

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Description

Field of application

[0001] The present invention relates to a handle comprising two gripping bars with an incorporated lock, according to the preamble of the main claim.

[0002] The handle in question is classifiable within the industrial sector relating to the production of accessories for doors and windows and is intended to be used to open and close the leaves of doors, main entrance doors, French windows or the like, made of glass, metal, wood or other materials.

State of the art

[0003] At present, as is known, handles composed of two tubular bars which can be easily gripped are widely available on the market, said handles being mounted fixed in a mirror arrangement, on the inner side and the outer side, respectively, of a door or a main entrance door generally made of glass and in particular for use in offices, public buildings and shops.

[0004] The above-mentioned tubular bars are fixed to the two sides of the door by means of spacing members. The outer gripping bar has, mounted thereon, a safety lock which can be operated with a key so as to move, via a transmission mechanism, one or two locking rods into an open and a closed condition.

[0005] The inner gripping bar has, mounted thereon, a knob which allows operation of the rods from inside the building without the use of the key.

[0006] The patent application IT VI 2004A000149 discloses, for example, a design of handle comprising an inner gripping bar and an outer gripping bar which can be fixed to the sides of a glass door by means of spacing members, the outer bar having, mounted thereon, a key-operated cylinder lock for actuating two locking rods by means of a toothed wheel and the inner bar being provided with a knob for releasing the cylinder and for operating the rods. An intermediate mechanism with telescopic operation is arranged between the cylinder and the toothed wheel so as to maintain the mechanical transmission between them when there is a variation in the thickness dimensions of the glass.

[0007] The above-mentioned intermediate telescopic mechanism, in order to transmit the movement, as explicitly envisaged, must necessarily comprise a hollow shaft housing axially in opposition a spring and a pin with a lug projecting radially from a longitudinal slit in the spindle.

[0008] With the handle thus designed it is possible to mount, with the aid of the above-mentioned intermediate mechanism, the two tubular gripping bars on the inner side and outer side of doors of any thickness, within reasonable limits, without having to modify the mechanism for transmitting the movement of the cylinder (situated on the outer side) to the toothed wheel for moving the bars (situated on the inner side).

[0009] This design of handle, while being highly adaptable for doors of any type, has in practice proved to be overly complicated to produce. More particularly, the intermediate telescopic mechanism requires numerous components in order to be able to function, resulting in a relatively high production cost.

[0010] Moreover, these components of the intermediate telescopic mechanism must be assembled on site, making installation of the handle difficult and laborious.

Disclosure of the invention

[0011] In this situation, the main object of the present invention is therefore to eliminate the drawbacks of the above-mentioned prior art by providing a handle comprising two gripping bars with an incorporated lock, which is inexpensive to produce, using in particular locks with a coupling system.

[0012] Another object of the present invention is to provide a handle comprising two gripping bars with an incorporated lock, which can be installed on doors of varying thickness without the need for any type of adaptation.

[0013] Another object of the present invention is to provide a handle comprising two gripping bars with an incorporated lock, which is constructionally simple and operationally entirely reliable.

[0014] A further object of the present invention is to provide a handle comprising two gripping bars with an incorporated lock, which can be rapidly and easily installed.

Brief description of the drawings

[0015] The technical features of the invention, in accordance with the above-mentioned objects, may be clearly determined from the contents of the claims below and the advantages thereof will emerge more clearly from the detailed description which follows, with reference to the accompanying drawings which illustrate a purely exemplary and non-limiting embodiment thereof, where:

FIG. 1 shows a cross-sectioned side view of an example of embodiment of a handle comprising two gripping bars with an incorporated lock according to the present invention, associated with a door shown only partially;

FIGS. 2A and 2B show a side view of an enlarged detail of the handle according to the present invention, relating to a lock equipped with coupling system.

Detailed description of a preferred example of embodiment

[0016] With reference to the accompanying drawings 1 denotes in its entirety a handle comprising two gripping bars with an incorporated lock, according to the present

invention.

[0017] The above-mentioned handle may be mounted on the leaf of a door or window of any type or made of any material although preferably it is intended to be mounted on either side, i.e. the inner side F1 and outer side F2, of a door 2 or main entrance door made of glass, for example of the shatterproof type, for shops, offices, public premises, etc.

[0018] The handle 1 may have the most suitable form from an aesthetic point of view without thereby departing from the scope of protection of the present patent.

[0019] In accordance with the example of embodiment shown in the accompanying figures, the above-mentioned handle 1 comprises an inner gripping bar 3 and an outer gripping bar 4 which are mounted at a certain distance from the door 2, via fixing means 5 described in detail below, on the inner side F1 and outer side F2, respectively, of the door 2.

[0020] The latter is preferably made of glass, for example shatterproof glass, and has a thickness generically indicated by D.

[0021] The means 5 for performing fixing to the door 2 are concealed by an inner spacer 6 and an outer spacer 7 which have a substantially cylindrical tubular form with one end shaped so as to rest with the entire edge on the preferably cylindrical surface of the gripping bars 3, 4.

[0022] The inner gripping bar 3 has, mounted internally, at least one locking rod 8 which can be moved in the direction of its length, i.e. generally in the vertical direction when the handle 1 is normally mounted on the door 2, between a closed position, where it is inserted with its tip inside a corresponding hole formed in the floor or inside the frame of the door 2, preventing opening thereof, and an open position, where it is disengaged from the hole and allows opening of the door 2.

[0023] Two locking bars may be envisaged, said bars being able to be operated simultaneously in opposite directions, one upwards and the other downwards, so as to close more securely the door 2 in the closed position.

[0024] The outer gripping bar 4 and the inner gripping bar 3 are fitted, in a position aligned with the spacing members 6, 7, respectively, with a security lock 9 operated by a key 9' and a knob 10 which can be manually operated.

[0025] The lock 9 and the knob 10 are both able to actuate the locking rod 8 via transmission means 11 passing inside the two spacers 6, 7.

[0026] According to the underlying idea of the present invention, the transmission means 11 comprise a toothed wheel 12 which is mounted on a support piece 13 inside the inner gripping bar 3 and engages with a toothed rack portion of the locking rod 8, and a shaped transmission shaft 14 which extends continuously through an axial through-hole 20 of the toothed wheel 12 so as to connect rotatably the latter with the lock 9 and the knob 10.

[0027] The lock 9 has an actuating member 15 rotatably connected to the transmission shaft 14 and able to receive the movement from the cylinder of the lock 9 via a coupling system 17 so that the cylinder 16 of the lock 9 is rotatably connected to the actuating rod 14 only when the key 9' is inserted as shown in Figure 2B.

[0028] In greater detail, the lock 9 is of the coupling type, i.e. equipped with a coupling disk 17 which is displaced overcoming the resistance of a spring (not shown) by insertion of the key 9' (or the end of the key) so as to engage with the actuating member 15 and cause rotation of the transmission shaft 14.

[0029] In this way, when the key 9' is extracted from the hole of the lock 9 as shown in Figure 2A, the transmission shaft 14 is disengaged from the cylinder 16 and is therefore free to rotate as a result of operation of the knob 10.

[0030] The actuating member 15 and the knob 10 are respectively provided with a first and second seat 18, 19 which are shaped so as to engage rotatably with the ends of the transmission shaft 14. For this purpose, the transmission shaft 14 has a polygonal - preferably square - cross-section and the seats 18, 19 of the actuating member 15 and the knob 10 as well as the axial hole 20 of the toothed wheel 12 have a matching shape with a square cross-section so as to allow insertion and axial sliding of the transmission shaft 14, constraining it to rotate integrally.

[0031] The seats 18, 19 are designed with dimensions sufficiently deep for the shaft 14 to have play for longitudinal displacement inside at least one of said seats so as to compensate for the variations in thickness D of the door 2, allowing transmission of the rotational movement of the actuating member 15 of the lock 9 or the knob 10 to the toothed wheel 12 despite the variation in thickness D of the door 2.

[0032] The above-mentioned fixing means 5 comprise a male pin 21 with a hollow threaded shank 22 inside which the transmission shaft 14 freely passes and a head 24 fixed as one piece to the shank 22 at one end of the latter.

[0033] The above-mentioned shank 22 of the male pin 21 passes through an opening 23 in the thickness D of the door 2, while the head 24 is fixed to the lock 9 by means of first screws 25 inserted inside first through-holes 26 formed in the head 24 and directed in the opposite direction to the shank 22.

[0034] During assembly, the outer spacer 7 remains fixed and positioned between the outer gripping bar 4 and the head 24 of the male pin 21.

[0035] The fixing means 5 also comprises an internally hollow female pin 27 inside which the transmission shaft 14 freely passes. The female pin 27 is internally threaded so that it can be fixed by means of screwing to the male pin 24 so as to keep it fixed to the door 2 together with the spacer 7 and to the outer gripping bar 4 by means of the lock 9 fixed to it.

[0036] A substantially cylindrical bush 28 is also provided, being arranged with its edge 29 bent back at 90° in contact with the inner side F1 of the door 2, and is closed by an end piece 30.

[0037] The same end piece 30 has, formed therein, second through-holes 31 inside which second screws 32 engage, said screws extending so as to engage in a mutually fixing relationship firstly with the support piece 13 positioned inside the inner gripping bar 3 and then at the ends with a contact ring 33 of the knob 10 arranged in contact with the outer face of the inner gripping bar 3.

[0038] The inner spacer 6 remains positioned between the inner gripping bar 3 and the edge 29 of the bush 28. Fixing of the bush 28 to the female pin 27 and consequently fixing of the inner gripping bar 3 to the door 2 is performed by means of a grub screw 34 inserted inside a through-hole 35 formed in the thickness of the bush 28 and the inner spacer 6 until it engages with an annular groove 35 provided in the outer surface of the female pin 27.

[0039] Assembly of all the components of the handle 1 when the latter is mounted on the door 2 is made particularly simple owing to the small number of components used.

[0040] For this purpose, fixing of the male pin to the lock 9 is then performed by arranging the outer spacer 7 between the head 24 of the pin 21 and the outer gripping bar 7, so that it thus remains fixed to the said outer gripping bar 4.

[0041] Likewise, the bush 28 is fixed, via the second screws 32, to the support piece 13 and to the contact ring 33 of the knob 10 by arranging the inner spacer 6 between the said bush 28 and the inner gripping bar, so that it thus remains fixed to the said inner gripping bar 3.

[0042] Finally, the bush 28 is locked to the female pin 27 via the grub screw, rendering the handle 1 completely integral with the door 2.

[0043] The invention described above therefore achieves the predefined objects and in particular allows the use of means 11 for transmission of the movement produced by the rotation of the lock 9 or the knob 10 and able to rotate the toothed wheel 12 for operation of the locking rod 8, said means remaining unchanged with a variation in the thickness dimensions of the glass without the provision of any intermediate mechanism with a complex structure and displacement limited to the thickness of the leaves.

[0044] Obviously, it may assume, during its practical realization, also forms and configurations different from that illustrated above, without thereby departing from the present scope of protection.

[0045] Moreover, all the details may be replaced by technically equivalent elements and the dimensions, the forms and the materials used may be of any nature according to requirements.

Claims

1. Handle comprising two gripping bars with incorporated lock, of the type comprising:

- an outer gripping bar, mounted on the outer side of a door by means of at least one outer spacer;
- an inner gripping bar, mounted on the inner side of a door by means of at least one inner spacer;

fixing means associated with said spacers so as to rigidly fasten said bars to said sides;

- at least one locking rod mounted inside said inner gripping bar and displaceable in the direction of its length between a closed position, where it prevents opening of the door, and an open position, where it allows opening of the door;
- a lock mounted on said outer gripping bar and able to operate said locking rod via transmission means passing inside said spacers;
- a knob mounted on said inner gripping bar and able to be operate said locking rod via said transmission means;

characterized in that said transmission means comprise:

- a toothed wheel which is mounted on a support piece inside said inner gripping bar and engages with a toothed portion of said locking rod;
- a transmission shaft which extends continuously through said toothed wheel so as to connect rotatably the latter to said lock and to said knob, said lock being provided with an actuating member rotatably connected to said transmission shaft and able to receive the movement from the cylinder of said lock via a coupling system, so that said cylinder is rotatably connected to said transmission shaft only with the key inserted.

2. Handle according to Claim 1, **characterized in that** said actuating member and said knob are respectively provided with a first and second shaped seat engaged rotatably with the ends of said transmission shaft, said shaft having play so as to be displaced longitudinally inside at least one of said seats with a variation in the thickness of the door.

3. Handle according to Claim 1, **characterized in that** said fixing means comprise:

- a male pin with a threaded shank, able to pass through an opening in the thickness of said door, and with a head fixed to said lock by means of first screws inserted in first through-holes of the head and directed in the opposite direction to said shank, said outer spacer being fixed in position between said outer gripping bar and the

head of said male pin;
- an internally hollow and threaded female pin which is fixed by means of screwing to said male pin so as to be retained on said door;
- a bush positioned so as to rest with its edge against the inner side of said door and closed by an end piece provided with second through-holes inside which second screws engage in order to fix said support piece positioned inside said inner gripping bar and a contact ring of said knob against the outer side of said inner gripping bar, said inner spacer being arranged between said inner gripping bar and the edge of said bush, at least one grub screw being inserted inside a through-hole aligned on said bush and on said inner spacer until it engages inside an annular groove of said female pin so as to retain said bush and the components connected to it on said door by means of said female pin.

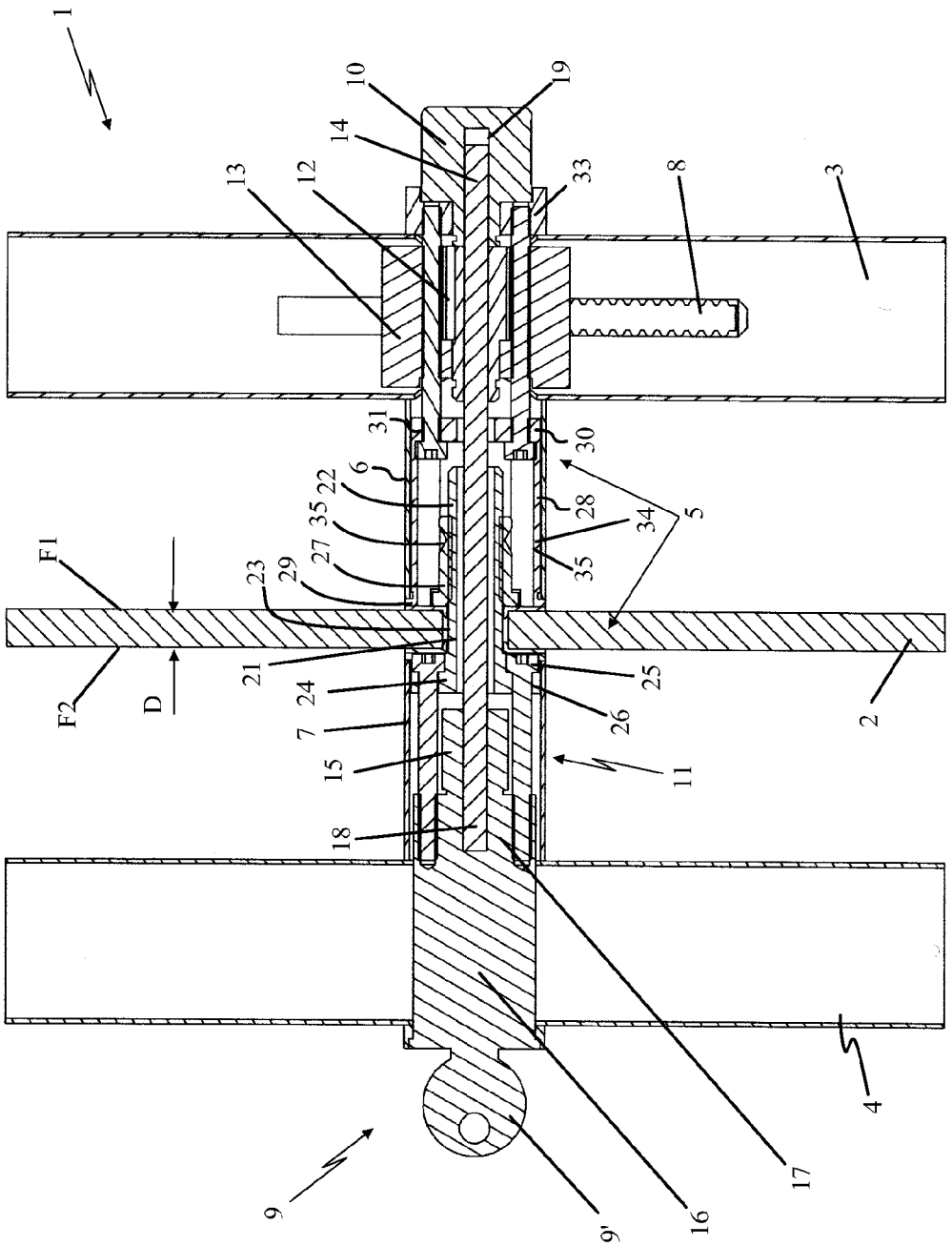
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Fig. 1

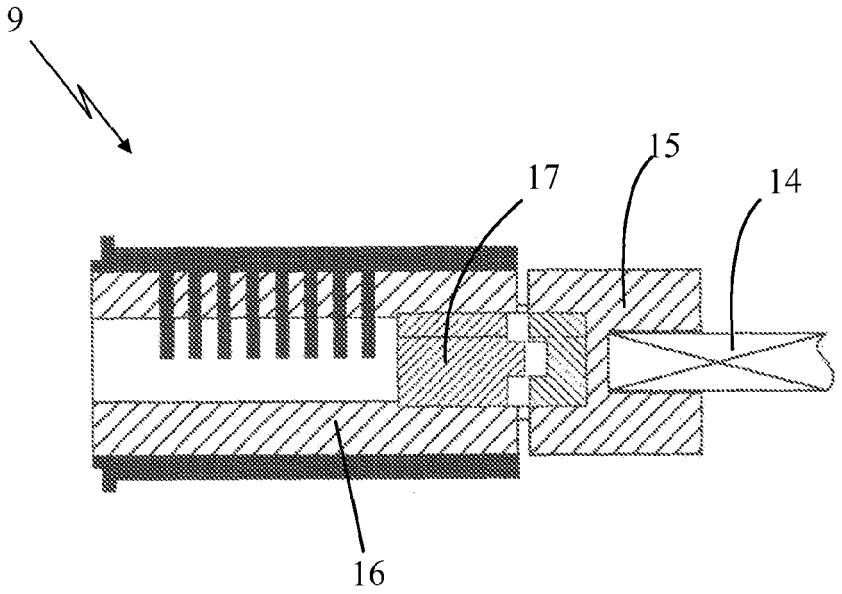

Fig. 2A

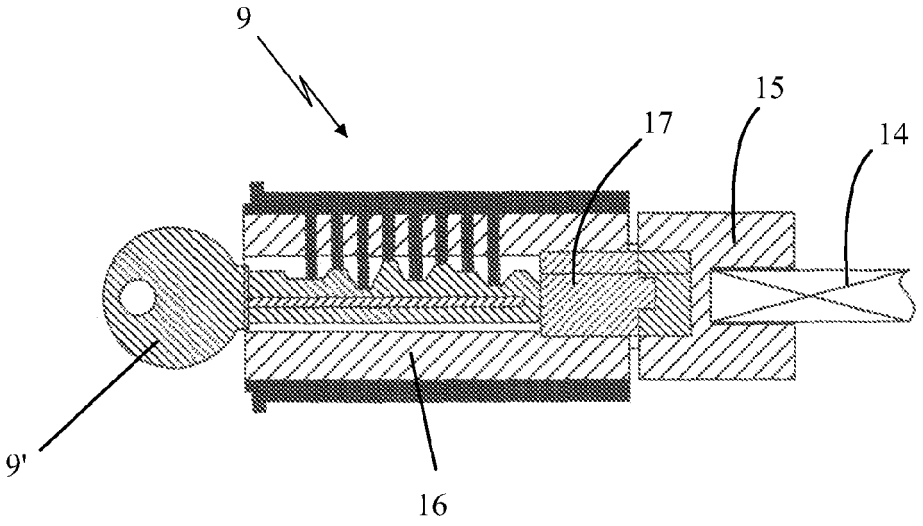

Fig. 2B

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EUROPEAN SEARCH REPORT

Application Number
EP 09 15 5413

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 1 026 346 A1 (META GLAS B V [NL]) 9 August 2000 (2000-08-09) * the whole document * -----	1	INV. E05B1/00 E05B17/04 E05C9/00
A	DE 20 2005 003529 U1 (CASMA SPA [IT]) 25 May 2005 (2005-05-25) * the whole document * -----	1	
A	US 3 670 537 A (HORGAN WILLIAM J JR) 20 June 1972 (1972-06-20) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC) E05B E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 August 2009	Westin, Kenneth

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 15 5413

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19-08-2009

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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