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(54) Title: LOCK FOR DOORS

(57) Abstract: A lock (1) for doors that comprises a box-like body (2) provided with at least one spring latch (3) and at least one sliding latch (4) both of which can perform a translational movement from a configuration of accommodation within respective inner cavities (5), to one of protrusion from the front edge (6) of the box-like body (2). The lock (1) comprises at least one removable module (7) provided with at least one component selected from an assembly for accommodating a handle (8), a cylinder (9) that can be actuated by means of a corresponding key, a spring latch (3), and a sliding latch (4).

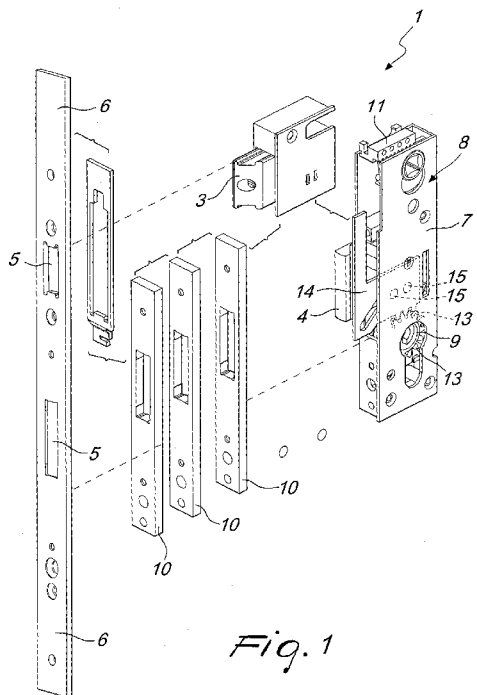


Fig. 1

WO 2013/114409 A1

LOCK FOR DOORS

The present invention relates to a lock for doors.

As is known, locks are substantially constituted by two closing elements: a spring latch, and a sliding latch.

5 The spring latch is constituted by a generally prismatic body, kept in protrusion by means of adapted elastic elements with respect to the contour of the lock, and adapted to be removably engaged in a corresponding seat of the jamb of the door.

The spring latch is generally actuated by a handle which can thus
10 command its retraction: the opening of the door is determined by the rotation of the handle which imposes the retraction of the spring latch, thus decoupling the door from the jamb.

The retraction of the spring latch can also be commanded by a specific
15 rotation of a cylinder actuated by means of a key (or another equivalent element).

The sliding latch is constituted by a plate that slides parallel to the lock (within it) and emerges from it to be engaged in a corresponding cavity of the jamb.

The extraction and retraction movements of the sliding latch are
20 commanded by a cylinder which is actuated by means of a key (or another equivalent element).

Every lock is designed to be installed on a door or on a door leaf that has a specific distance between the hole for accommodating the cylinder in the lock, and the edge of the door designed to come into contact with the
25 jamb of the door.

Such distance as a consequence also influences the dimensions and/or the positioning during assembly of the elements that make up the lock, such as for example the sliding latch and the spring latch.

Thus the necessity arises of making locks dedicated to the specific
30 distance (known as "backset" in the field of locks) between the front of the

lock and the center of the hole for the positioning of the cylinder.

This presupposes that every model of lock must be made according to a plurality of variations that differ substantially in terms of this distance.

Such requirement, for the producer company, implies a greater number
5 of different article codes (raw materials, semi-finished products, finished products) to be managed in order to be able to meet the different demands of the market.

Bearing in mind that, for each different article code, there are associated respective costs of provisioning, movement, storage and
10 management, it becomes a necessity for the company to seek to standardize, and thus reduce, as far as possible the number of different article codes necessary in order to make all the variations of a single product or model of product.

It must moreover be considered that for each article code (raw
15 material, semi-finished product, finished product) it is necessary to keep a preset quantity of material in stock, necessary to cater for unforeseen variability of market demand, which for the company in fact represents capital tied up in resources that are substantially unused.

The aim of the present invention is to solve the above-mentioned
20 problems, by providing a lock for doors made with modular and standardized components.

Within this aim, an object of the invention is to provide a lock for doors that necessitates a reduced number of different article codes (raw materials, semi-finished products, finished products) to be managed in order
25 to be able to meet the different demands of the market.

Another object of the present invention is to provide a lock for doors that entails reduced costs of provisioning, movement, storage and management of the article codes (raw materials, semi-finished products, finished products) necessary to produce it.

30 Another object of the present invention is to provide a lock for doors

that is low-cost, easily and practically implemented and safe in application.

This aim and these and other objects which will become more apparent hereinafter are achieved by a lock for doors comprising a box-like body provided with at least one spring latch and at least one sliding latch both of which can perform a translational movement from a configuration of accommodation within respective inner cavities, to one of protrusion from the front edge of said box-like body, characterized in that it comprises at least one removable module provided with at least one component selected from an assembly for accommodating a handle, a cylinder that can be actuated by means of a corresponding key, a spring latch, and a sliding latch.

Further characteristics and advantages of the invention will become more apparent from the description of a preferred, but not exclusive, embodiment of the lock for doors according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a partially exploded perspective view of the lock according to the invention;

Figure 2 is an assembled perspective view of the lock according to the invention;

Figure 3 is a front view of the lock according to the invention;

Figure 4 is a partially exploded perspective view of a different embodiment of the lock according to the invention;

Figure 5 is an assembled perspective view of the embodiment in Figure 4;

Figure 6 is a front view of the embodiment in Figure 4;

Figure 7 is a partially exploded perspective view of a different embodiment of the lock according to the invention;

Figure 8 is an assembled perspective view of the embodiment in Figure 7;

Figure 9 is a front view of the embodiment in Figure 7.

With particular reference to the figures, the reference numeral 1 generally designates a lock for doors that comprises a box-like body 2 provided with at least one spring latch 3 and at least one sliding latch 4 both of which can perform a translational movement from a configuration of accommodation within respective inner cavities 5, to one of protrusion from the front edge 6 of the box-like body 2.

The spring latch 3 and the sliding latch 4 can be prismatic in shape, arranged and slideable transversely with respect to the lock 1.

According to the invention the lock 1 comprises at least one removable module 7 provided with at least one component selected from an assembly for accommodating a handle 8, a cylinder 9 that can be actuated by means of a corresponding key, a spring latch 3, and a sliding latch 4.

In particular, between the front edge 6 of the box-like body 2 and the at least one module 7 spacing means 10 can be interposed for the arrangement of the at least one module 7 according to different configurations.

The spacing means 10 can be constituted by plates of predefined thickness which, positioned during assembly at the factory between the front edge 6 of the box-like body 2 and the at least one module 7, make it possible to modify the backset of the lock 1 (distance between the hole for accommodating the cylinder 9 and the front edge 6 of the box-like body 2) depending on the variant of the model of lock 1 that one wants to produce.

According to an embodiment of undoubted practical and applicative interest, shown in Figures 1, 2 and 3, the module 7 can comprise an assembly for accommodating a handle 8 and the respective transmission elements 11 for connection to an assembly 12 for the movement of the spring latch 3, a sliding latch 4, and a cylinder 9.

The cylinder 9 can be actuated by means of a corresponding key associated with a toothed wheel 13 for actuating the sliding latch 4.

The sliding latch 4 can be constituted by a plate 14 provided with at

least two locking appendages 15 for corresponding fastening elements of the toothed wheel 13, for mutual coupling according to at least two configurations.

The variation of the point of fixing the sliding latch 4 to the toothed wheel 13 is such as to ensure that the sliding latch 4 protrudes from the front edge 6 of the box-like body 2 when it is in the configuration of protrusion.

In fact if the spacing means 10 are used, during assembly, it is necessary that the fixing position of the sliding latch 4 be advanced further toward the front edge 6 of the box-like body 2 than in the case where the spacing means 10 are not present.

If this were not the case then the sliding latch 4 would not protrude from the lock 1 in such a way as to be removably engaged in a corresponding seat of the jamb of the door in which the lock 1 will be installed.

According to a different embodiment of particular utility, shown in Figures 4, 5 and 6, the removable modules 7 can be two in number.

The first module 7a can comprise an assembly for accommodating a handle 8 and respective transmission elements 11 for connection to an assembly 12 for the movement of the spring latch 3.

The second module 7b can comprise a cylinder 9 that can be actuated by means of a corresponding key associated with a toothed wheel 13 for actuating the sliding latch 4.

The sliding latch 4 can be comprised within the box-like body 2 of the lock 1 and interposed between the first module 7a and the second module 7b.

The sliding latch 4 can be constituted by a plate 14 that has at least one ridge 16, designed for coupling with a respective drivetrain element 17, of the type of a rack.

The rack in fact makes it possible to convert the rotary motion of the toothed wheel 13, actuated by the key, to a linear motion of the sliding latch 4.

The drivetrain element 17 can have a first 18a and a second 18b

plurality of projections alternating with indentations, respectively on the upper face and on the lower face.

The first plurality 18a can be adapted for removable coupling with the at least one ridge 16.

5 The second plurality 18b can be adapted for removable coupling, directly or indirectly, with at least one corresponding protuberance of the toothed wheel 13 for actuating the sliding latch 4.

The rotary movement of the key, inside the cylinder 9, causes the rotation of the toothed wheel 13 and the consequent action of the
10 protuberance on the second plurality 18b.

The protuberance, in turn, by resting on the second plurality 18b, determines the translational motion of the drivetrain element 17 and, as a consequence, of the sliding latch 4.

The spring latch 3, as shown schematically by way of example in
15 Figure 4, can be provided with a supporting bracket 19, provided with an abutment 20 for a toothed band 21.

The various spaces comprised between the teeth of the band 21 enable the accommodation of the abutment 20 according to different configurations.

The variation of the accommodation position of the abutment 20 is
20 such as to ensure that it protrudes from the front edge 6 of the box-like body 2 when it is in the configuration of protrusion.

In fact if the spacing means 10 are used, during assembly, it is necessary that the accommodation position of the abutment 20 be advanced further toward the front edge 6 of the box-like body 2 than in the case where
25 the spacing means 10 are not present.

If this were not the case the abutment 20 would not protrude from the lock 1 in such a way as to be removably engaged in a corresponding seat of the jamb of the door in which the lock 1 will be installed.

Such toothed band 21 can be provided at the bottom with a shoulder
30 22 for an arm 23 for actuating the assembly for accommodating a handle 8.

Such assembly 8 can comprise an elastic element so as to enable, once the handle is released by the user, the actuation arm 23 to return to its inactive position thus interrupting its action of thrust on the shoulder 22, and as a consequence it allows the spring latch 3 to return to the configuration of protrusion.

According to another embodiment, which is particularly simple and effective, the module 7 can comprise a sliding latch 4 and a cylinder 9.

The cylinder 9 can be actuated by means of a corresponding key associated with a toothed wheel 13 for actuating the sliding latch 4.

According to a different embodiment, the module 7 can comprise an assembly 8 for accommodating a handle and an assembly 12 for the movement of the spring latch 3.

According to a different embodiment, shown in Figures 7, 8 and 9, of particular practicality, the removable modules 7 can be two in number.

The first module 7c can comprise an assembly 8 for accommodating a handle and an assembly 12 for the movement of the spring latch 3.

The second module 7d can comprise a sliding latch 4 and a cylinder 9 that can be actuated by means of a corresponding key associated with a toothed wheel 13 for actuating the sliding latch 4.

The sliding latch 4 can be constituted by a plate 14 provided with at least two locking appendages 15 for corresponding elements for fastening the toothed wheel 13, for mutual coupling according to at least two configurations.

The variation of the point of fixing the sliding latch 4 to the toothed wheel 13 is such as to ensure that the sliding latch 4 protrudes from the front edge 6 of the box-like body 2 when it is in the configuration of protrusion.

In fact if the spacing means 10 are used, during assembly, it is necessary that the fixing position of the sliding latch 4 be advanced further toward the front edge 6 of the box-like body 2 than in the case where the spacing means 10 are not present.

If this were not the case then the sliding latch 4 would not protrude from the lock 1 in such a way as to be removably engaged in a corresponding seat of the jamb of the door in which the lock 1 will be installed.

Advantageously, the lock for doors is implemented with components
5 that are modular and standardized.

The lock 1, according to the invention, is in fact provided by assembling a reduced number of article codes (box-like body 2, removable modules 7, transmission elements 11, drivetrain elements 17, spacing means 10) which can be combined and assembled in various ways to obtain a
10 variety of diversified locks, in particular with regard to the backset (distance between the front of the lock 1 and the center of the hole for the positioning of the cylinder 9).

~~In this manner the advantage of being able to offer the market a wide~~
mix of locks 1 is combined with the one of being able to carry out mass
15 production of the component modules, with consequent lower production costs.

Moreover, reducing the number of article codes necessary entails a reduction in the quantity of material on hand in stock with consequent reduction of the costs of provisioning, movement, storage and in particular
20 management.

In practice it has been found that the lock for doors, according to the invention, fully achieves the set aim in that it is provided with modular and standardized components.

The invention, thus conceived, is susceptible of numerous
25 modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other,
30 different characteristics, existing in other embodiments.

In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

Where the technical features mentioned in any claim are followed by reference numerals and/or signs, said reference numerals and/or signs have
5 been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.

CLAIMS

1. A lock for doors comprising a box-like body (2) provided with at least one spring latch (3) and at least one sliding latch (4) both of which can perform a translational movement from a configuration of accommodation
5 within respective inner cavities (5), to one of protrusion from the front edge (6) of said box-like body (2), characterized in that it comprises at least one removable module (7) provided with at least one component selected from an assembly for accommodating a handle (8), a cylinder (9) that can be actuated by means of a corresponding key, a spring latch (3), and a sliding latch (4).
- 10 2. The lock for doors according to claim 1, characterized in that between said front edge (6) of said box-like body (2) and said at least one module (7), spacing means (10) are interposed for the arrangement of said at least one module (7) according to different configurations.
3. The lock for doors according to claim 1, characterized in that said
15 module (7) comprises an assembly (8) for accommodating a handle and respective transmission elements (11) for connection to an assembly (12) for the movement of said spring latch (3), a sliding latch (4), and a cylinder (9) that can be actuated by means of a corresponding key associated with a toothed wheel (13) for actuating said sliding latch (4).
- 20 4. The lock for doors according to claim 3, characterized in that said sliding latch (4) is constituted by a plate (14) provided with at least two locking appendages (15) for corresponding fastening elements of said toothed wheel (13), for mutual coupling according to at least two configurations.
- 25 5. The lock for doors according to claim 1, characterized in that said removable modules (7) are two in number, said first module (7a) comprises an assembly for accommodating a handle (8) and respective transmission elements (11) for connection to an assembly (12) for the movement of said spring latch (3), said second module (7b) comprises a cylinder (9) that can be
30 actuated by means of a corresponding key associated with a toothed wheel

(13) for actuating said sliding latch (4).

6. The lock for doors according to claim 5, characterized in that said sliding latch (4) is constituted by a plate (14) having at least one ridge (16) designed for coupling with a respective drivetrain element (17), of the type
5 of a rack.

7. The lock for doors according to claims 5 and 6, characterized in that said drivetrain element (17) has a first (18a) and a second (18b) plurality of projections alternating with indentations, respectively on the upper face and on the lower face, said first plurality (18a) being adapted for removable
10 coupling with at least one ridge (16) and said second plurality (18b) being adapted for removable coupling, directly or indirectly, with at least one corresponding protuberance of said toothed wheel (13) for actuating said sliding latch (4).

8. The lock for doors according to one or more of the preceding
15 claims, characterized in that said spring latch (3) is provided with a supporting bracket (19) provided with an abutment (20) for a toothed band (21), the different spaces comprised between the teeth of said band (21) enabling the accommodation of the abutment (20) according to different configurations.

20 9. The lock for doors according to one or more of the preceding claims, characterized in that said toothed band (21) is provided in the lower part with a shoulder (22) for an arm (23) for actuating said assembly for accommodating a handle (8).

10. The lock for doors according to claim 1, characterized in that said
25 module (7) comprises a sliding latch (4) and a cylinder (9) that can be actuated by means of a corresponding key associated with a toothed wheel (13) for actuating said sliding latch (4).

11. The lock for doors according to claim 1, characterized in that said
30 module (7) comprises an assembly (8) for accommodating a handle and an assembly (12) for the movement of said spring latch (3).

12. The lock for doors according to one or more of the preceding claims, characterized in that said removable modules (7) are two in number; said first module (7c) comprises an assembly for accommodating a handle (8) and an assembly (12) for the movement of said spring latch (3); said
5 second module (7d) comprises a sliding latch (4) and a cylinder (9) that can be actuated by means of a corresponding key associated with a toothed wheel (13) for actuating said sliding latch (4).

13. The lock for doors according to claims 10 and 12, characterized in that said sliding latch (4) is constituted by a plate (14) provided with at least
10 two locking appendages (15) for corresponding elements for fastening said toothed wheel (13), for mutual coupling according to at least two configurations.

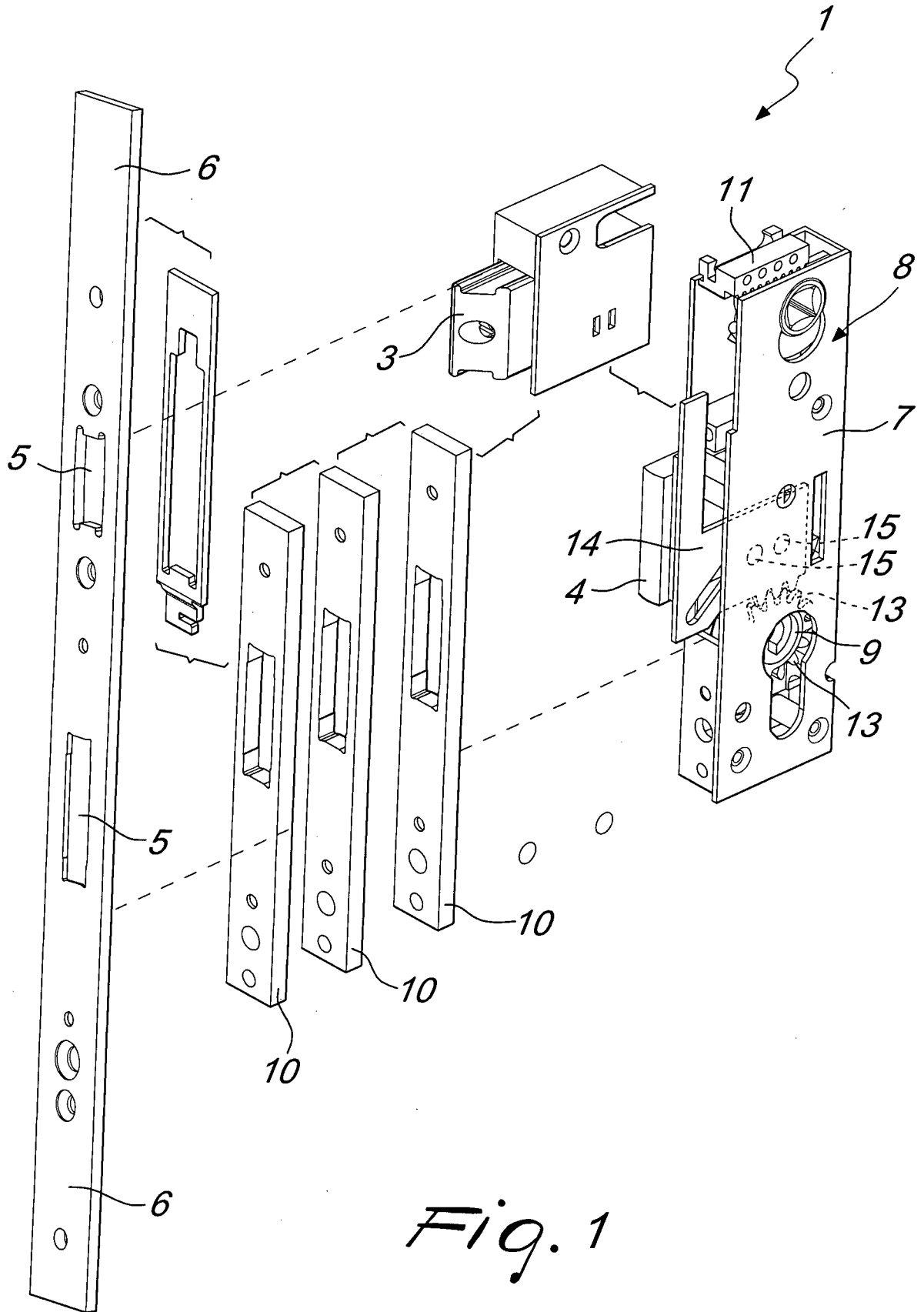


Fig. 1

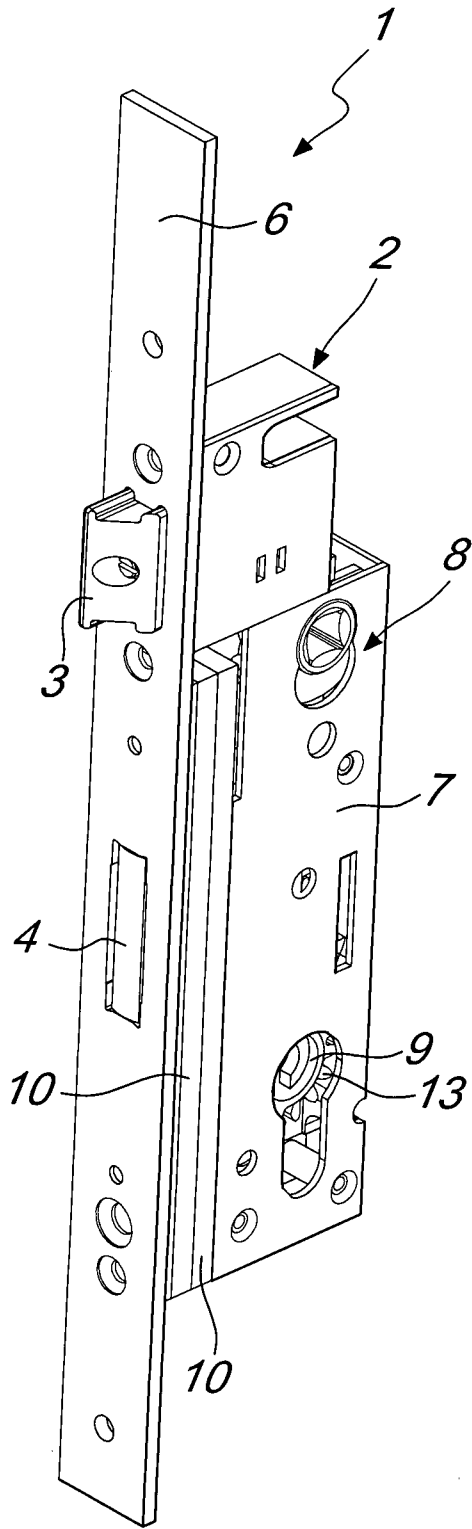


Fig. 2

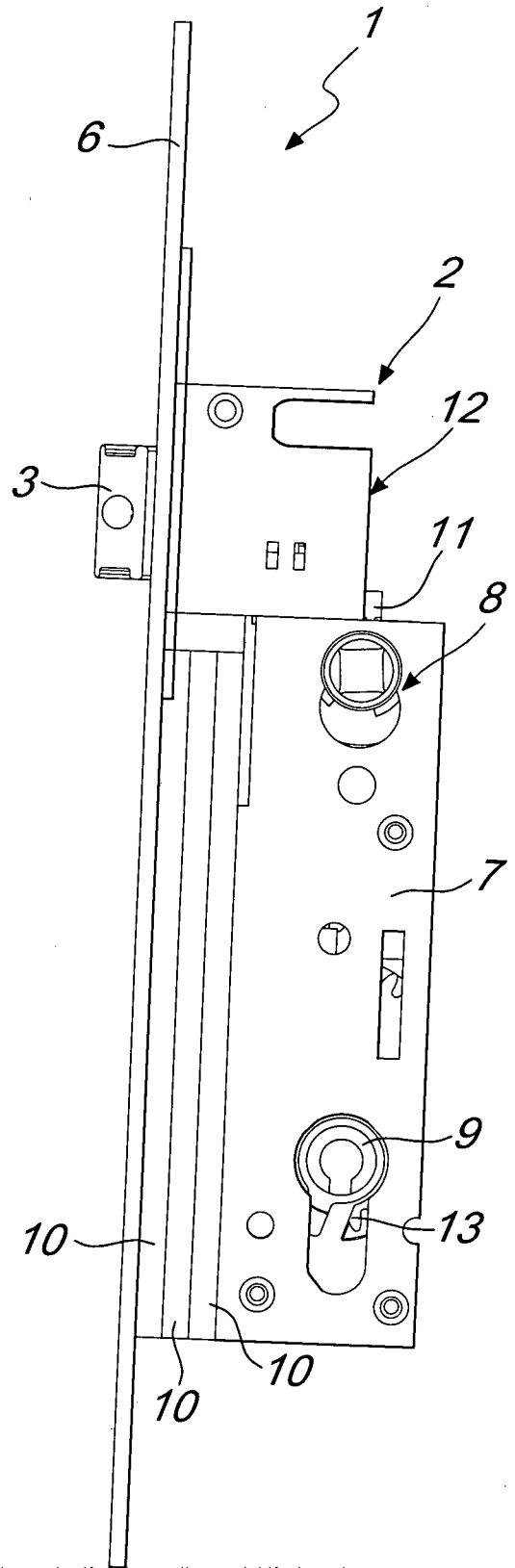


Fig. 3

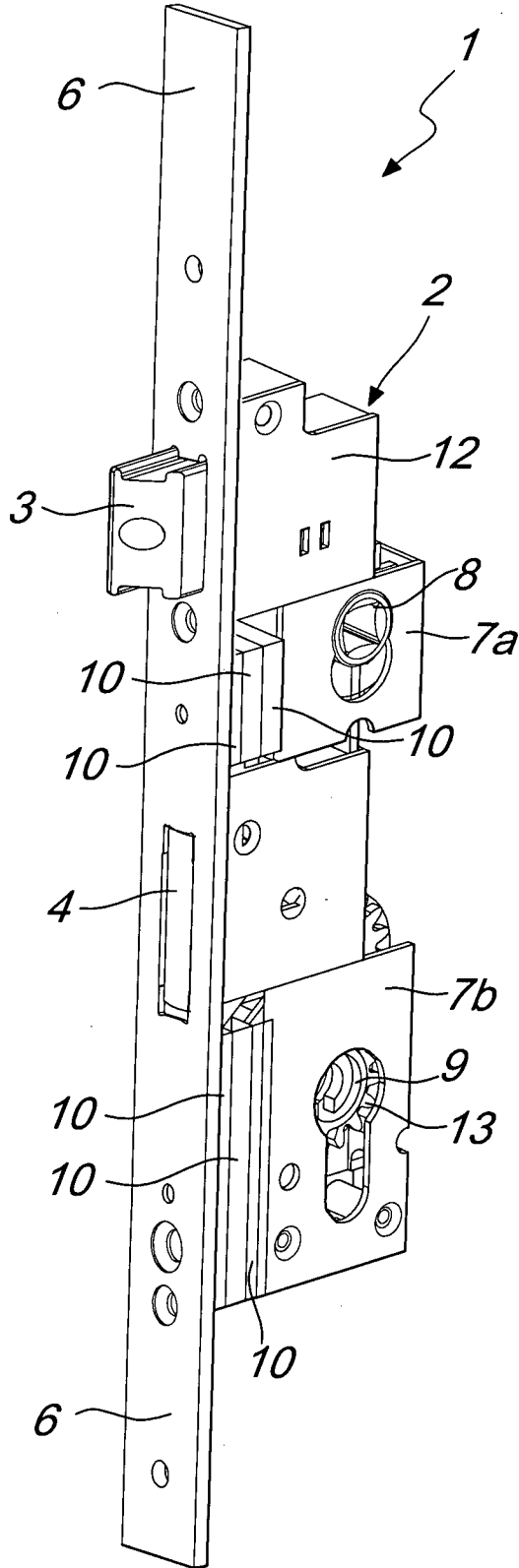


Fig. 5

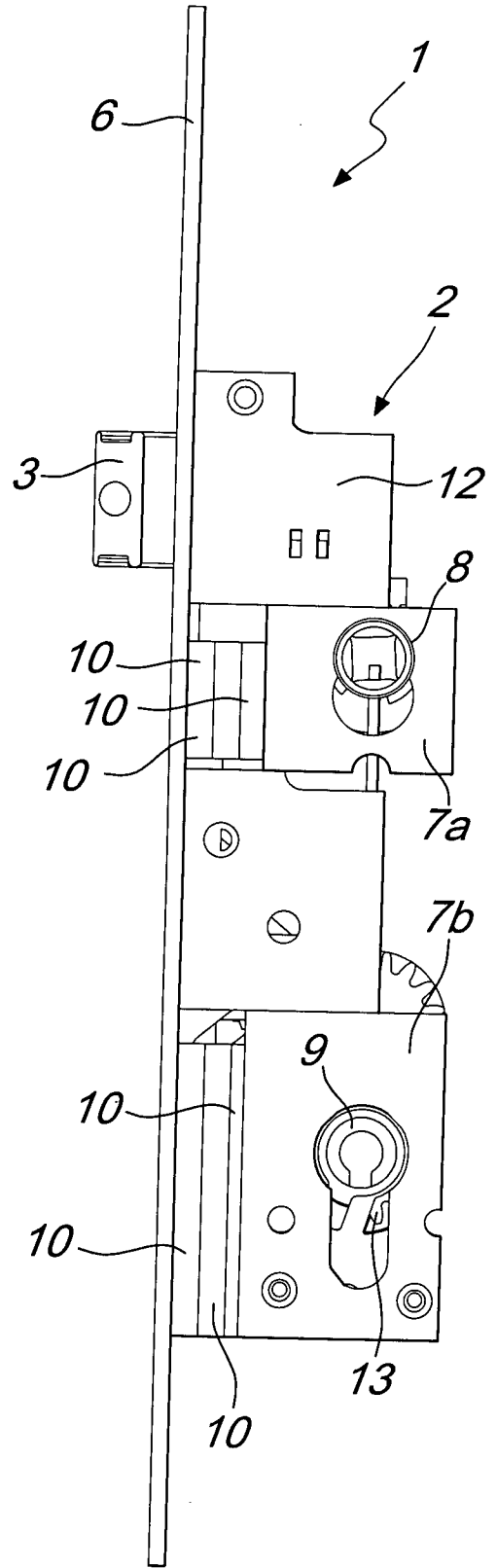


Fig. 6

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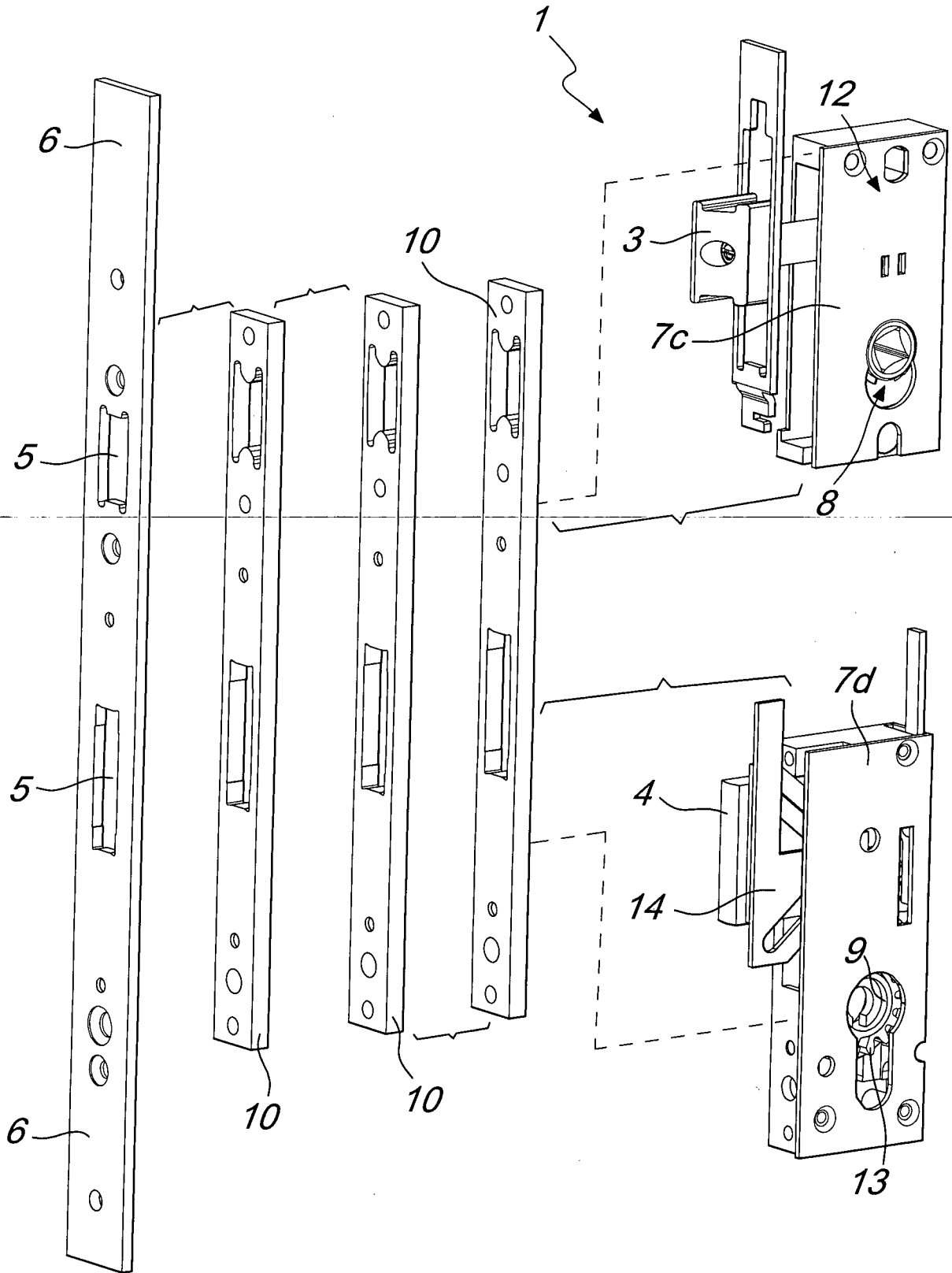


Fig. 7

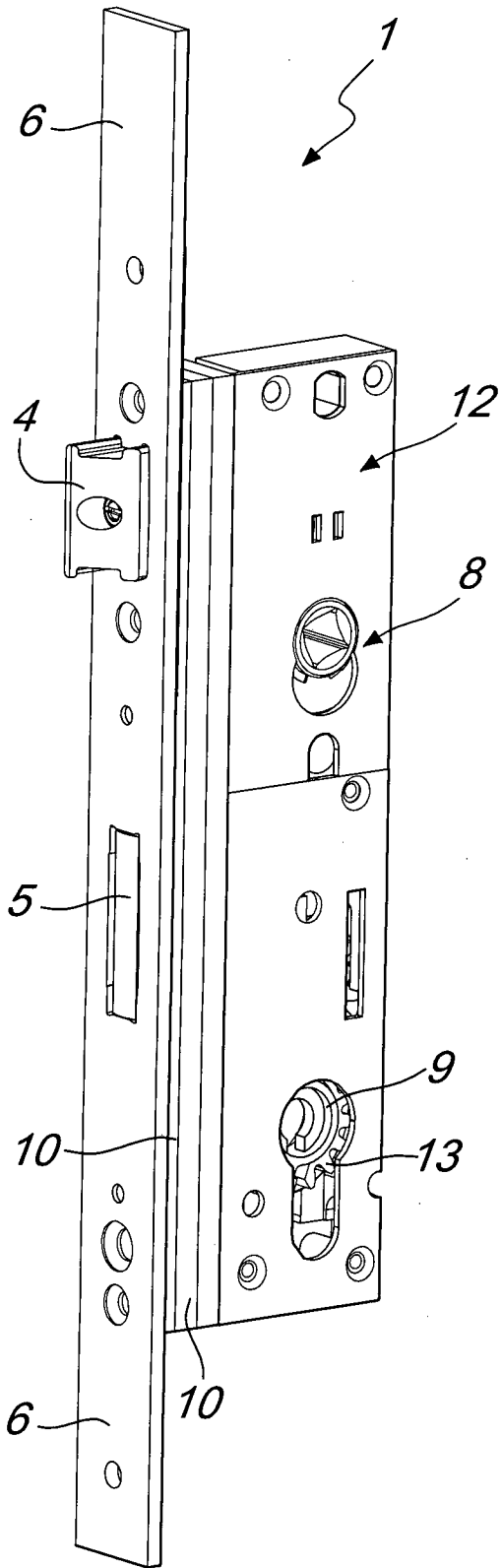


Fig. 8

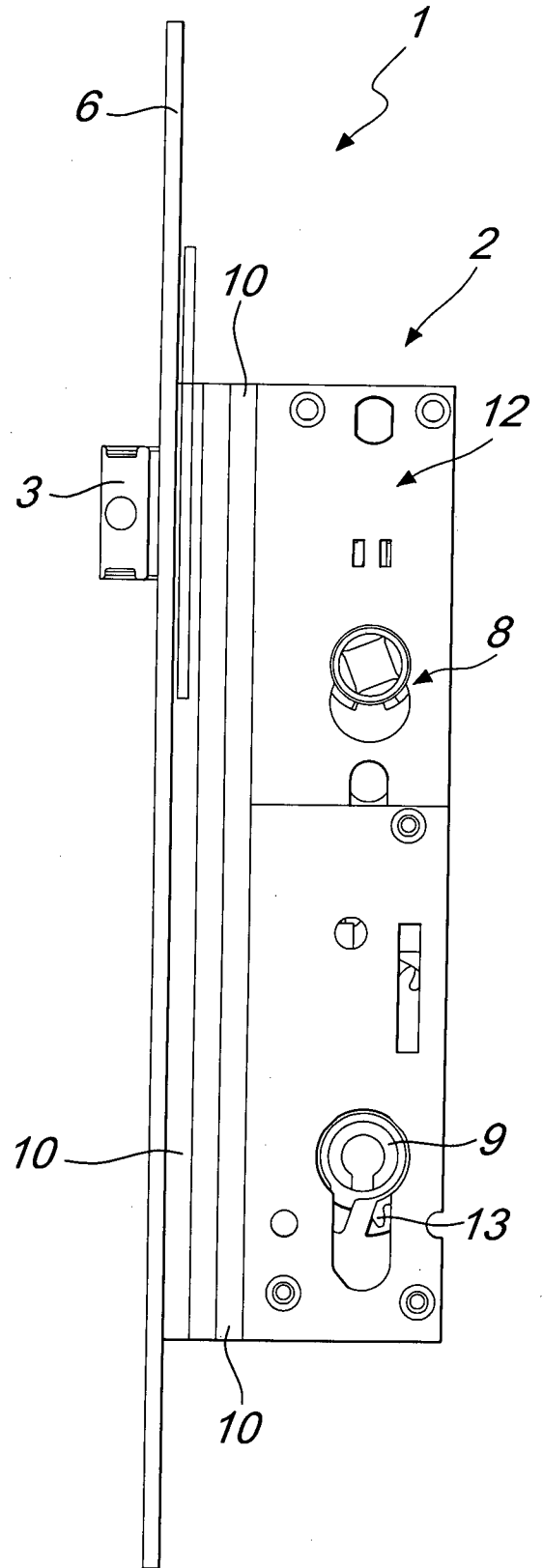


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2012/000026

A. CLASSIFICATION OF SUBJECT MATTER
 INV. E05B63/00 E05B63/06 E05B9/02
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 E05B E05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	----- EP 1 154 102 A2 (MOTTURA SERRATURE DI SICUREZZA [IT]) 14 November 2001 (2001-11-14) paragraph [0003] paragraph [0010] - paragraph [0017] figures fig.1, 3	1
X	----- US 2001/037665 A1 (RENZ WALTER [DE] ET AL) 8 November 2001 (2001-11-08) paragraph [0052] - paragraph [0055] paragraph [0076] paragraph [0082] figures 1-5, 14, 17, 18 ----- -/--	1,3,4, 10,11,13

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 22 October 2012	Date of mailing of the international search report 31/10/2012
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Antonov, Ventseslav
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INTERNATIONAL SEARCH REPORT

International application No

PCT/IT2012/000026

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Information on patent family members

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