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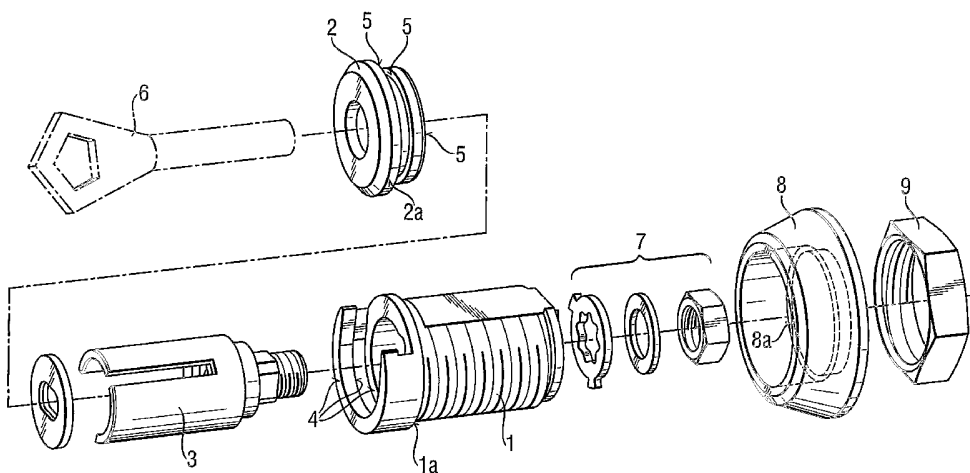
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(54) Title: CYLINDER HOUSING ARRANGEMENT



(57) Abstract: A cylinder housing arrangement, where the cylinder housing encloses a lock cylinder (3) or the like, which comprises a number of locking elements to be arranged by a key, preferably tumbler discs to be turned by a key, which discs in their locked position prevent the turning of the lock cylinder (3) relative to the cylinder housing. The cylinder housing comprises a body part (1) and a separate cover part (2), which is arranged to be installed in the cross-wise direction relative to the cylinder housing at the end of the body part (1) on the inserting side of a key (6), so that it is locked to the body part (1) in the axial direction of the cylinder housing.

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## CYLINDER HOUSING ARRANGEMENT

The invention relates to a cylinder housing arrangement in accordance with  
5 the preamble of claim 1.

Conventionally a cylinder housing consists of one piece, inside of which a  
lock cylinder with its locking members are installed from behind, whereby the  
cylinder housing itself or separate protection elements to be possibly  
10 mounted in front thereof form the front surface of the lock. It is possible to  
install the lock cylinder also from the front of the cylinder housing. As for the  
strength properties, a front-mounted lock is clearly superior to a conventional  
lock, if one attempts to break it by striking the lock cylinder inwards. A front-  
mounted lock is disclosed in the Finnish utility model No. 3629. In this solu-  
15 tion the lock cylinder is provided with a separate profiled plate to be mounted  
at the end thereof forming a part of the front surface of the cylinder housing.  
The lock cylinder is attached to the cylinder housing by a security plate  
mounted onto its back end, which plate may be affected by a special key, if  
the aim is to replace the tumbler disc package of the lock cylinder. The solu-  
20 tion is thus complicated and fairly awkward to use.

An object of the present invention is to provide a novel cylinder housing ar-  
rangement having a simple structure and being easily assembled and disas-  
sembled, which arrangement makes it possible to install the lock cylinder and  
25 replace its locking members from the front of the cylinder housing. An aim is  
also to improve the burglary resistance properties of the lock. A further aim is  
to provide an arrangement, which is advantageous from the viewpoint of  
manufacturing technique providing a wide range of options for adapting the  
cylinder housing to various objects of installation.

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The objects of the present invention can be achieved in a way described in  
claim 1 and in the other claims. According to the invention the cover part is

## 2

arranged to be installed in the crosswise direction relative to the cylinder housing at the end of the body part on the inserting side of a key, so that it is locked onto the body part in the axial direction of the cylinder housing. This kind of a lock is easy to assemble and disassemble e.g. in order to re-  
5 key it. The material of the separate cover part may, if so desired, differ from that of the body part. Naturally also the finishing of the cover part may be different from that of the body part, whereby the cover part may be finished so as to be compatible with the environment. Further, the body part may be for instance unhardened and the cover part case-hardened.

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In practice, in order to provide axial locking the body part and the cover part are provided with respective radial counter surfaces, which are arranged to cooperate with one another. The cover part may preferably have a cylindrical shape so that said counter surfaces thereof encircle its periphery. Thus the  
15 cover part forms a body of revolution, which may be rotated even when it is already assembled in position, whereby it preferably provides also a drilling shield.

If the front of the cover part is shaped so that it comprises a flange, which is  
20 in the radial direction wider than the body part and covers it entirely, the cover part may form the visible front end of the entire cylinder housing after the assembly thereof. Then the material of the installation aperture in the object of installation prevents the removal of the cover part from its position in the radial direction.

25

The cylinder housing arrangement may preferably also comprise a separate protection fitting element, which is arranged to be installed in the cylinder housing at least for the most part of the position of the cover part. Thus the protection fitting element keeps the cover part in its place. In addition, the  
30 protection fitting element may be shaped in different ways so that the assembly of the cylinder housing may be adapted according to the needs and restrictions of the application in question. Further, the protection fitting ele-

## 3

ment may be manufactured by using various kinds of finishes totally independently of the rest of the cylinder housing. The burglary resistance of the lock may preferably be affected by varying the shape, material and material thickness of the protection fitting element, as required.

5

The body part is preferably provided with a shoulder for the protection fitting element, which shoulder together with a counter surface in the protection fitting element determines the position of the protection fitting element in the axial direction of the cylinder housing. At the same time it prevents the removal of the protection fitting element from the front end of the cylinder housing.

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It is advantageous from the viewpoint of manufacturing technique that the body part is at least substantially cylindrical.

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In the following the invention is described by way of example with reference to the attached drawings, in which

- Figure 1 is an exploded view of an embodiment of the cylinder housing arrangement according to the invention;

20

- Figures 2a, 2b and 2c illustrate an assembly option for the cylinder housing arrangement according to the invention; and

- Figures 3a, 3b and 3c illustrate another assembly option for the cylinder housing arrangement according to the invention.

25

In the drawings the reference number 1 indicates a body part of a cylinder housing, inside of which a lock cylinder 3 is installed. The lock cylinder conventionally encloses a tumbler disc package and/or other corresponding locking elements, which are not, however, shown in more detail in this context, as they are not as such related to the present invention.

30

## 4.

After the lock cylinder 3 together with its locking members is installed inside the body part 1 and attached thereto by means 7, a cover part 2 is installed onto the body part in the radial direction. For this purpose the body part is provided with counter surfaces 4 and the cover part with matching counter surfaces 5, which cooperate during the installation so that they lock the cover part 2 in the axial direction into position. Thus, the cover part 2 may, however, be removed freely in the radial direction also away from its place till the cylinder housing has been installed into its position, whereby the material of the object of installation prevents the removal.

The reference number 6 refers to a key of the lock, which, when opening the lock, is inserted through the cover part 2 into the lock cylinder in order to arrange the locking members (not shown) into the opening position of the lock in a way known per se.

The cylinder housing arrangement according to the invention may also include a separate protection fitting element 8, which is installed on top of the cover part 2 from behind the body part 1. For this reason the body part 1 is provided with a shoulder 1a, against which a counter shoulder 8a in the protection fitting element is pressed. Then the protection fitting element 8 at the same time locks the cover part 2 into position. The whole cylinder housing arrangement is attached to its object of installation by a locking nut 9.

Figs. 2a, 2b and 2c as well as Figs. 3a, 3b and 3c illustrate how the cylinder housing arrangement according to the invention is installed into two different objects of application. Figs. 2a and 3a show various installation apertures 10a made in the object of installation, Figs. 2b and 3b show the cylinder housings mounted into the installation apertures 10a according to Figs. 2a and 3a, seen from the front, i.e. from the operating side, where the key is inserted into the lock, and Figs. 2c and 3c show the arrangements of Figs. 2b and 2c seen from behind.

In the arrangement according to Figs. 2 the assembly is completed without a separate protection fitting element, whereby the cover part 2 is directly supported by the wall of the installation aperture 10a in the object, which wall prevents the removal of the cover part 2 in the radial direction. The cover part 2 is also provided with a flange 2a extending in the radial direction, the diameter of which flange is larger than that of the body part 1 so that it not only covers the body part 1 entirely, but is also supported by the front surface of the object of installation 10. In order to make the arrangement hold its position in the object of installation its back end is provided with a support element 10b, by which the fixing nut 9 is supported.

In the arrangement according to Figs. 3 a protection fitting element 8 is used for preventing the removal of the cover part 2 from its position in the radial direction. The shoulders 1a and 8a shown in Fig. 1 prevent the pulling of the protection fitting element outwards, i.e. away from its position, and the fixing nut 9 mounted behind the object of installation prevents the disengagement of the whole cylinder housing arrangement.

The shaping of the parts may be varied, if needed, so that the cylinder housing arrangement may be installed in various objects of installation having different kinds of installation apertures. Similarly, the materials and material thicknesses of the various parts may be chosen on the basis of the required durability, costs etc.

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Thus, the invention is not limited to the above-described applications, but several other modifications are conceivable in the scope of the appended claims.

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**CLAIMS**

1. A cylinder housing arrangement, where the cylinder housing comprises a body part (1) and a separate cover part (2) to be attached thereto, and where  
5 the cylinder housing encloses a lock cylinder (3) or the like, which comprises a number of locking elements to be arranged by a key, preferably tumbler discs to be turned by a key, which discs in their locked position prevent the turning of the lock cylinder (3) relative to the cylinder housing, **characterised** in that said cover part (2) is arranged to be installed in the crosswise direc-  
10 tion relative to the cylinder housing at the end of the body part (1) on the inserting side of a key (6), so that it is locked onto the body part (1) in the axial direction of the cylinder housing.
2. A cylinder housing arrangement according to claim 1, **characterised** in that  
15 the body part (1) and the cover part (2) are provided with respective radial counter surfaces (4, 5), which are arranged to cooperate with one another.
3. A cylinder housing arrangement according to claim 1 or 2, **characterised** in that the cover part (2) has a cylindrical shape so that said counter surfaces  
20 (5) thereof encircle its periphery.
4. A cylinder housing arrangement according to any of the preceding claims, **characterised** in that the front of the cover part (2) is shaped so that it comprises a flange (2a), which is in the radial direction wider than the body part  
25 (1) and covers it entirely.
5. A cylinder housing arrangement according to any of the preceding claims, **characterised** in that it comprises a separate protection fitting element (8), which is arranged to be installed in the cylinder housing at least for the most  
30 part at the position of the cover part (2).

6. A cylinder housing arrangement according to claim 5, **characterised** in that the body part (1) is provided with a shoulder (1a), which shoulder together with a counter surface (8a) in the protection fitting element (8) determines the position of the protection fitting element (8) in the axial direction of the cylinder housing.

7. A cylinder housing arrangement according to any of the preceding claims, **characterised** in that the body part is at least substantially cylindrical.

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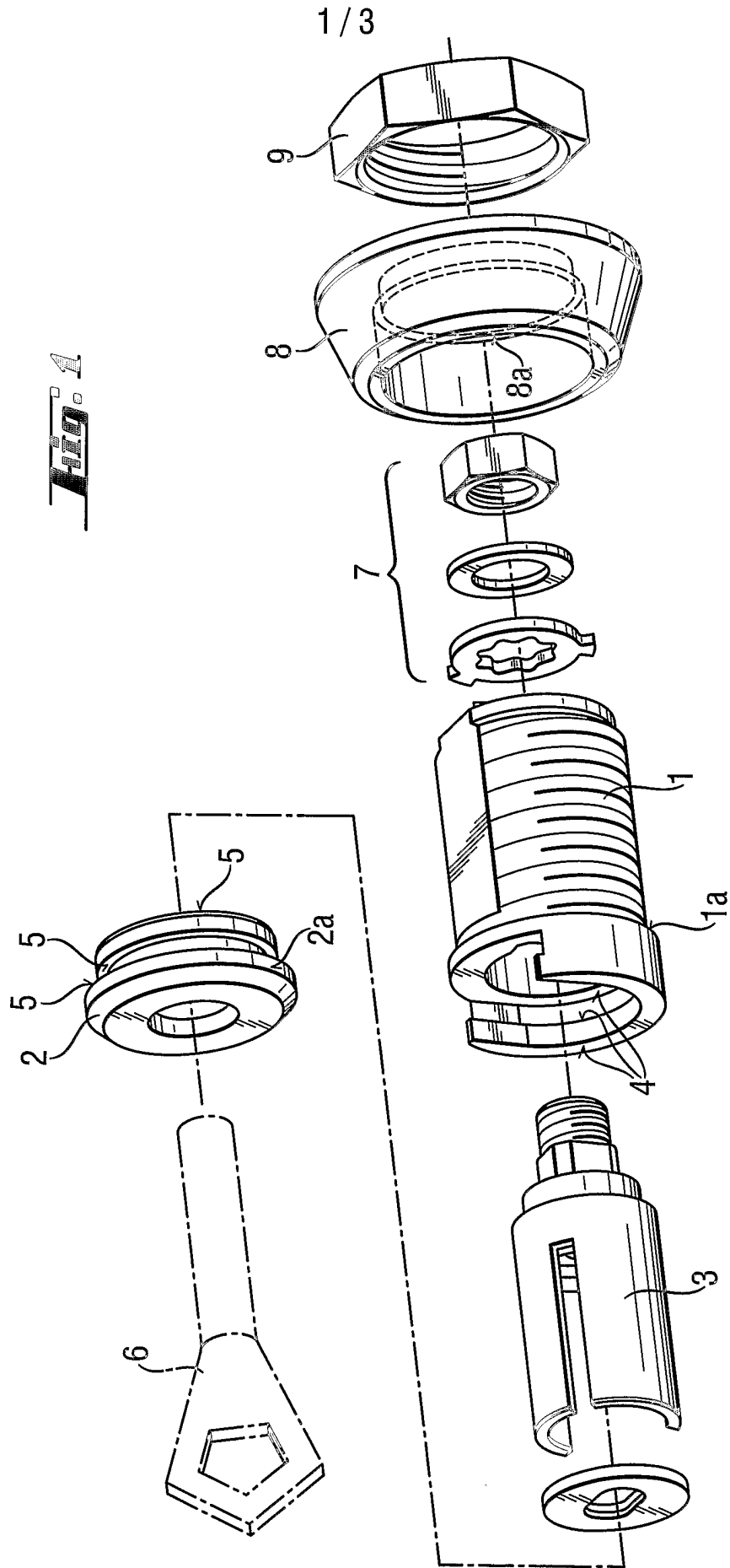
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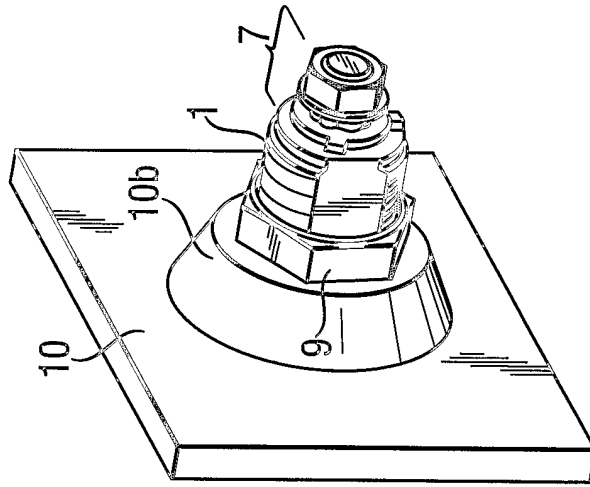
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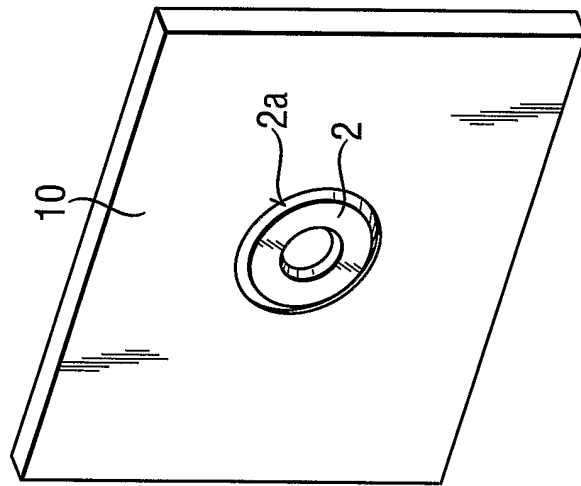


**FIG. 1**

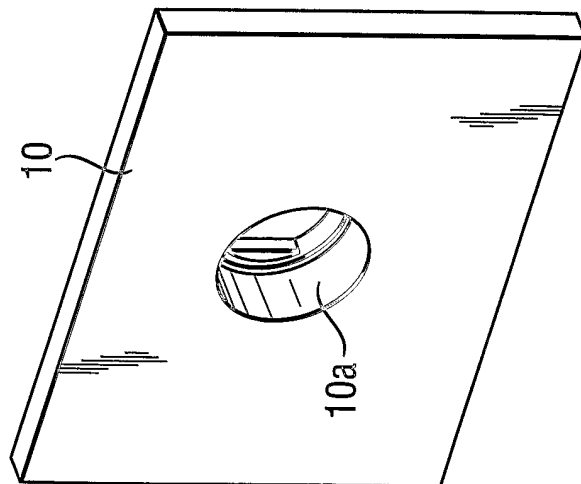




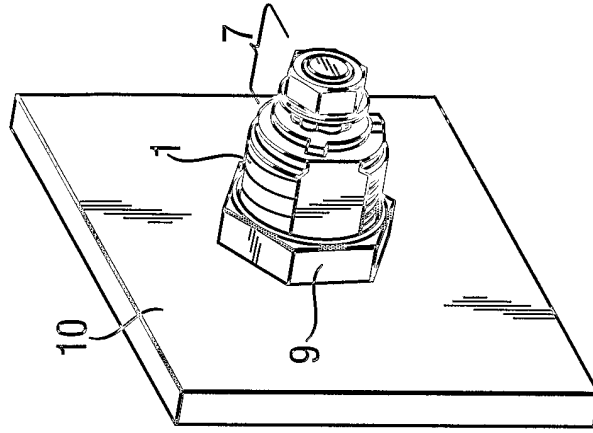
**Fig. 2c**



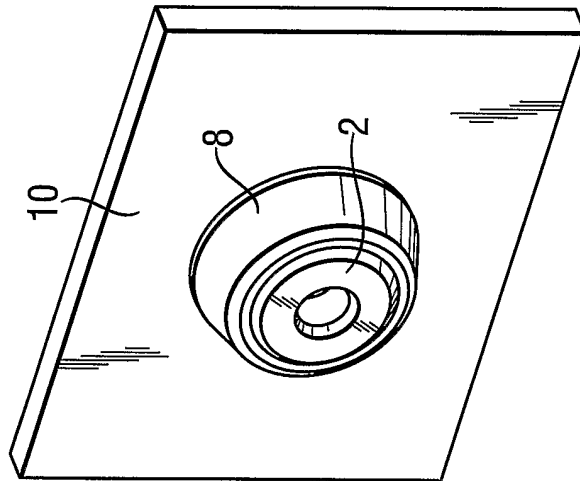
**Fig. 2b**



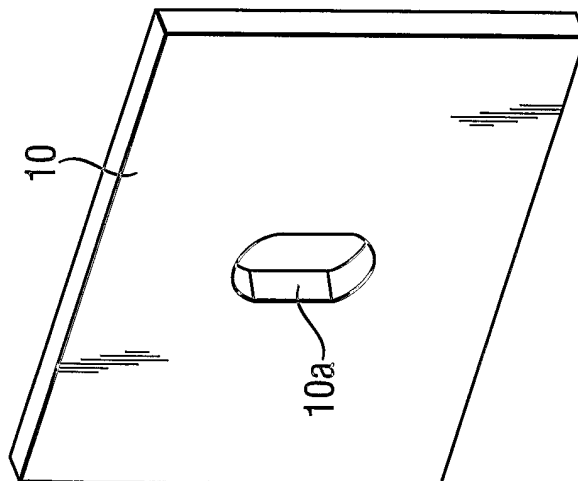
**Fig. 2a**



**Fig. 3c**



**Fig. 3b**



**Fig. 3a**

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/FI 2004/000090

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>				
<b>IPC7: E05B 9/04</b> According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols)				
<b>IPC7: E05B</b>				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
<b>SE,DK,FI,NO classes as above</b>				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 3835675 A (G.W. LIPPISCH), 17 Sept 1974 (17.09.1974)  --	1,2,7		
A	US 5572890 A (L.L. CARPENTER), 12 November 1996 (12.11.1996)  --			
A	US 4836001 A (W.R. FOSHEE), 6 June 1989 (06.06.1989)  --			
A	US 4679418 A (M.L. ALLEN), 14 July 1987 (14.07.1987)  --			
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">           * Special categories of cited documents:            "A" document defining the general state of the art which is not considered to be of particular relevance            "E" earlier application or patent but published on or after the international filing date            "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)            "O" document referring to an oral disclosure, use, exhibition or other means            "P" document published prior to the international filing date but later than the priority date claimed         </td> <td style="width: 50%; border: none;">           "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            "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            "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            "&amp;" document member of the same patent family         </td> </tr> </table>			* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"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 "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 "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 "&" document member of the same patent family
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Date of the actual completion of the international search	Date of mailing of the international search report			
1 June 2004	11-06-2004			
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 2004/000090

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

30/04/2004

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