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(54) **A shelf containing products for vending machines**

(57) The present invention relates to a shelf containing products for vending machines, made up of a tray (1) which is assembled on rails (2) along which it can move between a retracted position, in which it is inside the storage area, and an extracted position in which it projects from the storage area and from the rails (2), on which its rear end rests.

The assembly of the rail (2) and tray (1) can swivel about a hinge pin (7) traversing the front part of the rails (2). A stop (11) prevents the shelf from tipping, whilst a tension spring (14) offsets the weight of the tray (1) and the products (15) contained on its outermost half facilitating the reintroduction of the shelf into its original position.

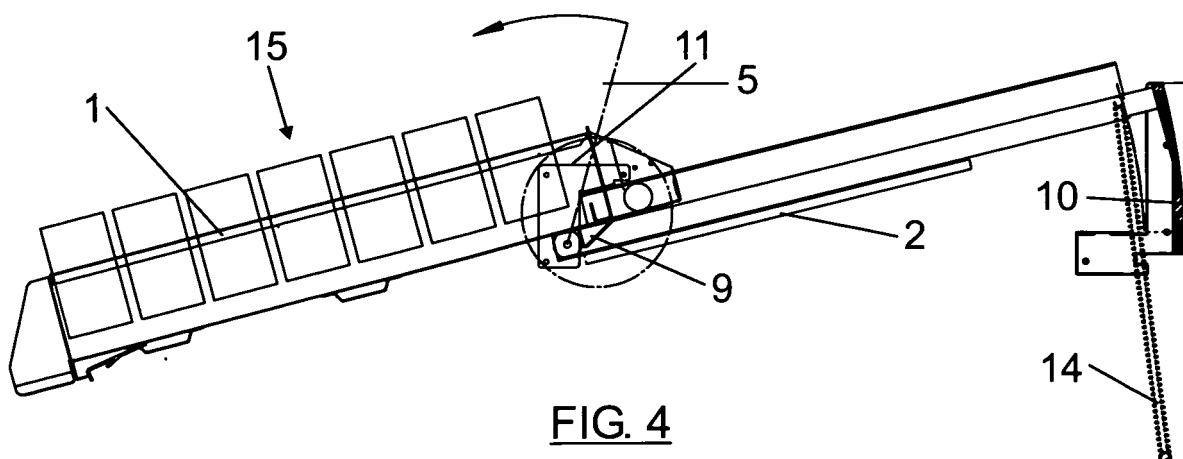


FIG. 4

Description

Field of the Invention

[0001] The present invention relates to a shelf containing products for vending machines, made up of a tray that is extractable from a retracted position, in which the support contains the products to be expended, to an extracted loading position.

Background to the Invention

[0002] For the purpose of obtaining a greater capacity of vending machines, these reach a considerable height, such that by maintaining the plan dimensions the capacity of the storage area containing the products can be increased.

[0003] Vending machines are known the storage area of which is sub-divided in floors, by means of shelves containing products, which are separated by a distance slightly greater than the height of the products to be contained, so as to have the largest possible number of shelves.

[0004] When the machines are of a certain height, access to the upper shelves for product restocking can be difficult. To prevent this problem machines are already known in which the upper shelves are made up of extractable swivelling trays. Therefore, when it is necessary to restock an upper tray, it is extracted until it is almost outside the storage area. For further facilitating access, these trays can be swivelled in their extracted position, such that the lower edge may be located below the horizontal operating position.

[0005] Therefore, to restock the product, the tray is extracted and swivelled downwards, such that it lowers at its front edge, thus facilitating access and product restocking. This ease of restocking means that this assembly is common in upper trays.

[0006] The drawback with this type of shelf is that when it is loaded with products in its extracted and swivelled position, it has a relatively high weight, requiring considerable effort by the worker restocking the product.

Description of the Invention

[0007] The purpose of the present invention is to eliminate the aforementioned drawback by means of an off-setting shelf provided with means facilitating its elevation in a loaded situation and its movement to the retracted position, requiring minimum effort by the worker.

[0008] The shelf of this invention is of the type made up of a tray assembled on rails along which it can move between a retracted position, in which it remains inside the storage area and rests completely on the rails, and an extracted position in which it projects from the storage area, resting on the end of said rails. The assembly of rails and tray is also able to swivel about a hinge pin perpendicularly traversing the rails at points located close

to the front end thereof.

[0009] According to the present invention, the rails are connected at their rear end to a spring acting on said rails in the direction opposite to the weight of the tray and products supported thereon with respect to the hinge pin of said rails.

[0010] Said spring may consist of a tension spring which is connected between the free rear end of the rails and a point of the structure of the machine located below the position occupied by said rails when they are in the rest position.

[0011] Furthermore, the spring may be calibrated such that it offsets the weight of the product contained on the outermost half of the tray, so the effort needed to swivel the tray upwards when loaded with the product will be minimal.

[0012] The tray is provided on its lower surface with stops limiting the maximum extraction and retraction positions. In addition, the frame of the machine has, on the sides of the product storage area, stops limiting the maximum swivelling angle of the tray from its horizontal rest position.

Brief Description of the Drawings

[0013] All the features of the shelf of the invention are set out below in greater detail with the aid of the attached drawings in which a non-limiting embodiment is shown.

Figure 1 shows a front view of the upper shelf of a product vending machine according to the invention. Figure 2 shows a side elevational view of a shelf according to the invention in the retracted position. Figure 3 shows a side elevational view of the shelf, with the tray in the extracted horizontal position. Figure 4 shows a view similar to that of Figure 3, with the tray and rails in the maximum inclination position. Figure 5 shows an enlarged view of detail A of Figure 2. Figure 6 shows an enlarged view of detail B of Figure 4.

Description of a Preferred Embodiment

[0014] Figure 1 shows the front view of an upper shelf of the storage area of a vending machine of the type comprising a series of helical rods (3) carrying out rotational movements for making a chosen product (15) advance along a tray (1) and causing it to fall from the front part of the tray (1) to a container from which the user collects it.

[0015] In this view the other shelves present in the storage area have been removed to allow greater understanding of the invention.

[0016] Figure 1 also shows an anti-tipping bar (17), which can vary from a lower position, in which the fall of the product is prevented (15) during the process of loading the tray (1), and an upper position in which the product

(15) can be served to the user.

[0017] Figures 2 to 4 show the shelf according to the invention, comprising a tray (1) assembled on rails (2) along which it can move between a maximum retraction position shown in Figure 2 and a maximum extraction position shown in Figure 3. The movement of the tray (1) on the rails (2) is facilitated by means of a front wheel (4) assembled on the front end of the rails (2) and a rear wheel (5) assembled on the tray (1).

[0018] As can be seen in Figure 5, the tray (1) has a front stop (6) on its lower portion which in the retracted position of the tray (1) rests against the pin (7) of the front wheels (4), preventing the extraction of said tray. To carry out the extraction, it is sufficient to act on handle (8), raising it slightly until the position shown by the dotted lines, in which the front stop (6) overcomes the hinge pin (7) and the tray (1) can be easily extracted to the position shown in Figure 3, which position is limited by the rear stop (9), Figures 2 and 5, also located on the lower surface of the tray (1), which rests in this extracted position against the front wheel (4).

[0019] The pin (7) of the front wheels further serves as a swivel pin for the swivelling of the assembly of tray (1) and rails (2), to the inclined position of Figure 4. To that end the storage container has rear guiding rails (10) through which the rear end of the rail moves (2), preventing its lateral movement.

[0020] The maximum swivelling angle of the assembly is defined by the stops (11), Figures 3 and 6, made up of angle brackets fixed on the sides of the storage area having an inclined surface (12) against which the rails (2) rest when they reach the allowed inclination limit, all of which is as shown in Figures 4 and 6.

[0021] As can be seen in Figures 2 to 4, between the rear end of the rails (2) and a point (13) of the structure of the machine located below the horizontal position of said rails, a tension spring (14) is assembled which acts, with respect to the swivel pin (7) of the assembly, in the direction opposite to the weight of the products (15) located on the tray (1).

[0022] When the shelf occupies the position of Figure 4, the spring (14) is in a maximum expansion position and therefore acting on the rear end of the rails (2) with the maximum tension effect. The spring or springs (14) may be calibrated such that in the horizontal position of Figure 3 they offset the weight of the products (16) occupying the front half of the tray (1).

[0023] It will thus be achieved that from the position in Figure 4, with the tray full of products (15), the swivelling of the assembly until it reaches the position of Figure 3 will require a minimum effort, the tray (1) then being easily moved to the retracted position of Figure 2.

along which it can move between a retracted position in which it is inside the storage area and rests completely on rails (2), and an extracted position, in which it projects from the storage area and rails (2), resting on the front end thereof, the assembly of rails (2) and tray (1) being able to swivel about a pin (7) perpendicularly traversing the rails (2) in their front part, **characterized in that** said rails (2) are connected at their rear end to a spring (14) acting on said rails (2) in the direction opposite to the weight of the shelf and products (15) supported by it, with respect to the hinge pin (7) of the assembly of said rails (2) and tray (1).

2. A shelf according to claim 1, **characterized in that** said spring (14) consists of a tension spring which is connected between the free rear end of the rails (2) and a point (13) of the structure of the machine, located below the position occupied by the rails (2) in their horizontal rest position.
3. A shelf according to previous claims, **characterized in that** said spring (14) is calibrated such that it offsets the weight of the products (16) contained on the outermost half of the tray (1).
4. A shelf according to claim 1, **characterized in that** the bottom portion of the tray (1) is provided with front and rear stops (6,9) which collide against front wheels (4) assembled on the rails (2) on which the tray (1) moves, in maximum retraction and extraction positions, respectively, so as to limit said positions.
5. A shelf according to claim 1, **characterized in that** the frame of the machine has stops (11) on the sides of the product storage area which have an inclined support surface (12) for the rails (2), limiting the swivelling angle of said rails (2) and tray (1) from their rest position.

Claims

1. A shelf containing products for vending machines, made up of a tray (1) which is assembled on rails (2)

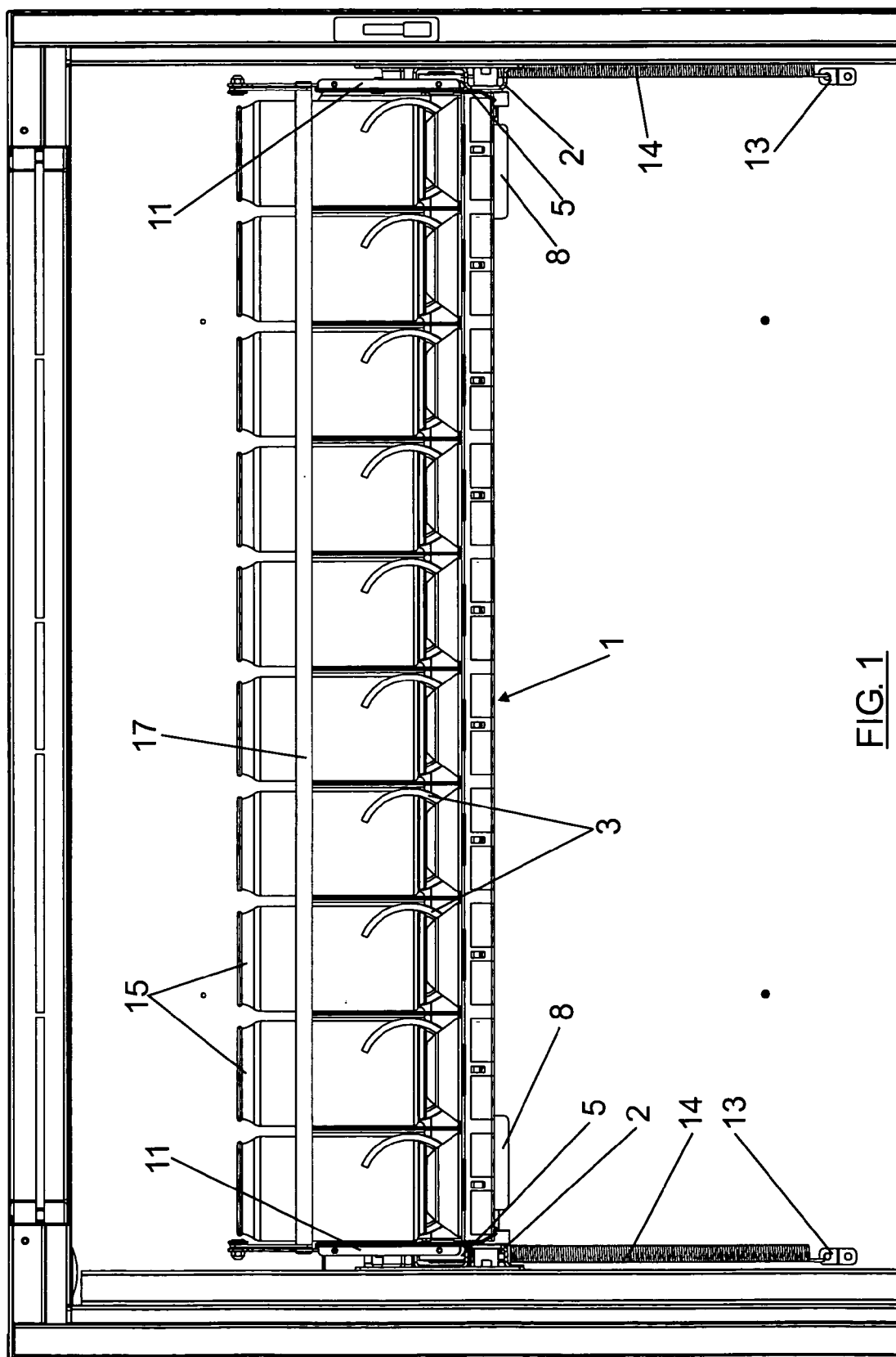
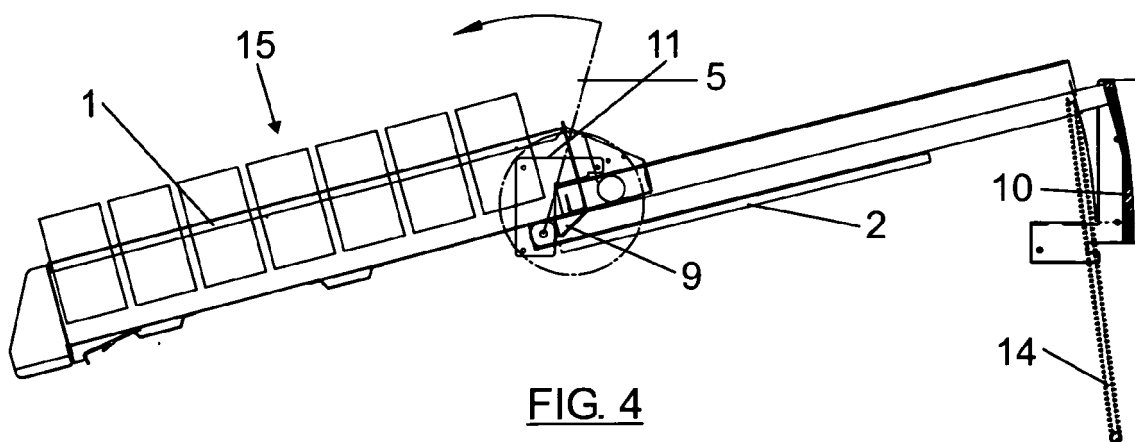
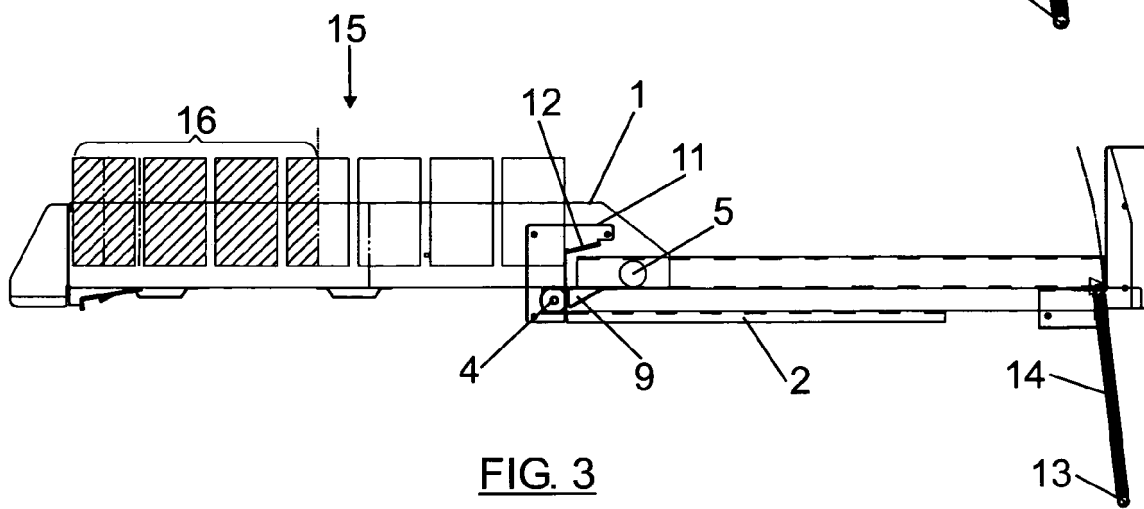
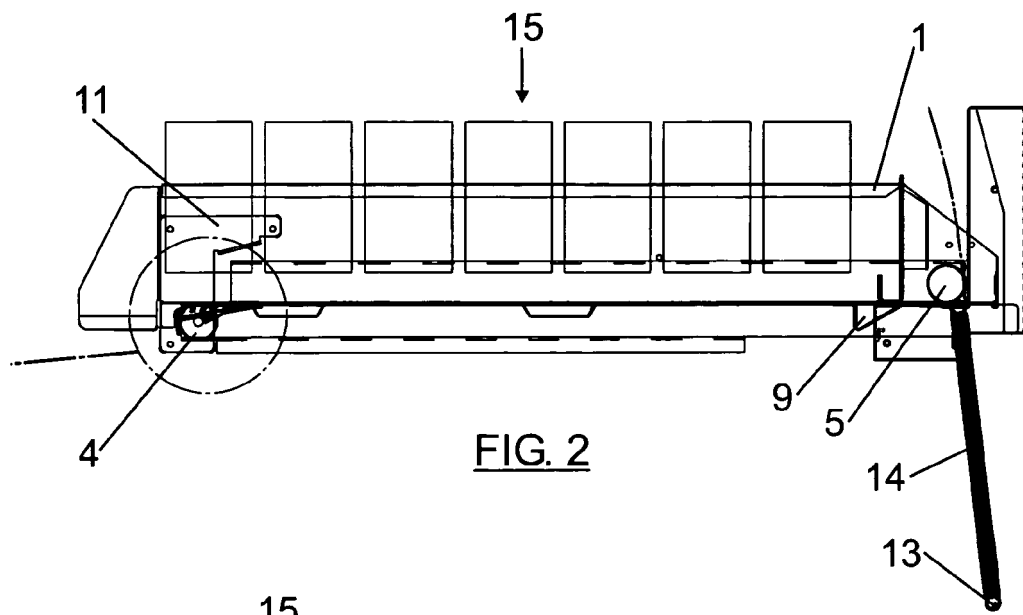


FIG. 1



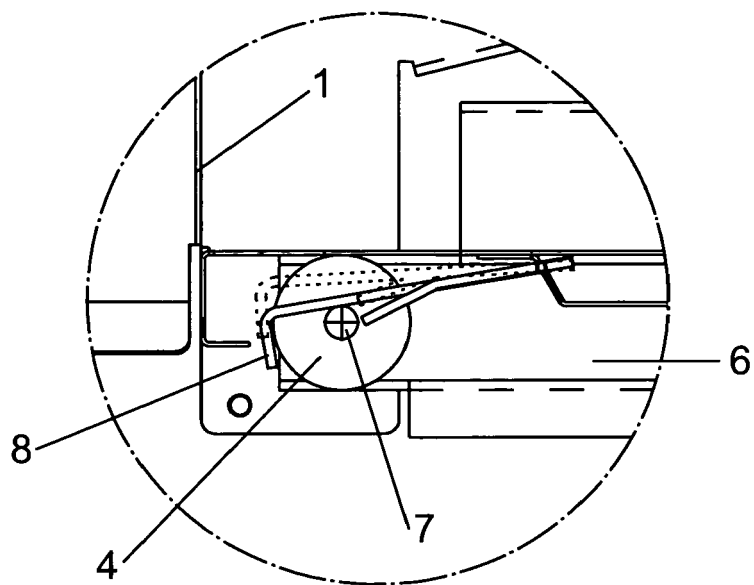


FIG. 5

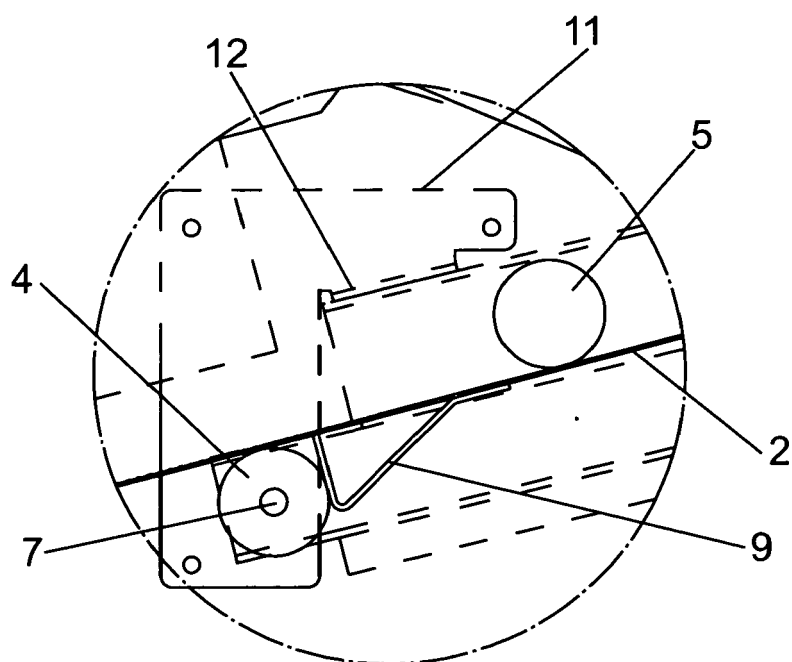


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0121

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 31 July 2006	Examiner Diaz Calvo, S
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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