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## (54) Two-directional opening system for household appliance door

(57) Two-directional opening system for household appliance door which is especially applicable for automatic washing machines so that the system has a double mechanism with some gyratory fastener means of the door, some means (5) of lifting of the door blockade for its opening and some blockade security means (6) of the door, being the gyratory fastener means of the door made up of a pair of bodies (1) and (3) that can be assembled between them, being they related with the apparatus structure and a pair of bodies (7) that are interlocked to the door and placed in a diametrical position with regard to it, while the body (1) is formed by a stud that is endowed of a pair of L-shaped projectings (2).

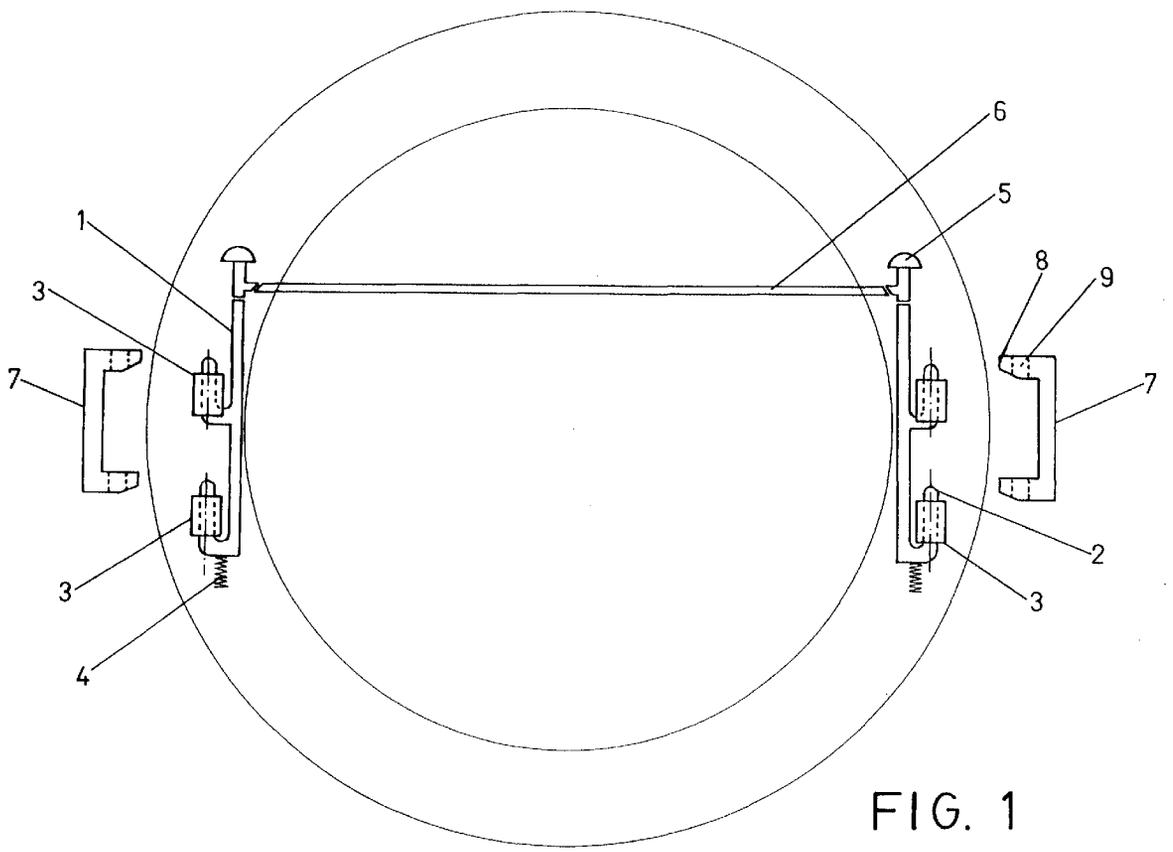


FIG. 1

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## Description

OBJECT OF THE INVENTION.

As is expressed in the title of the present descriptive report, the following invention consists of a two-directional opening system for household appliance door, which is preferably useful for its incorporation into automatic washing machines so that through it, it is allowed the same the door opening on the left or right.

In this way and without the necessity of complex manipulations, the household appliance is adapted to the user characteristics given that the household appliances as well as the great majority of products are manufactured for their adaptation in the usual handling by right-handed people so that in this way, they can be handled both the right-handed people and the left-handed people, that is those people that handle the left hand preferably.

If the household appliance is manufactured so that it can be opened the same on the right or on the left with a little change without the necessity of a laborious manipulation and being useful the same door structure for both cases, the industriallization of the product is substantially reduced, since different aesthetics are not necessary although the apparatus is manufactured for the door open to a side or the other.

Thus, the own closing element can act as a tum spindle so that the washing machine door has two identical mechanisms. In this way, the lifting of the blockade of one of them will allow the opening with regard to the other, obtaining a perfect adaptability of the apparatus to the characteristics and necesities of the user.

FIELD OF APLICATION.

The two-directional opening system for household appliance door that is showed, is especially applicable for automatic washing machines, so that the door can be opened the same to a side or the other witout have to realize any technical modification so that both its location and its manipulation by the user are made easy, since once it ha been intalled, it can be opened the more convenient sense for the user.

BACKGROUND OF THE INVENTION.

Conventionally, the household appliance doors are opened according to an only sense, so that they have the opening mechanism placed in opposition to the hinged spindle or in a distand place for be lifted the blockade on through a remote device, so that generally the manipulation means of opening and handling of the door are placed for makes easy its starting by right-handed people, meaning a problem for those people that use the left hand usually when the majority of the people use the right hand.

In this way, if we want to offer a product that is easily manageable by the right-handed and left-handed people, some differentiated apparatus models must be manufactured for they can be adquire according to the characteristics and the necessities of the user so that logically this puts up the price of the industriallization process.

The cited inconvenient is aggravated according to the product aesthetics that each day have a bigger importance and relevance, since if in the product aesthetic is showed some outdated element as the opening manacle according to the tum sense of the door, differentiated aesthetic frontals must be manufactured, which complicates the industriallization since a bigger amount of models must be manufactured. Thus, it happens, for example, in those models of automatic washing machines in which the opening manacle is upperly out of place with regard to the longitudinal spindle of the door.

Besides, the inconsequential opening of the household appliance in a sense or the other, makes its installation easy, since once it has been installed the user can open the door in the sense more convenient for carrying out the various acts that will be realized. This adquires its importance as a consequence of the limited space that often have the spaces where they are installed so that in its location, it must be took into account to a lesser extent to make easy its later handling in the acts that will be done. Thus, if it is situated in a comer of the room where it goes to be utilized, the door could be opened in the sense that makes easy the loading and unloading of the clothes.

DESCRIPTION OF THE INVENTION.

In the present report a system for the two-directional opening of household appliance door, which is especially applicable in automatic washing machines, being the same formed by a double mechanism that allows the gyratory fastener of the door as well as the blockade and the lifting of the blockade of the same for its opening, having a blockade safety catch of the washing machine door.

Thus, the gyratory fastener means of the washing machine door are formed by a pair of bodies that can be assembled between them, being they related with the general apparatus structure, and a pair of bodies that are interlocked to the door and placed in a diametrical position with regard to it.

One of the assembled bodies that define the spindle of turn and tie of the door are formed by a stud that is endowed of a pair of L-shaped projectings that are inserted through their vertical free wing into the respective holes of the pair of fixed body who they are assembled with, so that the cited studs remain affected by the respective springs with the upper extremes of the cited L-shaped projectings jutting out of the level of the lodging bodies, being it finished off by the cited extreme in a semispherical way.

The pair of bodies that are diametrally interlocked

to the structure of the door have a general form like C in straight line so that the lower sides of both wings have an extreme bevel and both vertically aligned holes where the jutting out extremes of the L-shaped projectings of the corresponding stud that is associated to them, materializing the gyratory union and the blockade.

The means of lifting of the blockade of the fastener mechanism are formed by the respective push-buttons of independent starting that work on the corresponding stud that is related with it, overcoming the strength of the spring that impels it upwards and liberating the corresponding union body that is interlocked to the door, while the other twin mechanism remains static, acting it as a tum spindle so that the door can tum with regard to it.

For avoiding the starting of the two liberating push-buttons of the blockade mechanism in the fastener of the door, the system has a safety catch that is formed by a strip that is placed between both push-buttons of lifting of the blockade, that limits the trip of the push-buttons and impels if both push-buttons are activated simultaneously to liberate the fastener mechanism, since it limits their trip and consequently the strip of the stud, which is endowed of the pair of L-shaped projectings that act as the tum spindle and as the blockade element.

In order to complement the description which is made hereinafter and for the purpose of providing a better understanding of its characteristics, the present descriptive report is accompanied by a set of drawings, in whose figures the most significant details of the invention are represented, in an illustrative and not limitative way.

## BRIEF DESCRIPTION OF THE DESIGNS.

Figure 1.- It shows a schematic frontal view of the two-directional opening system for household appliance door and especially automatic washing machines, where we can observe the elements that will act as the tum spindles of the door as well as fastener means of the same when the blockade body that is interlocked to the door is assembled with them.

Figure 2.- It shows a detailed perspective view of the assembly structure of the elements that are interlocked to the apparatus door an the elements of blockade and lifting of the blockade of the same, that are placed in relationship to the chassis of the own apparatus.

## DESCRIPTION OF A PREFERRED EMBODIMENT.

In view of the above cited figures and in accordance with the used numbering, we can observe how the two-directional opening of household appliance door and especially the doors of automatic washing machines, is formed by a double mechanism so that each one of them is formed by a stud (1) that is endowed of a pair of L-shaped projectings (2) that are lodged into the corresponding holes of the pair of fixed bodies (1) and (3) that are related with them, being the studs (1) affected by the action of the springs (4).

The L-shaped projectings (2) of the studs (1) jut out with regard to the bodies (3) where they are lodged for the body (7) that is interlocked to the door is inserted on them so that for making the cited assembly easy, the projectings (2) are finished off in a semispherical way at wing of lodging into the bodies (3) while the bodies (7) that are interlocked to the door have a pair of wings that are finished off with a bevel (8) at its lower side.

Thus, for the coupling connection between the door and the two-directional opening system, the bodies (7) will be placed with regard to their wings on the projectings (2) of the corresponding stud (1) for inserting their jutting out extremes into the respective holes (9) of the wings of the bodies (7).

In this way, the washing machine will have, in its frontal part, a pair of push-buttons (5) that will be related with each one of the studs (1), so that the starting of one of them causes the descent of the stud related with it, overcoming the strength of the spring (4) and consequently it causes the liberation of the body (7) that is fastened to the projectings (2) of the same, while the other stud (1) remains fixed and its projectings (2) will act as the tum spindle of the door.

Thus, it can be activated the same one push-button (5) or the other, causing the liberation of the blockade mechanism that is associated to it, remaining the other push-button static, so that how all the whole keeps a perfect and total symmetry, the industriallization is reduced at the same time that the opening chances on the right or on the left are covered.

In the other hand, for avoiding a possible simultaneous starting of the push-buttons (5) and the totally freedom of the door if the twin fastener mechanism is lifted the blockade on, the system has a strip (6) that related both push-buttons, limiting their strip so that if they are activated at the same time, it will act as the security mechanism, impeding the total descent of the push-buttons and therefore the liberation of the fastener elements of the door.

## Claims

1. TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR which is especially applicable for automatic washing machines, characterized because the system has a double mechanism with some gyratory fastener means of the door, some means of lifting of the door blockade for its opening and some blockade security means of the door.

2. TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR according to

the first claim and characterized because the gyratory fastener means of the door are made up of a pair of bodies (1) and (3) that can be assembled between them, being they related with the apparatus structure, and a pair of bodies (7) that are joined to the door and placed in a diametrical position with regard to it.

**3.** TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR according to the first and second claims and characterized because the body (1) is formed by a stud that is endowed of a pair of L-shaped projectings (2) , so that they are inserted into the respective holes of the pair of bodies (3) that are assembled to it, so that the studs (1) stay on the respective springs (4) and with the projectings (2) free extremes over the level of the bodies (3) where they are inserted.

**4.** TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR according to the first and second claims and characterized because the bodies (7) that are diametrally joined to the door have a general form like a C in straight line so that the lower sides of their wings have an extreme bevel (8) and there are both holes (9) where the projectings (2) extremes of the corresponding studs (1) that jut out with regard to the bodies (3) where they are inserted.

**5.** TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR according to the first claim and characterized because the means of inconsequential lifting of the blockade of the pair of the fastener mechanism are formed by a push-button (5) that works on the stud (1) that is joined to it so that the spring (4) pressure is overcome and the corresponding body (7) is liberated while the other body is static so that the door can revolve with regard to it.

**6.** TWO-DIRECTIONAL OPENING SYSTEM FOR HOUSEHOLD APPLIANCE DOOR according to the first claim and characterized because the blockade security means of the door are made up of a strip (6) that is located between the pair of push-buttons (5) of lifting of the blockade so that it limits their trips when one of them is activated, impeding their total descent.

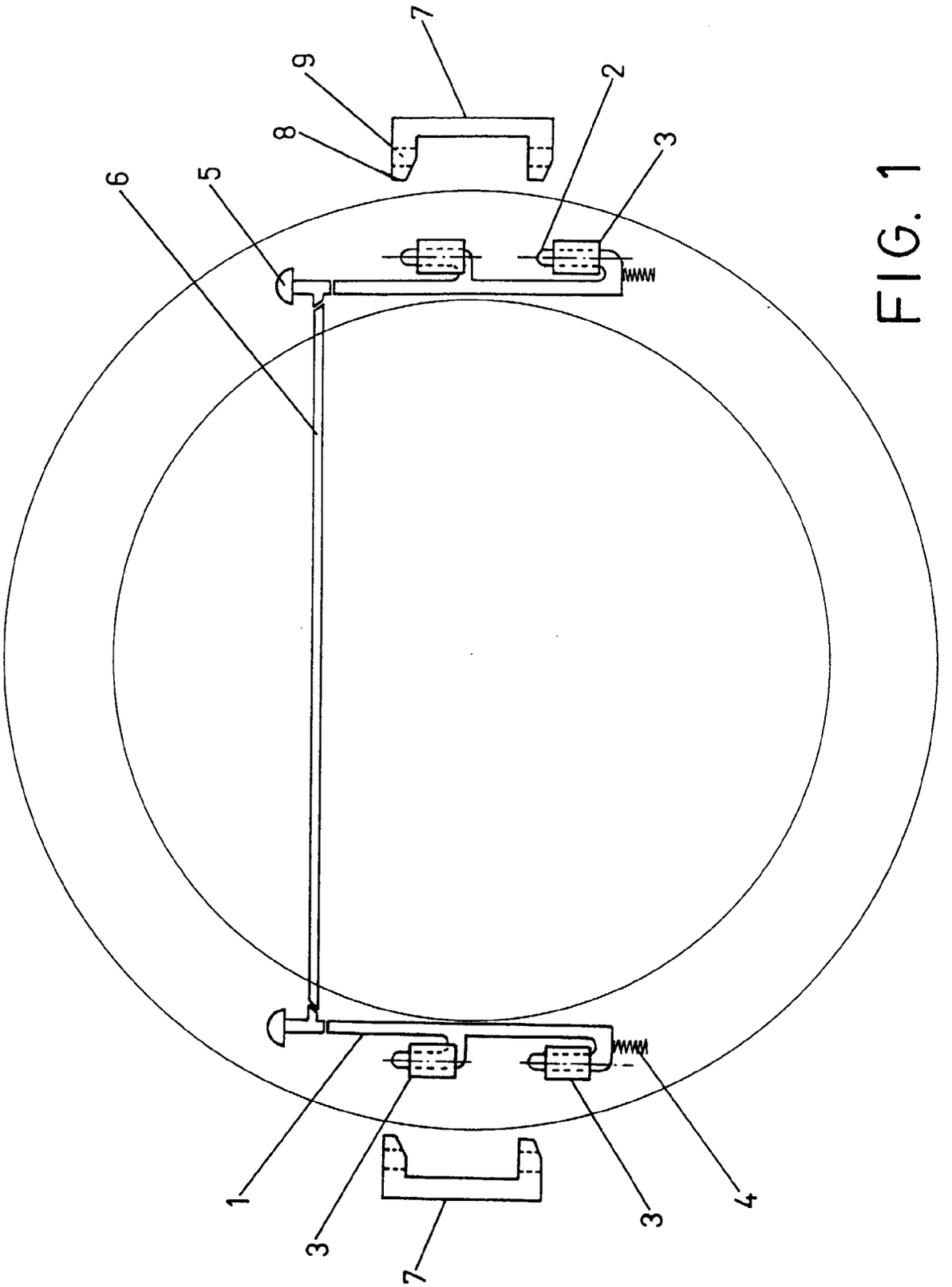


FIG. 1

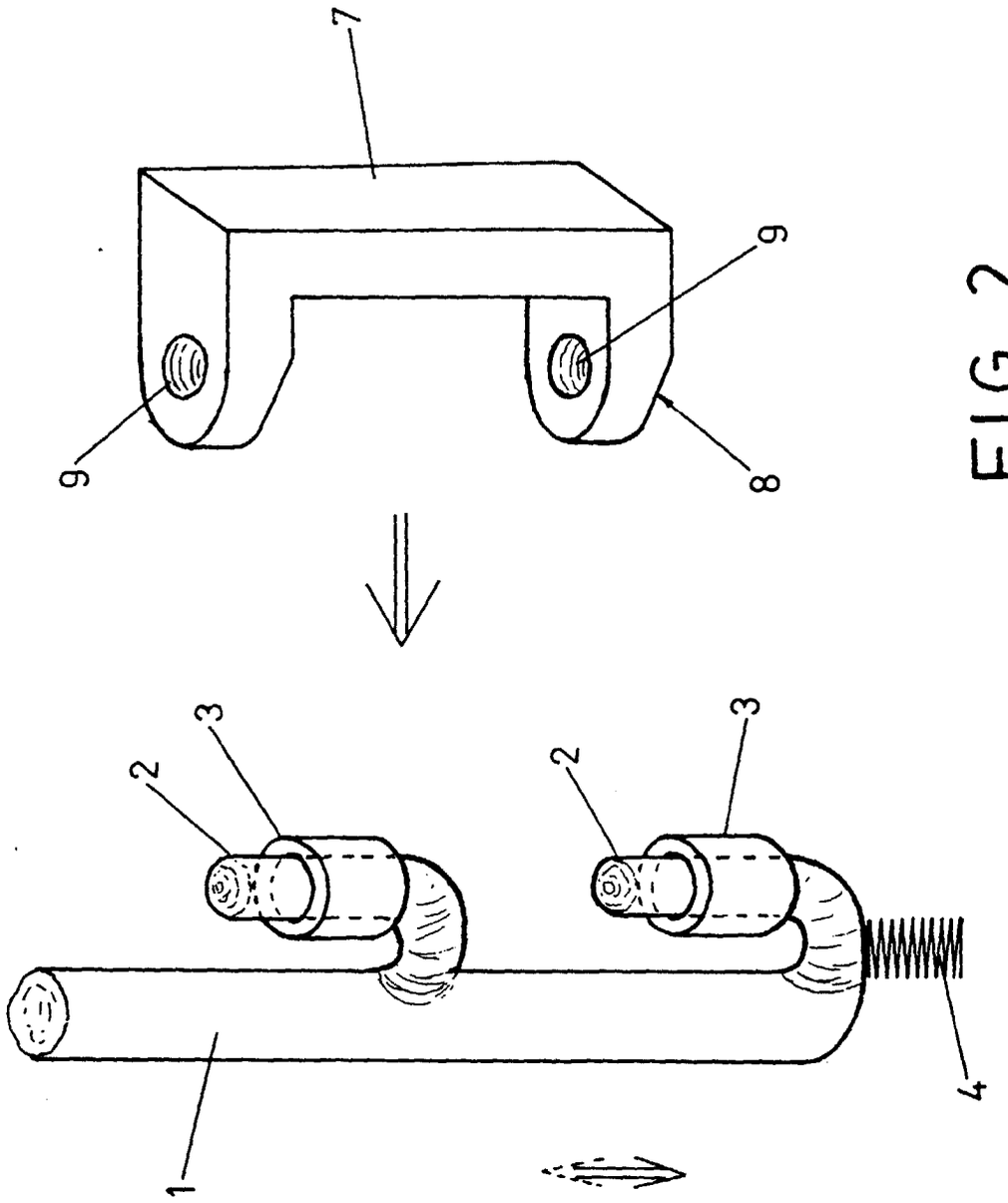


FIG. 2

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 97 50 0197

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| X<br>Y<br>A | DE 10 56 574 B (SIEMENS)<br>* column 3, line 8 - line 18; figures *<br>--- | 1,2<br>5<br>4 | E05D15/50<br>D06F39/14 |
| Y | EP 0 124 749 A (LICENTIA)<br>* abstract *<br>--- | 5 | |
| A | DE 123 852 C (HEGER ET AL)<br>* page 1, right-hand column, line 7 - line 8; figures *<br>--- | 3 | |
| A | FR 2 577 976 A (LEADER)<br>* page 8, line 18 - line 22; figures *<br>--- | 4 | |
| X<br>A | US 4 811 518 A (LADISA)<br>* abstract *<br>----- | 1,2<br>6 | |

| TECHNICAL FIELDS SEARCHED (Int.Cl.6) |
|---|
| E05D<br>D06F |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 20 February 1998 | Van Kessel, J |

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
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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
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& : member of the same patent family, corresponding document

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