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(54) LAUNDRY TREATMENT DEVICE

(57) A laundry treatment device (100) is provided, and includes a cabinet, an inner drum (120), a cover, a position limiter (140), a reset member (150) and a filter assembly (160). The inner drum (120) is disposed in the cabinet and has an air outlet (121) and an opening (122). The cover is disposed to the cabinet and configured to open or close the opening (122). The position limiter (140) is switchable between a first position and a second position. When located at the first position, the position limiter (140) stops the cover from closing the opening (122), and when the position limiter is located at the second position, the cover closes the opening. When the filter assembly (160) is removed from the air outlet, the position limiter is located at the first position, and when mounted at the air outlet (121), the filter assembly pushes the position limiter to switch the position limiter to the second position.

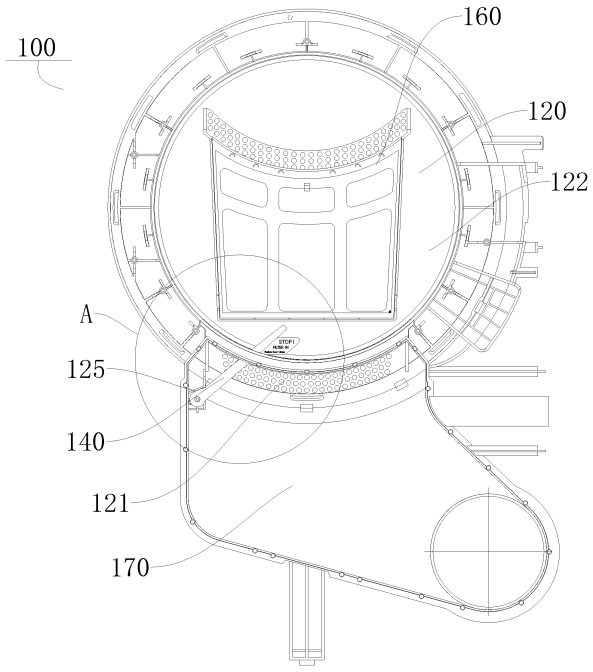

Fig. 1

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Description

FIELD

[0001] The present disclosure relates to a technical field of washing equipment, and more particularly to a laundry treatment device.

BACKGROUND

[0002] Most clothes dryers have a filtering mesh located at an air outlet supported by an inner drum. According to instructions for use, after being used for a corresponding period, the filtering mesh needs to be taken out for cleaning debris and flocks thereon, and if not, the efficiency of drying clothes of the clothes dryer will be influenced.

[0003] However, after being cleaned, the filtering mesh is usually forgotten to be placed back to its original position, and then the clothes dryer will operate without the filtering mesh during the next operation thereof, such that the debris and flocks enter the interior of the machine along with the airflow, and thus the machine may be prone to malfunction.

SUMMARY

[0004] Embodiments of the present disclosure seek to solve at least one of the problems existing in the related art to at least some extent. For that reason, the present disclosure provides a laundry treatment device, which prevents a filter assembly thereof from being forgotten to be mounted.

[0005] The laundry treatment device according to embodiments of the present disclosure includes a cabinet; an inner drum disposed in the cabinet and having an air outlet and an opening; a cover disposed to the cabinet and configured to open or close the opening; a position limiter switchable between a first position and a second position and having a rod shape, in which both ends of the position limiter are configured to be a fixed end and a free end respectively, when the position limiter is located at the first position, the free end of the position limiter extends into the opening to stop the cover from closing the opening, and when the position limiter is located at the second position, the free end of the position limiter moves out from the opening, and the cover is configured to close the opening; a reset member configured to constantly apply a pushing force on the position limiter in a direction towards the first position; and a filter assembly detachably disposed at the air outlet, in which when the filter assembly is removed from the air outlet, the position limiter is located at the first position, and when the filter assembly is mounted at the air outlet, the filter assembly is configured to push the position limiter to switch the position limiter to the second position.

[0006] In the laundry treatment device according to embodiments of the present disclosure, the position limiter is switchable between the second position and the first position where the position limiter stops the cover from closing the air outlet, and thereby the position limiter may be used to remind the user that the filter assembly is not mounted at the air outlet, so as to avoid machine malfunctions of the laundry treatment device caused by the debris and flocks entering the cabinet due to the filter assembly forgotten to be mounted, thus improving the security and practicality of the laundry treatment device.

[0007] According to some embodiments of the present disclosure, an air passage is provided between the inner drum and the cabinet, the air passage is communicated with the air outlet, and the position limiter is disposed in the air passage and located at a position close to the air outlet.

[0008] According to some embodiments of the present disclosure, the fixed end of the position limiter is pivotably connected with an outer wall of the inner drum, such that the free end of the position limiter is configured to extend into the opening.

[0009] According to some embodiments of the present disclosure, one of the fixed end and the inner drum has a pivoting hole, and the other one thereof has a pivoting shaft configured to be fitted with the pivoting hole.

[0010] According to some embodiments of the present disclosure, the outer wall of the inner drum is provided with a support seat, the pivoting shaft is disposed to the support seat, and the support seat is provided with a limiting baffle, in which when the position limiter is located at the first position, the limiting baffle abuts against the position limiter.

[0011] According to some embodiments of the present disclosure, the reset member is configured to be a torsion spring fitted over the pivoting shaft.

[0012] According to some embodiments of the present disclosure, an end surface of the free end of the position limiter is configured to be an arc-shaped surface.

[0013] According to some embodiments of the present disclosure, in a direction from the fixed end to the free end, a sectional area of the position limiter decreases gradually.

[0014] According to some embodiments of the present disclosure, a free end of the position limiter is provided with a label portion, and when the position limiter is located at the first position, the label portion is located in the opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] These and other aspects and advantages of embodiments of the present disclosure will become apparent and more readily appreciated from the following descriptions made with reference to the drawings, in which:

Fig. 1 is a partial view of a laundry treatment device according to embodiments of the present disclosure, in which a filter assembly is removed from an air

outlet and a position limiter is located at a first position;

Fig. 2 is a partially enlarged view of portion A shown in Fig. 1;

Fig. 3 is an explosive view of a laundry treatment device according to embodiments of the present disclosure;

Fig. 4 is a partial view of a laundry treatment device according to embodiments of the present disclosure, in which a filter assembly is mounted at an air outlet and a position limiter is located at a second position; and

Fig. 5 is a partially enlarged view of portion B shown in Fig. 4.

[0016] Reference numerals:

laundry treatment device 100,
inner drum 120, air outlet 121, opening 122, pivoting shaft 123, support seat 124, limiting baffle 125, position limiter 140, fixed end 141, pivoting hole 142, free end 143, arc-shaped surface 144, label portion 145, reset member 150,
filter assembly 160,
air passage 170.

DETAILED DESCRIPTION

[0017] Reference will be made in detail to embodiments of the present disclosure. The embodiments described herein with reference to drawings are explanatory, illustrative, and used to generally understand the present disclosure. The embodiments shall not be construed to limit the present disclosure.

[0018] In the specification, unless specified or limited otherwise, relative terms such as "front", "rear", "right", "left", "inner", "outer", "lower", "upper", "horizontal", "vertical", "above", "below", "up", "top", "bottom" as well as derivative thereof (e.g., "horizontally", "downwardly", "upwardly", etc.) should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present disclosure be constructed or operated in a particular orientation.

[0019] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In the description of the present disclosure, "a plurality of" means two or more than two, unless specified otherwise.

[0020] In the present disclosure, unless specified or limited otherwise, the terms "mounted," "connected," "coupled," "fixed" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements, which can be understood by those skilled in the art according to specific situations.

[0021] A laundry treatment device 100 according to embodiments of the present disclosure will be described in the following with reference to Figs. 1-5. It should be noted that, the laundry treatment device may be configured to be a clothes dryer or a washing-drying machine.

[0022] As shown in Figs. 1-5, the laundry treatment device 100 according to embodiments of the present disclosure includes a cabinet, an inner drum 120, a cover, a position limiter 140, a reset member 150 and a filter assembly 160.

[0023] Specifically, the inner drum 120 is disposed in the cabinet, the inner drum 120 has an air outlet 121 and an opening 122, and the cover is disposed to the cabinet and configured to open or close the opening 122. The position limiter 140 is switchable between a first position and a second position. As shown in Figs. 1-2, the position limiter 140 is located at the first position; as shown in Figs. 4-5, the position limiter 140 is located at the second position. When the position limiter 140 is located at the first position, a part of the position limiter 140 extends into the opening 122, so as to stop the cover from closing the opening 122, that is, when the position limiter 140 is located at the first position, the cover cannot close the opening 122. When the position limiter 140 is located at the second position, the position limiter 140 moves out from the opening 122, and the cover is configured to close the opening 122.

[0024] The reset member 150 is configured to constantly apply a pushing force on the position limiter 140 in a direction towards the first position and the filter assembly 160 is detachably disposed at the air outlet 121, i.e. the reset member 150 applies a force to the position limiter 40 all the time, in which the force allows the position limiter 140 to move towards the first position when the filter assembly 160 is removed from the air outlet 121. Thus, when the filter assembly 160 is removed from the air outlet 121, the position limiter 140 is located at the first position. Moreover, when the filter assembly 160 is mounted to the air outlet 121, the filter assembly 160 is configured to push the position limiter 140 to switch the position limiter 140 to the second position.

[0025] It may be understood that, under the constant push of the reset member 150, the position limiter 140 has a trend of moving towards the first position. When the filter assembly 160 is removed from the air outlet 121, the filter assembly 160 no longer stops the position limiter 140, and thus the position limiter 140 moves to the first position under the action of the reset member 150. At the moment, a part of the position limiter 140 extends into the opening 122, so as to stop the cover from closing the opening 122, that is, the cover cannot close the opening 122. When a user takes out the filter assembly 160 and forgets to mount the filter assembly 160 back to the air

outlet 121, the position limiter 140 may stop the cover, so that the cover cannot be buckled to the cabinet. Thus, the position limiter 140 may be used to remind the user that the filter assembly 160 is not mounted to the air outlet 121, so as to avoid machine malfunctions of the laundry treatment device 100 caused by the debris and flocks entering the cabinet due to the filter assembly 160 forgotten to be mounted, thereby improving the security and practicality of the laundry treatment device 100.

[0026] In the laundry treatment device 100 according to embodiments of the present disclosure, the position limiter 140 is switchable between the second position and the first position where the position limiter 140 stops the cover from closing the air outlet, and thereby the position limiter 140 may be used to remind the user that the filter assembly 160 is not mounted to the air outlet 121, so as to avoid the machine malfunctions of the laundry treatment device 100 caused by the debris and flocks entering the cabinet due to the filter assembly 160 forgotten to be mounted, thus improving the security and practicality of the laundry treatment device 100.

[0027] According to some embodiments of the present disclosure, as shown in Fig. 1 and Fig. 4, an air passage 170 is provided between the inner drum 120 and the cabinet, the air passage 170 is communicated with the air outlet 121, and the position limiter 140 is disposed in the air passage 170 and located at a position close to the air outlet 121. Thus, the structure of the laundry treatment device 100 may be more compact and reasonable.

[0028] According to some embodiments of the present disclosure, the position limiter 140 is configured to have a rod shape and both ends of the position limiter 140 are configured to be a fixed end 141 and a free end 143 respectively. The fixed end 141 may be pivotably connected with an outer wall of the inner drum 120, and the free end 143 is configured to extend into the opening 122. On one hand, not only the structure of the position limiter 140 may be simplified, on the other hand, but also the flexibility of the position limiter 140 may be improved, thus allowing the position limiter 140 to be smoothly switchable between the first position and the second position.

[0029] Further, as shown in Figs. 1-3, one of the fixed end 141 and the inner drum 120 has a pivoting hole 142, and the other one thereof has a pivoting shaft 123 configured to be fitted with the pivoting hole 142. It may be understood that, in order to facilitate the pivotable connection between the fixed end 141 and the inner drum 120, the pivoting hole 142 may be formed in the fixed end 141, and the pivoting shaft 123 may be disposed to the inner drum 120. Certainly, the pivoting shaft 123 may be disposed to the fixed end 141 and the pivoting hole 142 may be formed in the inner drum 120. For example, as shown in Fig. 3, the fixed end 141 of the position limiter 140 has the pivoting hole 142 and the outer wall of the inner drum 120 is provided with the pivoting shaft 123.

[0030] As shown in Fig. 3, in order to improve the structural strength of the pivoting shaft 123 and the stability of the fit between the fixed end 141 and the inner drum 120, in some embodiments of the present disclosure, the outer wall of the inner drum 120 is provided with a support seat 124, and the pivoting shaft 123 is disposed to the support seat 124. The support seat 124 is provided with a limiting baffle 125. When the position limiter 140 is located at the first position, the limiting baffle 125 abuts against the position limiter 140. Thus, it is easy to limit the position limiter 140 to the first position, when the filter assembly 160 is removed. During the mounting process of the filter assembly 160, the position limiter 140 may be pushed to the second position.

[0031] When the position limiter 140 is located at the second position, in order to facilitate the user to understand the function of the position limiter 140, the free end 143 of the position limiter 140 may be provided with a label portion 145. When the position limiter 140 is located at the first position, the label portion 145 is located in the opening 122. Optionally, the label portion 145 may be provided with characters or patterns for user's easy identification.

[0032] In order to further simplify the structure of the laundry treatment device 100 and save the producing cost, as shown in Figs. 1-5, in some embodiments of the present disclosure, the reset member 150 may be configured to be a torsion spring fitted over the pivoting shaft 123, and thereby the torsion spring may constantly apply a pushing force on the position limiter 140 in the direction towards the first position under the action of an elastic force. As shown in Figs. 1-5, in some embodiments of the present disclosure, in order to facilitate the filter assembly 160 to push the position limiter 140 to the second position, an end surface of the free end 143 of the position limiter 140 may be configured to be an arc-shaped surface 144. In some other embodiments of the present disclosure, in a direction from the fixed end 141 to the free end 143, a sectional area of the position limiter 140 decreases gradually.

[0033] The laundry treatment device according to a specific embodiment of the present disclosure will be described with reference to Figs. 1-5. It should be noted that, the following descriptions are just explanatory and illustrative, and should not be construed to limit the present disclosure.

[0034] As shown in Figs. 1-5, the laundry treatment device 100 includes the cabinet, the inner drum 120, the cover, the position limiter 140, the reset member 150 and the filter assembly 160.

[0035] The inner drum 120 is disposed in the cabinet and has the air outlet 121 and the opening 122. The cover is disposed to the cabinet and configured to open or close the opening 122. The position limiter 140 has a rod shape and is disposed on the outer wall of the inner drum 120. The position limiter 140 is switchable between the first position and the second position. As shown in Figs. 1-2, the position limiter 140 is located at the first position; as shown in Figs. 4-5, the position limiter 140 is located at the second position.

[0036] In order to improve the structural strength of the pivoting shaft 123 and the stability of the fit between the position limiter 140 and the inner drum 120, the outer wall of the inner drum 120 is provided with the support seat 124, and the support seat 124 is provided with the limiting baffle 125. When the position limiter 140 is located at the first position, the limiting baffle 125 abuts against the position limiter 140. Thus, it is easy to limit the position limiter 140 to the first position, when the filter assembly 160 is removed. During the mounting process of the filter assembly 160, the position limiter 140 may be pushed to the second position.

[0037] Both ends of the position limiter 140 are configured to be the fixed end 141 and the free end 143 respectively. The fixed end 141 has the pivoting hole 142, and the support seat 124 is provided with the pivoting shaft 123. The pivoting shaft 123 is configured to be fitted with the pivoting hole 142, specifically pivotably disposed in the pivoting hole 142. When the position limiter 140 is located at the first position, the free end 143 of the position limiter 140 extends into the opening 122. When the position limiter 140 is located at the second position, the free end 143 of the position limiter 140 moves out from the opening 122.

[0038] As shown in Figs. 1-2, in the direction from the fixed end 141 to the free end 143, the sectional area of the position limiter 140 decreases gradually, and the end surface of the free end 143 of the position limiter 140 is configured to be the arc-shaped surface 144. In order to facilitate the user to understand the function of the position limiter 140, the label portion 145 is disposed to the free end 143 of the position limiter 140. When the position limiter 140 is located at the first position, the label portion 145 is located in the opening 122. The label portion 145 is provided with characters or patterns for user's easy identification.

[0039] When the position limiter 140 is located at the first position, a part of the position limiter 140 extends into the opening 122 so as to stop the cover from closing the opening 122, that is, when the position limiter 140 is located at the first position, the cover cannot close the opening 122. When the position limiter 140 is located at the second position, the position limiter 140 moves out from the opening 122, and the cover is configured to close the opening 122.

[0040] The reset member 150 is the torsion spring and configured to constantly apply a pushing force on the position limiter 140 in the direction towards the first position, and the filter assembly 160 is detachably disposed at the air outlet 121. When the filter assembly 160 is removed from the air outlet 121, the position limiter 140 is pushed to the first position by the torsion spring; when the filter assembly 160 is mounted to the air outlet 120, the filter assembly 160 pushes the position limiter 140 to switch the position limiter 140 to the second position.

[0041] It may be understood that, under the constant push of the reset member 150, the position limiter 140 has the trend of moving towards the first position. When the filter assembly 160 is removed from the air outlet 121, the filter assembly 160 no longer stops the position limiter 140, and thus the position limiter 140 moves to the first position under the action of the reset member 150. At the moment, a part of the position limiter 140 extends into the opening 122, thereby stopping the cover from closing the opening 122, that is, the cover cannot close the opening 122. When a user takes out the filter assembly 160 and forgets to mount the filter assembly 160 back to the air outlet 121, the position limiter 140 may stop the cover from being buckled to the cabinet, and thus the position limiter 140 may be used to remind the user that the filter assembly 160 is not mounted to the air outlet 121, so as to avoid the machine malfunctions of the laundry treatment device 100 caused by the debris and flocks entering the cabinet due to the filter assembly 160 forgotten to be mounted, thereby improving the security and practicality of the laundry treatment device 100.

[0042] Reference throughout this specification to "an embodiment," "some embodiments," "one embodiment", "another example," "an example," "a specific example," or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the appearances of the phrases such as "in some embodiments," "in one embodiment", "in an embodiment", "in another example," "in an example," "in a specific example," or "in some examples," in various places throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0043] Although explanatory embodiments have been shown and described, it would be appreciated by those skilled in the art that the above embodiments cannot be construed to limit the present disclosure, and changes, alternatives, and modifications can be made in the embodiments without departing from spirit, principles and scope of the present disclosure.

Claims

1. A laundry treatment device (100), comprising:

a cabinet;
an inner drum (120) disposed in the cabinet and having an air outlet (121) and an opening (122);
a cover disposed to the cabinet and configured to open or close the opening (122);
a position limiter (140) switchable between a first position and a second position and having a rod shape, wherein both ends of the position limiter (140) are configured to be a fixed end (141) and a free end (143) respectively, when the position

limiter (140) is located at the first position, the free end (143) of the position limiter (140) extends into the opening (122) to stop the cover from closing the opening (122), and when the position limiter (140) is located at the second position, the free end (143) of the position limiter (140) moves out from the opening (122), and the cover is configured to close the opening (122);

a reset member (150) configured to constantly apply a pushing force on the position limiter (140) in a direction towards the first position; and

a filter assembly (160) detachably disposed at the air outlet (121), wherein when the filter assembly (160) is removed from the air outlet (121), the position limiter (140) is located at the first position, and when the filter assembly (160) is mounted to the air outlet (121), the filter assembly (160) is configured to push the position limiter (140) to switch the position limiter (140) to the second position.

2. The laundry treatment device (100) according to claim 1, wherein an air passage (170) is provided between the inner drum (120) and the cabinet, the air passage (170) is communicated with the air outlet (121), and the position limiter (140) is disposed in the air passage (170) and located at a position close to the air outlet (121).

3. The laundry treatment device (100) according to claim 1, wherein the fixed end (141) of the position limiter (140) is pivotably connected with an outer wall of the inner drum (120), such that the free end (143) of the position limiter (140) is configured to extend into the opening (122).

4. The laundry treatment device (100) according to claim 3, wherein one of the fixed end (141) and the inner drum (120) has a pivoting hole (142) and the other one thereof has a pivoting shaft (123) configured to be fitted with the pivoting hole (142).

5. The laundry treatment device (100) according to claim 4, wherein the outer wall of the inner drum (120) is provided with a support seat (124), the pivoting shaft (123) is disposed to the support seat (124), and the support seat (124) is provided with a limiting baffle (125),

wherein when the position limiter (140) is located at the first position, the limiting baffle (125) abuts against the position limiter (140).

6. The laundry treatment device (100) according to claim 4, wherein the reset member (150) is configured to be a torsion spring fitted over the pivoting shaft (123).

7. The laundry treatment device (100) according to claim 3, wherein an end surface of the free end (143) of the position limiter (140) is configured to be an arc-shaped surface (144).

8. The laundry treatment device (100) according to claim 3, wherein in a direction from the fixed end (141) to the free end (143), a sectional area of the position limiter (140) decreases gradually.

9. The laundry treatment device (100) according to any one of claims 1-8, wherein the free end (143) of the position limiter (140) is provided with a label portion (145),

wherein when the position limiter (140) is located at the first position, the label portion (145) is located in the opening (122).

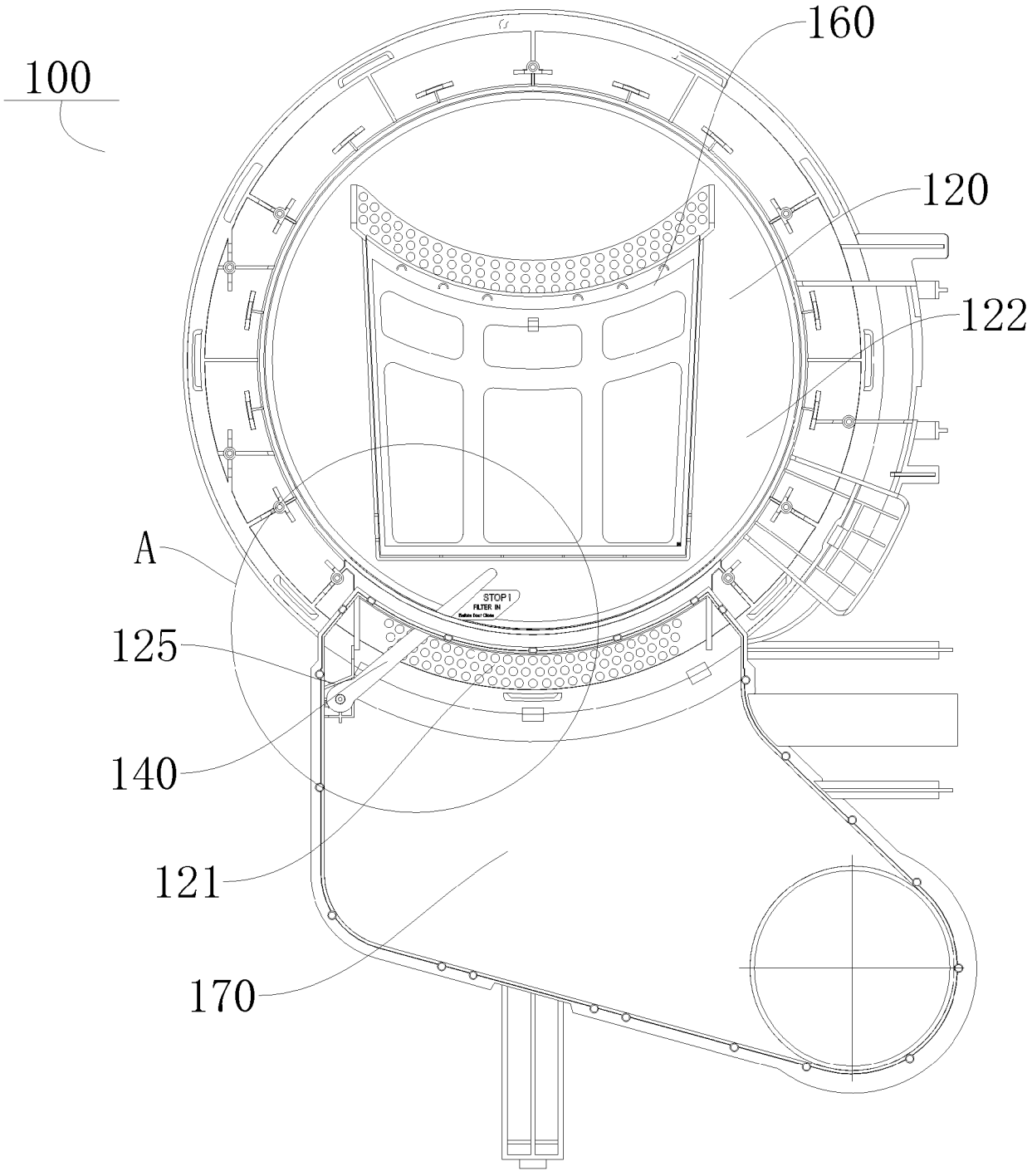

Fig. 1

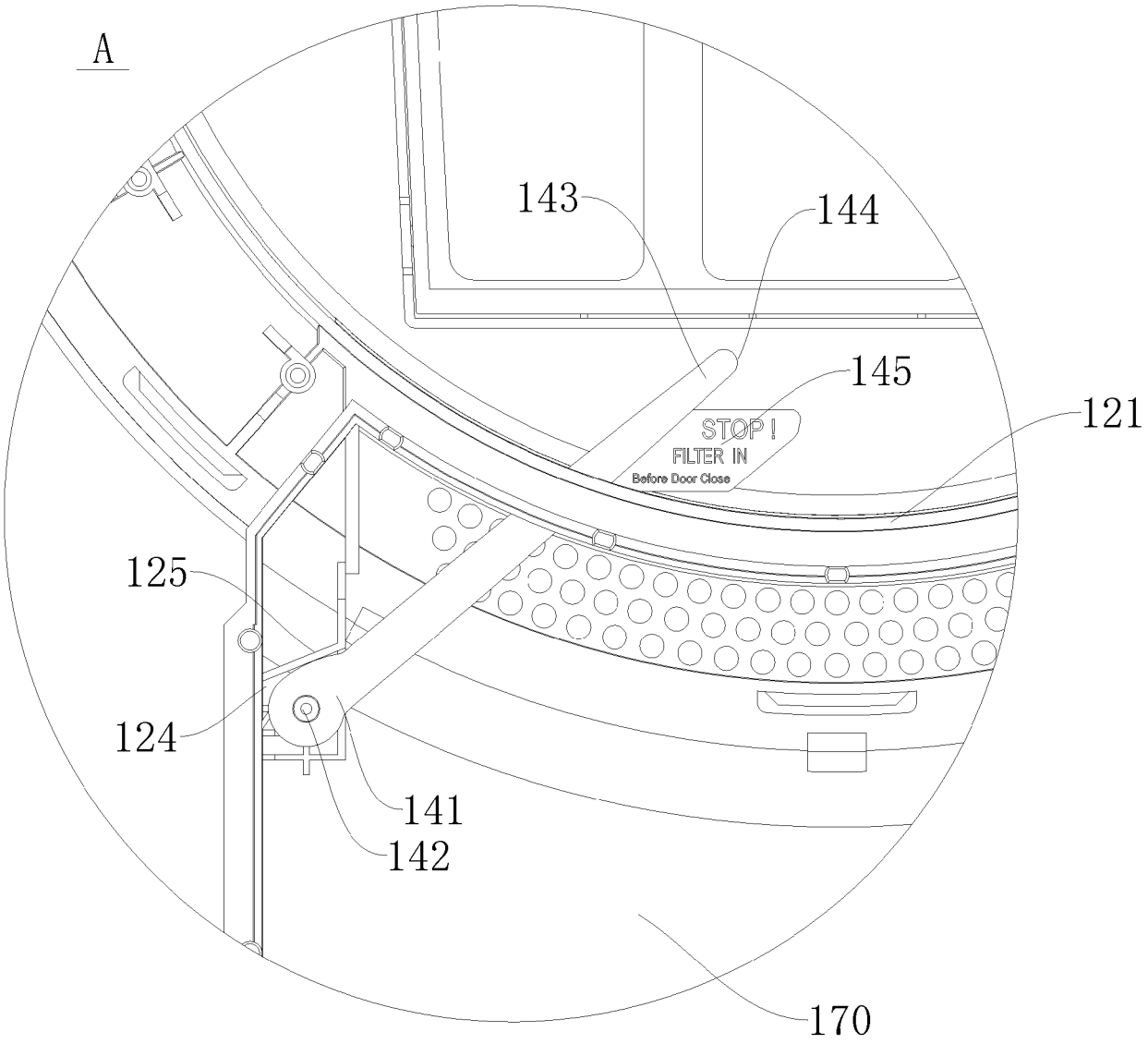
A
143
144
145
121
STOP !
FILTER IN
Before Door Close
125
124
141
142
170

Fig. 2

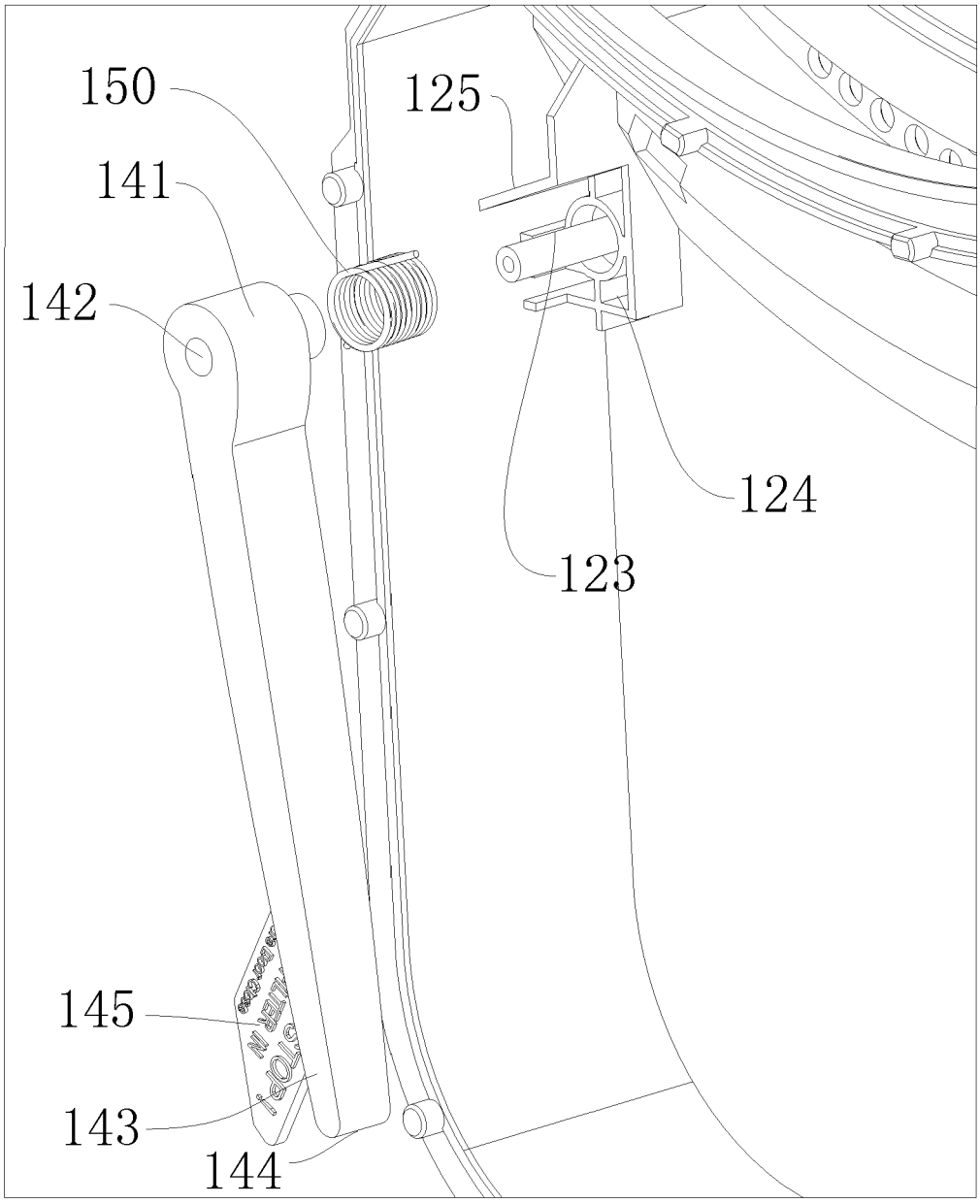

Fig. 3

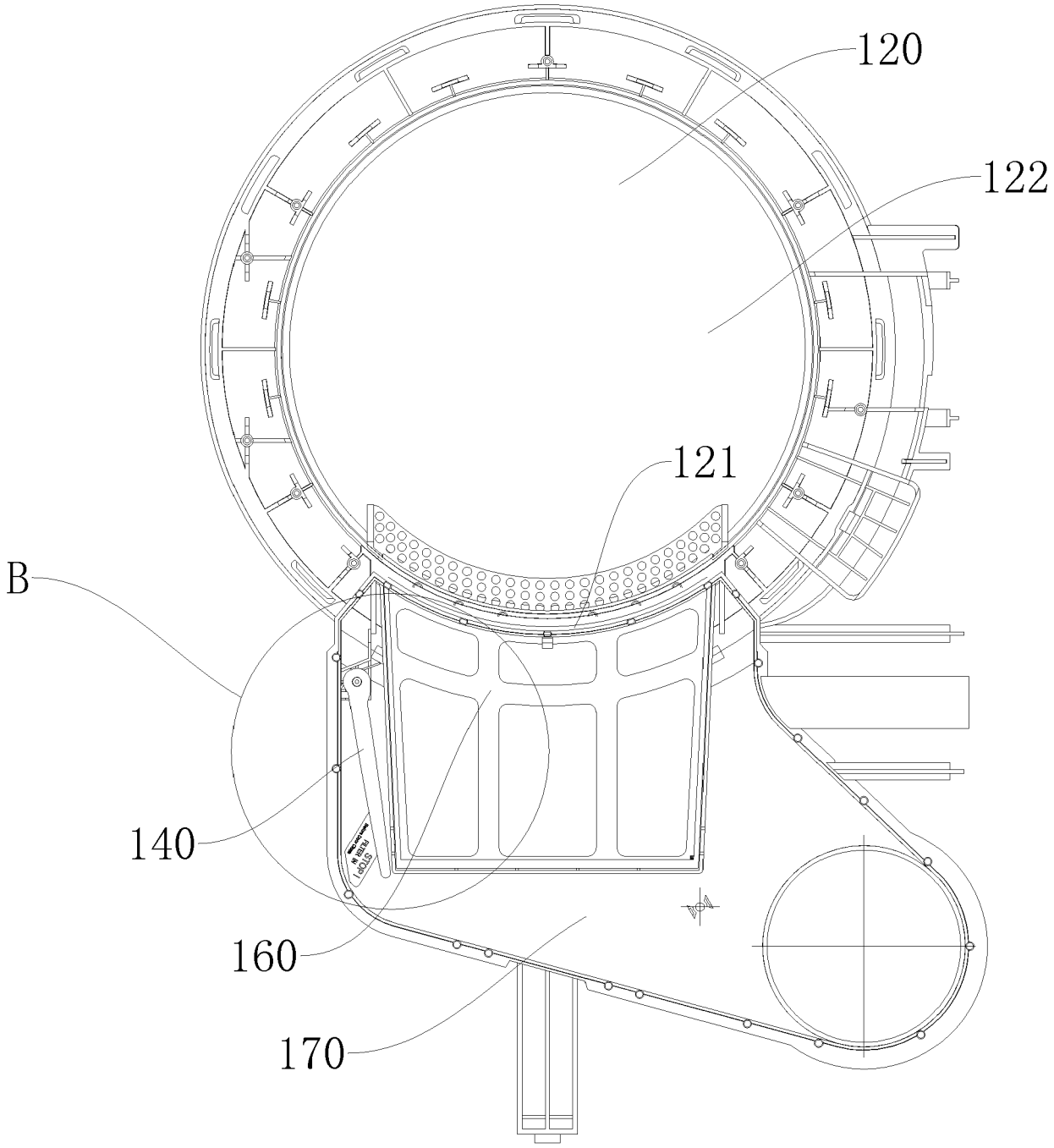

Fig. 4

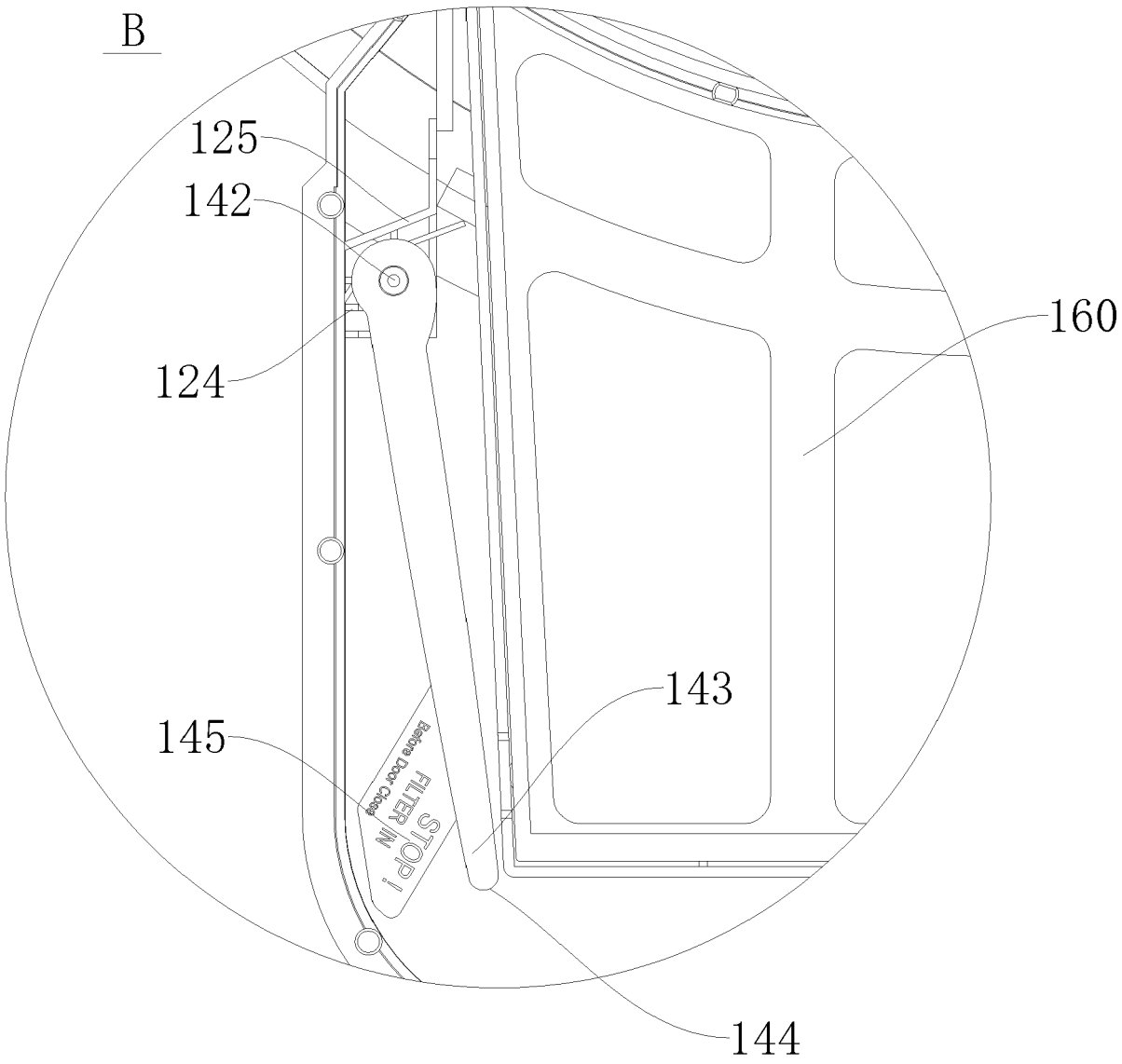

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 17 15 3470

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	DE 44 07 914 A1 (BAUKNECHT HAUSGERAETE [DE]) 14 September 1995 (1995-09-14) * column 2, line 19 - column 2, line 60; figures *	1-9	INV. D06F58/00 D06F58/22 D06F58/20
A	JP 2007 307067 A (SHARP KK) 29 November 2007 (2007-11-29) * figures 1-8 *	1-9	
A	KR 2012 0019209 A (LG ELECTRONICS INC [KR]) 6 March 2012 (2012-03-06) * figures 1,3-8 *	1-9	

TECHNICAL FIELDS SEARCHED (IPC)

D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 March 2017	Beckman, Anja

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 15 3470

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-03-2017

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