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(54) **A DISHWASHER COMPRISING A FILTER**

GESCHIRRSPÜLER MIT EINEM FILTER

LAVE-VAISSELLE COMPRENANT UN FILTRE

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Description

[0001] The present invention relates to a dishwasher comprising a filter.

[0002] In dishwashers, dirt and stains on the dishes are removed by means of the spraying arms which spray water. Dirt dispersing into the washing tub is drained by means of the drainer provided at the base of the dishwasher. Thus, dirt is prevented from entering the water line and clogging the line. The drainer is detachably mounted onto the base of the dishwasher. Thus, the drainer can be easily detached by the user to be washed and cleaned. Dirt smaller than the holes of the drainer is held by a filter which has smaller holes and which is detachably mounted onto the drainer. Water softening systems are used for decreasing the hardness of the washing water and for providing an effective washing. The water softening system comprises an ion exchanger and a salt container which enables the resin in the ion exchanger to be soaked in the brine so as to carry out the regeneration process. In order to decrease the hardness of water, the water received from the mains is passed over the ion exchanger and is delivered to the tub to be used in the washing process. Brine is provided in the salt container which is activated for regenerating the ion exchanger and the amount of salt in the brine decreases in the course of time. A conductivity sensor detects the decrease of salt in the salt container and the user is warned to add salt into the salt container. However, adding salt to the salt container is difficult for the user since it is not easy for the user to access the salt container disposed inside the body of the dishwasher. In the state of the art, funnel-shaped salt filling tools which facilitate pouring salt into the salt container are available. But said tools are stored outside the machine. A salt filling means which provides ease of utilization for the user is necessary.

[0003] In the state of the art German Patent Application No. DE4214147, a filling container is disclosed, which can be situated on the salt container and can be stored outside the dishwasher.

[0004] In the state of the art European Patent Application No. EP2555662 is disclosed a dishwashing machine comprising a filtering element having a filtering side wall and defining internally a cavity, the cross-section of the bottom portion of which tapers in a downwards direction.

[0005] In the state of the art European Patent Application No. EP0752231 is disclosed a dishwashing machine comprising the filtering means.

[0006] In the state of the art International Patent Application No. WO2014090539 is disclosed a dishwasher comprising an ion exchanger and a salt container.

[0007] In the state of the art European Patent Application No. EP0855165 is disclosed a dishwasher comprising an improved filtering device.

[0008] In the state of the art China Patent Application No. CN202446037 is disclosed a filtration system for a dishwasher.

[0009] In the state of the art United Kingdom Patent

Application No. GB1022827 is disclosed a filtering apparatus for dishwasher.

[0010] In the state of the art China Patent Application No. CN101822919 is disclosed a filtering device of a dishwasher, especially relates to a filtering device which is arranged inside of a water collecting slot for containing washing water and is used for filtering dirt in the washing water. The aim of the present invention is the realization of dishwasher wherein it is made easier for the user to access the salt container for filling in salt.

[0011] The dishwasher realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body, a washing tub which is disposed in the body, a draining element which is provided on the washing tub base, a filter which is detachably mounted onto the draining element and a salt container for adjusting the hardness of the water. The washing process is performed in the washing tub. By means of the draining element provided on the washing tub base, the dirt removed from the dishes are held before entering the washing line. Thus, the washing line is prevented from being clogged. By means of the salt added to the salt container, the hardness of the water can be adjusted, thus improving the washing performance. The filter is composed of a microfilter and a coarse filter. While the microfilter holds small particles of dirt, the coarse filter prevents large particles of dirt from entering the washing line.

[0012] The dishwasher of the present invention comprises the coarse filter which can be detached from the filter to be mounted onto the salt container. Thus, the user can more easily access the salt container to fill in salt. By means of the conical shape of the coarse filter, the salt can be easily filled into the salt container.

[0013] According to the present invention, the dishwasher comprises a rotary element which is disposed on the coarse filter. The rotary element is detachably mounted onto the coarse filter.

[0014] The rotary element can be easily detached and cleaned by the user.

[0015] According to the present invention, the dishwasher comprises a plurality of first openings which are arranged on the coarse filter and a plurality of second openings which are arranged on the rotary element. By rotating the rotary element over the coarse filter, the first opening and the second opening can overlap or be separated. Thus, the size of dirt particles which may pass through the coarse filter and the amount of salt can be adjusted.

[0016] In an embodiment of the present invention, the dishwasher comprises at least two feet disposed on the coarse filter. While the coarse filter is on the microfilter, the feet extends away from the microfilter. By means of the feet, the coarse filter can be mounted onto the salt container.

[0017] In an embodiment of the present invention, the dishwasher comprises at least two claws disposed on the salt container and a groove arranged on the foot. By

fitting the claws into the grooves, the coarse filter is fixed onto the salt container. Thus, salt can be filled into the salt container.

[0018] In an embodiment of the present invention, the dishwasher comprises the coarse filter which has a conical shape narrowing down towards the salt container when mounted on the salt container. Thus, the coarse filter can be used as a funnel.

[0019] By means of the present invention, a dishwasher is realized, comprising a coarse filter which can be used for facilitating the access of the user to the salt container.

[0020] A dishwasher realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of the dishwasher.

Figure 2 - is the perspective view of the base when the coarse filter is on the filter.

Figure 3 - is the exploded view of the filter.

Figure 4 - is the perspective view of the base when the coarse filter is on the salt container.

[0021] The elements illustrated in the figures are numbered as follows:

- 1- Dishwasher
- 2- Body
- 3- Washing tub
- 4- Draining element
- 5- Microfilter
- 6- Coarse filter
- 7- Filter
- 8- Salt container
- 9- Rotary element
- 10-First opening
- 11- Second opening
- 12- Foot
- 13- Claw
- 14- Groove
- A- First position

B- Second position

T- Washing tub base

[0022] The dishwasher (1) comprises a body (2); a washing tub (3) which is disposed in the body (2) and wherein the washing process is carried out; a draining element (4) which is disposed on the base (T) of the washing tub (3); a filter (7) which is detachably mounted onto the draining element (4) and which has a microfilter (5) for holding dirt and a coarse filter (6) which can be detachably mounted onto the microfilter (5) and which holds dirt particles; and a salt container (8) wherein the salt used for adjusting the hardness of water is filled. By means of the draining element (4), the dirt removed from the dishes is prevented from entering the washing line. The draining element (4) can be easily detached and washed by the user. By means of the filter (7) mounted onto the draining element (4), smaller dirt particles can be held. The filter (7) is composed of the microfilter (5) and the coarse filter (6). The microfilter (5) and the coarse filter (6) are detachably mounted onto each other. During the washing process, the hardness of the water sprayed onto the dishes is reduced by means of the salt filled into the salt container (8). Thus, the washing performance is increased.

[0023] The dishwasher (1) of the present invention comprises the conical coarse filter (6) which has a first position (A) where the coarse filter (6) is placed onto the microfilter (5) and a second position where the coarse filter (6) is detached from the microfilter (5) and placed onto the salt container (8). In the first position (A) the coarse filter (6) is on the microfilter (5) and used for draining. After being detached from the microfilter (5), the coarse filter (6) is turned upside down to the second position (B). In the second position (B), the coarse filter (6) is mounted onto the salt container (8), thus enabling the user to fill salt into the salt container (8).

[0024] In an embodiment according to the present invention, the dishwasher (1) comprises the filter (7) having a rotary element (9) which is detachably mounted onto the coarse filter (6) and which is used for adjusting the size of dirt particles which may pass through the coarse filter (6). The rotary element (9) can be easily detached from the filter (7) to be cleaned by the user.

[0025] In an embodiment according to the present invention, the dishwasher (1) comprises the filter (7) having a plurality of first openings (10) arranged on the coarse filter (6) and a plurality of second openings (11) arranged on the rotary element (9) so as to align with the first openings (10) wherein the first openings (10) and the second openings (11) are displaced with the rotation of the rotary element (9) being rotated over the coarse filter (6). The rotary element (9) can be rotated over the coarse filter (6). The second openings (11) on the rotary element (9) are displaced while the latter rotates. Thus, the first openings (10) and the second openings (11) can be aligned with each other by the user. Consequently, larger dirt

particles and a larger amount of salt can pass through the coarse filter (6). The size of opening can be adjusted by rotating the rotary element (9) over the coarse filter (6). Thus, the amount of salt which can pass through the coarse filter (6) when the latter is on the salt container (8) can be adjusted.

[0026] In an embodiment of the present invention, the dishwasher (1) comprises the filter (7) having at least two feet (12) which are provided on the coarse filter (6), which extend away from the microfilter (5) when the coarse filter (6) is on the microfilter (5) and which enable the coarse filter (6) to be mounted onto the salt container (8). While the coarse filter (6) is on the microfilter (5), the feet (12) extends away from the microfilter (5). When the coarse filter (6) is mounted onto the salt container (8), the feet (12) extend towards the salt container (8) to be fitted.

[0027] In an embodiment of the present invention, the dishwasher (1) comprises the coarse filter (6) which can be fixed onto the salt container (8) by means of at least two claws (13) provided on the salt container (8) and the foot (12) having a groove (14) provided on the foot (12) to be fitted over the claw (13). The claws (13) at the mouth of the salt container (8) are fitted into the grooves (14) on the foot (12) so as to complete the fixing process. Thus, the user can more easily fill salt into the salt container (8).

[0028] In an embodiment of the present invention, the dishwasher (1) comprises the coarse filter (6) which has a conical shape narrowing down towards the salt container (8) when mounted on the salt container (8). By means of the narrowing diameter of the coarse filter (6) towards the salt container (8), the former has a funnel shape. Thus, the need for an additional funnel to fill salt into the salt container (8) is eliminated.

[0029] By means of the present invention, a dishwasher (1) which provides ease of use is realized. The coarse filter (6) on the filter (7) can be used both for filtration and for serving as a funnel by being mounted onto the salt container (8). Thus, the user can easily add salt when the amount of salt in the salt container (8) decreases. By means of the rotary element (9) mounted onto the coarse filter (6), the amount of salt passing through the first openings (10) on the coarse filter (6) can be adjusted.

Claims

1. A dishwasher (1) **comprising** a body (2); a washing tub (3) which is disposed in the body (2) and wherein the washing process is carried out; a draining element (4) which is disposed on the base (T) of the washing tub (3); a filter (7) which is detachably mounted onto the draining element (4) and which has a microfilter (5) for holding dirt and a conical coarse filter (6) which can be detachably mounted onto the microfilter (5) and which holds dirt particles; and a salt container (8) wherein the salt used for adjusting the hardness of water is filled, whereby the

conical coarse filter (6) has a first position (A) where the coarse filter (6) is placed onto the microfilter (5) and a second position where the coarse filter (6) is detached from the microfilter (5) **characterized by** the conical coarse filter (6) being placed onto the salt container (8) in the second position (B) and by the filter (7) having a rotary element (9) which is detachably mounted onto the coarse filter (6) and which is used for adjusting the size of dirt particles which may pass through the coarse filter (6) and the filter (7) having a plurality of first openings (10) arranged on the coarse filter (6) and a plurality of second openings (11) arranged on the rotary element (9) so as to align with the first openings (10) wherein the first openings (10) and the second openings (11) are displaced with the rotation of the rotary element (9) being rotated over the coarse filter (6)..

2. A dishwasher (1) as in claim 1, **characterized by** the filter (7) having at least two feet (12) which are provided on the coarse filter (6), which extend away from the microfilter (5) when the coarse filter (6) is on the microfilter (5) and which enable the coarse filter (6) to be mounted onto the salt container (8).
3. A dishwasher (1) as in claim 2, **characterized by** the coarse filter (6) which can be fixed onto the salt container (8) by means of at least two claws (13) provided on the salt container (8) and the foot (12) having a groove (14) provided on the foot (12) to be fitted over the claw (13).
4. A dishwasher (1) as in any one of the above claims, **characterized by** the coarse filter (6) in the shape of a cone which narrows down towards the salt container (8) when the coarse filter (6) is on the salt container (8).

Patentansprüche

1. Ein Geschirrspüler (1) **umfasst** einen Körper (2); eine Waschwanne (3), die in dem Körper (2) angeordnet ist und in der der Waschvorgang durchgeführt wird; ein Abtropfelement (4), das am Boden (T) der Waschwanne (3) angeordnet ist; einen lösbar auf das Abtropfelement (4) aufgesetzten Filter (7) mit einem Mikrofilter (5) zur Aufnahme von Schmutz und einem kegelförmigen Grobfilter (6), der auf dem Mikrofilter (5) lösbar aufsteckbar ist und Schmutzpartikel aufnimmt; und einen Salzbehälter (8), in den das zum Einstellen der Wasserhärte verwendete Salz eingefüllt wird, wobei der konische Grobfilter (6) eine erste Position (A) aufweist, wo der Grobfilter (6) auf den Mikrofilter (5) aufgesetzt wird und eine zweite Position, in der der Grobfilter (6) von dem Mikrofilter (5) gelöst ist, **gekennzeichnet ist er dadurch**, dass der konische Grobfilter (6) in der zwei-

ten Position (B) auf den Salzbehälter (8) aufgesetzt ist und dass der Filter (7) ein Drehelement (9) aufweist, der lösbar auf dem Grobfilter (6) montiert ist und zur Einstellung der Größe von Schmutzpartikeln dient, die den Grobfilter (6) passieren dürfen und wobei der Filter (7) mehrere erste Öffnungen (10) aufweist, die an dem Grobfilter (6) angeordnet sind, und mehrere zweite Öffnungen (11), die an dem Drehelement (9) angeordnet sind, um mit den ersten Öffnungen (10) ausgerichtet zu sein, wobei die ersten Öffnungen (10) und die zweiten Öffnungen (11) mit der Drehung des Drehelements (9) verschoben werden, das über den Grobfilter (6) gedreht wird.

2. Ein Geschirrspüler (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der Filter (7) mindestens zwei Füße (12) aufweist, die am Grobfilter (6) vorgesehen sind, die sich von dem Mikrofilter (5) weg erstrecken, wenn der Grobfilter (6) auf dem Mikrofilter (5) ist, und die eine Montage des Grobfilters (6) auf dem Salzbehälter (8) ermöglichen.
3. Ein Geschirrspüler (1), wie in Anspruch 2 aufgeführt, **ist dadurch gekennzeichnet, dass** der auf dem Salzbehälter (8) befestigbare Grobfilter (6) durch mindestens zwei Krallen (13), die an dem Salzbehälter (8) vorgesehen sind, und wobei der Fuß (12) eine Nut (14) aufweist, die an dem Fuß (12) vorgesehen ist, um über die Krallen (13) zu passen.
4. Ein Geschirrspüler (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** der Grobfilter (6) die Form eines Kegels aufweist, der sich zum Salzbehälter (8) hin verengt, wenn der Grobfilter (6) auf dem Salzbehälter (8) aufliegt.

rotatif (9) qui est monté de manière amovible sur le filtre grossier (6) et qui est utilisé pour ajuster la taille des particules de saleté qui peuvent passer à travers le filtre grossier (6) et le filtre (7) ayant une pluralité de premières ouvertures (10) disposées sur le filtre grossier (6) et une pluralité de deuxièmes (6) et une pluralité de secondes ouvertures (11) disposées sur l'élément rotatif (9) de manière à s'aligner sur les premières ouvertures (10), les premières ouvertures (10) et les secondes ouvertures (11) étant déplacées par la rotation de l'élément rotatif (9) sur le filtre grossier (6)..

2. Un lave-vaisselle (1) selon la déclaration 1, **caractérisé par le fait que** le filtre (7) a au moins deux pieds (12) qui sont prévus sur le filtre grossier (6), qui s'étendent à l'écart du microfiltre (5) lorsque le filtre grossier (6) est sur le microfiltre (5) et qui permettent au filtre grossier (6) d'être monté sur le récipient à sel (8).
3. Un lave-vaisselle (1) selon la déclaration 2, **caractérisé par** le filtre grossier (6) qui peut être fixé sur le récipient à sel (8) au moyen d'au moins deux griffes (13) prévues sur le récipient à sel (8) et le pied (12) ayant une rainure (14) prévue sur le pied (12) pour s'emboîter sur la griffe (13).
4. Un lave-vaisselle (1) comme dans l'une quelconque des déclarations ci-dessus, **caractérisé par** le filtre grossier (6) en forme de cône qui se rétrécit vers le récipient de sel (8) lorsque le filtre grossier (6) est sur le récipient de sel (8).

Revendications

1. Un lave-vaisselle (1) **comprenant** un corps (2) ; une baignoire (3) disposée dans le corps (2) et dans laquelle le processus de lavage est effectué ; un élément de vidange (4) disposé sur la base (T) de la baignoire (3) ; un filtre (7) monté de manière amovible sur l'élément de vidange (4) et doté d'un microfiltre (5) destiné à retenir les impuretés et d'un filtre grossier conique (6) pouvant être monté de manière amovible sur le microfiltre (5) et qui retient les particules d'impuretés ; et un bac à sel (8) dans lequel le sel utilisé pour ajuster la dureté de l'eau est rempli, le filtre grossier conique (6) ayant une première position (A) dans laquelle le filtre grossier (6) est placé sur le microfiltre (5) et une deuxième position dans laquelle le filtre grossier (6) est détaché du microfiltre (5) **caractérisé par le fait que** le filtre grossier conique (6) est placé sur le bac à sel (8) dans la deuxième position (B) et par le filtre (7) ayant un élément

Figure 1

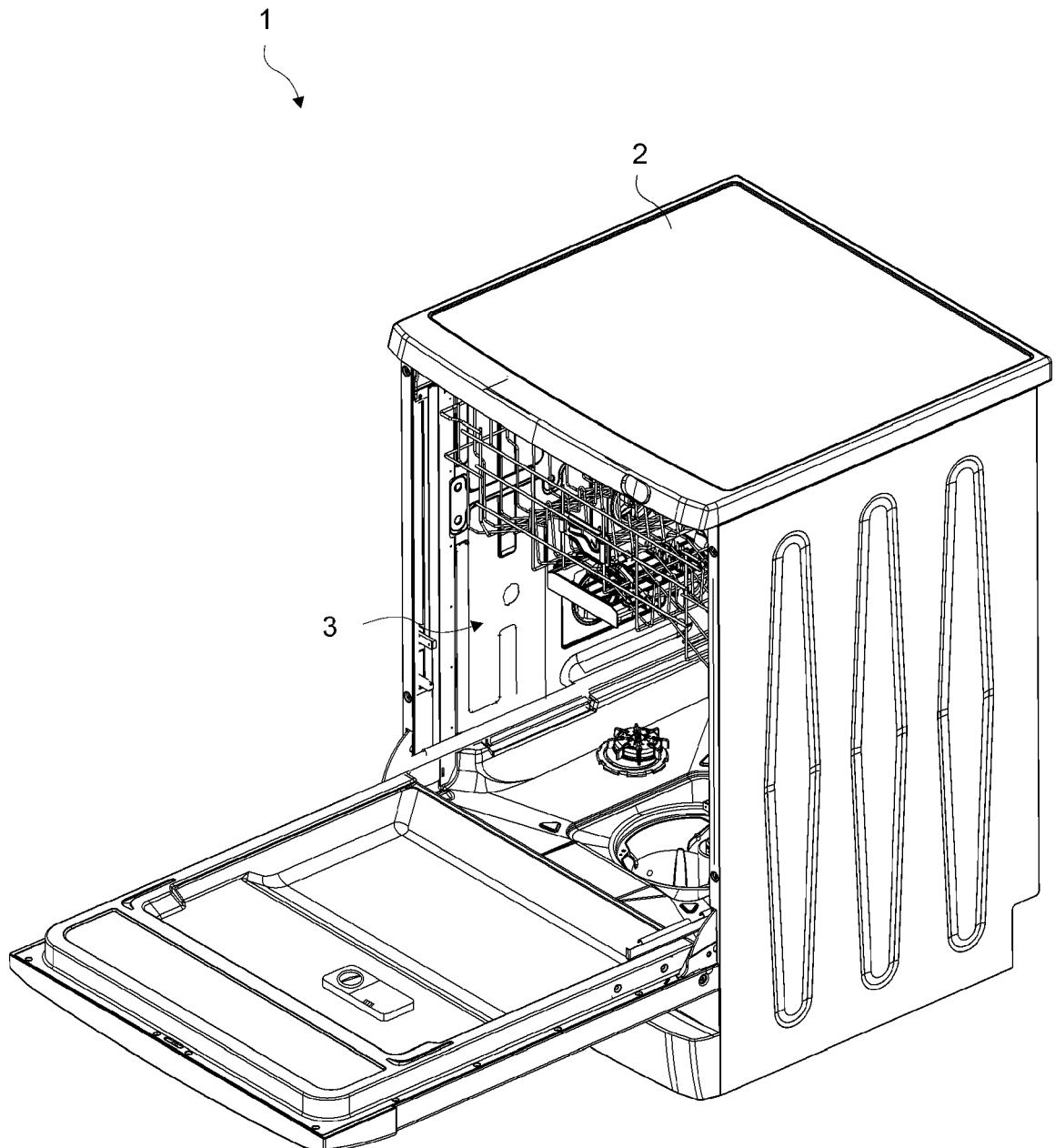


Figure 2

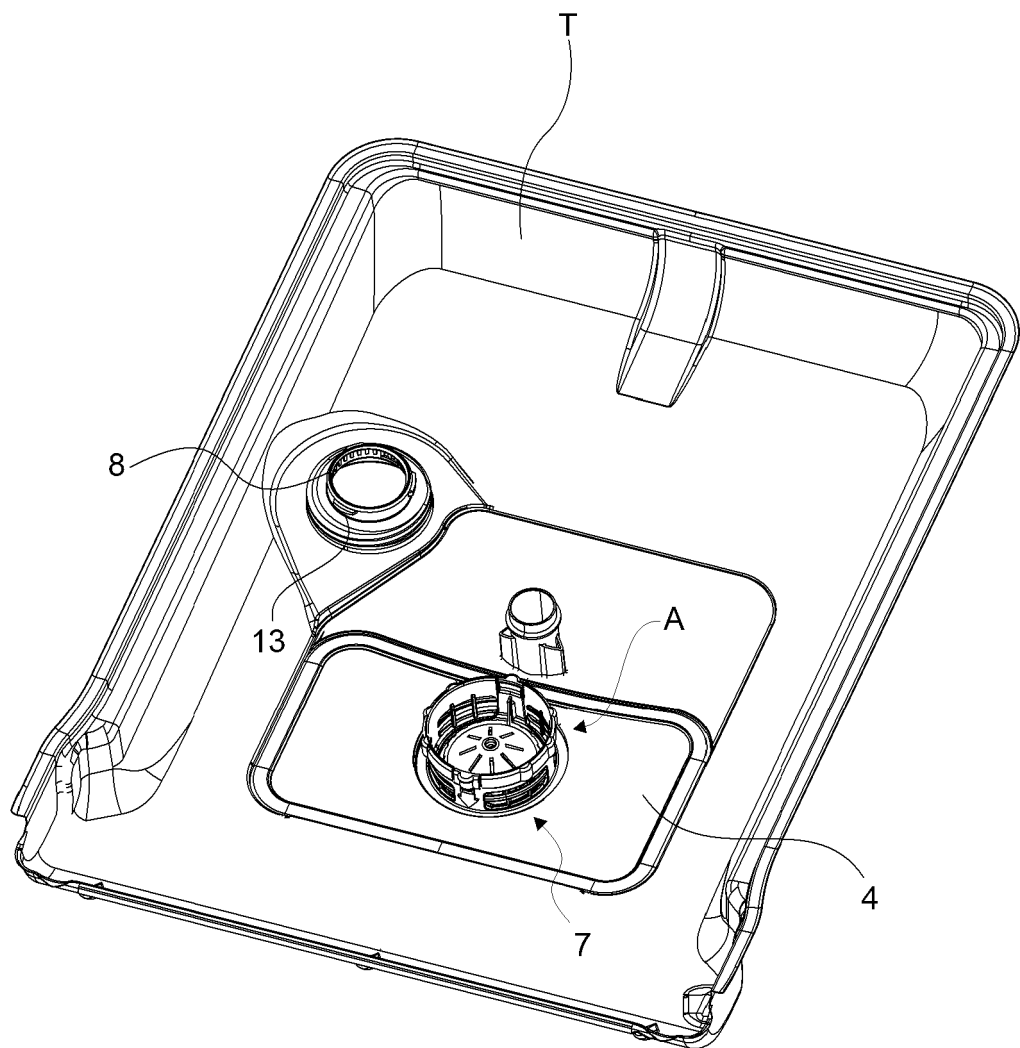


Figure 3

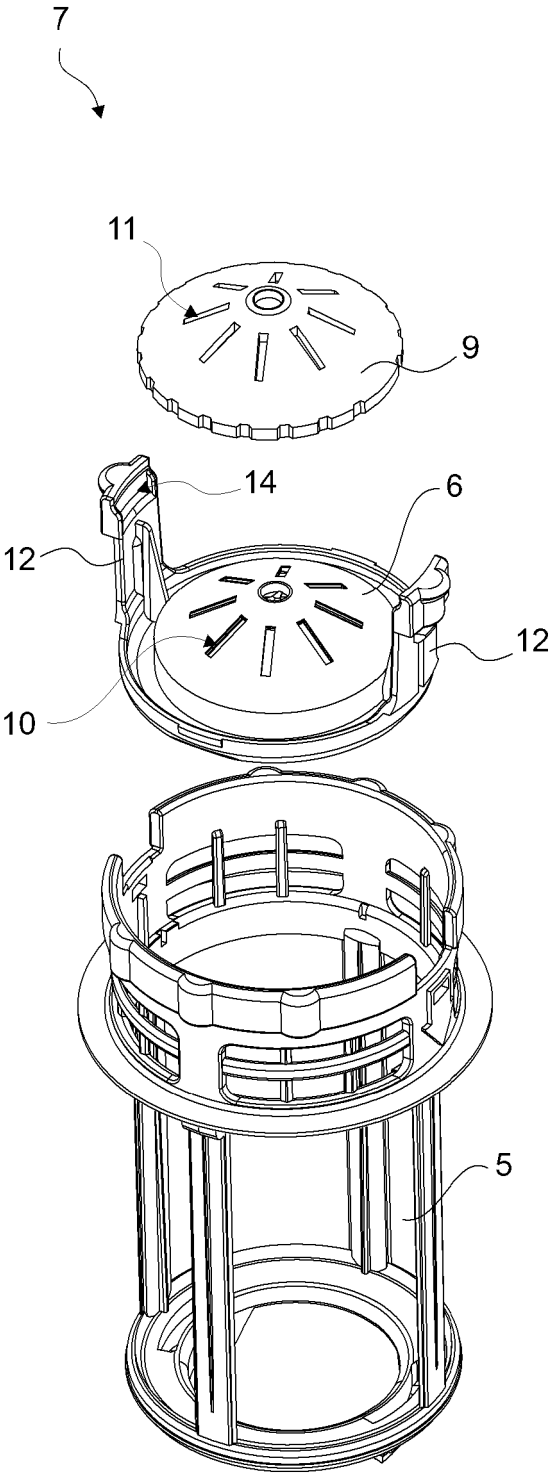
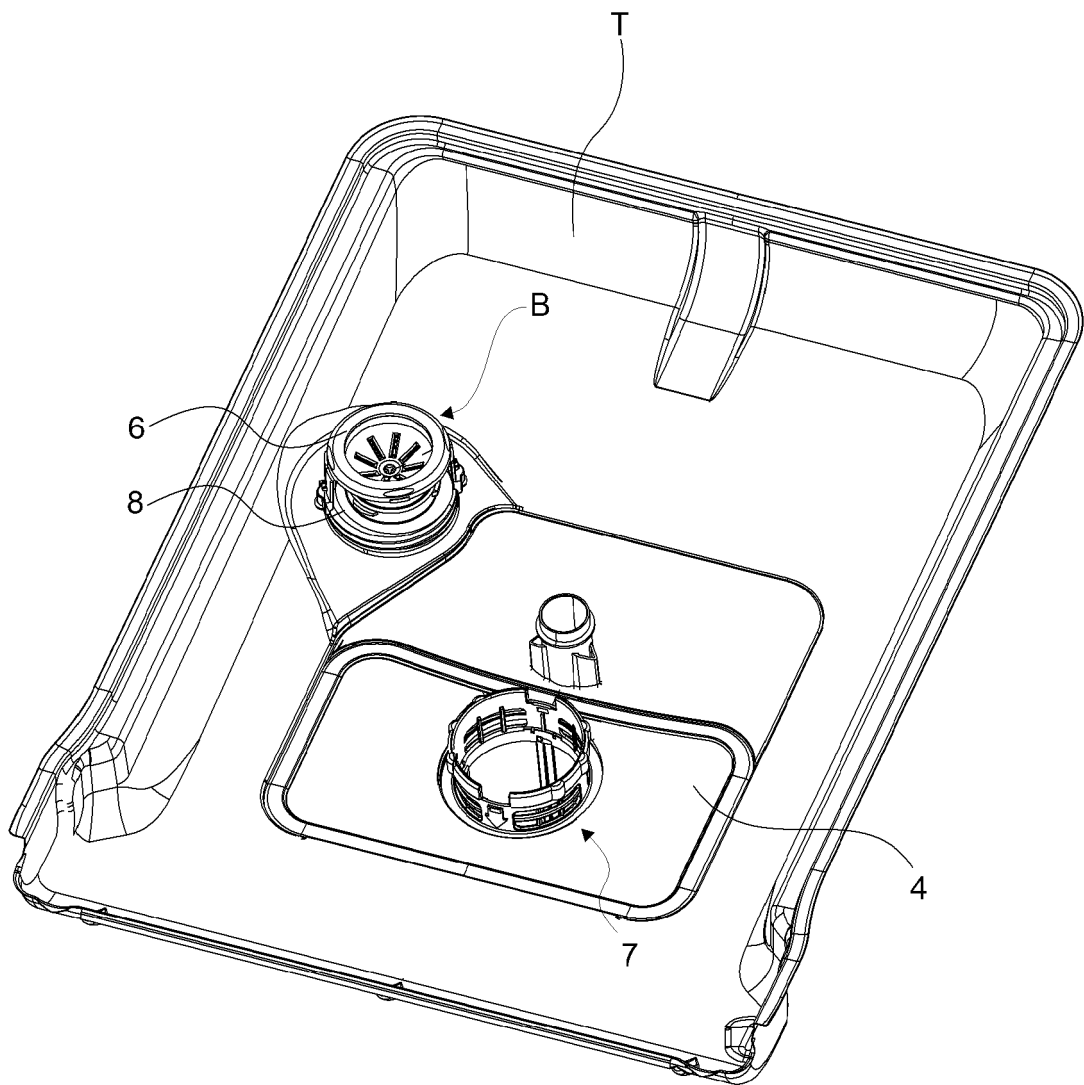


Figure 4



REFERENCES CITED IN THE DESCRIPTION

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