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- **Buyuk, Turgay**
45030 Manisa (TR)
- **Sayir, Halil**
45030 Manisa (TR)
- **Balkan, Okan**
45030 Manisa (TR)
- **Eldem, Mehmet**
45030 Manisa (TR)

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(71) Applicant: **Vestel Beyaz Esya Sanayi ve Ticaret
A.S.**
45030 Manisa (TR)

(74) Representative: **Cayli, Hülya**
Paragon Consultancy Incorporated
Koza Sokak No: 63/2
GOP 06540 Ankara (TR)

(72) Inventors:
• **Ugur, Hasan**
45030 Manisa (TR)

(54) **A storage system**

(57) A storage system developed according to the present invention is suitable for use in a washing device (M) provided with at least one body (1); at least one interior compartment (2), which is disposed in the body (1), into which items to be washed are placed and in which wash and rinse cycles are performed; and at least one base (3) in which wash liquid present in the interior compartment (2) is collected. The storage system comprises at least one container (4) to which the wash liquid collected at the base (3) is transferred; at least one transfer line (5) by which the excess of the wash liquid transferred to the container (4) is transferred to said interior compartment (2) once the container is filled; at least one opening (6) by which the transfer line (5) is opened to the interior compartment (2); at least one pool (8) disposed in a part of the transfer line (5) opening to the container (4); and at least one channel (9) extending from the transfer line (5) towards the pool (8).

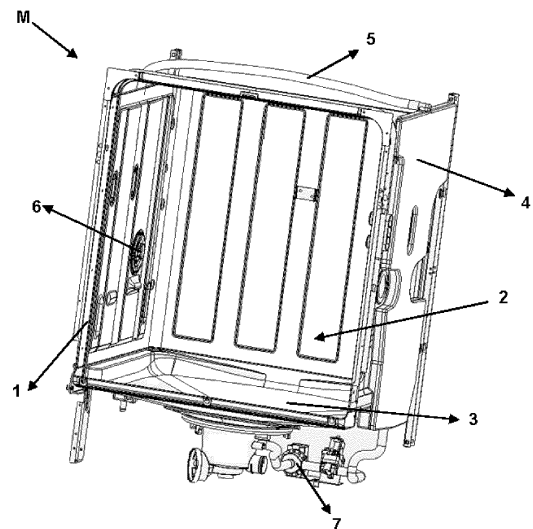


Figure – 1

Description

Field of Invention

[0001] The present invention relates to a storage system used in washing devices.

Prior Art

[0002] In washing devices such as laundry washers or dishwashers, washed items are rinsed following a washing process. The contamination of rinse liquid (e.g. water) is generally low. Therefore, the rinse water (particularly the final rinse water) is collected in a reservoir to save water and is used in the next washing process as the first wash water (e.g. to loosen the dirt of the items to be washed). However, bacterial growth can take place in water over time as the water collected in the reservoir is kept until the next washing process. Bacterial growth, in turn, may cause unpleasant odor to form and get into the interior of the washing device. In the prior art, various embodiments have been made to prevent this undesired odor. In the embodiments of the prior art, water collected in the washing device is disinfected using chemical products or electrical processes. In these embodiments, however, the disinfection process of stored water is costly.

[0003] In the patent document EP2283762A2 according to the prior art is disclosed a household appliance wherein wash water is reused. In said household appliance, wash water is collected in a container and is used in a further washing process. According to that document, wash water is passed through an odor trap before it is supplied to the reservoir such that dirt particles in water are removed. Even when the water cleaned from dirt particles is left standing, relatively less odor formation takes place as compared to untreated water. However, since water collected in the container is only physically cleaned in the system disclosed in that document, unpleasant odors do occur anyway to some extent and reach the interior of the washing device.

Brief Description of Invention

[0004] The storage system developed according to the present invention is suitable for use in a washing device provided with at least one body; at least one interior compartment, which is disposed in the body, into which items to be washed are placed, and in which wash and rinse cycles are performed; and at least one base wherein wash liquid present in the interior compartment is collected. The storage system comprises at least one container to which wash liquid collected at the base is transferred; at least one transfer line by which the excess of wash liquid transferred to the container is transferred to said interior compartment once the container is filled; at least one opening by which the transfer line is opened to the interior compartment; at least one pool disposed in a part of the transfer line which opens to the container; and at

least one channel extending from the transfer line towards the pool.

[0005] By virtue of the storage system developed according to the present invention, water used in a wash cycle (e.g. the final wash cycle) of the washing device wherein the storage system is employed is stored and used in a further washing process. Additionally, unpleasant odor formed in the container is prevented from getting into the interior compartment by means of the pool and the channel structure disposed in the storage system.

Object of Invention

[0006] The object of the present invention is to develop a storage system for storing and reusing wash liquids in washing devices.

[0007] Another object of the present invention is to develop a storage system by which the transfer of unpleasant odor is prevented to the interior compartment of the washing device making use of the storage system.

[0008] A further object of the present invention is to develop a reliable and durable storage system.

Description of Figures

[0009] Illustrative embodiments of a storage system developed according to the present invention are illustrated in the accompanying figures described below.

Figure 1 is a perspective view of a washing device wherein a storage device according to the present invention is used.

Figure 2 is a perspective view of the storage system. Figure 3 is a perspective view of detail "A" given in figure 2.

Figure 4 is a front cross-sectional view of a container disposed in the storage system.

[0010] The parts in the figures are individually designated as following.

Washing device	(M)
Body	(1)
Interior compartment	(2)
Base	(3)
Container	(4)
Transfer line	(5)
Opening	(6)
Pump	(7)
Pool	(8)
Channel	(9)

Description of Invention

[0011] Washing devices such as dishwashers or laundry washers may comprise a storage container to save

wash water. The storage container collects particularly the final rinse liquid (e.g. rinse water) so that the collected water can be used in the next washing process. The water collected in the storage container in such washing devices forms unpleasant odors over time. The unpleasant odor reaches the interior of the washing device and annoys the user. Accordingly, a storage system is developed according to the present invention by which the odor of water collected in the storage container is prevented from getting into the interior of the washing device.

[0012] The storage system developed according to the present invention and illustrated in figures 2-4 is suitable for use in a washing device (M) illustrated in figure 1 and provided with at least one body (1); at least one interior compartment (2), which is disposed in the body (1), into which items to be washed are placed, and in which wash and rinse cycles are performed; and at least one base (3) wherein the wash liquid present in the interior compartment (2) is collected. The storage system comprises at least one container (4) to which the wash liquid collected at the base (3) is transferred; at least one transfer line (5) by which the excess of the wash liquid transferred to the container (4) is transferred to said interior compartment (2) once the container is filled; at least one opening (6) by which the transfer line (5) is opened to the interior compartment (2); at least one pool (8), preferably with an "U" shape, disposed in a part of the transfer line (5) which opens to the container (4); and at least one channel (9) extending from the transfer line (5) towards the pool (8). In representative embodiments of the present invention wherein the washing device (M) is e.g. a dishwasher, the base (3) corresponds to the basin of the dishwasher. In another representative embodiment wherein the washing device (M) is a laundry washer, the base (3) corresponds to the tub of the laundry washer.

[0013] In a representative embodiment according to the present invention, preferably the rinse water of the washing device (M) is taken from the base (3) of the interior compartment (2) and supplied to the container (4). No water inlet takes place into the pool (8) until the water supplied to the container (4) comes to a defined level. When the water in the container (4) reaches the defined level (e.g. exceeds an upper level of the pool (8)), the pool (8) starts filling with water. Preferably when the container (4) is completely filled with water, the excess of water supplied to the container (4) is delivered via the pool (8) and the channel (9) to the transfer line (5). Excess water reaches the opening (6) through the transfer line (5) and supplied to the interior compartment (2). When delivery of water to the container (4) is stopped, some amount of water is left in the pool (8) as illustrated in figure 4. Water left in the pool (8) forms a water trap between the container (4) and the transfer line (5). The water trap, in turn, prevents air flow from the container (4) to the transfer line (5). Thus, even if the water collected in the container (4) produces unpleasant odor over time, this odor is not transferred to the transfer line (5). Thus, the transfer of undesired odors into the interior compart-

ment (2) of the washing device (M) is prevented. Additionally, since no moving parts are comprised in the storage system developed according to the present invention which may be damaged in time, the storage system is made reliable and durable.

[0014] In an alternative embodiment according to the present invention, the storage system comprises at least one pump (7) for transferring the wash liquid collected at the base (3) to the container (4). The pump (7) may be special to the storage system, or may be a drainage pump which is already disposed in the washing device (M) and the outlet of which may be controlled.

[0015] In a further alternative embodiment according to the present invention, the storage system comprises at least one check valve (not illustrated in the figures) which is preferably situated at a part of the transfer line (5) which connects to the channel (9), which has one side opening to the transfer line (5) and another side opening to the exterior, which allows air flow from the exterior to the transfer line (5) and prevents air and/or liquid flow from the transfer line (5) to the exterior. By virtue of the check valve, it is prevented that the entire wash liquid in the pool (8) is supplied to the transfer line (5) by siphon effect particularly in embodiments wherein the height of the opening (6) is lower as compared to the pool (8).

[0016] By virtue of the storage system developed according to the present invention, the water used in a wash cycle (e.g. the final wash cycle) of the washing device (M) wherein the storage system is employed is stored and used in a further washing process. Additionally, unpleasant odor formed in the container (4) is prevented from getting into the interior compartment (2) by means of the pool (8) and the channel (9) structure disposed in the storage system.

Claims

1. A storage system suitable for use in a washing device (M) provided with at least one body (1); at least one interior compartment (2), which is disposed in the body (1), into which items to be washed are placed, and in which wash and rinse cycles are performed; and at least one base (3) wherein wash liquid present in the interior compartment (2) is collected, **characterized by** comprising

- at least one container (4) to which the wash liquid collected at the base (3) is transferred;
- at least one transfer line (5) by which the excess of the wash liquid transferred to the container (4) is transferred to said interior compartment (2) once the container is filled;
- at least one opening (6) by which the transfer line (5) is opened to the interior compartment (2);
- at least one pool (8) disposed in a part of the transfer line (5) which opens to the container (4); and

- at least one channel (9) extending from the transfer line (5) towards the pool (8).

2. The storage system according to claim 1, **characterized in that** the pool (8) has a "U" shape. 5
3. The storage system according to claim 1, **characterized in that** the washing device (M) is a dishwasher. 10
4. The washing device according to claim 3, **characterized in that** the base (3) is in the form of a basin.
5. The storage system according to claim 1, **characterized in that** the washing device (M) is a laundry washer. 15
6. The washing device according to claim 5, **characterized in that** the base (3) is in the form of a tub. 20
7. The storage system according to claim 1, **characterized by** comprising at least one pump (7) for transferring the wash liquid collected at the base (3) to the container (4). 25
8. The storage system according to claim 7, **characterized in that** the pump (7) is specially configured for the storage system.
9. The storage system according to claim 7, **characterized in that** the pump (7) is a drainage pump which is already disposed in the washing device (M) and the outlet of which may be controlled. 30
10. The storage system according to claim 1, **characterized by** comprising at least one check valve which is situated in the transfer line (5), which has one side opening to the transfer line (5) and another side opening to the exterior, which allows air flow from the exterior to the transfer line (5) and prevents air and/or liquid flow from the transfer line (5) to the exterior. 35 40
11. The storage system according to claim 10, **characterized in that** the check valve is situated at a part of the transfer line (5) which connects to the channel (8). 45

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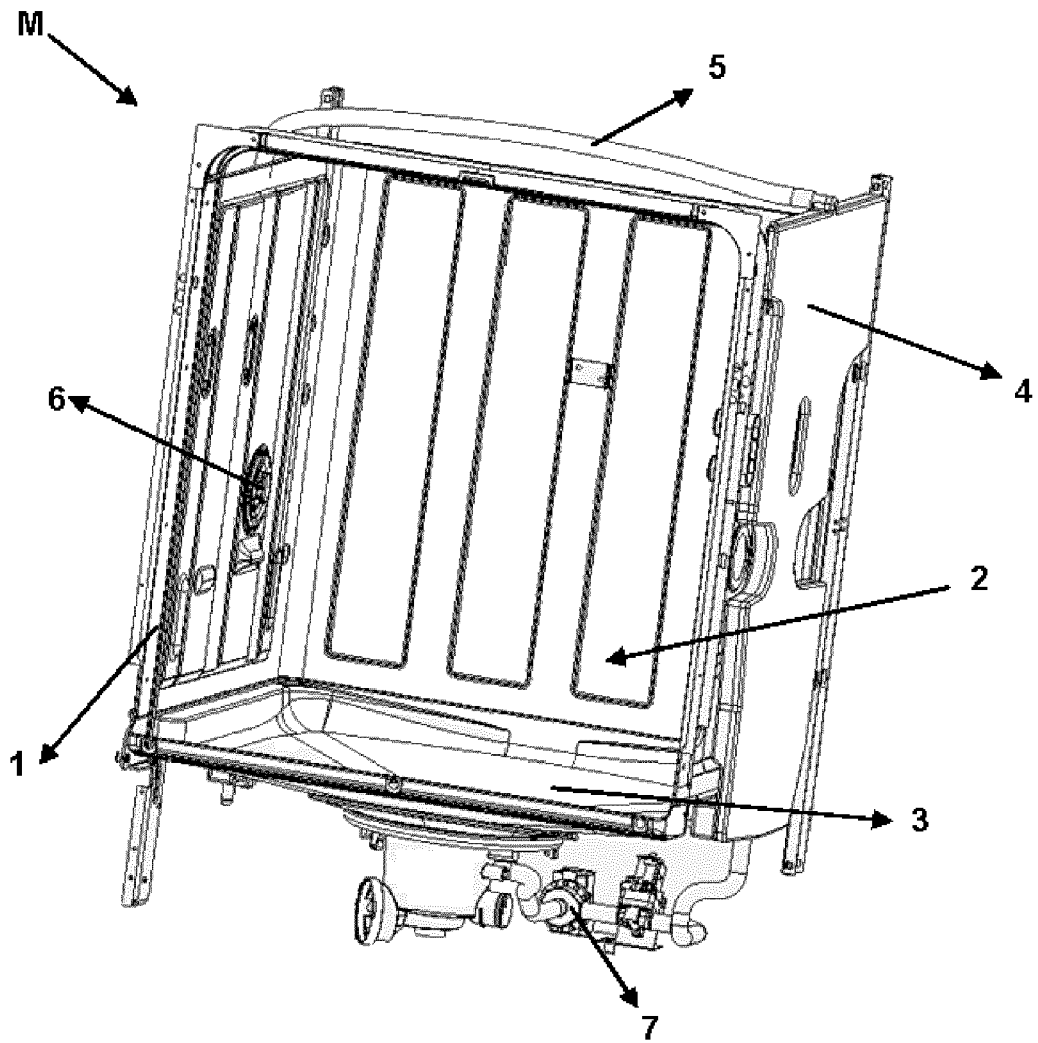


Figure – 1

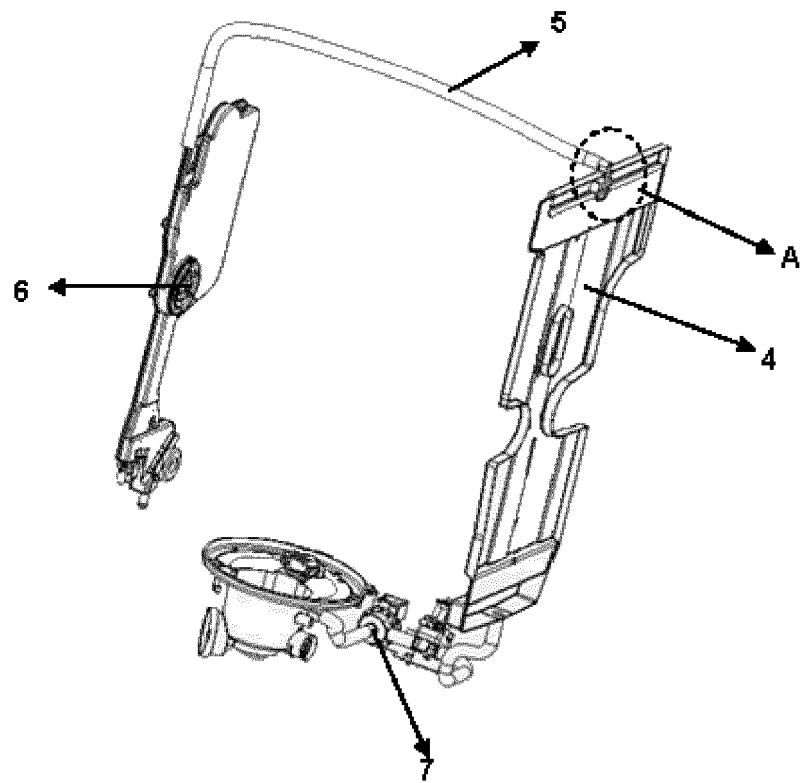


Figure - 2

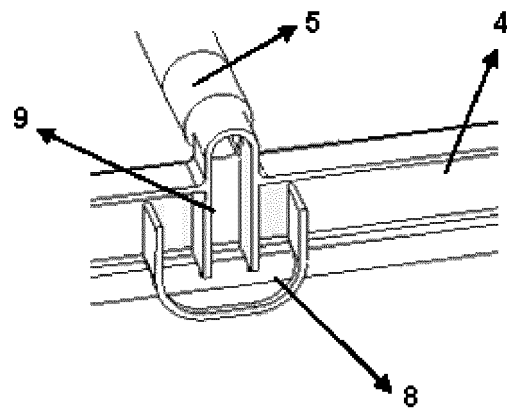


Figure - 3

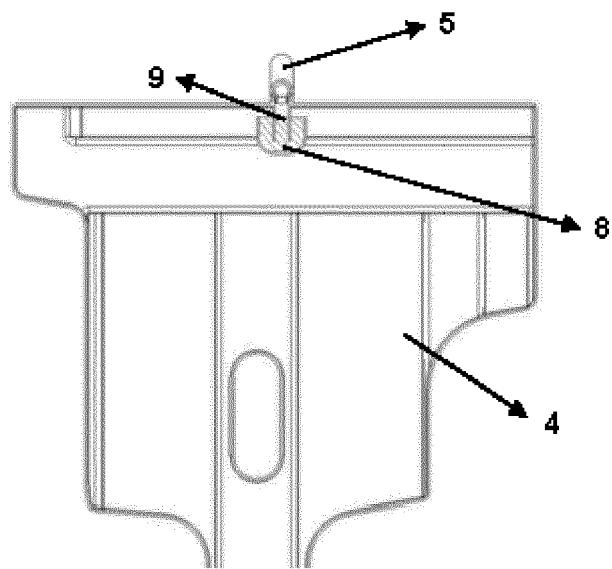


Figure – 4



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 5337

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	EP 2 524 642 A1 (BONFERRARO SPA [IT]) 21 November 2012 (2012-11-21) * the whole document *	1-11	INV. A47L15/42 D06F39/00
A	EP 0 691 099 A2 (CANDY SPA [IT]) 10 January 1996 (1996-01-10) * the whole document *	1-11	
A,D	EP 2 283 762 A2 (BSH BOSCH SIEMENS HAUSGERÄTE [DE]) 16 February 2011 (2011-02-16) * the whole document *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47L D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 June 2014	Examiner Jezierski, Krzysztof
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 5337

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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03-06-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2524642	A1	21-11-2012	NONE
EP 0691099	A2	10-01-1996	DE 69532256 D1 22-01-2004 DE 69532256 T2 18-11-2004 EP 0691099 A2 10-01-1996 IT MI940477 U1 04-01-1996
EP 2283762	A2	16-02-2011	DE 102009028278 A1 10-02-2011 EP 2283762 A2 16-02-2011

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2283762 A2 [0003]