

(19)



(11)

EP 1 941 827 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
09.07.2008 Bulletin 2008/28

(51) Int Cl.:
A47L 15/42^(2006.01)

(21) Application number: **07425006.9**

(22) Date of filing: **08.01.2007**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
 HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
 SK TR**
 Designated Extension States:
AL BA HR MK RS

(71) Applicant: **Bonferraro S.p.A.**
37060 Bonferraro (VR) (IT)

(72) Inventor: **Ambrosi, Andrea**
37052 Casaleone VR (IT)

(74) Representative: **Concone, Emanuele et al**
Società Italiana Brevetti S.p.A.
Via Carducci 8
20123 Milano (IT)

(54) Dishwasher with noise reduction member

(57) In a dishwasher according to the present invention the water falling on the bottom (1) of the wash tank is intercepted by a member (2), having an inverted frustoconical shape and provided with a central hole (4), secured to the lower sprinkler (3) so as to be supported between the latter and the bottom (1), whereby the water falling on the bottom (1) is intercepted by the member (2) and since the point of contact between the water and the member (2) is inside the tank there is no propagation of acoustic waves to the outside. In this way, there is obtained a noise reduction without increasing the power consumption as it occurs in conventional dishwashers in which the soundproofing is obtained by means of bituminous materials applied to the external walls of the tank which heat up by absorbing heat stolen from the water.

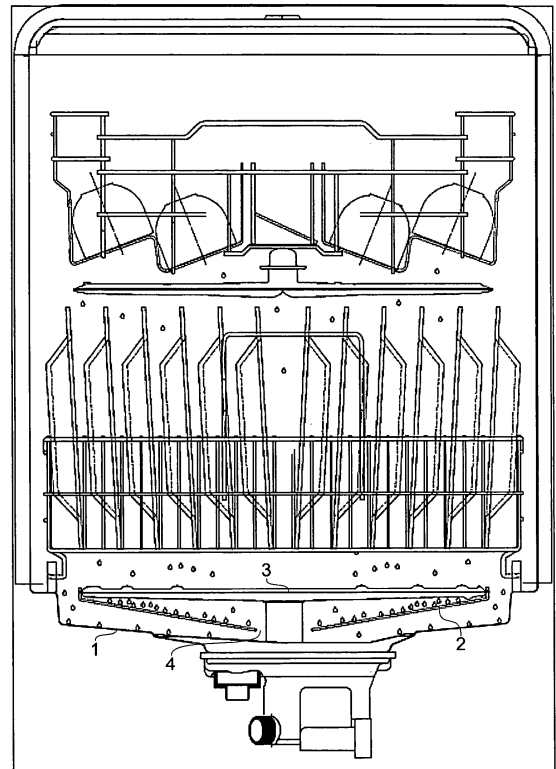


Fig. 1

EP 1 941 827 A1

Description

[0001] The present invention relates to dishwashers, and in particular to a dishwasher provided with a noise reduction member.

[0002] It is known that modern dishwashers have reached high levels of silence, but said silence is obtained thanks to the use of large amounts of bituminous materials applied to the external walls of the wash tank. The use of such materials has the drawback of leading to an increase in power consumption during the operation of the machine, since these materials heat up by absorbing heat stolen from the water. Due to this, conventional dishwashers have difficulties in achieving high levels of power efficiency.

[0003] One of the origins of the noise made by a dishwasher is the fall of water on the bottom of the wash tank. The impact of the water drops causes the tank bottom to vibrate, whereby the acoustic waves are directly transmitted to the bottom space of the machine and radiate therefrom.

[0004] Therefore the object of the present invention is to provide a dishwasher which overcomes the above-mentioned drawbacks. This object is achieved by means of a dishwasher provided with a noise reduction member arranged between the tank bottom and the lower sprinkler. Other advantageous features of the present dishwasher are disclosed in the dependent claims.

[0005] The main advantage of the dishwasher according to the present invention is that of obtaining a noise reduction without increasing the power consumption, or at most with an extremely reduced increase, so as to achieve a high power efficiency.

[0006] A further advantage of this dishwasher stems from the structural simplicity of the devised arrangement, which implies significant savings both in material and labour during the manufacturing step.

[0007] These and other advantages and characteristics of the dishwasher according to the present invention will be clear to those skilled in the art from the following detailed description of two embodiments thereof, with reference to the annexed drawings wherein:

Fig. 1 is a diagrammatic vertical sectional view showing a first embodiment of the dishwasher according to the invention; and

Fig. 2 is a diagrammatic vertical sectional view showing a second embodiment of said dishwasher.

[0008] With reference to fig. 1, there is seen that in a dishwasher according to the present invention the water falling on the bottom 1 of the wash tank is intercepted by a member 2, preferably having an inverted frustoconical shape, secured at the ends of the lower sprinkler 3 so as to be supported between the latter and bottom 1. The sloped walls of the noise reduction member 2 preferably converge to a central hole 4 to drain the intercepted water to bottom 1, said hole 4 being preferably formed close to

the region where the dishwasher filter (not shown) is located.

[0009] It is therefore clear that during the wash phase, regardless of the lower sprinkler 3 being in operation or not, the water falling on bottom 1 of the wash tank is intercepted by member 2 and readily conveyed to the central region. Since the point of contact between the water and the sloped wall of member 2 is inside the tank there is no propagation of acoustic waves to the outside, but for a minimum amount caused by the water falling along the periphery of the tank, beyond the radius of the lower sprinkler 3, which makes contact with the tank bottom 1 since it is not intercepted.

[0010] However, it would be possible to shape member 2 so that it extends beyond the lower sprinkler 3, with a suitable play with respect to the tank walls, thus minimizing the area of bottom 1 not covered by member 2. Obviously, the latter can be made of a plastic material or the like, with a small thickness and weight so as to prevent useless increases in the power absorbed by member 2.

[0011] The second embodiment illustrated in fig. 2 shows how a similar member 2' can also be directly supported by the tank bottom 1 as long as this is achieved through insulating supports, such as rubber feet 5, suitable to prevent the transmission of the vibrations from member 2' to bottom 1. This arrangement makes easier to establish the size of member 2' so that it intercepts substantially all the water falling on bottom 1, since such a member 2' does not rotate with sprinkler 3 and therefore can be placed on bottom 1 with a minimum play.

[0012] Moreover, in this case it is possible to provide apertures in member 2' at the salt reservoir plug and at the filter, so as to be able to access them without having to remove the lower sprinkler 3 and member 2 as required in the first embodiment.

[0013] It is clear that the above-described and illustrated embodiments of the dishwasher according to the invention are just examples susceptible of various modifications. In particular, the noise reduction member can be made with different shapes and materials, for example with a wavy surface and/or a fine mesh structure that intercepts the drops yet allows the water to pass through to bottom 1 even in the absence of the central hole 4.

Claims

1. A dishwasher including a wash tank in which the dishes are washed by at least one sprinkler (3) located close to the bottom (1) of said tank, **characterized in that** it further includes a noise reduction member (2, 2') arranged between said sprinkler (3) and said bottom (1).
2. A dishwasher according to claim 1, **characterized in that** the noise reduction member (2, 2') covers the bottom (1) over an area at least substantially corresponding to the area swept by the sprinkler (3).

3. A dishwasher according to claim 1 or 2, **characterized in that** the noise reduction member (2, 2') has an inverted frustoconical shape.
4. A dishwasher according to the preceding claim, **characterized in that** the noise reduction member (2, 2') has a central hole (4). 5
5. A dishwasher according to the preceding claim, **characterized in that** the central hole (4) is formed close to the region of the bottom (1) where the dishwasher filter is located. 10
6. A dishwasher according to one of the preceding claims, **characterized in that** the noise reduction member (2, 2') has a wavy surface. 15
7. A dishwasher according to one of the preceding claims, **characterized in that** the noise reduction member (2, 2') has a fine mesh structure suitable to intercept the water drops yet allowing the water to pass through to the bottom (1) of the tank. 20
8. A dishwasher according to one of the preceding claims, **characterized in that** the noise reduction member (2) is mounted on the sprinkler (3). 25
9. A dishwasher according to one of claims 1 to 7, **characterized in that** the noise reduction member (2') rests directly on the bottom (1) of the tank through insulating supports (5). 30
10. A dishwasher according to the preceding claim, **characterized in that** the noise reduction member (2') has apertures at the salt reservoir plug and at the dishwasher filter. 35

40

45

50

55

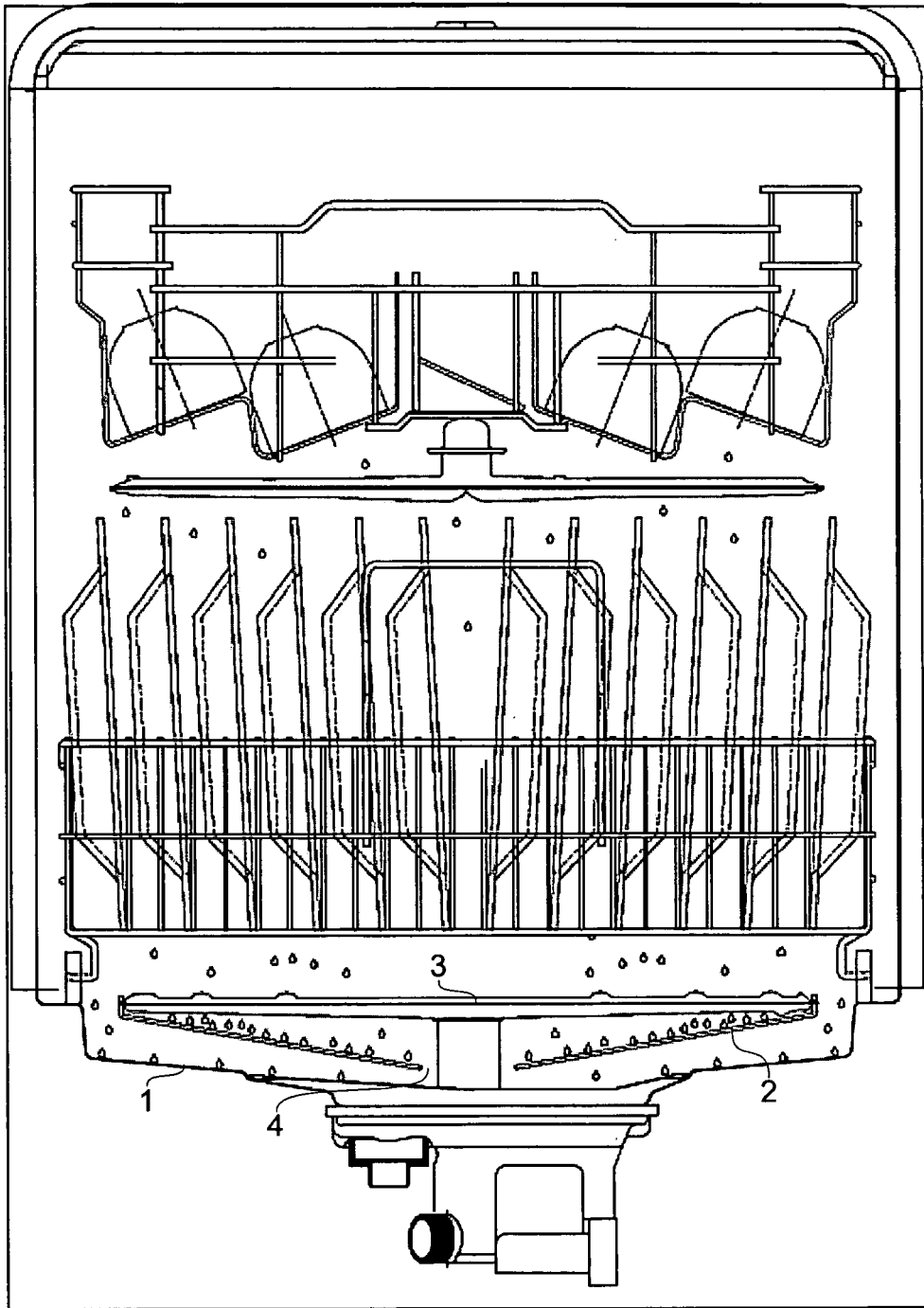


Fig. 1

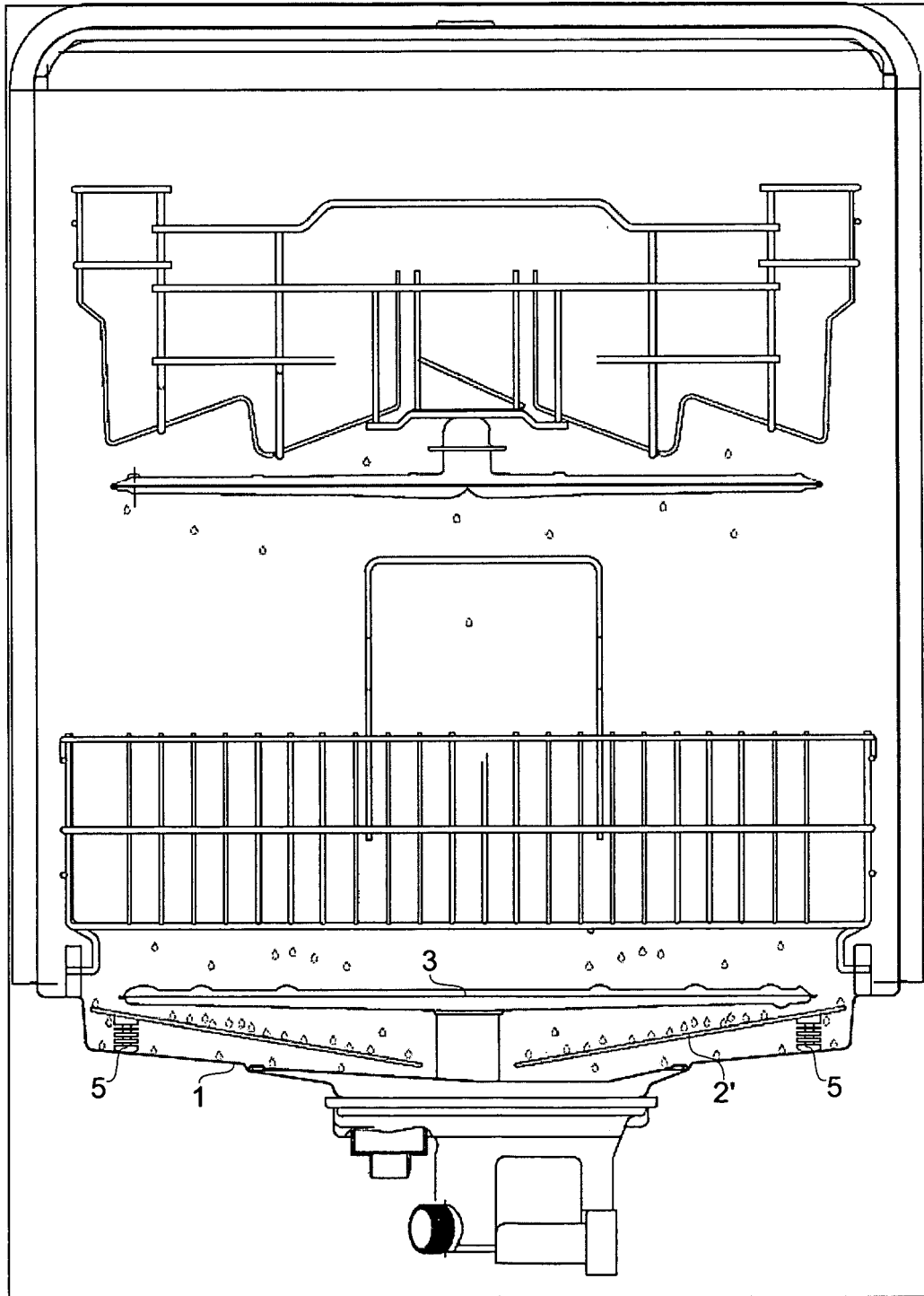


Fig. 2



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 1 415 585 A (SAMSUNG ELECTRONICS CO LTD [KR]) 6 May 2004 (2004-05-06) * abstract; figure 1 * -----	1-10	INV. A47L15/42
A	JP 2003 265892 A (SEKISUI CHEMICAL CO LTD) 24 September 2003 (2003-09-24) * abstract; figure 1 * -----	1-11	
A	JP 2001 112695 A (TOTO LTD) 24 April 2001 (2001-04-24) * abstract; figure 1 * -----	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A47L
Place of search		Date of completion of the search	Examiner
The Hague		20 July 2007	FAYMANN, L
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	

1
EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 42 5006

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-07-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1415585 A	06-05-2004	CN 1493248 A	05-05-2004
		JP 2004148094 A	27-05-2004
		KR 20040038309 A	08-05-2004
		US 2004084068 A1	06-05-2004

JP 2003265892 A	24-09-2003	NONE	

JP 2001112695 A	24-04-2001	NONE	

EPO FORM P0459

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