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(54) Support for dishwasher basket guides

(57) *A support (1) for rack guides provided with a shaped rail (4) associated to the rack, and at least one anchoring bracket (5), which is anchored to a fixed side wall (3), and has two pins (7) set in a direction transverse to the side wall (3) on opposite sides of the rail (4) and fixed with respect to the side wall (3) itself; each pin (7) being provided with a respective end head (20), which defines a free end of the pin (7), is substantially oriented in the direction of the rail (4), and is provided with a rolling body (25) partially inserted inside the head (20) and set between the head (20) itself and said rail (4) .*

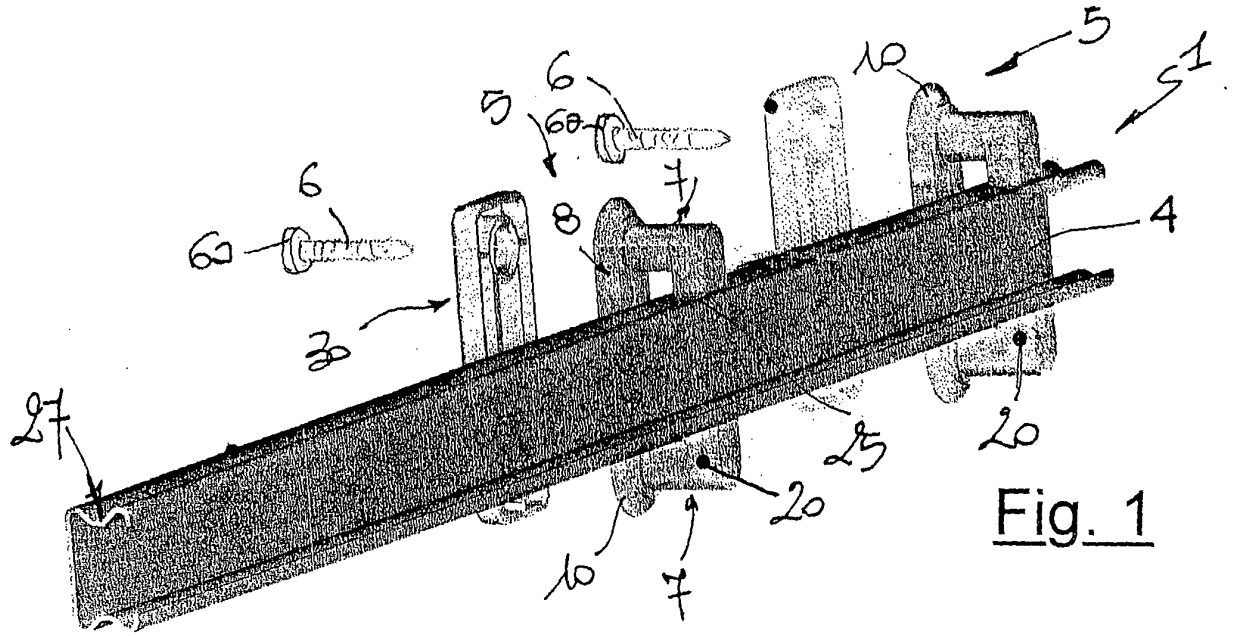

Fig. 1

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Description

[0001] The present invention relates to a support for rack guides.

[0002] In particular, the present invention regards a support for rack guides that can be applied to racks of dishwashers, to which the ensuing treatment will make explicit reference without this implying any loss of generality.

[0003] In the field of dish-washers, the supports for guides of a known type comprise, for each side of the rack, a shaped rail associated to the guide itself, and at least one anchorage rail, which is anchored to a side wall of the tank of the dish-washer and comprises, in turn, as is, for example, described and illustrated in the U.S. patent No. US 5,345,959, two pins set in a direction transverse to the side wall on opposite sides of the rail, and, for each pin, a respective threaded screw, inserted through the pin and the side wall for anchoring the pin to the side wall itself, and a wheel, which is mounted so that it can turn on the pin and is coupled to the rail.

[0004] In the U.S. patent referred to above, each rail engages along a longitudinal axis of its own in at least two pairs of wheels, which have an outer shape complementary to a profile of the rail itself to enable the latter to translate longitudinally with respect to the corresponding side wall when it becomes necessary to move the rack. The complementary shapes of the rail and of the wheels prevent the rail itself from being displaced in ways other than the translation along its own longitudinal axis.

[0005] The support for rack guides of the type described above, albeit widely used in the field of dishwashers, presents some drawbacks basically due to the environment in which the supporting guide itself is installed. Said supporting guide, in fact, is subjected, throughout its working life, to continuous thermal stresses due to the washing cycles, as well as to various mechanical stresses due to loads not always distributed properly on the rack.

[0006] All the stresses referred to above, as well as the presence also of corrosive substances typically used in dish-washers, or else the presence of lime deposits, progressively reduce both the efficiency and the useful life of these supports for guides.

[0007] The purpose of the present invention is to provide a support for rack guides that will be free from the drawbacks described above.

[0008] According to the present invention, a support for rack guides is provided, comprising a shaped rail associated to the guide, and at least one anchoring bracket, which is anchored to a fixed side wall and comprises, in turn, two pins set in a direction transverse to the side wall on opposite sides of the rail and fixed with respect to the side wall itself, the support being characterized in that it comprises, for each pin, a respective end head, which defines a free end of the pin and is substantially oriented in the direction of the rail, and a rolling body, which is partially inserted within the head and is set between the head itself and said rail.

[0009] Since it has likewise been found that the supports for rack guides such as the ones described, for example, in the U.S. patent referred to above, require modalities of assembly that are relatively complicated and times for installation that are relatively long, a further purpose of the present invention is to provide a support for rack guides that will be easy to install and will not necessarily require interventions of adjustment once it has been installed.

[0010] Consequently, preferably, for this purpose, the support defined above comprises a plate for connection between said two pins, the plate being made of a single piece with the pins themselves and being designed to be positioned up against of the side wall.

[0011] The invention will now be described with reference to the annexed plate of drawings, which illustrates a non-limiting example of embodiment thereof and in which:

- Figure 1 is a perspective view with parts in cross section and parts removed for reasons of clarity of a preferred embodiment of a support for rack guides made according to the present invention;
- Figure 2 is a perspective view of a detail of Figure 1; and
- Figure 3 is a cross-sectional view of a detail of Figure 1.

[0012] With reference to Figure 1, designated as a whole by 1 is a support for rack guides.

[0013] It remains understood right from the start that the support for rack guides forming the subject of the present treatment is not constrained only to use with rack guides for washing appliances, but can advantageously be used wherever it is necessary to take out a container, such as, for instance, a rack or else a drawer, from a compartment, causing translation of the container itself in a direction parallel to itself.

[0014] The rack (of a known type and not illustrated) is set in an extractable way inside a tank 2 of the dishwasher, and the corresponding guide is slidably coupled to the walls 3 (Figure 3) of the tank 2 itself by interposition of the support 1, which comprises, for each side of the rack, a shaped rail 4 fixed with respect to the rack itself, and two anchoring brackets 5 fixed to the corresponding wall 3 by means of a respective pair of self-tapping fixing screws 6.

[0015] In the example of embodiment shown in Figure 1, the support 1 is provided with two brackets 5 set along the rail 4, but, if need be and, for example, according to the weight of the rack, the guide 1 can even be provided with a higher number of brackets 5.

[0016] According to what is illustrated in Figure 2, each bracket 5 comprises two pins 7 set in a direction transverse to the side wall 3 and on opposite sides of the rail 2, a plate 8 transverse and fixed with respect to both of the pins 7, and a counterplate 30 set on the opposite side

of the wall 3 with respect to the plate 8 for gripping in a sandwich fashion the wall 3 to the plate 8 and for fixing the bracket 5 itself to the wall 3.

[0017] The plate 8 is made of a single piece with the pins 7, and has a flattened main body 9 set between the two pins 7 and a suction-pad profile 10, which extends around the body 9 and the two pins 7, and, once it is pressed against the wall 8 as a result of the pulling action of the screws 6, also exerts a fluid-tight elastic action on the wall 3, preventing any infiltration through the holes 11 for passage of the screws 6 themselves, which are made through the wall 3.

[0018] The counterplate 30 has two through holes 31, which are set at a distance between centres from one another equal to the distance between centres of the two pins 7, and are traversed by the screws 6 so as to clamp the heads 6a of the screws 6 themselves.

[0019] According to what is illustrated in Figure 3, each pin 7 extends in cantilever fashion from the body 9 along a respective axis A transverse to the body 9 itself to terminate with a respective shaped end head 20 and comprises a hollow cylindrical body 21, which is fixed with respect to the head 20 and to the body 9, and has a cavity 22 open on the outside of the body 9 itself for receiving a corresponding screw 6.

[0020] The cavity 22 involves also part of the corresponding head 20 in order to enable a greater penetration of the screw 6 and bestow also a greater stiffness on the structure of the entire pin 7.

[0021] Finally, each pin 7 comprises a rolling body 25, which is partially inserted inside the corresponding head 20 and is set between the head 20 itself and the rail 4. In particular, each head 20 is substantially oriented towards the rail 4 and comprises a hemispherical socket 26 which is open so as to receive inside it the rolling body 25, and two blocking tabs 27, which are fixed with respect to the head 20, and extend partially in front of an opening 28 of the socket 26 so as to block the rolling body 25 inside the socket 26 itself and in such a way that substantially half of the rolling body 25 is set on the outside of the socket 26 so as to slide along a longitudinal concavity 27 of the rail 4.

[0022] The arrangement of the two tabs 27 is such that, once the rolling body 25 is inserted in the concavity 27, said rolling body 25 can roll with minimum friction within the concavity 27 itself working also on sides of its own in a direction transverse to the direction of mutual movement. In addition, sliding of the rail 4, or rolling of the rolling bodies 25, is likewise ensured also by the opposed position of the two rolling bodies 25 of the same bracket 5 on the rail 4 itself.

[0023] Finally, the reduced dimensions of the socket 26 and the presence inside it of the body 25 considerably reduce the possibility of debris and whatever else penetrating inside the socket 26 so reducing the rolling efficiency of the rolling body 25.

[0024] Finally, from the above description, the simplicity of construction of the pins 7 and of the socket 26 if compared with the solutions currently existing in the field of dish-washers appears clearly evident.

[0025] In conclusion, it should be added that each screw 6 is of the self-tapping type; consequently, also assembly of each support is considerably simplified. In fact, once the plate 8 and the counterplate 30 are set alongside the wall 3 in such a way that the cavity 22 of each pin 7 and each hole 31 are aligned to one another and to the holes 11, it will be very simple, as well as rapid, to insert a screw 6 inside the cavity 22 so as to fix the plate 8 and the counterplate 30 to one another and up against the wall 3.

[0026] It is understood that the invention is not limited to the embodiment described and illustrated herein, which is to be considered merely as example of embodiment of the support for rack guides, which may instead undergo further modifications as regards shapes and arrangement of parts and details of construction and assembly.

Claims

1. A support (1) for rack guides comprising a shaped rail (4) associated to the rack, and at least one anchoring bracket (5), which is anchored to a fixed side wall (3) and comprises, in turn, two pins (7) set in a direction transverse to the side wall (3) on opposite sides of the rail (4) and fixed with respect to the side wall (3) itself; the support (1) being **characterized in that** it comprises, for each pin (7), a respective end head (20), which defines a free end of the pin (7) and is substantially oriented in the direction of the rail (4), and a rolling body (25), partially inserted inside the head (20) and set between the head (20) itself and said rail (4).

2. A support according to Claim 1, **characterized in that** it comprises a plate (8) for connection between said two pins (7); the plate (8) being made of a single piece with the pins (7) themselves and being designed to be positioned up against the side wall (3).

3. A support according to Claim 1 or Claim 2, **characterized in that** each of said end heads (20) comprises a hemispherical compartment (26), positioned inside which is said rolling body (25), and at least one blocking tab (27), which is fixed with respect to the end head (20) itself and extends partially in front of an opening (28) of the compartment (26) so as to block the rolling body (25) inside the compartment (26) itself.

4. A support according to Claim 3, **characterized in that** each of said end heads (20) comprises two blocking tabs (27), which are set in a direction parallel to the corresponding rail (4) and extend partially in front of the opening (28) of the compartment (26)

towards one another so as to block the rolling body (25) inside the compartment (26) itself.

5. A support according to Claim 3 or Claim 4, **characterized in that** it comprises a mounting plate (30), designed to be set on the opposite side of the side wall (3) with respect to the connection plate (8), and, for each pin (7), a screw (6) inserted through the mounting plate (30), the side wall (3), and inside the pin (7) itself.

6. A support according to Claim 5, **characterized in that** said screw (6) is partially inserted also inside the corresponding head portion.

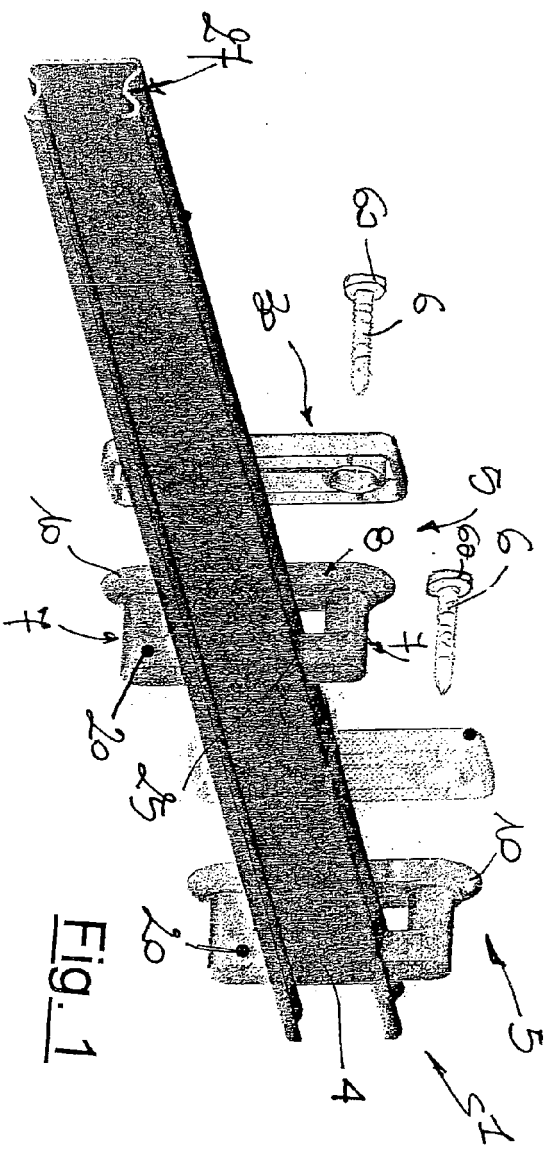

Fig. 1

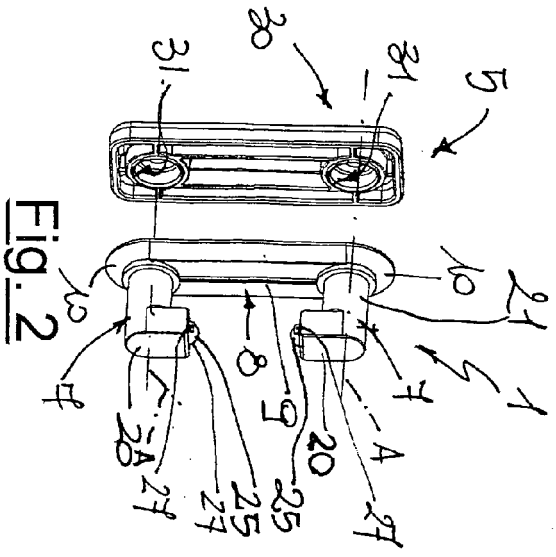

Fig. 2

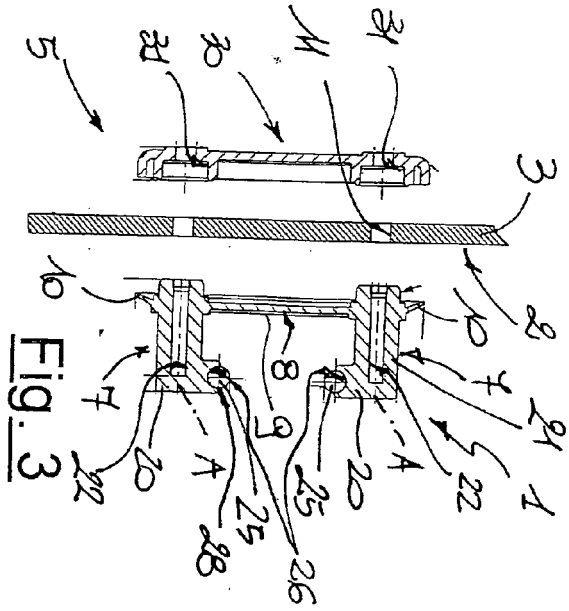

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 06 02 6408

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 1 195 129 A (AEG HAUSGERAETE GMBH [DE]) 10 April 2002 (2002-04-10) * paragraph [0014] - paragraph [0019]; figures 1-3 *	1-6	INV. A47L15/50
A	EP 1 552 781 A (SCHOCK METALLWERK [DE]) 13 July 2005 (2005-07-13) * paragraph [0090] - paragraph [0106]; figure 6 *	1-6	
D,A	US 5 345 959 A (MATTESON JAMES A [US]) 13 September 1994 (1994-09-13) * the whole document *	1-6	
A	WO 03/039323 A (BSH BOSCH SIEMENS HAUSGERAETE [DE]; BUEHLMEYER ALEXANDER [DE]; KUECUEK) 15 May 2003 (2003-05-15) * page 3, line 31 - page 4, line 25; figure 1 *	1-6	
A	EP 1 584 283 A (FULTERER GMBH [AT]) 12 October 2005 (2005-10-12) * abstract; figure 3 *	1-6	TECHNICAL FIELDS SEARCHED (IPC) A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 April 2007	Hannam, Martin

CATEGORY OF CITED DOCUMENTS

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12-04-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1195129 A	10-04-2002	DE 10049490 A1	11-04-2002
EP 1552781 A	13-07-2005	DE 102004001402 A1	04-08-2005
US 5345959 A	13-09-1994	NONE	
WO 03039323 A	15-05-2003	DE 10154557 A1	15-05-2003
		EP 1443847 A1	11-08-2004
		US 2004256333 A1	23-12-2004
EP 1584283 A	12-10-2005	NONE	

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Patent documents cited in the description

- US 5345959 A **[0003]**