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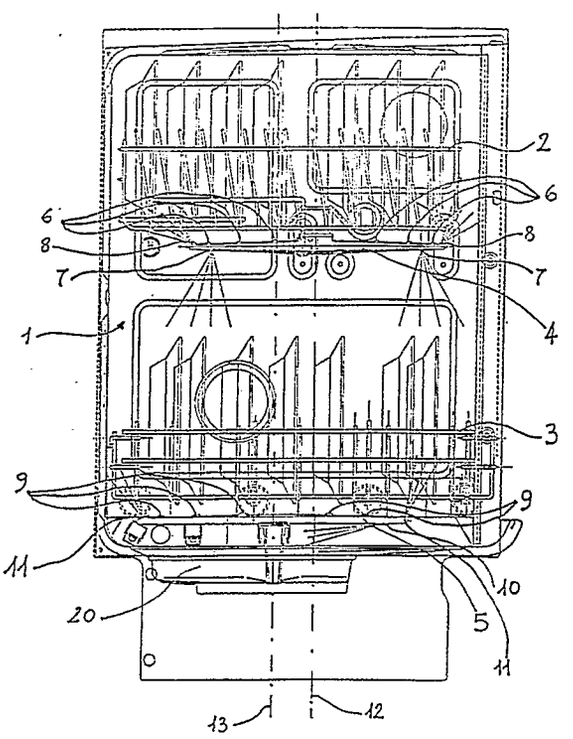
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(54) Improved dishwashing machine.

(57) The present invention relates to a dishwashing machine having a rectangular base, with one dimension of the washing chamber substantially bigger than the other, comprising all the elements as known for its operation, characterized in that the washing arms located inside the washing chamber have a non-coaxial arrangement.

Fig. 1



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IMPROVED DISHWASHING MACHINE

The present invention relates to a dishwashing machine having a rectangular base, with one dimension of the washing chamber substantially bigger than the other, comprising all the elements as known for its operation.

To uniform the style of composable kitchen elements, the manufacturers of household appliances endeavour to introduce such products on the market place that may comply more and more with the users' requirements. This is why at retailer shops it is possible to see more and more household appliances of different size, different colour tones, featuring details of undoubtful esthetic taste or bearing glamorous fashion names that increase the value of appliances.

The present invention relates to a dishwashing machine with one dimension of the washing chamber substantially bigger than the other, eg. with its depth bigger than its width. The problem characterizing the machines of this type is that the rectangular shape of the washing chamber, seen in plan view, does not let the spraying arms to reach evenly each part of the chamber internal space, thus affecting the washing results of the crockery.

As known, the European Patent application nr. 0 278 371 describes a dishwashing machine caving a rectangular base, which in its front view shows a convex line along the washing chamber sides near the lower arm.

This achievement has the purpose of providing a lower arm that is longer than the upper one, which would not be achievable should the chamber sides be perpendicular all over their length, as in this case the motion of the lower arm would be hindered by said chamber walls. Therefore, it is the aim of said European Patent application to have the lower arm increasing, through its larger diameter, the washing capacity in the washing chamber depth, since an arm with a diameter slightly smaller than the width of said washing chamber would not achieve it.

However, said Patent application entails considerable problems both of constructive and cost-effect nature, among which the most significant and obvious ones are as follows:

- construction of the washing chamber causes considerable manufacturing difficulties due to its special configuration;
- the manufacturing costs for the washing chamber are higher if compared to standard machines;
- the small space increase achievable through a convex configuration is not such yet to allow construction of a very deep washing chamber without falling back into the known inconveniences for this type of dishwashing machines.

Therefore, the purpose of the present invention is to indicate an improved dishwashing machine, relatively simple and reasonable in cost, which allows anyway an even washing result all over the washing chamber without any of the inconveniences mentioned above.

To achieve said purpose it is the aim of the present invention to realize a dishwashing machine having a rectangular base, with one dimension of the washing chamber substantially bigger than the other, comprising all the elements as known for its operation, characterized in that the spraying arms located inside the chamber have a non-coaxial arrangement.

Further aims and advantages of the present invention are clearly described in the following detailed description and annexed drawings, where:

- Fig. 1 is a side sectional view of a dishwasher achieved according to the present invention;
- Fig. 2 is a top view of the dishwasher according to the present invention, showing specifically the spraying arms.

In Fig. 1, where a side sectional view of the dishwashing machine achieved according to the invention is shown, number 1 indicates the washing chamber of the dishwasher containing two baskets to hold the crockery, namely an upper one number 2 and a lower one number 3. Beneath said baskets 2 and 3 there are two spraying arms, 4 and 5 respectively, provided with outlet holes for the washing fluid; said holes are obtained on the upper surface 6, on the lower surface 7 and on the ends 8 of the upper spraying arm 4, and likewise on 9, 10, 11 of the lower spraying arm 5.

As shown in the figure, spraying arms 4 and 5 are located on two different axis 12 and 13, respectively.

Fig. 2, showing a top view of the dishwasher without the baskets 2 and 3, is a better view of how axis 12 and 13 of the upper arm 4 and lower arm 5 are differing; moreover, the circumferences 14 and 15 attained by the vertexes of said arms 4 and 5 are clearly visible.

It will be noted that the two rotating axis 12 and 13 of spraying arms 4 and 5 are out-of-alignment in respect both to the side and depth of the washing chamber 1. Thus, as it can be seen from the circumferences 14 and 15 attained by the arms 4 and 5, also the chamber corners are reached by the water jets of the spraying arms.

Fig. 2, reporting the reference numbers of Fig. 1, brings to evidence the rectangular base of the washing chamber 1, where numbers 16 and 16a indicate the side walls, 17 the front door and 18 the

bottom wall; an arm 19 on the side wall is foreseen to support the spraying arm 4.

According to the present invention, the spraying arms 4 and 5 can achieve a good washing result of the crockery placed on the baskets 2 and 3 through the jets of the washing fluid coming out of the holes 6, 7, 8, 9, 11. This result is obtained by the non-coaxial arrangement of said spraying arms, which covers the spaces of the washing chamber 1 otherwise difficult to reach. Washing action is also increased by the special presence of the holes 7, through which the detergent fluid coming from the upper spraying arm 4 is sprayed onto the crockery placed on the lower basket 3, whereas the holes 10 are intended for the cleaning of the filter located in the base 20 of the dishwashing machine through the action of the spraying jets coming from the lower spraying arm 5.

The characteristics of the dishwashing machine described above are clearly illustrated in the description and annexed drawings.

Likewise also the advantages of the improved dishwashing maschine according to the present invention are clear.

Specifically, they are represented by:

- the possibility of increasing the depth of the washing chamber 1, however without detriment for the washing results;
- its simple achievement in view of the manufacturing procedures;
- its low cost as the standard shape of the washing chamber does not need to be changed.

It is obvious that for the man skilled in the art many other changes to the dishwashing machine described by way of example are possible, however without departing from the scope of the innovating criteria inherent of the present invention.

By way of example it is suggested the possibility of a different arrangement of the upper spraying arm 4 instead of locating it on an arm 19, eg. to receive the washing fluid from above though keeping its non-coaxial position against the lower spraying arm 5.

A further version may consist of a different arrangement of the crockery supports in the baskets. For instance, a part of the lower basket 3 could have its supports arranged with a different orientation form the one described in Fig. 1, selecting an inclination angle that allows an excellent spraying on the crockery from both spraying arms. To this purpose it is suggested that orientation of the crockery supports in the lower basket 3 be selected in such a way that on the crockery touched by the jets of washing fluid no shaded areas are left in respect to the upper arm 4 and the lower one 5.

Claims

1. Dishwashing machine having a rectangular base, with one dimension of the washing chamber substantially bigger than the other, comprising all the element as known for its operation, characterized in that the spraying arms (4, 5) are located inside the washing chamber in a non-coaxial arrangement (12, 13).

2. Dishwashing machine according to claim 1, characterized in that the two rotating axis (12, 13) of the spraying arms (4, 5) are out-of-alignment in respect to the sides and depth of the machine.

3. Dishwashing machine according to claim 1, characterized in that said spraying arms (4, 5) are provided with a set of holes (6, 7, 8, 9, 10, 11) for the spraying of the crockery placed in the baskets (2, 3); said holes being so arranged to cover the space of the washing chamber 1 in a practically even manner with the jets of washing fluid.

4. Dishwashing machine according to claim 1, characterized in that some holes (7) have been obtained in the lower surface of the upper spraying arm (4) so as to co-operate in the washing of the crockery arranged in the lower basket (3).

5. Dishwashing machine according to any of the preceeding claims, characterized in that said lower spraying arm (5) is provided with some holes (10) obtained in its lower surface.

6. Dishwashing machine according one or more of the preceeding claims, characterized in that the crockery supports in the lower basket (3) are oriented in such a way that on the crockery touched by the jets of the washing fluid no shaded areas are left in respect to the upper arm (4) and the lower one (5).

Fig. 1

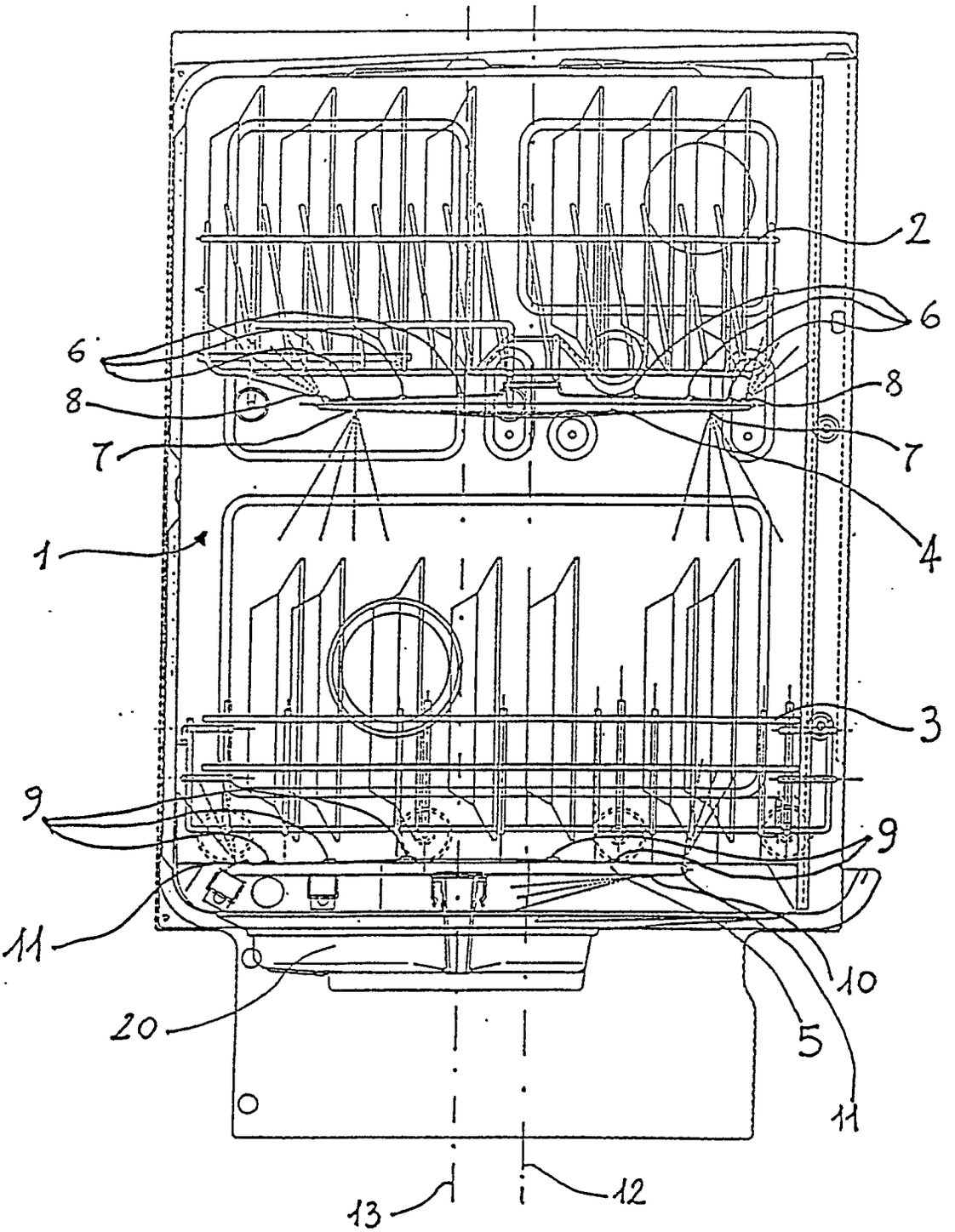
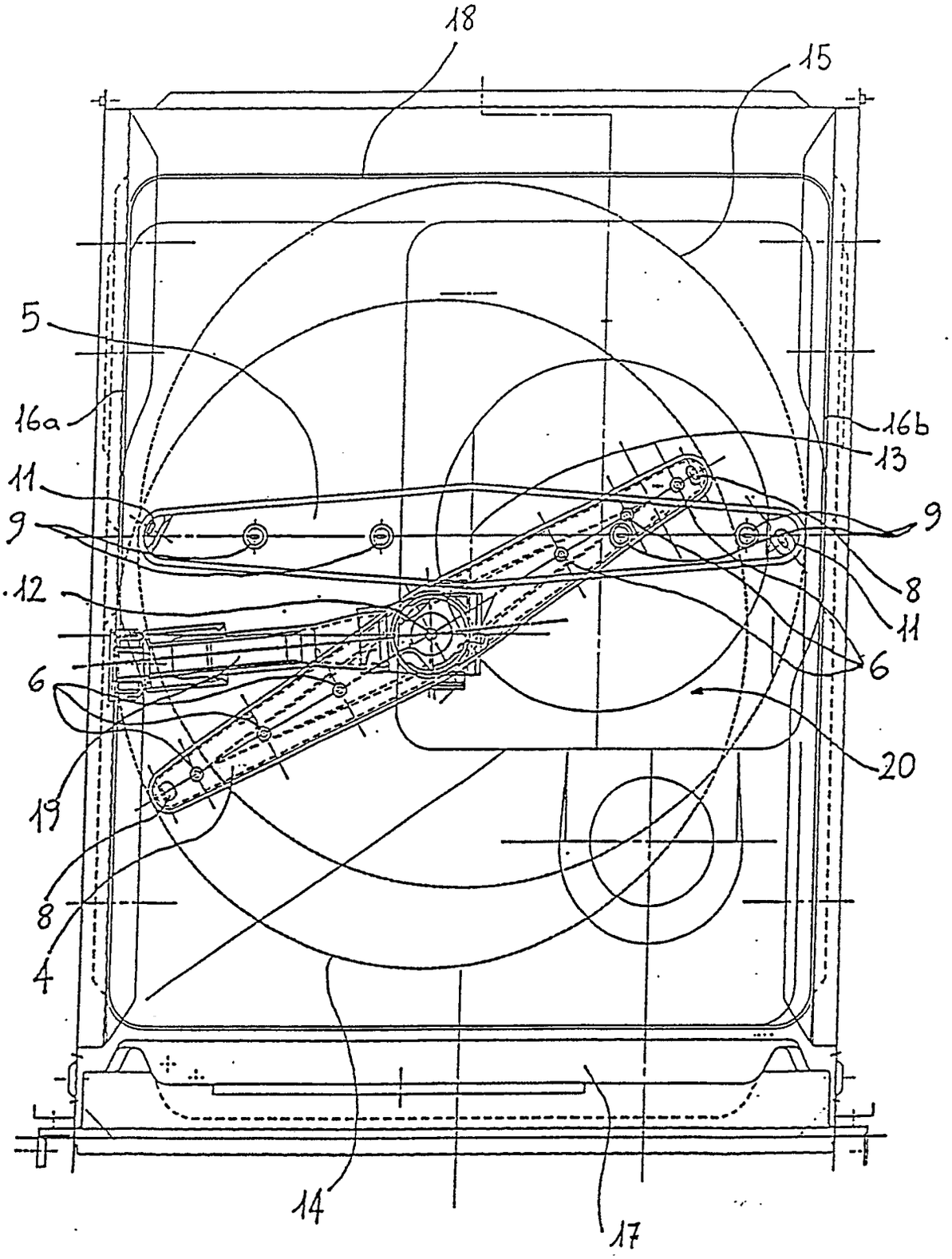


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 2677

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	FR-A-2243671 (GENERAL ELECTRIC) * page 17, line 8 - page 18, line 5; figure 13 *	1, 3, 4, 6	A47L15/23
X	US-A-2960990 (JONES ET AL) * figures 1, 8 *	1	
X	US-A-3285779 (DUNHAM) * figure 4 *	1	
X	DE-B-1183214 (SIEMENS) * figure 1 *	1, 4	
A	GB-A-858151 (INSULEX LTD) * the whole document *	1	
A	EP-A-0068974 (ESSWEIN S.A.) * abstract; figure 2 *	4, 5	
A	DE-A-1962252 (HOOVER LTD.) * the whole document *	1, 3	
D,A	EP-A-0278371 (ZANUSSI S.P.A.)		TECHNICAL FIELDS SEARCHED (Int. Cl.5) A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 MAY 1990	SCHARTZ J.

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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