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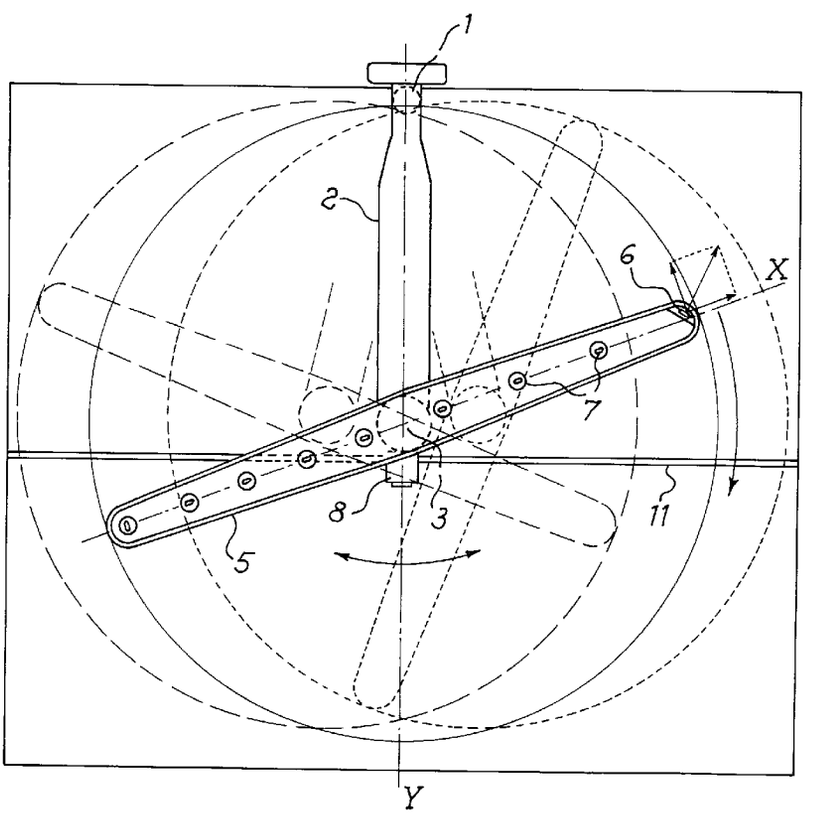
(54) Revolving sprinkling assembly for dishwashers, provided with horizontal reciprocating motion

(57) A revolving sprinkling assembly for dishwashers includes a sprinkler (5) provided with at least one propulsion nozzle (6) and centrally pivoted on a vertical shaft (3) located at one end of a support arm (2) which in turn is vertically pivoted at the other end to a feed duct (1) integral with the washing space. The support arm (2) is also provided at the free end with a horizontal roller (8) resting in the center of a transverse guide (11) fixed to the walls of the washing space, said guide (11) having a central lowering whose sides are the stops for limiting the horizontal travel of the arm (2).

Fig. 1



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Description

The present invention relates to revolving sprinkling assemblies for dishwashers, and in particular to a sprinkling assembly capable of moving also with a reciprocating motion in the horizontal plane.

The revolving sprinklers of known kind essentially consist in a single revolving device pivoted on a vertical axis central shaft and provided with at least one propulsion nozzle at one end, as well as with other nozzles arranged along said device to sprinkle the dishes contained in the dishwasher rack. Since the rotation axis of said device is fixed, the resulting paths of the nozzles consist in circumferences centered on the rotation axis.

From this follows that the above-mentioned device sprinkles always and only the surfaces of the dishes which are along said circular paths, with a limited washing effectiveness. Moreover, the area which can be reached by the water ejected from the nozzles approximately corresponds to the area of the square circumscribed about the circular path of the outermost nozzle.

The first aspect of the problem has already been dealt with and effectively solved by the applicant through a revolving sprinkling assembly of orbital type. Said orbital sprinkler covers a much greater surface of the dishes thanks to the combination of the motion of a lower revolving sprinkler with that of at least another upper revolving sprinkler mounted in an eccentric position on the lower one, this assembly yet retaining the same overall dimension of a conventional sprinkler.

However, this effective solution does not allow to reach an area greater than the above-mentioned one, i. e. it can be usefully applied only in the case of a dishwasher whose washing space has a substantially square plan.

Therefore, the object of the present invention is to provide a revolving sprinkling assembly which overcomes the above-mentioned limitations of prior art sprinklers.

This object is achieved by means of a sprinkling assembly having the characteristics cited in claim 1.

The main advantage of the sprinkling assembly according to the present invention is its capacity of sprinkling also the outermost dishes whenever they are arranged in a rectangular washing space.

A further advantage of the present sprinkler is given by the greater surface directly sprinkled by the jets ejected from the nozzles, thanks to the combination of the revolving motion with the reciprocating motion. In this way, in fact, the nozzle paths have a much more complex development.

These and other advantages and characteristics of the sprinkling assembly according to the present invention will be apparent to those skilled in the art from the following detailed description of a preferred embodiment thereof with reference to the annexed drawings wherein:

Fig.1 is a schematic top plan view showing the extreme positions reached by the sprinkling assembly according to the invention; and

Fig.2 is a schematic front view of the sprinkling assembly of fig.1.

In these figures, there is seen that the present sprinkling assembly essentially consists of a vertical feed duct 1, secured to the rear wall of the washing space, at the top of which a support arm 2 is pivoted with a vertical axis and carries at its free end a vertical shaft 3, on which a sprinkler 5 is in turn centrally pivoted. This sprinkler 5 has a reduced size with respect to the width of the upper rack 4 , i.e. of the dishwasher. This is apparent from the top plan view of fig.1, wherein the three circles indicate the paths of the ends of sprinkler 5 in the central position (shown in continuous line) and in the two extreme positions of the reciprocating motion (in broken lines).

Said horizontal reciprocating motion is generated by sprinkler 5 itself due to the distance between the axis of shaft 3 on which it is pivoted and the pivot point of support arm 2 on duct 1. In fact, the water under pressure passes through duct 1, arm 2 and shaft 3 and reaches sprinkler 5, which revolves due to the effect of at least one propulsion end nozzle 6. The inclined jet of said nozzle 6 generates a reaction force which can be broken up into a first component along the X axis of sprinkler 5 and a second component along a direction perpendicular thereto. While this second component is the one which generates the revolution of sprinkler 5, the component along the X axis is discharged on shaft 3 located on the Y axis of the support arm 2. This results, therefore, in a horizontal rotation of said arm 2 pivoted on the vertical axis of duct 1, moving alternately from right to left and backwards according to the revolution of sprinkler 5, i.e. according to the direction from which the axial component arrives on shaft 3.

Obviously, sprinkler 5 also includes, in its upper portion 9, washing nozzles 7 which however do not give any contribution to the motion since their jets are substantially vertical. The lower portion 10 also includes other propulsion jets 12 oriented as nozzle 6. It should be noted that said nozzles, though defined as propulsion nozzles, also have a washing function, since their jets also have a vertical component. Furthermore, their characteristics (number, position, orientation, etc.) define the revolving speed of sprinkler 5 and therefore also the frequency and reciprocating speed of the support arm 2, whereby said characteristics are fixed according to the needs so as to obtain a balanced sprinkling assembly provided with a uniform motion.

In order to prevent that the horizontal shifting of arm 2 is excessive, thus leading sprinkler 5 to hit the walls of the washing space, it is advisable to provide end stops which define the amplitude of the travel of arm 2. Said arm 2 is provided at the end with a horizontal roller 8 which rests in the center of a transverse guide 11 fixed

to the walls of the washing space. This guide 11 has a central lowering whose sides are the stops which block roller 8 so as to limit the travel of arm 2. Such a solution also advantageously provides a support to arm 2 so that it is not a cantilever arm, whereby the pivot point between duct 1 and arm 2 is not subjected to heavy mechanical stresses.

It should be noted that the illustrated embodiment concerning a sprinkling assembly secured to the rear wall of the washing space for sprinkling the upper rack has a merely exemplificative purpose, in that the same structure can be applied in several other ways. First of all, the wall to which duct 1 is secured may be one of the side walls in case the washing space is more long than wide. Secondly, the reciprocating sprinkling assembly may be located also below the lower rack or above the upper one, by overturning it or not according to the desired position. In these cases, duct 1 can even come out directly from the floor or the ceiling of the washing space, arm 2 being consequently shorter.

The type of stops used can be adapted according to said arrangement, e.g. by using two simple pins fixed to the floor of the washing space or a U-shaped arc fixed to the ceiling of the washing space. Finally, sprinkler 5 can be of any kind, in particular also an orbital sprinkler as previously mentioned.

Claims

1. A revolving sprinkling assembly for dishwashers including a sprinkler (5) provided with at least one propulsion nozzle (6) and centrally pivoted on a vertical shaft (3) located at one end of a support arm (2) through which water under pressure is fed, characterized in that said support arm (2) is in turn vertically pivoted at the other end thereof to a feed duct (1) integral with the washing space, and in that the amplitude of the resulting horizontal reciprocating motion of the support arm (2) is limited by a pair of stops.

2. A sprinkling assembly according to claim 1, characterized in that the support arm (2) is also provided at the free end thereof with a horizontal roller (8) resting in the center of a transverse guide (11) fixed to the walls of the washing space, said guide (11) having a central lowering whose sides are the stops for limiting the travel of the arm (2).

Fig. 1

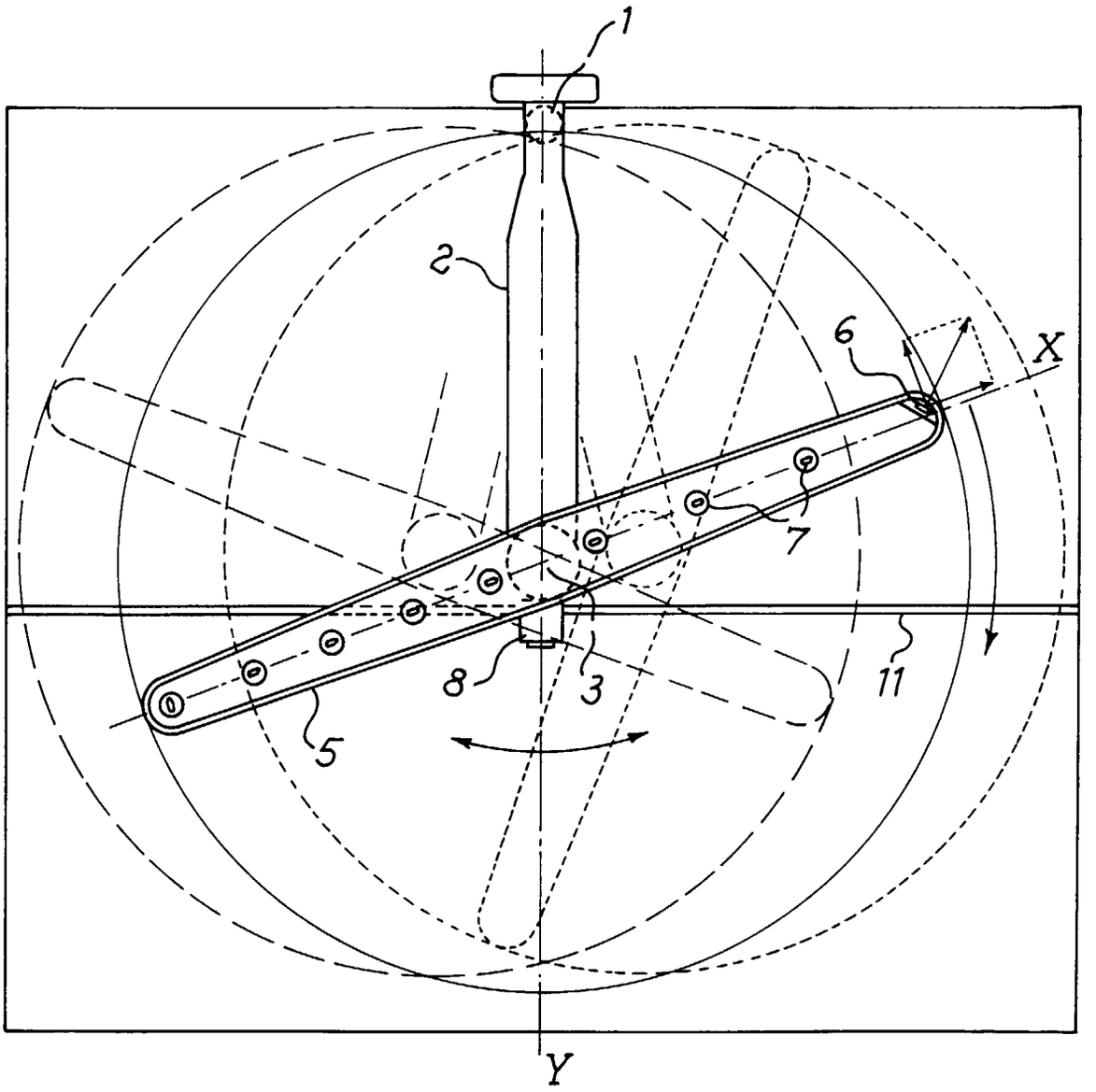

Fig. 2