

12

EUROPEAN PATENT APPLICATION

21 Application number: 84200899.7

51 Int. Cl.⁴: **D 06 F 39/02**

22 Date of filing: 21.06.84

30 Priority: 24.06.83 IT 2220583 U

43 Date of publication of application:
27.03.85 Bulletin 85/13

84 Designated Contracting States:
DE FR GB

71 Applicant: **N.V. Philips' Gloeilampenfabrieken**
Groenewoudseweg 1
NL-5621 BA Eindhoven(NL)

72 Inventor: **Cereda, Bruno**
c/o **INT.OCTROOIBUREAU B.V. Prof. Holstlaan 6**
NL-5656 AA Eindhoven(NL)

74 Representative: **Gorter, Willem Karel et al,**
INTERNATIONAAL OCTROOIBUREAU B.V. Prof.
Holstlaan 6
NL-5656 AA Eindhoven(NL)

54 **Device for correctly positioning the water delivery nozzle in laundry or dish washing machines.**

57 A water delivery device for domestic washing machines which are provided with a programmer, comprising a nozzle (3) which is angularly mobile about an axis of rotation under the control of the timer (2), is connectable to a water supply, which can be directed towards one of a series of utilisation inlets (A, B, C), wherein the nozzle (3) is traversed by an elbow channel (5), is mobile along its axis of rotation, and is provided with engagement means (9) arranged to engage with fixed countermeans (24) when the nozzle (3) moves along said axis under the thrust of the delivered water.

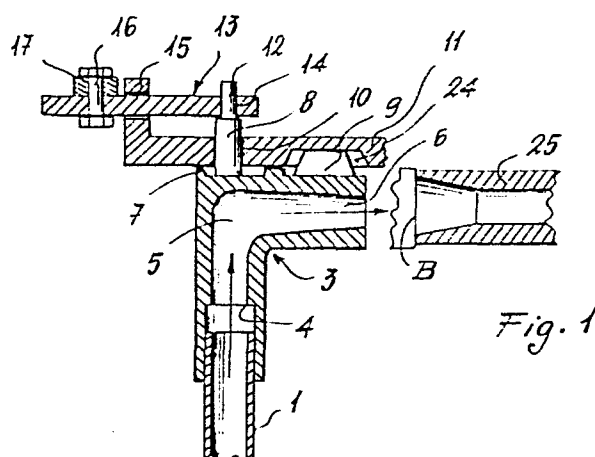


Fig. 1

"Device for correctly positioning the water delivery nozzle in laundry or dish washing machines."

The invention relates to a water delivery nozzle for domestic washing machines (for laundry or dishes), provided with a programmer (timer) comprising a nozzle which is angularly mobile under the control of the timer, is connectable to a water supply, and can be directed towards one of a series of utilization inlets. German utility model 66 07188 describes a device of this kind. The utilization inlets pertain to the various compartments of the container into which the washing machine user places the various substances (detergents, bleaches, softeners, etc.) which are used during the washing machine operating cycle. The water directed towards a given compartment removes the relative substance and transfers it into the machine tub.

The main drawback of this known design is that machining inaccuracies (due to the fact that the components of the device are constructed of moulded and/or blown thermoplastic material) and/or assembly inaccuracies and wear lead to errors in the aiming of the nozzle which, even if modest, at least lead to inadequate water feed to the compartment, and thus incomplete removal of the contained substance. If the aiming error is greater, it is possible for the water not even to reach the compartment.

From USA patent 3,951,684 it is also known to use a telescopic tube for recirculating the wash liquid under pressure in a dish washer to the rotary sprayer, which is supported by the upper slidable dish-supporting rack. Said tube is supported by the lower slidable dish-supporting rack, and moves axially under the pumping pressure of said wash liquid until it abuts against an inlet provided centrally in the base of the rotary sprayer. This known construction is of poor reliability in that inaccurate positioning of the slidable racks prevents the teles-

copic tube from reaching the correct abutting position, and thus prevents the two rotary sprayers from being properly fed with wash liquid. Moreover, the many impurities which are inevitably contained in the wash liquid mean
5 that when it is recirculated in a dishwasher they tend to deposit in the seat of the telescopic tube, which is thus prevented from moving axially.

The main object of the present invention is to provide a device of the aforesaid type, which allows exact
10 directioning of the nozzle independently of assembly and/or machining errors or wear of the moving parts.

This and further objects which will be more apparent from the detailed description given hereinafter are attained according to the invention by a device of
15 the aforesaid type, characterized essentially in that the nozzle is traversed by an elbow channel, is mobile along its axis of rotation, and is provided with engagement means arranged to engage with fixed counter-means when the nozzle moves along said axis under the thrust of the water.

20 The invention will be more apparent from the detailed description of a preferred embodiment thereof given by way of non-limiting example hereinafter with reference to the accompanying drawing, in which

Figure 1 is a vertical section through the device,
25 substantially on the line I-I of Figure 2;

Figure 2 is a diagrammatic plan view of the device with certain parts omitted for clarity;

Figure 3 is a partial diagrammatic section on the line III-III of Figure 2.

30 In the figures, the reference numeral 1 indicates a stationary conduit which is connected in known manner to a water supply, for example to the water main, by way of a solenoid valve, not shown, controlled by the programmer (timer) provided in the washing machine in which the device
35 according to the invention is mounted.

On the end of the conduit 1 there is mounted a nozzle 3 in such a manner that it can rotate about the axis of said conduit and move axially along said axis.

The nozzle is traversed by an elbow channel 5 which tapers at its free end, at 6, and which at its other end has a cross-section which corresponds to that of the conduit 1 (to enable it to be mounted thereon, rotated and slid), and is bounded by an annular shoulder 4 which by abutting against the upper contour of the conduit 1 limits the axial movement of the nozzle.

The nozzle upperly comprises a support ring 7, a pin 8 surrounded by said ring, and a tooth 9 of substantially triangular or trapezoidal cross-section (see Figure 3).

The pin 8 traverses a corresponding bore 10 provided in a stationary wall 11 which defines the compartment, not shown, which houses a normal extractable drawer into which the user places the wash substances.

The reduced end part 12 of the pin 8 is of square or polygonal section, and on it there is mounted the end of a lever 13 having a correspondingly configured hole 14, so that the part 12 can slide along said hole 14 but at the same time be torsionally coupled thereto.

The lever 13 traverses a guide slot 15 provided in the wall 11, and is hinged at 16 to one end of a rod 17, the other end of which is hinged at 18 to a lever 19.

The lever 19 is hinged at 20 to a fixed point, and is loaded by a spring 21, the purpose of which is to keep it in contact with a cam 22 mounted on an output shaft 23 of the conventional programmer (timer) 2. The levers 13 and 19 and the rod 17 constitute an articulated parallelogram. In said wall 11, at predetermined angular distances from each other and directed along the radii of a circle having its centre coinciding with the axis of the conduit 1, there are provided grooves or notches 24 in positions corresponding with the projection 9, and having substantially the same configuration as this latter.

The inlets A, B and C of three stationary conduits 25, for example provided in a part connected to the wall 11, lie in the same radial planes as the grooves 24. Said inlets and the outlet 6 of the nozzle lie in the same trans-

verse plane. The conduits 25 lead for example to the compartments of a normal container for receiving the wash substances which the inlet water provided by the nozzle 3 discharges into the washing machine tub.

5 Its operation is as follows:

 It will be assumed that the solenoid valve disposed in the conduit 1 is closed, and that the nozzle 3 is in front of the inlet C. It will also be assumed that the wash programme provides for the nozzle 3 to discharge
10 water into the inlet B. In the light of these assumptions, the timer 2, by means of its cam 20 and the parallelogram 13, 17 and 19, rotates the nozzle 3 until it is moved in front of the inlet B. After this the cam 22 stops, and the solenoid valve disposed in the conduit 1 is then opened so
15 that the water flows through the nozzle 3 and enters the inlet B of the conduit 25 which conveys it where required. The water which flows through the elbow channel 5 of the nozzle 3 exerts on this latter an axial thrust which raises it (see Figure 1). During this raising movement, the tri-
20 angular tooth 9 engages in the appropriate groove 24 and determines the alignment of the nozzle 3 with the inlet B, even if for any reason the nozzle control device had been unable to effect this alignment by its own action. The cooperating inclined surfaces between the tooth and groove
25 thus compensate for assembly and/or manufacturing inaccuracies and errors and also wear, thus causing the nozzle 3 to always align with the various inlets (A, B, C). Compared with the dishwasher construction described heretofore, the alignment is further facilitated in this case by the
30 fact that only clean water is delivered by the present device.

 When delivery has terminated, the solenoid valve of the conduit 1 is closed by the programmer. As there is now no water thrust, the nozzle 3 falls down under its own
35 weight on to the conduit 1, where it is halted by the contact of the annular shoulder 4 against the upper end of said conduit. The tooth 9 consequently disengages from the groove 24, and the unit again assumes its starting position. The

present invention covers all those modifications which fall within the same inventive concept.

Thus for example the invention also covers a design in which a set of teeth replaces the grooves 24, and a
5 groove replaced the tooth on the nozzle.

10

15

20

25

30

35

1. A water delivery device for domestic washing machines (for laundry or dishes) which are provided with a programmer (timer), comprising a nozzle (3) which is angularly mobile about an axis of rotation under the control of the timer (2), is connectable to a water supply, and can be directed towards one of a series of utilization inlets (A, B, C), characterized in that the nozzle (3) is traversed by an elbow channel (5), is mobile along its axis of rotation, and is provided with engagement means (9) arranged to engage with fixed counter-means (24) when the nozzle (3) moves along said axis under the thrust of the delivered water.
2. A device as claimed in Claim 1, characterized in that the means and counter-means comprise projections (9) and recesses (24) provided with inclined surfaces which cooperate for centering purposes.
3. A device as claimed in the preceding Claims, characterized in that the nozzle (3) upperly comprises a projection (9) designed to engage in any required groove of a set of grooves (24) provided angularly spaced apart in a stationary wall (11) and lying, as does the projection (9), in radial planes passing through the axis of rotation of the nozzle (3).
4. A device as claimed in one or more of the preceding Claims, characterized in that the nozzle (3) upperly comprises an operating pin (8, 12) aligned with the axis of rotation of the nozzle (3).

