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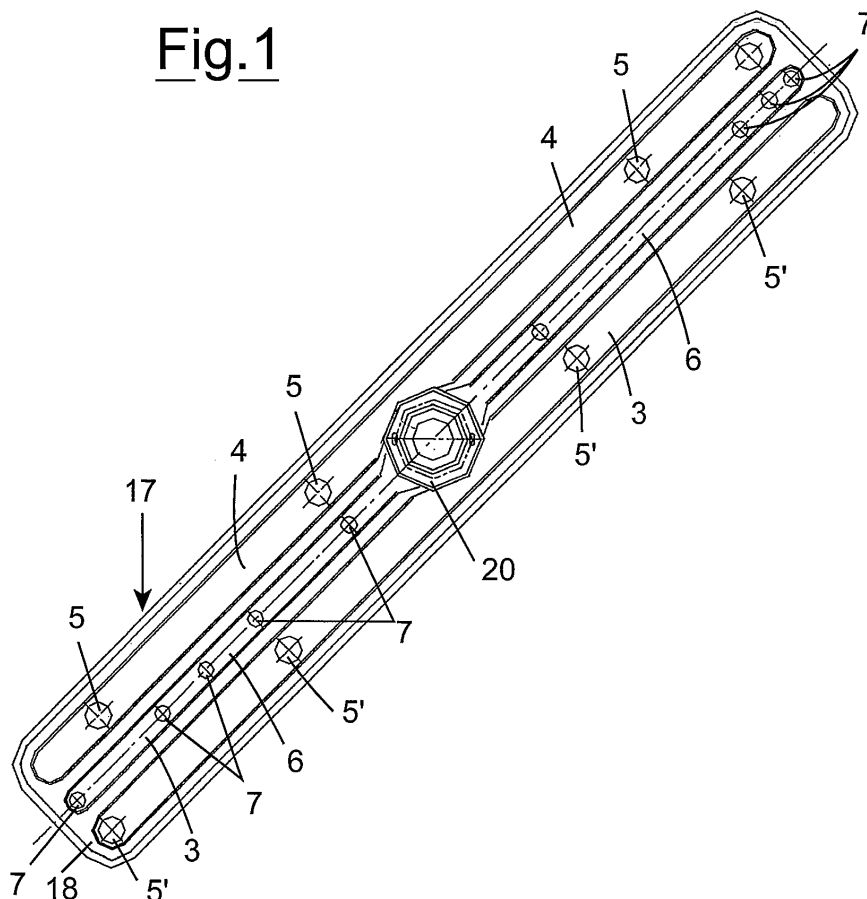
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(54) **Washing unit**

(57) A washing unit (10) of the type provided with at least one washing whirl (11) comprising at least two series of nozzles (5, 5') for dispensing washing liquid and at least one series of rinsing nozzles (7). The two series

of nozzles (5, 5') are arranged according to a first and a second row, lying on the same plane and parallel. The unit further exhibits a separate washing feeding duct (3, 4) for each row of washing nozzles (5, 5').

Fig.1



Description

[0001] The present invention relates to a whirl washing unit for dishwashers, and in particular to a whirl washing unit for industrial dishwashers.

[0002] Industrial dishwashers are traditionally provided with a washing unit comprising a first washing whirl, provided with two arms provided with dispensing nozzles, and with a second rinsing whirl arranged coaxially to the first washing whirl.

[0003] The particular configuration of the washing unit necessarily implies a considerable vertical development of the machine, with consequent inconvenience of use and overall dimensions.

[0004] Moreover, in restaurants or bars with exposed counters the dishwashers must stay below the counter so as to not aesthetically affect the place.

[0005] Another limit of this type of systems is given by the washing efficiency.

[0006] In fact, after the dirt deposited on the kitchenware has been impinged with a first water jet the whirl must rotate by 180° to be impinged thereby again.

[0007] To increase the efficiency or the cleaning effect, washing units have therefore been proposed provided with cross shaped whirls, with dispensing jets located on all the four arms of the cross.

[0008] In this case, the cleaning efficiency increases but not proportionally to the construction complexity of the whirl. Moreover, in any case the cleaning effect does not achieve the desired efficiency.

[0009] This type of whirls further implies a high waste of water and energy, due to the high amount of hot water required for washing.

[0010] In the light of the above, the need of having a washing unit for dishwasher, like the one according to the present invention, which should be easy and inexpensive to make, and which should allow increasing the washing efficiency as compared to traditional whirls, is clear.

[0011] The object of the present invention therefore is to obviate the disadvantages mentioned above and in particular, that of obtaining a washing unit capable of reducing the consumption of water and energy required for washing.

[0012] Another object of the present invention is to obtain a washing unit which should be easy and inexpensive to make and which should achieve at the same time a high washing efficiency..

[0013] These and other objects according to the present invention are achieved by making a washing unit as described in claim 1.

[0014] Further features of the device are the subject of the dependent claims.

[0015] The features and advantages of a washing unit according to the present invention will appear more clearly from the following description, made by way of a non-limiting example with reference to the annexed schematic drawings, wherein:

- figure 1 shows a schematic plan view of a first embodiment of the washing unit according to the present invention;
- figure 2 shows a schematic perspective view of a first embodiment of the washing unit according to the present invention.

[0016] With reference to figures 1-2, there is shown a washing unit 10 for dishwashers of the type provided with at least one washing whirl 11 comprising at least two series of nozzles 5, 5' for dispensing the washing liquid. The two series of nozzles 5, 5' are arranged according to a first and a second row, lying on the same plane and parallel.

[0017] Moreover, there is at least a third series of rinsing nozzles 7, arranged according to a third row.

[0018] Advantageously, according to the present invention, the washing unit 10 comprises a separate washing feeding duct 3, 4 for each row of washing nozzles 5, 5'. In other words, each washing duct 3 or 4 sequentially connects all the washing nozzles 5, 5' of a same row.

[0019] The washing ducts 3, 4 are, of course like the rows, arranged in parallel and are spaced.

[0020] Thanks to the two parallel rows of washing nozzles 5, 5', the spraying zone of washing liquid that impinges the kitchenware and consequently the washing efficiency by mechanical action increase. At the same time, the distance between the rows of nozzles 5, 5' implies during the dispensing of the washing liquid that also the two sheets of washing liquid, produced thereby, are temporally spaced.

[0021] The temporal distance between the two washing sheets corresponds to the time required for the whirl to cover half a turn, as a consequence the emollient action of the washing liquid (detergent mixed with water) is amplified.

[0022] The washing unit 10 further comprises, as mentioned hereinbefore, at least one series of rinsing nozzles 7, arranged according to a third row. The row of rinsing nozzles 7 lies in the same plane as the series of washing nozzles 5, 5'.

[0023] To this end, the washing unit 10 comprises a feeding duct 6 especially dedicated to the feeding of the row of rinsing nozzles 7.

[0024] In other words, the rinsing duct 6 sequentially connects all the rinsing nozzles 7 so as to form the above row.

[0025] The row of rinsing nozzles 7 therefore lies in the same plane as the rows of washing nozzles 5, 5' and is parallel thereto.

[0026] In particular, the rinsing feeding duct 6, and as a consequence the series of rinsing nozzles 7, is arranged between the two washing feeding ducts 3, 4.

[0027] According to a preferred embodiment of the present invention, the washing unit 10 consists of an enclosure 17 which comprises at least two half shells 18, 19 of stamped plate.

[0028] The two half shells 19, 18 are suitably shaped

so as to form upper and lower half ducts.

[0029] The two half ducts 18, 19 are connected to each other for obtaining the ducts from the connection of the half ducts.

[0030] According to an advantageous aspect of the present invention, the two half shells 18, 19 are connected to one another by seaming, whereas the hydraulic separation between ducts 3, 4, 6 thus formed is obtained by projection welding.

[0031] According to another advantageous aspect of the present invention, the hydraulic separation between ducts 3, 4, 6 formed by the connection of the two half shells 18, 19 is obtained by seaming.

[0032] The washing unit 10 according to the present invention further comprises a mount 20 for a driving shaft of the known type or in any case within the capacity of the man skilled in the art.

[0033] Also nozzles 5, 5', 7 are of known type or, in any case, easy to find on the market and for this reason they are not described in further detail.

[0034] Although in the present invention, reference is made to a washing unit consisting of two rows of nozzles 5, 5' for dispensing washing liquid and of a row of rinsing nozzles 7, in any case it is possible to provide for more rows of nozzles for dispensing washing liquid 5, 5' and more rows of rinsing nozzles 7.

[0035] According to an embodiment not shown, it is further possible to provide for four rows nozzles for dispensing washing liquid, arranged in pairs of two, and two rows of rinsing nozzles, each arranged between a washing pair.

[0036] In this case, the two pairs shall be arranged substantially perpendicular to one another, forming a cross shaped whirl.

[0037] The above description clearly shows the features of the device subject of the present invention as well as the relevant advantages, among which we may mention:

- reduction of the overall dimensions in the vertical direction, thanks to the presence of the row of rinsing nozzles on the same plane as the washing nozzles;
- reduction of the overall dimensions in the working surface direction, thanks to the presence of the two rows of washing nozzles on parallel axes;
- doubling of the washing efficiency by mechanical action;
- increase of the washing efficiency by emollient action, thanks to the temporal distance between the two washing sheets;
- construction simplicity and functionality;
- relatively low manufacturing costs;
- decrease of water and energy consumption.

[0038] Finally, it is clear that several changes and variations can be made to the washing unit thus conceived, all falling within the invention; moreover, all details can be replaced with technically equivalent elements. In the

practice, the materials used as well as the sizes, can be whatever, according to the technical requirements.

5 Claims

1. A washing unit (10) of the type provided with at least one washing whirl (11) comprising at least two series of nozzles (5, 5') for dispensing washing liquid and at least one series of rinsing nozzles (7), **characterised in that** said at least two series of nozzles (5, 5') are arranged according to a first and a second row lying on the same plane and parallel, and **in that** it comprises a separate washing feeding duct (3, 4) for each row of washing nozzles (5, 5').
2. A washing unit (10) according to claim 1, **characterised in that** said washing ducts (3, 4) are parallel and spaced.
3. A washing unit (10) according to claim 1, **characterised in that** each of said washing ducts (3, 4) sequentially connects all the washing nozzles (5, 5') of a same row.
4. A washing unit (10) according to claim 1, **characterised in that** it comprises at least one series of rinsing nozzles (7) lying on the same plane as said series of washing nozzles (5, 5').
5. A washing unit (10) according to claim 1, **characterised in that** it comprises a duct for feeding the rinsing nozzles (7).
6. A washing unit (10) according to claim 1, **characterised in that** it comprises at least one enclosure (17) adapted for containing said series of washing nozzles (5, 5') and said at least one series of rinsing nozzles (7).
7. A washing unit (10) according to claim 6, **characterised in that** said enclosure (17) comprises at least two half shells (18, 19).
8. A washing unit (10) according to claim 7, **characterised in that** said two half shells (18, 19) are of stamped plate.
9. A washing unit (10) according to claim 1, **characterised in that** said two half shells (18, 19) are connected to one another for making said ducts (3, 4, 6).
10. A washing unit (10) according to claim 1, **characterised in that** said two half shells (18, 19) are connected to one another by seaming.
11. A washing unit (10) according to claim 1, **characterised in that** the hydraulic separation between the

ducts (3, 4, 6) is obtained by projection welding.

12. A washing unit (10) according to claim 1, **characterised in that** the hydraulic separation between the ducts (3, 4, 6) is obtained by seaming.

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Fig.1

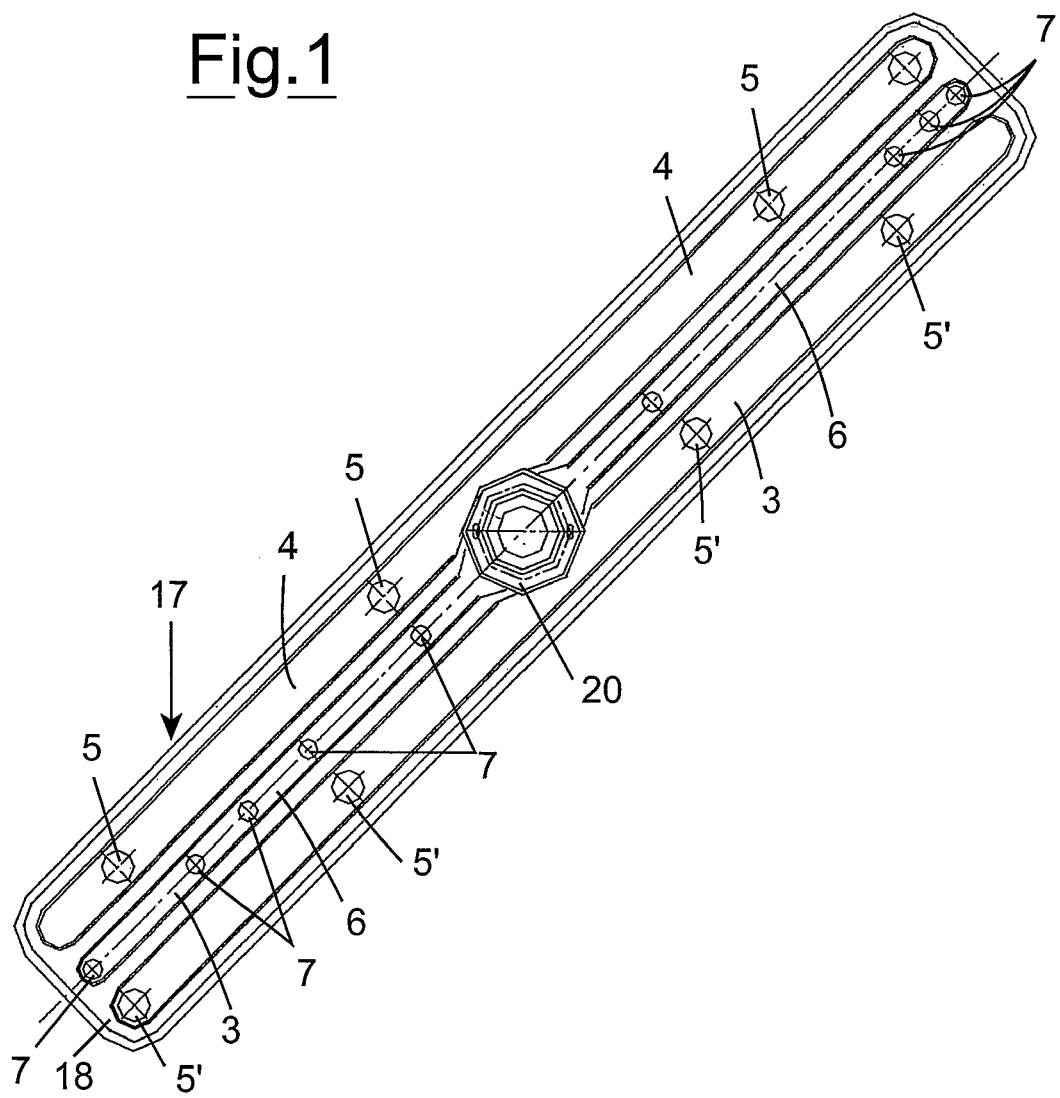


Fig. 2

