Oct. 29, 1963 V. A. GRUNVOGEL 3,108,606

UTENSIL WASHING MACHINE WITH WASHING EQUIPMENT PLACED IN THE BOTTOM OF THE RECEPTACLE, ESPECIALLY TUMBLE SPRAY APPARATUS

Filed Sept. 10, 1962 2 Sheets-Sheet 1

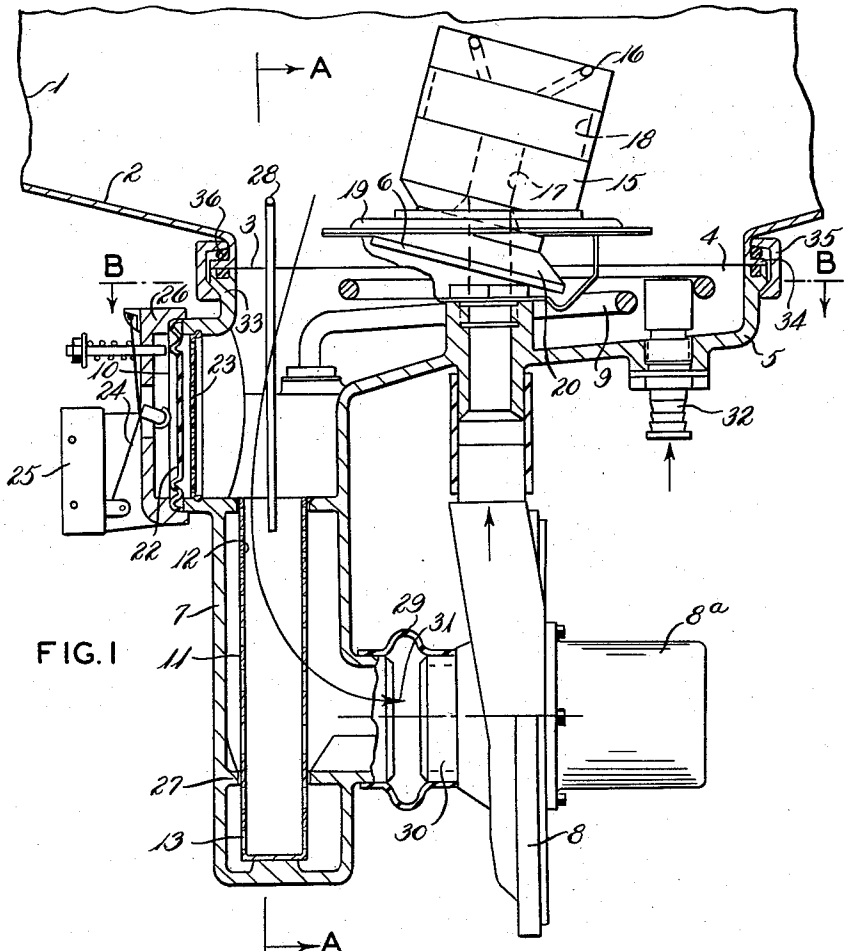


FIG. 1

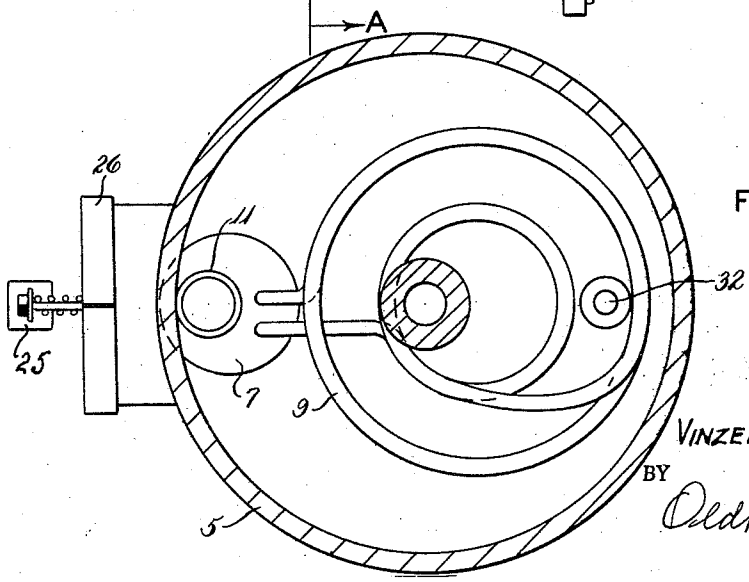


FIG. 2

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FIG. 3

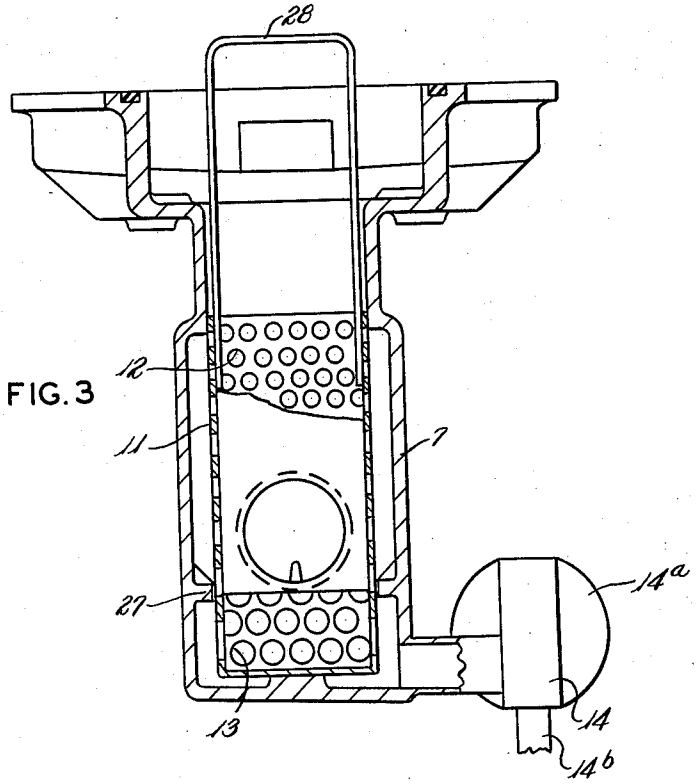
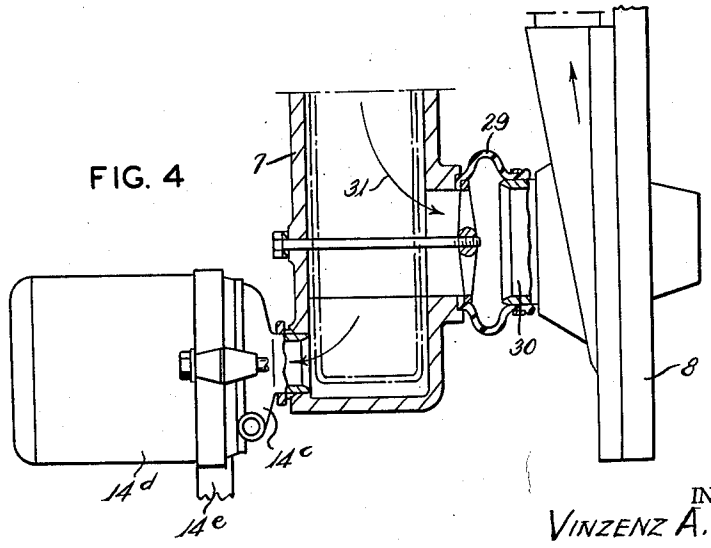


FIG. 4



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UTENSIL WASHING MACHINE WITH WASHING EQUIPMENT PLACED IN THE BOTTOM OF THE RECEPTACLE, ESPECIALLY TUMBLE SPRAY APPARATUS

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Utensil washing machines are known in various forms. In their basic construction they consist of the receptacle to hold the utensils to be washed, and with the washing equipment placed in the receptacle. The washing equipment, for example, consists of a driven blade system which distributes the washing fluid and throws it on the utensils to be washed, or of an impulse driven tumble spray apparatus with a rotating nozzle body, which nozzle body has nozzle openings from which jets of washing fluid issue producing the driving impulse at the same time. In all known forms a considerable number of outlets are necessary in the bottom of the receptacle, for example on the one hand for the drive shaft of the blade system or for the tumble spray apparatus, for carrying back the washing fluid, for heating, for discharge openings, for emptying the receptacle, and the like. The invention provides a simplification.

The invention provides a utensil washing machine having washing equipment placed in the bottom of the receptacle, for example, tumble spray apparatus. The washing equipment with all accessories and all additional installations, such as pumps, motor if necessary, heating and the like, including discharge openings for the washing fluid for emptying the receptacle, are combined into a unit, and this is inserted in an opening in the lower part of the receptacle. In a preferred embodiment of the invention the lower part of the receptacle consists of an essentially circular chamber in which the actual washing apparatus, for example a blade system or tumble spray apparatus, is mounted concentrically, while a sink well is connected below the chamber, and also the pump is arranged and connected on the suction side with the sink well and on the pressure side with the washing equipment. The heating apparatus is also placed in the circular chamber in the preferred development form, surrounding the washing equipment, the heating apparatus being, for example, placed around the washing apparatus in the form of heating coils. In order to insure that the heating does not operate when there is no water in the machine, the invention prefers that a diaphragm pressure switch be placed in the side of the sink well, which permits or causes the switching on of the heat only when a specified amount of water is in the machine, which water will exert the required pressure on the diaphragm pressure switch.

The details of the construction according to the invention can be in various ways. Thus, it may be advantageous to provide a removable screen basket in the sink well, while it is also possible to divide the sink well in two parts, an upper part with finer sieve openings provided in the screen basket which is connected with the suction side of the pump and consequently comes into action when the washing liquid is circulated, and a lower part of the sink shaft or chamber in which the screen basket has considerably larger openings and is connected with another pump, through which the washing fluid can be completely removed from the receptacle. The drive motor can be fastened below the circular chamber for the washing equipment which is driven by a mechanical moment of rotation.

The advantages of the invention reside particularly in

the fact that in utensil washing machines according to the invention there is only one outlet or opening required in the bottom of the utensil receptacle, in which the opening of the operating unit as described is set, containing in itself all the operating elements. The construction is not only simplified by this, but at the same time the assembly of the utensil washing machine is facilitated.

The invention is explained in detail as follows, based on drawings showing only one example of the invention.

The drawings comprise:

FIG. 1, which is a vertical axial section through the receptacle of a utensil washing machine according to the invention;

FIG. 2, which is a horizontal section taken on line B—B through the apparatus shown in FIG. 1;

FIG. 3, which is a vertical section on line A—A through the apparatus shown in FIG. 1; and

FIG. 4 which is similar to the lower portion of FIG. 1 but showing a modification thereof.

The utensil washing machine shown in the drawings consists in its basic construction, omitting the construction of the housing, of the receptacle **1** and the washing equipment placed in the receptacle bottom **2**. In the example given, this washing equipment is a tumble spray apparatus, whose details are further described below. The washing equipment with all accessories and all additional installations, which will also be further described below, has been combined into a single unit which has a circular top flange or opening **4** aligning with a circular opening **3** in the receptacle bottom **2**. The receptacle opening **3** thus connects to an essentially circular chamber **5**. The washing equipment itself is mounted concentrically in the chamber, that is, the tumble spray apparatus, indicated as a whole by the numeral **6**, is placed concentrically in the circular chamber **5**. The sink well **7** is placed below the chamber **5**, as is also the pump **8** by which the washing fluid is circulated. The pump **8** is connected on one side with the sink well **7** and on the other side with the spray apparatus. The pump **8** is driven by a suitable motor means **8***a*. The heat coils **9** surrounding the washing equipment, are also in the circular chamber **5**. A diaphragm pressure switch **10** placed in the sink well is part of this heat apparatus, and insures that the heat is only switched on, or can only be switched on, when a specified amount of liquid is in the receptacle. A removable screen basket **11** is also provided in the sink well **7**, having small screen openings **12** in its upper part, and larger screen openings **13** in its lower part. Actually the sink well **7** is divided into two parts, with the fine screen openings **12** of the screen basket **11** in the upper part, while the larger screen openings **13** of the screen basket **11** are in the lower part. The washing liquid is drawn off through the finer openings of the screen basket **11** when it is circulated by the pump **8**. If the receptacle **1** is to be emptied of the washing fluid, this is done through the larger openings **13** of the screen basket **11** from the lower part of the sink well **7** through the pump **14** driven by motor **14***a*, as indicated in FIG. 3, to discharge to drain line **14***b*.

The following is still to be presented in detail concerning the form of the invention shown in the drawings:

The tumble spray apparatus **6** consists of a nozzle body **15**, which has nozzle openings **16** in its surface. A bore **17** is placed axially in the nozzle body **15** for carrying the washing fluid to the nozzle openings **16**, and the bore is connected with the openings **16** by a distributing chamber **18**. The openings **16** are so arranged that they transmit a moment of rotation to the nozzle body **15** by an impulse effect, so that the nozzle body describes a rotary movement in which it rolls and is supported by the roller ring **19** with its collar **20**. The nozzle body

15 is also set on its connecting pipe supports (not shown in detail), and is also kept from lifting up by the collar 20.

The diaphragm pressure switch 10 has in the usual way a diaphragm 22 under pressure from the washing fluid, in front of which there is a screen 23, while the diaphragm 22 regulates a micro-switch 25 by means of a lever arm 24. This whole arrangement is held firmly by the cover 26 which is screwed to the corresponding stays on the side of the sink well.

The screen basket 11 placed in the sink well 7 is held firmly therein by flanged projections 27, so that the sink well 7 is divided into an upper and a lower part by the said flanges 27 as already mentioned for circulation and emptying. The screen basket 11 can be easily removed from the sink well 7 with the aid of the bar 28. As stated, in normal washing operation, the washing fluid is carried in the direction of the arrow 31 by the pump 8, which is usually a centrifugal pump and is connected with the sink well 7 by the flexible sleeve 29 with its exhaust connection 30, and the said fluid is forced into the tumble spray apparatus. The filling of the receptacle can be done through the pipe connection 32. If the receptacle 1 is to be completely emptied, this is done by drawing off the fluid from the lower part and the sink well 7 with the pump 14. In a modification of the invention the arrangement of this pump is shown in FIG. 4 which shows the lower part of a section similar to FIG. 1. The pump 14*c* is fastened directly to the well 7 without a connecting conduit as in FIG. 3. One side of the pump 14*c*, sealed by a circular cord ring, is securely connected to the well, while the other side supports a flange-connected motor 14*d* and fan wheel removably mounted thereon by two screws. This makes the motor easily accessible and removable after the front wall of the machine is removed. The pump 14*c* discharges to drain 14*e*.

The connection between the receptacle bottom 2 and the unit forming the lower part of the receptacle which the apparatus contained therein which has been described, can be arranged in any desired manner. In the example of the invention given the flanges 33 and 34 are provided with protrusions or projections on the flange 4 and on the opening 3 of the receptacle, and are set upon each other and held together by a clamplike gripping element 35. Packing materials 36 are provided to effect sealing.

I claim:

1. A utensil washing machine including a receptacle having an opening in the bottom thereof, a unit removably mounted in and closing the bottom opening in the receptacle, the unit forming a substantially circular chamber and the chamber being concentrically aligned on the axis of the receptacle, a tumble spray apparatus

concentrilly mounted in the chamber, a sink well at one side of the chamber, a pump, the suction side of the pump being connected to the sink-well, the pressure side of the pump being connected to the spray apparatus, the spray apparatus being driven by the mechanical moment of rotation of the liquid being forced therethrough by the pump, a removable screen basket provided in the sink well and being operatively divided into upper and lower parts, the upper part being provided with fine screen openings through which the washing fluid is circulated by the fluid circulating pump, and the lower part with coarser screen openings, and separate pump means for withdrawing the washing fluid from the receptacle and sink well through the coarser screen openings and discharging the fluid into a drain.

2. A machine according to claim 1 wherein heating coils surround the tumble spray apparatus.

3. A machine according to claim 1 wherein heating coils surround the tumble spray apparatus and a diaphragm pressure switch positioned in the sink well allows the heating coils to be turned on only when washing fluid is in the receptacle.

4. A utensil washing machine including a receptacle having an opening in the bottom thereof, a unit casing removably mounted in and closing the bottom opening in the receptacle, said unit casing carrying a tumble spray apparatus extending into the receptacle and the unit casing including a sink well, a removable screen means being provided in the sink well and having upper and lower parts, pump and motor means carried by the unit casing but outside the unit casing for drawing washing fluid through the upper part of the sink well screen means and for discharging it to the tumble spray apparatus to rotate it, and separate pump and motor means carried by the unit casing but outside the unit casing for withdrawing all of the washing fluid from the receptacle and connecting through the lower part of said sink well screen means for discharging the fluid therefrom.

References Cited in the file of this patent

UNITED STATES PATENTS

1,667,745	Smellie	May 1, 1928
1,931,996	Schimpke	Oct. 24, 1933
2,621,666	Hiort Af Ornas	Dec. 16, 1952
2,808,063	Abresch et al.	Oct. 1, 1957
2,825,348	Low	Mar. 4, 1958
3,034,518	Butsch et al.	May 15, 1962
3,049,132	Gilson	Aug. 14, 1962
3,051,182	Gibson	Aug. 28, 1962

FOREIGN PATENTS

72,235	France	Oct. 26, 1959