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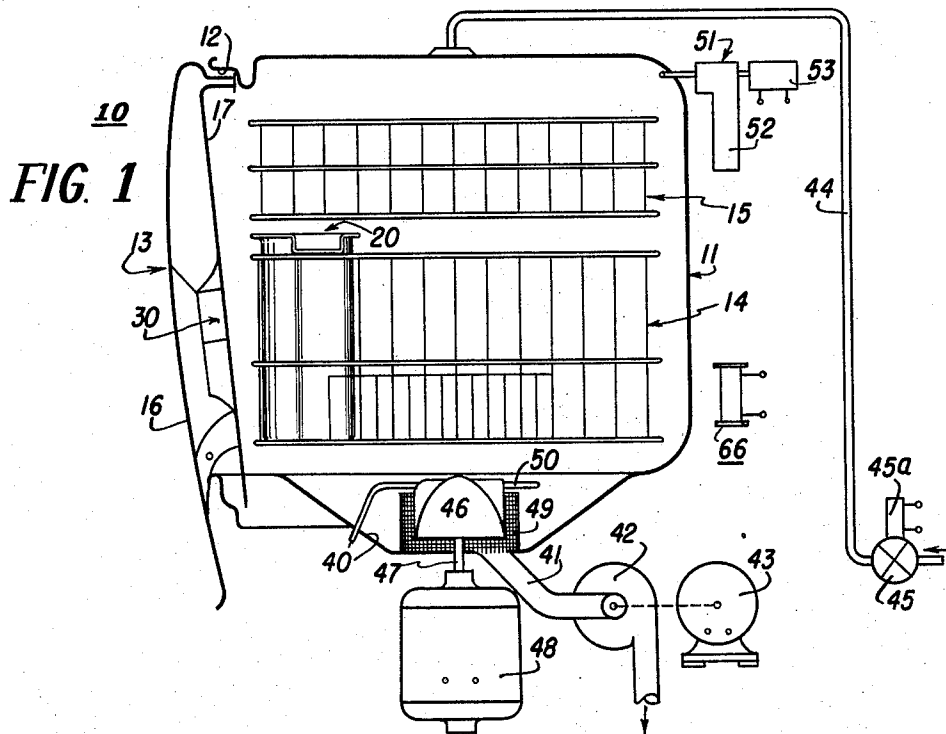
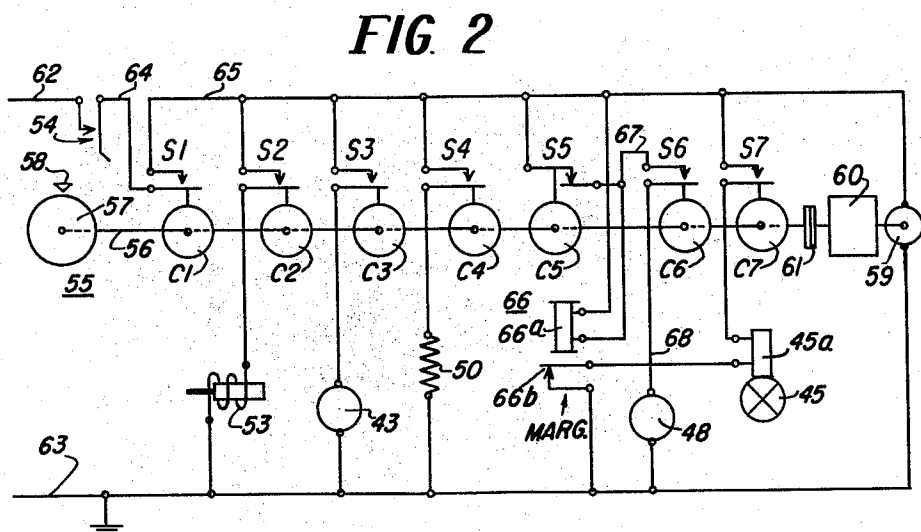
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2,957,813

METHODS OF DETARNISHING SILVERWARE

Filed March 31, 1958

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

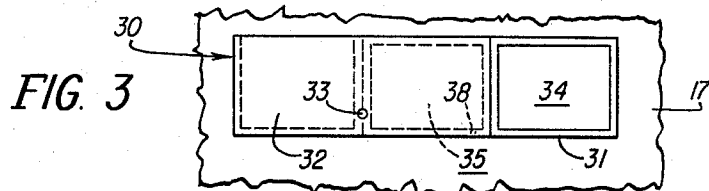
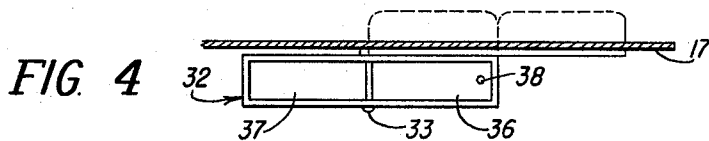
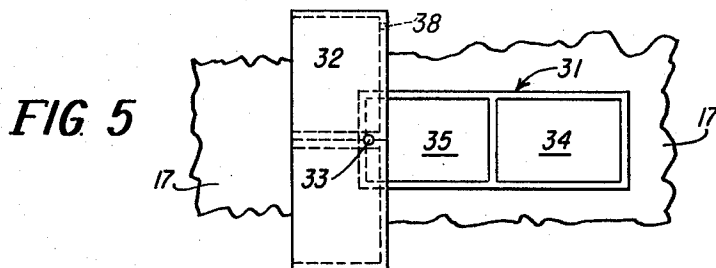
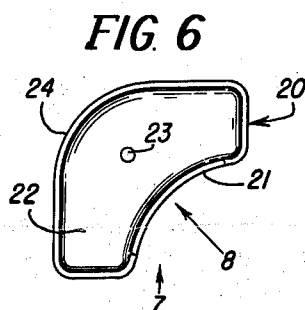
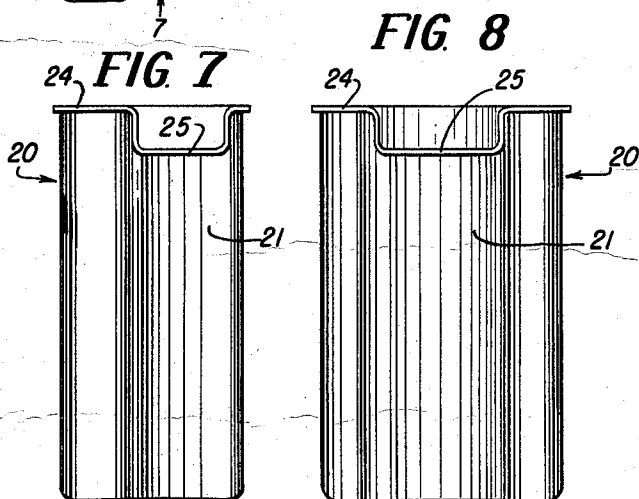
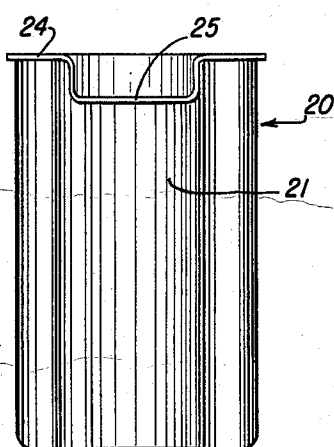


FIG. 8



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METHODS OF DETARNISHING SILVERWARE

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7 Claims. (Cl. 204—144)

The present invention relates to methods of detarnishing silverware, and more particularly to such methods that can be readily carried out in automatic dishwashing apparatus.

It is a general object of the invention to provide a method of detarnishing silverware that can be carried out in automatic dishwashing apparatus, without control of the chemical reactions involved on the part of the operator, and without alternation of the normal cycle of operation of the automatic dishwashing apparatus.

Another object of the invention is to provide a method of detarnishing silverware which comprises certain steps that generally correspond to the usual dishwashing steps that are carried out in an automatic dishwashing apparatus, whereby the detarnishing steps mentioned may be carried out in the automatic dishwashing apparatus in the normal cycle of operation thereof.

Further features of the invention pertain to the particular arrangement of the steps of the method, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof will best be understood by reference to the following specification, taken in connection with the accompanying drawings, in which:

Figure 1 is a diagrammatic illustration of an automatic dishwashing apparatus that may be employed in carrying out the method of the present invention;

Fig. 2 is a schematic diagram of the electric control circuit for the dishwashing apparatus of Fig. 1;

Fig. 3 is an enlarged front view of the two-stage detergent dispenser incorporated in the front door of the dishwashing apparatus of Fig. 1, and illustrating the position thereof in the first dispensing stage thereof;

Fig. 4 is a plan view, partly in section of the detergent dispenser shown in Fig. 3;

Fig. 5 is another front view of the detergent dispenser, shown in Fig. 3, and illustrating the position thereof in the second dispensing stage thereof;

Fig. 6 is a plan view of the silverware bucket carried by the dishrack of the dishwashing apparatus of Fig. 1;

Fig. 7 is an elevational view of the bucket, taken in the direction of the arrow 7 in Fig. 6; and

Fig. 8 is another elevational view of the bucket, taken in the direction of the arrow 8 in Fig. 6.

Referring now to Fig. 1, there is diagrammatically illustrated an automatic dishwashing apparatus 10, suitable for carrying out the method of the present invention; which dishwashing apparatus 10 is of the general construction of that disclosed in U.S. Patent No. 2,635,941, granted on April 21, 1953, to Edgar S. Stoddard, and modified to incorporate a two-stage detergent dispenser of the general construction of that disclosed in U.S. Reissue Patent No. 24,198, granted on August 21, 1956, to John C. Sharp and Leonard J. Martiniak. The dishwashing apparatus 10 comprises an upstanding vat 11 provided with a front opening 12 and carrying a front

2

door 13 movable between open and closed positions with respect to the front opening 12. Arranged within the vat 11 are a lower dishrack 14 and an upper cuprack 15 that are mounted upon the side walls of the vat 11 for rolling movement into and out of the front opening 12, when the front door 13 occupies its open position. Also the dishrack 14 removably carries a silverware bucket 20 in the front left-hand corner thereof. The front door 13 includes an outer sheet 16 and an inner sheet 17; and the inner sheet 17 carries a two-stage detergent dispenser 30.

The bottom of the vat 11 defines a sump 40 that is provided with a drain conduit 41, in which there is arranged a drain pump 42, the outlet of the drain pump 42 communicating with the drain plumbing, not shown, and being driven by an electric motor 43. In the arrangement, the drain conduit 41 is effectively closed by the drain pump 42 to retain water in the sump 40, except when the drain pump 42 is operated to discharge the water from the sump 40 via the drain conduit 41 and thence to the exterior. A hot water supply conduit 44 communicates with the top of the vat 11; which hot water supply conduit 44 is connected to a source of hot water under pressure, not shown; and which hot water supply conduit 44 includes an inlet valve 45 of the solenoid operated type, the solenoid being indicated at 45a, the inlet valve 45 being normally biased into its closed position. An impeller 46 is arranged in the bottom of the sump 40 and carried by the operating shaft 47 of an electric drive motor 48, the operating shaft 47 extending in sealed relation through an opening provided in the bottom of the sump 40; whereby the impeller 46 is operated incident to operation of the motor 48 in order to effect the circulation of the water in the sump 40 through the racks 14 and 15, with the front door 13 in its closed position. Also the impeller 46 is surrounded by an associated reticulated screen 49 so as to prevent the entry of foreign articles of substantial size into the impeller 46 or into the drain conduit 41. Also an electric heating unit 50 is arranged in surrounding relation with respect to the impeller 46 and is employed for the purpose of drying the article supported by the racks 14 and 15 incident to the circulation of a hot current of air in the vat 11 by the operation of the impeller 46 in the absence of the charge of water in the sump 40. Finally, a wetting agent dispenser 51 is operatively associated with the vat 11 and provided with a liquid wetting agent container 52 and an operating solenoid 53. In the arrangement, when the solenoid 53 is energized, the dispenser 51 is operated to inject a standard measured quantity of the liquid wetting agent from the container 52 into the vat 11.

The general mode of operation of the dishwashing apparatus 10 will best be understood from the schematic diagram of the operating circuit therefor shown in Fig. 2; wherein it will be observed that a door switch 54 is provided in cooperating relation with the front door 13; which door switch 54 is operated into its open and closed positions in response to corresponding operation of the front door 13 into its open and closed positions. Further, the dishwashing apparatus 10 comprises a program controller 55 that includes a rotatably mounted operating shaft 56, the outer end of the operating shaft 56 carrying a manually settable dial 57 cooperating with an associated index marker 58. Also the operating shaft 56 carries seven control cams C1 to C7, inclusive, that respectively govern seven sets of switch springs S1 to S7, inclusive. Finally, the program controller 55 comprises an electric timer motor 59 that may be of the "Telechron" type and provided with an operating shaft connected to an escapement mechanism 60. In turn, the operating shaft of the escapement mechanism 60 is connected to the inner end of the operating shaft 56 by an associated slip clutch 61. In

the arrangement, when the manual dial 57 is operated out of its off position, the electric timer motor 59 is energized, whereby the escapement mechanism 60 is operated so as to effect subsequent step-by-step rotation of the operating shaft 56 back into its off position, whereupon the electric timer motor 59 is deenergized. During the step-by-step movement of the operating shaft 56 from its operated position back into its off position, an automatic cycle of the dishwashing apparatus 10 is effected by virtue of the controls exercised by the cams C1, etc. upon the associated switches S1, etc.

The control circuit also comprises a pair of line conductors 62 and 63 that are respectively connectible to a pair of power supply conductors, not shown, and supplied with 118 volts, single-phase, A.-C. In the arrangement, the line conductor 62 is ungrounded while the line conductor 63 is grounded, the line conductor being terminated by one spring of the door switch 54, and the other spring of the door switch 54 being connected by a conductor 64 to one spring of the set S1. The other spring of the set S1 is connected to a supply conductor 65. The solenoid 53 of the wetting agent dispenser 51 is connected between the conductors 63 and 65 via the set of switch springs S2; the drain pump motor 43 is connected between the conductors 63 and 65 via the set of switch springs S3; the electric heating unit 50 is connected between the conductors 63 and 65 via the set of switch springs S4; and the timer motor 59 is connected directly between the conductors 63 and 65. Also the control circuit comprises an electromagnetic relay 66 of the marginal type and provided with an operating winding 66a and a pair of contact springs 66b, the winding 66a being connected between the supply conductor 65 and a conductor 67. Further, the set of switch springs S5 respectively terminates the supply conductor 65 and the conductor 67; while the set of switch springs S6 respectively terminates the conductor 67 and a conductor 68. The impeller drive motor 48 is connected between the conductors 63 and 68; and the solenoid 45a is connected between the conductors 63 and 65 via the set of switch springs S7 and the contact springs 66b.

Considering now the general mode of operation of the electric control circuit, when the front door 13 occupies its closed position, the door switch 54 is closed connecting power to the conductor 64; whereby operation of the manual dial 57 out of its off position causes the control cam C1 to effect closure of the set of switch springs S1 so that the power is connected to the conductor 65 in order to effect operation of the timer motor 59 in the manner previously explained. When the timer motor 59 effects the return of the operating shaft 56 back into its off position through the escapement mechanism 60 in the manner previously explained, the cam C1 effects operation of the set of switch springs S1 into its open position thereby removing power from the conductor 65 and arresting further operation of the control circuit.

The control cam C6 effects closure of the set of switch springs S6, while the set of switch springs S5 occupies its closed position thereby to complete a direct circuit for operating the impeller motor 48, this circuit including the switch springs S5 and S6 and the conductors 67 and 68; whereby operation of the impeller motor 48 effects operation or rotation of the impeller 46. At this time, a charge of hot water is introduced into the vat 11 by closure of the set of switch springs S7, whereby the solenoid 45a is energized effecting operation of the inlet valve 45 into its open position with the resulting supply of hot water into the vat 11. Also at this time, the set of switch springs S5 is operated into its open position so as to interrupt the normally completed path for short-circuiting the winding 66a of the relay 66 in order to complete an alternative circuit for energizing the impeller motor 48 in series relation with the winding 66a of the relay 66. At this time, the relay 66 is not operated as it is of the marginal type; however, as the quantity of hot water introduced into the

vat 11 accumulates in the sump 40, the impeller 46 is loaded effecting loading of the impeller motor 48. As the motor 48 is thus loaded, the current traversing the winding 66a of the relay 66 is increased and ultimately when a full charge of hot water is accumulated in the sump 40, the load imposed upon the impeller 46 is adequate to effect loading of the motor 48 such that the current traversing the winding 66a effects operation of the relay 66; whereby the relay 66 opens its contact springs 66b to deenergize the solenoid 45a in order to return the inlet valve 45 back into its closed position. Still subsequently, the control cam C7 opens the set of switch springs S7 so as positively to interrupt a further point in the circuit for energizing the solenoid 45a of the inlet valve 45; and the control cam C5 returns the set of switch springs S5 back into its closed position so as again to complete the direct circuit for energizing the impeller motor 48 and the direct path for short-circuiting the winding 66a of the relay 66 in order to return the relay 66 back into its restored position. This arrangement insures that the charge of hot water introduced into the vat 11 is a fixed and predetermined charge as metered by the relay 66. At any time, the water contained in the vat 11 may be discharged therefrom by operation of the drain pump motor 43 that is effected by the control cam C3 closing the set of switch springs S3. Similarly, energization of the electric heating unit 50 is governed by the cam C4 in response to the closure of the switch springs S4. Also, in a similar manner, the solenoid 53 of the wetting agent dispenser 51 may be operated to effect the injection of a measured quantity of the wetting agent into a charge of hot water contained in the vat 11, as previously noted, by the control of the cam C2 in response to operation of the set of switch springs S2 into its closed position.

The arrangement and disposition of the control cams C1, etc., carried by the operating shaft 56 of the program controller 55 is such that the automatic cycle of the dishwashing apparatus comprises an initial spraying step during which hot water is sprayed downwardly through the racks 15 and 14 and into the sump 40 and pumped to the exterior by operation of the drain pump 42; which spraying step occupies a time interval of 90 seconds. Following this spraying step, operation of the drain pump 42 is arrested and hot water is accumulated in the sump 40 during operation of the impeller 46; whereby a first charge of hot wash water is accumulated in the sump 40 and circulated by the impeller 46, this first charge of hot wash water being predetermined by the measuring relay 66, in the manner previously explained. During this first washing step, a first charge of detergent is supplied into the hot wash water by the detergent dispenser 30; and the first washing step comprises 315 seconds.

Following the first washing step, there is a time interval of 90 seconds during which the drain pump 42 is operated to effect draining of the first charge of hot wash water from the sump 40.

Thereafter, a second charge of hot wash water is introduced into the vat 11 and thereinto a second charge of detergent is supplied by the detergent dispenser 30. This second washing step proceeds for 315 seconds, followed by a draining time interval of 90 seconds, in the manner described above.

Then a first rinsing step of 135 seconds, followed by a draining time interval of 90 seconds, are carried out in the vat 11; and subsequently a second rinsing step of 135 seconds, followed by a draining time interval of 90 seconds, are carried out in the vat 11. In the beginning of the second rinsing step, the wetting agent dispenser 51 is operated in order to inject the measured quantity of wetting agent into the second charge of hot rinse water so that the second rinsing step proceeds utilizing the second charge of hot rinsing water containing the wetting agent mentioned.

At this time, the electric heating unit 50 is energized simultaneously with operation of the impeller 46; whereby a current of hot air is circulated in the vat 11 into dry-

ing relation with the dishes carried by the racks 14 and 15; which drying step may proceed for a time interval of 1200 seconds; and thereafter operation of the impeller 46 is arrested while energization of the heating unit 50 is continued for an additional time interval of about 600 seconds. At this time, the automatic cycle of the dishwashing apparatus 10 is completed and the manual dial 57 is operated back into its normal off position by operation of the timing motor 59; and, of course, at this time, operation of the timing motor 59 is arrested, as previously explained.

Considering now in greater detail the construction and arrangement of the two-stage detergent dispenser 30, and referring to Figs. 3 to 5, inclusive, it is noted that the dispenser 30 is carried by the inner sheet 17 of the front door 13 and comprises a stationary first structure 31 and a movable second structure 32, the movable structure 32 being pivotally mounted by a pivot pin 33 adjacent to the lower portion thereof upon the left-hand side of the first structure 31, as illustrated. In the arrangement, the first structure 31 defines two detergent-receiving pockets 34 and 35; and the second structure 32 defines two water-receiving pockets 36 and 37, the water-receiving pocket 36 having a drain hole 38 formed in the bottom thereof. In the dispenser 30, the two structures 31 and 32 may be formed of molded material, such, for example, as the phenol-formaldehyde condensation products "Bakelite"; and the first structure 31 is mounted in a cooperating opening provided in the inner sheet 17.

In the operation of the dispenser 30, when the second structure 32 occupies its position illustrated in Fig. 5, two charges of detergent are placed in the respective detergent-receiving pockets 34 and 35; and then the movable structure 32 is rotated about the pivot pin 33 into its ready position of Fig. 3, so that the right-hand side of the movable structure 32 covers the left-hand pocket 35, the right-hand pocket 34 is exposed at this time.

During the first washing step of the dishwashing apparatus 10, the water circulated in the vat 11 by the impeller 46 is caught in the two water-receiving pockets 36 and 37 and overflowed from the tops thereof during the first washing step. Also, in the first washing step, the first charge of detergent contained in the detergent-receiving pocket 34 is washed therefrom by the circulated wash water and dissolved therein. At the conclusion of the first washing step, and during the following draining step, the water is drained from the water-receiving pocket 36 through the drain hole 38 provided in the bottom thereof, while the water is retained in the water-receiving pocket 37. Accordingly, during this draining step mentioned, the left-hand side of the movable structure 32 is rendered substantially heavier than the right-hand side thereof, whereby the movable structure 32 is rotated about the pivot pin 33 from its ready position of Fig. 3 into its operated position of Fig. 5, so that the left-hand detergent-receiving pocket 35 is then exposed to the interior of the vat 11. Of course, in the second washing step of the dishwashing apparatus 10, the charge of wash water circulated therein washes the second charge of detergent out of the detergent-receiving pocket 35 so that it is dissolved in the circulated wash water in the second washing step.

Accordingly, the detergent dispenser 30 is of the two-stage type dispensing its first charge of detergent from the first pocket 34 into the first charge of wash water and dispensing its second charge of detergent from the second pocket 35 into the second charge of wash water, during the automatic cycle of the dishwashing apparatus 10.

Considering now the construction and arrangement of the silverware-receiving bucket 20 and referring to Figs. 6 to 8, inclusive, it is noted that the bucket 20 is removably carried in the left-hand front corner of the dishrack 14 and has a generally triangular configuration in transverse section, and as illustrated the bucket 20 comprises a tubular side wall 21 and a flat bottom wall 22 having

a drain hole 23 therein. The bucket 20 is provided with an open top around which there is carried a downwardly rolled rim 24; and preferably, the portion of the side wall 21 facing the interior of the vat 11, and consequently the impeller 46, has a cutout or notch 25 formed therein in order to accommodate the catching of a charge of water in the bucket 20 incident to operation of the impeller 46.

As a constructional example, the bucket 20 may have a height of about 10" and each leg of the right triangle prescribing the exterior sides of the tubular side wall 21 may have a dimension of about 5". Also in the arrangement, the bucket 20 is preferably formed of sheet metal and specifically the same is formed of a metal selected from the class consisting of aluminum and magnesium, for a reason more fully explained hereinafter.

During the operation of the dishwashing apparatus 10, water accumulating in the sump 40 is caught-up by the impeller 46 and hurled through the racks 14 and 15, whereby a charge of the water is caught in the bucket 20 and retained therein during the washing action of the impeller 46. However, at the conclusion of the washing action mentioned, when operation of the impeller 46 is arrested, the charge of water contained in the bucket 20 leaks therefrom through the drain hole 23 provided in the bottom wall 22 thereof and back into the sump 40 and is pumped to the outside by operation of the drain pump 42 in the following drain step in the automatic cycle of the dishwashing apparatus 10.

Turning now to the present method of detarnishing silverware in the dishwashing apparatus 10, it is noted that the regular silverware-receiving basket, not shown, that is normally supported in the left-hand front corner of the rack 14 is removed therefrom, and the silverware-receiving bucket 20 is substituted therefor in the rack 14. The silverware is then placed in the bucket 20 and the rack 14 is returned to its normal position in the vat 11. At this time, a charge of detergent is loaded into the pocket 34 of the dispenser 30 and a charge of electrolyte is loaded into the pocket 35 of the dispenser 30; and the movable structure 32 is operated into its ready position of Fig. 3.

At this time, operation of the dishwashing apparatus 10 is initiated; and in the first washing step the detergent is washed from the pocket 34 into the hot wash water producing a hot washing solution for effecting washing of the silverware arranged in the bucket 20. Of course a charge of the washing solution is caught in the bucket 20 during the first washing step in submerging and wetting relation with the silverware contained therein. At the conclusion of the first washing step, and during the following draining step, the charge of the washing solution caught in the bucket 20 drains therefrom through the drain hole 23 and back into the sump 40 and is pumped to the outside by the drain pump 42. Also during the draining step following the first washing step, the detergent dispenser 30 is actuated into its operated position of Fig. 5, as previously explained; whereby during the second washing step, the electrolyte is washed from the pocket 35 into the hot wash water producing a hot silverware-treating solution for effecting treating of the silverware arranged in the bucket 20. Of course, a charge of the treating solution is caught in the bucket 20 during the second washing step in submerging and wetting relation with the silverware contained therein. At the conclusion of the second washing step and during the following draining step, the charge of the treating solution caught in the bucket 20 drains therefrom through the drain hole 23 and back into the sump 40 and is pumped to the outside by the drain pump 42.

In the subsequent portion of the automatic cycle of the dishwashing apparatus 10, the silverware in the bucket 20 is subjected to a first rinsing step in hot water, and still subsequently to a second rinsing step in hot water, also containing the wetting agent that is injected there-

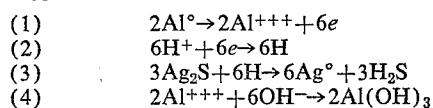
into by the wetting agent dispenser 51; all in the manner previously explained.

While a wide variety of detergents may be employed in the washing step, that sold under the trade name "Electrasol," a product comprising about 60% sodium tripolyphosphate and 40% sodium metasilicate is recommended, as this product is mildly aggressive toward aluminum or magnesium, is an excellent detergent, and is effective to strip accumulated scale or oxides from the bucket 20, as well as simultaneously to remove food soils from the silverware therein, and otherwise to clean-up the interior of the vat 11. Also, the detergent that is sold under the trade name "Calgonite," a product comprising about 40% sodium hexametaphosphate and 60% sodium metasilicate, is entirely satisfactory. Accordingly, in the washing step the silverware is cleaned so that the principal tarnishing agent remaining thereupon is silver sulfide.

Also while a wide variety of electrolytes may be employed in the treating step, sodium tripolyphosphate is recommended, because of its simplicity and economy. More fundamentally, the electrolyte employed normally comprises a mild alkaline compound that is capable of reacting aggressively with aluminum or magnesium to set up a galvanic current capable of decomposing the silver sulfide, without substantial deleterious etching of the silver base metal. Of course, ordinary bicarbonate of soda is satisfactory for the present purpose, but it is less desirable than sodium tripolyphosphate, in that it has a tendency to form a paste in the cup in the dispensing pocket 35 of the dispenser 30 when it is contacted with hot water; which characteristic is not encountered when sodium tripolyphosphate is employed, as the latter compound is much more readily soluble when contacted with hot water. A suitable detarnishing electrolyte of the present class comprises the product sold under the trade name "Thanx," a product comprising about 60% sodium tripolyphosphate and 40% chlorinated trisodium phosphate is inexpensive and is also an excellent detergent. Thus when the product "Thanx" is employed in the treating step, both detarnishing and washing by detergent action, are combined.

While a wide variety of wetting agents may be employed, the product "Rinse Dry" is recommended and this product comprises an aqueous solution of a conventional compound of the low-forming non-ionic class; whereby the injection of a small quantity of the preparation from the dispenser 51 into the charge of hot rinse water contained in the vat 11 is productive of approximately 100 p.p.m. of the wetting agent in the rinsing solution thus produced. Of course, any other suitable wetting agent in liquid form may be employed, but preferably it should be of non-ionic form.

Considering the galvanic battery action that is involved when the silverware contained in the bucket 20 is submerged in the treating solution containing the electrolyte, simultaneously with the contact of the silverware with the aluminum metal of the bucket 20 (in the case where the bucket 20 is formed of a suitable aluminum alloy), it is suggested that the following reactions take place:



In these reactions in the galvanic system, the metallic aluminum of the bucket 20 serves as the effective anode and the tarnished silverware serves as the effective cathode; and moreover, it will be understood that substantially identical equations are involved when the bucket 20 is formed of magnesium. In fact, with ordinary electrolytes of the character described, magnesium is more reactive than aluminum, so that the detarnishing process proceeds at a greater rate. Moreover in the galvanic system, instead of forming the bucket 20 of aluminum or mag-

nesium, a separate and distinct anode formed of aluminum or magnesium may be provided therein. For example, an aluminum or magnesium plate or strip may be arranged in the bottom of the bucket 20 so that it is contacted by the silverware placed therein.

Of course, in the first rinsing step, most of the reaction products are removed from the silverware by the hot rinse water; and in the second rinsing step, the remainder of the reaction products are removed from the silverware by the hot rinse water, and the contained wetting agent insures that there is improved drainage of this rinse water from the silverware.

Preferably in the washing step, the washing solution has a temperature in the general range 120° F. to 180° F., the temperature of 150° F. being ideally suited to the washing step. Also the quantity of detergent is normally such as to produce approximately a 0.3% solution thereof in the charge of hot water. In the following detarnishing step, it is preferably that the charge of hot water be in the relatively high temperature range noted and the quantity of electrolyte employed is such as to produce approximately a 0.3% solution thereof in the charge of hot water. Also such hot water is employed in the two rinsing steps; and in the second rinsing step, it is preferable that the hot rinse water contain about 100 p.p.m. of the recommended wetting agent previously noted.

In view of the foregoing, it is apparent that there has been provided a method of detarnishing silverware, or other silver articles, that comprises steps that can be readily carried out in a conventional automatic dishwashing apparatus, since the steps of the detarnishing method generally correspond to the steps of the ordinary dishwashing method that is carried out in the dishwashing apparatus.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. The method of detarnishing silver articles comprising placing said articles in a container having a drain hole in the bottom thereof and arranged in a vat, wherein said container also comprises an anode arranged in contact with said articles and formed of an element selected from the group consisting of aluminum and magnesium, introducing a charge of treating solution into said vat, said treating solution consisting essentially of an aqueous solution of sodium tripolyphosphate, circulating throughout a first predetermined time interval said treating solution from said vat into said container and therefrom through said drain hole and back into said vat, wherein the rate of circulation of said treating solution into said container is higher than the rate of drainage of said treating solution from said container so that a bath of said treating solution is accumulated in said container during said first predetermined time interval in submerging and wetting relation with said articles and said anode, draining said treating solution from said vat to the exterior, introducing a charge of rinsing water into said vat, circulating throughout a second predetermined time interval said rinsing water from said vat into said container and therefrom through said drain hole and back into said vat, and then draining said rinsing water from said vat to the exterior.

2. The method of detarnishing silver articles comprising placing said articles in a container having a drain hole in the bottom thereof and arranged in a vat, wherein said container also comprises an anode arranged in contact with said articles and formed of an element selected from the group consisting of aluminum and magnesium, introducing a hot charge of treating solution into said vat, said treating solution consisting essentially of an aqueous solution of sodium tripolyphosphate, circulating

5. The method of detarnishing silver articles comprising placing said articles in a container having a drain hole in the bottom thereof and arranged in a vat, wherein said container also comprises an anode arranged in contact with said articles and formed of an element selected from the group consisting of aluminum and magnesium, introducing a charge of washing solution into said vat, said washing solution essentially comprising an aqueous solution of a detergent, circulating through-

7. The method of detarnishing silver articles comprising placing said articles in a container having a drain hole in the bottom thereof and arranged in a vat, wherein said container also comprises an anode arranged in contact with said articles and formed of an element selected from the group consisting of aluminum and magnesium, introducing a charge of washing solution into said vat, said washing solution essentially comprising an aqueous solution of a detergent, circulating throughout a first predetermined time interval said washing solution from said vat into said container and therefrom through said drain hole and back into said vat, draining said washing solution from said vat to the exterior, introducing a charge of treating solution into said vat, said treating solution consisting essentially of an aqueous solution of sodium tripolyphosphate, circulating throughout a second predetermined time interval said treating solution from said vat into said container and therefrom through said drain hole and back into said vat, wherein the rate of circulation of said treating solution into said container is higher than the rate of drainage of said treating solution from said container so that a bath of said treating solution is accumulated in said container during said second predetermined time interval in submerging and wetting relation with said articles and said anode, drain-

ing said treating solution from said vat to the exterior, introducing a charge of rinsing solution into said vat, said rinsing solution essentially comprising an aqueous solution of a wetting agent, circulating throughout a third predetermined time interval said rinsing solution from said vat into said container and therefrom through said drain hole and back into said vat, and then draining said rinsing solution from said vat to the exterior.

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