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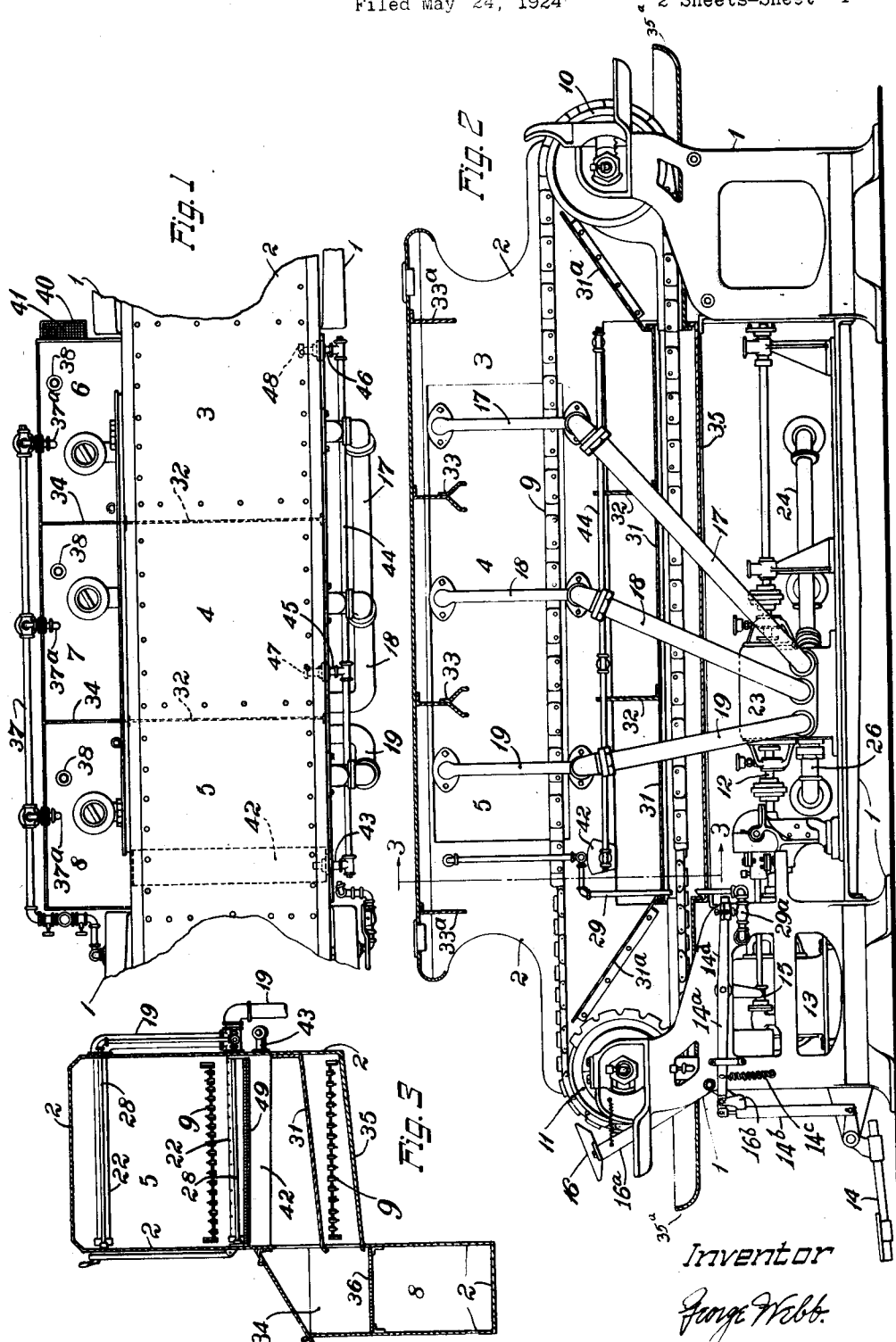
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1,719,409

MACHINE FOR WASHING DISHES AND OTHER ARTICLES

Filed May 24, 1924

2 Sheets-Sheet 1



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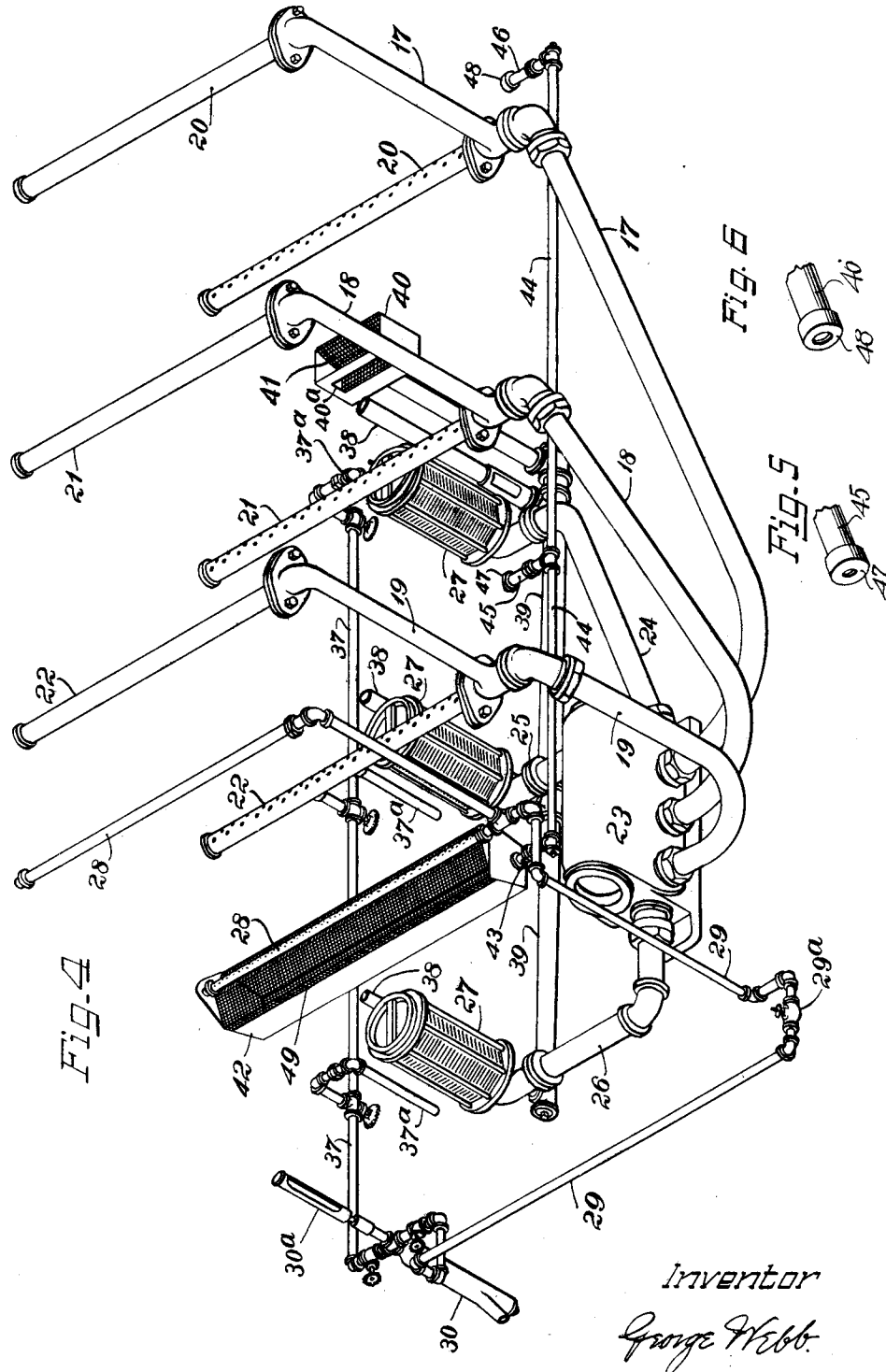
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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MACHINE FOR WASHING DISHES AND OTHER ARTICLES.

Application filed May 24, 1924. Serial No. 715,759.

The invention relates to washing machines of the class having a plurality of divisions in which the dishes or other articles to be cleaned are successively treated with
5 appropriate cleaning liquids. Each division is provided with a tank containing a cleaning liquid and means are associated with each tank for forcing liquid contained therein against the dishes or other articles
10 to be cleaned.

In machines of this class having two divisions in which the articles to be cleaned are successively treated with cleaning liquids, the tank corresponding to the first division usually contains a washing solution containing a suitable detergent, while the
15 tank corresponding to the second division contains hot rinsing water. In some machines the rinsing treatment takes place in a third division, such machines having an additional washing division provided with a corresponding tank containing a washing
20 solution where the articles to be cleaned are subjected to a second washing treatment prior to the rinsing treatment. In both two- and three-division machines, the dishes and other articles to be cleaned are usually treated, after their treatment with liquid from the tank containing the rinsing water,
25 with sprays of boiling water or boiling water and steam, which finally rinse and sterilize said articles and serve to add clean hot water to said tank, hereinafter called the rinse tank. In some cases, however, no such
30 final sprays are provided and the water in the rinse tank is then otherwise renewed and kept at a high temperature.

In two-division machines as heretofore constructed and arranged, the hot water
35 from the rinse tank passes through an overflow into the preceding tank containing the washing solution, hereinafter called the wash tank, and from the wash tank, into the waste outlet. Similarly, in three-division
40 machines, the overflow takes place from tank to tank, and from the first wash tank into the waste outlet. In this way, the cleaning liquid in each of the tanks is kept at a proper level and liquid of higher tem-

perature than the liquid in the respective
50 wash tanks is automatically added to said washing liquids in the operation of the machine.

The passage from one tank to the other in this way of substantially the same volume
55 of liquid as that of the clean water being supplied to the rinse tank in the operation of the machine, while it keeps the liquids in the wash tanks at the required level, also serves to rapidly dilute the washing solu-
60 tions in said tanks and thereby necessitates, in order to keep the said solutions at the required strength for effective treatment of the articles being washed, the frequent addition of detergent to said tanks, thus wast-
65 ing detergent and requiring frequent attention on the part of the operator.

Furthermore, where the clean water is supplied to said rinse tank, let us say, at the rate of one half a gallon per minute or
70 even more, which happens of necessity in machines having the clean water supplied to said tank by final rinsing and sterilizing sprays if said sprays are to accomplish their
75 primary function of rinsing and sterilizing effectively, it follows that by this system of overflow the washing solution in the first tank becomes, especially in the smaller machines in which the capacity of the tanks is
80 correspondingly small, within a short time too hot for effective cleaning, with the result that certain matter, instead of being loosened from the soiled dishes and other articles, is baked onto said dishes and articles and is consequently not removed by the
85 treatments they receive in the succeeding division or divisions of the machine.

In accordance with one object of the invention, particularly applicable to three-
90 division machines, I provide a means whereby liquids are transferred in regulated quantities directly from the final or rinsing division to each of the other divisions, so that the temperatures of the liquids in the said other divisions are properly maintained and so
95 that excessive temperatures and excessive dilution of the liquids are avoided. This is in contrast with the prior practice as already

described wherein the entire quantity of fluid supplied to the rinsing division was allowed to overflow without regulation or control through the successive other divisions.

In accordance with another object of the invention, I provide a means independent of the tank or container in the last division for collecting fluid in its movement from the articles toward the said container and collecting and diverting some of it directly into one or more of the other divisions.

In accordance with still another object of the invention, I provide a conveyor for moving the articles through the machine, means for supplying fresh liquid directly to each of two or more divisions, and means for cutting off the supply of fresh liquid whenever the conveyor is stopped.

Other and further objects of the invention will become apparent as the description proceeds.

In the accompanying drawings:

Fig. 1 represents a partial plan view of a dish washing machine to which the invention is shown applied, the covers and screens for the tanks having been removed.

Fig. 2 represents said machine in side elevation, the casing being shown in central vertical longitudinal section and parts having been broken away.

Fig. 3 represents a vertical transverse section through the casing of the machine and through the conveyor, the section being taken on the line 3—3 of Fig. 2.

Fig. 4 represents in an isometric view the fluid piping system of the machine, detached.

Figs. 5 and 6 are perspective views showing details.

The machine shown in the drawings is similar generally to that disclosed in Patent No. 1,640,693 for Machine for washing dishes and other articles, issued August 30, 1927 in the name of E. L. Couch, and comprises a frame 1 supporting a casing 2. The machine has divisions 3, 4 and 5 for washing, rewashing, and rinsing and sterilizing, respectively. Said divisions have, in their lower portions, see Figs. 1 and 3, corresponding tanks 6, 7 and 8 for containing the washing and rinsing liquids. These tanks are each arranged to receive liquid delivered against the articles in the corresponding division and preferably they are arranged laterally of the main frame 1 and the casing 2, thereby rendering said tanks readily accessible for emptying and cleaning, and leaving a space under the upper portion of the casing 2 for receiving parts to be described further on.

The dishes and other articles to be washed are moved through the upper portions of the divisions 3, 4 and 5 of the machine by an endless open-work conveyor 9, such as is fully disclosed, for example, in a patent

granted to E. L. Couch for Belt, No. 1,313,266, dated August 19, 1919, which is supported by two drums 10 and 11 arranged, respectively, at the receiving and delivery ends of the machine. The drum 11 has a driving engagement with said conveyor and is itself driven by suitable mechanism including a clutch 15 from the shaft 12 of the motor 13. The movement of the conveyor is controlled by suitable means, such as the foot treadle 14, which actuates the clutch 15. A pivoted lever 14^a is provided which is connected to the treadle 14 by means of a link 14^b. A spring 14^c engages the lever 14^a and tends to move it in the direction to disengage the clutch 15. By means of the treadle 14 and the link 14^b the lever 14^a is moved in opposition to the spring 14^c to engage the clutch.

The movement of the conveyor is further controlled by a safety device comprising the inclined shelf 16, Fig. 2, at the delivery end of the machine for guiding the clean dishes to a suitable table (not shown) provided to receive them. The shelf 16 is carried by an arm 16^a. A latch 16^b is interposed between the lever 14^a and a shoulder on the link 14^b, and a connection is provided between the arm 16^a and the latch 16^b so that movement of the arm toward the left will move the latch toward the right and disengage it from the link 14^b. The shelf 16 and arm 16^a may be moved toward the left when the shelf is engaged or caught by a broken dish or a hard piece of food or refuse or by anything which fails to pass freely over the top of the shelf. Such movement toward the left disengages the latch 16^b from the link 14 and permits the clutch 15 to be disengaged by means of the spring 14^c thus stopping the conveyor.

I provide means associated at least with each division ahead of the last division, and preferably with the said last division also, for forcibly delivering the liquid from the corresponding container against the articles being washed in a manner permitting the return thereof to its container. Preferably and as shown the liquids from the tanks 6, 7 and 8 are supplied under strong pressure through the pipe lines 17, 18 and 19 to their respective spraying terminals 20, 21 and 22 extending transversely through the respective divisions 3, 4 and 5 of the machine above and below the conveyor, see Figs. 2, 3 and 4, the pressure being transmitted by a suitable means, such as a multiple centrifugal pump 23 preferably driven by the same motor 13 which drives the conveyor. Inasmuch as the pump is connected with the motor directly, and not through the clutch 15, it will be understood that the starting and stopping of the conveyor do not in any way interfere with or affect the operation of the pump. The liquids are drawn from the respective tanks 6, 7 and 8 through pipe lines 24, 25

and 26, the ends of which within the tanks are provided with suitable filters 27 to insure that the liquids pass to the pump and the spraying terminals substantially free from solid matter.

When the spraying terminals 22 for the rinse tank 8 are provided as preferred and as shown spraying terminals 28 for the final rinsing and sterilizing treatment are located beyond them. These terminals may be varied as to form, but I have shown upper and lower pipes located respectively above and below the upper run of the conveyor. The terminals 28 are supplied with boiling water, or boiling water and steam, through a supply pipe line 29 which is shown, see Fig. 4, leading from a suitable mixer 30 having inlets for connecting a water line and a steam line. The mixer 30 may be provided as shown in Fig. 4, with a suitable temperature indicator, as 30^a.

The flow of liquid through the pipe line 29 to the spraying terminals 28 is governed by suitable valves, comprising a valve 29^a, which is preferably controlled by the mechanism for operating the clutch 15. An arm 14^a of the lever 14^a is provided with means for engaging the valve 29^a to open it. When the conveyor is being driven, the valve 29^a is open to permit the flow of liquid through the pipe line 29 to the spraying terminals 28, but it is automatically actuated to stop said flow in the operation of the clutch 15 to stop the conveyor.

To shield the lower span of the conveyor 9 and the drums 10 and 11 from any solid matter which may drop through the upper span of said conveyor and also to guide the liquids, forced from the openings in the spraying terminals 20, 21, 22 and 28 back to the laterally arranged tanks 6, 7 and 8, a lengthwise horizontal plate 31 having upwardly inclined end portions 31^a is provided between the lower spraying terminals and the lower span of the conveyor. The plate 31, though lengthwise horizontal, is laterally inclined downwardly toward the tanks, see Fig. 3, and has secured to it vertical plates 32 extending upward and forming partial partitions between the divisions 3, 4 and 5 of the machine. Corresponding partial partitions 33 depend from the top of the casing 2 and these are preferably branched at their lower portions, as shown in Fig. 2, to guide the liquids striking the top of the casing more surely into their respective tanks. Near the ends of the casing 2 and depending from its top are arranged the plates 33^a for preventing splashing of liquids from the open ends of the casing.

The laterally inclined plate 31 delivers the refuse and liquid falling upon it from the upper portions of the divisions 3, 4 and 5 of the machine into the laterally arranged tanks 6, 7 and 8 in the lower portions of said divi-

sions, the vertical partitions 34 between the tanks extending upward above the adjacent low side of the plate 31, see Fig. 3, and forming, with the corresponding partial partitions 32 and 33 in the upper portions of the casing 2 of the machine, means to aid in guiding the liquids into their respective tanks.

Just below the lower span of the conveyor, a second laterally inclined plate 35 is provided, see Figs. 2 and 3, said plate having connected to its opposite ends drip trays 35^a each extending beyond the adjacent drums supporting the conveyor. It will be seen that this plate and the connected trays shield the motor and parts of the mechanism mounted in the frame below them from any drippings from the conveyor, catching the same and returning them to the tanks.

The tanks are preferably provided, as shown in Fig. 3, with screens 36 to catch particles of offal washed from the dishes and into the tanks. These screens are readily removable for cleaning. To permit such removal and for other purposes, such as emptying or cleaning the tanks, said tanks are provided with a hinged cover, or covers, as shown in Fig. 3.

For filling the tanks or heating the water in the same, when filled, to the desired temperature, a supply pipe line 37 is provided leading from the mixer 30 hereinbefore referred to and having terminals 37^a, extending into the respective tanks 6, 7 and 8, the said terminals being preferably provided with steam heaters of known construction (not shown). By properly manipulating valves in the water and steam lines leading to the mixer 30, but not shown herein, water and steam may be admitted thereto simultaneously, or water or steam alone, as desired. The flow of water and steam from the mixer 30 to the tanks is controlled by suitable valves arranged in the pipe line 37 in a usual manner, see Fig. 4.

There is no intercommunication between the tanks through the partitions separating said tanks, and each tank is provided with a stand pipe 38, see Figs. 1 and 4, which connects with the waste pipe line 39 and prevents the liquid in its tank from rising above the level determined by the height of said standpipe. In addition to such a standpipe 38, which serves also as a means for emptying its tank, the first wash tank 6 is preferably provided with an elongated horizontal opening in one wall thereof communicating with a corresponding opening 40^a in the side of a waste trough 40 connected to the waste pipe line 39, see Figs. 1 and 4. The level of the bottom of said opening in the wall of the tank is preferably slightly below the level of the top of the standpipe 38 in said tank, so that scum and grease floating on the sur-

face of the washing liquid in this tank may drain off into the trough 40, and be there caught by a removable screen 41, which is removed from time to time and cleaned.

5 For the efficient operation of the machine, it is necessary and desirable to have the washing and rinsing liquids in the various tanks, when the machine is started in operation, at the proper temperature and level
10 and to maintain these conditions as nearly as possible in the continued operation of the machine without further attention on the part of the operator.

The proper temperature for the strong
15 washing solution in the first tank 6 is, let us say, from about 120° to 140° Fahrenheit; for the solution in the second tank 7, from about 170° to 190° Fahrenheit; for the rinse water in the third tank 8, as near the boiling
20 point or 212° Fahrenheit as possible; and for the final rinsing and sterilizing sprays which discharge into the rinsing division of the machine, the temperature of boiling water or live steam at atmospheric pressure, 212°
25 Fahrenheit.

In the machine hereinbefore described, the rinse tank 8 is kept at the proper level and temperature by the water flowing into it from the rinsing and sterilizing sprays which
30 discharge clean hot water at the rate of, let us say, about half a gallon per minute or even more, into said tank.

In order to maintain the proper conditions of temperature and level as regards the
35 liquids in the wash tanks during the operation of the machine, in accordance with the invention, a predetermined volume of the hot rinse water is automatically transferred from the rinsing division of the machine into
40 each of the washing divisions. In the embodiment of the invention selected for illustration a portion of the water from the final rinsing and sterilizing sprays is collected and transferred through a suitable conduit
45 or conduits to the respective washing divisions.

To this end, a trough or reservoir 42 is provided extending transversely of the casing 2 and located directly beneath the lower
50 member of one of the spraying devices in the rinsing division. As shown the trough is below the lower member of the terminal 28 and is arranged to catch a portion of the hot water discharged from the spraying openings
55 in the spraying terminals 28. From the lower portion of said reservoir which, in the operation of the machine, is kept constantly full to overflowing, a pipe line leads to each of the washing divisions 3 and 4 of the machine. This pipe line comprises a short
60 length of pipe 43 leading from the reservoir 42 to the outside of the casing 2, where it connects with a longitudinally extending pipe 44, which is slightly inclined downward
65 away from the reservoir 42, see Fig. 2, and

the short laterally extending pipes 45 and 46 leading from said longitudinal pipe 44 through the casing 2 into the washing divisions 4 and 3, respectively. The discharge
70 ends of said pipes 45 and 46 are preferably provided with some means whereby the size of the discharge orifices may be controlled. In the present embodiment of the invention, such means may comprise caps 47 and 48,
75 threaded onto the ends of the pipes 45 and 46, respectively, each cap having a discharge orifice of a size corresponding to the volume of hot water required to be added to each of the tanks 7 and 6 in order to maintain the proper conditions of temperature
80 and level in said tanks. The caps 47 and 48 are shown in detail in Figs. 5 and 6 respectively. As illustrated the opening in the cap 48 is slightly larger than that in the cap 47 thus permitting a larger quantity of liquid to flow into the washing division 3.
85 However, the relative sizes of the openings in the caps 47 and 48 may be widely varied in order to regulate the flow of liquid and thus maintain the proper temperatures. 90

By the foregoing construction it will be evident that the volume of hot water transferred from the rinsing division 5 of the machine to each of the washing divisions
95 may be readily controlled to suit given conditions either by changing the inclination of the longitudinal pipe 44, so as to change the head of water above the discharge orifices, or by substituting caps 47 and 48 having
100 orifices of different sizes, or by both these methods combined.

By this construction and arrangement, the volume of hot water admitted automatically to the wash tanks can be so controlled as to
105 be just enough to keep the solution in said tanks from falling below the level of the overflow outlets in said tanks thereby economizing not only in the use of water but also in the use of detergent, and to keep
110 said solutions at the proper temperatures for effective washing.

It will also be understood from the foregoing description that I have provided means for supplying fresh water or other liquid to each division of the machine, and
115 that the valve 29^a with the control devices therefor constitute means for cutting off the supply to the said divisions simultaneously with the stopping of the conveyor.

To prevent particles of refuse from dropping into the reservoir 42, the same is provided with a screen cover 49 which is highest along the central vertical plane of the reservoir and slopes toward each side of the same, whereby particles dropping on the
120 screen are easily washed off the same and fall with the overflow from the reservoir upon the inclined plate 31.

While the invention has been shown and described herein as applied to a three-divi- 130

sion dish washing machine having an endless conveyor for moving the articles to be washed through said divisions and a final rinsing and sterilizing spray for supplying fresh hot water to the machine, it will be understood that, with slight changes in the construction and arrangement of parts, within the skill of the mechanic, it may be applied to other types of dish washing machines having a plurality of tanks for containing the washing and rinsing liquids.

What I claim and desire to secure by Letters Patent is:

1. In a machine for washing dishes and other articles, the combination of three divisions in which the articles to be washed are successively treated with cleaning liquids and each including a liquid container and overflow means therefor separate from and independent of each other container, means for forcibly delivering the liquids from at least the first two of the containers against the articles being washed and for returning the said liquids to their respective containers, means for supplying clean liquid to the last division of the series, means for delivering the liquid so supplied against the articles being washed, and means for transferring clean liquid from the last said division directly to each other division.

2. In a machine for washing dishes and other articles, the combination of three divisions in which the articles to be washed are successively treated with cleaning liquids and each including a liquid container and overflow means therefor separate from and independent of each other container, means for forcibly delivering the liquids from at least the first two of the containers against the articles being washed and for returning the said liquids to their respective containers, means for supplying clean liquid to the last division of the series, means for delivering the liquid so supplied against the articles being washed, means for transferring clean liquid from the last said division directly to each other division, and means for regulating the quantity of liquid so transferred to each division.

3. In a machine for washing dishes and other articles having at least two divisions in which the articles to be washed are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against the articles in the said division, the combination of means for forcibly delivering the liquid from a container in a division ahead of the last division against the articles being washed in a manner permitting the return of the said liquid to its container, means for supplying liquid to the last division, means in the last division for delivering the liquid against the articles being washed, and means independent of the container in the last division and

located in part in the path of the liquid from the articles to the container for collecting a portion of the said liquid and transferring it directly to the first said division.

4. In a washing machine having two tanks and washing mechanism associated with each of them, the combination of sprays for directing rinsing liquid against the washed articles, and means for guiding a portion of the liquid from the rinse sprays into each of the tanks so as to cause an overflow from each tank.

5. In a machine for washing dishes and other articles having at least two divisions in which the articles to be washed are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against the articles in the said division, the combination of means for forcibly delivering the liquid from a container in a division ahead of the last division against the articles being washed in a manner permitting the return of the said liquid to its container, means for supplying liquid to the last division, means in the last division for receiving the liquid directly from the supplying means and delivering it against the articles being washed, and means independent of the container in the last division and located in part in the path of the liquid from the articles to the container for collecting a portion of the said liquid and transferring it directly to the first said division.

6. In a washing machine, the combination of a casing containing two tanks, means for circulating liquid from one of said tanks over the articles to be washed and returning it to its tank, means for circulating liquid from the other tank over said articles, means for directing a rinsing liquid against the washed articles, guiding means encountered by said second washing liquid and a part of the rinsing liquid after it has passed over the articles and adapted to direct this part of the liquid into one of said tanks so as to cause an overflow therefrom, and guiding means encountered by another part of the rinsing liquid after it has passed over the articles and adapted to direct it into the other tank so as to cause an overflow therefrom.

7. In a machine for washing dishes and other articles having at least two divisions in which the articles to be washed are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against the articles in the said division, the combination of means for forcibly delivering the liquid from the several containers against the articles being washed in a manner permitting the return of the said liquids to their respective containers, means for supplying additional liquid to the last division, means

in the last division supplemental to the
aforesaid delivering means therein for re-
ceiving the additional liquid directly from
the supplying means and delivering it
5 against the articles being washed, and means
independent of the container in the last di-
vision and located in the path of the addi-
tional liquid from the articles to the
container for collecting a portion of the said
10 liquid and transferring it directly to the first
said division.

8. In a machine for washing dishes and
other articles having a series of three di-
visions in which the articles to be washed
15 are successively treated with cleaning liquids
and each division including a liquid con-
tainer arranged to receive liquid delivered
against the articles in the said division, the
combination of means for forcibly deliver-
20 ing the liquids from the containers in the
divisions ahead of the last division against
the articles being washed in a manner per-
mitting the return of the said liquids to
their respective containers, means for sup-
25 plying liquid to the last division, means in
the last division for delivering the liquid so
supplied against the articles being washed,
and means independent of the container in
the last division and located in part in the
30 path of the liquid from the articles to the
container for collecting a portion of the said
liquid and transferring some of it to each
of the first said divisions.

9. In a machine for washing dishes and
35 other articles having a series of three di-
visions in which the articles to be washed
are successively treated with cleaning liquids
and each division including a liquid con-
tainer arranged to receive liquid delivered
40 against the articles in the said division, the
combination of means for forcibly deliver-
ing the liquids from the containers in the
divisions ahead of the last division against
the articles being washed in a manner per-
45 mitting the return of the said liquids to
their respective containers, means for sup-
plying liquid to the last division, means in
the last division for delivering the liquid so
supplied against the articles being washed,
50 means independent of the container in the
last division and located in part in the path
of the liquid from the articles to the con-
tainer for collecting a portion of the said
liquid and transferring some of it to each
55 of the first said divisions, and means for
regulating the quantity of liquid so trans-
ferred to each division.

10. In a machine for washing dishes and
other articles having at least two divisions
60 through which the articles to be washed are
moved and in which they are successively
treated with cleaning liquids and each di-
vision including a liquid container arranged
to receive liquid delivered against the ar-
65 ticles in the said division, the combination of

means for forcibly delivering the liquid
from a container in a division ahead of the
last division against the articles being
washed in a manner permitting the return
of the said liquid to its container, means 70
for supplying liquid to the last division,
means in the last division for delivering the
liquid so supplied against the articles being
washed, a trough independent of the con-
tainer in the last division and extending 75
across the machine transversely of and below
the path of movement of the articles there-
through for collecting a portion of the li-
quid delivered by the last said delivering
means, and a conduit connected with the 80
trough for transferring some of the liquid
directly to the first said division.

11. In a machine for washing dishes and
other articles having at least two divisions
through which the articles to be washed are 85
moved in which they are successively treated
with cleaning liquids and each division in-
cluding a liquid container arranged to re-
ceive liquid delivered against the articles in
the said division, the combination of means 90
for forcibly delivering the liquid from a con-
tainer in a division ahead of the last division
against the articles being washed in a man-
ner permitting the return of the said liquid
to its container, means for supplying liquid 95
to the last division, means in the last divi-
sion for delivering the liquid so supplied against
the articles being washed, a trough independ-
ent of the container in the last division and
extending across the machine transversely of 100
and below the path of movement of the
articles therethrough for collecting a portion
of the liquid delivered by the last said de-
livering means, and a conduit connected with
the trough for transferring some of the 105
liquid directly to the first said division, the
said conduit being restricted in capacity so
as to carry less than the total amount of
liquid collected by the trough thus causing
some of the liquid to overflow from the 110
trough and be directed into the correspond-
ing container.

12. In a machine for washing dishes and
other articles having at least two divisions
115 through which the articles to be washed are
moved and in which they are successively
treated with cleaning liquids and each divi-
sion including a liquid container arranged to
receive liquid delivered against the articles
in the said division, the combination of 120
means for forcibly delivering the liquid from
a container in a division ahead of the last
division against the articles being washed in
a manner permitting the return of the said
liquid to its container, means for supplying 125
liquid to the last division, means in the last
division for delivering the liquid so supplied
against the articles being washed, a trough
independent of the container in the last di-
vision and extending across the machine 130

transversely of and below the path of movement of the articles therethrough for collecting a portion of the liquid delivered by the last said delivering means, a conduit connected with the trough for transferring some of the liquid directly to the first said division, and a screen normally covering the said trough to prevent foreign material washed from the articles being transferred with the liquid to the first said division.

13. In a machine for washing dishes and other articles having at least two divisions in which the articles to be washed are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against articles in the said division, the combination of an endless conveyor having its upper run arranged for moving the articles to be washed through the successive divisions, means for forcibly delivering the liquid from a container in a division ahead of the last division against the articles being washed in a manner permitting the return of the said liquid to its container, means for supplying the liquid to the last division, means in the last division for delivering the liquid so supplied against the articles being washed, the said means including a perforated pipe arranged transversely of and immediately below the upper run of the conveyor, a trough independent of the container in the last division and located immediately below the said perforated pipe for collecting a portion of the liquid delivered by the last said delivering means, and a conduit connected with the trough for transferring some of the liquid directly to the first said division.

14. In a machine for washing dishes and other articles, the combination of a casing having at least two divisions in which the articles to be washed are successively treated with cleaning liquids, liquid containers associated with the respective divisions at one side of the casing and each arranged to receive liquid delivered against the articles in the corresponding division, means for forcibly delivering the liquid from a container in a division ahead of the last division against the articles being washed in a manner permitting the return of the said liquid to its container, means for supplying liquid to the last division, means in the last division for delivering the liquid so supplied against the articles being washed, a trough independent of the container in the last division and extending across the casing transversely of and below the path of movement of the articles therethrough, for collecting a portion of the liquid delivered by the last said delivering means, and a pipe connected with the trough and extending externally of the casing along the side opposite the said containers and

serving to transfer some of the liquid to the first said division.

15. In a machine for washing dishes and other articles having at least two divisions through which the articles to be washed are moved and in which they are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against the articles in the said division, the combination of a conveyor for moving the articles to be washed through the said divisions successively, means for forcibly delivering the liquids from the several containers against the articles to be washed as said articles are moved by the conveyor, means for supplying additional liquid directly to each of the said divisions independently of the liquid container in any other division, means for driving the conveyor, and two interconnected devices respectively serving simultaneously to stop the action of the conveyor driving means and to cut off the said supply of additional liquid to all of the said divisions.

16. In a machine for washing dishes and other articles having at least two divisions through which the articles to be washed are moved and in which they are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against the articles in the said division, the combination of a conveyor for moving the articles to be washed through the said divisions successively, means for forcibly delivering the liquids from the several containers against the articles to be washed as said articles are moved by the conveyor, means for supplying additional liquid directly to each of the said divisions independently of the liquid container in any other division, power mechanism for operating the said liquid delivering means and the said conveyor and including means whereby the conveyor may be stopped and started while the liquid delivering means continues in operation, and two interconnected devices respectively serving simultaneously to stop the conveyor while the liquid delivering means continues in operation and to cut off the said supply of additional liquid to all of the said divisions.

17. In a machine for washing dishes and other articles having at least two divisions in which the articles to be washed are successively treated with cleaning liquids and each division including a liquid container arranged to receive liquid delivered against articles in the said division, the combination of an endless conveyor having its upper run arranged for moving the articles to be washed through the successive divisions, means for forcibly delivering the liquids from a container in a division ahead of the last division against the articles being

washed in a manner permitting the return of the said liquid to its container, means for supplying additional liquid directly to each of the said divisions independently of the
5 liquid container in any other division, means for driving the conveyor, a movable shelf for receiving articles from the conveyor, and two interconnected means automatically operable by movement of the shelf and respectively serving simultaneously to 10 stop the action of the conveyor driving means and to cut off the said supply of additional liquid to all of the said divisions.

This specification signed this 23d day of May, A. D. 1924.

GEORGE WEBB.