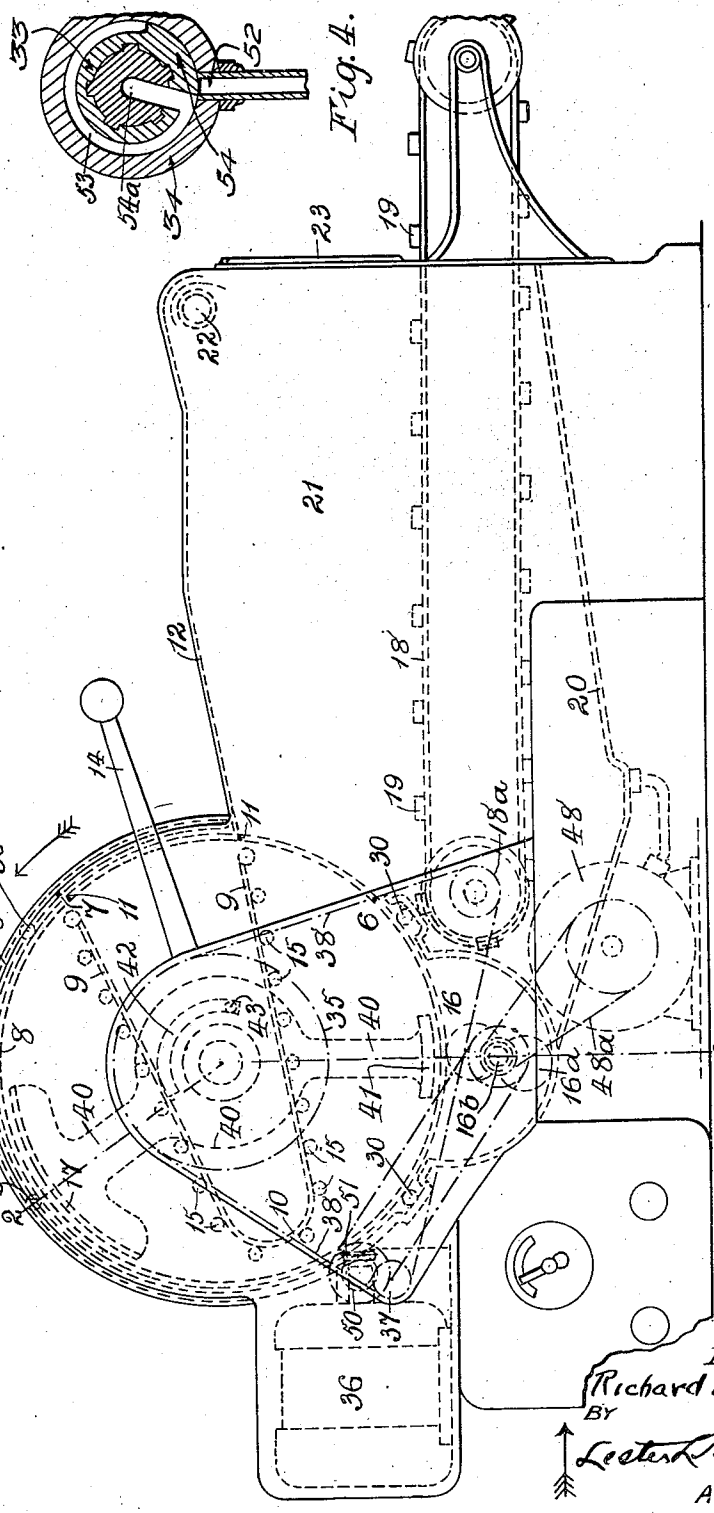
Feb. 19, 1946. R. NUNDY 2,395,009

MACHINE FOR WASHING PLATES, DISHES, AND OTHER ARTICLES USED FOR MEALS

Filed Oct. 8, 1943 3 Sheets-Sheet 1



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Filed Oct. 8, 1943 3 Sheets-Sheet 2

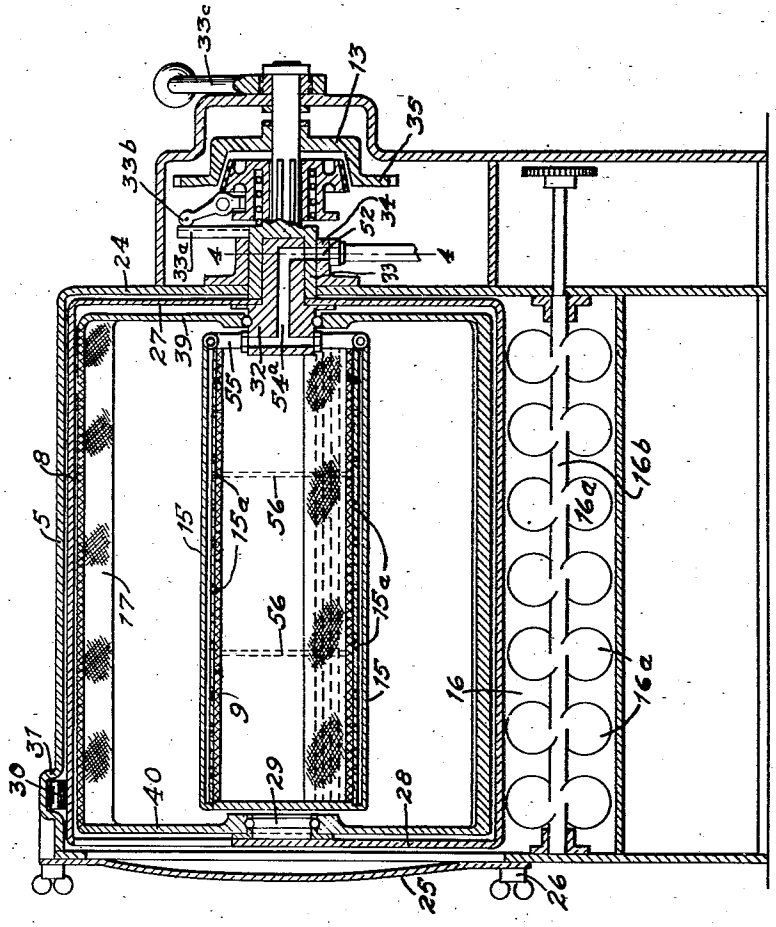


Fig. 2.

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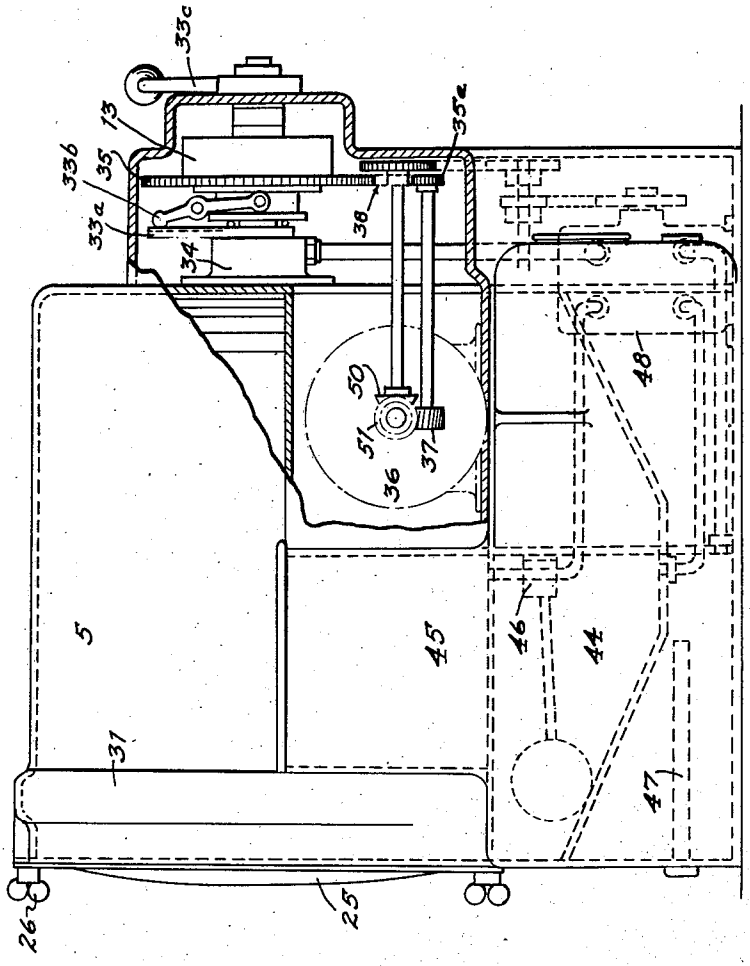


Fig. 3.

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UNITED STATES PATENT OFFICE

2,395,009

MACHINE FOR WASHING PLATES, DISHES, AND OTHER ARTICLES USED FOR MEALS

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Application October 8, 1943, Serial No. 505,546
In Great Britain August 13, 1941

11 Claims. (Cl. 134—112)

The invention relates to washing plates, dishes and other articles used for meals, and has for its object to provide a novel or improved machine for such purpose.

A machine constructed according to the invention comprises an outer or stationary drum and an inner drum each disposed with its axis horizontal, the inner drum being adapted to be turned within the outer drum. The outer drum has a relatively large peripheral opening, the upper part to receive the articles, preferably from a convenient chute, and the lower part being for the articles to pass out through it, preferably on to a suitable conveyor; or the outer drum may have two openings one to receive the articles and the other to allow the articles to pass out. The inner drum contains a chamber of wire gauze or fine wire mesh extending substantially the whole length of the drum and being preferably somewhat triangular or parabolic in shape in cross-section, the apex of the triangle or parabola extending to near the inner surface of the drum but so as to leave a small space. Surrounding the gauze or mesh, and extending along the inner drum are tubes to receive hot water and expel it in jets through holes formed in the tubes, the holes being so placed that the jets of water are projected through the gauze or mesh and caused to impinge on an article or articles within the chamber. This latter has a single opening extending for substantially the length of the chamber and being positioned opposite a corresponding opening in the periphery of the inner drum.

The inner drum is rotated, one revolution at a time, such as by an electric motor; and clutch means are provided to disconnect the drive automatically when the opening of the inner drum comes opposite the upper opening in the outer drum or the upper part of a single opening therein. A plate, dish or other article or articles are then inserted, such as by passing them down the chute, and it, or they, enter the gauze chamber. The clutch is then engaged by hand when the inner drum makes a revolution and again stops. The movement of the inner drum automatically opens a passage for the hot water and automatically closes it when the opening in the inner drum comes opposite the lower opening or lower part of the opening in the outer drum. Meanwhile the article or articles are subjected to the action of the hot water jets on both sides and, owing to the shape of the chamber, it or they turn over. The wire gauze or mesh affords a yielding support for the article or articles so that there is no liability of breakage. The triangular or parabolic formation of the chamber ensures that the article or articles will turn over during the washing operation.

As the articles leave the drums they may be passed down on to a suitable conveyor extending through a heated drying chamber.

A convenient embodiment of the invention is described with reference to the drawings herewith, of which—

Figure 1 is a side view showing the machine in somewhat diagrammatic form.

Figure 2 is a transverse section taken on the irregular line 2, 2, of Figure 1.

Figure 3 is an end view, partly broken away, to show parts within, and looking in the direction of the arrow at the extreme left hand end of Figure 1.

Figure 4 is a fragmentary sectional view, to an enlarged scale, the section being taken in the plane indicated by the line 4, 4, of Figure 2.

In these drawings, 5 indicates the outer or fixed drum. It has an opening at one side extending substantially the length of the drum and having a peripheral depth extending between the numerals 6 and 7 in Figure 1. Within the drum 5 is a rotatable drum 8 of a diameter sufficiently less than that of the drum 5 to allow of its free rotation therein. Fixed within the drum 8 is a chamber 9 of wire gauze and of somewhat parabolic form. The apex 10 of the chamber is distanced away from the wall of the inner drum. The drum 8 has a peripheral opening 11, 11, so that the chamber 9 is completely open at its base.

The articles to be washed are placed on a sloping table 12, and (when the drum 8 and chamber 9 are in the position indicated in Figure 1) they slide, or are impelled by hand, one at a time, into the chamber 9. A clutch 13 (see Figures 2 and 3) is then operated by a handle 14 (see Figure 1) and the drum 8 with the chamber 9 commences to rotate. As soon as the bottom of the opening 11, 11, reaches the point 7 the drum 8 becomes closed, and, at this point of time, hot water is turned on to flow to tubes 15 fixed in the drum 8 immediately outside the chamber 9 and the tubes have holes 15a through which jets of water are directed through the gauze wall of the chamber 9 and on to the article or articles within.

At the bottom of the drum 5 is a well 16 to receive water flowing down through the gauze wall of the chamber 9, and in the well are a number of impellers 16a which agitate the water in the well and at the bottom of the drum 5 throwing

it up over the article in the chamber, when the mouth of the chamber 9 comes opposite the well.

To prevent the article falling into the well at this time a gauze cover 17 has moved to position covering the mouth of the chamber 9 so that the article rests on the gauze cover.

When the lower edge of the opening 11, 11, reaches the point 6 the article can slide out from the chamber 9 through the opening 6, 7, of the drum 5, and fall on to a conveyor 18 provided with rubber cushions 19. The gauze cover 17 has in the meantime moved clear of the opening 11, 11. Below the conveyor is a sump 20 and above it a chamber 21 strongly heated by an electric heating element 22. The articles follow each other along the conveyor and pass out dry from the chamber 21 through a flap door 23. Water draining from the articles as they leave the chamber 9 passes down through the conveyor into the sump 20, also water from the drum 5 is allowed to overflow into the sump 20 at a point just below the bottom of the opening 6, 7.

When the drum 8 and chamber 9 come to the position shown in Figure 1 the clutch 13 is automatically thrown out. The clutch is not described in detail and may be of a known type. The part 33 has on it a striker 33*a* which, at the end of each revolution, strikes a lever 33*b* which moves back the inner clutch member and disengages it from the outer member. 33*c* is a hand lever connecting with the main shaft through a free-wheeled device; thus by moving up the lever the drum is rotated and the striker 33*a* leaves the lever 33*b* so that the clutch reengages.

The right hand end, as seen looking at Figure 2, of the outer drum 5 is permanently closed by a wall 24 but its left hand end is closed by a removable cover 25 secured by wing nuts 26. The right hand end of the inner drum is also permanently closed by a wall 27; but its left hand end is left open except for a spider 28 carrying a journal 29, the purpose of which is described hereinafter. The journal is carried by the spider and supports one end of the frame 40. It does not support the chamber 15 and has no need to do so, since the chamber 15 is carried by the rotatable drum 8.

The inner drum is, at its left hand end, supported for rotation by a set of rollers 30 having axles carried in a channel 31 of the drum 5. The right hand end of the inner drum 8 is supported by a journal block 32 splined within a sleeve 33 which is adapted to turn in a bearing 34 fixed to the outer surface of the wall 24. The sleeve 33 is driven through the clutch 13 by a chain sprocket wheel 35. This latter is constantly driven from an electric motor 36 through a second sprocket wheel 35*a*, chain 38, and worm gear 37. The chain 38 also drives the conveyor 18 by the sprocket wheel 18*a*.

Journalled on ball bearings of the block 32 is an end frame 39 supporting the right hand end of the gauze cover 17, the left hand end of which is supported by a frame 40 journalled on a ball bearing of the journal 29 already referred to. The frames 39 and 40, also carry a counterweight 41 to over balance the weight of the cover 17 and tend to impel it to the position shown in Figure 1. In the frame 39 is a concentric slot 42 in which engages a stud 43 (see Figure 1) carried by the wall 27 and by the engagement of this stud against the ends of the slot the movement of the cover 17 is controlled to ensure that it will close the aperture 11, 11, before the article can fall out from the chamber 9, into the well and will open it again before the lower edge of the opening 11, 11, reaches the point 6.

After removal of the cover 25 the inner drum can be completely removed its journal block 32 sliding out from the internal splines of the sleeve 33. The chamber 9 and the gauze cover 17 remain in the drum 8. Access for cleaning is obtained through the spider 28 and the aperture 11, 11, of the chamber 9. The interior of the drum 5 and the well 16 are also open for cleaning.

The water supply to the tubes 15 is derived from a hot water tank 44 fed from a header tank 45 through a ball valve 46. Within the tank 44 are electric heating elements 47 one of which is shown in Figure 3. Water is pumped from the tank 44 by a pump unit 48 (see Figure 1) driven by chain and sprocket gear 48*a* from the shaft 16*b* which drives the impellers 16*a*. This shaft is driven by chain-and-sprocket gear from a bevel wheel 50 engaging with a bevel wheel 51 on the end of the shaft of the motor 36.

The pump unit 48 delivers the hot water to a port 52 (see Figures 2 and 4) in the bearing 34. The sleeve 33 has a groove 53 extending round the greater part of its periphery and opposite the port 52. Between the ends of the groove 53 is a solid portion 54 which, by covering the port 52, stops the water supply to the groove 53 during the time any part of the opening 11, 11, is exposed to the opening 6, 7. The groove 6 is in constant communication with a central bore 54*a* in the journal block 32 and from the bore 54*a* the tubes 15 are fed by radial pipes 55.

The journal block 32, after having been removed from the sleeve 33, must of course be replaced in the same position relative thereto, and for this reason the splines connecting these parts are irregularly placed.

Water collected in the sump 20 may be pumped therefrom by the pump unit 48 back to the header tank 45. The pump is a double pump having two separate parts. Almost any conventional rotary pump may be used.

By the provision of removable gauze partitions 56 (see Figure 2) supplied with the machine, and adapted to be inserted as required in the chamber 9, several articles may be washed at the same time without risk of breakage.

Having fully described my invention what I claim and desire to secure by Letters Patent is:

1. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a perforated chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said perforated chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the perforations on to the article within the chamber and means for intermittently turning said inner drum together with the said chamber within it.

2. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a perforated chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed horizontally and adjacent to the outer surface of said perforated chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the perforations on to the article within the chamber and means for intermittently turning said inner drum together with the said chamber within it.

3. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a perforated chamber of parabolic form fixed within said inner drum and extending substantially the whole length thereof, said chamber being open at its base to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said perforated chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the perforations on to the article within the chamber and means for intermittently turning said inner drum together with the said chamber within it.

4. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of saidwire gauze chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, and means whereby the supply of hot water to the tubes is cut off while the said aperture in the inner drum is coinciding with the said aperture in the outer drum.

5. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, a removable cover at one end of said outer drum, and a driving member upon which said inner drum is mounted in a manner to allow of its being driven thereby but removable endwise therefrom.

6. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, a removable cover at one end of said outer drum, a driving member upon which said inner drum is mounted in a manner to allow of its being driven thereby but removable endwise therefrom, said inner drum being open at the end thereof which is presented to said one end of said outer drum and roller bearings engaging and supporting the periphery of said inner drum at the respective end thereof.

7. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, and a clutch through the medium of which said inner drum is intermittently turned, said clutch being adapted to be engaged by hand and automatically dis-

engaged when the inner drum has made a complete revolution.

8. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards such chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, and means for intermittently turning said inner drum together with the said chamber within it, a well at the bottom of said outer drum, impellers turnably mounted in said well and means for driving said impellers whereby they throw water from the well over the article when the said open base of the gauze chamber comes opposite the said well.

9. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards such chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, a well at the bottom of said outer drum, impellers turnably mounted in said well, means for driving said impellers whereby they throw water from the well over the article when the said open base of the gauze chamber comes opposite the said well, a gauze cover within said inner drum pivotally mounted therein, a counter weight connected to such gauze cover in a manner to ensure that said gauze cover will cover the aperture in said gauze chamber when said aperture is over said well to prevent said article from falling thereinto.

10. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for the passage of articles therethrough, a wire gauze chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said wire gauze chamber, holes in such tubes directed towards said chamber through which jets of hot water may be directed through the wire gauze on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, a removable cover at one end of said outer drum, a journal at one end of said inner drum, a sleeve splined on said journal, a bearing attached to the respective end of said outer drum and supporting said sleeve, said journal being withdrawn from said sleeve when said inner drum is withdrawn from said outer drum, a port in said bearing, a hot water supply pipe communicating with said port, a peripheral groove in said sleeve extending the greater part of the way therearound, a solid portion between the ends of said groove and adapted to close said port when said aperture in the inner drum is opposite said aperture in the outer drum, and a longitudinal passage in said journal connecting said groove with said tubes surrounding said chamber.

11. A machine for washing articles used for meals and comprising an outer stationary drum, an aperture in the peripheral wall of said outer drum, an inner rotatable drum, both drums being disposed with their axes horizontal, an aperture in the peripheral wall of said inner drum adapted to register with the aperture of the outer drum for passage of articles therethrough, a perforated chamber fixed within said inner drum and extending substantially the whole length thereof, said chamber being open to the aperture in the periphery of said inner drum to receive articles therethrough when said aperture in said inner drum comes opposite the said aperture in the outer drum, tubes for hot water supply disposed adjacent to the outer surface of said perforated chamber, holes in such tubes directed through the perforations on to the article within the chamber, means for intermittently turning said inner drum together with the said chamber within it, and removable perforated partitions within said perforated chamber to allow of several articles being washed at the same time without risk of breakage.

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