Sept. 11, 1934. F. P. BLAIR 1,973,327

DISHWASHING DEVICE

Filed Jan. 5, 1931

Fig. 1

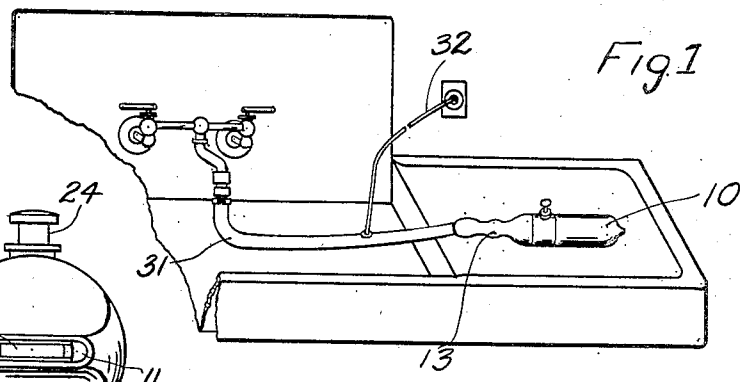


Fig. 5

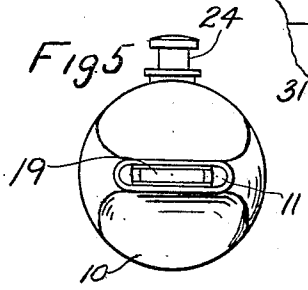


Fig. 2

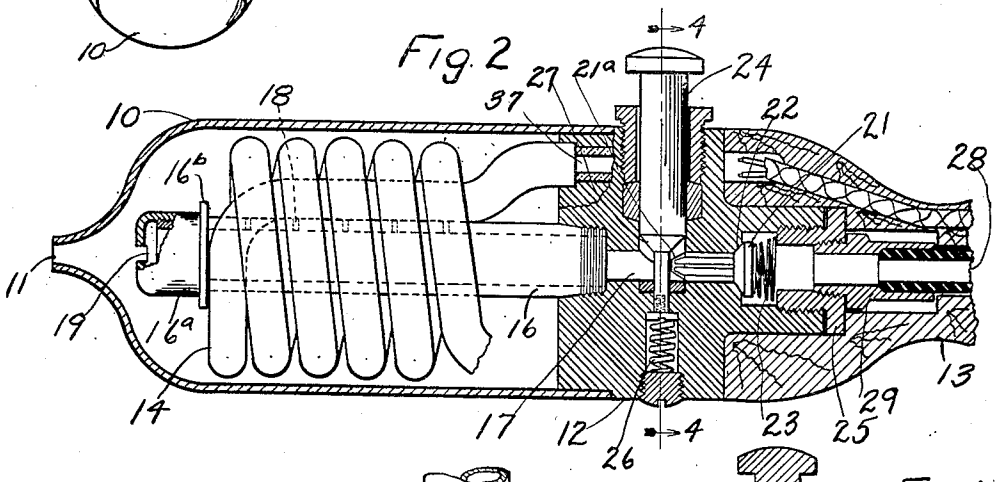


Fig. 3

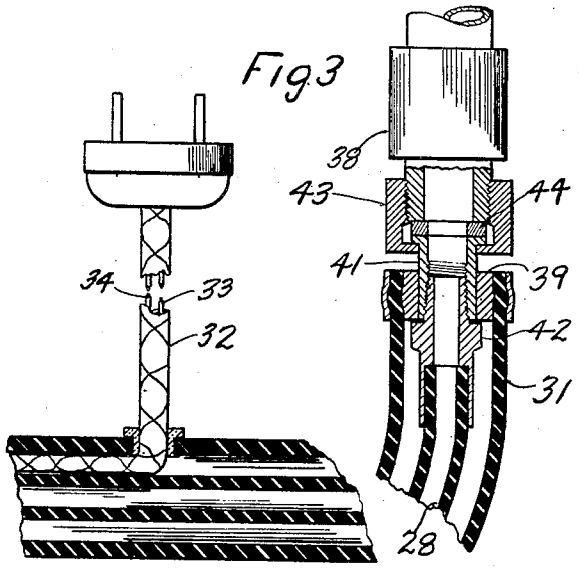
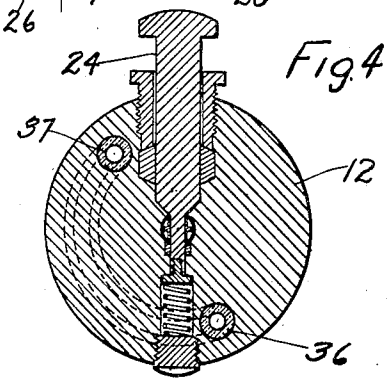


Fig. 4



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1,973,327

DISHWASHING DEVICE

Frank P. Blair, Chicago, Ill., assignor to Emil F. Stern and Marion W. Grigsby, both of Chicago, Ill.

Application January 5, 1931, Serial No. 506,659

12 Claims. (Cl. 219—39)

My invention relates in general to a washing device and in particular to a hand controlled device for washing dishes.

The principal object of the invention is the provision of a simplified dishwasher.

Another object is to construct a dishwasher adapted to be vended economically for ordinary home use.

Another object is the provision of a dishwasher which would completely wash and sterilize the dishes in a relatively short period of time.

Other objects and features of the invention will be apparent from a consideration of the following detailed description taken with the accompanying drawing, wherein

Fig. 1 is a general view of the dishwasher showing the manner in which it is connected,

Fig. 2 is an enlarged fragmentary sectional view showing the main features of the device.

Fig. 3 is a sectional view showing the manner in which the device is attached and details of construction of the water and current supply cable, and

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 2, and

Fig. 5 is an end view of the device, showing the boiler and water tube outlets.

According to the general features of the invention, I provide a relatively small washing device adapted to be held in the hand and supplied with electric current energizing a heating element; and water, preferably hot, which is controlled to generate hot water and steam or steam alone for dishwashing and sterilizing purposes. The washing device is provided with a nozzle through which the washing fluid passes and which may be directed in a stream against the article to be treated.

Referring to Fig. 2, the washing device itself comprises a boiler 10, having a narrow flat outlet orifice 11 and suitably connected to a body portion 12. A handle 13 connected to the body portion serves as a means for grasping the device when in use. A heating element 14 of a character to be described, is housed in the boiler and within the heating element is a water passing chamber 16 connected centrally to the body portion and adapted to communicate with the water opening 17 in the body portion. The water chamber has a plurality of small radial openings 18 and an end opening 19, the water being adapted to pass through the radial openings and the front opening, depending upon the manner in which the fluid is controlled. The water passing through the radial openings strikes against the heating element and immediately is converted into steam, which is adapted to pass through the opening 11 in the boiler. Water over a predetermined amount passes through the front opening 19 in the water chamber and when so controlled, the device expels a mixture of steam and hot water, or very hot water at the boiling point, as required.

The water is controlled by a valve system, including a valve plunger 21 adapted to engage against a seat 22, formed centrally of the body portion, the valve normally being held against the seat by a spring 23. A valve operating plunger 24, normally held in an inoperative position by a spring 26 has a cam or tapered portion 27 adapted to engage a tapered portion 21*a* on a valve plunger 21. The pressure on the valve operating the plunger 24 by the thumb engages the portion 27 against the portion 21*a*, thereby forcing the valve plunger 21 away from its seat 22 and so allows the passage of water therethrough. The plunger 21 is fluted as shown, the water passing through the fluted portions when the valve is open. The tension of the spring 23 is controlled by the position of the coupling member 25.

The handle is hollow as shown and is adapted to pass a flexible water tube 28, which is connected to the body portion by a coupling member 29, threaded into the member 25. This flexible water tube is housed in a flexible casing 31, which also houses a cable 32 carrying a pair of conductors 33 and 34 adapted to be connected through a suitable plug to an ordinary electrical outlet. The conductors enter the body portion and are distributed to the heating element through insulated conduit canals 36 and 37 in the body portion. A channel 35 in the handle portion serves to pass one of the conductor pairs to the canal 36.

As to the heating element, I prefer the use of a standard type of element, including an outside casing with an inside heating element embedded in a suitable insulating material, such as asbestos. Other types of heating elements, however, may be employed. The heating element is held in position in any suitable manner. In my present embodiment the water tube 16 has an end cap 16*a* threaded to it, and a flange 16*b* which engages the heating element and forces and holds the ends thereof in openings in the body member formed as continuations of the insulated canals 36 and 37.

The flexible water tube is connected by suitable means to a hot water faucet 38. I show a construction which gives good results, in which a terminal plug 39 is provided in the flexible casing

and in which is inserted a coupling 41, to which an end coupling 42 on the flexible water tube is adapted to connect. A coupling nut 43 is threaded to the outlet end of the faucet and has a flange engaging a flange on the coupling member 41 to couple this member with the faucet. A suitable gasket 44 is inserted to provide a tight connection. This permits the device to be attached to the faucet without turning the casing or flexible water tubing.

In the operation of the device the flexible tubing is connected to a source of hot water and an electrical connection is made to an ordinary commercial source of power. This immediately generates heat in the heating element, but initially the water is prevented from passing into the water tube 16 by the hand operated valve system. The plunger 24 may then be depressed to pass the water into the boiler for the operation of the device.

I design the water tube so that when full water pressure is applied thereto approximately 80% of the water will pass through the opening 19 and about 20% thereof will pass through the openings 18. This is the condition when the plunger 24 is fully depressed. When operated in this way the portion of the water passing through the openings 18 strikes the hot heating element and immediately is generated into steam which then passes out through the orifice 11 with the main body of water. Some heat is imparted to the water by its passage through the water tube and boiler, and by the combination of the steam therewith. However, I prefer that the water supplied to the water tube should initially be heated by the ordinary hot water heating system employed in most establishments. This water should be somewhere between 140 degrees and 200 degrees to obtain the best results with the device as here designed, that is, with the commercial device as now engineered and which the patent drawing shows in substantial detail.

When the plunger 24 is only slightly depressed and a small amount of water only passes into the water tube, the most of this water will pass through the openings 18 and clear steam will be passed out through the opening 11. This is used preferably after the dishes have been washed, as the steam not only sterilizes the washed dishes, but aids greatly in the drying thereof. I have found that if live steam is directed against the dishes they can be thoroughly dried without the use of a towel or other equipment but merely by the use of the steam in approximately one minute of time.

In using the device, therefore, the dishes are placed in a suitable rack and the plunger 24 substantially fully depressed, and the resulting stream of hot water and steam directed against the dishes until all foreign matter has been removed therefrom. The plunger 24 is then released slightly until steam alone passes through the orifice 11, and this is directed against the dishes to complete the washing operation and sterilizing of the dishes. The dishes are then allowed to stand in the tray a short time and are found to be thoroughly washed, dried and sterilized.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. In a dishwashing device, a frame member, a boiler connected to one side of the frame member and having an outlet orifice, a handle secured to the opposite side of the frame member, a heating element in the boiler, a flexible water tube extending through the handle and adapted to be connected to a source of hot water supply, and means, operated while the handle is grasped in the hand, for directing water against the element to generate steam in the boiler, the steam passing through said boiler outlet orifice, and means for directing hot water directly through said orifice without contact with the heating element.

2. In a dishwashing device, a frame member, a boiler connected to one side of the frame member and having an outlet orifice, a handle secured to the opposite side of the frame member, a heating element in the boiler, a flexible water tube extending through the handle and adapted to be connected to a source of hot water supply, and means, operated while the handle is grasped in the hand, for directing water against the element to generate steam in the boiler, the steam passing through said boiler outlet orifice, and means for directing hot water directly through said orifice without contact with the heating element.

3. In a dishwashing device, a flexible casing, a flexible water tube in the casing adapted to be connected to a source of hot water supply, an electrical conductor also carried by the flexible casing, a heating element heated by current supplied by said conductor, means for directing water from the flexible tube against the heating element to generate steam, means for directing the steam so generated against the dishes, and means for directing hot water directly through said orifice without contact with the heating element.

4. In a dishwashing machine, a boiler having an outlet orifice, a heating element in the boiler, means for directing water in finely divided condition against the element to generate steam and means for directing additional water through the outlet orifice without coming in contact with the heating element.

5. In a dishwashing machine, a boiler having an outlet orifice, a longitudinally axially aligned water tube having an end opening and radial openings, a heating element in the boiler surrounding the water tube, and means for supplying a controlled amount of water to the water tube, the openings in the water tube being positioned and dimensioned so that at substantially full normal water pressure, about eighty percent. of the total water passes through the end opening.

6. In a dishwashing device, a body member, a boiler connected thereto, a longitudinally extending water tube in the boiler secured to the body member at one end and free at the other end, a heating element surrounding the water tube and extending substantially the length thereof, with its ends projecting into openings in the body member, and means on the free end of the water tube for removably holding said heating element ends in the body member.

7. In a dish washing device, a frame member, a boiler secured on one side of the frame member and a handle on the other side of said frame member, a heating element in the form of a hollow tube disposed in the form of a helix, and having its ends disposed parallel to each other, a resistance element in the heating element tube, a water tube carried by the frame and disposed axially of the heating element, said water tube having radial apertures for discharging water against the heating element, an apertured cap threaded on the water tube and having a flange engaging the heating element to hold it assem-

bled to the frame, and means for controlling the quantity of water admitted to the water tube, the boiler having a nozzle for directing hot water or steam from the boiler against the dishes.

8. The combination defined in claim 7, including a flexible water connection extending through the handle and adapted to be connected to a source of hot water supply, and a flexible electrical conductor also extending through the handle and adapted to connect to the heating element.

9. In a dish washing device, a frame member, a boiler secured on one side of the frame member and a handle on the other side of said frame member, a heating element in the form of a hollow tube disposed in the form of a helix, and having its ends disposed parallel to each other, a resistance element in the heating element tube, a water tube carried by the frame and disposed axially of the heating element, said water tube having radial apertures for discharging water against the heating element, an apertured cap threaded on the water tube and having a flange engaging the heating element to hold it assembled to the frame, and a valve controllable by a finger when the handle is grasped for controlling an amount of water delivered to the water tube.

10. In a portable dishwashing machine, a boiler having an outlet orifice, a longitudinally extending water tube disposed through the center of the boiler and having an end orifice opening within the boiler and aligned with the outlet orifice, with said end orifice spaced away from the outlet orifice, a heating coil surrounding the water tube with said tube having radial openings for spraying water onto said coil, a water supply for said water tube and means for controlling said supply whereby steam may be generated in the boiler and water heated in the tube to mix just inside the outlet orifice and pass therefrom in a directed stream.

11. In a portable dishwashing machine, a frame member, a handle secured on one side of the frame member, a boiler secured on the other side thereof, having an outlet orifice at its opposite end, a water tube extending longitudinally of the boiler in alignment with the outlet orifice and having radial openings along the length thereof, a heating coil carried around the water tube, a water passage extending through the handle to the frame member, and valve means carried in the frame member for controlling the water supply through the frame member to the water tube in a manner whereby a portion of the water is discharged through the radial openings to be generated into steam, and the remaining portion heated in the water tube and discharged therefrom to mix with the steam and be directed in a stream from the outlet orifice.

12. In a portable dishwashing machine, a body member, a handle secured on one side of the body member, a boiler secured on the other side thereof having an outlet orifice at its opposite end, means for carrying water from the body member to the outlet orifice and heating means surrounding said first means, a water passage through the handle to the body member, a longitudinal opening in the body and a valve in the body member for controlling the water flow through the longitudinal opening to the water carrying means, said valve comprising a longitudinally extending plunger seated at one end of the longitudinal opening, and a valve operating plunger carried vertically in the body member adapted to engage one end of the longitudinally extending plunger to move it outwardly from its seat at one end of the longitudinal opening and permit the flow of water therethrough from the handle to the boiler whereby steam is generated in the boiler and water heated to be mixed and discharged therefrom through the outlet orifice.

FRANK P. BLAIR.