Sept. 29, 1942. W. M. FUCHS 2,297,614

DISHWASHING AND DRYING APPARATUS

Filed June 7, 1939 2 Sheets-Sheet 1

Fig. 1

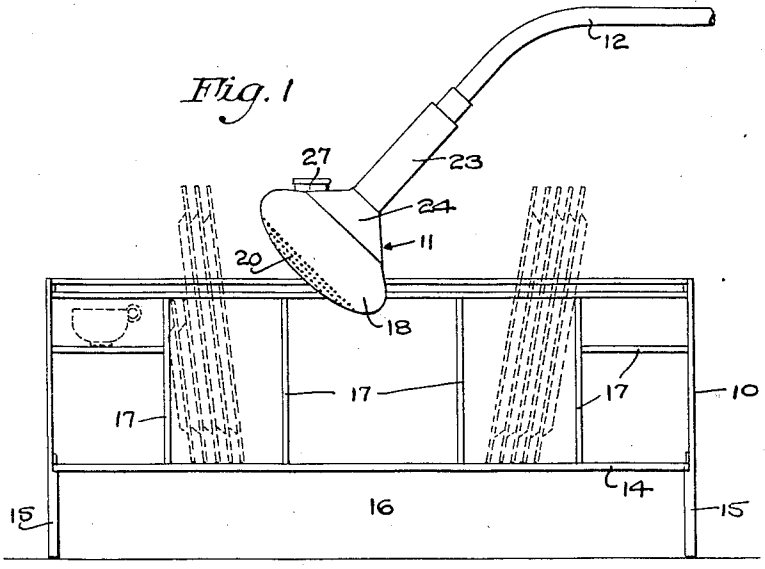
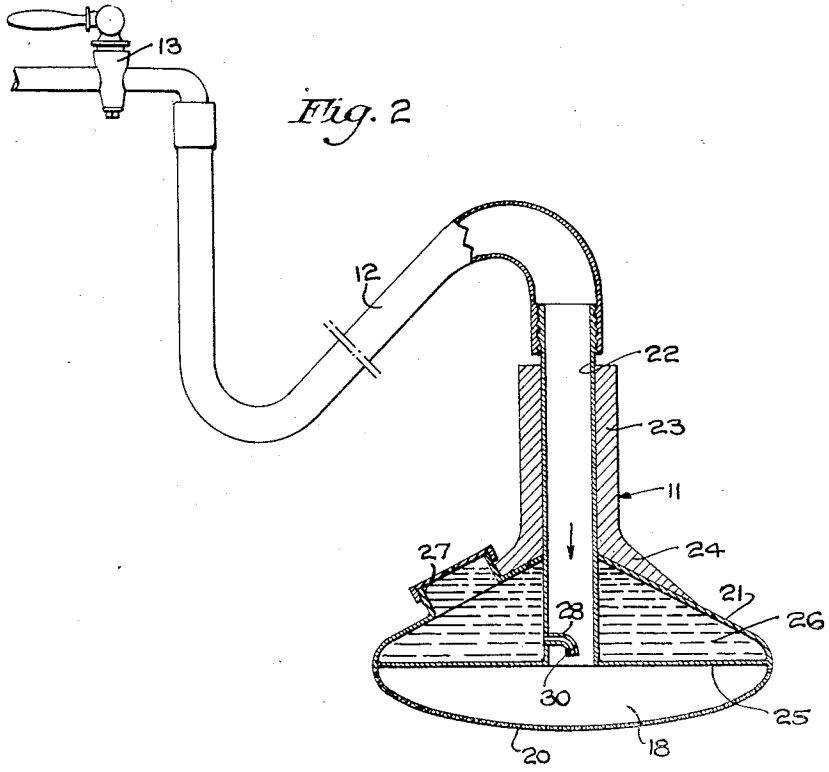


Fig. 2



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Fig. 5

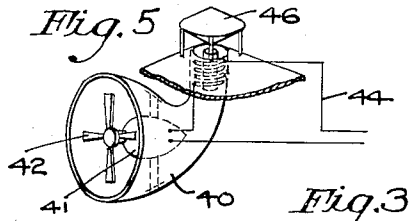


Fig. 3

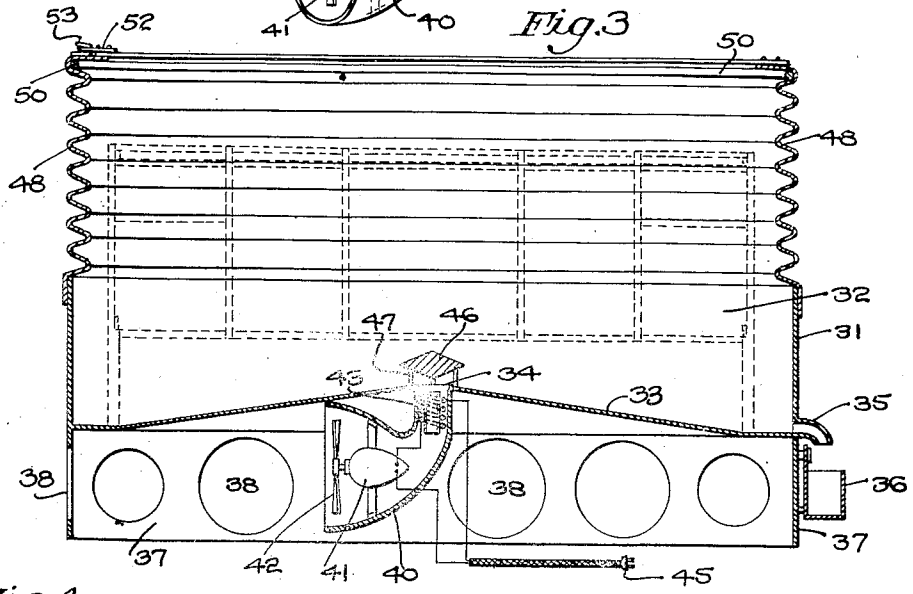
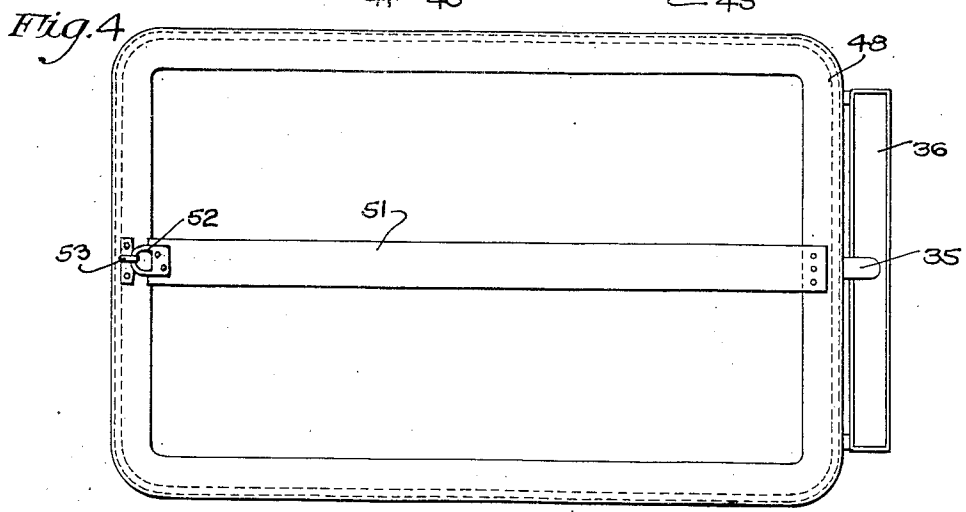


Fig. 4



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UNITED STATES PATENT OFFICE

2,297,614

DISHWASHING AND DRYING APPARATUS

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Application June 7, 1939, Serial No. 277,329

2 Claims. (Cl. 34—231)

The present invention relates to an apparatus for washing and drying dishes, saucers, cups, table and kitchen utensils and other articles for domestic or other uses.

Some of the objects of the present invention are to provide an improved apparatus for expeditiously washing and drying dirty articles; to provide a basket or other receptacle, for articles to be cleaned, which can be readily and easily handled and in which the articles are accessible as well as exposed for washing; to provide an improved nozzle for spraying articles wherein a novel wetting agent assures complete cleaning of the articles; to provide a nozzle for washing purposes wherein the wash water flowing under pressure is mixed with a proportioned amount of a wetting agent; to provide a drying apparatus wherein articles in a basket within such apparatus are subjected to heated air; to provide a drying apparatus which can be adjusted to accommodate batches of articles of different size; to provide a novel air heating and circulating means for a dish or article drying apparatus; to provide a drying apparatus wherein provision is made for draining drip from the articles without decreasing the efficiency of the heating means; and to provide other improvements as will hereinafter appear.

In the accompanying drawings Fig. 1 represents a side elevation of a basket for articles to be washed and showing a spray nozzle embodying one form of the present invention; Fig. 2 represents a sectional elevation of the spray nozzle with the associated hose connected to a source of water supply; Fig. 3 represents a sectional elevation of one form of drying unit of the invention; Fig. 4 represents a plan of the unit shown in Fig. 3; and Fig. 5 represents a detail in perspective of one form of mechanism for supplying heated air to the drying unit.

Referring to the drawings, the means for washing and rinsing plates, saucers, cups, metal utensils and other articles is shown in Fig. 1 in association with a basket or frame 10 and consists generally of a spray nozzle 11 attached to a flexible hose 12 for attachment to a faucet 13. As shown, the basket 10 is of open work construction having a bottom 14 supported by legs 15 at an appreciable distance from the ground line to provide a laterally disposed space 16. The body of the basket 10 includes a plurality of suitably arranged and spaced partitions 17 forming compartments for conveniently receiving articles of different size and shape.

For effective washing, wetting and rinsing the articles in the frame 10, the nozzle 11, as here shown, consists of a face 18, of such curved contour as to distribute liquid, by way of the face perforations 20, for most advantageous and effective concentration of the liquid upon the articles. This face 18 is circumferentially joined to a substantially conical top 21 so that the two together form a tubular body which communicates with the exterior by way of a tube 22, the projecting end of which is threaded to receive the connecting end of the hose 12. A sleeve 23 is fitted about the tube 22 and terminates in a flanged base 24 which is united to the top 21 to form a complete unitary nozzle structure.

For the purpose of mixing a wetting agent with the incoming water, an annular plate 25 forms a lateral extension of the discharge end of the tube 22 and joins the latter to the inner periphery of the nozzle body to thus create a reservoir 26 for the selected wetting agent. A capped inlet 27 provides means for filling the reservoir 26 and replenishing the supply of wetting agent, while a jet 28 forms a discharge conduit from the reservoir 26. As shown, this jet 28 is in the form of a tube so angularly disposed as to discharge in the direction of the flow of liquid traversing the tube 22. The conduit 30 is relatively small and its arrangement in the tube 22 results in an injector whereby the water leaving the tube 22 draws in wetting solution proportioned to the necessary requirements.

For the purpose of drying the dishes or other articles after the washing operation, a casing 31 is provided of preferably rectangular shape and formed of sheet metal, though any suitable material may be used. This casing 31 forms an open top chamber 32 of a size to accommodate the basket 10 with sufficient clearance thereabout for effective circulation of heated air. The casing 31 is shown as converging upwardly from the general location of the legs 15 of the basket 10 to provide a re-entrant bottom 35 having a centrally located air inlet 34 at the apex of said bottom. Thus, drip from the wet dishes is directed outwardly to find an escape by way of a drain pipe 35 which is superposed with respect to a collecting trough 36. An annular flange 37 forms a lower extension of the walls of the casing 31 and elevates the bottom 33 sufficiently to form a bottom chamber to which air has access by way of holes 38. The trough 36 is supported by the flange 37 for ease of assembly.

For supplying heated air to the inlet 34 a duct 40 leads to the inlet 34 and also forms a housing for an electric motor 41 which drives a blower

fan 42. The duct 40 is generally funnel shaped so that its larger inlet end is about the fan 42 and its smaller outlet end connected to the inlet 34. An electric heating element 43 is interposed in the path of the air going through the duct 40, this element as here shown being in the form of a coil which is energized by the motor circuit 44 which receives current from a suitable source when the terminal 45 is plugged into an electric outlet.

In order to distribute the incoming forced air as it leaves the inlet 34, a baffle 46 is mounted on legs 47 in coaxial relation above the inlet 34, such baffle being preferably shaped as two cones base to base, whereby the lower cone face spreads the air outwardly in all lateral directions while the upper cone serves to direct drip from the basket 10 away from the inlet 34.

Since the casing 31 is preferably shallow for ease in handling, provision is made for retaining the circulating heated air about the basket by a flexible wall 48 preferably of canvas or other material lending itself to bellows-like construction. The lower marginal edge of the wall 48 conforms to the shape of the casing 31 and is fastened thereto as a part thereof. The upper marginal edge of the wall 48 is reinforced and held as an open top by a continuous stiffener wire 50.

To support the extensible wall 48 in position when a filled basket is within the casing 31, a strap 51 is fastened at one end to the top of the marginal portion of the wall 48 while its opposite end terminates in a hasp 52 arranged to receive a hook 53 fixed to the opposite marginal portion of the wall 48, the arrangement being such that the strap 51 can be brought laterally across the top opening of the wall 48 and thus rest upon the dishes or articles in the basket to thereby retain the wall properly distended as an air and heat confining wall.

In the foregoing reference is made to the liquid in the reservoir 26 as a wetting agent by which is meant a surface active compound containing both water soluble and oil soluble groups. For example, soaps, fatty alcohol sulfates, sulfated fatty acid amides, sulfated fatty acid esters, secondary alcohol sulfates, sulfated esters of higher alcohols, dibasic acids, hydrocarbons, and many other compounds may be employed. The requirement is that the wetting agent be effective in removing films of fat and grease from the articles so that the accompanying and following water stream by its mechanical force completes the washing operation.

The device of the invention operates as follows: Dishes or other tableware to be washed and dried are arranged in the basket 10 and the latter then placed in the sink. The nozzle 11 with its reservoir 26 filled with a suitable liquid wetting agent is then connected by the hose 12 to the faucet 13 whereupon the articles can be subjected to the water stream entering the nozzle by way of the tube 22. The velocity of the water stream as it passes the jet 28 gives an injector action which draws out a small amount of the wetting agent which, mixing with the water stream, supplements the mechanical force by a chemical one to remove films of fat and grease. Following the washing, wetting and rinsing operation, the basket is placed in the casing 32 and the flexible wall 48 elevated to such a position that the strap 51 can be placed over and rest upon the articles in the basket 10 thus providing a solid wall encircling the basket but allowing the air within the casing to leave by way of the open top. When so arranged, the blower fan 42 is started and air enters by way of the inlet 34 and during its passage thereto picks up the required amount of heat from the unit 43 so that the entering air is heated to a temperature for efficient drying of the articles. In this connection it should be noted that the baffle 46 not only deflects the air laterally in all directions but also serves the purpose of directing drip water away from the inlet 34. All of the drip from the basket 10 can travel by gravity outwardly and downwardly over the inclined bottom of the casing and find an exit through the drain 35 to the collecting trough 36. The articles in the basket are thus dried quickly and are clean and the operation effected in a sanitary way with both a time and labor saving as well as an efficient result.

What is claimed as new and useful is:

1. A drying device consisting of an open top casing formed by a lower section of rigid material and an upper section of flexible material, said flexible section of the casing being arranged to be expanded to increase the height of said casing, an inlet for air to said casing, means for supplying heated air to said inlet, and means arranged to coact with the contents of said casing for holding said flexible section thereof expanded.

2. A drying device consisting of an open top casing formed by a lower section of rigid material and an upper section of flexible material, said flexible section of the casing being arranged to be expanded to increase the height of said casing, an inlet for air to said casing, means for supplying heated air to said inlet, a retaining ring connected to the upper free end of said flexible section of the casing to maintain the same in open condition, and means arranged to coact with the contents of said casing for holding said flexible section thereof expanded.

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