March 17, 1925. 1,529,770

H. F. CAVANAUGH ET AL

DISHWASHING MACHINE

Filed Oct. 4, 1922 2 Sheets-Sheet 1

Fig. 1.

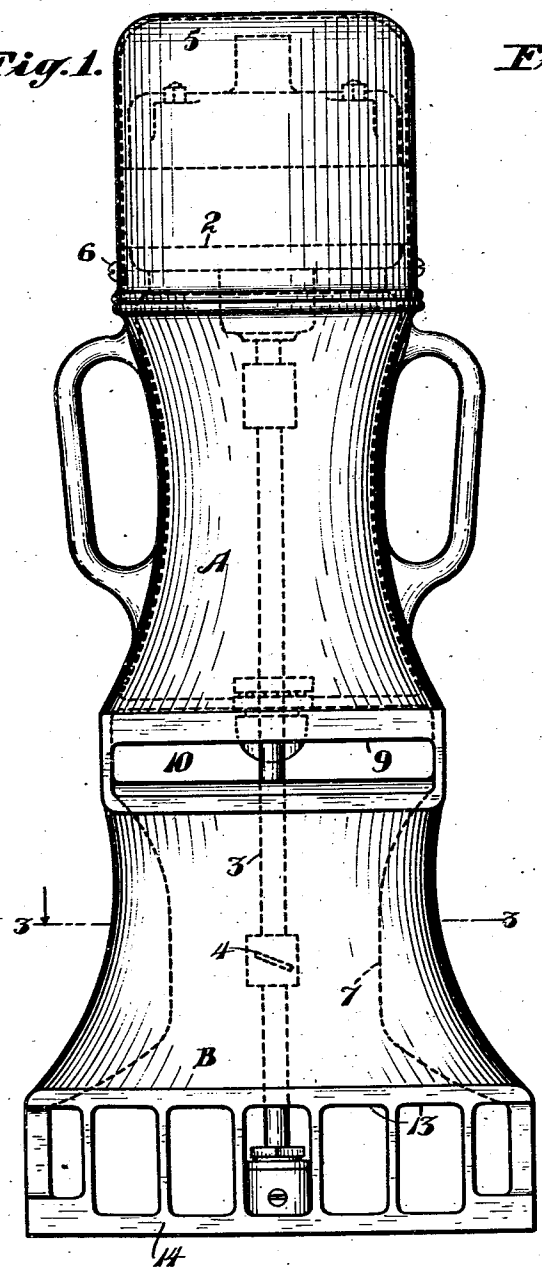

Fig. 2.

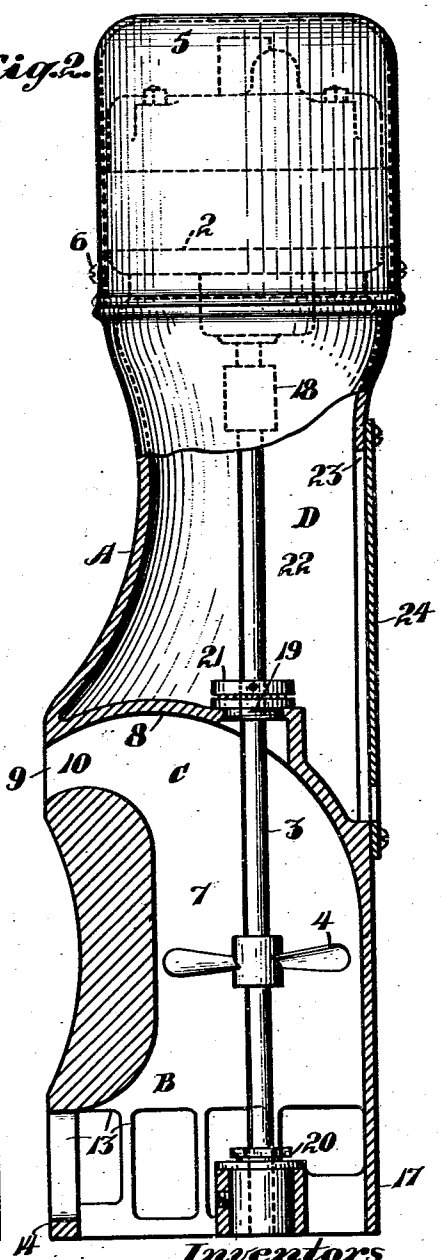

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Fig. 3.

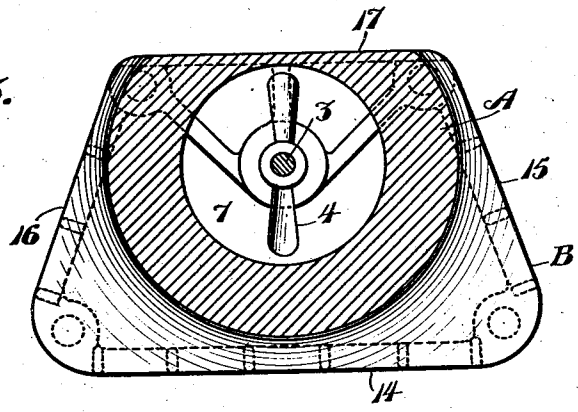
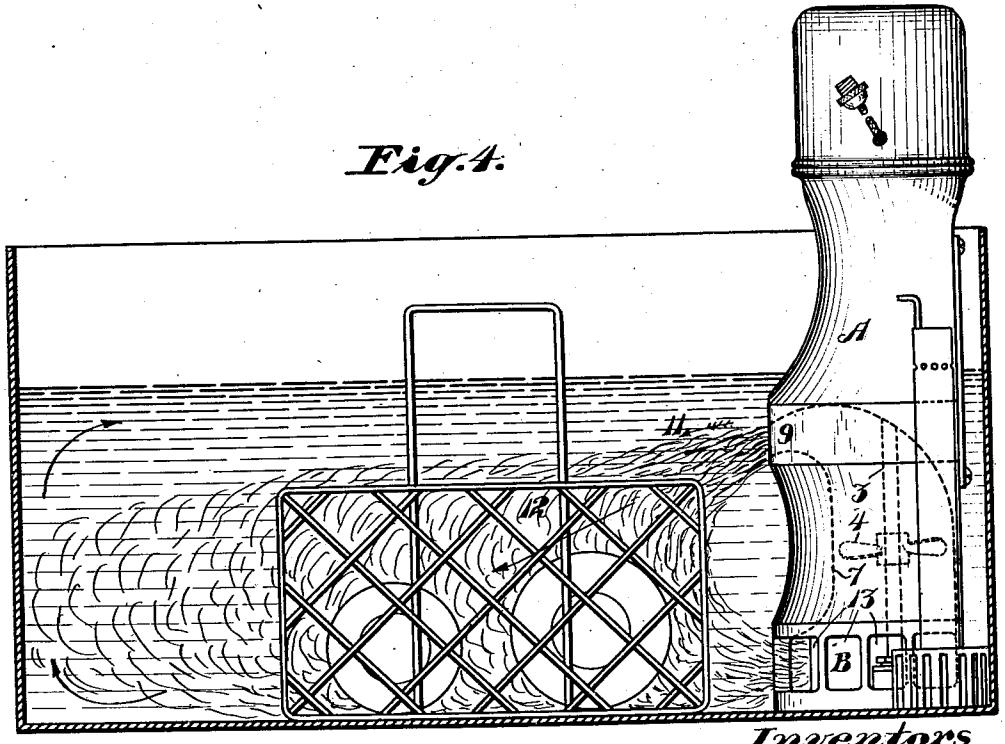


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY F. CAVANAUGH AND THEODORE S. HALL, OF OAKLAND, AND EDWIN S. CULVER, OF PIEDMONT, CALIFORNIA, ASSIGNORS TO SURGEX MANUFACTURING COMPANY, OF EMERYVILLE, CALIFORNIA, A CORPORATION OF CALIFORNIA.

DISHWASHING MACHINE.

Application filed October 4, 1922. Serial No. 592,231.

To all whom it may concern:

Be it known that we, HARRY F. CAVANAUGH and THEODORE S. HALL, residing at Oakland, county of Alameda, State of California, and EDWIN S. CULVER, residing at Piedmont, county of Alameda, State of California, and citizens of the United States, have invented new and useful Improvements in Dishwashing Machines, of which the following is a specification.

This invention relates to a dish washing machine and especially to a machine of the portable type.

The object of the present invention is to generally improve and simplify machines of the character described; to provide a machine which is particularly adapted for use in hotels, restaurants and like places, where dishes must be handled rapidly and in large quantities, and where the dishes are rinsed, scalded and dried by themselves after washing; to provide a machine which is portable to permit it to be quickly and readily moved from one tank to another, etc., and which may be placed in any suitable manner in a tank or receptacle regardless of drain connections or the shape of the tank; to provide a machine which is motor-driven; and further to provide novel means for efficiently circulating water, and for producing a flattened fan-like discharge whereby the water may be effectively directed through the dishes and circulated through the tank in such a manner that an underflow and an overflow return current is produced, the latter not only washing the dishes in the rear, but also skimming the surface of the wash water, thus removing scum, suds, fatty matter, etc., which would otherwise collect on the dishes when withdrawn. Other objects will hereinafter appear.

One form which our invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a front view of the machine.

Fig. 2 is a side elevation partly in section.

Fig. 3 is a cross section on line 3—3, Fig. 1.

Fig. 4 is a sectional view of a tank showing the machine in position when washing dishes.

Referring to the drawings in detail, and particularly to Figs. 1, 2 and 3, A indicates in general a casting, which consists of a base section B, an intermediate section C, and an upper section D. These sections are formed integral with relation to each other as they are produced in a single casting and they serve two functions: first that of a support for an electric motor of suitable construction, such as indicated at 2, and secondly that of a journal member and support for a shaft 3 and an impeller 4, which is secured thereon. The electric motor may be secured on the upper end of the housing in any suitable manner and it is preferably enclosed when in position by means of an exterior cap 5, which is secured by means of screws or the like, as indicated at 6, thereby forming a substantially water-tight joint between the casting and the cap. The intermediate portion C is cored out to form a water circulating chamber 7. The shaft 3 extends vertically through this chamber and is positioned substantially centrally therewith. The upper end of the chamber is curved and directed forwardly as indicated at 8, and it terminates in a nozzle 9, which is elongated and substantially rectangular in shape. (See particularly Fig. 1). That is the upper end of the circulating chamber 7 terminates in a nozzle opening 10, which has the rectangular shape referred to, and this discharge opening is deflected in a downward direction as indicated by the arrow 11 to direct the water into and between the dishes disposed in a basket indicated at 12. The lower end of the water circulating chamber terminates in the base portion B, which is provided with a series of radially disposed openings 13 through which the inlet water is admitted when the machine is in operation. These numerous openings provide a liberal area for the incoming water and it thus enters with the least resistance possible, said openings also forming a grateing to guard against the admission of dish cloths, etc.

The base portion is provided with a substantially flat face, as shown at 14, a pair of inwardly curved side sections 15 and 16, and a short back or rear section 17, which is parallel with the front section 14. This particular arrangement of the front, side and rear sections is of some importance as it often happens that tanks are equipped with waste pipes extending a consider-

able distance upwardly above the bottom of the tank. These drain fittings consume space and it is for this reason that the sides 15 and 16 are shaped as shown. That is, their curvature reduces the amount of space consumed by the base section and therefore permits the machine as a whole to be centered in the rear of the smaller tanks without interfering with the connections or fittings referred to.

The shaft 3 is coupled in any suitable manner as indicated at 18 to the motor-shaft and it is held in its vertical position by means of a pair of bearings such as shown at 19 and 20. These bearings are preferably of the self-lubricating type as they remain in a submerged condition when the machine is in operation. A thrust collar is also employed, as shown at 21, to relieve the motor of any thrust which the impeller 4 creates when in operation. The main casting A is cored out above the circulating chamber 7 to form a chamber 22. An opening 23 is formed in the rear side of the casting to permit access to the chamber, for instance to adjust or inspect the thrust collar and the coupling 18 or otherwise. A removable hand plate 24 is, however, employed by which the chamber is normally closed and drain openings are formed in the lower part of the chamber or in the hand hole plate to permit free escape of any water which may enter through the bearing 19.

In actual operation the machine is placed in one end of the tank as shown in Fig. 4. Water containing soap or other washing ingredients, is then admitted to the tank until the approximate level indicated is obtained. A wire basket containing the dishes to be washed is then placed in the tank and in front of the discharge nozzle 9 in such a position that the discharging fan shaped stream of water will be effectively directed downward and through the basket and between the dishes. The current set up by the fan-shaped stream after passing downward and through the dishes is deflected along the bottom of the tank to the opposite end of the tank and then upwardly and back through the dishes and along the surface, one feature of this action being that part of the return current skims the surface of suds and refuse. This is of great importance as such matter would otherwise adhere to the surface of the dishes when the basket is removed.

The washing of the dishes only requires a few seconds and it is then desirable that they should be rinsed and scalded. The basket with the dishes is therefore placed in the scalding tank. The water is here maintained at practically a boiling temperature and the dishes are therefore rapidly rinsed and sterilized and will dry by themselves when the basket is removed.

The general construction and design of the machine here illustrated are of considerable importance. First it should be noted that the mechanism employed is extremely simple as only three working parts are required, to-wit, the motor, the shaft and the impeller carried thereby. Such simplicity of construction eliminates the necessity of skilled operators, etc., and should therefore give satisfactory service with comparatively little attention and care. The motor may be attached to any standard lighting circuit by an extension or plug as shown, and as the casting employed holds the motor considerably above the water overflow line, it can be seen that short-circuiting, etc., will be avoided. The machine as a whole is light in weight and is provided with handles such as shown and can therefore be easily and readily grasped and moved from one tank to another whenever desired. The shape of the base portion permits the lower end to be entirely open and also serves as a liberal inlet to the circulating chamber 7, as numerous openings 13 may be formed in the front and sides thereof. The inward flare in the side sections 15 and 16 is also important as it reduces the amount of floor or bottom space required, particularly when drain fittings, etc., are encountered.

While certain features of the present invention are more or less specifically illustrated, we wish it understood that various changes in form and proportion may be resorted to within the scope of the appended claims, similarly that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

Having thus described our invention, what we claim and desire to secure by Letters Patent is—

A dish washing machine of the character described comprising a vertically disposed casting, a base portion thereon, a water circulating chamber formed in the casting above the base portion, a plurality of grate-like inlet openings formed in the base portion and in communication with the lower end of the chamber, an elongated, downwardly directed, horizontally disposed, rectangular shaped discharge spout formed in the casting and in communication with the upper end of the chamber, an electric motor on the upper end of the casting, a housing enclosing the same, a vertically disposed shaft journalled in the casting and extending into the water circulating chamber, said shaft being directly connected with the motor, and an impeller secured on the shaft and also disposed in the water circulating chamber.

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