Feb. 1, 1955 J. A. PIETSCH 2,700,978

DISHWASHER WITH SOIL SEPARATION CHAMBER

Filed June 17, 1954

FIG. 1

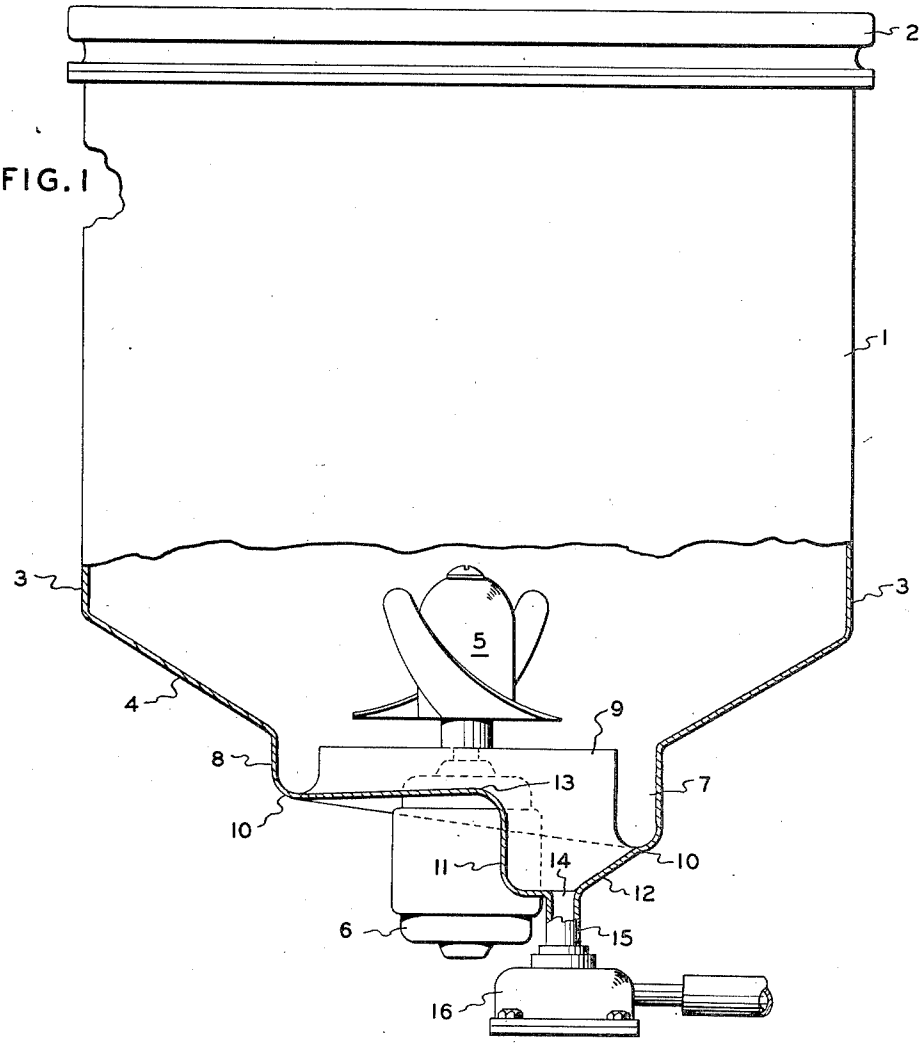
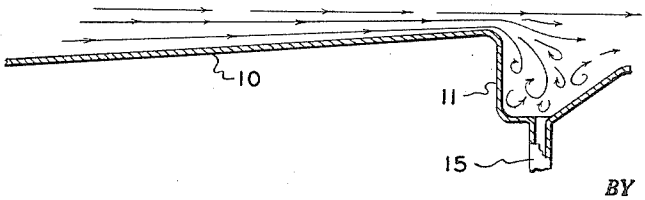


FIG. 2



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DISHWASHER WITH SOIL SEPARATION CHAMBER

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5 Claims. (Cl. 134—186)

This invention relates to dishwashing apparatus and more particularly to dishwashers of the type having a washing tub provided with a power driven impeller in the bottom thereof which hurls washing liquid upwardly and outwardly in the vat to effect the washing of dishes supported in the tub.

In dishwashers of this character a predetermined quantity of washing liquid is continuously circulated during each wash or rinse cycle. Generally, some food soil as well as liquid is circulated throughout the tub during each cycle and is redeposited on the dishes. As a result, a certain percentage of such soil remains on the dishes at the end of the washing operation.

The object of the present invention is to provide a dishwasher having an improved soil separation sump which effectively separates food soils from the washing water so as to prevent recirculation of such material by the impeller.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Briefly stated, in accordance with one aspect of my invention, I provide a dishwasher tub having a rotary impeller carried on its bottom wall and surrounded by an annular sump chamber which decreases in depth in the direction of rotation of liquid circulated by the impeller. Located in the lowermost portion of the chamber and overlooked by the highest portion is a drain port through which food soils and washing liquid pass out of the tub. During washing operations soil laden water is circulated upwardly along the inclined annular trough, and as it passes over the edge at the uppermost portion the soil settles into the lowermost portion adjacent the drain port.

For a better understanding of my invention reference may be made to the accompanying drawing in which:

Fig. 1 is an elevation, partly in section, of a dishwasher tub embodying my invention.

Fig. 2 is a diagrammatic developed section of the bottom wall of the annular chamber of my invention.

Referring to the drawing the numeral **1** designates a dishwasher tub provided with a suitable cover **2** and formed by generally vertical side walls **3** and a depressed bottom wall **4**. The tub may be rectangular in cross-section, for example, in which case the side walls **3** will be four in number and generally rectangular in shape. Centrally located within tub **1** and carried by bottom wall **4** is a rotary impeller **5** rotated on a generally vertical axis by a suitable electric motor **6**. Depending from bottom wall **4** and in generally concentric relation to the axis of rotation of impeller **5** is an annular chamber or sump **7** defined by an outer generally cylindrical wall **8**, an inwardly spaced generally cylindrical wall **9**, a bottom wall portion **10** connecting walls **8** and **9**, and a generally vertical wall portion **11**. Bottom wall portion **10** is upwardly inclined in the form of a spiral from its lowermost portion **12** to its uppermost portion **13** which overlooks the lowermost portion and is connected thereto by vertical wall portion **11**. A drain port **14** is located adjacent the lowermost portion **12** of inclined bottom wall **10** and may be connected by a drain pipe **15** to a suitable drain pump **16**.

Tub **1** is of course provided with suitable means such as racks for supporting dishes and other objects to be washed therein, and suitable means for introducing water and detergent or other suitable washing liquids. Inasmuch as these elements and features are well known in the art and form no part of the present invention they have not been shown in the drawing. Also, it will be understood that if automatic operation of the apparatus is desired suitable automatic control means for initiating and terminating the washing, rinsing and drying cycles may be provided.

In operation, washing liquid is circulated in tub **1** by impeller **5**, and as the washing of the dishes proceeds particles of food waste are entrained in the liquid. In the absence of an arrangement such as that provided by my invention such food soils would be constantly recirculated and redeposited on the dishes, leaving some soil on the dishes at the end of the washing cycle. However, in accordance with my invention soil entrained in the washing liquid is collected in the annular sump **7** at the bottom of the tub and is retained adjacent the drain port **14** until the washing liquid is drained from the tub at the end of the washing cycle. As impeller **5** circulates liquid in the tub a generally circular flow pattern is established on the depressed bottom wall **4** where returning liquid is collected. Inasmuch as bottom wall portion **10** is upwardly and spirally inclined in the direction of rotation of this liquid, the liquid swirls upwardly along the incline and the soil particles, being heavier, tend to gravitate toward bottom wall portion **10**. As the liquid and entrained solids pass over the uppermost portion **13** of sump **7** the soil particles rapidly fall out and accumulate in the lowermost portion of the sump as illustrated in Fig. 2. While the swirling liquid in annular chamber **7** flows at a relatively high velocity, the lowermost section **12** in which the drain port is located is a region of low turbulence and low water velocity below the flow path of the higher velocity currents, and the soil collected therein is not carried out again into the main stream. Thus during both washing and rinsing operations any food soil particles in the liquid being circulated are rapidly collected or deposited in the lowermost portion of sump **7** and are discharged from the tub when pump **16** is energized.

While I have shown and described a particular embodiment of my invention, it will be evident to those skilled in the art that various changes and modifications may be made without departing from my invention in its broader aspects and I therefore aim in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of my invention.

What I claim as my invention is:

1. A dishwasher comprising a tub having side walls and a depressed bottom wall, a rotary impeller carried by said bottom wall and operable to circulate liquid in said tub in a generally rotary path, an annular sump depending from said bottom wall and surrounding said impeller, and a drain port in the lowermost portion of said sump, the bottom wall of said sump being in spiral form and upwardly inclined in the direction of rotation of said liquid from a low point adjacent said port to a high point overlooking said port.

2. A dishwasher comprising a tub having side walls and a depressed bottom wall, a rotary impeller carried by said bottom wall and operable to circulate liquid in said vat in a generally rotary path, an annular sump depending from said bottom wall and including a pair of generally cylindrical concentrically spaced walls and an annular connecting bottom wall therebetween surrounding said impeller, and a drain port in the lowermost portion of said annular bottom wall, said annular bottom wall being in spiral form and upwardly inclined in the direction of rotation of said liquid from a low point adjacent said port to a high point overlooking said port.

3. A dishwasher comprising a tub having side walls and a depressed bottom wall, a rotary impeller carried by said bottom wall and operable to circulate liquid in said tub in a generally rotary path, said bottom wall having a still deeper depressed portion at the center thereof, said portion including a pair of concentrically spaced upwardly directed walls surrounding the axis of said impeller and a connecting bottom wall cooperating to define an annular sump surrounding the axis of said impeller, the lowermost portion of said sump being located below said impeller and exteriorly of the sweep thereof, and a drain port in said lowermost portion of said sump, said bottom wall of said

sump being in spiral form and upwardly inclined in the direction of rotation of said liquid from a low point adjacent said port to a high point overlooking said port.

4. A dishwasher comprising a tub having side walls and a depressed bottom wall, a rotary impeller carried by said bottom wall and operable to circulate liquid in said tub in a generally rotary path, an annular inclined trough formed in said bottom wall and surrounding the axis of rotation of said impeller, said trough being upwardly inclined in the direction of rotation of the liquid impelled by said impeller, a substantially vertical wall portion connecting the lowermost portion of said trough and the uppermost portion thereof, and a drain opening in said lowermost portion.

5. A dishwasher comprising a tub having four upright side walls defining a washing chamber substantially rectangular in horizontal cross-section, and also having a depressed bottom wall, an impeller rotating in the depressed bottom wall on an axis substantially coinciding with the central vertical axis of said chamber, said impeller having blades which engage cleansing liquid in said

bottom wall so as to hurl it upwardly and outwardly toward said side walls and with a generally rotary motion about said axis, said bottom wall having a still deeper depressed section at the center thereof, said section including an upwardly directed first wall element and an upwardly directed second wall element and a connecting curved third wall element cooperating to define an annular sump surrounding said impeller, the lowermost portion of said sump being located below said impeller and exteriorly of the sweep thereof, said connecting wall element having a drain port formed therein adjacent said lowermost portion of said sump, said connecting wall element being upwardly inclined in spiral form in the direction of rotation of said liquid from a low point adjacent said port to a high point overlooking said port, and a generally vertical wall element connecting the uppermost portion of said connecting wall element and the lowermost portion of said connecting wall element.

No references cited.