United States Patent [19]

Field et al.

[11] **3,709,236**

[45] **Jan. 9, 1973**

[54] DISHWASHER

[75] Inventors: **Thomas R. Field**, Indianapolis; **Clinton H. Beckwith**, Knightstown, both of Ind.

[73] Assignee: **Jenn-Air Corporation**, Indianapolis, Ind.

[22] Filed: **Dec. 8, 1969**

[21] Appl. No.: **882,955**

[52] **U.S. Cl.** **134/104**, 134/107, 134/176, 134/183, 239/251

[51] **Int. Cl.** **B08b 3/02**

[58] **Field of Search**.....134/107, 176, 179, 180, 181, 134/183, 191, 105, 108, 111, 104; 239/251

[56] **References Cited**

UNITED STATES PATENTS

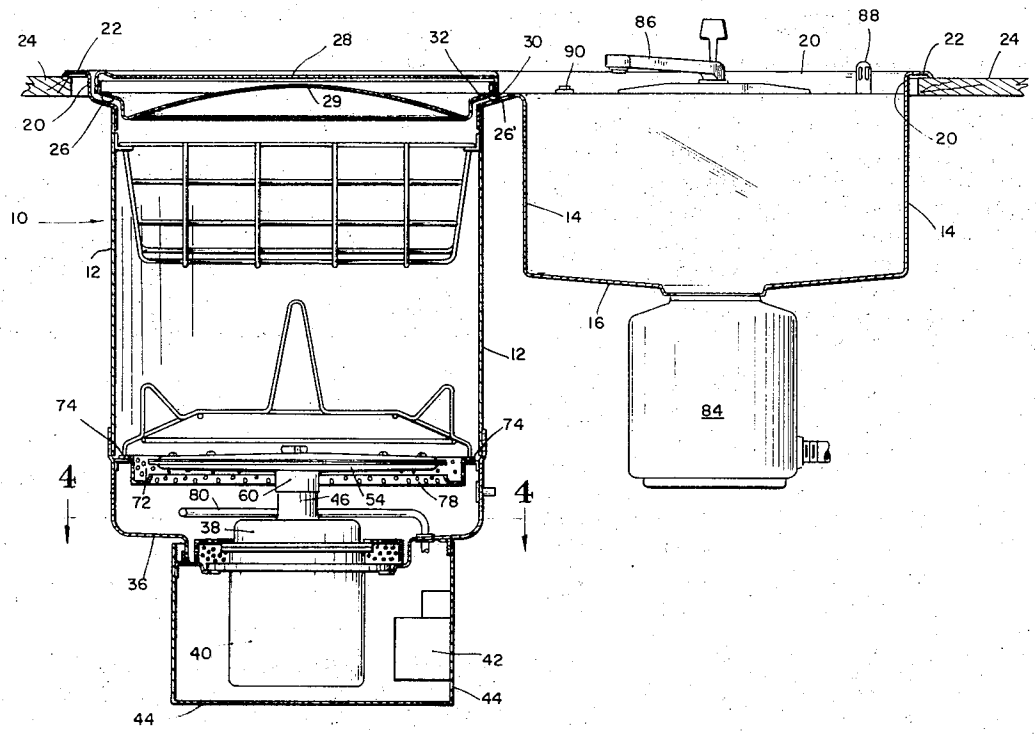
3,064,664	11/1962	Warhus	134/176
1,831,223	11/1931	Anstiss	134/181 X
2,275,189	3/1942	Wieghart	239/251 X
3,384,907	5/1968	Lappin et al.	134/179 X
3,049,136	8/1962	Van Scoyk	134/180 X
3,180,348	4/1965	Clearman	239/251 X
3,370,869	2/1968	Dutcher	134/176 X
3,108,606	10/1963	Grunvogel	134/108 X
3,323,529	6/1967	Geiger et al.	134/111 X
2,619,435	11/1952	Flinchbaugh	134/111
3,323,529	6/1967	Geiger et al.	134/104

Primary Examiner—Robert L. Bleutge
Attorney—Harold R. Woodard

[57] **ABSTRACT**

A side-by-side top loading dishwasher in combination with a sink wherein the wall therebetween in conjunction with a specific closure for the dishwasher is adapted to direct accidental water overflow into the sink. A disk-shaped spray head overlies the heating element to protect dishes from direct radiation. Its spinning action directs waste particles centrifugally to the outer periphery of the machine.

6 Claims, 14 Drawing Figures



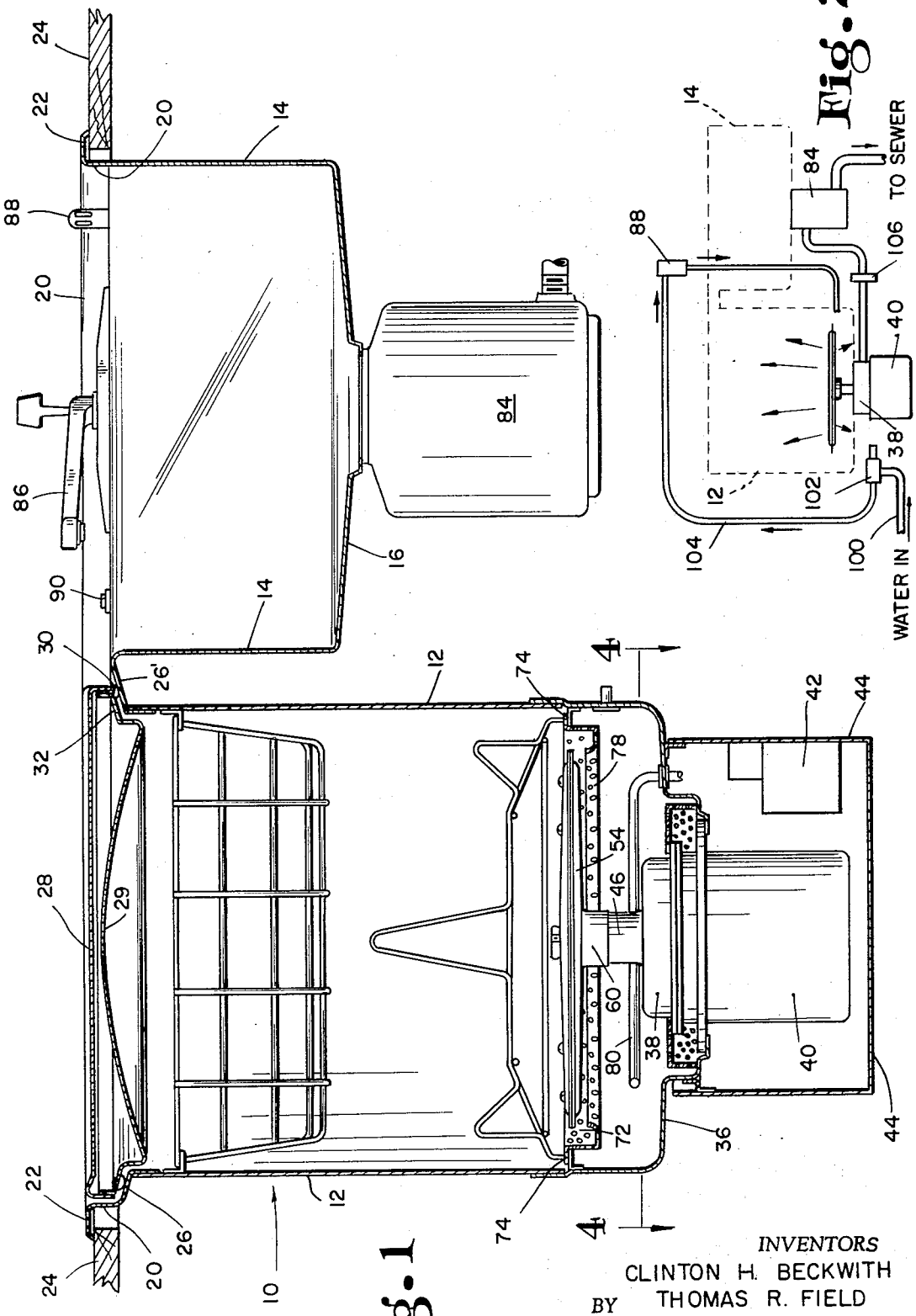


Fig. 2

Fig. 1

INVENTORS
CLINTON H. BECKWITH
BY THOMAS R. FIELD
Kenneth E. Walden
ATTORNEY

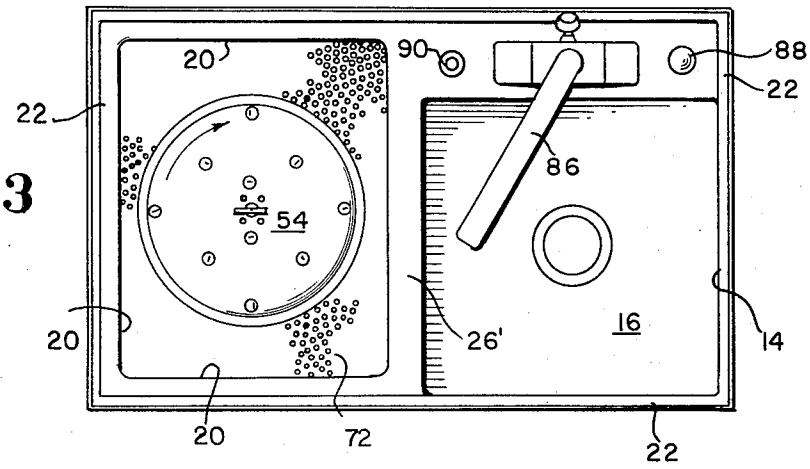


Fig. 3

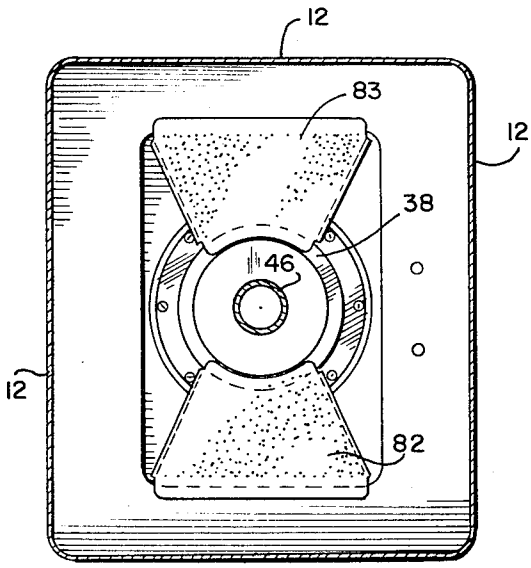


Fig. 4

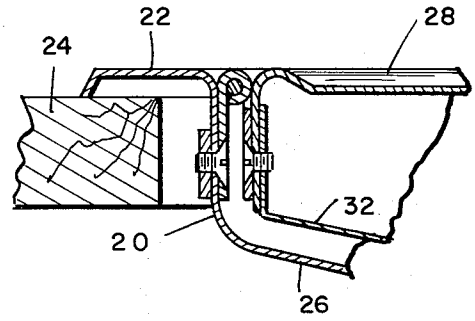


Fig. 5

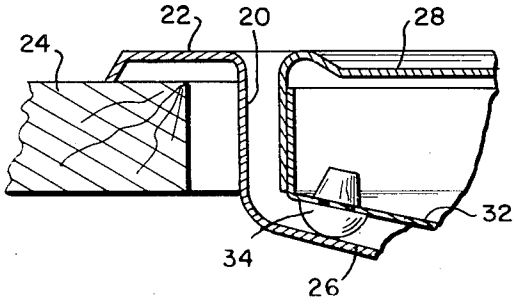


Fig. 6

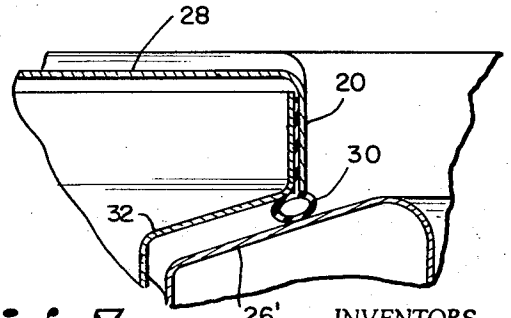


Fig. 7

INVENTORS
CLINTON H. BECKWITH
THOMAS R. FIELD
BY
Kenneth E. Walden
ATTORNEY

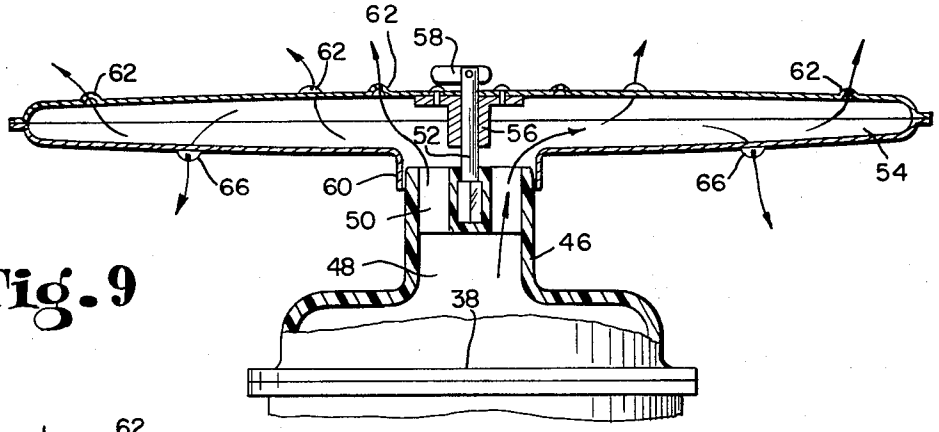


Fig. 9

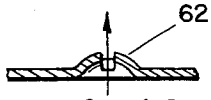


Fig. 10

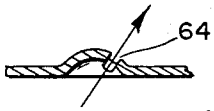


Fig. 11

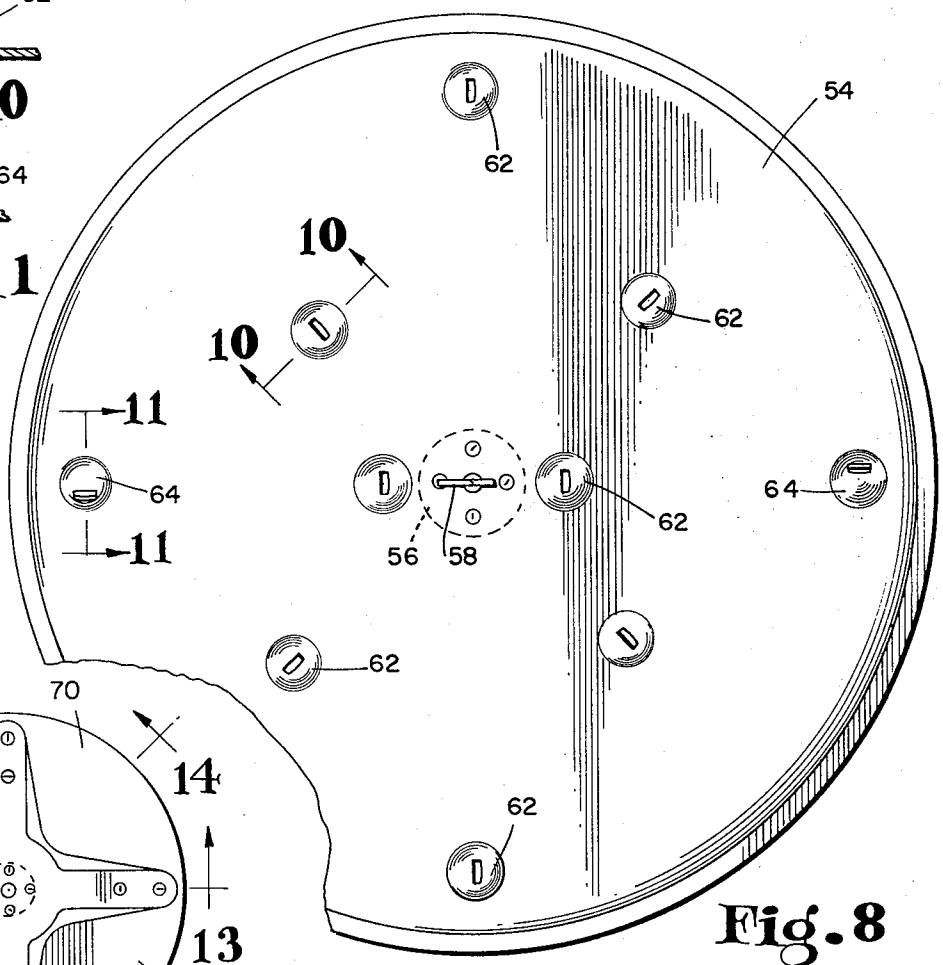
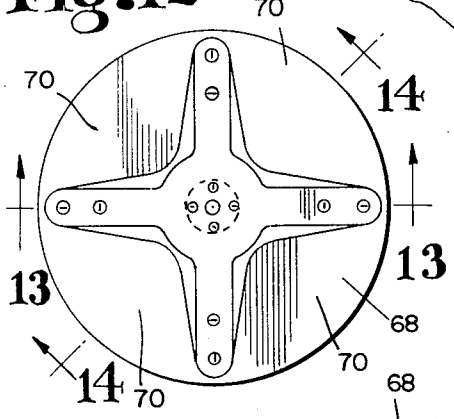


Fig. 8

Fig. 12



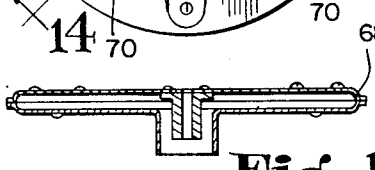


Fig. 13

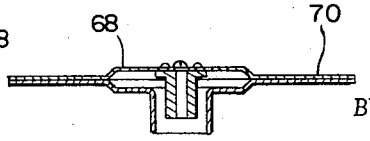


Fig. 14

INVENTORS
CLINTON H. BECKWITH
BY THOMAS R. FIELD
Kenneth E. Walden
ATTORNEY

DISHWASHER

This invention relates to a top loading dishwasher in side-by-side relationship with a sink wherein the dam or wall therebetween in conjunction with the dishwasher lid permits water in accidental overflow to be directed into the sink for discharge to the sewer. In the past no substantial efforts have been directed to designs of this feature and when accidental overflow did occur, water was as likely as not to run into the kitchen floor. The lid and partition wall cooperate for the desired result. Further, invention resides in a disk-like spray head which overlies the pump and heating element. Its shape protects dishes from direct radiation from the heating element and its spinning action centrifugally throws food particles toward the periphery of the washer where it falls into a screen tray to prevent its uninhibited recirculation with the water as moved by the pump.

In the following part of the specification, reference will be made to the several figures of the drawings wherein:

FIG. 1 is a cross-sectional view of the improved dishwasher sink combination;

FIG. 2 is a schematic representation of the water piping and moving members;

FIG. 3 is a plan view of the sink, dishwasher and disk-like spray head, all at reduced scale;

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 1;

FIG. 5 is a cross-sectional view of the dishwasher wall and lid and showing a hinge therebetween;

FIG. 6 is another cross-sectional view showing the lid and wall;

FIG. 7 is a still further cross-sectional view showing the lid and seal adjacent the partition wall;

FIG. 8 is a plan view of the disk-like spray head;

FIG. 9 is a cross-sectional view of the spray head shown in FIG. 8;

FIG. 10 is a cross-sectional view taken generally along line 10—10 of FIG. 8;

FIG. 11 is a cross-sectional view taken generally along line 11—11 of FIG. 8;

FIG. 12 is a plan view, at reduced scale, of an alternate form of spray head;

FIG. 13 is a cross-sectional view taken generally along line 13—13 of FIG. 12; and,

FIG. 14 is a cross-sectional view taken generally along line 14—14 of FIG. 12.

The combination dishwasher and sink is designated generally by the numeral 10 in FIGS. 1 and 3. The body or frame thereof comprises a pair of side-by-side tubs. Side walls 12 of the dishwasher tub generally terminate at the lower part thereof with an arrangement and mechanism which will be fully disclosed hereinafter. Side walls 14 and bottom 16 generally define the sink tub.

Upper portions of the sink and dishwasher terminate in a peripheral rim-portion which completely surrounds both. This rim includes vertically upstanding portions 20 and lateral portions 22. Both tubs are adapted to be received in a cut-out in a cabinet top 24 with lateral portions 22 being oversize so as to support the combination therein. This arrangement is often termed a "-Drop in." Walls 12 of the dishwasher are connected to upstanding portions 20 by a sloping portion 26 at the front, back and left hand side as viewed in FIG. 1. Sloping portion 26', located at the same level as sloping portions 26, defines the top of a wall between the dishwasher and sink.

Lid or closure 28 is shown in closed position in FIG. 1. It is evident from an inspection of the lid in closed position (also shown in FIG. 5, 6 and 7) that the contour of the lid 28 and rim portions 20, 26 are complementary, though spaced apart.

FIGS. 1 and 7 show a seal 30 provided between slope 32 of lid bottom 29 and slope 26' of the wall top. This seal prevents water from passing from the washer to the sink at this location when the lid is in position. As will be noted in FIG. 6 a round rubber bumper 34 is carried through slope portion 32 and is adapted to abut against slope 26 of wall 12 for supporting the lid therefrom. Accordingly the lid is otherwise supported in spaced relationship so as to permit passage of air to and from the washing tub but without normal loss of water caused by water spray during the washing cycle. A tortuous path is defined by the space for consuming the kinetic energy of the water to prevent its exit. However, in the event of a malfunction of mechanism within the washer and the water level rises to the level of overflow, water passes under static pressure through the tortuous path between the rim and lid along the front, back and left hand side (FIG. 1) and flows over slope 26' of the wall between the dishwasher and sink and runs into the sink. By this arrangement of a lower wall between the dishwasher tub and sink water will never spill over onto the kitchen floor in the event of overflow from the washer thereby establishing an important safety feature.

The lower portions of the walls 12 of the dishwashing tub are inturned, as indicated by the numeral 36 in FIG. 1, and terminate in an annular seat in which a pump housing 38 is received and secured in water tight relationship. An electric motor 40 is secured to the underneath section of housing 38 for rotating a pump impeller therein. Electric motor 40, controls therefor (not shown) and timing apparatus 42 are enclosed by a box-like structure 44 which is secured to the underneath side 36 of the washing tub.

The upper portion of pump housing 38 terminates in a discharge neck portion 46 which includes an opening 48. FIG. 9 shows a spider 50 located at 90° or 120° radials therein defining a hub at the center for retaining a shaft 52 in upright position therefrom.

A disk-like spray head 54 as shown in FIG. 9 includes a hub 56 which is adapted to be rotatably received over shaft 52. Latch mechanism 58 is adapted to be folded over to the position shown in FIG. 9 to hold the spray head in position thereon. The underneath portion of the disk-like spray head 54 includes a depending flange 60 which is adapted to loosely surround and be rotatable over the top portion of discharge neck 46 of the pump housing. A plurality of outlets in the form of slots in protrusions 62 are located on the top plate of the head. Certain of these slots such as 64 (see FIG. 11) are tangentially disposed. As water is pumped from the housing 38 into the cavity of spray head 54 water is sprayed generally upwardly from these slots. The upwardly directed slots 62 spray dishes above while slanted slots additionally provide rotation of the disk. Additional slots 66 may be located on the bottom to provide a downwardly directed stream for clean an underlying screen.

An alternate form of disk-like spray head **58** is shown in FIGS. **12**, **13** and **14**. As shown in the plan view FIG. **12**, the cavity therein is in a cross-shape with the area **70** therebetween being flat members through which water does not flow. Cross-sectional view FIG. **13** is taken through that portion of the disk which is adapted to permit water flow, while the cross-sectional view in FIG. **14** is taken through the flattened portion.

As will be noted from an examination of the arrangement shown in FIG. **1**, a screen or basket such as a perforated metal sheet **72**, generally of rectangular shape, is positioned below the disk-shaped spray head. Opposite ends **74** of the screen are adapted to be supported from protrusions **76** located on the wall **12**. This screen has a centrally depressed portion to the side of and generally below the level of the spray head. A central orifice **78** in the basket or screen generally underlies the outer edges of the spray head. The spray head generally overlies this orifice or opening to prevent food particles from dropping therethrough.

A heating element **80** underlies the spray head and the relative position of these elements is clearly shown in FIG. **1**. As will be evident, the rotating disk-like spray head **54** in rotation will by centrifugal force created thereby throw food particles laterally onto screen **72**. In addition, the head overlies heating element **80** to protect dishes from direct radiation during the drying cycle.

FIG. **4**, which is a cross-sectional view taken generally along line **4—4** of FIG. **1**, shows segmented screens **82**, **83** in position about pump housing **38**. These screens are located on of the intakes to pump housing whereas other intakes are located at 90° therebetween. The screens are positioned to cover pump intakes during the washing cycle; however, no cover is provided for intakes to the pump when water is being discharged to the sewer.

Both upper and lower dish racks are supported from protrusions (not shown) on front and back walls **12** as seen in FIG. **1**.

The sink as shown in FIG. **1** and **3** may have a waste disposer **84**. A water faucet and controls **86** are located on the back. The faucet is adapted to be positionable over either the sink or dishwasher tub.

A siphon break **88** and starting switch **90** are located to the back of the sink as shown in FIG. **1** and **3**.

FIG. **2** is a schematic representation of the water piping in conjunction with controls therefor. The dishwasher tub **12** and sink **14** are represented by dashed lines.

A washer or discharge pump **38** and motor **40** are shown positioned under tub **12**, while disposer **84** is shown under sink **14**. A fresh water supply enters through pipe **100** and is admitted through solenoid controlled valve **102** to pipe **104** where it flows to siphon break **88**. (The solenoid for valve **102** is controlled by the timer switch **42** not shown in this diagram.) Water flows past the siphon break into dishwasher tub **12**. Timer **42** allows water to flow into the dishwashing tub for a predetermined period whereupon valve **102** is closed. Water now in the dishwashing tub, if not already at a predetermined temperature, is heated by coil **80**. During the washing cycle water is pumped up through rotatable spray head **54** and discharged upwardly. At the proper sequence, motor **40** is reversed and water in tub **12** is pumped to the sewer. Another siphon break **106** is shown in the discharge line. When a disposer **84** is used in conjunction with sink **14**, discharge preferably passes through the disposer. However, in the event that a disposer isn't used, the discharge from the dishwasher is pumped directly to the sewer. Thereby, sewer water is prevented from entering the washer. Siphon break **88** prevents contamination of city water.

By the above specification, a dishwasher-sink combination has been disclosed and described. One of the main features reside in the side-by-side relationship with a partition wall between the tubs thereof which terminates at a height lower than the surrounding rim. Additionally the lid which cover the top opening dishwasher is received over the opening in spaced relation with parts of the tub providing for ventilation, but under normal conditions not permitting spray water to travel outwardly therefrom. However, in the event of overflow caused by static pressure within the dishwasher as distinguished from kinetic energy of splashing water, water will travel upwardly between the tub wall **12** and corresponding parts of the lid and flow over wall **26'** into the sink. By this arrangement water on the floor in the event of electrical or other mechanical failures in the control mechanism is prevented.

Another outstanding feature of the dishwasher herein relates to the disk-like spray head **54** which overlies heating element **80** to prevent direct radiation therefrom reaching dishes stacked in the baskets. Additionally the spinning action of the disk throws food particles, which may be washed clean from the dishes, outwardly by centrifugal action onto the peripheral tray or screen.

While the embodiment disclosed has found to be satisfactory, minor changes or deviations therefrom can be made without departure from the claims which define the invention.

We claim:

1. In a dishwasher including a tub having a sump in the bottom thereof with heating means, power driven pump means for drawing washing liquid from the sump and discharging it through a rotatable spray head into an upper washing area of the tub, the imprevement comprising:

a hollow disk-shaped spray head adapted for rotation in a horizontal plane above the sump,

said disk-shaped spray head covering a substantial portion of the horizontal area of the tub and having outlet openings in the top thereof with at least some being so directed for causing rotation of said head as washing liquid is discharged therethrough,

screen means covering the horizontal area radially outwardly from the outer periphery of the disk-shaped spray head to the tub walls for defining means for straining washing liquid passing back to the sump for restraining food particles of over a pre-determined size,

said screen means having an inner periphery underlying the outer perimeter of the rotatable disk-shaped spray head whereby washing liquid and food particles after having fallen onto the head are propelled radially outwardly by centrifugal force onto the screen means.

2. The claimed subject matter of claim **1** further defined by said disk-shaped spray head overlying the

heating means thereby preventing direct radiation on dishes from the heating means.

3. In a dishwasher including a tub having a sump in the bottom thereof with heating means, power driven pump means for drawing washing liquid from the sump and discharging it through a rotatable spray head into an upper washing area of the tub, the improvement comprising:

a hollow disk-shaped spray head adapted for rotation in a horizontal plane above the sump and below dishes to be washed,

said spray head having spray openings therein at least part of which so directed for causing rotation of said head upon washing liquid being supplied thereto by the pump,

said disk-shaped spray head being larger than and overlying the heating means thereby preventing substantially all direct radiation from the heating means on the dishes during a drying cycle.

4. The invention according to claim 3 wherein the outer periphery of the disk-shaped spray head overlies the heating element in close proximity thereto.

5. The invention according to claim 5 wherein the heating element is disposed in a general loop configuration having a diameter generally less than that of the disk-shaped spray head.

6. In a dishwasher including a tub having a sump in the bottom thereof with heating means, power driven pump means for drawing washing liquid from the sump and discharging it through a rotatable spray head into an upper washing area of the tub, the improvement comprising:

a hollow disk-shaped spray head adapted for rotation in a horizontal plane above the sump,

said spray head having spray openings therein at least part of which so directed for causing rotation of said head upon washing liquid being supplied thereto by the pump,

said disk-shaped spray head overlying the heating means thereby preventing direct radiation on dishes from the heating means,

said disk-shaped spray head additionally overlying a central portion of screen means which extends across the tub whereby washing liquid falling on the disk-shaped spray head is thrown centrifugally therefrom onto the screen for restraining food particles from passing to the sump.

* * * * *