Nov. 3, 1964 A. M. BARON 3,155,106

DISHWASHER DRAIN AIRGAP

Filed Aug. 13, 1962

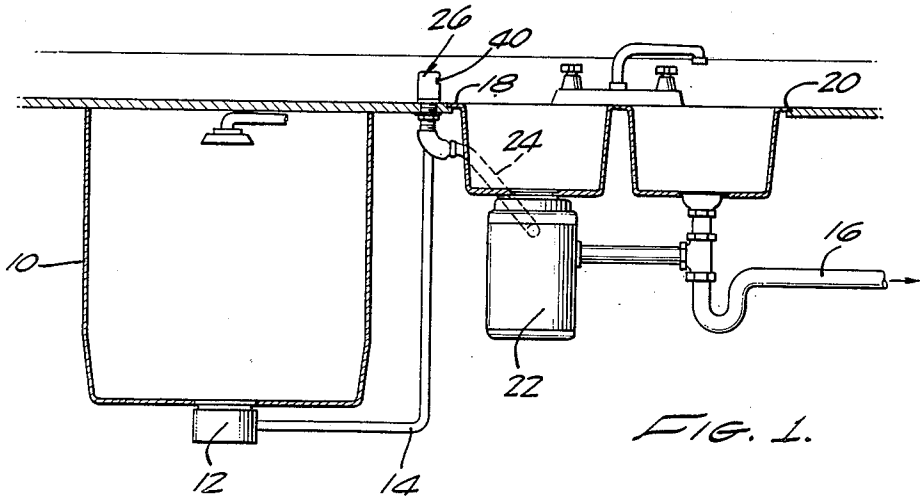


FIG. 1.

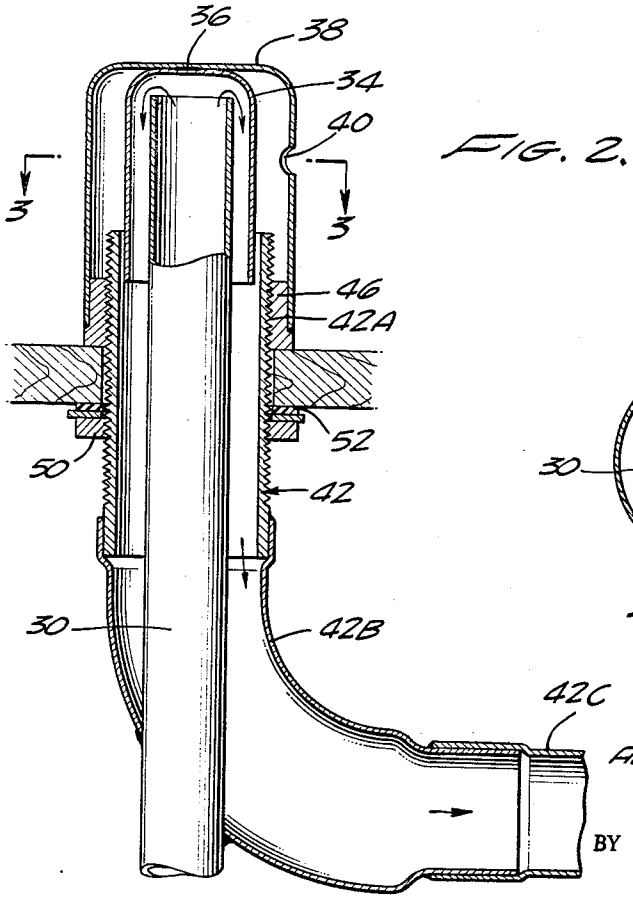


FIG. 2.

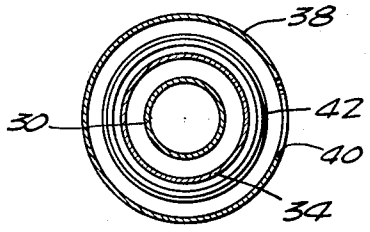


FIG. 3.

ALFRED M. BARON
INVENTOR.

BY Lyon & Lyon

ATTORNEYS

United States Patent Office

3,155,106

Patented Nov. 3, 1964

3,155,106

DISHWASHER DRAIN AIRGAP

Alfred M. Baron, Los Angeles, Calif., assignor to United States Brass Corporation, a corporation of Minnesota

Filed Aug. 13, 1962, Ser. No. 216,545
2 Claims. (Cl. 137—216)

This invention relates to dishwasher drain plumbing and, more particularly, to improvements therein.

The modern dishwasher usually discharges the water used for washing dishes into the sewer line by pumping this water from the bottom of the dishwasher up until it is high enough to be able to flow into the drain pipe of an adjacent sink. Should the pump motor fail for any reason, then a condition can arise wherein the drain pipe of the dishwasher can effectively form a siphon, as a result of which the waste water of the sink can be siphoned back into the dishwasher. This constitutes a health hazard. To avoid this, there is a requirement that at some point within the drain or discharge connection between the dishwasher and the sink waste pipe, air be permitted to enter in order to prevent any siphon action from occurring. A number of different plumbing fixtures have been devised for performing what is called an isolation between the dishwasher drain and the main drain line. While these are effective for performing the required isolation, they have not been satisfactory because of the difficulty in their installation, as well as their maintenance. The problem of maintenance arises if the person using the dishwasher is not careful in removing food particles from the dishes and/or utensils before inserting these into the dishwasher. These food particles can collect at any restriction or large bend in the discharge pipe. Since both of these are usually present in the region of the discharge pipe, where the drain air gap occurs, the pipe can become plugged at this region. With the presently known arrangement, the opening and cleaning of the pipe is extremely difficult and time-consuming.

An object of this invention is the provision of drain-gap plumbing which may be more quickly and easily installed than has been possible heretofore.

Another object of the present invention is the provision of drain-gap plumbing which is simpler to maintain when necessary than has been possible heretofore.

Yet another object of the present invention is the provision of novel and useful drain-gap plumbing which is easier to manufacture than previously known devices.

These and other objects of the invention may be achieved in an arrangement wherein the drain pipe from a dishwasher is terminated adjacent a structure which serves the function of redirecting the flow of the water from the pipe which strikes the structure into a path which is opposite in direction to the direction of the water in the pipe and which is adjacent the pipe. This flow-redirecting structure extends adjacent the pipe for a sufficient distance to insure that the redirected water flow will continue to flow in the reverse direction. There is a space between the termination of this redirecting structure and the beginning of the pipe which carries away the waste water. At this point, air is introduced in order to prevent any siphoning action from occurring. Installation of the drain-gap plumbing is simply effectuated by passing the pipe which carries the dishwasher waste water back to the sink drain through an opening normally provided for it in the sink. This pipe is threaded. On the portion of this pipe which extends through the opening in the sink, there is screwed a cap having internal threads, which cap includes the flow-reversing member. The cap is threaded down on the pipe

until it is on the surface of the sink. The assembly is completed by a nut previously threaded on the portion of the pipe which is on the other side of the sink structure, which is brought up tight to hold the assembly in place.

The novel features that are considered characteristic of this invention are set forth with particularity in the appended claims. The invention itself, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description when read in connection with the accompanying drawings, in which:

FIGURE 1 is a drawing of a dishwasher and sink, exemplifying the location of the embodiment of the invention;

FIGURE 2 is a cross-sectional view of an embodiment of the invention; and

FIGURE 3 is a view in section along the line 3—3 of FIGURE 2.

Reference is now made to FIGURE 1. This shows an arrangement of dishwasher and sink with the embodiment of the invention placed to enable the dishwasher to drain to the sink waste line. The dishwasher **10** usually has a pump **12** at the bottom. The dishwasher drain line **14** is brought up to an elevation higher than the waste pipe **16** of the sinks **18**, **20**. The structure **22** shown below the sink **18** represents a garbage disposal device of the type which grinds foods fine enough to be discharged down the drain pipe **16**. A discharge pipe **24** connects the drain-gap structure **26** to the garbage disposer **22**. Provision is normally made in these garbage disposer devices **22** for connection with the drain pipe from a dishwasher.

The arrangement of the apparatus shown in FIGURE 1 is one for enabling the pump **12** to pump the waste water from the dishwasher **10** into the drain pipe **16**. A drain gap **26**, which is an embodiment of this invention, serves the function of reversing the flow of the water and also for providing an air gap to prevent any siphon action from occurring. It will be noted that the device **26** is attached to the surface of the sink.

FIGURE 2 is a cross section of the embodiment of the invention **26**, which is shown in FIGURE 1. FIGURE 3 is a cross-sectional view along the lines 3—3 of FIGURE 2. The invention includes a pipe section **30**, which may be called the inflow pipe. This inflow pipe is connected to the pipe **14** and terminates above the drainboard **32** of the sink. Opposite the open end of the pipe **30** is a cap member **34**, which serves the function of reversing or redirecting the flow of the water which is pumped through the pipe **30**. This member **34** effectively constitutes a cap which is supported so that the pipe **30** is within the opening of the cap. The cap member walls extend down along the outside of the walls of the inflow pipe for a sufficient distance to insure that any water whose direction of flow is redirected by striking the closed end of the cap member **34** will be guided into an outflow pipe **42**.

The member **34**, which can be termed an inner cap, is supported within another cap structure **38**. The structure **38** may be termed an outer cap. The inner cap **34** is spot-welded, or brazed, at the location **36** to the outer cap **38**. The outflow pipe **42** has three sections which are brazed or soldered together. These consist of a threaded section **42A**, which is coaxially positioned relative to the inflow pipe and overlaps the ends of the inner cap for a sufficient distance to insure that the redirected water flow will enter and flow out of the outflow pipe without any backup or splashing. The threaded section is connected to a right-angle pipe section **42B**, which supports the inflow pipe. The right-angle pipe section is

then connected to an external coupling section 42C, which couples to the pipe 24, leading to the garbage disposer 22.

An opening 40 exists at one side of the outer-cap member 38. Thus, air can enter into the space between the top of the inner-cap member 34 and the outer-cap member 38, and can flow along the sides of the inner-cap member and into the outflow pipe to admit atmospheric pressure to the space between the termination of the inner-cap member and the commencement of the outflow pipe 42. A ring 46, having internal threads, is brazed to the end of the outer cap member 38. The threads on the ring can engage the threads on the section 42A for attaching the cap to the outflow pipe and positioning the inner cap opposite the end of the inflow pipe 30.

Prior to mounting on the sink drainboard, the inner cap 34 and outer cap 38 consist of one portion of the assembly. The inflow pipe 30, threaded pipe section 42A, and right-angle pipe 42B exists as a second assembled portion. To assemble these together on the sink drainboard is a simple matter. The inflow pipe 42 is inserted in the aperture provided therefor in the sink drainboard to a desired height, which can be fixed by a nut 50, which is threaded on the threaded pipe section 42A. A washer 52 is interposed between the nut and sink drainboard. The outer cap 38 is then screwed down on the outflow pipe until a junction is made with the top of the sink drainboard. Connection can thereafter be made to the pipe 14 and to the pipe 24.

In order to remove the assembly for cleaning, it is a simple matter to loosen up the nut 50 thereafter to unscrew the outer-cap member 38, whereupon access is had to the pipe sections for cleaning. Air can freely enter the opening 40 and have access to the regions where reverse flow of water occurs where the end of the inflow pipe opposes the inner cap and is redirected down through the outflow pipe.

There has accordingly been described and shown herein a novel, useful, and simple arrangement for providing an air gap in the pipe coupling between the drain of a dishwasher and the main drain of a sink. Assembly of the arrangement is made very simply, and it also provides a simple and convenient assembly for servicing and maintaining these pipes when required. This apparatus also prevents any possibility of pump-back spillage due to possible pumping action of a garbage disposal when there is a slight or marked clogging in the wasteline to which it is attached. It also eliminates cross-connections.

I claim:

1. Apparatus for providing a drain gap comprising an outer cap having a cylindrical cavity which is open at one end, an inner cap smaller than said outer cap, means supporting said inner cap within the cavity of said outer cap, said inner cap having a cylindrical cavity therein which is open at one end, the openings of the cavities of both of said caps facing in the same direction, an outflow pipe having one end extending into the outer cap cylindrical cavity and coupled to the walls thereof, an inflow pipe having a diameter which is less than that of said inner cap, means supporting said inflow pipe coaxially within said outflow pipe and with one end extending within the cavity of said inner cap adjacent to the closed end of said inner cap cavity, and an opening in the walls of said outer cap for admitting atmospheric pressure into the space between said inner cap and said outflow pipe, said outflow pipe having threads formed in its outer surface, means mounted on the walls of the cavity of said outer cap for threadably engaging said outer cap with the threads on said outflow pipe's outer surface, and a nut threaded on said outflow pipe's outer walls for enabling said apparatus to be clamped to a supporting surface between said nut and the end of said outer cap.

2. Apparatus for providing a drain gap comprising an outflow pipe, an inflow pipe of smaller diameter than said outflow pipe, one of said inflow pipe and said outflow pipe being bent at an intermediate region, said inflow pipe passing through the wall of said outflow pipe in sealing relationship, one end portion of said inflow pipe being substantially coextensive with one end portion of said outflow pipe and supported coaxially within said outflow pipe, an outer cap removably coupled to the outflow pipe for closing said one end portion, an inner cap of smaller diameter than said outer cap carried by said outer cap, said inner cap being of smaller diameter than said outflow pipe and of larger diameter than said inflow pipe, said inner cap being coaxial with said inflow pipe and said outflow pipe with the wall of said inner cap extending into the space between said inflow pipe and said outflow pipe when said outer cap is coupled to said outflow pipe, and an aperture formed in said outer cap at a level above the open end of said inner cap for contionuously admitting atmospheric pressure to the space between said inner cap and said outflow pipe.

References Cited in the file of this patent

UNITED STATES PATENTS

2,294,785	Langdon	Sept. 1, 1942
2,878,826	Dolenga	Mar. 24, 1959