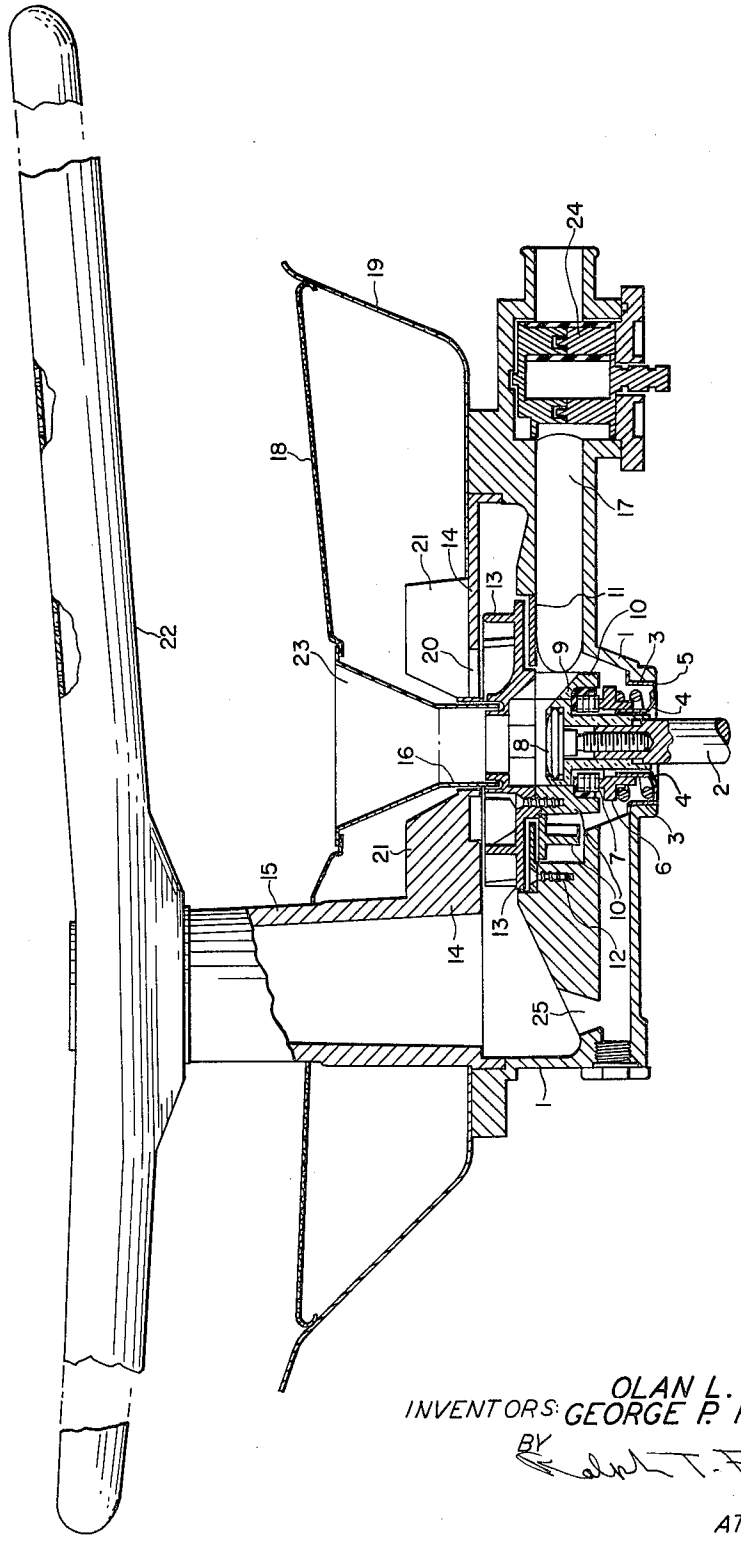
Oct. 5, 1965 O. L. LONG ET AL 3,210,009

DISHWASHER PUMP AND FILTER

Filed Dec. 16, 1963



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United States Patent Office

3,210,009
Patented Oct. 5, 1965

3,210,009

DISHWASHER PUMP AND FILTER

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Filed Dec. 16, 1963, Ser. No. 331,046
5 Claims. (Cl. 239—124)

This invention relates to water circulation means employed in devices such as dishwashers and particularly to the pumping and filtering means for moving the water about and to means for collecting and disposing of debris so as to maintain the water passed over the dishes as clean as possible and particularly free of the debris washed therefrom.

The provision of means of this nature has long been an object in the dishwasher art but has always been met by expensive means, either in the form of a pair of pumps, one for the water distribution system and a separate one for the drain and disposal system or, where a single pump has been used, a bulky, complicated and costly device.

The object of the present invention is the provision of an economical compound pump having a pair of impellers, one for the filtered water distribution system and one for the debris collecting and disposal system.

In accordance with the present invention a centrifugal type of pump is provided, one having a single shaft on which are mounted a pair of impellers, one for moving the water in the distribution system where it is played over the dishes to be washed then falls to a filter above a sump from which it is returned to the impeller of the pump. The debris washed from the dishes will not pass through the filter but gradually moves to the center of the filter which is located just above the eye of the pump. At this point a funnel is set into the filter which then extends downwardly and through a space provded in the said impeller to a second or drain impeller which will move the debris collected therein to a drain line when a drain valve therein is opened to discard the debris.

A feature of the invention is a bypass passage leading from the output of the main pump to the eye of the drain pump for agitating the debris collected at the eye of the drain pump and for providing an increased head of water to wash away the collected debris when the drain valve is opened. This bypass also provides means to drain completely the system by providing means located at the output of the main circulating pump whereby no water will be trapped therein.

The drawings consist of a single sheet having one figure, schematic in nature and being partially a vertical section of the device of the present invention.

The pump housing **1** may be constructed of any suitable material, such as molded plastic. A face seal prevents the leakage of water down the surface of the motor driven shaft **2** and consists of a trough-shaped ring **3** bearing downwardly on a horizontal surface of the housing **1** and forming a lower seat **4** for a spring **5** used to press a washer means **6** upwardly against a rotating bearing surface **7**. These parts are seated and then tightened into place when the head of the impeller screw **8** is driven home far enough to properly adjust the sleeve **9**. This sleeve **9** may be of a non-circular outward contour to fit snugly into a mating opening of the lower impeller **10** so that the rotation of the motor driven shaft **2** will be imparted to the lower impeller **10**. After the impeller screw **8** has been driven substantially into place, a separator plate **11** is attached to the housing **1** by screws such as **12**. Thereafter the upper impeller **13** is secured to the body of the lower impeller **10**, and a pressure

plate **14**, having an outlet pipe **15** formed integrally therewith, is secured to the housing **1** to form a closure for the pump. Thereafter the impeller screw **8** is tightened so that the upper impeller **13** will neither scrape the surface of the separator plate **11** nor the pressure plate **14**.

The inner surface of the impeller **13** is provided with a circular recess into which the mouth of a funnel **16** may be set so as to direct debris separated from the water flowing away from the washing operation into the drain pump consisting of the lower impeller **10** and its drain outlet **17**. The bulk of the water returning from the washing operation falls upon a filter screen **18** and then into a sump pan **19** whence it is returned through an opening **20** at the center of the pressure plate **14** to the upper impeller **13**. This upper impeller drives this water toward its outlet and thence upwardly through the outlet pipe **15** to the distribution arm **22** which rotates to distribute the water over the stacked dishes in known manner.

A number of fins **21** are formed as part of the pressure plate **14** to prevent swirling of the water as it flows from the sump pan into the main pump consisting substantially of the upper impeller **13**.

The debris washed off the stacked dishes is washed down the filter screen **18** surface and thence down a funnel **23**, through the mouth **16** thereof to the location of the lower impeller **10** where it accumulates until the drain valve **24** is opened. While the funnel **23** in the preferred embodiment herein illustrated is imperforate, it may be found desirable to utilize a perforated construction of funnel.

A bypass **25**, from the main pump, leads water to the drain pump to agitate the collected debris during the wash period and to provide drain means for the pump system when the drain valve **24** is opened.

In operation, when the drain valve **24** is closed, the water for the washing operation circulates through the main pump and about its impeller **13**, up the outlet pipe **15**, through the rotating distribution arm **20**, over the stacked dishes, through the filter screen **18**, through the openings **20** of the pressure plate **14** and back into the pump. When the drain valve **24** is opened there is a rush of water and debris from the drain pump formed substantially from the drain impeller **10**, the outlet **17** and the valve **24**, whence it is discarded. The opening **25** forms an outlet for the main pump and serves to flush the drain pump.

Both pumps are continouusly in operation except that there is no discharge from the drain pump when the drain valve **24** is closed. The operation of the lower impeller **10** and bypass keeps the collected debris in a state of agitation so that it may be readily discharged when the drain valve **24** is opened.

What is claimed is:

1. In a pump and filter system for use in a device wherein debris is separated from objects subjected to washing, a pump having a principal impeller located within a circuit including said impeller, an area of use and a filter, and a drain impeller having an unimpeded inlet leading through the center of said filter and the center of said principal impeller and therefrom to a drain valve, said system also including a bypass from the outlet of said principal impeller to said drain impeller to provide agitation of debris collected in said inlet.

2. In a pump and filter system for use in a device wherein debris is separated from objects subjected to washing, a centrifugal pump having a principal impeller located within a circuit including said impeller, an area of use and a filter, and a drain impeller having an unimpeded inlet leading through the center of said filter and the center of said principal impeller and therefrom to a

drain valve, said system also including a bypass from the outlet of said principal impeller to said drain impeller to provide agitation of debris collected in said inlet.

3. In a pump and filter system for use in a device wherein debris is separated from objects subjected to washing, a centrifugal pump having a principal impeller located within a circuit including said impeller, an area of use and a filter, said filter being a wide mouthed funnel-shaped screen pierced at its center point to accommodate a smaller narrow mouthed funnel leading through the center of said principal impeller to a drain impeller, said narrow mouthed funnel being provided to dispose of debris washed from said wide mouthed screen funnel by wash water in said circuit exceeding the amount thereof failing to be filtered whereby debris is collected in said narrow mouthed funnel leading to said drain impeller, and a drain impeller having an inlet leading from said narrow mouthed funnel and therefrom to a drain valve, said system also including a bypass passage from the outlet of said principal impeller to said drain impeller to provide agitation of debris collected in said inlet.

4. In a pump and filter system for use in a device wherein debris is separated from objects subjected to washing, a pump having a principal impeller located within a circuitous path including said principal impeller, a water distribution arm, a filter and a sump, an outlet from said principal impeller leading through said sump and said filter to said water distribution arm and a funnel leading

through said filter and said sump and thence through a passage through the center of said principal impeller and therefrom to a drain valve, said system also including a bypass passage from the outlet of said principal impeller to said drain impeller to provide agitation of debris collected in said funnel and said inlet to said drain impeller.

5. In a pump and filter system for use in a device wherein debris is separated from objects subjected to washing, a compound centrifugal pump having two impellers, a principal impeller, a filter and a sump, and a drain impeller for collecting debris rejected by said filter, a discharge passage including a drain valve leading from said drain impeller, a passage from the said filter including a funnel leading therethrough and through the center of said principal impeller to the center inlet of said drain impeller and a bypass passage from the outlet of said principal impeller to said drain impeller to provide agitation of debris collected at the inlet of said drain impeller.

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