March 29, 1966 R. L. MERCER 3,242,871

DOMESTIC APPLIANCE PUMP

Filed Oct. 13, 1964 2 Sheets-Sheet 1

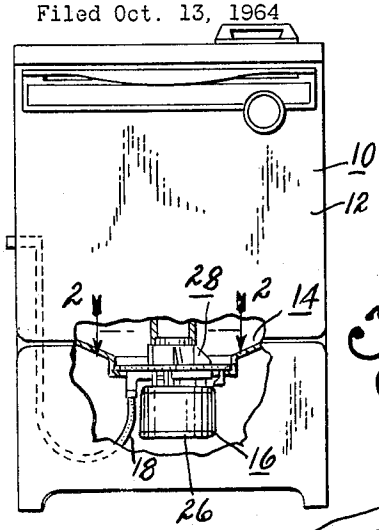

Fig. 1

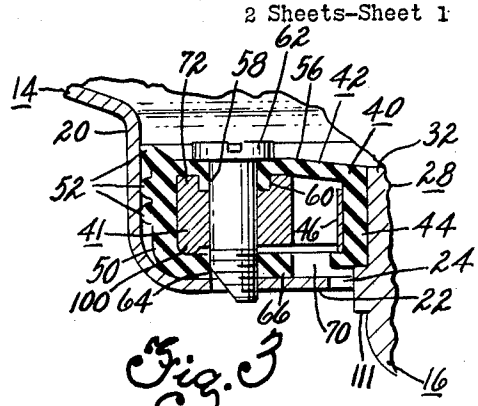

Fig. 3

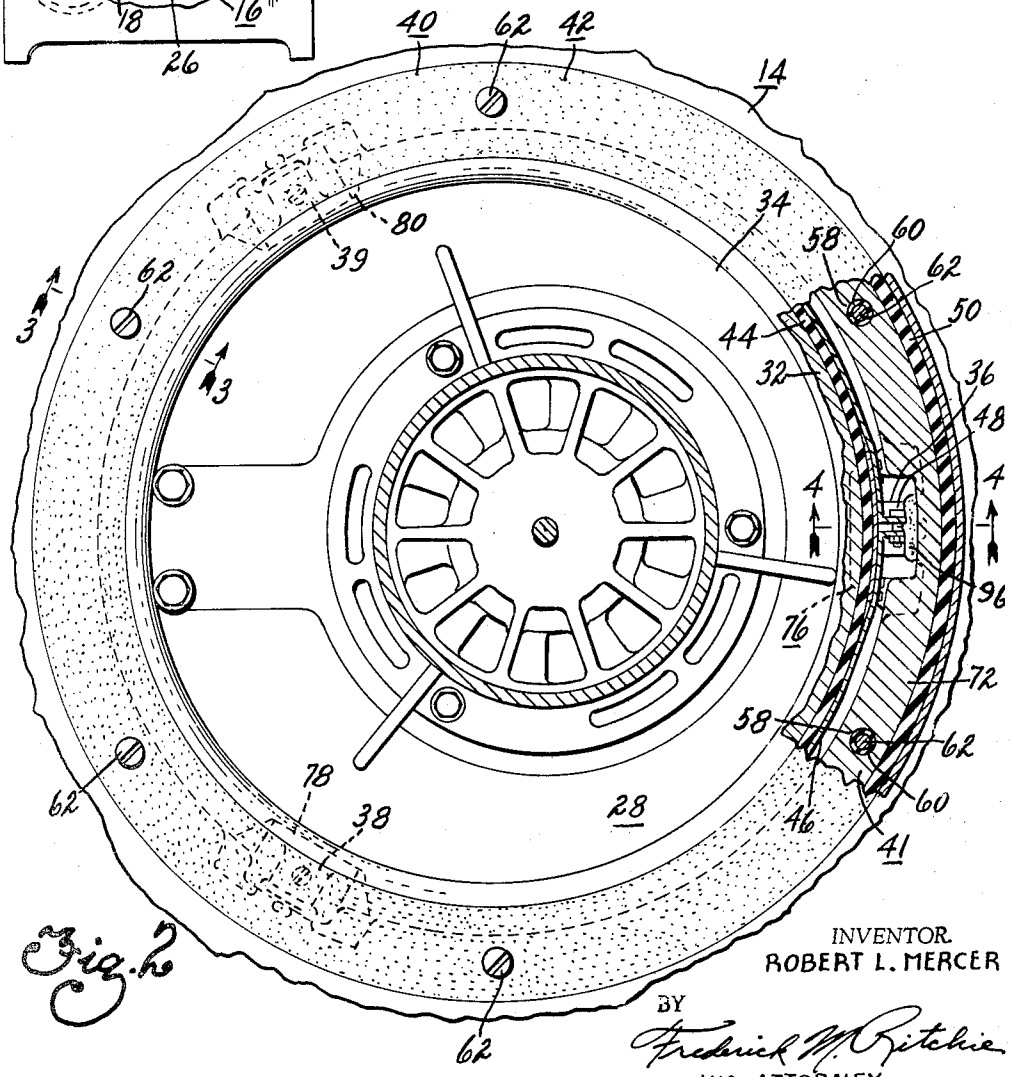

Fig. 2

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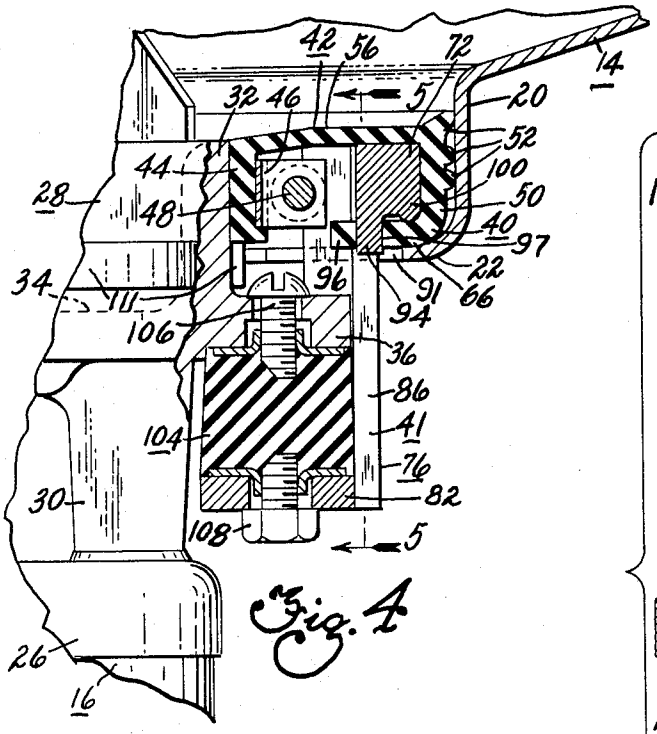

Fig. 4

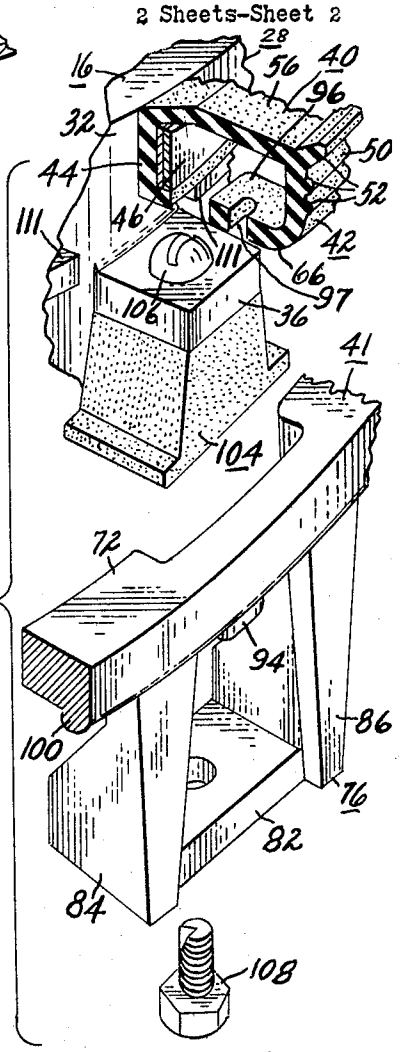

Fig. 6

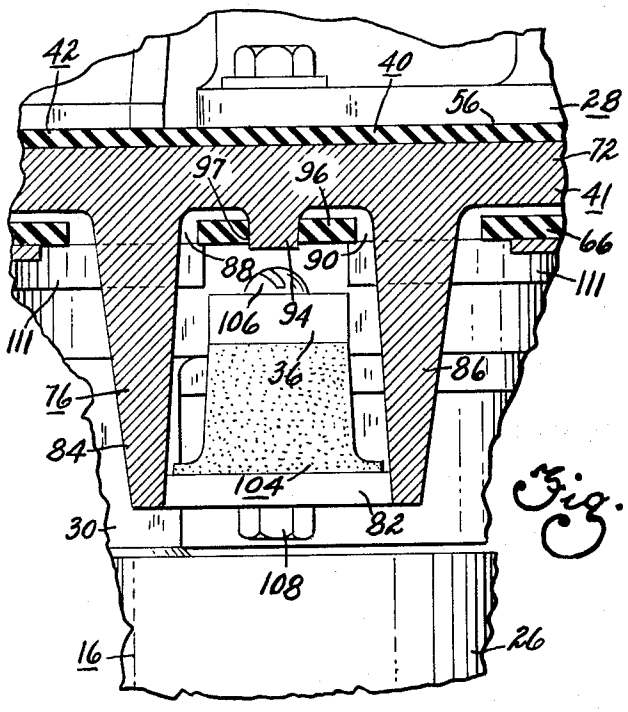

Fig. 5

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United States Patent Office 3,242,871 Patented Mar. 29, 1966

3,242,871

DOMESTIC APPLIANCE PUMP

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Filed Oct. 13, 1964, Ser. No. 403,574
8 Claims. (Cl. 103—218)

This invention relates to a dishwasher and more particularly to an improved mounting arrangement for attaching a pump and motor assembly to a dishwasher tub.

In the manufacture of domestic appliances it is desirable to utilize simple procedures for assembling the component parts. The attachment of a pump or motor to a dishwasher must be reliable and easily effected to assure a long, trouble-free life for the appliance. In addition to these general concepts, the operation of a dishwasher should be comparatively quiet and relatively vibration-free. These aims require a connecting arrangement between the moving and stationary parts of the dishwasher which is sturdy and yet capable of absorbing operational vibrations.

Accordingly, it is a general object of this invention to provide an improved mounting arrangement for a pump and motor assembly to the outlet of a fluid distribution chamber.

It is a more specific object to provide an improved resilient connection between a dishwasher and its pump and motor assembly.

A more specific object of the invention is the provision of a plurality of shock absorbing blocks supportingly interconnecting the pump and motor assembly with the dishwasher tub.

It is a further object to provide a mounting arrangement whereby the pump and motor assembly is quickly attached to and supported in the drain outlet opening of a dishwasher tub.

A more specific object of this invention is the provision of an improved arrangement for mounting a pump and motor assembly to a dishwasher sump which permits said assembly to be installed from above said sump.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a front elevational view with parts broken away, showing the pump and motor assembly supported in a dishwasher sump;

FIGURE 2 is a fragmentary sectional view taken along line 2—2 in FIGURE 1, partly in elevation and with parts broken away to show the improved mounting arrangement of this invention;

FIGURE 3 is a fragmentary sectional view taken along line 3—3 in FIGURE 2;

FIGURE 4 is a fragmentary sectional view taken along line 4—4 in FIGURE 2;

FIGURE 5 is a fragmentary sectional view taken along line 5—5 in FIGURE 4; and

FIGURE 6 is a fragmentary exploded perspective view of the pump and motor assembly mounting arrangement.

In accordance with this invention, and with reference to FIGURE 1, a dishwasher **10** having a front loading access door **12** and a tub sump or sunken bottom portion **14** is provided with a vertically arranged pump and motor assembly **16** of the type taught in the copending application Ser. No. 341,209, filed Jan. 30, 1964 and assigned to the same assignee as this invention. The pump and motor assembly **16** is disposed relative to the internal plumbing of the dishwasher to connect with a drain line

18 having a high loop for preventing the gravity draining of water from the dishwasher sump. The sump **14** has a recessed sump outlet portion **20** including an annular shoulder **22** defining an opening **24** for receiving the pump and motor assembly **16**.

The pump and motor assembly **16** is comprised of a motor **26** and a pump **28** supported on and connected to the motor **26** by columns or legs **30**. Long screws (not shown) extend through the motor **26** from the bottom thereof into the legs **30** for fastening the pump and motor into assembled relationship. In general the pump **28** has an upstanding annular collar **32** defining the pump inlet or water collecting basin **34**. Extending generally radially outwardly from the pump wall **32** are three connector tabs **36**, **38** and **39**. These tabs serve as the connecting link for joining the pump and motor assembly to the improved mounting arrangement of this invention.

In general and with reference to FIGURE 4 the mounting arrangement is comprised of a sealing means or seal **40** for preventing the egress of water from the sump through the opening **24** and a shock absorbing support means **41** cooperating with the seal **40** in the water sealing function thereof and with the connector tabs **36**, **38** and **39** for resiliently and sound absorbingly supporting the pump and motor assembly **16**.

The sealing means **40** is comprised of an annular substantially closed rubber tube-like seal **42** generally rectangular in cross section and having a radially inner side **44** circumscribing the pump collar **32** and sealingly fastened thereto by a circumscribing band **46** including an adjustable tightening bolt **48** for snugly sealingly attaching the inner wall **44** of the seal to the pump collar **32**. A radially outer side wall **50** of the annular seal includes a plurality of peripherally arranged annular ribs **52** which sealingly engage the annular wall **20** of the sump outlet to prevent egress of water along this jointure. The radially inner and outer side walls **44** and **50** of the seal are joined by a top wall **56** facing into the dishwasher sump and including six holes **58** defined by integral depending sleeve portions **60** through which fastening means such as a screw **62** may extend in connecting the mounting arrangement to the shoulder **22** of the sump outlet (FIGURE 3). The fastening means **62**, in order to form a more perfect seal with the shouldered wall **22** of the sump, extends through a hole **64** formed in a bottom wall **66** of the tube-like seal **42**, said bottom wall **66** being integral with the side wall **50** of the seal and extending part way toward the inner side wall **44**—an annular break or opening **70** being left in the seal **42** to receive a pump seal retaining ring means **72** which is a portion of the shock absorbing support means **41**, now to be described more fully.

The die cast aluminum ring **72** (FIGURE 6) includes three depending U-shaped brackets **76**, **78** and **80** having base portions such as **82** suspended from the ring **72** by integral side legs such as **84** and **86** which extend through cutouts such as **88**, **90** in the bottom wall **66** of the seal **42** and through notches such as **91** in the shoulder **22** of the sump outlet. Within each bracket **76**, **78** and **80** and at the top thereof there is a depending lug such as **94** which cooperates with a ported flap **96** which locks thereover for retaining the seal **42** in enveloping relationship to the ring **72**. Note that a continuous peripheral rib **100** on the bottom of the ring **72** engages the bottom wall **66** of the seal **42** at a point where the seal bottom wall lies in juxtaposition to the shoulder wall **22** of the sump outlet. Thus the weight of the sump and motor assembly acting through the rib **100** of the ring **72** provides an additional seal means at this point.

With the shock absorbing support means **41** in assembled relationship the base portion such as **82** of each

bracket such as **76** underlies a respective connector tab such as **36** and has sandwiched therebetween a shock absorbing mounting means **104** fastened as by a screw **106** to the connector tab **36** and by a screw **108** to the base portion **82** of the bracket. The shock absorbing means **104** may be a block of rubber having opposed faces of sheet metal bonded thereto. Thus the weight of the pump and motor assembly **16** is carried on the resilient block **104** with this weight being transmitted to the shoulder **22** of the sump outlet by means of the brackets **76**, **78** and **80**, the ring **72** including the rib **100** and the bottom wall **66** of the seal **42**. The vibration of the motor and pump is thus isolated from the stationary components of the dishwasher sump by the vibration absorbing characteristics of the shock absorbing mounting blocks **104** and the resilient characteristics of the bottom wall of the seal **42**.

The assembly of the mounting components to the pump and motor assembly as well as the assembly of the pump and motor assembly to the dishwasher will now be described. First, the shock absorbing mounting blocks such as **104** are fastened to their respective connector tab **36** by the fastening means such as **106**. Then the annular seal **42** is fitted around the collar **32** of the pump inlet, positioned on a ledge **111** and snugly and sealingly fastened to the collar by tightening the band **46** with the adjusting screw **48**. Next the ring **72** is fitted over the bottom of the motor **26** and lifted into place until the base portions such as **82** of the brackets such as **76** engage the bottom of their respective shock absorbing mounting blocks such as **104**. Screws such as **108** are then used to secure the ring to the connector tabs of the pump and motor assembly through the shock absorbing blocks. The radially outer side wall **50** of the seal is worked around the outside of the ring **72** and with the bottom wall of the seal underlying the ring and the integral ring rib **100**—the flap **96** being worked into a position where the lug **94** snaps into the flap port **97** to lock the seal in enveloping relationship with the ring **72**. At this point the mounting components are assembled to the pump and motor assembly and ready for mounting the entire structure within the sump of the dishwasher.

The mounting arrangement of this invention envisions a mounting from the top of the sump rather than from below. Thus the pump and motor assembly with its mounting components is lowered through the opening **24** in the sump outlet (the brackets **76**, **78** and **80** aligning with their respective sump outlet notches, such as **91**) until the bottom wall of the seal **42** comes to rest on the shoulder **22** of the sump outlet. Screws such as **62** are inserted through the openings such as **58** in the top of the seal and threaded into the shoulder **22** of the sump outlet to lock the pump and motor assembly to the sump outlet. It should be noted that, in normal dishwashing operations, the screws **62** could be dispensed with and the holes **58** eliminated, since gravity would retain the sump and motor assembly in operating relationship with the dishwasher sump. However, various manufacturing and shipping operations require that the pump and motor assembly be attached to the sump outlet.

While the embodiment of the present invention as herein disclosed constitute a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In an arrangement for mounting a motor and pump assembly to a washer sump having a shouldered sump outlet, the combination comprising:

(a) housing means having a pump inlet defined by an upstanding annular collar surrounding said inlet, and three connector tabs extending generally radially from spaced points around said annular collar and adapted for connecting said motor and pump assembly to said washer sump,

(b) means for sealing between said sump outlet and said housing means including an annular substantially closed rubber tube-like seal generally rectangular in cross section and having a radially inner side sealingly fastened to said annular collar of said housing means, a radially outer side sealingly engaged with said sump outlet, a top side joining said inner and outer sides and a bottom side extending part way from said outer side toward said inner side adjacent the shoulder of said sump outlet,

(c) and means for supporting said housing means including an annular pump seal retaining ring having a ring portion inside said tube-like seal and including a peripheral, downwardly extending continuous rib engaging the bottom side of said tube-like seal where said bottom side is adjacent the shoulder of said sump outlet, said ring portion having three U-shaped brackets depending therefrom through notches in said bottom side and coincidental respectively with said connector tabs, each of said brackets including a base portion underlying its respective connector tab, and a resilient shock absorbing rubber block in sandwiched relation between each coincidental pair of said base portions and said connector tabs whereby the weight of said motor and pump assembly is resiliently carried by said shouldered pump outlet through said bottom side of said tube-like seal, said pump retaining ring, said brackets and said rubber blocks.

2. In an arrangement for mounting a motor and pump assembly to a washer sump having a shouldered sump outlet, the combination comprising:

(a) housing means having wall means and connector tab means extending generally outwardly therefrom and adapted for connecting said motor and pump assembly to said washer sump,

(b) means for sealing between said sump outlet and said housing means including a substantially closed tube-like seal having an inner side sealingly engaged with said wall means of said housing means, an outer side sealingly engaged with said sump outlet, a top side joining said inner and outer sides and a bottom side extending part way between said outer side and said inner side adjacent the shoulder of said sump outlet,

(c) and means for supporting said housing means including a pump seal retaining means having a support portion inside said tube-like seal and including a substantially continuous rib engaging the bottom side of said tube-like seal where said bottom side is adjacent the shoulder of said sump outlet, said support portion having bracket means depending therefrom and including means underlying said connector tab means, and a resilient shock absorbing means in sandwiched relation between said connector tab means and said underlying means whereby the weight of said motor and pump assembly is resiliently carried by said shoulder sump outlet through said bottom side of said tube-like seal, said pump seal retaining means, said bracket means and said resilient shock absorbing means.

3. In an arrangement for mounting a motor and pump assembly to a washer sump having a shouldered sump outlet, the combination comprising:

(a) housing means having wall means and connector tab means extending generally outwardly therefrom and adapted for connecting said motor and pump assembly to said washer sump,

(b) means for sealing between said sump outlet and said housing means including a substantially closed tube-like seal having a first side sealingly engaged with said wall means of said housing means, a second side sealingly engaged with said sump outlet, a third side joining said first and second sides and a fourth side extending part way between said second side and said first side adjacent the shoulder of said sump outlet,

(c) and means for supporting said housing means including a pump seal retaining means having a support portion inside said tube-like seal and including a substantially continuous rib engaging the fourth side of said tube-like seal where said fourth side is adjacent the shoulder of said sump outlet, said support portion having bracket means depending therefrom and including means in vertical spaced relationship to said connector tab means, and a resilient shock absorbing means in sandwiched relation between said connector tab means and said vertically spaced means whereby the weight of said motor and pump assembly is resiliently carried by said shouldered sump outlet through said fourth side of said tube-like seal, said pump seal retaining means, said bracket means and said resilient shock absorbing means.

4. The mounting arrangement of claim **3** wherein said second side of said sealing means includes rib means sealingly engaged with said sump outlet.

5. The mounting arrangement of claim **3** wherein said fourth side of said sealing means includes a lock flap portion having a port and wherein said pump seal retaining means includes a lug interfitting with the port in said flap portion.

6. The mounting arrangement of claim **3** wherein said resilient shock absorbing means is a block of rubber.

7. The mounting arrangement of claim **3** wherein said fourth side of said sealing means overlies said shouldered sump outlet, said sump outlet being larger than the pump and motor portions of said pump and motor assembly to facilitate the lowering of said assembly through said sump outlet but being smaller than the support portion of said pump seal retaining means for retaining and supporting said assembly in said washer sump.

8. In an arrangement for mounting a pump assembly to a sump having a shouldered sump outlet, the combination comprising:

(a) housing means having a pump inlet defined by an upstanding annular collar surrounding said inlet, and a connector tab extending generally radially from said annular collar and adapted for connecting said pump assembly to said sump,

(b) means for sealing between said sump outlet and said housing means including an annular substantially closed tube-like seal generally rectangular in cross section and having a radially inner side sealingly fastened to said annular collar of said housing means, a radially outer side sealingly engaged with said sump outlet, a top side joining said inner and outer sides and a bottom side extending part way from said outer side toward said inner side adjacent the shoulder of said sump outlet,

(c) and means for supporting said housing means including an annular pump seal retaining ring having a ring portion inside said tube-like seal and including a peripheral, downwardly extending continuous rib engaging the bottom side of said tube-like seal where said bottom side is adjacent the shoulder of said sump outlet, said ring portion having a bracket depending therefrom through a notch in said bottom side and coincidental with said connector tab, said bracket including a base portion underlying said connector tab, and a resilient shock absorbing block in sandwiched relation between said base portion and said connector tab whereby the weight of said pump assembly is resiliently carried by said shouldered pump outlet through said bottom side of said tube-like seal, said pump seal retaining ring, said bracket and said block.

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