United States Patent

[11] 3,583,835

[72] Inventors **Robert W. Coburn, Sr.**
Minneapolis;
John B. Lyman, Bloomington, both of, Minn.

[21] Appl. No. **842,601**
[22] Filed **July 17, 1969**
[45] Patented **June 8, 1971**
[73] Assignee **Whirlpool Corporation**

[54] **DISHWASHER MOTOR MOUNTING**
7 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **417/360,** 134/188, 277/12, 277/32, 277/189, 415/201
[51] **Int. Cl.** **F04b 21/00**
[50] **Field of Search** 134/188; 415/201; 417/360; 277/12, 32, 189

[56] **References Cited**
UNITED STATES PATENTS

2,492,288	12/1949	Hollerith	415/201UX
3,398,866	8/1968	Flame et al.	134/188X
3,406,637	10/1968	Perl	134/188X

Primary Examiner—Daniel Blum
Attorneys—James S. Nettleton, Thomas E. Turcotte, Gene A. Heth, Burton H. Baker, Donald W. Thomas, Frank C. Harter and Hofgren, Wegner, Allen, Stellman and McCord

ABSTRACT: A dishwasher having a tub for washing liquid and an opening in the bottom through which is suspended the motor of a motor-pump unit with the pump being on the interior of the tub, a sealing gasket around the unit and supported by the inner surface of the tub adjacent the opening and a plurality of spring clips exerting a downward force on the motor and upward force on the pump and a compressive force against the bottom surface of the tub in the region of the opening to increase the downward pull on the sealing gasket.

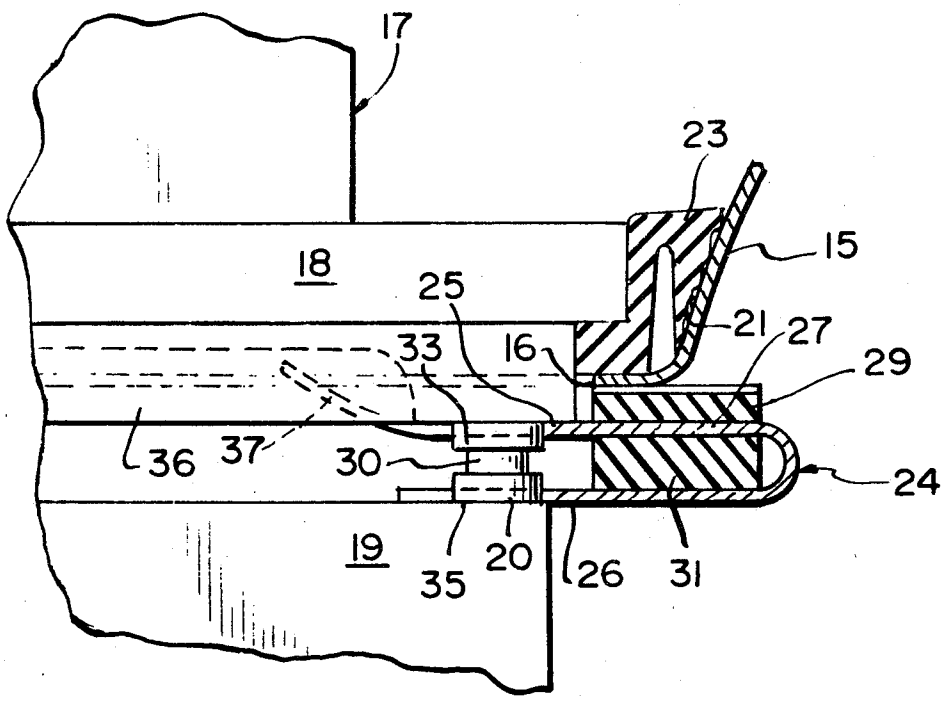


FIG.1

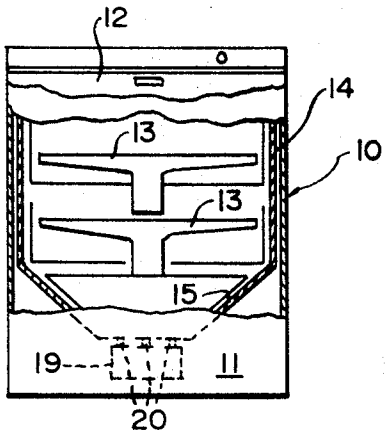


FIG.4

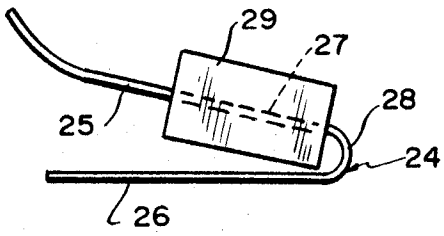


FIG.3

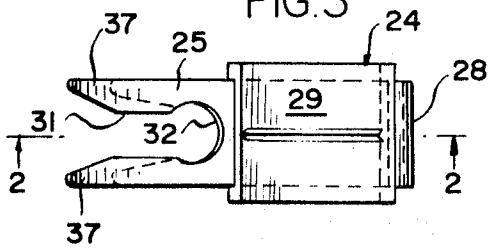


FIG.2

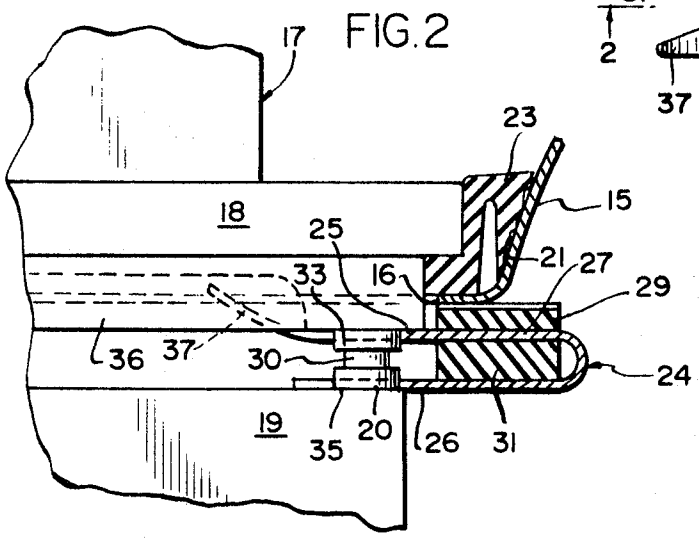


FIG.6

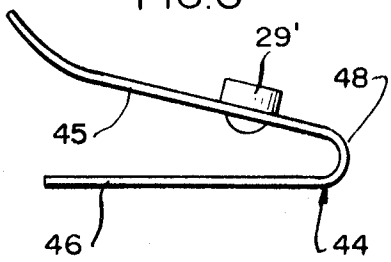
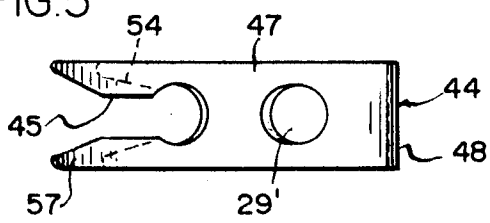


FIG.5



INVENTORS.
ROBERT W. COBURN SR.
JOHN B. LYMAN

BY Hofgren, Wegner, Allen, Stellman & McCord.

ATTORNEYS.

DISHWASHER MOTOR MOUNTING

One of the features of this invention is to provide an improved gasket seal structure which employs a plurality of spring clips having the function of pressing the motor-pump unit more securely against the sealing gasket on the interior of the tub to prevent damage to the parts thereof during severe handling of the dishwasher.

Other features and advantages of the invention will be apparent from the following description of one embodiment thereof taken in conjunction with the accompanying drawings. Of the drawings:

FIG. 1 is a schematic view partially broken away of a dishwasher embodying the invention.

FIG. 2 is an enlarged fragmentary vertical sectional view of the structure at the bottom of the tub.

FIG. 3 is a plan view of a spring clip of the invention.

FIG. 4 is a side elevational view of the clip.

FIG. 5 is a plan view of a second embodiment of the clip.

FIG. 6 is a side elevational view of the second embodiment of the clip.

The dishwasher **10** of the illustrated embodiment includes the usual cabinet **11** with a front opening door **12** and a pair of vertically spaced rotatable spray arms **13** that are rotatable during use to spray washing liquid within an interior tub **14**.

The tub **14** has a bottom sump **15** of generally inverted truncated conical shape and has a central circular opening **16** in which is positioned a motor-pump unit **17**. The pump of the unit includes a pump body **18** positioned within the opening **16** and an electric motor **19** depending therefrom and beneath the sump opening **16**. The motor **19** is suspended from the pump body **18** by a plurality of studs **20**, of which only one is shown in FIG. **2**, but the disclosed embodiment uses four of these supporting studs **20** spaced about 90° apart as indicated in FIG. **1**.

In order to seal the unit **17** in liquidtight relationship to the bottom interior surface **21** of the sump **15** in the area surrounding the central opening **16**, there is provided a sealing gasket **23** between the outer periphery of the pump body **18** and the interior surface **21** around the opening **16**.

As a further sealing element there is provided a spring clip **24** for each stud **20**. Thus, in the disclosed embodiment there are four of these clips. Each clip, as illustrated in FIGS. **2—5**, comprises a pair of spring portions **25** and **26** that flare outwardly from each other when unstressed, as shown in FIG. **4**, with the result that they describe in side elevation a generally hairpin shape. Each spring portion contains an opening for receiving a stud **20**, as illustrated in FIG. **2**, with one spring portion **25** bearing upwardly against the bottom of the pump body **18** and the other portion **26** bearing downwardly against the motor **19**. When the clips are assembled in their operating position, the spring portions **25** and **26** are distorted toward each other as shown in FIG. **2** to exert a spring pressure as described.

Each spring clip **24** is provided with a part **27** which in the illustrated embodiment is the root end of the upper spring portion **25** that is adjacent the bend **28** that connects the upper and lower spring portions **25** and **26**. This part **27** of each clip **24** carries a resilient bumper **29** which may be of rubber or the like and when the clip **24** is in position the top inner part of the bumper is compressed against the outer surface of the tub adjacent the opening **16** to exert a compressive force holding the pump body **18** tightly pressed against the sealing gasket **23**.

As is shown in FIG. **2**, each stud **20** has an intermediate section **30** of reduced cross section and one of these spring portions, here shown as the extended end **25**, has a slotted end **31** that can pass around the reduced section **30** when the spring portions **25** and **26** are tightly compressed toward each other which, of course, also compresses the intermediate portion **31** of the rubber bumper **29** therebetween. This slotted end **31** has an enlarged area **32** that as shown is at the extreme inner end for receiving an end **33** of the stud.

The other spring portion **26** is provided with a relatively wide tapered slot like that at **54** (FIG. **3**) which receives the opposite stud end **35** when the spring clip is in position.

The pump body **18** on the side adjacent the motor **19** is provided with a plurality of radiating ribs **36** with each stud **20** being located at a rib. Each clip has its one spring portion **25** provided with ends bent upwardly as indicated at **37** so that these two bent ends will be positioned on opposite sides of a corresponding rib **36** in order to hold the clip **24** against turning movement on its stud **20**.

An alternative embodiment of the invention may be seen in FIGS. **5** and **6**. In the alternative embodiment the rectangular resilient bumper **29** is replaced with a circular resilient bumper **29'**. Bumper **29'** has a reduced thickness portion which passes through an opening in the spring portion **45** which has a flat section **47** to thereby retain the bumper on the clip **44**. This embodiment is likewise provided with a second spring portion **46** and a bend **48**.

With this invention a very simple device which is embodied in the plurality of spring clips **24** not only increases the sealing force on the annular gasket **23** which seals the motor-pump unit **17** to the bottom of the tub **15** but also provides resilient mounting of the motor-pump unit **17** to the tub **15** so that rough handling of the dishwasher, whether during shipment or after installation, prevents damage to the motor-pump unit **17** and particularly to the porcelain finish typically applied to the tub **15**.

Having described our invention as related to the embodiments shown in the accompanying drawings, it is our intention that the invention be not limited by any of the details of description, unless otherwise specified.

The embodiments of the invention in which we claim an exclusive property or privilege are defined as follows:

1. A dishwasher comprising: a tub with a bottom opening; a motor-pump unit in said opening with the motor suspended beneath the tub; spaced mounting studs connecting the pump and motor; gasket sealing means around said opening between said unit and the interior of the tub; and a plurality of spring clips each having a pair of spring portions with openings receiving a said stud, one said portion bearing upwardly against said pump and the other bearing downwardly against said motor, each said clip being provided with a part adjacent the outer surface of said tub and carrying a resilient bumper compressed against said outer surface to exert a downward force on said gasket sealing means.

2. The dishwasher of claim **1** wherein each said stud has an intermediate section of reduced cross section, and one of said spring portions has a slotted end passing around said intermediate section in installing said clip and an enlarged area receiving a said end.

3. The dishwasher of claim **1** wherein said pump is provided with an external rib adjacent each stud, and each said clip has a spring portion with a slot receiving a stud and a said rib to hold the clip against turning relative to its stud.

4. The dishwasher of claim **3** wherein each said stud has an intermediate section between its ends of reduced cross section, said slot having a width to pass around said reduced section, and an enlarged area receiving a said stud end to secure said clip on its stud.

5. The dishwasher of claim **1** wherein each said clip is of U-shape having a pair of leg spring portions connected by a bend, each of said spring portions having a slot receiving a said stud.

6. The dishwasher of claim **5** wherein each said stud has an intermediate section of reduced cross section, and one of said spring portions has a slotted end passing around said intermediate section in installing said clip and an enlarged area receiving a said end.

7. The dishwasher of claim **5** wherein said pump is provided with an external rib adjacent each stud, and each said clip has a spring portion with a slot receiving a stud and a said rib to hold the clip against turning relative to its stud wherein each said stud has an intermediate section between its ends of reduced cross section, said slot having a width to pass around said reduced section, and an enlarged area receiving a said stud end to secure said clip on its stud.