Dec. 20, 1960 J. W. JACOBS 2,965,317

DOMESTIC APPLIANCE

Filed Nov. 22, 1957 2 Sheets-Sheet 1

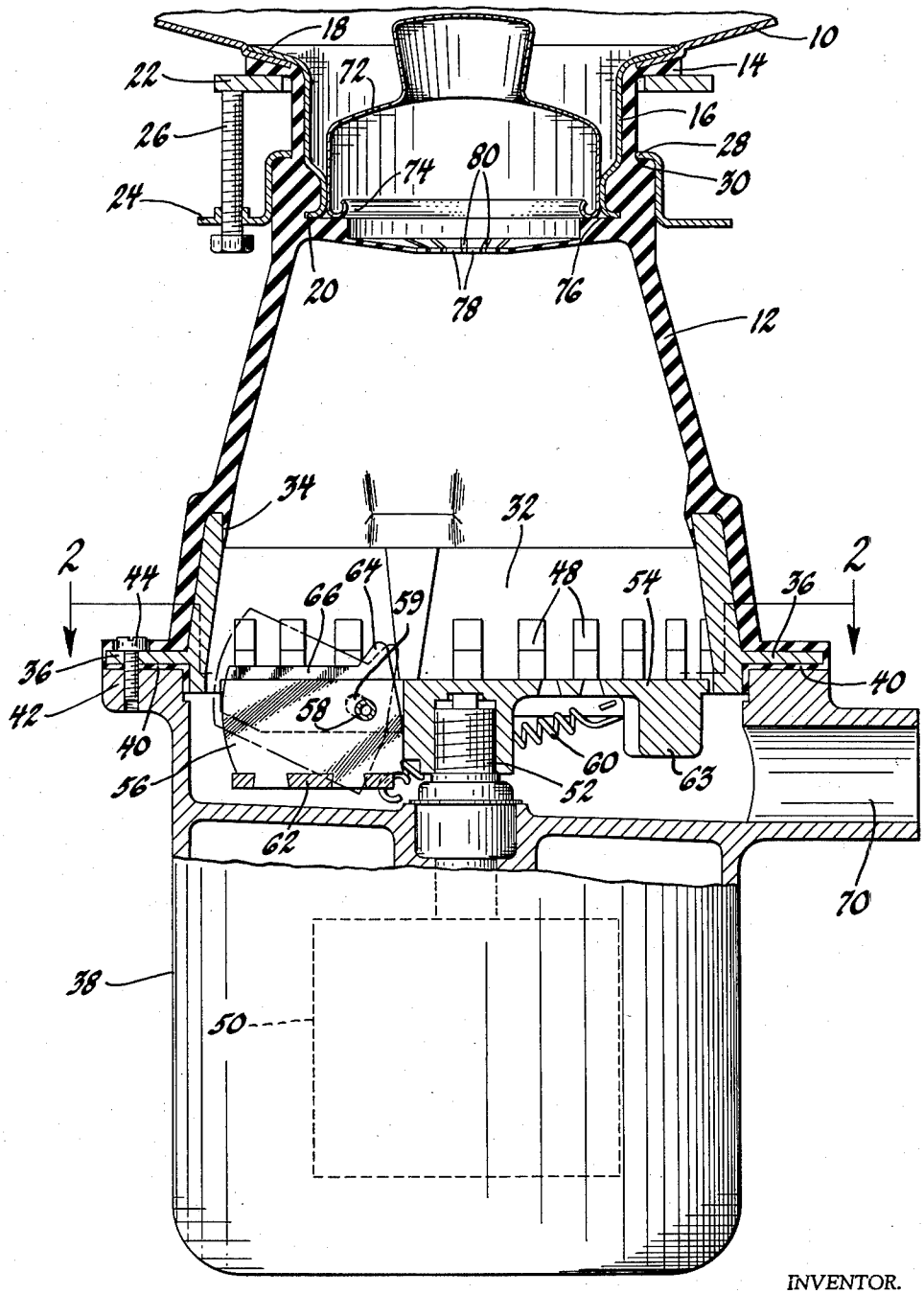


Fig. 1

INVENTOR.
James W. Jacobs
BY Edwin S. Dybwig
HIS ATTORNEY

Dec. 20, 1960 J. W. JACOBS 2,965,317

DOMESTIC APPLIANCE

Filed Nov. 22, 1957 2 Sheets-Sheet 2

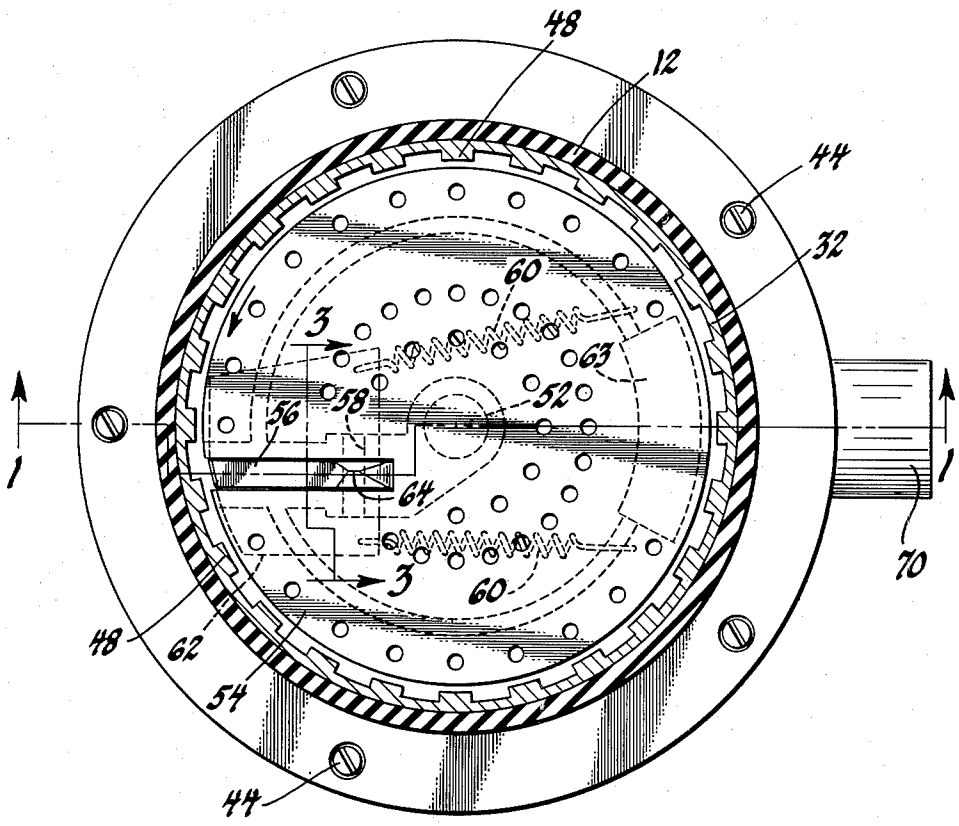


Fig. 2

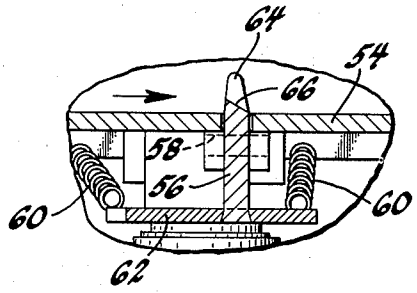


Fig. 3

INVENTOR.
James W. Jacobs
BY Edwin L. Aylsworth
HIS ATTORNEY

United States Patent Office 2,965,317 Patented Dec. 20, 1960

2,965,317

DOMESTIC APPLIANCE

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Nov. 22, 1957, Ser. No. 698,192

3 Claims. (Cl. 241—46)

This invention relates to a domestic appliance and more particularly to a waste disposal unit.

The present invention is directed to improvements in the cutter vanes, the housing, and the mounting arrangement for the unit all of which are designed to provide for more quiet and troublefree operation.

The changes which have resulted in quieter operation are of such a nature that they have also resulted in a reduction in the manufacturing costs.

In the improved unit, the upper housing of the disposal unit is made of elastomeric material which includes an integrally formed mounting and sealing flange and also includes an integrally formed flexible splash guard element so arranged that the outer periphery of the splash guard provides a ledge for arresting the downward movement of a stopper removably disposed within the inlet throat of the disposal unit. Thus the number of individual parts which must be made and handled as separate parts in the factory has been reduced.

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 form of the present invention is clearly shown.

In the drawings:

Figure 1 is largely a sectional view taken substantially on line 1—1 of Figure 2 showing a preferred embodiment of the invention;

Figure 2 is a sectional view taken substantially on line 2—2 of Figure 1; and

Figure 3 is a fragmentary sectional view taken substantially on line 3—3 of Figure 2.

Referring now to the drawing wherein a preferred embodiment of the invention has been shown, reference numeral 10 designates the bottom wall of a conventional sink having the usual drain opening adjacent which the disposal unit is mounted so as to receive waste material placed in the sink. The disposal unit includes a generally tubular elastomeric upper housing section 12 which as shown may be tapered slightly from bottom to top so that the opening at its bottom end is somewhat larger than the top opening. The upper end of the housing 12 is provided with an outwardly extending flange portion 14 which underlies the bottom wall of sink 10 adjacent the drain opening in the sink.

A sheet metal supporting sleeve or throat element 16 which is provided with an outwardly directed upper flange 18 and an outwardly directed bottom flange 20 is arranged as shown and serves to support the disposal unit in alignment with the drain opening in the sink. The outwardly directed flange 14 is firmly clamped against the bottom wall of the sink 10 by means of a special clamping device including an upper ring 22 which underlies the flange 14, a lower screw supporting ring 24, and a plurality of screws 26 which are carried by the screw supporting ring and have their upper ends arranged to press against the clamping ring 22. The screw supporting ring 24 may be made of sheet metal and

includes an inwardly directed flange 28 which is adapted to abut against a ledge or shoulder 30 formed on the housing 12 as shown. The elastomeric housing 12 is sufficiently flexible to allow sufficient distortion thereof to permit inserting the throat element 16. While the element 16 is being inserted, the screw supporting ring 24 is raised above the ledge 30 so as to allow outward movement of elastomeric walls of the housing 12. Once the element 16 is in place the ring 24 is moved down so as to hold the parts assembled.

The housing 12 is preferably formed of an elastomeric material such as natural rubber or one of the various synthetic rubber-like materials. Such materials are very durable and are substantially unaffected by acids and other substances which would normally come into contact with the elastomeric material. A shredder ring 32 is molded in place adjacent the lower portion of the housing 12. As shown in the drawings a downwardly extending flange portion 34 of the elastomeric material overlies the inner upper edge of the shredder ring 32 so as to prevent any waste material striking or catching on the upper edge of the shredder ring. The shredder ring is provided with a radially extending flange portion 36 which is wholly embedded in the molded elastomeric material from which the main housing portion 12 is made. By virtue of this construction the flange 36 may be held in place on the upper end of the motor and impeller housing 38 and the elastomeric material 40 which underlies the mounting flange 36 and which is integrally formed with the main housing 12 serves as a gasket material for preventing any leakage between the flange 36 of the shredder ring and the flange 42 of the housing 38. Suitable cap screws 44 are used for clamping the housing sections 12 and 38 together. This construction greatly reduces the number of parts required and also reduces the number of joints which could eventually cause leaks.

The shredder ring 32 includes the usual comminuting projections 48. A conventional motor 50 disposed within the motor housing 38 serves to drive the vertically disposed shaft 52 which has keyed to its upper end a rotary grinding wheel 54 on which is mounted at least one movable vane or impeller element 56. The element 56 is supported on a pivot 58 operating in a slot 59 formed in the depending portion of the grinding wheel 54. The vane 56 is normally biased both by gravity and by means of one or more springs 60 into a downward position as shown in solid lines in Figures 1 and 3. The bottom edge of the impeller vane 56 has secured thereto a weighted blade 62 to which the springs 60 are attached as best shown in Figures 1 and 2. The wheel 54 includes a counter-weight portion 63 opposite the weighted impeller 56. When the motor is in operation the grinding wheel will be rotating at a rather high speed such that the vane 56 will tend to move upward and radially outwardly from the solid line position into the dot-dash line position shown in Figure 1 due to centrifugal force overcoming the pull exerted by the spring 60 and gravity.

As best shown in Figures 1 and 3 the vane 56 is provided with a food turn-over projection 64 which at all times project above the surface of the grinding wheel 54. The upper edge of the vane 56 extends above the upper surface of the grinding wheel 54 and is beveled as shown at 66 so that the vane is at all times effective for engaging waste material lying on the grinding wheel 54. However, the direction of the bevel 66 is such that when the vane is in its down position, such as when the motor first starts, none of the waste material can become wedged between the forwardly moving flat side of the vane and any portion of the shredder ring. The beveled surface of the upper edge of the vane serves to

cam waste material upwardly and over the vane in the event of any tendency to jam. It is obvious from the above described construction that the vane projects above the upper surface of the grinding wheel at all times so as to be effective in moving any waste material lying on the wheel from the very beginning of the rotation of the wheel, but the construction and arrangement of the vane and its beveled surface is such as to greatly reduce the tendency of any waste material becoming wedged between the forwardly moving side of the vane and the shredder ring. In the event that any waste material should become wedged between the forward side of the vane while in its upper position so as to stop the motor, the spring **60** combined with the force of gravity will tend to pull the vane down so as to allow the motor to continue rotating the grinding wheel assembly. The direction of movement of the grinding wheel assembly is indicated by the arrows in Figures 2 and 3.

The waste material is adapted to be introduced through the upper end of the elastomeric housing **12** and the comminuted waste material is adapted to leave the disposal unit through the usual drain outlet **70** in accordance with well-known practice. A sheet metal stopper element **72** is provided as shown for closing the inlet to the disposal unit when it is desired to use the sink with the drain closed. It will be noted that this sheet metal stopper element **72** is provided with a bottom rolled edge **74** which rests against a ledge **76** formed as an integral part of the elastomeric housing **12**. In disposal units of this type it is desirable to provide a splash guard adjacent the inlet to the comminuting chamber. These splash guards are usually made as separate elements whereas in the embodiment shown this splash guard includes a plurality of splash guard segments **78** formed integrally with the casing **12**. Thus radial slits **80** are formed as shown in Figure 1 whereby the splash guard segments **78** may be pushed out of the way when it is desired to place waste material into the comminuting chamber.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. Waste disposal apparatus comprising a generally tubular housing adapted to be mounted below a sink with its upper end secured directly to said sink in alignment with the drain opening in the sink, said tubular housing comprising a molded elastomeric element having embedded therein adjacent the lower portion of said elastomeric element a shredder ring and having integrally formed adjacent the upper end thereof an outwardly directed flange for direct sealing engagement with the sink and having an inwardly directed flange terminating in a plurality of radially inwardly projecting splash guard segments, said shredder ring having an outwardly directed motor mounting flange, a motor housing secured in abutting relationship to said last named flange, said elastomeric element including an integrally formed sealing flange disposed between said motor housing and said motor mounting flange, and screw means passing through said motor mounting flange and extending into a portion of said motor housing for clamping said motor housing to said motor mounting flange so as to compress said sealing flange and thereby seal the joint between said motor housing and said motor mounting flange.

2. Waste disposal apparatus comprising a housing having a shredder ring, a motor having a drive shaft, a rotor carried by said drive shaft and having its outer periphery arranged in close proximity to the lower edge of said shredder ring, said rotor having a slot in its outer periphery, a centrifugally operated cutter vane, means for pivotally supporting said cutter vane for pivotal and sliding movement within said slot whereby upon rotation of said shaft centrifugal force causes said vane to move radially outwardly into closer proximity to said cutter ring and the outer end of said vane to move upwardly to present a larger waste moving surface above the upper surface of said rotor, said cutter vane having a first end portion arranged in close proximity to the center of rotation of said rotor and having its other end disposed adjacent to the outer edge of said rotor, said means for pivotally supporting said cutter vane including a horizontally disposed pin and a vertically inclined slot arrangement whereby said vane can both pivot about said pin and move endwise and upwardly within said rotor opening, said cutter vane and said pin and slot being so arranged that said pin and vane tend to move downwardly and centripetally in said slot by gravity action.

3. In a waste disposal mechanism, means forming a chamber for comminuting waste material, a rotor in said chamber, said rotor having an opening in its upper surface, a cutter vane disposed within said opening, means for pivotally supporting said cutter vane on said rotor, said cutter vane having an upper surface projecting above the upper surface of said rotor at all times and having said upper surface beveled with the lower edge of beveled surface arranged substantially in alignment with the upper surface of said rotor when said vane is in its lowermost position, said cutter blade having a first end portion arranged in close proximity to the center of rotation of said rotor and having its other end disposed adjacent to the outer edge of said rotor, said means for pivotally supporting said cutter vane including a horizontally disposed pin and a vertically inclined slot arrangement whereby said vane can both pivot about said pin and move endwise and upwardly within said rotor opening, said cutter vane and said pin and slot being so arranged that said pin and vane tend to move downwardly and centripetally in said slot by gravity action and to move radially outwardly and upwardly in response to centrifugal force during high speed rotation of said rotor.

References Cited in the file of this patent

UNITED STATES PATENTS

2,577,152	Powers	Dec. 4, 1951
2,642,233	Powers	June 16, 1953
2,643,066	Lamb	June 23, 1953
2,743,875	Brezosky et al.	May 1, 1956
2,767,927	Green	Oct. 23, 1956
2,828 086	Macemon	Mar. 25, 1958
2,832,548	Hammes	Apr. 29, 1958
2,834,554	Bebinger	May 13, 1958
2,894,698	Brucken	July 14, 1959

FOREIGN PATENTS

18,716	Great Britain	of 1901