

May 15, 1962

G. A. LYON
SINK STRUCTURE

3,034,147

Filed Sept. 25, 1959

2 Sheets-Sheet 1

Fig-1

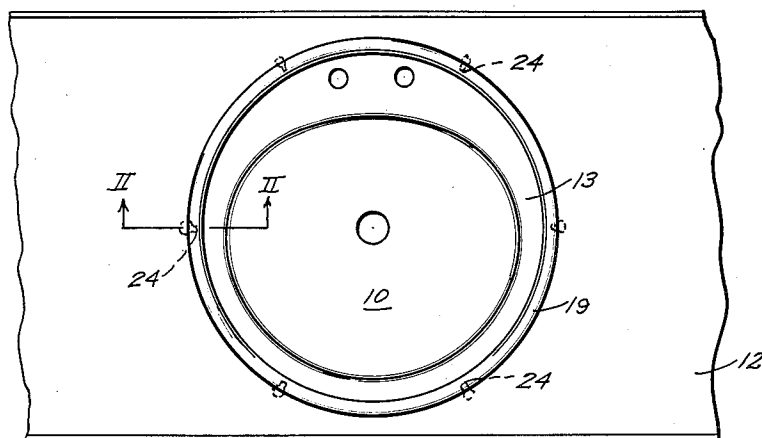


Fig-2

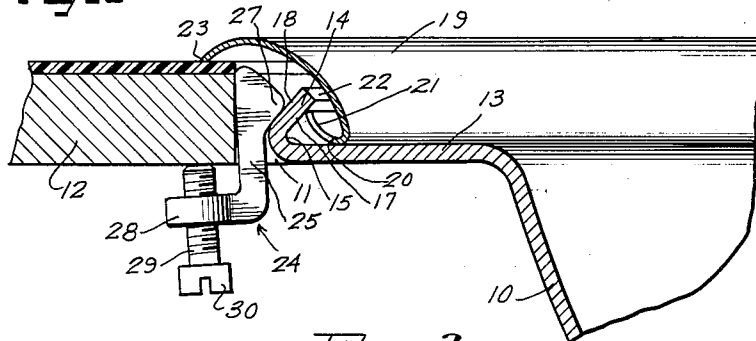


Fig-3

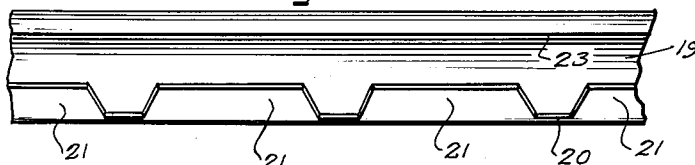
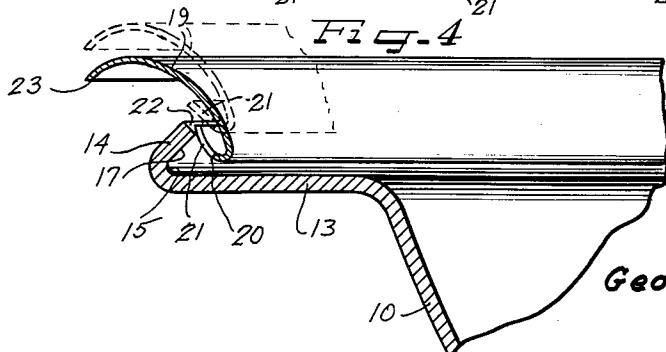


Fig-4



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Fig. 5

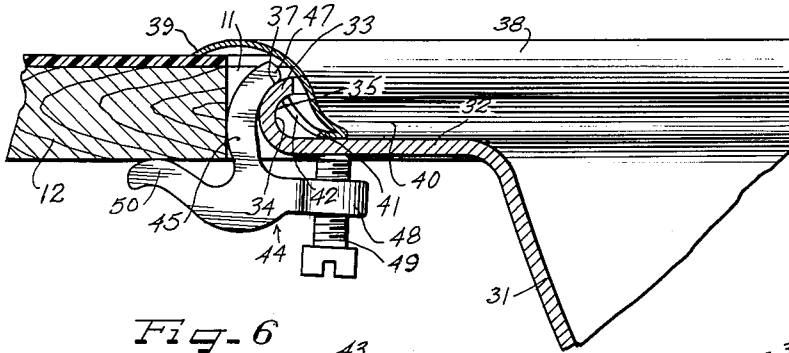


Fig. 6

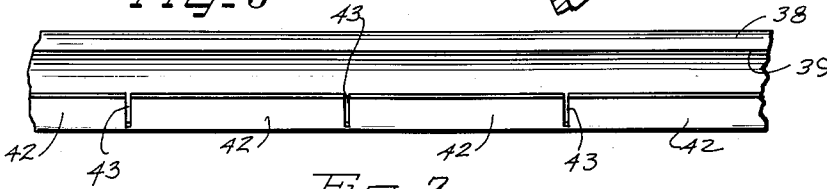


Fig. 7

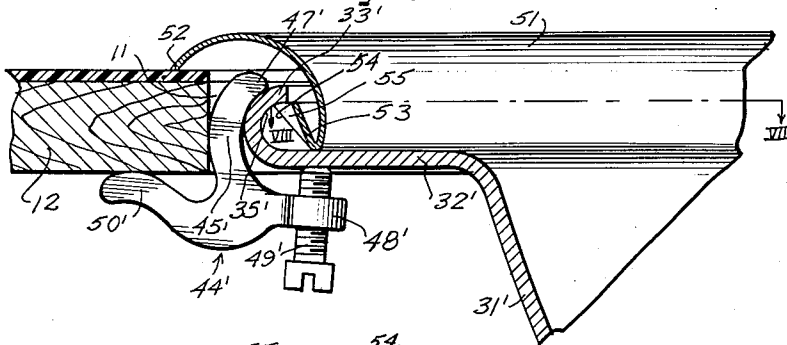


Fig. 8

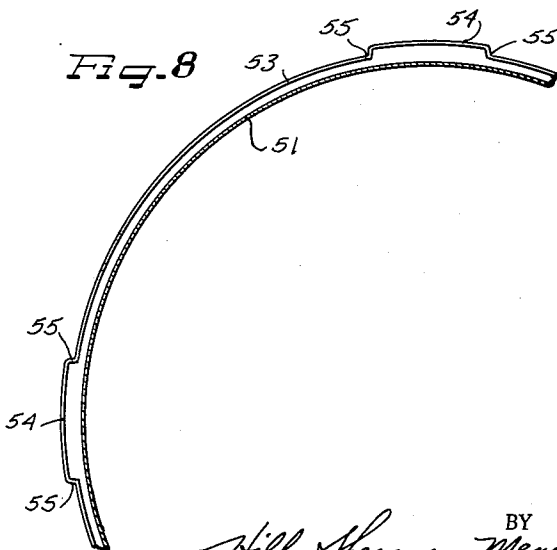
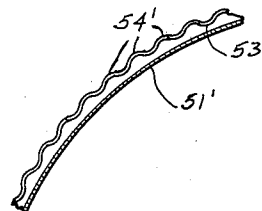


Fig. 9



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SINK STRUCTURE

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4 Claims. (Cl. 4-187)

The present invention relates to improvements in sink structures and more particularly concerns sinks of the rigid rim flange type and means for mounting the same with a counter top.

Sinks of the rigid stamped enameled steel type are desirably provided with reinforcing terminal structure on the rigid rim flanges thereof. This complicates mounting of the sinks with respect to counter tops.

It is accordingly an important object of the present invention to provide improved means for mounting rigid rim flange sinks.

Another object of the invention is to provide an improved rigid rim flange sink having a novel reinforcing terminal flange structure which is not only useful to avoid overflow leakage but also to facilitate assembly with the sink of supporting molding frame means by which the sink is adapted to be supported in operative relation to a counter top.

A further object of the invention is to provide an improved sink and molding frame strip combination.

Still another object of the invention is to provide an improved sink structure including means to facilitate retention of a sink and molding frame member by means of retaining clips.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a top plan view of a sink structure embodying features of the invention;

FIGURE 2 is an enlarged fragmentary sectional elevational detail view taken substantially on the line II-II of FIGURE 1;

FIGURE 3 is a fragmentary developed side elevational view of the supporting molding frame strip of FIGURES 1 and 2;

FIGURE 4 is a sectional view similar to FIGURE 2 but showing the molding frame strip in the course of being assembled with the sink;

FIGURE 5 is a sectional view similar to FIGURE 2 but showing a modification;

FIGURE 6 is a developed side elevational view of the molding frame strip member of FIGURE 5;

FIGURE 7 is a sectional view similar to FIGURES 2 and 5 but showing still another modification;

FIGURE 8 is a fragmentary reduced scale sectional detail view through the molding frame strip of FIGURE 7; and

FIGURE 9 is a fragmentary sectional detail view similar to FIGURE 8 but showing a modified form of the molding frame strip retaining flange means.

As shown in FIGURES 1 and 2, a sink 10 is constructed and arranged to be mounted within a suitable opening 11 in a counter top 12 which may be of the wooden base and thermo-setting plastic upper wear surface lamina type. In this instance, the sink is shown as having a generally oval bowl with a laterally outwardly projecting rim flange 13 on its upper end which is of circular perimeter and thereby defines a plumbing shelf of substantial width on the rear part of the sink. This form of sink is especially adapted for lavatory and bar sink uses, and it is obvious that the sink may be of other sizes and perimeter shapes.

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Suitable heavy gauge material such as steel may be used in the construction of the sink 10 providing a substantially rigid bowl and rim structure which may be enameled as preferred. Desirably, the outer terminus of the rim flange 13 is constructed as an upwardly and inwardly projecting terminal lip flange 14 of substantial width providing a generally inwardly opening groove 15 with the underlying portion of the rim flange 13. On its inner side the flange 14 provides a downwardly and inwardly facing shoulder 17 while on its outer side the flange provides an upwardly and outwardly facing shoulder 18. In addition to affording substantial reinforcement against warpage for the rim flange 13, especially such as might occur during the heat encountered in vitreous enameling, such flange provides a convenient overflow leakage barrier for the outer margin of the rim flange.

According to the present invention, the rim lip flange 14 serves the important function of interlockingly coacting with a molding frame strip ring member 19 which is adapted to be made from relatively light gauge, resilient material such as stainless steel and affords a supporting frame and joint bridging and sealing means between the sink 10 and the counter top 12. To this end, the supporting frame member 19 is of generally arched cross-section and of an inside diameter and generally downwardly and inwardly sloping form to engage the rim flange 13 inwardly adjacent to the terminal lip flange 14. On its inner margin the frame member 19 has an underturned reinforcing and finishing flange 20 arranged to seat upon the rim flange 13 whereby the frame member 19 provides a primary overflow curb for the sink.

For retaining engagement with the sink rim lip flange 14, the underturned frame member flange 20 has projecting integrally therefrom and generally upwardly and outwardly in concealed relation behind the body of the frame member 19 a circumferentially spaced series of resilient spring retaining fingers 21 (FIGS. 2 and 3). These fingers are of a length to project to a slightly greater diameter than the diameter of the tip of the lip flange 14 and the adjacent portion of the inner shoulder surface 17 of the lip flange. In width the fingers 21 are substantially greater than their length whereby they have substantial resilient stiffness, which is progressively greater from the tips of the fingers to juncture with the underturned flange 20 by virtue of the tapered side construction of the fingers. Actually, the fingers 21 are formed by notching out an extension of the underturned flange 20 to subdivide the same into the plurality of relatively resiliently flexible fingers 21.

Attachment of the frame ring member 19 to the sink is adapted to be effected simply and conveniently in the manner depicted in FIGURE 4. Thus, the ring member 19 is generally centered with respect to the rim flange lip 14, with the retaining fingers 21 initially in a normally straight condition, as shown in dash outline in FIGURE 4, against the tip of the lip flange 14 which is provided with an inwardly and downwardly sloping lead-in surface 22. Relative axial assembly movement of the sink and the frame ring member 19 then causes the retaining fingers 21 to flex toward the body of the ring frame member 19 and slidably cam inwardly on the lead-in surface 22 as depicted in full outline in FIGURE 4. When the tips of the retaining fingers 21 have passed the free edge of the lip flange shoulder surface 17, the fingers resiliently snap outwardly and tend to cam downwardly and outwardly along the surface 17 and thus thrust the underturned rib-like flange 20 on the inner margin of the frame ring firmly in bottomed seating engagement with the rim flange 13. In view of the variance in relative diametrical disposition of the tips of the retaining fingers 21 and the lip flange shoulder 17 a permanently tensioned gripping

thrusting biting engagement of the retaining fingers against the overhanging shoulder 17 is maintained as shown in FIGURE 2 and as indicated by the bowed tensioned condition of the retaining fingers 21. It will be appreciated, of course, that if desired the groove 15 and the chamber defined thereby with the inner margin of the frame ring member 19 may be filled with a plastic sealing cement or calking compound.

Although assembly of the frame ring 19 with the sink may be effected in the upright relation shown in FIGURE 4, where the sink may be supported in a stationary position and the frame ring 19 pressed into the retaining interengagement with the rim lip flange 14, it may be found more convenient to effect assembly in an inverted relationship wherein the frame ring member 19 is supported in a stationary jig or on a suitable surface and the sink 10 moved into the assembled interrelationship wherein the retaining fingers 21 and the retaining flange 14 are in the generally interhooked retaining gripping relation.

If desired, of course, the sink 10 and the frame ring member 19 may be assembled at the factory and the unit then shipped to the point of use and there assembled as a unit with the counter top 12. On the other hand, the sink 10 and the frame strip member 19 may be shipped in knock-down separate condition to the point of use and there assembled into a unit before installation with the counter top. Moreover, should the frame ring member 19 become damaged in any way which would make it undesirable either from a utility or appearance standpoint, it can be removed from the sink by means of an appropriate tool inserted behind the retaining fingers 21 to pry the same free from the lip flange 14 so that a replacement frame member 19 can be assembled with the sink.

In effecting installation of the sink and frame member as a unit with the counter top 12, the sink is inserted through the counter top opening 11 until the outer margin of the frame member overlies the margin of the upper surface of the counter top 12 and a downturned outer sealing edge 23 of the frame member engages the counter top. This may be effected either in an inverted relation of the sink assembly and the counter top or in an upright relation thereof. In such assembly there is a reasonable gap between the perimeter of the sink rim flange 13 as provided at juncture of the lip flange 14 with the rim flange 13 and the edge of the counter top defining the opening 11. This affords some tolerance for ease in installing plumbing. It also affords a gap through which suitable retaining clips 24 can extend where it is desired to use the same for retaining the sink and counter top against separation, although if desired, such clips may be dispensed with and plumbing relied upon to draw the sink downwardly relative to the counter top to afford a snug sealing interengagement of the frame ring edge 23 with the counter top and to hold the sink against upward displacement relative to the counter top.

In the form shown, the retaining clips 24 of which there may be any suitable number circumferentially spaced as indicated in FIGURE 1, are of generally L-shape having an upwardly extending retaining arm 25 having an upper head and including an inwardly projecting retaining projection shoulder 27 engageable retainingly with the generally upwardly and outwardly facing shoulder surface 18 of the lip flange 14. On the lower end of the arm 25 is an outwardly projecting arm 28 that is adapted to underlie the counter top in spaced relation and carries movable clamping means 29 in the form of a screw threaded through the arm 28 to engage at its upper end tip against the underside of the counter top 12, while the lower end of the screw has a tool-engageable head 30.

Assembly of the clip 24 is adapted to be effected by inserting the arm 25 and the head projection 27 through the gap between the sink rim edge and the counter top while the clip is turned 90° from the position shown in FIGURE 2 so that the arm 25 and the projection which are thinner in the dimension normal to the face shown

than the gap will easily pass through the gap. Then by turning the clips into the position shown, the shoulder projection 27 engages against the lip flange shoulder 18. At the same time, the head end of the arm 25 thrusts against the adjacent edge defining the counter top opening 11. Then, when the screw 29 is drawn up from an originally backed off relation to that shown, the screw thrusts up against the underside of the counter top and draws the clip downwardly so that the projection 27 pulls downwardly on the rim flange shoulder 18 and thereby exerts a downward thrust against the retaining fingers 21 and thereby pulls the molding frame member 19 downwardly and clampingly thrusts the edge 23 against the upper side of the counter top. Any tendency of the shoulder projection 27 to slip off of the slanted shoulder 18 of the sink rim lip flange is counteracted by engagement of the head end of the arm 25 of the clip against the edge of the counter top so that actually a wedging action is effected between the head of the clip and the sink rim flange and the counter top for effectively holding the sink against transverse displacement, in cooperation with the other retaining clips 24. In addition, since the material of the counter top 12 is of extremely low resonance and may be considered a "dead" material from a resonance standpoint, the coaction of the clip heads with the edge of the counter top serves as a vibration damping transmission between the sink rim flange and the counter top and between the lip flange 14 and the ring frame member 19.

In the modification of FIGURES 5 and 6, the counter top 12 and the sink receiving opening 11 therein are the same as in the form of FIGURES 1 and 2, but a sink 31 is provided having a rigid lateral rim flange 32 with a reinforcing and interlock terminal lip flange 33 which is of arcuate cross-section providing an inwardly opening groove 34 and having on its inner side an overhanging generally downwardly and inwardly facing shoulder surface 35 and on its outer side an outwardly and upwardly facing shoulder 37.

Between the perimeter of the rim flange 32 as defined by the outer side of the terminal flange lip 33 and the edge of the counter top 12 defining the opening 11 is a gap which is bridged by a molding frame strip ring member 38 having its outer edge 39 in engagement with the upper surface of the counter top and arching over the gap and the flange lip 33 to overlie at its inner margin the rim flange 32 inwardly beyond the lip flange 33. On such inner margin is an inwardly turned portion 40 providing a drainback groove formation for the inner margin of the frame member 38 and joining an underturned reinforcing and finishing flange 41 which seats against the rim flange. Projecting upwardly and outwardly as extensions from the underturned flange 41 are respective resiliently flexible retaining fingers 42 having their tips disposed normally on a differential diameter with respect to the overhanging shoulder surface 35 of the lip flange to engage in resiliently tensioned gripping biting endwise thrusting retaining relation with a tendency to cam down the slope of the shoulder surface 35 and thus firmly thrust the underturned seating flange 41 against the rim flange 32. It will be observed that in this instance only narrow slits 43 separate the fingers 42, thus attaining maximum holding value from the fingers while nevertheless enabling the fingers to flex relatively resiliently for self-adjusting retaining gripping of the fingers with the lip flange shoulder. Attachment of the frame ring member 38 to the sink may be effected in the same manner as described in connection with the form of FIGURES 1 and 2.

Where it is desired to secure the sink assembly in place with respect to the counter top 12 by means of retaining clips, the clips 44 may be used. These clips include upwardly extending respective retaining arms 45 which in this instance are of a generally curved form adapted to be inserted into the gap between the sink rim and the counter top by an upward arcuate swinging movement to

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engage an inwardly projecting shoulder head portion 47 upon the shoulder 37 of the lip flange. Thrusting of the arm 45 against the adjacent edge defining the counter top opening 11 prevents slipping of the retaining projection 47 away from the shoulder 37. On its lower portion the clip 44 has an inwardly projecting arm 48 which is adapted to underlie the rim flange 32 in spaced relation and carries movable means such as a screw 49 threaded therethrough for engagement at its upper end tip against the underside of the rim flange 32. This tends to rock the clip 44 about a fulcrum at engagement of the head projection 47 with the shoulder 37 outwardly to thrust an outwardly and upwardly projecting lower arm 50 against the underside of the counter top 12, thereby effecting a clamping coaction of the arm 50 with the edge 39 of the frame member 38 and a downward thrusting of the shoulder projection 47 against the lip flange shoulder 37 to draw the sink rim and thus the interlocked frame rim member 38 firmly downwardly.

In FIGURES 7 and 8 is shown a form of the invention which in several respects is similar to the form of FIGURE 6, and more especially with respect to the sink and the retaining clip structure which are identified by primed reference numerals to show similarity to the form of FIGURE 5. In this form, however, a frame molding ring member 51 is provided which is of transversely arched form having an outer edge 52 for engagement with the upper surface of the counter top 12 and with the body of the member arching in bridging relation over the gap between the terminal lip flange 33' to overlie the adjacent portion of the rim flange 32'.

At its inner margin, the frame ring member 51 has an underturned reinforcing and finishing flange 53 providing at juncture with the frame ring member 51 a seat engaging the rim flange 32'. In this instance, the flange 53 extends upwardly and outwardly obliquely behind the body of the frame member 51 at such an angle as to clear the tip of the lip flange 33' for freedom in applying the frame member 51 in the assembly. However, at intervals such as four or more, the flange 53 has outwardly offset retaining finger projections 54 integrally joining the flange 53 on angular reinforcing generally triangular connecting flange portion 55. The finger portions are of substantial width although substantially narrower than the remainder of the flange 53 intervening therebetween and project outwardly just far enough beyond the perimeter of the tip of the flange 53 to engage retainingly in thrusting gripping relation with the downwardly and outwardly sloping retaining shoulder surface 35' of the lip flange 33'.

Assembly of the frame member 51 with the sink 31' is adapted to be accomplished similarly as described in connection with the assemblies of FIGURES 2 and 5. That is, a relative axial assembly movement causes the retaining finger offset projections 55 to snap resiliently in behind the turned over lip flange 33' and cammingly thrustingly engage the camming shoulder surface 35'. The manner in which the retaining finger projections 54 are formed and integrated with the flange 53 makes use of the resiliency of the entire flange for tensioning the finger projections into thrusting engagement with the lip flange shoulder of the sink rim.

A slight modification of the retaining finger structure of the frame ring is depicted in FIGURE 9 wherein primed reference numerals represent substantially similar parts of the frame ring as in the frame ring 51 of FIGURES 7 and 8. The difference resides in that the underturned reinforcing flange 53' is formed with a series of corrugations providing the retaining fingers 54'. These corrugation-like fingers 54' are offset in the flange closer together than the fingers 54 of FIGURES 7 and 8, but the resilient thrusting retaining engagement relation thereof with the sink rim flange lip is substantially the same as described in connection with the offset wider and more widely spaced fingers 54 already described.

It will be understood that modifications and variations

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may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a structure including a counter top having an opening therein, a rigid appliance member having a rigid rim flange projecting generally horizontally outwardly from the appliance and extending from an inner perimeter to an outer perimeter which is smaller than said opening and is disposed in gap relation to the margin of the counter top defining said opening, said outer perimeter being defined by a turned upwardly and inwardly extending reinforcing lip flange integral in one piece with the rim flange and providing an inwardly and downwardly facing shoulder, and a molding frame strip member having a body portion bridging the gap between the rim flange outer perimeter and said counter top margin and having an outer margin seating on the counter top margin and an inner margin concealingly overlying said lip flange and including a flange portion interlockingly interengaged with said shoulder and substantially sealingly engaged with said rim flange, whereby the molding frame strip supports and determines the vertical disposition of the appliance member relative to the counter top.

2. In a structure including a counter top having an opening therein, a rigid appliance member having a rigid rim flange projecting generally horizontally outwardly from the appliance and extending from an inner perimeter to an outer perimeter which is smaller than said opening and is disposed in gap relation to the margin of the counter top defining said opening, said outer perimeter being defined by a turned upwardly and inwardly extending reinforcing lip flange integral in one piece with the rim flange and providing an inwardly and downwardly facing shoulder, and a molding frame strip member having a body portion bridging the gap between the rim flange outer perimeter and said counter top margin and having an outer margin seating on the counter top margin and an inner margin concealingly overlying said lip flange and including a flange portion interlockingly interengaged with said shoulder, whereby the molding frame strip supports and determines the vertical disposition of the appliance member relative to the counter top, said inner margin of the strip substantially sealingly seating on the rim flange inwardly from said lip flange and providing a sealant-receiving chamber between the lip flange and the inner margin of the strip, the inner margin of the strip being substantially spaced outwardly from the inner perimeter of the rim flange and providing an overflow curb for the rim flange.

3. In a structure including a counter top having an opening therein, a rigid appliance member having a rigid rim flange projecting generally horizontally outwardly from the appliance and extending from an inner perimeter to an outer perimeter which is smaller than said opening and is disposed in gap relation to the margin of the counter top defining said opening, said outer perimeter being defined by a turned upwardly and inwardly extending rigid reinforcing lip flange integral in one piece with the rim flange and providing an inwardly and downwardly facing shoulder, and a molding frame strip member having a body portion bridging the gap between the rim flange outer perimeter and said counter top margin and having an outer margin seating on the counter top margin and an inner margin concealingly overlying said lip flange and including a flange portion interlockingly interengaged with said shoulder and substantially sealingly engaged with said rim flange, whereby the molding frame strip supports and determines the vertical disposition of the appliance member relative to the counter top, and retaining clips engaging said lip flange and the underside of the counter top and acting to pull downwardly on the rigid lip flange and thus upon the strip to draw the outer margin of the strip firmly against the upper side of the counter top.

4. In a structure including a counter top having an opening therein, the counter top being formed from a ma-

terial of low inherent resonance factor, a member subject to sound producing vibrations and having a rim flange with a reinforcing terminal adjacent to but spaced in gap relation from the edge of the counter top defining said opening, a frame strip bridging the gap between said terminal and the counter top and having a portion resting on the countertop and a portion retainingly interengaging with the terminal and thereby substantially sealingly engaging with the rim flange and defining the vertically supported disposition of the member within said opening, and wedging means wedgingly engaging said terminal and said edge of the counter top and thereby holding said member against transverse displacement relative to the counter top and effecting a sound damping connection between the rim flange and the counter top.

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