May 15, 1962 G. A. LYON 3,034,146

SINK STRUCTURE

Filed Aug. 13, 1959

Fig. 1

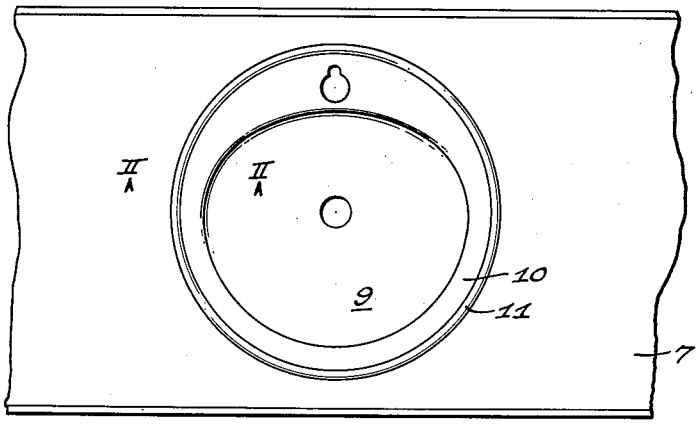



Fig. 2

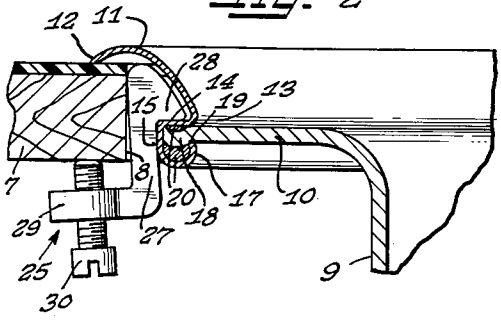



Fig. 3

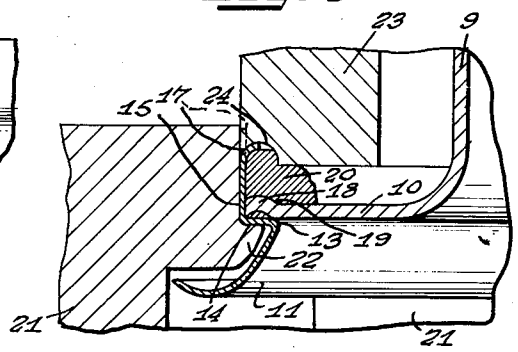



Fig. 4

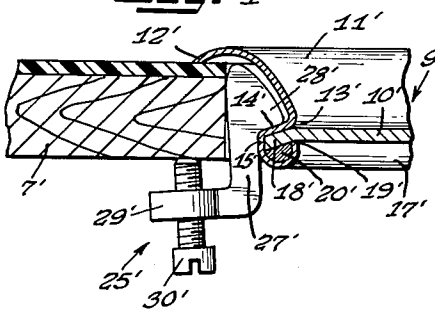
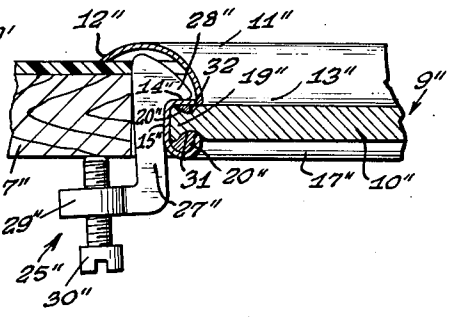



Fig. 5




INVENTOR

George Albert Lyon

BY Hill, Sherman, Meroni, Gross & Simpson

ATTORNEY

United States Patent Office 3,034,146 Patented May 15, 1962



# 3,034,146
# SINK STRUCTURE

George Albert Lyon, Detroit, Mich., assignor to Lyon Incorporated, Detroit, Mich., a corporation of Delaware

Filed Aug. 13, 1959, Ser. No. 833,593
3 Claims. (Cl. 4—187)

The present invention relates to improvements in sink structures and more particularly concerns a new and improved sink structure.

Sinks having substantially rigid rim flanges are desirably assembled with a counter top by means of a supporting and joint closing and sealing molding strip structure. Customarily, such a structure comprises a generally T-shaped frame strip member providing a joint between the counter top and the sink rim flange and having a portion extending downwardly therebetween and providing a support for retaining clips or lugs. Disadvantages inherent in such a construction reside in that generally the frame molding strip and the sink must be supplied as separate parts to be assembled on the job. Damage to the separate frame strip is an ever present liability from bending or other mishandling. Furthermore, it requires a substantial degree of experience and care in properly assembling the frame strip and the sink rim to assure a snug, water-tight joint.

Furthermore, with the molding strip frame arrangement as described, the flange portion thereof which overlies the sink rim is customarily in the same plane as the portion or flange thereof that overlies the counter top, thus affording little if any protection against overflow or splash from running onto the counter top.

A desirable improvement comprises permanently assembling a rolled sheet metal strip frame molding structure with the rim flange in such a manner that the sink and frame molding strip can be handled as a unit and placed as a unit in assembly with the counter top. Stainless steel strip is a desirable material for this purpose. However, stainless steel strip as it is cold worked as by bending it into shape and bending retaining flange structure thereon into retaining relation to the sink rim flange attains a hardness and springiness which develops considerable spring-back in the retaining flange structure. This makes it difficult to effect a snug fluid-tight and rattle-proof connection of the strip with the rim flange.

A principal aim of the present invention is to overcome the prior difficulties and disadvantages and provide a firm water-tight connection of a thin sheet metal, such as stainless steel, molding frame strip and a rigid sink rim flange wherein the problem of a spring-back is overcome.

Another object of the invention is to provide an improved sink structure wherein a formed sheet metal molding frame strip is attached to a rigid rim flange of a sink in a permanent, rattle-proof and water-tight manner and at the same time provide convenient shoulder means for retaining clip brackets by which the sink and supporting molding frame strip are retained in position with respect to a supporting counter top.

Still another object of the invention is to provide a connection between a sheet metal molding frame strip and a rigid rim flange in a manner permanently trapping a substantial body of sealing material in the joint between the strip and the rim flange.

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 drawing, in which:

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

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

FIGURE 3 is a fragmentary vertical sectional detail view, more or less schematic, illustrating steps in the method of making a sink and molding frame strip assembly;

FIGURE 4 is a sectional detail view similar to FIGURE 2 but showing modification; and

FIGURE 5 is a similar view showing another modification.



Referring to FIGURES 1 and 2, a counter top 7 may be of the more or less conventional wood panel and thermosetting plastic upper surface type and provided with a sink receiving opening 8 within which a sink 9 is received. In the present instance, the sink 9 is of the type which is made from a heavy gauge metal, of substantial rigidity, and porcelain enamel finish or otherwise surface treated having a generally oval bowl with an upper lateral rim flange 10 of circular outline and somewhat smaller diameter than the diameter of the counter top opening 8 which is of complementary circular outline.

In order to provide the sink 9 with supporting means, as well as juncture sealing means, and in addition an overflow curb, a molding strip frame ring 11 is provided which is attached to the rim flange 10. To this end, the molding frame member 11 comprises a thin gauge metal strip such as stainless steel which is readily adapted to be rolled into the desired section and affords a desirable finished appearance when the exposed surface thereof is polished and for surface hardness and brilliance possibly also flash chrome plated. On its outer margin the molding frame member 11 has a downturned edge portion 12 which is on a diameter to overlie and engage sealingly with the upper surface of the counter top 7 adjacent to the opening 8. From the counter top-engaging edge portion 12, the strip 11 arches upwardly and then extends downwardly and inwardly to a substantially lower elevation than the edge 12 to a turned reinforcing juncture 13 with an underturned outwardly projecting reinforcing and seating flange 14 of a width to engage over the upper side of the margin of the rim flange 10.

For securing the molding strip member 11 onto the rim flange 10, the underturned, concealed frame member inner marginal rim engaging flange 14 has a downwardly extending terminal flange portion 15 of a diameter to encompass the edge of the rim flange 10 and with the extremity of the flange 15 curled to provide a reinforcing generally return-bent bead 17 for underlying the sink rim flange margin. At its edge the bead flange portion 17 engages firmly against the underside of the rim flange and effects with the juncture rib 13 of the frame strip a firm clamping retaining grip on the rim flange margin.

A firm interlock against transversely outward displacement from the rim flange is assured by the provision of an angular formation 18 of the rim flange margin, in this instance of generally downwardly projecting rib and upwardly opening groove shape affording an interlock shoulder 19 at juncture thereof with the remainder of the rim flange 10 and which shoulder is opposed by the edge of the crimp bead flange 17.

Although the joint between the frame molding member 11 and the sink rim flange 10 as effected by the flange structure 17 is fairly tight, complete sealing against any leakage is assured by confinement of sealing material 20 of preferably at least initially plastic type within the rim flange groove opposing the frame member flange 14, and within the substantial groove provided by the bead flange 17 of the frame member. The substantial body of plastic material in the bead flange 17 also has desirable sound damping efficiency.

In a desirable method of making and assembling the sink and rim flange structure, the sink 9 is completely

formed inclusive of the angular marginal portion 18 of the rim flange. The molding frame strip 11 is rolled into shape inclusive of the underturned outwardly projecting inner marginal flange 14, but with the flange extension portion 15 projecting axially straight, away from the body of the frame strip molding member 11, as shown in dash outline in FIG. 3. Assembly of the molding frame member 11 with the rim flange margin is then easily effected by a relative generally axial movement until the frame member flange 14 engages with the rim flange margin and with the frame member flange 15 disposed about the edge of the rim flange. Thereafter, the terminal portion of the frame member flange 15 is bent and curled over into clamping engagement with the opposite side of the rim flange margin.

In effecting attachment of the frame molding strip 11 to the sink rim flange 10, the frame member 11 may conveniently be supported in a die structure in a suitable press, such die structure including segmental radially relatively movable die members 21 which have supporting nose portions 22 coactive to provide a supporting ledge engageable with the frame member underturned flange 14 in inverted relation thereon, with the ledge nose portion of the die assembly extending into an outwardly opening groove defined between the flange 14 and the body of the frame member 11, as shown in FIG. 3. In this relationship and with the frame strip member flange 15 extending straight as shown in dash outline, the sink 9 is assembled in inverted relation with the margin of the rim flange 10 supported upon the opposed shoulder provided by the strip member flange 14, sealing material having been placed either on the flange 14 or within the groove of the angular flange marginal portion 18 in advance of such assembly. A mass of the sealing material is then applied in the corner defined by the flange 15 and the rim flange margin substantially as shown. A curling die member 23 having a curling groove 24 is then activated to drive downwardly, engaging the edge of the flange 15 in the curling groove 24 and curling the same inwardly and over into the bead flange 17 formation and until the edge of the bead flange portion 17 engages the shoulder 19 of the rim flange. As the flange portion 17 is curled over, it is worked beyond its elastic limits and stiffened against spring-back so that after the edge of the flange portion 17 has been driven into engagement with the rim flange it will not spring back but will hold with clamping engagement against the rim flange. While the flange portion 17 is being curled, the sealing material 20 is trapped therein and pressed against the rim flange marginal angular portion 18 so that at the conclusion of the curling action, the sealing material will be maintained under pressure and in thoroughly leak-proof manner within the channel or groove of the turned bead flange 17. At conclusion of the curling action, the curling die 23 is backed off, and the segmental die members 21 are backed off and the sink removed with the frame rim strip member 11 permanently attached to the rim flange 10.

After the sink 9 has been assembled with the counter top 7, it is desirable to place at least moderate downward compressive pressure of the molding frame edge portion 12 against the upper surface of the counter top 7. This may, if preferred, be accomplished by so organizing the plumbing attached to the sink as to create a downward pull on the sink 9 so that through its rigid permanent connection with the frame member 11 it will create the desirable downward compressive force. On the other hand, this desirable coaction of the sink rim flange extension frame member 11 may be accomplished by means of suitable bracket clip means such as the substantially L-shaped clips 25 (FIG. 2) which in a suitable circumferentially spaced series coact with the upwardly facing shoulder provided by the underturned flange 14 to have the desired pull-down function.

In the exemplary form shown, each of the clips 25 is of generally L-shape having an upwardly extending arm 27 dimensioned to extend through a narrow gap between the downwardly projecting flange portion 15 and the adjacent edge defining the counter top opening 8. An inwardly projecting shoulder lug 28 on the head end portion of the arm 27 is engageable with the shoulder provided by the flange 14. Projecting outwardly from the lower end of the arm 27 is a second arm 29 which is arranged to underlie the counter top 7 in spaced relation and carries threaded therethrough a screw 30 which, after the clip 25 has been assembled with the sink, is adapted to be driven up clampingly against the underside of the counter top to thereby effect a downward drawing of the clip and thus of the head shoulder lug 28 which thrusts downwardly on the shoulder flange 14 and thereby draws the frame strip member 11 downwardly and clampingly thrusts the edge 12 against the upper side of the counter top.

In the modification of FIGURE 4, the several features of the structure are substantially the same as in the form of FIGURE 2 and the same method of making the assembly of sink and rim frame molding strip extension of the rim flange may be employed. Accordingly, the same, but primed, reference numerals have been applied in FIGURE 4 to indicate identity of parts, and the applicability of the same description as in connection with FIGURES 1–3, except as will now be described. In this form of FIGURE 4, the rim flange terminal portion 18′ is angularly disposed to project slightly downwardly obliquely and the seating flange 14′ of the molding frame strip member is of complementary oblique formation, as is also the engaging thrust surface of the shoulder projection 28′ of the retaining spring clips 25′. If preferred, the flange 18′ may, of course, be directed to slope upwardly, substantially the same interlocking effect being attained since then the shoulder 13′ will interlock with the rim flange terminal to substantially the same effect as the edge of the bead flange 17′ locks against the shoulder 19′.

Much the same structure is shown in the modification of FIGURE 5 wherein double primed reference numerals indicate identity of parts and description corresponding to the form of FIGURES 1–3 except for slight modification as will now be pointed out. In this form, the sink 9″ may be of a thicker wall construction such as of a porcelain material, or a cast metal structure so that the rim flange 10″ is of greater thickness than in a drawn metal sink. To this end, the terminal 19″ of the rim flange 10″ is provided with at least on its underside a groove 31 within which the sealing material 20″ is interlockingly engaged so that after it has hardened as is usual with the type of plastic sealing material utilized for this purpose, an effective interlock is provided between the turned bead flange 17″ and the groove 31″. A similar though preferably shallower groove 32 is formed in the terminal flange portion 19″. In functional effect, therefore, the terminal portion 19″ provides angular shoulder structure for interlock purposes similarly as in the forms of FIGURES 2 and 4 wherein it will be appreciated that although there is a positive interlock of the edge of the bead flange 17″ with a juncture shoulder afforded by the regular rim flange terminal, the sealing material within the groove of the bead flange 17 and 17′ after setting also affords a substantial interlock of the contiguous parts.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a sink structure including a sink member having a substantially rigid lateral upper end rim flange, a molding frame rim flange extension strip carried by the rim flange and having a margin thereof wrapped about the rim flange terminal and provided with a terminal bead flange portion clampingly engaging the underside of the rim flange terminal portion and defining a groove opening toward the rim flange terminal portion, said rim flange terminal portion having a groove therein opposing the

inside of the bead flange terminal groove, and sealing material interlockingly interengaging in said grooves.

2. In a sink assembly including a sink member having a substantially rigid lateral upper end rim flange, a cross-sectionally arched sheet metal molding frame strip having an inner marginal underturned flange seating on the terminal margin of said rim flange and having a portion projecting downwardly along the edge of the rim flange, a terminal bead on said portion clampingly engaging the underside of the rim flange terminal, said rim flange margin having an upwardly opening groove therein opposing said underturned flange, and sealing material trapped in said groove by said underturned flange.

3. In a sink assembly including a sink member having a substantially rigid lateral upper end rim flange, a cross-sectionally arched sheet metal molding frame strip having an inner marginal underturned flange seating on the terminal margin of said rim flange and having a portion projecting downwardly along the edge of the rim flange, a terminal bead on said portion clampingly engaging the underside of the rim flange terminal, said rim flange margin having an upwardly facing groove opposing said underturned flange and a downwardly facing groove opposing said bead, and sealing material in said grooves and trapped therein by respectively said underturned flange and said bead.




**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,609,735 | Rabezzana | Dec. 7, 1926 |
| 2,002,456 | Sebell | May 11, 1935 |
| 2,112,439 | Graff et al. | Mar. 29, 1938 |
| 2,158,467 | Madsen | May 16, 1939 |
| 2,331,449 | Witteberg | Oct. 12, 1943 |
| 2,362,846 | O'Brien | Nov. 14, 1944 |
| 2,405,897 | Milone et al. | Aug. 13, 1946 |
| 2,475,112 | Stanitz | July 5, 1949 |
| 2,790,181 | McCarthy | Apr. 30, 1957 |
| 2,837,593 | Rueger | June 3, 1958 |
| 2,840,829 | Hammer | July 1, 1958 |
| 2,890,462 | Ross | June 16, 1959 |