March 12, 1963 W. A. JUERGENS 3,080,569

MOUNTING OF FLANGED APPLIANCES IN COUNTERTOPS

Filed Oct. 10, 1960

FIG. 1

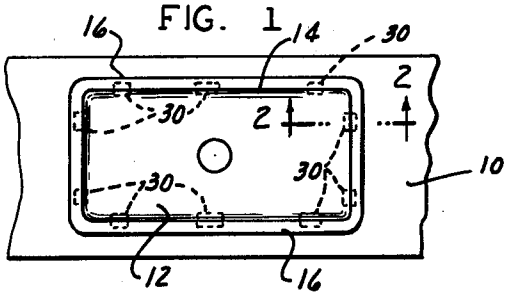


FIG. 2

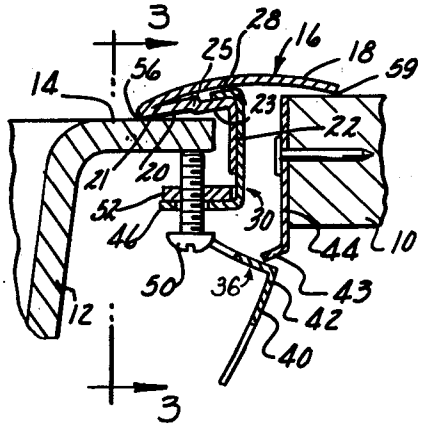


FIG. 3

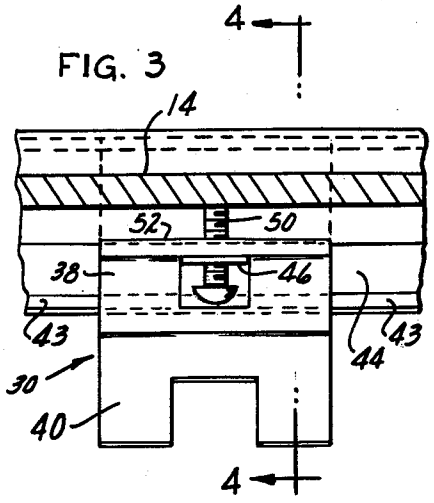
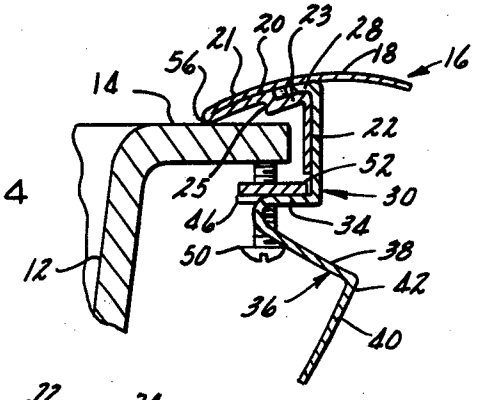


FIG. 4



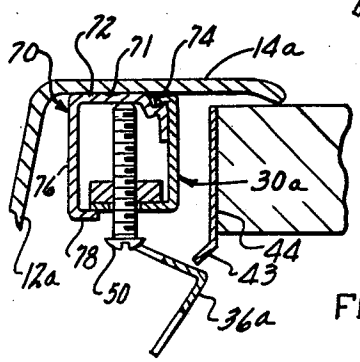
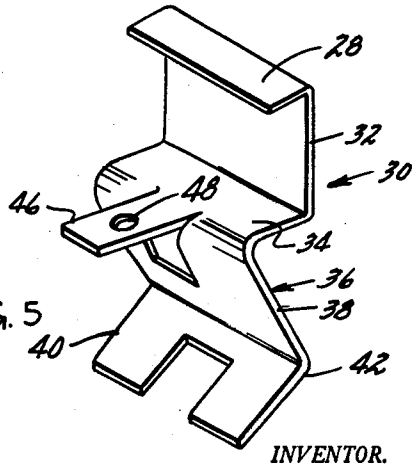


FIG. 6

FIG. 5



INVENTOR.
WILLIAM A. JUERGENS
BY
WILSON, SETTLE, McRAE & CRAIG
ATTORNEYS

United States Patent Office 3,080,569 Patented Mar. 12, 1963

3,080,569

MOUNTING OF FLANGED APPLIANCES IN COUNTERTOPS

William A. Juergens, Harper Woods, Mich., assignor to Juergens Manufacturing Company, Inc., Southfield, Mich., a corporation of Michigan

Filed Oct. 10, 1960, Ser. No. 61,747
8 Claims. (Cl. 4—187)

This invention relates to the mounting of peripherally flanged appliances such as sinks, range units and cutting board assemblies, etc. in countertops.

One object of the invention is to provide a mounting structure for the above purpose which provides a tight seal between the flanged appliance and the countertop.

Another object is to provide a mounting which permits the appliance to be installed in the countertop opening in a very short period of time.

A further object is to provide a mounting structure for the above purpose which may initially be installed in a locked position on the flanged appliance while it is remote from the countertop, after which the appliance and mounting structure may be installed as a unit in the countertop opening by a single easily accomplished downward movement from above the countertop surface.

A still further object is to provide a mounting structure of the above type wherein the flanged appliance and mounting structure may be installed in the countertop without need for gaining access to the sometimes cramped spaces beneath the countertop.

An additional object of the invention is to provide a mounting structure for the above purpose and which permits the flanged appliance to be removed from the countertop at a time subsequent to the installation if desired.

Another object of the invention is to provide a mounting structure which has each of the advantageous features, including quick appliance installation time, tight sealing action, and removability of the appliance after installation.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIGURE 1 is a top plan view of a sink-countertop assembly utilizing one embodiment of the invention.

FIGURE 2 is an enlarged sectional view taken on line 2—2 in FIGURE 1.

FIGURE 3 is a sectional view taken on line 3—3 in FIGURE 2.

FIGURE 4 is a sectional view taken on line 4—4 in FIGURE 3 but with the sink-rim assembly shown prior to installation in the countertop.

FIGURE 5 is a perspective view of a tension-applying means employed in the FIG. 2 arrangement.

FIGURE 6 is a sectional view through a sink-countertop assembly utilizing a second embodiment of the invention.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practised or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to FIGURE 1, there is shown a conventional countertop **10** having an opening therein of a dimension slightly in excess of the lateral dimension of the conventional sink appliance **12**. As is usual, the sink is provided with a peripheral flange **14**.

In the FIGURE 1 embodiment the joint between the sink flange and countertop is bridged by a peripheral rim element **16** which extends completely around the sink as shown in FIGURE 1. As shown in FIGURE 2, the rim element is of generally T-shaped cross section, with an upper generally horizontal arcuate wall portion **18**, a reversely turned under wall portion **20**, and a downwardly directed stiffener wall portion **22**. Wall portion **20** comprises two wall sections **21** and **23** interconnected by a short angular wall section **25**. The rim element is initially formed to the FIGURE 4 configuration and may be slightly deformed to the FIGURE 2 configuration during the procedure of installing the sink in the countertop. The rim element is of course bent to the FIGURE 1 frame-like character prior to assembly onto the sink.

In the FIGURE 4 position of parts the space between wall section **23** and wall portion **18** defines a groove which is adapted to receive the upper flange portions **28** of tension-applying clips **30**. As shown in FIGURE 1 a number of clips **30** are utilized in the illustrated installation. In an illustrative installation ten clips might be employed, arranged in groups of two along each of the sink shorter edges and three along each of the sink longer edges. If desired the clips may be longer or shorter than illustrated in FIGURES 1 and 3, and the number of clips will be varied according to such factors as type of appliance, clip length, and size of the appliance.

Each clip includes a vertical wall portion **32** extending downwardly from flange **28** to form a hook configuration, a horizontal ledge-forming wall portion **34** extending laterally from wall portion **32**, and a spring arm detent portion **36** extending angularly from wall portion **34**. The detent portion is defined by an arm **38** and an angularly turned flange **40**, the juncture therebetween forming a cam surface **42** for engagement with fixed retainer elements **44** (FIGURE 2) during and after installation of the sink in the countertop opening. It will be understood that elements **44** are installed at spaced points around the countertop opening prior to installation of the sink therein. Elements **44** may be of any appropriate length.

As best shown in FIGURE 5, each tension-applying clip **30** includes a horizontal tab-like wall portion **46** extending integrally from wall **34**, as by being struck upwardly out of the material which forms wall **38**. An opening **48** is formed through wall portion **46** to freely receive the shank portion of a screw **50**. As shown in FIGURES 2 and 4 the upper end of the screw is adapted to engage the underside of the sink flange **14**, and the shank portion of the screw is adapted to mesh with threads formed in an elongated force-transmitting bar **52**. By reference to FIGURE 3 it will be seen that bar **52** is co-extensive in length with wall portion **34** so that as the screw **50** is turned to move upwardly relative to bar **52** the reaction force is distributed along the entire length of the tension-applying clip **30**. The use of bar **52** is very advantageous in providing a satisfactory construction.

FIGURE 4 illustrates the position of parts after the clip **30** and rim element **16** have been initially assembled onto the edge portion of sink flange **14**, and screw **50** has been turned to engage the underside of flange **14**. It would appear from a casual inspection of FIGURE 4 that the frame-clip assembly would have a tendency to collapse downwardly around contact line **56**. However, this is not the case because the stiffness of the frame-like rim prevents such an action. In the FIGURE 4 condition of parts the sink-rim-clip assembly is rigid and without any slippage or disengagement of the clips off of the assembly; the assembly can therefore be handled easily during mounting thereof in the countertop opening.

After the rim and clips have been installed on the sink the entire assembly may be mounted in the countertop opening by a simple downward pushing action on the

assembly. During this downward pushing action the cam surfaces **42** of clip detent portions **36** are deflected by engagement with retainer element flanges **43**, after which the spring force in the detent portions causes them to snap back underneath the retainer elements to the FIGURE 2 positions.

In the FIGURE 2 installed position each detent structure **36** is slightly deformed from its free state condition so as to provide a force for sealing the joint **59** and preventing any upward displacement or looseness of the sink-rim element assembly relative to the countertop. Lack of looseness is of course necessary to the attainment of a tight seal betwen the sink, rim element and countertop.

If desired the sink may be removed from the countertop opening without permanently breaking or destroying any of the structures. Thus, when screws **50** are backed downwardly in bars **52** the clips **30** may be slid to the right (FIGURE 2) and dropped down with a clockwise turning action about wall **22** so as to be removed from the assembly. The rim and sink may then be removed from the countertop opening.

It will be seen that the FIGS. 1–5 arrangement has the desired advantages of quick installation from above the countertop surface, tight sealing action, and removability after installation.

FIGURE 6 illustrates the invention as applied to a flanged appliance wherein the flange thereof is intended to overlie the countertop surface. Such as arrangement is commonly termed a "rimless" arrangement because no separate rim is employed therein. In the FIGURE 6 embodiment the appliance has a series of retainers or mounts **70** welded on its periphery, as at **71** on the underside of the rim-forming flange **14***a*. It will be understood that the retainers can be mounted at different locations on the appliance periphery in accordance with different appliance flange designs and configurations.

Each retainer or mount includes an upper flange **72** configured to provide a notch or groove **74**, a downwardly extending web wall **76**, and a lower flange **78**. As shown in FIGURE 6 the retainers may removably mount a series of clips **30***a* which are essentially the same in general construction as the previously discussed clips **30**.

The procedure of mounting the FIGURE 6 sink in the countertop opening involves sequentially installing the clips on retainers **70**, tightening screws **50** to lock the clips in place, and forcibly depressing the assembly into the countertop opening from above the countertop surface so as to cause the clip detent portions **36***a* to snap beneath the retainer element flanges **43**. Removal of the appliance from the countertop opening involves unlocking and removing clips **30***a* from brackets **70**, and lifting the sink appliance from the countertop opening.

It will be seen that the FIGURE 6 arrangement possesses the above-mentioned desirable characteristics of the FIGS. 1–5 arrangement, namely quick installation from above the countertop surface, tight sealing action, and after-use removability.

It will be understood that the above description is intended to be illustrative of the invention and that minor structural changes may be resorted to while still practising the invention. For example, it is contemplated that screws **50** can be replaced by clip-mounted rotary cams or slidable shims. Various other mechanical expedients may be resorted to without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. In combination with an appliance having a peripheral rim adapted to be mounted within an opening in a supporting structure, a frame having a top portion overlying said appliance rim and adapted to overlie said supporting structure and a vertical portion extending therebetween, said frame defining a gap between the top of said vertical portion and said top portion, a separate clip having a portion within said gap for releasable connection to said frame, means on said clip connecting said appliance rim to said frame to permit installation of said appliance and frame as a unit in said opening in said supporting structure, and a spring detent on said clip adapted to lock said molding frame to said supporting structure when said appliance and frame are inserted into said opening as a unit, said spring detent comprising an elongated arm extending away from the appliance and bent to define a cam surface engageable with the supporting structure.

2. The combination comprising an appliance having a peripheral rim,

a countertop having an opening therein receiving said appliance with said rim overlying a portion of the countertop upper surface,

a retainer on the underside of said peripheral rim,

a portion of said retainer being spaced from said rim to form a groove extending generally parallel to said rim,

a portion of said retainer being formed as a flange spaced from said groove,

a separate clip having a hook portion extending into said groove,

a ledge formed on said clip in spaced relation to said hook and engaged with said flange,

means forcing said ledge into contact with said flange and said hook into contact with said groove to mount said clip to said retainer,

and a spring detent arm extending from said clip ledge and away from said retainer flange and being bent to define a cam surface engaged with said countertop to lock said rim of said appliance to said countertop.

3. In combination, a sink having a peripheral rim,

a countertop having an opening receiving said sink with the periphery of said rim positioned within said opening,

a frame having a top with adjacent portions overlying said sink rim and said countertop,

said frame having a subwall defining a gap beneath the top of said frame,

a separate clip to connect said sink to said frame and thereby permit installation of said sink and frame as a unit in said opening,

said clip comprising a wall having first and second spaced edges and a face surface,

a lip formed along said first edge and within said frame gap,

a ledge formed along said second edge,

said lip and ledge extending away from said face in the same direction,

means carried by said ledge engaged with said rim to force said rim into retaining engagement with said frame top,

and said ledge being doubled back as an elongated spring detent arm extending away from said sink and being bent intermediate its ends to define a cam surface engaged with said countertop to interlock with said countertop.

4. In combination,

an appliance having a peripheral rim,

a support structure having an opening receiving said appliance with the periphery of said rim positioned within said opening,

a retainer strip secured in said opening,

a molding frame having adjacent portions overlying said appliance rim and said support structure and defining a gap beneath said overlying portions,

a separate clip to connect said appliance to said frame and thereby permit installation of said appliance and frame as a unit in said opening,

said clip including a wall having first and second spaced edges and a face surface,

means formed on said first edge connecting said clip to said frame gap,

a ledge formed along said second edge,

said ledge extending beneath said appliance rim,

means carried by said ledge and engaged with said rim to force said rim into retaining engagement with said frame,

and said ledge being doubled back as an elongated spring detent arm extending away from said appliance and being bent to define a cam surface engaged with said retainer strip to interlock with said retainer strip and secure said frame to said support structure.

5. In combination,

an appliance having a pheripheral rim,

a support structure having an opening receiving said appliance with the periphery of said rim positioned within said opening,

a molding frame of generally T-shaped cross section having a top overlying said appliance rim and said support structure, with a perpendicular wall extending between said appliance and support structure,

said perpendicular wall being deformed to define a gap beneath said top,

a separate clip to connect said appliance to said frame and thereby permit installation of said appliance and frame as a unit in said opening,

said clip comprising a wall having first and second spaced edges and a face surface,

means formed along said first edge and within said gap to connect said clip to said frame,

a ledge formed along said second edge,

said ledge extending beneath said appliance rim, threaded means carried by said ledge and engaged with said rim to force said rim into retaining engagement with said frame top,

and a portion of said ledge being doubled back as an elongated spring detent arm extending away from said appliance and defining a cam surface engaged with said support structure to interlock with said support structure and secure said frame to said support structure.

6. In combination,

an appliance having a peripheral rim,

a support structure having an opening receiving said appliance with the periphery of said rim positioned within said opening,

a retainer strip secured in said opening,

a molding frame having a top overlying said appliance rim and said structure and a portion extending between said appliance and support structure,

said molding frame defining a gap between the top of said extending portion and said top,

a separate clip to connect said appliance and frame as a unit and thereby permit installation of said appliance and frame as a unit in said opening,

said clip comprising a wall having first and second spaced edges,

said first edge being turned over as a lip and within said frame gap,

a ledge formed along said second edge and extending generally parallel to said lip,

a screw threadably extended through said ledge and engaged with said rim to force said rim into retaining engagement with said top of said frame,

and said ledge having a portion doubled back as an elongated spring detent arm, said spring detent arm being bent intermediate its ends to define a cam surface engaged with said support structure to interlock said frame to said retainer strip.

7. In combination with a sink having a peripheral rim,

a support structure having an opening receiving said sink with the periphery of said rim positioned within said opening,

an endless frame extending around the periphery of said rim and having portions overlying said rim and said support structure and defining a gap beneath said overlying portions,

a separate clip to connect said sink and frame as a unit and thereby permit installation of said sink and frame as a unit in said opneing,

said clip including means connected to said frame gap and a portion extending beneath said rim,

means extending between said extending portion and said rim forcing said rim into engagement with said frame overlying portion,

and said extending portion being doubled back as an elongated spring detent arm and being bent to define a cam surface engaged with said support structure to interlock said frame to said support structure.

8. In combination,

an appliance having a peripheral rim,

a support structure having an opening receiving the appliance with said peripheral rim overlying said structure adjacent said opening,

a retainer strip secured in said opening,

a retainer bracket secured beneath said rim and positioned to lie adjacent said retainer strip,

said bracket defining a gap with the underside of said rim,

a separate clip connecting said bracket to said retainer strip,

said clip having a hook within said gap for releasable connection to said rim,

said clip including a ledge extending toward said appliance,

means carried by said clip and engaged with said bracket to lock said clip to said bracket,

and said ledge having a portion doubled back as an elongated spring detent arm and being bent to define a cam surface engaged with said retainer strip to interlock said appliance bracket to said support structure.

References Cited in the file of this patent

UNITED STATES PATENTS

2,778,032	Meehan	Jan. 22, 1957
2,790,181	McCarthy	Apr. 30, 1957
2,843,855	Hammer	July 22, 1958
2,877,468	Lawson	Mar. 17, 1959
2,885,691	Juergens	May 12, 1959
2,992,436	Camp	July 18, 1961
2,993,088	Camp	July 18, 1961