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SUCTION MOUNTING FOR CAN OPENERS OR THE LIKE

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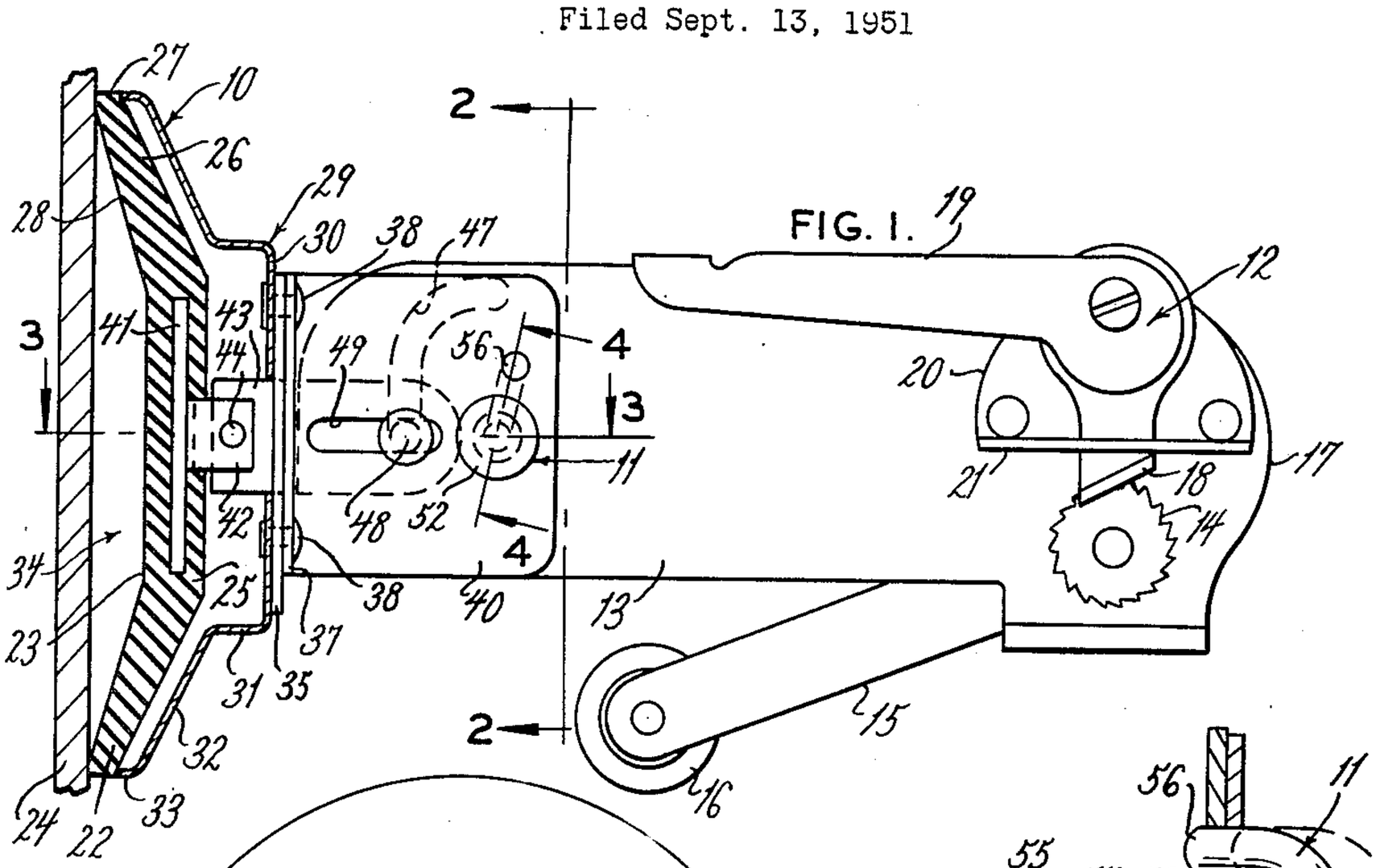

FIG. 1.

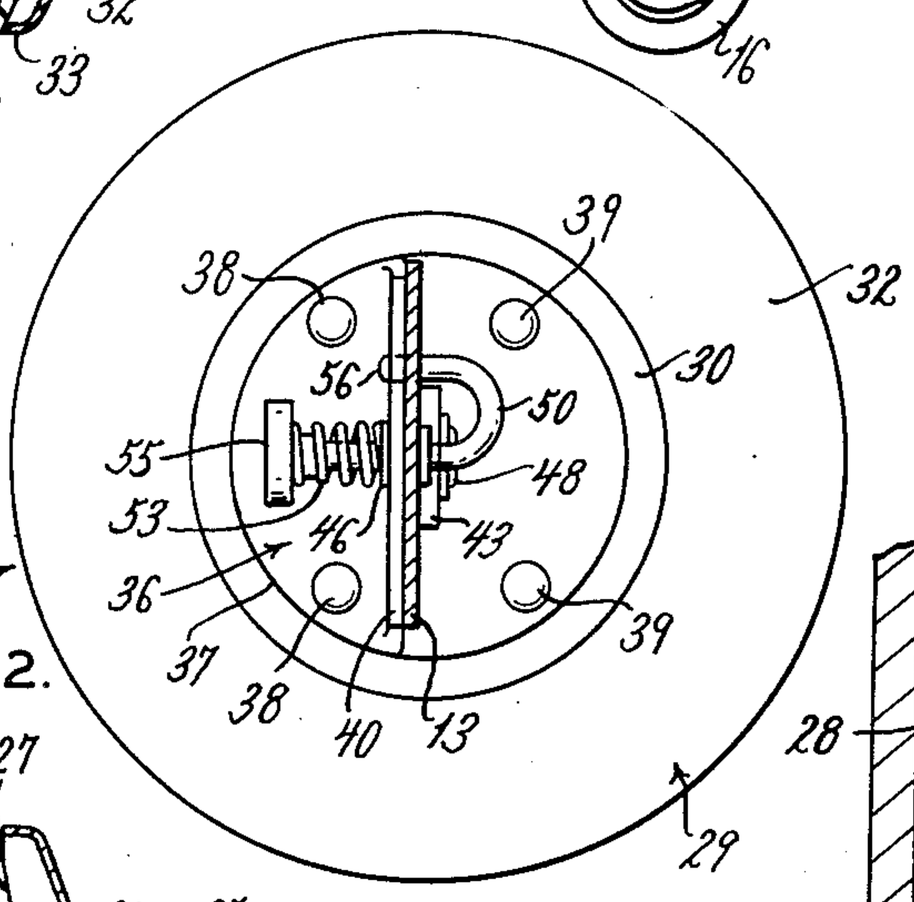

FIG. 2.

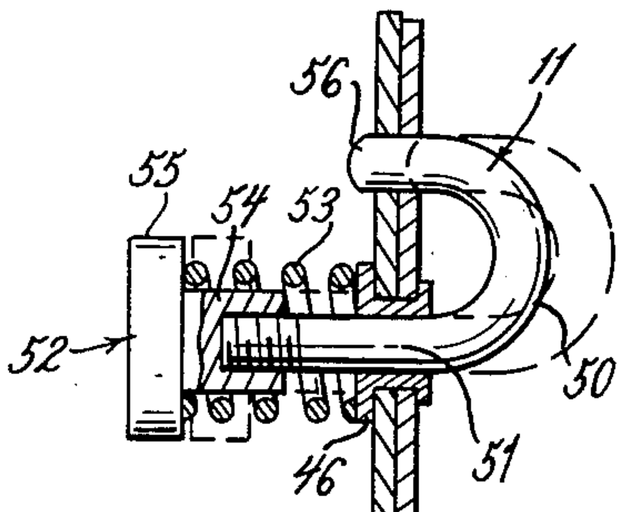

FIG. 4.

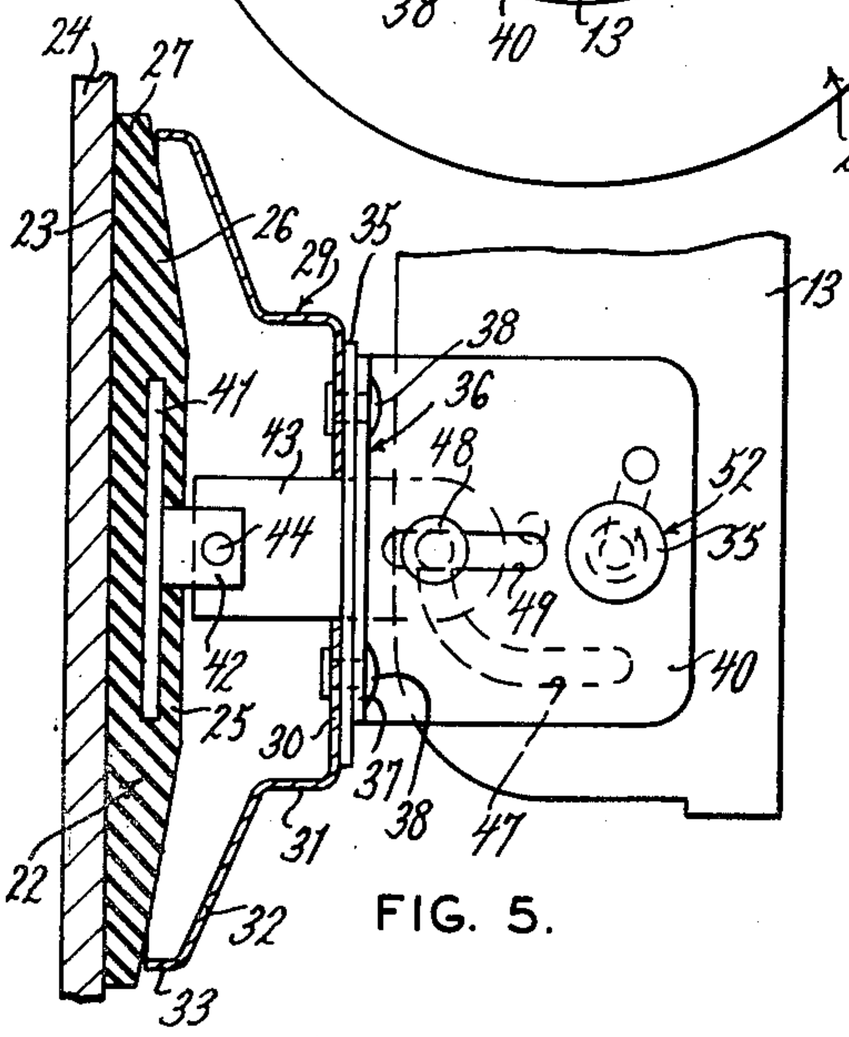

FIG. 5.

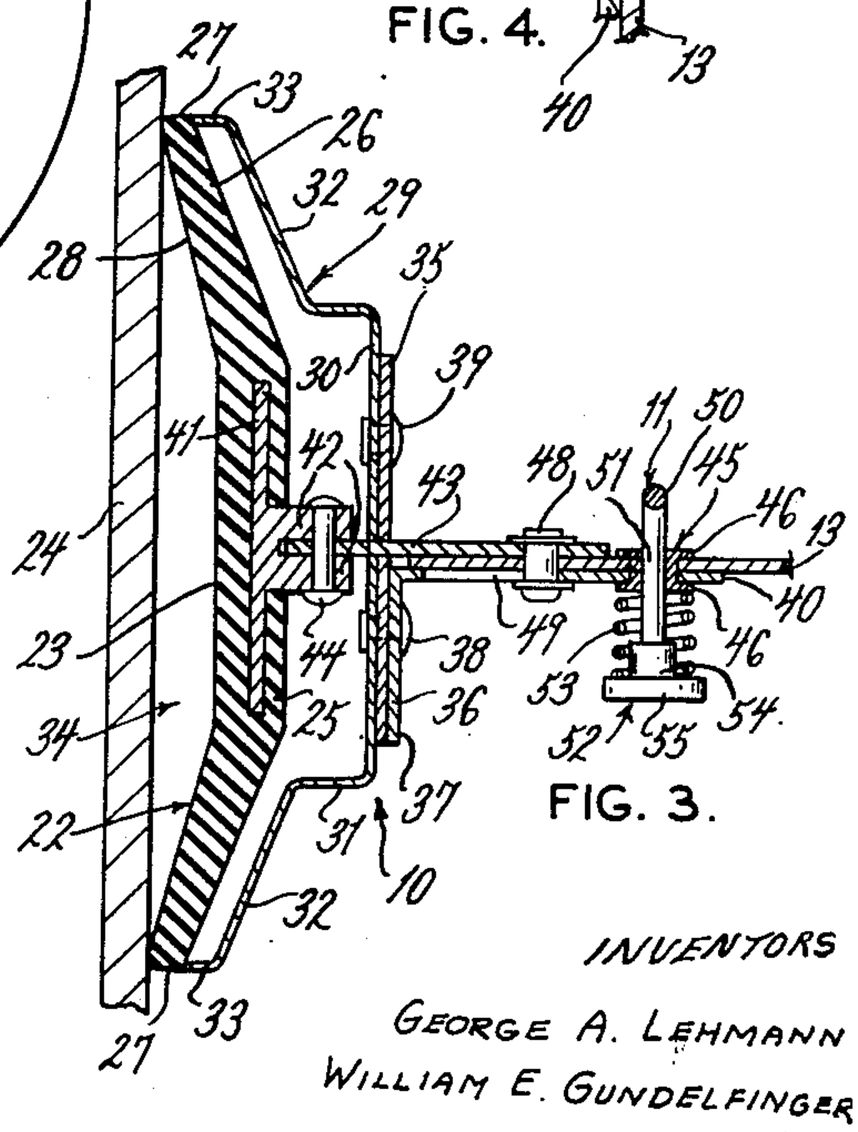

FIG. 3.

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SUCTION MOUNTING FOR CAN OPENERS OR THE LIKE

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5 Claims. (Cl. 248—206)

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This invention relates to improvements in suction mountings for manually operated devices, and has particular reference to improved mounting means for a can opener, or the like, to enable such devices to be detachably secured to any smooth surface.

The characteristics of the improved bracket device render it adaptable to various fields of usage, but is intended particularly to provide an effective and conveniently attachable can opener support, which will fasten the can opener assembly in a fixed position with respect to a relatively smooth surface, without subjecting the surface to any disfigurement, and yet insure strong rigid securement thereto. These and other important objectives and advantages are realized in a mounting which consists of an elastic diaphragm, a compression member which overlies the diaphragm and seats against the peripheral margin thereof, and an arm element reciprocably movable through the compression member and operatively actuated by angular displacement of the can opener body with a pivot and slotted camming means.

Another feature of the invention is afforded by the coaction of the reciprocable arm element, compression cup member and pivotally attached can opener body, which are associated in such manner as to permit angular movement of the can opener body about a pivot axis externally located and spaced from the compression member. Hence, there is produced either a depthwise suction-gripping or releasing action as the swingable body is moved respectively, to a horizontal or vertical position.

Still another important objective is realized by the inclusion of a novel spring-actuated locking mechanism, which may automatically or selectively prevent accidental or other unintended angular displacement of the can opener body, particularly such movement incident to normal operative use of the can opener assembly, that might destroy the vacuum-sealing effect. Briefly summarized, the locking means comprises a hook-shaped element, a lock nut and a compression type coil spring. The shank portion of the hook element extends along the pivot axis of the can opener body and a bracket plate, and is threadedly received by the lock nut. The nut retains the spring in axial relation about the shank, so as to urge the hooked end portion into locking engagement with the can opener body and bracket plate, when the can opener assembly is disposed horizontally for use.

The objects above expressed and others implied from the description to follow will become more readily apparent from the following detailed description of a single preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

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Fig. 1 is an elevational view, partly in section, of the suction wall bracket and can opener assembly operatively secured for use;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view of the locking means as taken along line 4—4 of Fig. 1; and

Fig. 5 is an elevational view, partly in section, showing the can opener body in the raised inoperative position incident to either application or removal of the wall bracket.

Referring now by characters of reference to the drawing, it is apparent that the suction-gripping wall bracket structure, generally indicated at 10, may serve advantageously in numerous and varied fields of usage. However, the bracket 10 and coacting locking means 11, later fully described, were developed for particular use with a can opener assembly, designated generally at 12 and shown by Fig. 1. The can opener proper may be of the usual construction, and is described briefly for completeness as consisting of an elongate planar body 13, a notched feeding or friction wheel 14 rotatively actuated by a crank 15 and turning knob 16 carried on the outermost rounded body portion 17, a cutting blade 18 disposed above the wheel and structurally arranged for vertical rectilinear movement by a pivoted horizontal lever arm 19, a plate 20 secured contiguous with the body 13, and an integral projecting flange 21 that positions the top rim of the can during opening thereof.

The wall bracket 10 provides an effective and conveniently attachable can opener mounting, adaptable for securement to any relatively smooth surface. As best viewed in Fig. 5, the configuration of an elastic diaphragm 22, preferably constructed of rubber or rubber-like material, provides a planar face portion 23 of circular cross-section, which lies contiguous with the wall surface 24, incident to either initial application or removal of the bracket assembly. There is also provided a thickened medial portion 25, and outwardly sloping side regions 26, which radially converge to the peripheral marginal surface 27. When operatively applied to the wall 24, the diaphragm 22 assumes the conformation shown

in Figs. 1 and 3, the center portion 25 being disposed in spaced relation to the wall, while the annular margin 27 is held tightly flush thereto. The sloping side portions 26 then provide a lower surface 28 that converges to the margin in the same manner as the top surface, and the circular center faces are disposed in substantial parallelism with the wall.

A cup-shaped compression member, generally referred to at 29, positions and encloses the elastic diaphragm 22 in overlying relation, and coacts therewith to provide and maintain the effective vacuum-sealing characteristics that insure substantial permanence in attachment. The number 29 includes a planar, circular center plate portion 30 integrally connected by side walls 31 to the sloping flaring skirt portion 32, the skirt converging radially outwardly to provide a short peripheral flange 33. While the diaphragm center region 25 is lifted from the wall, by means later to be described, to provide the intervening vacuum pocket, shown in Figs. 1 and 3 at 34, the flange 33 bears against the top marginal surface, retaining the lower edge flush to the wall.

A circular reinforcing plate 35 is secured contiguous with and substantially overlies the outer surface of the flat medial plate portion 30 of the compression member. Positioned over the reinforcing plate element 35, is a right angular bracket flange 36, which provides a base portion 37 located in edgewise conformity with the margin of the circular reinforcing plate, and secured to the plate 35 and the central compression plate 30, by a pair of rivets 38. A second pair of oppositely disposed rivets 39 fasten the reinforcing plate 35 to the center compression cup portion 30. A planar, substantially rectangular flange 40 is provided integral with and in vertical right angular relation to the base 37, and is located in such manner as to be slightly offset from the center longitudinal axis of the wall bracket structure 10, the base area of the bracket flange 36 being slightly less than the semi-circular area of the plate portion 35.

Embedded substantially midway in the thickened medial portion 25 of the diaphragm, is a circular disk element 41, which is provided centrally with a pair of opposed integral lugs 42, the lugs extending outwardly through the top surface of the elastic diaphragm. The actuator or reciprocable arm member 43 is provided with a small circular aperture at the inner end portion, and pivoted between the lugs 42 by a transverse pivot pin 44 extending through the lugs and aperture. The arm 43 is disposed in a vertical plane coincident with the longitudinal axis, and projects outwardly through a slotted region in the center compression cup plate 30 and reinforcing plate 35. The spacing between the outer arm end portion and the bracket flange 40 is such that the elongate can opener body 13 may be inserted therebetween, and be positioned and located in a vertical plane.

A pivot element 45 (Fig. 3) is inserted through registering apertures in the outer end portion of the flange 40 and body plate 13, the apertures lying in a horizontal plane taken along the center axis of the wall bracket structure 10. For reasons later appearing, it is preferred that the pivot element 45 be centrally apertured, and provided with collars 46 on opposite faces of the flange 40 and can opener body 13, to secure the latter connected members in pivotal relation. An elongate curvilinear slot 47 is provided in the underlying rounded end portion of the can opener body

13, and serves as a guide slot for a slidable stud or pin 48 inserted through the outer end portion of the reciprocable arm 43. The stud also extends through an elongate linear slot 49 provided in the bracket flange 40, the latter slot being disposed horizontally in a plane with the longitudinal axis as shown in Figs. 1 and 5. The curvilinear slot 47 is arranged and located in such manner as to urge the stud 48 and arm 43 inwardly to the position shown in Fig. 5, upon vertical disposition of the can opener body 13, and outwardly to the position shown by Fig. 1 upon horizontal disposition.

When initially applying the suction bracket structure 10 to a particular wall location, the can opener body 13 is raised to a vertical position (Fig. 5). The stud 48 is cammed inwardly by the curvilinear slot 47, carrying the arm 43 therewith, the linear slot 49 in the flange 40 permitting this depthwise movement. Hence, the upper peripheral surface of the diaphragm 22 is allowed to slightly clear the coating cup flange 33, and presents a planar gripping surface 23, which is pressed tightly against the wall. While holding the diaphragm at the desired point of attachment, the can opener body 13 is angularly displaced about pivot 45 to the horizontal position shown in Fig. 1. As the body plate 13 is moved, the stud is urged by the camming surfaces of the curvilinear slot 47 to the other slot extremity, the stud carrying connected reciprocable arm 43 outwardly to the fully extended position. The arm lifts the embedded disk 41 and encompassing medial diaphragm portion 25, while simultaneously the periphery 27 is forced in air-sealing relation against the wall surface by the coacting compression cup flange 33. The foregoing manipulation forms the pocket 34, shown in Figs. 1 and 3, which affords an air volume under reduced pressure. The comparative partial vacuum in cooperation with the atmospheric pressure secures the bracket to the wall. Of course, disengagement is equally as rapid, and involves the reversal of the above steps, viz., raising the can opener body 13 to the vertical position, and hence destroying the effective vacuum-gripping relation.

It is readily apparent, that any angular displacement of the can opener body 13 will loosen the mounting to some extent. Therefore, it is extremely important and advantageous that any accidental or unintended movement be prevented. If the locking means, generally indicated at 11 and shown best in Fig. 4, were not included, the normal rotational forces applied at the crank 15 incident to opening a can, would inadvertently move the can opener body upwardly about the pivot 45.

The novel locking means 11 (Fig. 4) is spring-actuated, and provides a hook element 50, the shank portion 51 of which projects through the apertured pivot element 45, and hence lies in the pivot axis. A lock nut 52 is threadedly received by the shank end. A coil spring 53 of compression type is normally positioned concentrically with the shank 51, and located about the threaded body portion 54 of the nut, the respective end turns thereof abutting the head 55 and pivot collar 46. The rounded hooked or reversed end 56 projects through conforming apertures provided in the bracket flange 40 and body plate 13 slightly above the pivot axis, the apertures being in register when the can opener is horizontally disposed (Fig. 1). The size of the spring 53 and length of threaded shank end region is determined so the spring 53 will at all times tend to

urge the rounded hooked end 56 into the registering apertures, and yet provide sufficient spacing between the lock nut 52 and pivot collar 46, to permit the hook element and nut to be shifted to the right under spring loading, thus removing the hooked end from the bracket flange aperture, as shown by the dashed lines of Fig. 4.

From the foregoing description, it is thought that the operation of the locking means 11 has become fully apparent, but for completeness and further clarity, it should be noted that when the device is initially mounted, the nut 52 is depressed, thereby shifting the hook element 50 and removing the hooked end 56 from the flange aperture. As the can opener body 13 is moved about the pivot 45 and shank 51, the locking end portion 56 is rotatively varied by the body aperture about the pivot axis, to a position indicated at 51 by dashed lines in Fig. 5, slidingly bearing in an arcuate path on the inner flange face. Incident to application of the suction bracket 10 to a particular wall location, in the manner described in the operational steps hereinbefore set forth, the hook end 56 is slidingly returned along the same path, as the body 13 is lowered to the operative horizontal position. Whereup, the compressive loading of the spring 53 will snap the hook 56 into the flange aperture, and hence lock the can opener in the horizontal position to prevent any unintended angular displacement that might destroy the vacuum-sealing effectiveness of the elastic diaphragm and compression cup, whether such movement be incident to normal operative use of the can opener or accidental jarring.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

We claim as our invention:

1. In a suction type fastener adapted for use with a can opener assembly, an elastic diaphragm, a compression member positioning the diaphragm, a reciprocably movable arm connected to the diaphragm, a flange plate located adjacent the compression member, a can opener body located adjacent the flange plate, means pivotally connecting the can opener body and flange plate, and a stud connected to the arm, the can opener body and flange plate being provided with slotted means which slidably coact with the stud to actuate the reciprocable arm, a locking means consisting of a hook element, a lock nut received by the hook element, and a spring located about and tending to urge the hook element into locking engagement with the can opener body and flange plate.

2. In a suction holding device adapted for use with a can opener assembly, an elastic diaphragm, a compression member overlying the diaphragm, a reciprocably movable arm connected to the diaphragm and projecting through the compression member, a flange plate secured to the compression member and provided with an elongate slot, a can opener body positioned between the arm and flange plate and provided with an elongate curvilinear slot, a slidable stud connected to the arm and extended through the slots, the flange plate and can opener body being provided with apertures lying in register when the can opener assembly is disposed in operative position, a locking means consisting of a hook element serving as the pivotal connection between the can opener body and flange plate, a lock nut received by the hook element, and a spring located about and tending to urge the hook element into locking engagement with the said flange and said can opener body apertures.

3. In a suction type fastener adapted for use with a can opener assembly, an elastic diaphragm, a cup-shaped compression member positioning the diaphragm in overlying relation, a reciprocably movable arm connected centrally to the diaphragm and projecting from the compression member, a bracket flange secured to and disposed in right angular relation with the compression member, parallel to the arm, the bracket flange being provided with an elongate linear slot, a planar can opener body positioned between and contiguous with the bracket flange and arm, the can opener body being provided with an elongate curvilinear slot, the bracket flange and can opener body being each provided with an aperture which lie in register when the can opener assembly is in operative position, a stud extended through the arm and slots, a locking means comprising a hook element serving as a pivotal connection between the bracket flange and can opener body, a lock nut threadedly received on the hook element, and a compression type coil spring positioned about and tending to urge the hook element into locking engagement with the said bracket flange and can opener body apertures.

4. In a suction holding device adapted for use with a can opener assembly, an elastic diaphragm, a compression member overlying the diaphragm, a reciprocably movable arm connected to the diaphragm and projecting through the compression member, a flange plate secured to the compression member and provided with an elongate slot, a can opener body located between the flange plate and arm, the can opener body being provided with an elongate curvilinear slot, a stud connected to the arm and extended through the slots, an apertured pivot element connecting the can opener body and flange plate, the can opener body and flange plate being provided with apertures which lie in register when the can opener assembly is in operative position, a locking means consisting of a hook element, the shank portion of which extends through the apertured pivot element, a lock nut threadedly received by the shank, and a compression type coil spring located axially about the shank, the spring abutting the lock nut and tending to urge the hook element into locking engagement with the apertured flange plate and can opener body.

5. In a vacuum support adapted for use with a can opener assembly, an elastic diaphragm, a cup-shaped compression member overlying and positioning the diaphragm, a disk embedded in the center portion of the diaphragm, a reciprocably movable arm connected to the disk and projecting outwardly from the compression member, a bracket flange secured to and disposed in right angular relation with the compression member, parallel to the arm, the bracket flange provided with an elongate linear slot, a planar can opener body positioned between and contiguous with the bracket flange and arm, the can opener body being provided with an elongate curvilinear slot, a stud connected to the arm and extending through the slots, a pivot element having a center passageway connecting the can opener body and bracket flange, the can opener body and bracket flange being provided with apertures which lie in register when the can opener

assembly is in operative position and the arm is in the extended outermost position, a locking means comprising a hook element, the shank portion of which extends through the hollow pivot element and along the pivot axis, a lock nut threadedly received by the shank, and a coil spring of compression type located axially about the shank, the end turns of the spring abutting the nut and pivot element, the spring loading at all times retaining the reversed end portion of the hook element in one of the said bracket flange and can opener body apertures, tending to urge the said reversed end into locking engagement with the other said aperture, upon angular displacement of the can opener body about the pivot axis, incident to operative application of the diaphragm to a wall surface.

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