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(54) GARBAGE DISPOSER REPLACEMENT UNIT

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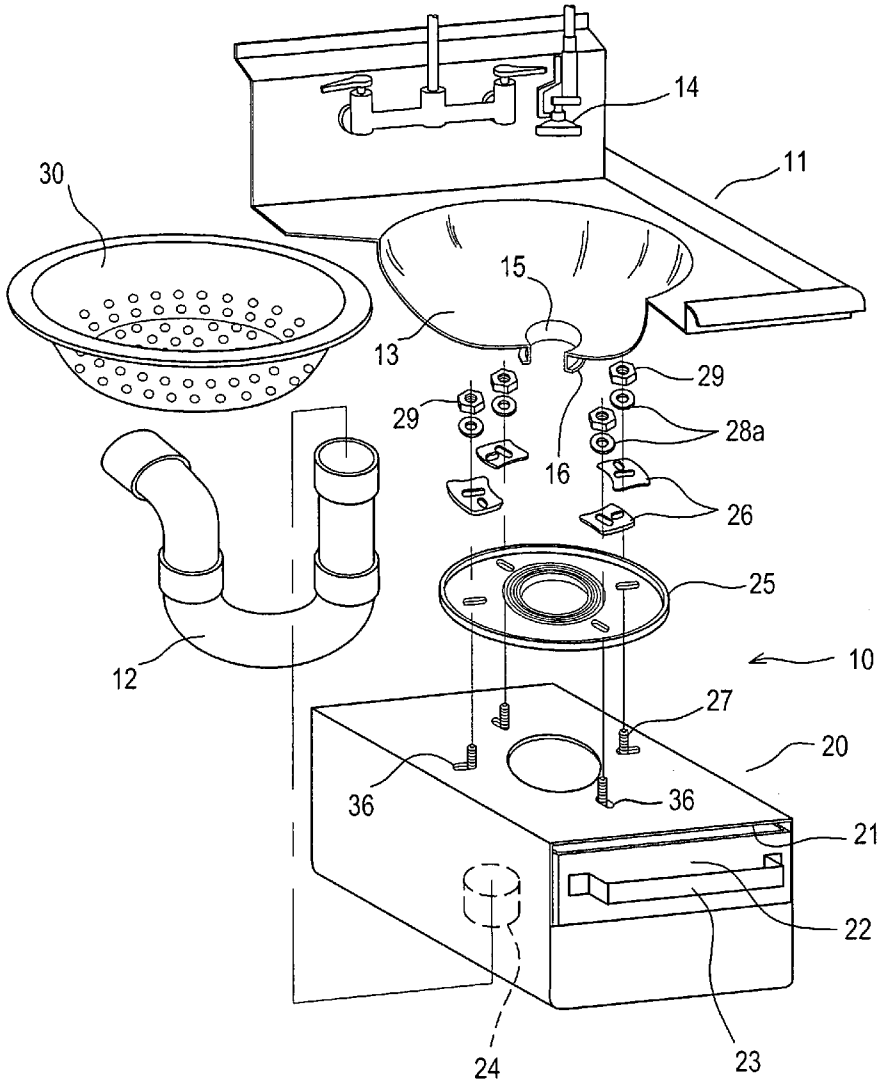
(57) **ABSTRACT**

A garbage disposer replacement unit includes a pre-rinse basket with food waste straining holes. A main body houses a tray slidingly suspended that retains small particles food waste via fine bottom perforations. The tray has a top opening larger than a drain diameter of an existing bus bowl in a kitchen. A plastic clip disc pairs with clip top members to clip the main body onto bus bowl flanges. The clip disc drain adapter adjusts and adapts the unit's outlet to different drain diameters of existing bus bowl fixtures. The clip disc and a top clip member constitute a clip assembly for adjustably clipping the unit main body to the given drain flange easily but securely. Optionally, a four-legged riser replaces the clip assembly to attach to the unit main body top for bus bowls with a flangeless standard drain fitting.



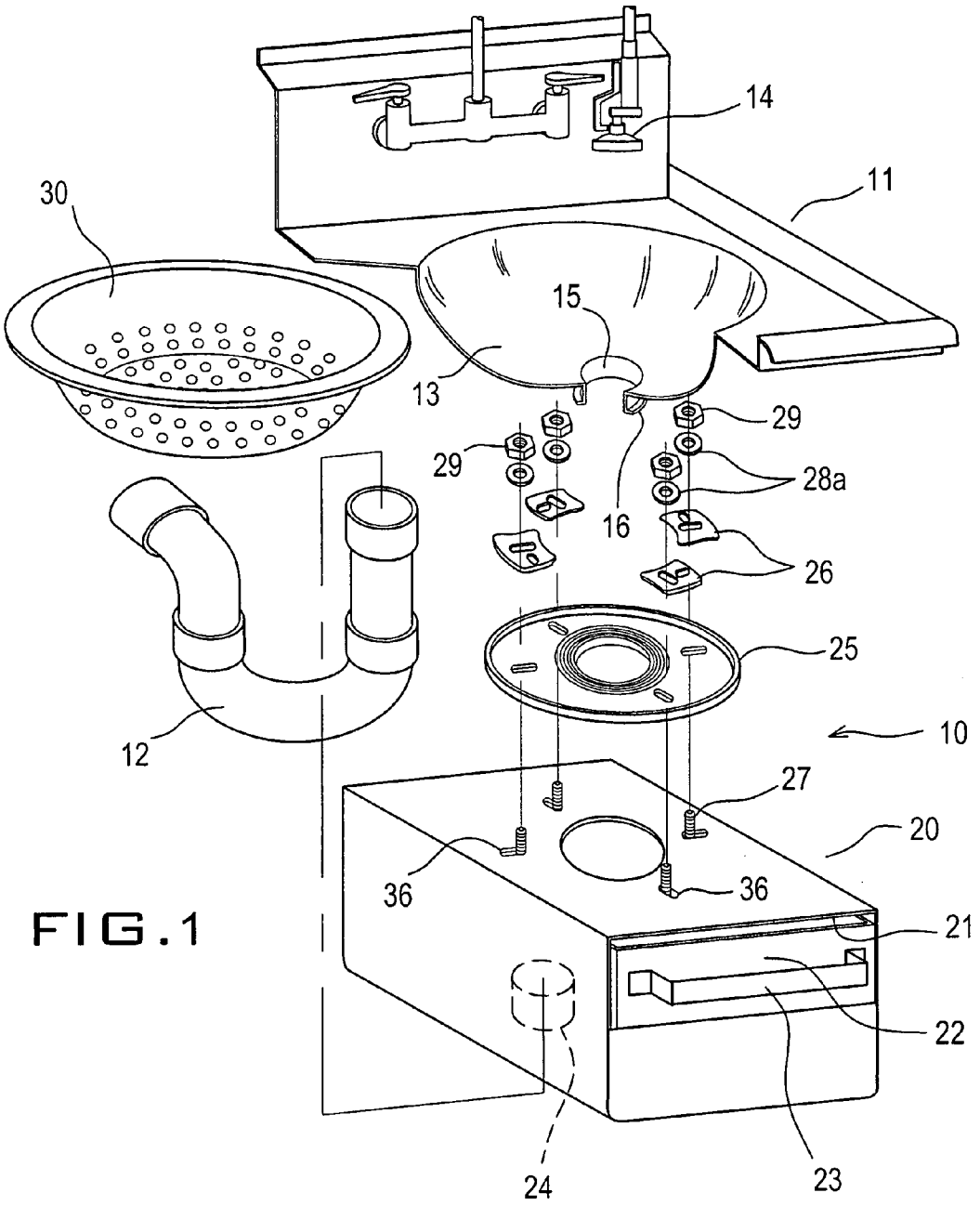


FIG.1

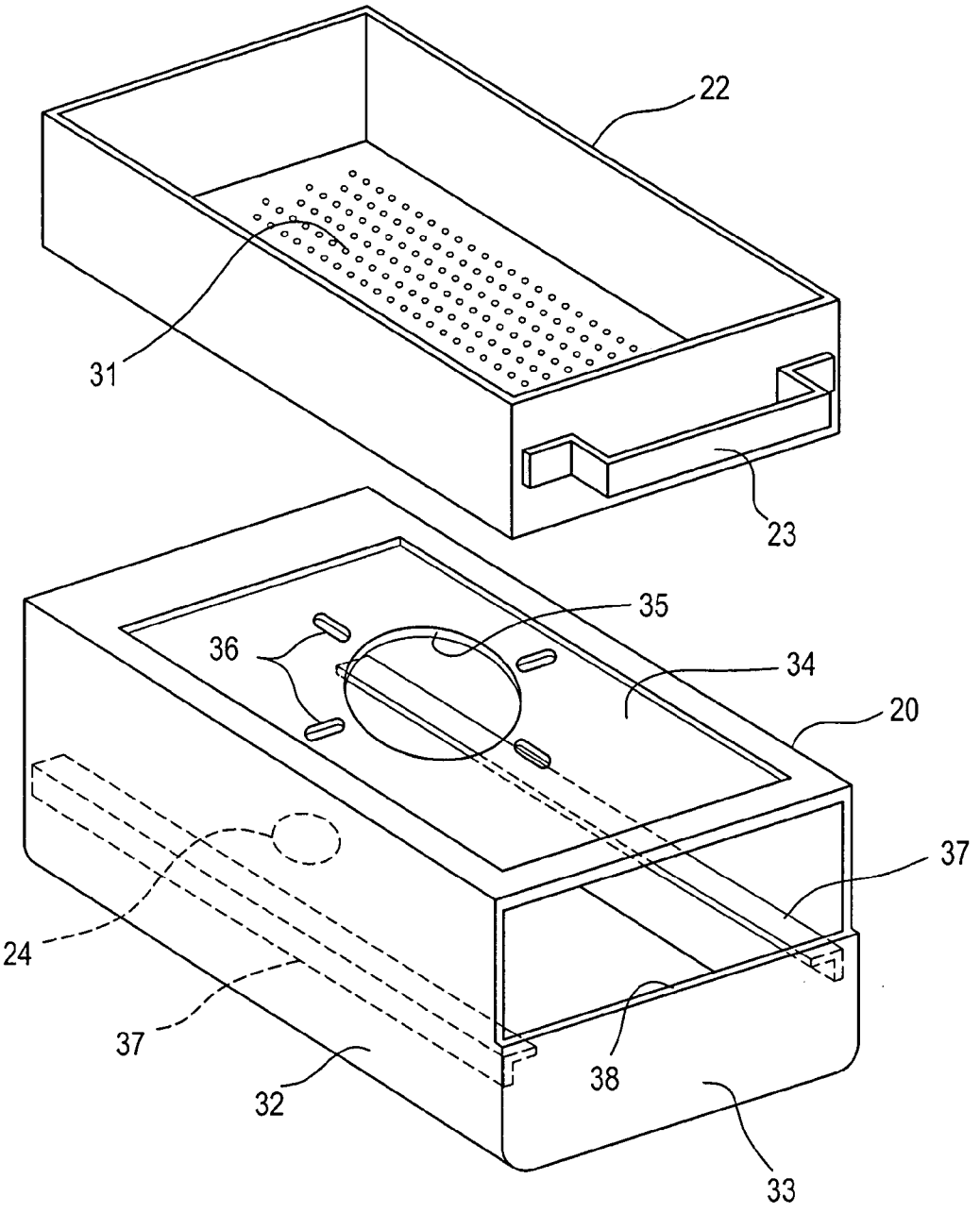


FIG.2

FIG.3

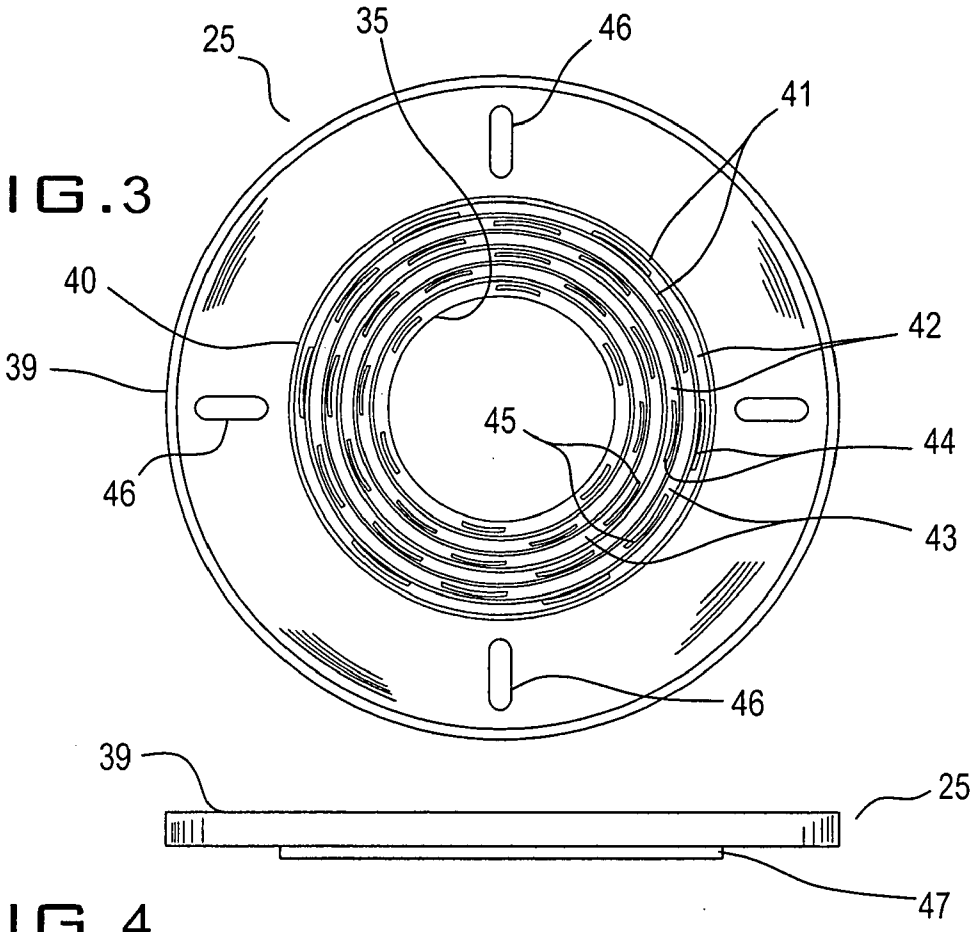


FIG.4

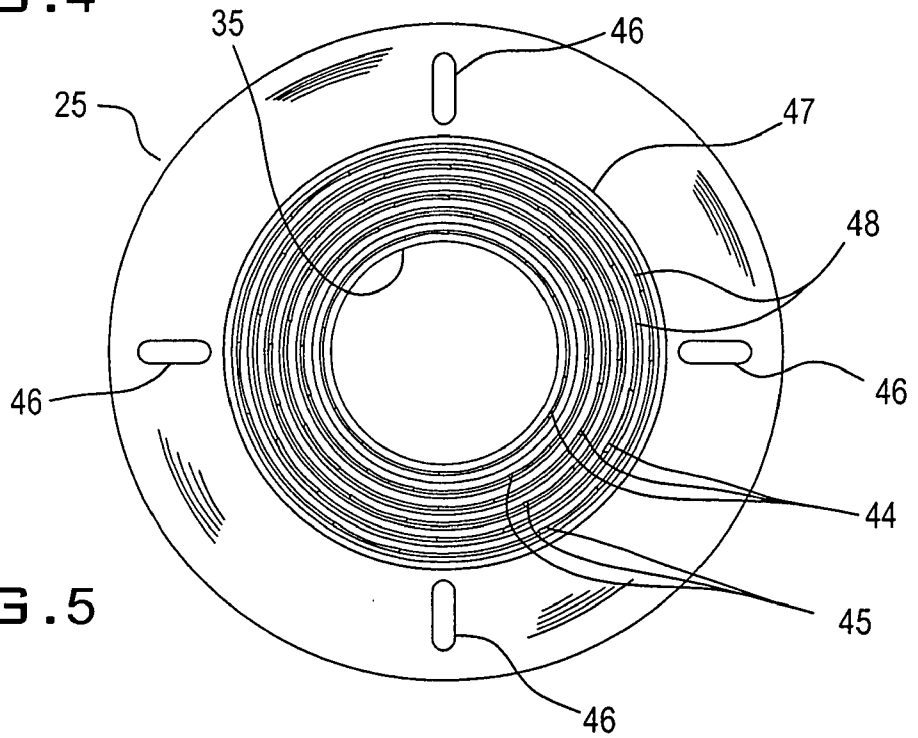
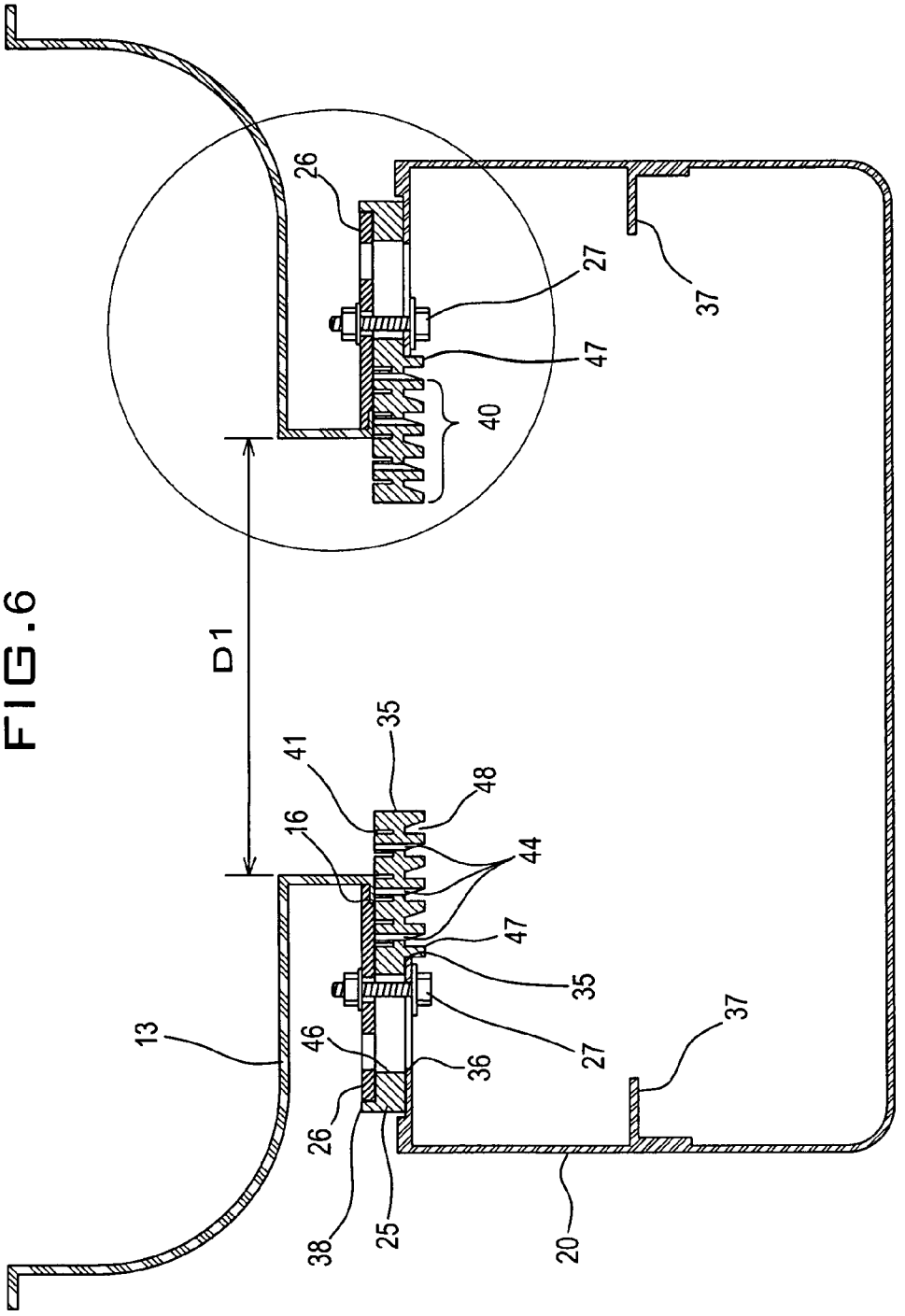


FIG.5

FIG.6



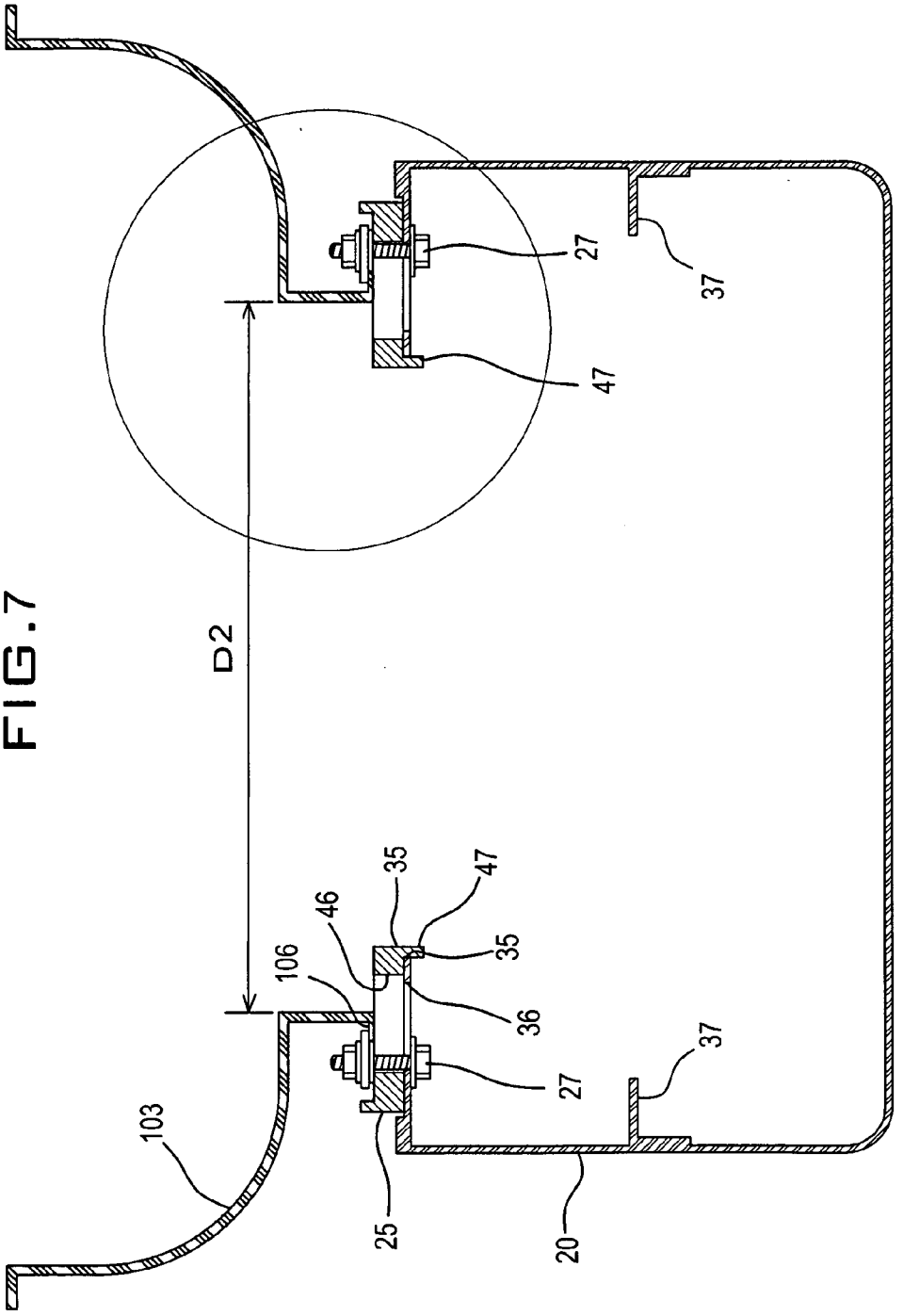


FIG.7

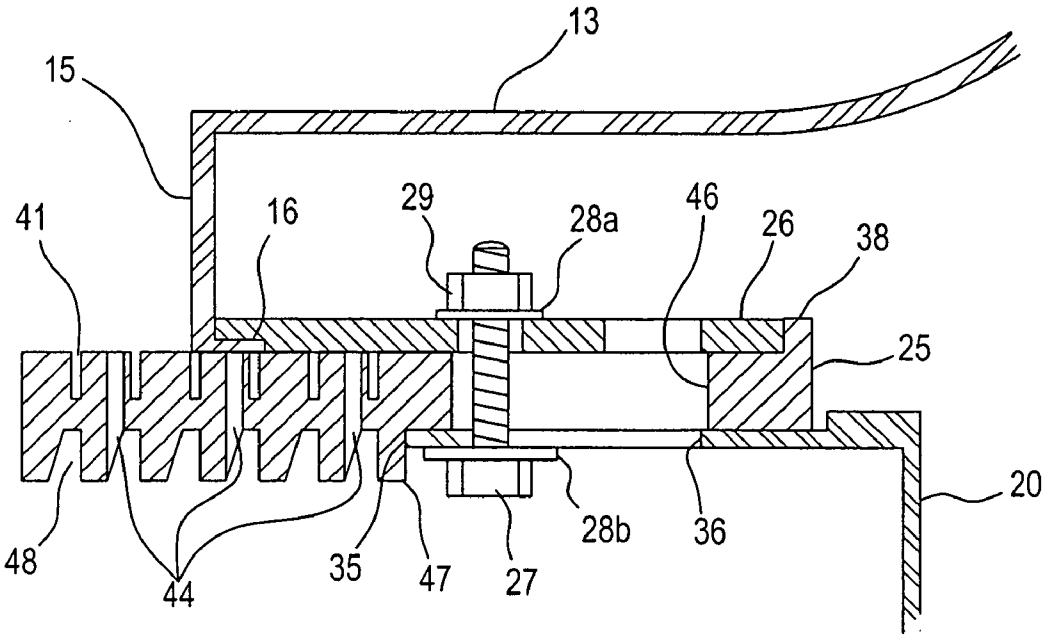

13
15
41
16
29
28a
46
26
38
25
20
48
44
35
47
27
28b
36

FIG.8

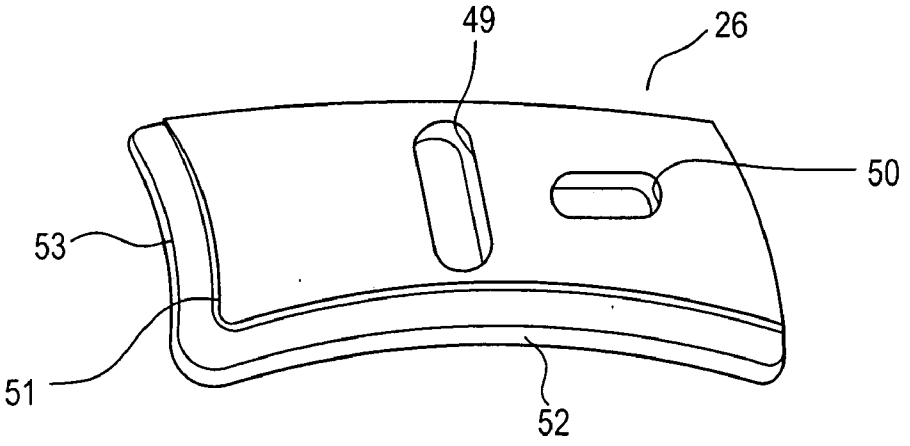

49
26
50
53
51
52

FIG.9

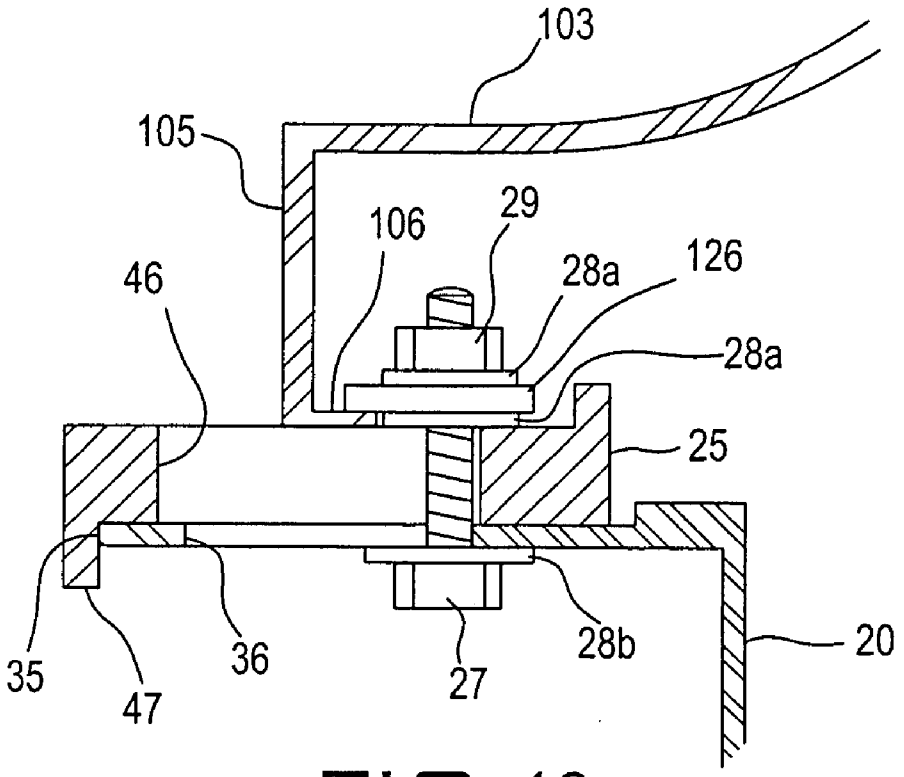


FIG.10

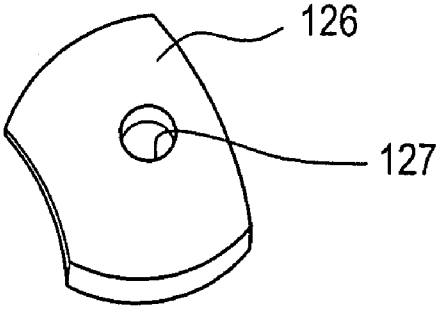


FIG.11

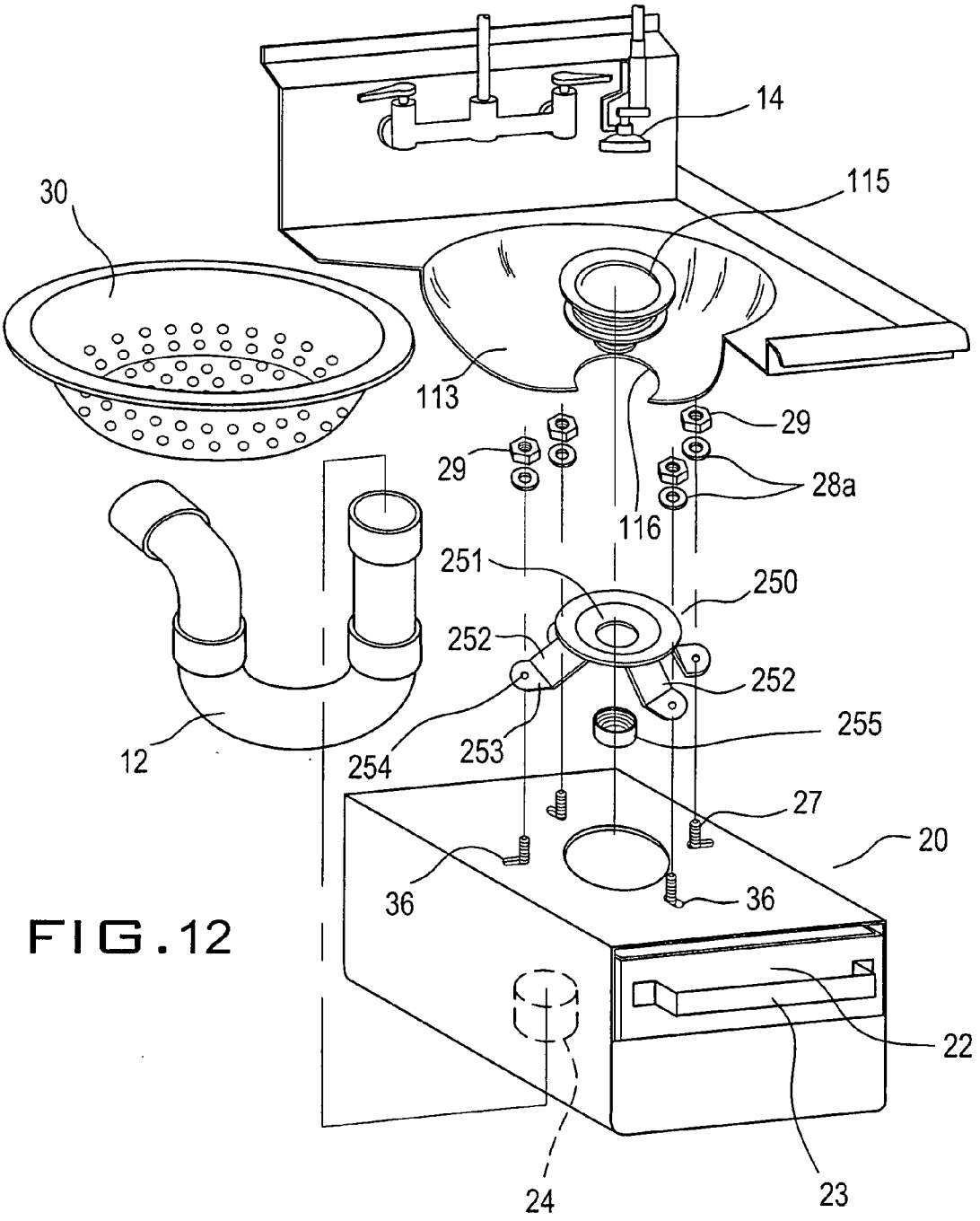

14
115
30
113
29
29
28a
116
251
250
252
252
255
253
254
12
27
20
36
36
22
24
23

FIG.12

GARBAGE DISPOSER REPLACEMENT UNIT

BACKGROUND OF THE INVENTION

[0001] A. Field of the Invention

[0002] The present invention relates to a garbage disposal, and more particularly to a garbage disposer unit for use in food industries to replace motorized disposers that have become an environmentally harmful way to dispose of food wastes.

[0003] B. Description of Related Art

[0004] Restaurant food waste from rinsed dirty dishes is an environmental problem. Garbage disposers are highly efficient at disposing of food waste at a high rate, unfortunately they have other problems. Drain waste has the potential to create public health hazards. Excessive food service waste can overburden community wastewater systems and consequently, the oceans and streams of our natural environment. In this regard, the currently popular powered garbage disposers are problematic. Heavy-duty disposers have a high initial cost and maintenance with lost operation time at busy restaurants when they need fast dish washing with food disposal. Some cities such as Irvine, Calif. have banned garbage disposers because of the environmental awareness that the motorized disposers basically excrete food waste in a slurry state to the rivers and public facilities where it is difficult to recycled into potable water. Thus, the food waste will eventually end up in the ocean where it can cause bacteria blooms and other environmental disasters.

[0005] One alternative to the garbage disposer is a strainer system to catch food waste from rinsed dirty dishes. Strainers built into the piping system have been used for more than a hundred years. U.S. Pat. No. 495,998 shows a sink trap design patented in 1893, the disclosure of which is incorporated herein by reference. A larger unit is shown in U.S. Pat. No. 960,901 to Hall for a trap for kitchen sinks patented in 1910, the disclosure of which is incorporated herein by reference. Hall shows a top strainer removable for cleaning and a bottom strainer. A horizontal line strainer was invented by Buker as shown in U.S. Pat. No. 2,915,188 patented in 1957, the disclosure which is incorporated herein by reference. The Buker device allows a continuous horizontal flow having a removable screen. A more recent improvement is seen in U.S. Pat. No. 4,045,351 to Peterson patented Aug. 30, 1977, the disclosure of which is incorporated herein by reference. The Petersen device has a removable strainer mounted below a sink. While the previously cited patented inventions may help with household drain straining, they are not well-suited to a high flow restaurant type of environment. They also have inconvenient design features that would not allow their use as a replacement of a garbage disposer.

[0006] Therefore, the object of the present invention is to provide a garage disposer replacement unit that can be installed immediately in place of a motorized disposer unit using a simple installation means. Another object of the present invention is to provide a clip-on device for installation of a detachable under-sink unit, which clip-on device is easily adaptable to various existing drain sizes of the sink fixture. Another object of the present invention is to provide a screw-on device for a swift installation of a detachable under-sink unit to the sink fixture, which has a standard existing drain fittings.

SUMMARY OF THE INVENTION

[0007] A garbage disposer replacement unit according to the present invention includes a pre-rinse basket which can be custom made of stainless steel. The basket has multiple straining holes for filtering larger food chunks off dishes by dishwashing personnel. Below the basket is a unit that primarily comprises a main body constructed by sheets of stainless steel bent and welded or stamped into a shape of a drawer box with a deep bottom floor for holding an accumulation of food wastes for controlled disposal. The main body has a front rectangular opening through which a tray enters and slidably suspended in the interior of the main body. The tray has fine perforations at its bottom to filter out small particles of food wastes that pass the large holes of the basket. The tray has a top opening that is much larger than an available drain diameter of an existing bus bowl in a kitchen. This allows it to receive the first filtered wastes down the bus bowl.

[0008] According to a first embodiment of installation of the main unit body to the sink fixture of a bus bowl, a clip disc formed of a plastic is paired with a number of clip top members to clip the main body onto the flanges of the bus bowl with the assistance of a fastening means. The clip disc has a drain adapter to adapt the unit's hole to the different drain diameters of existing bus bowl fixtures. An optional hole diameter is defined by the innermost of multiple annular grooves, which may be sawn off by an installer of the unit. The clip disc and a top clip member constitute a clip assembly for adjustably clipping the unit main body to the given drain flange easily but securely.

[0009] An alternative embodiment is offered to the clip assembly made by the clip disc and a top clip member in installing the unit main body to the kind of bus bowl that does not have an integral drain flange commonly found on garbage disposers but a standard drain fitting screwed in an opening formed in the bus bowl. A riser is provided with an annular plate to conform to the bottom of the drain fitting and four legs protruding diametrically outwardly and downwardly of the annular plate. Each of the legs has a horizontal foot section formed with a bolt hole. A ring screw that is already in the drain fitting may be used to fasten the annular plate leaving the four legs free for attachment by the unit main body.

[0010] The unit main body is attached by a fastening means including the bolts threaded from the interior of the main body through metal rings and the bolt holes of the foot sections, which abut the top plain of the main body. Then, the rings and nuts at the four feet around the annular plate securely fasten protruding ends of the bolts.

DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a perspective view of the garbage disposer replacement unit according to the present invention as applied to a kitchen sink shown partially broken away.

[0012] FIG. **2** is a perspective view of the main body of the garbage disposer replacement unit of FIG. **1**.

[0013] FIG. **3** is a top view of a clip disc with drain adapter constituting a base member of a clip assembly for holding the garbage unit under a bus bowl according to a first embodiment of the present invention.

[0014] FIG. **4** is a side view of the drain adapter plate of FIG. **3**.

[0015] FIG. **5** is a bottom view of the drain adapter plate of FIG. **3**.

[0016] FIG. **6** is a cross sectional view of the garbage disposer replacement unit installed under a bus bowl with a smaller drain size.

[0017] FIG. **7** is a cross sectional view of the garbage disposer replacement unit installed under a bus bowl with a bigger drain size.

[0018] FIG. **8** is an enlarged view of the cross section of the garbage disposer replacement unit encircled in FIG. **6**.

[0019] FIG. **9** is a bottom perspective view of a clip top member to clip on the flanges of the smaller drain of FIGS. **6** and **8** in cooperation with the drain adapter plate.

[0020] FIG. **10** is an enlarged view of the cross section of the garbage disposer replacement unit encircled in FIG. **7**.

[0021] FIG. **11** is a perspective view of an alternative clip top member to clip on the flanges of the bigger drain of FIGS. **7** and **10** in cooperation with the drain adapter plate.

[0022] FIG. **12** is a perspective view of an alternative installation means of a riser for fastening the unit main body to a bus bowl that has a standard drain fitting according to a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Referring to FIG. **1**, a garbage disposer replacement unit according to the present invention is generally referenced by number **10** and is shown in an exploded view to show its installation to a kitchen sink **11** as well as a wall plumbing **12** typical in any kitchen setting. The kitchen sink **11** has a bus bowl **13** wherein dishes are washed as it drains wastes with running water from a faucet **14**. At the bottom enter of the bus bowl **13** is formed a typical drain **15** with certain diameter terminated by outward flanges **16** for installing a waste treatment means such as a motorized garbage disposer, which the inventive sink unit **10** is replacing.

[0024] Different bus bowls with various drain diameters have produced and are available in the market. For, example, small drains are sized 3½", 4", 4½", 5", 5½", 6", and **6½". Bigger drains include diameters of** 7½", 8", 8½" and 9".

[0025] The garbage disposer replacement unit is also called a sink unit **10**. The sink unit **10** comprises a main body **20** constructed by sheets of stainless steel bent and welded into a shape of a drawer box with a deep bottom floor for holding an accumulation of food wastes for controlled disposal. The main body **20** has a front rectangular opening **21** though which a tray **22** enters and slidably suspended in the interior of the main body **20**. An oversized handle **23** is attached to the tray **22** for handling the same in its sliding in and out as well as transporting the filtered wastes. A secondary drain **24** formed in the bottom of the main body **20** is adapted to connect with the wall plumbing **12**.

[0026] A clip disc **25** formed of a plastic is paired with an exemplary number of four clip top members **26** to clip the main body **20** onto the flanges **16** of the bus bowl **13** with the assistance of a fastening means including four upward threading bolts **27** from the interior of the man body **20**, metal rings **28***a* and nuts **29**, which is further detailed below.

[0027] The sink unit **10** includes a pre-rinse basket **30** which can be custom made of stainless steel. The basket **30** has multiple straining holes for roughly filtering food wastes off dishes by dishwashing personnel who will use the sink unit **10**. The straining basket has straining holes preferably circular 4-7 mm diameter. The basket straining holes can be adjusted by about 60% without substantial performance degradation, but the best mode is 5-6 mm.

[0028] FIG. **2** shows the main body **20** of the sink unit **10** in more detail where the tray **22** is taken out for a better view. The tray **22** is in the shape of a drawer with four sidewalls and a bottom wall formed with perforations **31** to filter out wastes at a finer level than that of the straining holes of the basket **30**. The tray perforations are preferably 1-3 mm diameter circular apertures. The diameter can be adjusted by about up to 40% without substantial performance degradation, but the best mode is 2 mm.

[0029] The main body **20** is provided by a number of sheet members which may comprise a side plate **32** bent generally in U-shape, a front plate **33** for closing substantially the bottom half of an end opening of the side plate **32**, a rear plate for closing the entire opposite end opening of the side plate **32** not shown and a top plate **34** to cover the top opening of the side plate **32**. The main body **20** may be fabricated by known methods of fastening metal such as stamping, spot welding, laser welding to name a few.

[0030] The top plate **34** has an annular opening **35** that is bigger than an available drain diameter as listed above and is positioned to communicate with the drain **15** of the bus bowl **13**. Also formed in the top plate **34** are four elongated openings **36** to position the threads of the bolts **27** at adjustable locations toward and away from the center of the annular opening **35** for the purpose described below.

[0031] A pair of horizontal guide rails **37** having an L-shaped cross section are welded inside of the side plate **32** opposing each other at a level lower than an upper edge **38** of the front plate **33** to provide a slight safety barricade against an involuntary slippage of the tray **22** out of the main body **20**. To remove the tray, a user lifts the handle up to clear the safety barrier and pulls the tray out to empty the tray of food particles. The food particles caught by the tray are preferably between 2-5 mm in size. This would capture most rice, grains and small sized bread particles. The food particles retained within this tray may increase in size as they absorb water.

[0032] The reservoir is formed in the bottom half of the main body **20** housing below the top half area devoted to the tray area. The guide rails **37** hold the tray within the tray area above the reservoir. The reservoir is formed between the sidewalls **32** and front wall **33** above the main body drain **24**. During use, the reservoir may fill up in case of drainage block. The reservoir thus operates as a buffer against water overflowing from the front opening over the front edge **38**.

[0033] FIGS. **3** to **4** show the clip disc **25** in closer views. The top surface of the clip disc **25** as shown in FIG. **3** is generally flat except the end walls **39** raised slightly indicating the top surface as opposed to the bottom surface of the disc **25**. The disc **25** section from the annular opening **35**

about a half way toward the end walls **39** is formed as a drain adapter **40** for adjusting the diameter of the annular hole **35** to adapt to a given drain diameter of an existing bus bowl. The number of optional hole diameters is defined by annular grooves **41**, six of which are shown. Two adjacent grooves **41** define an annular island **42** or **43** flush with the top surface of the disc **25**. The equidistant slits **44** are for receiving a saw blade. Every other island **42** includes a number of equidistant slits **44** at a first set of the same radial positions while the intervening islands **43** include the same number of slits **45** at a second set of the same radial positions, which are set so that slits **44** and slits **45** in the adjacent islands are staggered relative to each other to maintain the rigidity of the clip disc **25**. Four identical elongated openings **46** are formed in the clip disc **25** at the corresponding locations to the elongated openings **36** of the main unit body **20**.

[**0034**] FIG. **4** showing the side of clip disc **25** reveals the added thickness to the bottom of the drain adapter **40**, which is bounded by an annular ridge **47** on which the annular opening **35** of the unit main body **20** engages as shown in cross section in FIGS. **6**, **7**, **8** and **10**. The annular ridge **47** is clearly shown in FIG. **5** where the bottom side of the clip disc **25** has grooves **48** of same number as but wider than the grooves **41** on the top surface to facilitate easy access of a cutting means like a saw to the slits **44** and **45** for cutting adjustment of the size of the annular hole **35**.

[**0035**] Two opposite grooves **41** and **48** can be compared in width more clearly in FIGS. **6** and **8**, which detail the installation of the unit main body **20** under the bus bowl **13** with a small drain size D**1** in cross section. In this case, the clip disc **25** is placed between the main body **20** and the flanges **16** of the bus bowl **13** with the annular islands **42** and **43** intact and the elongated openings **36** of the main body **20** and the openings **46** of the clip disc **25** registered.

[**0036**] Then, the clip top members **26** are prepared to grip the flanges **16** against the top surface of the clip disc **25**. In order to allow fastening of the clip assembly **25**/**26** with the main body **20**, the clip top member **26** has a latitudinal slot **49** for a fastener in its center as shown in FIG. **9**. Also formed is a longitudinal slot **50**, which is located off center toward a shorter side of the rectangular member **26**. The clip top member **26** has a stepped bottom **51** along two adjacent sides to engage the flanges **16** of the bus bowl **13**. In addition, two sets of the opposite edges of the clip member **26** are shaped to the corresponding sections of the flanges **16** and the end walls **39** of the clip disc **25** where abutments take place.

[**0037**] Therefore, the clip top member **26** may be selectively oriented for varying diametric distances of the flanges **16** of the bus bowl **13** relative to the end walls **38** of the clip disc **25** depending on the size of a given drain **15**. I.e., the longer side **52** of the clip member **26** may abut the flanges **16** for larger drains **15** while the shorter side **53** may abut the same for smaller drains **15**.

[**0038**] Furthermore, having two differently and perpendicularly oriented slots **49** and **50** through which a fastening is made multiplies the adaptability of the clip member **26** to a wide variety of drain sizes. As shown in FIG. **9**, the bolt is put through slot **50** in smaller diameter drains to use the shorter side **53**, but the bolt is put through slot **49** in larger diameter drains to use the longer side **52**. Because the small diameter drain **15** is provided in FIG. **8**, the clip member **26** extends longitudinally spanning the flanges **16** and the end walls **38**.

[**0039**] Eventually, the bolts **27** are threaded from the interior of the main body **20** through metal rings **28***b* and the elongated openings **36** and through the clip assembly **25**/**26** to be securely fastened by the rings **28***a* and nuts **29** at its four circumferential locations around the clip disc **25**.

[**0040**] FIGS. **7** and **10** show that the same main unit body **20** is attached to a different bus bowl **103** having way larger drain size D**2**. In this case, the clip disc **25** has its entire drain adapter section **40** seen in FIG. **6** cut off to have the biggest adapted hole **35** and is placed between the main body **20** and the flanges **106** of the bus bowl **103** with the elongated openings **36** of the main body **20** and the openings **46** of the clip disc **25** registered.

[**0041**] Here, an alternative design of clip top members **126** are prepared to grip the flanges **106** against the top surface of the clip disc **25**. As shown in FIG. **11**, the clip top member **126** is a smaller rectangular piece with curved edges shaped to the corresponding sections of the flanges **16** and the end walls **39** of the clip disc **25**. A through hole **127** is formed in the near center of the clip member **126** for a penetration of a fastener. Clearance of the clip top member **126** above the clip disc **25** for wedging the flanges **106** is now provided by inserting an additional ring **28***a* as shown in FIG. **10**.

[**0042**] Even with the single-hole clip member **126** there is a room for adjusting the clipping location diametrically in the clip disc **25** to adapt to a range of variation of the large diameter drain **105**. A comparison of the location of the bolt **27** in the elongated openings **36** and **46** in FIG. **10** to that of FIG. **8** clearly shows the diametrical adaptability of the clipping location for the different drains **105**.

[**0043**] Similarly, the bolts **27** are threaded from the interior of the main body **20** through metal rings **28***b* and the elongated openings **36** and through the clip assembly **25**/**28***a*/**126** to be securely fastened by the rings **28***a* and nuts **29** at its four circumferential locations around the clip disc **25**.

[**0044**] FIG. **12** shows an alternative to the clip assembly made by the clip disc and a top clip member in installing the unit main body **20** to a bus bowl **113**, which does not have an integral drain flange but a standard drain fitting **115** screwed in an opening **116** formed in the bus bowl **113**. A riser **250** is provided with an annular plate **251** to conform to the bottom of the drain fitting **115** and four legs **252** protruding diametrically outwardly and downwardly of the annular plate **251**. Each of the legs **252** has a horizontal foot section **253** formed with a bolt hole **254**. The legs **252** may be integrally formed with the annular plate **251** while they may also be provided by separate members welded to the plate **251**. A ring screw **255** that is already in the drain fitting **115** may be used to fasten the annular plate **251** to the drain fitting **115** leaving the four legs **252** free for attachment by the unit main body **20**.

[**0045**] The unit main body **20** is attached by a fastening means including the bolts **27** threaded from the interior of the main body **20** through metal rings and the bolt holes **254** of the foot sections **253**, which abut the top plain of the main

body **20**. Then, the rings **28***a* and nuts **29** at the four feet **253** around the annular plate **251** securely fasten the protruding ends of the bolts **27**.

[**0046**] With such construction of the sink unit **10** replacing the garbage disposer the dish washing individual may first use the basket **30** in the bus bowl **13** to roughly filter out bulky wastes after a load of dish washing and before emptying the basket to an assigned container. At intervals between extended periods of washing tasks the kitchen operator may slide out the tray **22** to check for the accumulation of finer wastes in the main unit body **20** wherein a secondary filtering has been carried out by the finer perforations **31** in the tray **22** letting significantly less contaminated water pass down the secondary drain **24**.

[**0047**] Therefore, while the presently preferred form of the garbage disposer replacement unit has been shown and described, and several modifications thereof discussed, persons skilled in this art will readily appreciate that various additional changes and modifications may be made without departing from the spirit of the invention, as defined and differentiated by the following claims.

1. A garbage disposer replacement unit for straining food waste comprising:

a. a basket with food waste straining holes;

b. a main body having a reservoir, wherein the main body is located below the basket;

c. a tray slidingly suspended within the main body above the reservoir, wherein the tray has fine bottom perforations smaller than the food waste straining holes.

2. The garbage disposer replacement unit of claim 1, wherein fine bottom perforations are about 2 mm diameter circular apertures and the straining holes are circular with a 5-6 mm diameter.

3. The garbage disposer replacement unit of claim 1, further comprising:

a. a plastic clip disc drain adapter adapted to clip an existing bus bowl flange to the main body;

b. clip top members attaching to the plastic clip disc drain adapter.

4. The garbage disposer replacement unit of claim 3, wherein the plastic clip disc drain adapter further comprises: a number of optional hole diameters defined by concentric annular grooves to make adjustable the plastic clip disc drain adapter.

5. The garbage disposer replacement unit of claim 3, wherein the plastic clip disc drain adapter further comprises: slits for cutting adjustment of the size of an annular hole on the plastic clip disc drain adapter to make adjustable the plastic clip disc drain adapter.

6. The garbage disposer replacement unit of claim 3, wherein clip top members further comprise: two differently oriented slots to provide a pair of diameter ranges for each clip top member.

7. The garbage disposer replacement unit of claim 1, further comprising: a four-legged riser to attach to the main body to standard flangeless drain fitting.

8. The garbage disposer replacement unit of claim 1, further comprising: a fastening means adapted to connect an existing bus bowl to the main body.

9. The garbage disposer replacement unit for straining food waste comprising:

a. a basket with food waste straining holes;

b. a main body having a reservoir, wherein the main body is located below the basket;

c. a tray slidingly suspended within the main body above the reservoir, wherein the tray has fine bottom perforations smaller than the food waste straining holes;

d. a clip disc drain adapter adapted to clip an existing bus bowl flange to the main body, wherein the clip disc drain adapter has clip disc holes to receive clip disc bolts, wherein the clip disc drain adapter is attached to the main body by clip disc bolts;

e. clip top members attaching to the plastic clip disc drain adapter.

10. The garbage disposer replacement unit of claim 9, wherein the clip disc drain adapter further comprises: a number of optional hole diameters defined by concentric annular grooves to make adjustable the clip disc drain adapter.

11. The garbage disposer replacement unit of claim 9, wherein the clip disc drain adapter further comprises: slits for cutting adjustment of the size of an annular hole on the clip disc drain adapter to make adjustable the clip disc drain adapter.

12. The garbage disposer replacement unit of claim 9, wherein clip top members further comprise: two differently oriented slots to provide a pair of diameter ranges for each clip top member.

13. A garbage disposer replacement unit for straining food waste comprising:

a. a main body having a reservoir, an inlet, and an outlet;

b. a tray slidingly suspended within the main body above the reservoir, wherein the tray has fine bottom perforations.

14. The garbage disposer replacement unit of claim 13, wherein fine bottom perforations are 1-3 mm diameter circular apertures.

15. The garbage disposer replacement unit of claim 13, further comprising:

a. a plastic clip disc drain adapter adapted to clip an existing bus bowl flange to the main body;

b. clip top members attaching to the plastic clip disc drain adapter.

16. The garbage disposer replacement unit of claim 15, wherein the plastic clip disc drain adapter further comprises: a number of optional hole diameters defined by concentric annular grooves to make adjustable the plastic clip disc drain adapter.

17. The garbage disposer replacement unit of claim 15, wherein the plastic clip disc drain adapter further comprises: slits for cutting adjustment of the size of an annular hole on the plastic clip disc drain adapter to make adjustable the plastic clip disc drain adapter.

18. The garbage disposer replacement unit of claim 15, wherein clip top members further comprise: two differently

oriented slots to provide a pair of diameter ranges for each clip top member.

19. The garbage disposer replacement unit of claim 13, further comprising: a four-legged riser to attach to the main body to standard flangeless drain fitting.

20. The garbage disposer replacement unit of claim 13, further comprising: a fastening means adapted to connect an existing bus bowl to the main body.

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