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(54) **TOILET FLANGES AND THE MOUNTING THEREOF**

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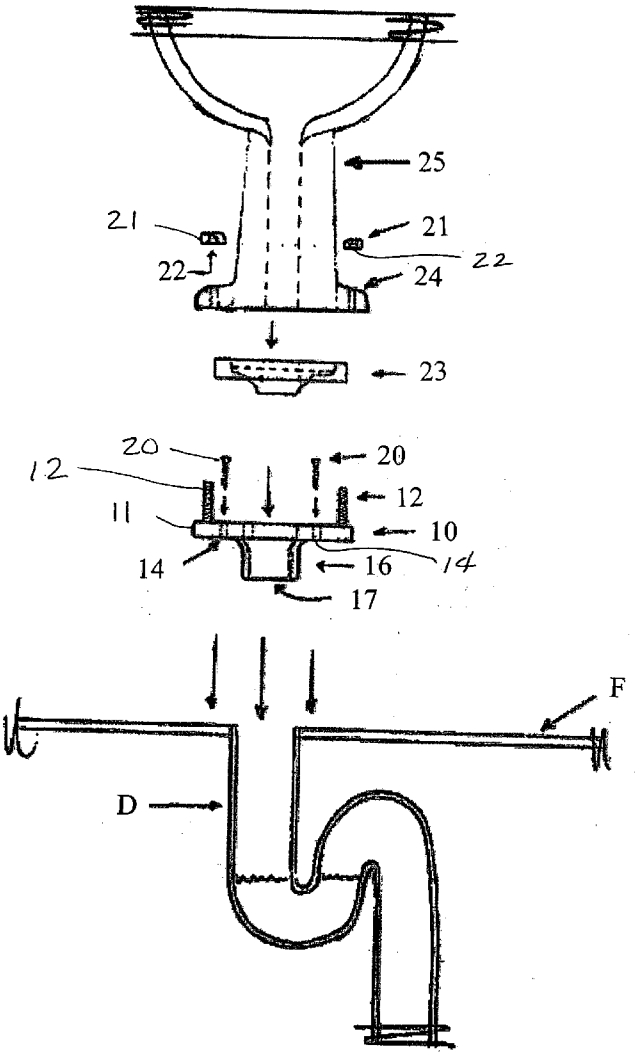
(57) **ABSTRACT**

An improved flange that provides simple and time saving installation of a toilet fixture. The flange includes an annular ring that defines at least one aperture adapted to receive a connector for attaching the flange to the floor and at least one mounting bolt rigidly and permanently affixed to the annular ring, the mounting bolt extending upwardly from the annular ring and being adapted to pass through at least one mounting aperture of the toilet. The flange is adapted for use in originally attaching the toilet to the floor or in repairing or extending existing flanges. In one embodiment, the flange is used in combination with a one-piece mounting cap that removes the need for separate washers and nuts.



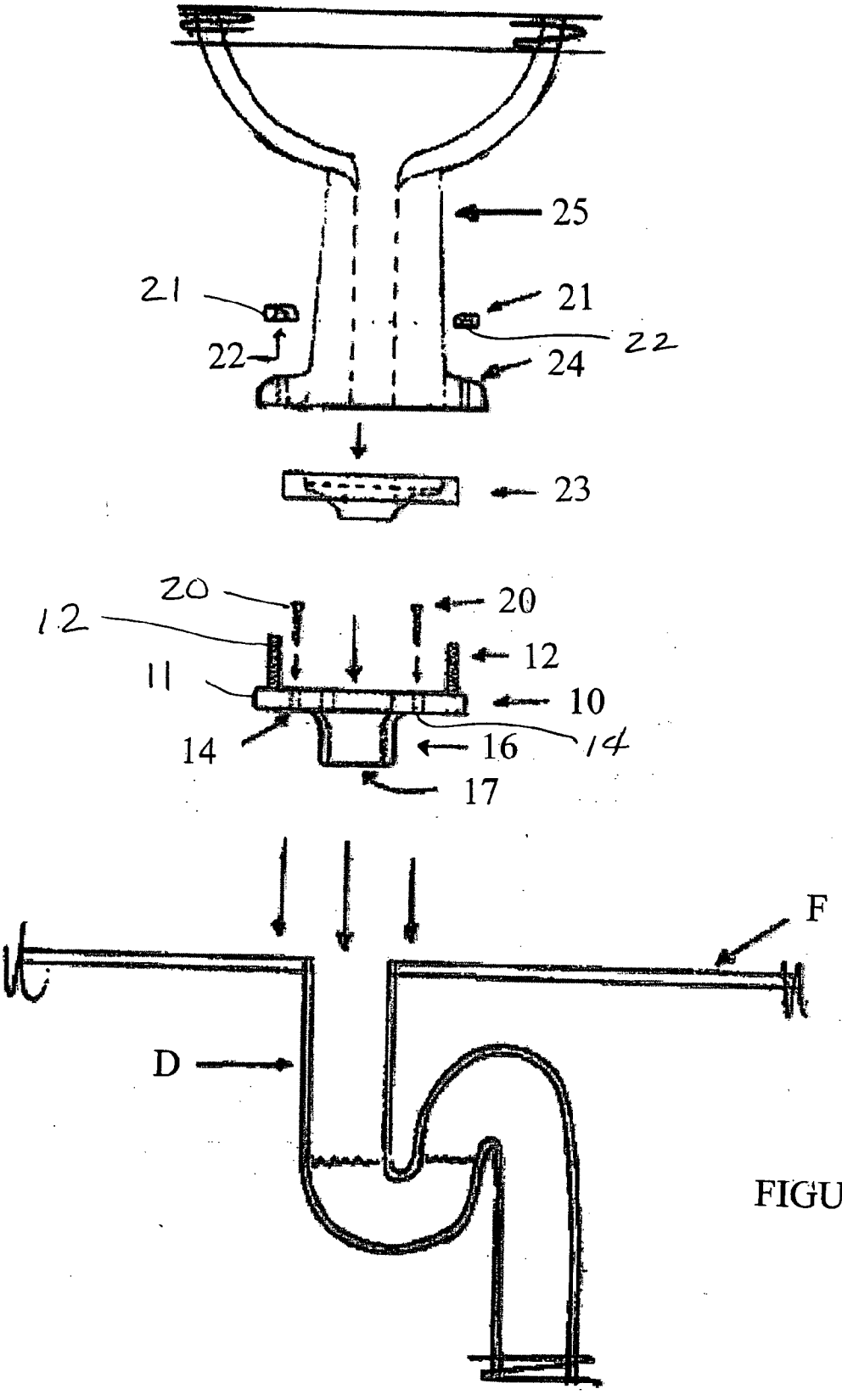


FIGURE 1

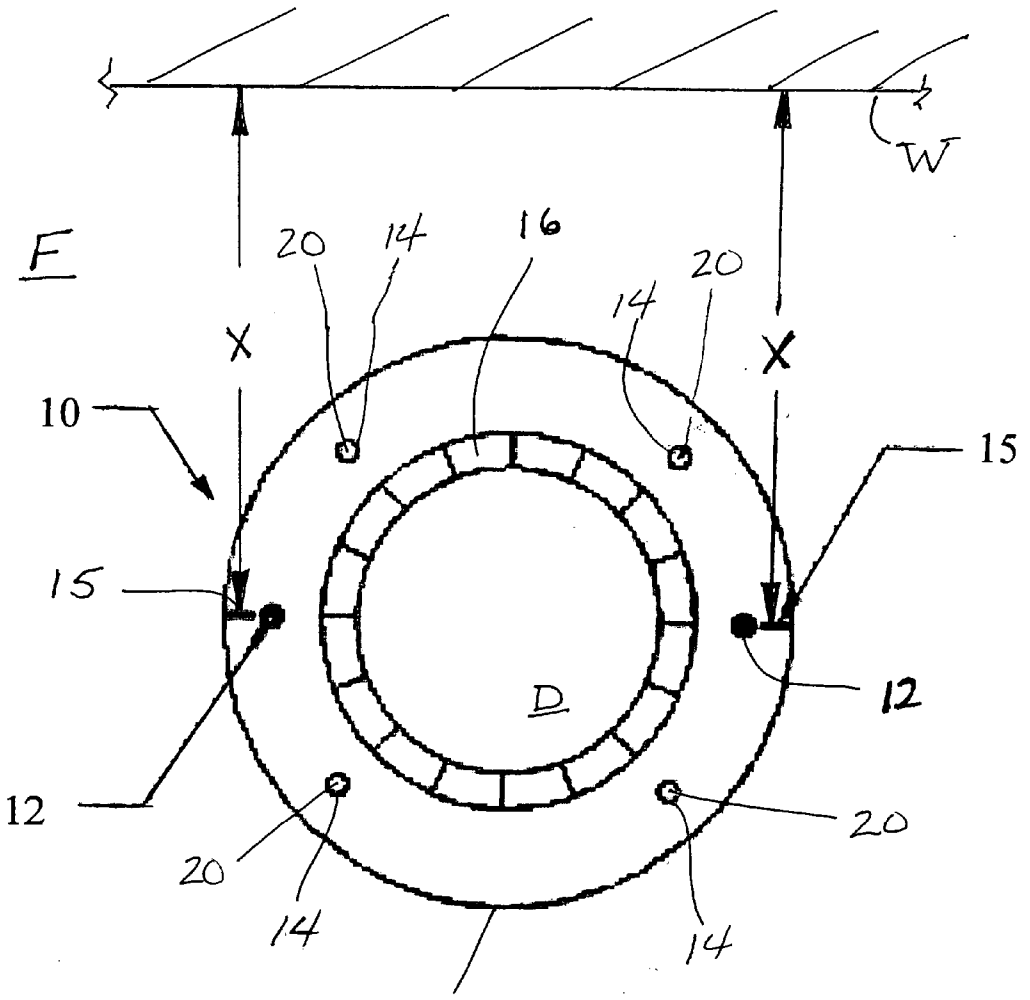


FIGURE 2

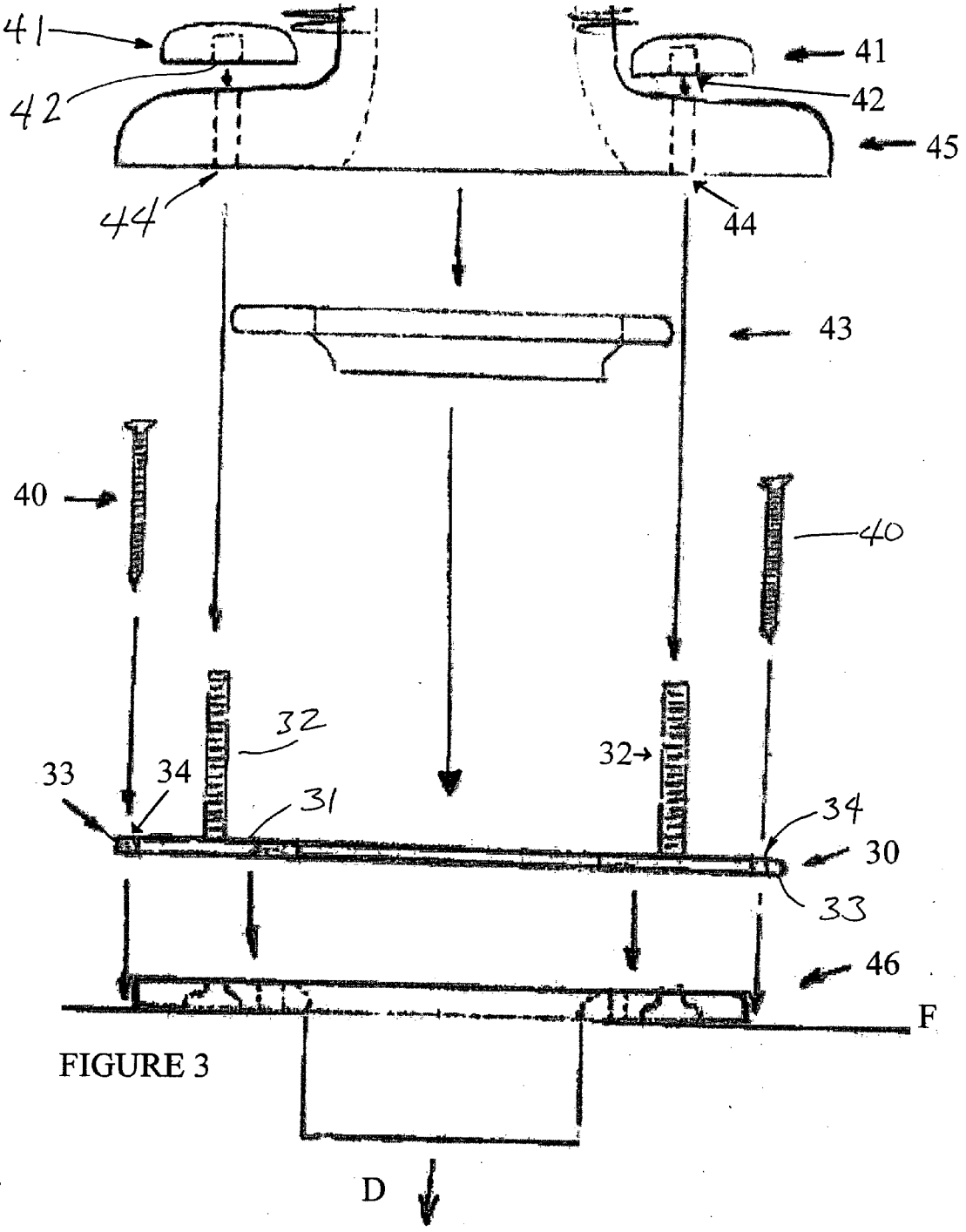


FIGURE 3

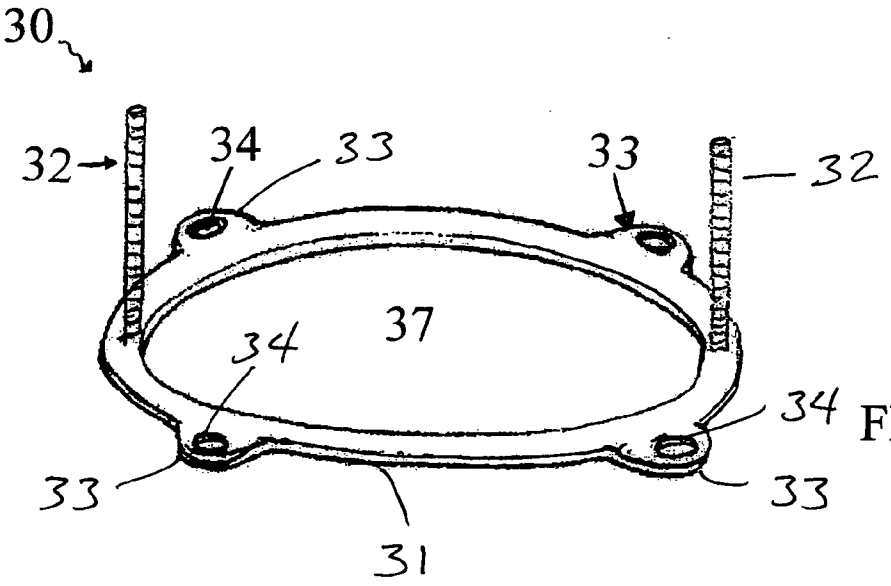


FIGURE 4

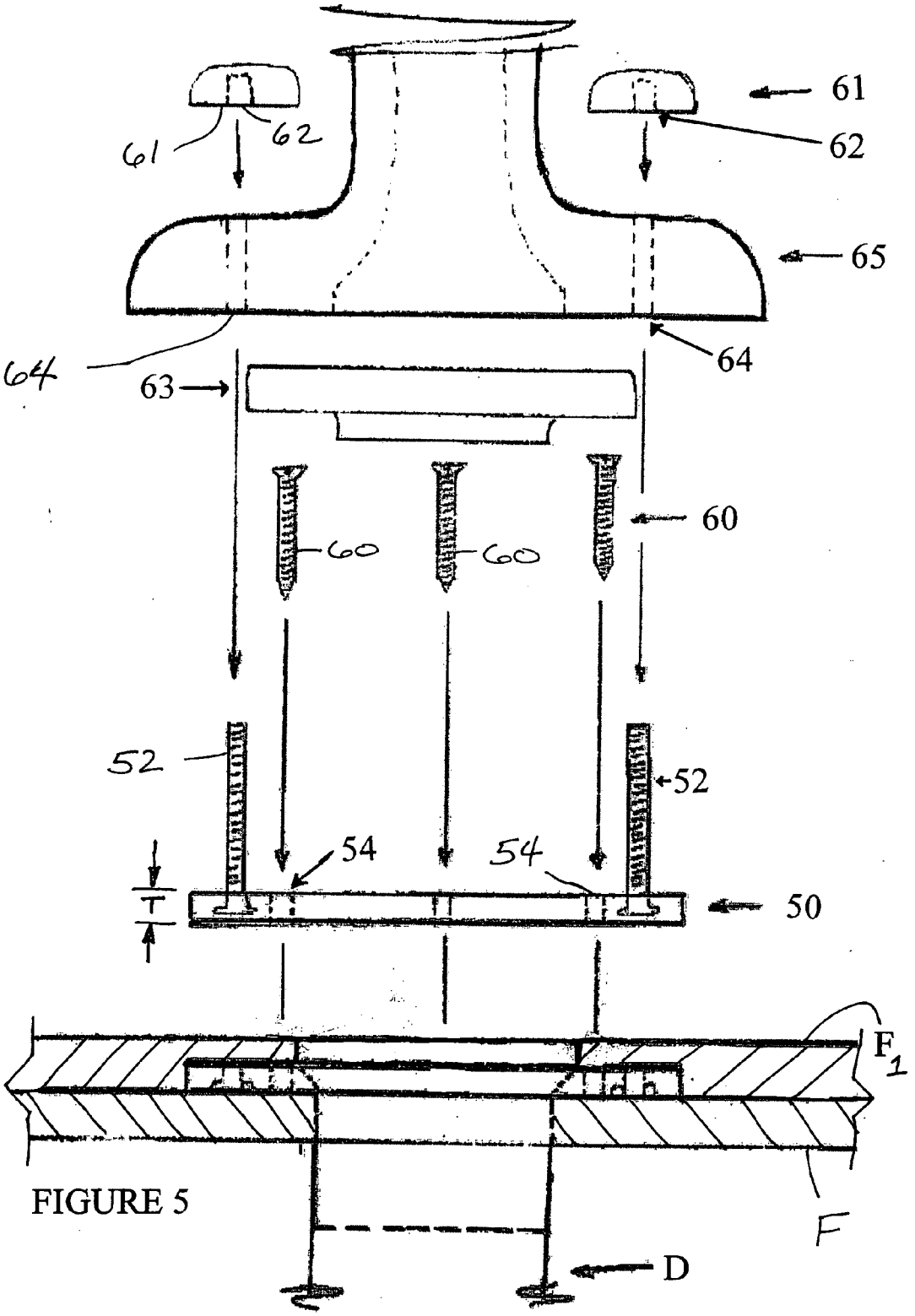


FIGURE 5

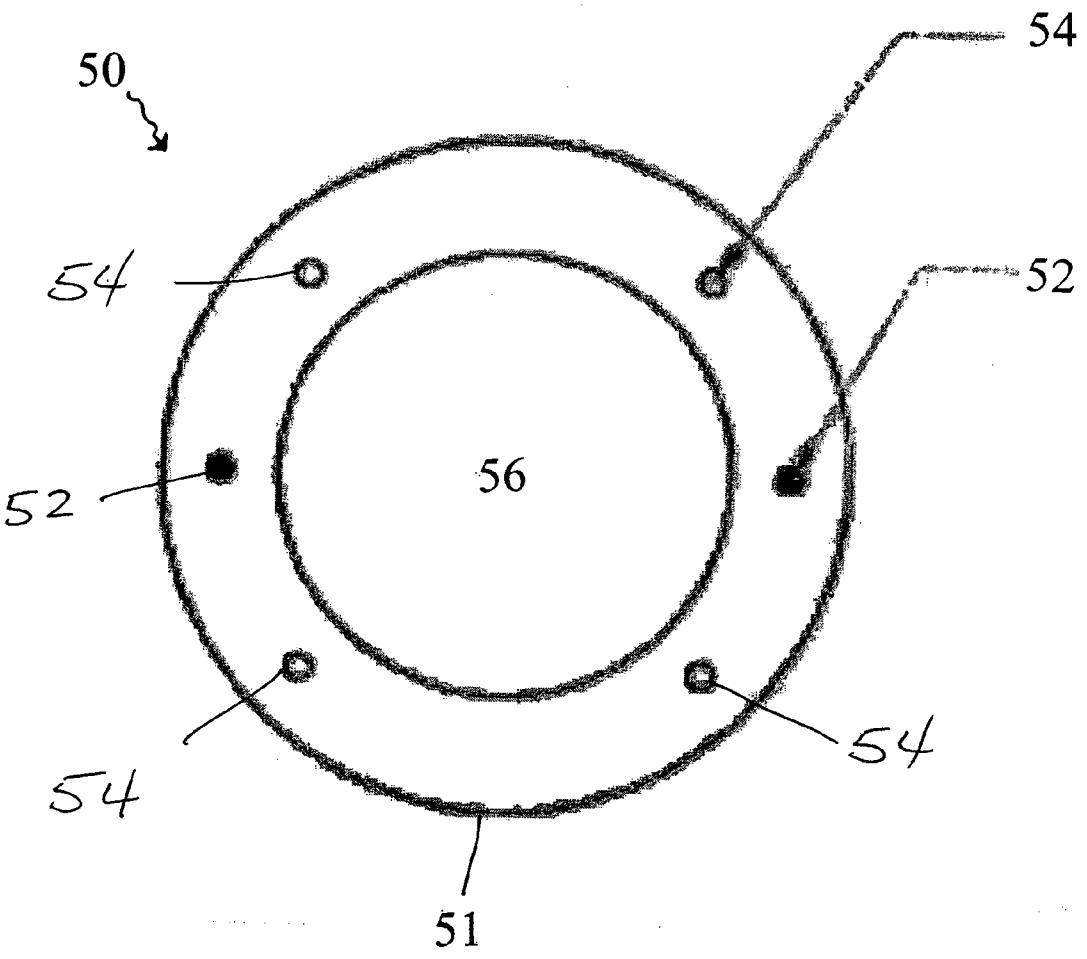


FIGURE 6

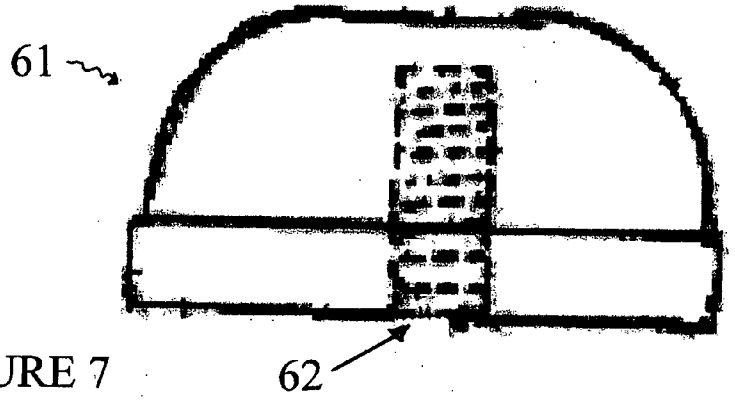


FIGURE 7

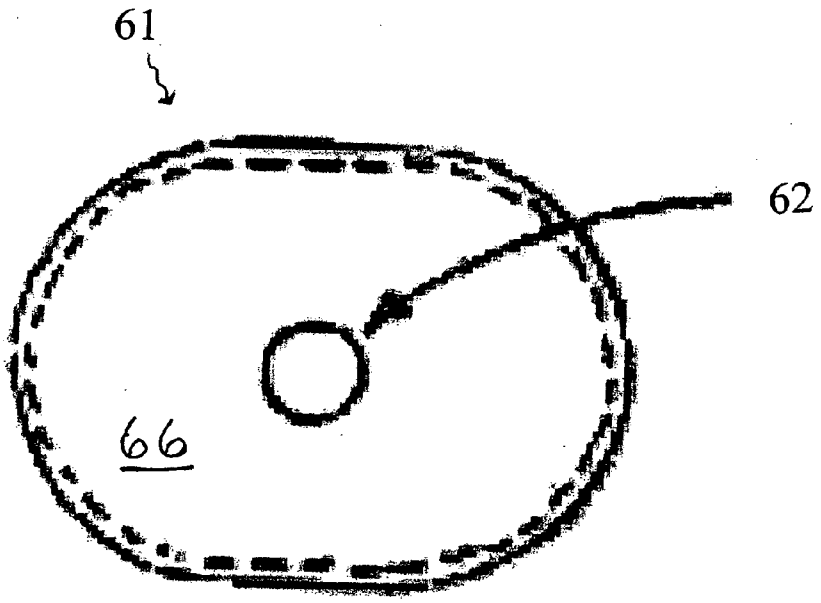


FIGURE 8

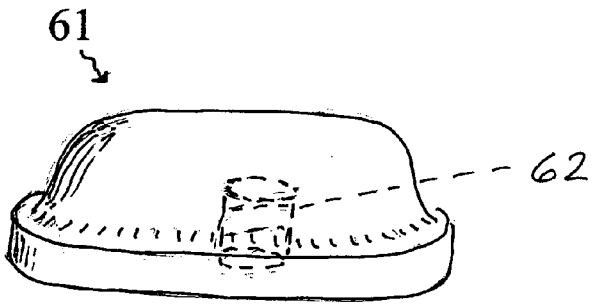


FIGURE 9

TOILET FLANGES AND THE MOUNTING THEREOF

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates generally to the field of plumbing and more particularly relates to a toilet flange and various embodiments thereof and the mounting of a toilet fixture thereon.

[0003] 2. Background of the Invention

[0004] Numerous efforts have been made to mount toilet fixtures known as "commodes" or "water closets" to a bathroom floor since the advent of the modern lavatory. In general, the toilet is mounted over an opening (i.e., drain hole) in a bathroom floor and secured thereto using a flange and a wax seal. The flange is mounted to the bathroom floor in registry with the drain hole in the floor and one or more mounting bolts are passed through bolt openings in the flange and then through corresponding openings in the toilet, and secured thereto using nuts or other fasteners to secure the toilet to the floor about the opening. In the past, a pair of bolts have been used in association with, but not rigidly and permanently affixed to, the flange. These bolts are passed through openings in the flange body in an upward direction prior to the flange being mounted to the floor using conventional fastening means. The bolts are positioned in an upstanding orientation such that, when the toilet is lowered into place over the flange, the bolts will pass through the corresponding openings in the toilet. However, because all of the products known to the inventor on the market today suffer from the disadvantage of having the bolts freely movable related to the flange, one slight shift in the orientation of the bolts will prevent the installer from being able to place the toilet over the flange while simultaneously causing the bolts to pass through the openings in the toilet. Since toilet installations are usually done by one person, this leads to the extremely frustrating and time consuming situation where the installer, after having lifted the heavy toilet and attempted to slowly lower it onto the flange, accidentally bumps one or both of the bolts, causing them to fall out of position. The installer then has to raise the toilet back up and move it to a different location and set it down on the floor and reorient the bolts. This event can happen over and over again given the modern toilet flange kits employ bolts which are very easy to move out of the vertical orientation. This situation is further exacerbated when installing a toilet in a tight space.

[0005] Once the toilet fixture is successfully placed above the mounting bolts and the flange, threaded nuts are typically used to secure the toilet tightly to the floor/flange juncture. These nuts are particularly unsightly. Hence, there have been developed numerous covers and caps to cover the nut, bolt, and washer on either side of the toilet and thereby improve the aesthetic appearance thereof. However, it is particularly undesirable to use the caps that are now uniformly available as they can be easily knocked out of place, work loose essentially on their own over time, and become lost.

[0006] Another frequently encountered problem with in-use toilet flanges is that they occasionally become broken. Once the flange breaks, the toilet is subject to movement and leakage. Presently, the only ways to remedy this type of situation is to remove the toilet, remove the flange and replace it with a new flange or to remove the toilet and use a repair flange that requires assembly and separate bolts and nuts. Removal of the existing flange can be both difficult and time consuming, as well as create collateral problems relative to leakage and the alignment thereof with the opening in the floor.

[0007] Even further, when remodeling a bathroom, it is commonplace to put down new flooring, e.g. hardwood or tile, and purchase and install a new toilet fixture. The new flooring prevents the direct installation of the new toilet fixture to the existing flange due to the increased height of the new floor. One remedy to this situation is the current use of an extension flange. The commercially available extension flanges do not include rigidly and permanently affixed bolts. Similar to the issue discussed above with regard to new installation, the installer must place the toilet on the bolts without knocking them over. Another remedy is to cut the existing flange out and replace it with a new construction flange at the correct floor level. Either remedy adds unnecessarily to the complexity and time consumption associated with the installation.

[0008] It is, therefore, an object of this invention to improve the apparatus used to mount a toilet fixture to a bathroom floor.

[0009] It is also an object of the present invention to facilitate the simple and time saving installation of a toilet fixture to a bathroom floor by a single installer.

[0010] It is a further object of this invention to provide a toilet mounting flange wherein mounting bolts associated therewith are rigidly and permanently fixed relative to the flange, without the need for assembly.

[0011] It is a still further object of this invention to provide toilet bowl mounting nuts that have a decorative cap integrally formed therewith without the need for washers.

[0012] It is also an object of this invention to provide a toilet flange which permits the easy repair thereof without removal of the broken toilet flange, or the use of separate parts i.e. flange, bolts, washers, and nuts.

[0013] It is also an object of the invention to provide a toilet flange which can be used to accommodate a new floor.

[0014] These and other objects of the invention, along with various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and description, in which there is illustrated multiple embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. **1** is an exploded elevational view of one embodiment of the one-piece toilet flange and the one-piece toilet bowl mounting cap of the present invention being utilized to mount a toilet to a floor.

[0016] FIG. **2** is top plan view of the one-piece toilet flange of FIG. **1** shown spaced from a wall.

[0017] FIG. **3** is an exploded elevation view of a second embodiment of the invention in the form of a one-piece toilet

repair flange and the one-piece toilet bowl mounting cap being utilized to repair the broken flange of an existing toilet.

[0018] FIG. **4** is a perspective view of the one-piece toilet repair flange of FIG. **3**.

[0019] FIG. **5** is an exploded view of a third alternate embodiment of the present invention in the form of a one-piece toilet extension flange and the one-piece toilet bowl mounting cap used to accommodate a rise in the floor level due to the added thickness of flooring being installed (i.e., tile or hardwood) during a remodeling project.

[0020] FIG. **6** is a top plan view of the one-piece toilet extension flange of FIG. **5**.

[0021] FIG. **7** is a side plan view of the one-piece toilet bowl mounting cap of the present invention.

[0022] FIG. **8** is a bottom view of the mounting cap of FIG. **7**.

[0023] FIG. **9** is a perspective view of the mounting cap of FIG. **7**.

DETAILED DESCRIPTION

[0024] In view of the foregoing shortcomings inherent in the toilet flanges and mounting hardware presently available on the market and in view of the objects set forth above, the present invention is directed to a plurality of improved toilet fixture mounting assemblies.

[0025] The first such assembly, which is depicted in FIG. **1**, is particularly suited to new construction applications and employs a toilet mounting flange **10** in the form of an annular ring body **11** (best seen in FIG. **2**) mounted to a bathroom floor F, generally substantially in registry with a toilet drain D. The flange **10** has rigidly and permanently affixed thereto one or more mounting bolts **12** extending upwardly therefrom. The flange **10** is secured to the floor F using any suitable mounting fasteners **20**, such as mounting screws. A drain spout **16** may be associated with the flange **10** to assist in the alignment of the flange **10** with the toilet drain D and drain hole, although a drain spout **16** is not considered to be essential to this invention. If the flange **10** is mounted to the floor F, a wax seal **23**, as is widely known in the art, may be placed on the flange **10** in registry with the drain hole and the base **25** of the toilet fixture to be lowered thereupon. The toilet base **25** defines one or more apertures **24** therethrough adapted to receive the one or more bolts **12** which are rigidly and permanently affixed to the flange **10**. By having the bolts **12** rigidly and permanently affixed to the flange **10**, bumping or knocking the bolts **12** while installing the toilet base **25** to the flange **10** will not cause the bolts **12** to become disoriented. Corresponding one-piece toilet bowl mounting caps **21** are employed to threadingly engage the bolts **12** and sandwich the toilet base **25** between the flange body **10**, the wax seal **23** and the one-piece toilet bowl mounting caps **21**, thereby affixing the toilet base **25** to the floor F. Suitable finishing steps may be employed thereafter, such as caulking around the juncture of the toilet base **25** and the floor F, although such steps are not considered to be a part of the invention.

[0026] The flange **10** employs one or more floor mounting holes **14** peripherally about the annular ring body **11** adapted to receive floor mounting fasteners **20** therethrough while attaching the flange **10** to the floor F around the drain hole. The flange **10** includes two or more indicia such as alignment lines **15** that can be used to properly align the flange **10**, and as a result the toilet base **25**, with a wall W. As shown in FIG. **2**, during installation, the alignment lines **15** are each equally spaced a distance X from the wall W, ordinarily by using a measuring instrument, and then the floor mounting fasteners **20** are used to secure the flange **10** to the floor F.

[0027] As most toilet bases **25** currently employ a pair of mounting apertures **24**, one on either side of the toilet base **25**, the preferred embodiment of the invention employs a pair of mounting bolts **12** which are preferably made of brass, but may be made of nylon, fiberglass, polyvinyl chloride (PVC), or any other material having suitable strength and durability/corrosion resistance. Each of the bolts **12** is rigidly and permanently affixed to the flange **10**, as by molding together or otherwise firmly and permanently attaching the bolts **12** to the flange **10**.

[0028] In another embodiment, depicted in FIGS. **3** and **4**, a repair flange **30** is disclosed, adapted to be used to cover any existing broken flange. The flange **30** comprises a thin, annular body **31**, preferably made of metal, but may be made of any suitable material, having one or more mounting holes **34** defined by mounting tabs **33** arranged peripherally about the periphery **31** of the flange **30**. In use, when an existing toilet flange breaks, the toilet is removed. The existing mounting bolts extending up from the broken toilet flange are removed and discarded as by sliding bolts out of the keyway in the flange and the repair flange **30** mounted directly above the broken flange in registry with the drain hole. New mounting fasteners **40** are placed through the apertures **34** in the mounting tabs **33** and driven into the floor F to securely mount the repair flange **30** thereover. The repair flange **30** incorporates rigidly and permanently affixed mounting bolts **32** extending upwardly therefrom upon which the toilet base **45** can be mounted as described in connection with FIGS. **1** and **2**. In this way, the problems associated with a broken toilet flange can be remedied without removing the existing flange, as removal thereof is often extremely difficult and may result in damage to the toilet drain which extends into the floor.

[0029] Another embodiment of the invention is disclosed in FIGS. **5** and **6** and comprises a toilet flange **50** adapted to be utilized to bridge the gap between a toilet fixture and the floor/toilet drain opening when new flooring has been installed. For example, in a remodel, it is common place to install new tile, wood flooring, etc., which raises the level of the floor relative to the drain opening in the original floor. Because of this, the existing flange is not high enough relative to the new floor level. To rectify this, the extension flange **50** is employed, which is of a thickness T that is sufficient to substantially match the thickness of the new flooring F^1. The extension flange **50** is mounted directly over the existing flange, eliminating the need for any additional work preparatory to the installation of the toilet. The existing mounting fasteners in the original flange are removed. If possible, the apertures **54** in the extension flange **50** are aligned over the original holes. If not, the new floor mounting fasteners **60** are passed through the old flange where necessary. The extension flange **50** is mounted directly into the floor and rigidly and permanently affixed mounting bolts **52** extend upwardly there from to which the toilet fixture is mounted as discussed above.

[0030] It is to be understood in connection with this invention that it is a principal feature of each embodiment that the mounting bolts be rigidly and permanently affixed to the flange such that they act as one piece with the flange and, as a result, the toilet base mounting bolts will remain in their vertical orientation when the flange is mounted to the floor.

[0031] To overcome the disadvantages inherent in using a simple nut to attach to the mounting bolts while mounting the toilet base, the present invention also contemplates the use of a one-piece toilet bowl mounting cap **61**. The one-piece toilet bowl mounting cap **61** eliminates the need for separate nuts and washers. The one-piece toilet bowl mounting cap **61** defines internal threads **62** adapted to be threadingly engaged to external threads on the toilet flange mounting bolts and an integral covering thereover. The one-piece toilet bowl mounting cap may be made of polyvinyl chloride (PVC), nylon, fiberglass, or any other moldable materials. The covering may take any form, for example it may be spherical, square, rectangular, oblong, elliptical, it may have a hexagonally arranged surface adapted to be engaged by a wrench, etc. In the embodiment shown in FIGS. **7** through **9**, the one-piece toilet bowl mounting cap **61** is formed in an oblong shape which facilitates the hand tightening of the cap **61** over the mounting bolt while preventing the possibility of cracking the toilet base by over tightening. The oblong shape provides the necessary leverage for the installer to tighten the nut to a degree which will cause the toilet to be securely and snuggly mounted to the mounting bolt/toilet flange. In addition, the one-piece embodiment removes the likelihood of the cap being accidentally knocked from the bolt. The one-piece toilet bowl mounting cap **61** combination may further eliminate the need to utilize a washer because the contact surface **66** may serve as a built in washer.

[0032] The invention has been shown and described herein in the form of multiple embodiments with alternative features. It is to be understood, however, that the invention is not limited to the embodiments disclosed herein, and that the invention is intended to be limited only by the following claims.

I claim:

1. A flange for mounting a toilet to a surface, the toilet including a base portion defining at least one mounting aperture, the flange comprising:

an annular ring defining at least one aperture adapted to receive a connector for attaching the flange to the floor;

at least one mounting bolt rigidly and permanently affixed to the annular ring, the at least one mounting bolt extending upwardly from the annular ring and being adapted to pass through at least one mounting aperture of the toilet.

2. The flange of claim 1, wherein the surface is a floor proximate at least one wall of a room, the flange further comprising one or more alignment indicia disposed on the annular ring to facilitate positioning of the annular ring such that the toilet is mounted in a predetermined angular orientation relative to the at least one wall.

3. The flange of claim 1, further comprising a drain spout.

4. The flange of claim 1, further comprising at least one one-piece toilet bowl mounting cap, the toilet bowl mounting cap including a decorative outer surface and a threaded, recessed inner surface, and adapted to be engaged by the at least one mounting bolt to secure the base portion of the toilet to the flange.

5. The flange of claim 4, wherein an external surface of the at least one mounting bolt is threaded.

6. The flange of claim 1, wherein the surface is an existing toilet mounting flange mounted to a floor and wherein the at least one aperture is adapted to receive a connector for attaching the flange to the existing toilet mounting flange and the floor.

7. The flange of claim 6 wherein the floor is proximate to at least one wall of a room, the flange further comprising one or more alignment indicia disposed on the annular ring to facilitate positioning of the annular ring such that the toilet is mounted in a predetermined angular orientation relative to the at least one wall.

8. A repair flange adapted to overlay a broken toilet flange and to secure a toilet to a floor, the broken toilet flange positioned between the toilet and the floor, the toilet including a base portion defining at least one mounting aperture, the repair flange comprising:

an annular ring having one or more mounting tabs that each define a tab aperture, wherein each tab aperture is adapted to receive a connector for attaching the repair flange to a floor; and

at least one mounting bolt rigidly and permanently affixed to the annular ring, the at least one mounting bolt extending upwardly from the annular ring and being adapted to pass through at least one mounting aperture of the toilet.

9. The repair flange of claim 8, wherein the tab apertures are attached to an outside periphery of the annular ring.

10. The repair flange of claim 8, the broken toilet flange having an annular ring that defines one or more apertures, the repair flange further defining one or more apertures that coincide with the one or more apertures of the broken toilet flange.

11. The repair flange of claim 8, further comprising at least one one-piece toilet bowl mounting cap, the toilet bowl mounting cap adapted to be mated with the at least one mounting bolt to secure the base portion of the toilet to the flange.

12. The flange of claim 11, wherein an external surface of the at least one mounting bolt is threaded and wherein an internal surface of the one-piece toilet bowl mounting cap is threaded.

13. A flange for extending a thickness of an existing toilet mounting flange, the existing toilet mounting flange positioned between a base portion of a toilet and a floor, the flange comprising:

an annular ring defining at least one aperture adapted to receive a connector for attaching the flange to the existing toilet mounting flange and the floor; and

at least one mounting bolt rigidly and permanently affixed to the annular ring, the at least one mounting bolt extending upwardly from the annular ring and being adapted to pass through at least one mounting aperture of the toilet.

14. The flange of claim 13, further comprising at least one one-piece toilet bowl mounting cap, the toilet bowl mounting cap adapted to be mated with the at least one mounting bolt to secure the base portion of the toilet to the flange.

15. The flange of claim 14, wherein an external surface of the at least one mounting bolt is threaded and wherein an internal surface of the one-piece toilet bowl mounting cap is threaded.

* * * * *