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Omidi

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(54) **EXTENDER FOR TOILET FLUSH ACTIVATOR**

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E03D 5/092 (2006.01)

(52) **U.S. Cl.**
CPC ***E03D 5/092*** (2013.01)

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USPC 4/249
See application file for complete search history.

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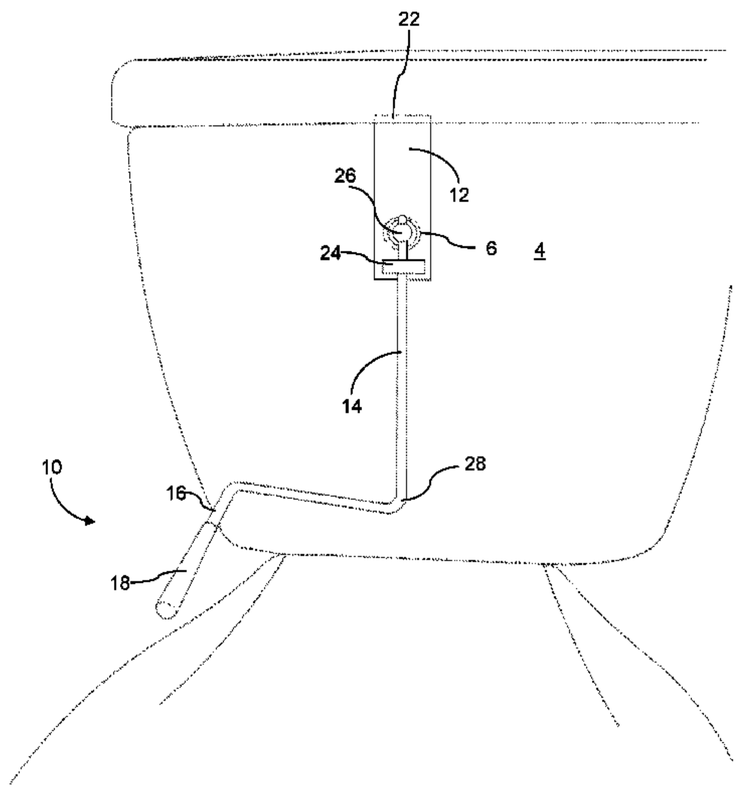
(57) **ABSTRACT**

An extender for a push-button and/or motion sensor toilet flush actuator, has a fulcrum member for mounting on a rim of a tank of the toilet and a sleeve for slidably receiving a rigid extension rod, which has an angular bend between the first rod end and the second rod end. An extender head is connected to one end of the rigid extension rod is adapted to engage the flush actuator. A lever arm is connected to the other end of the rigid extension rod for operation of the extender by a user's upper extremity, so that when the user applies pressure to the second lever end of the lever arm, the rigid extension rod moves to allow the extender head to engage the flush actuator.

22 Claims, 5 Drawing Sheets



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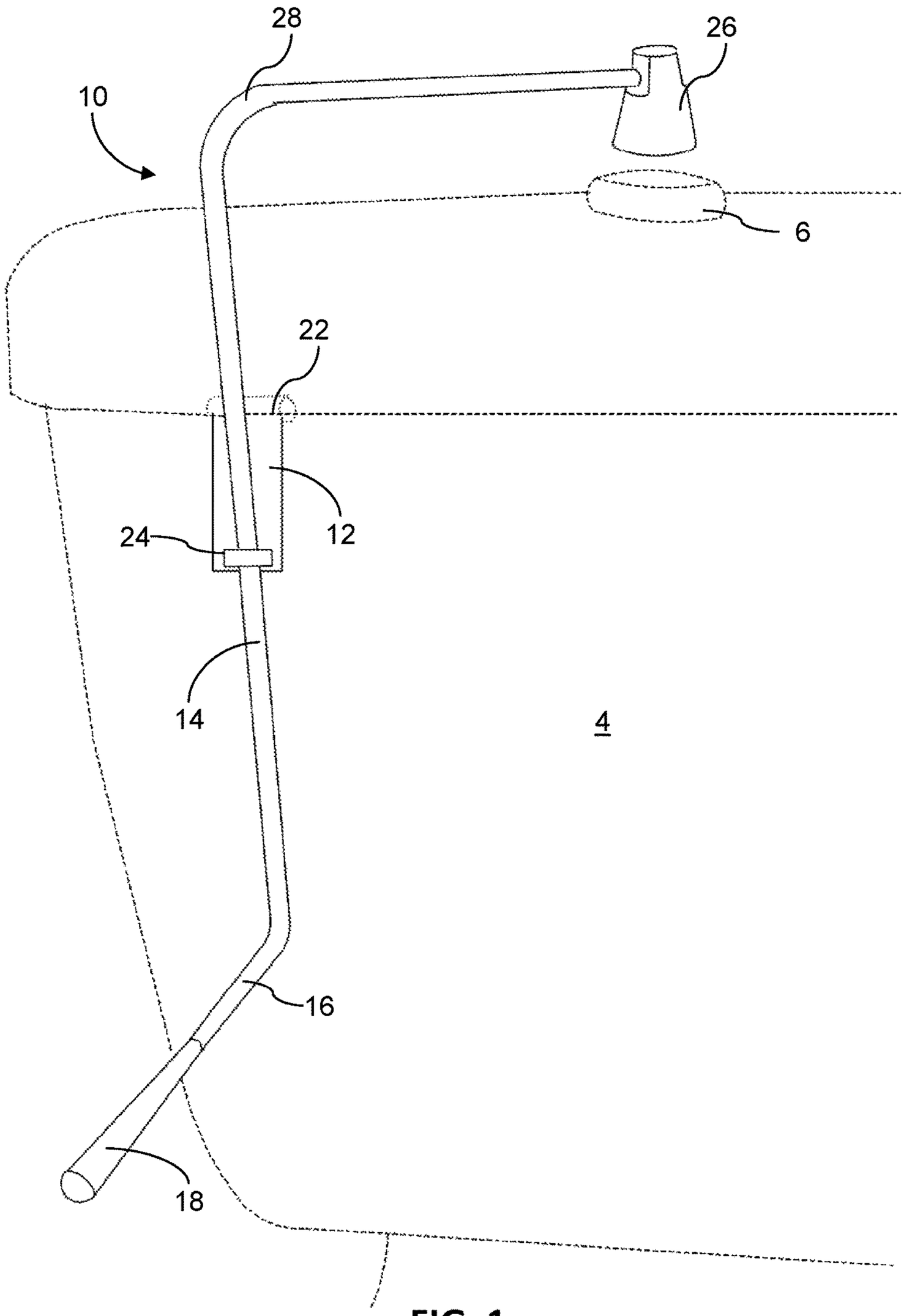


FIG. 1

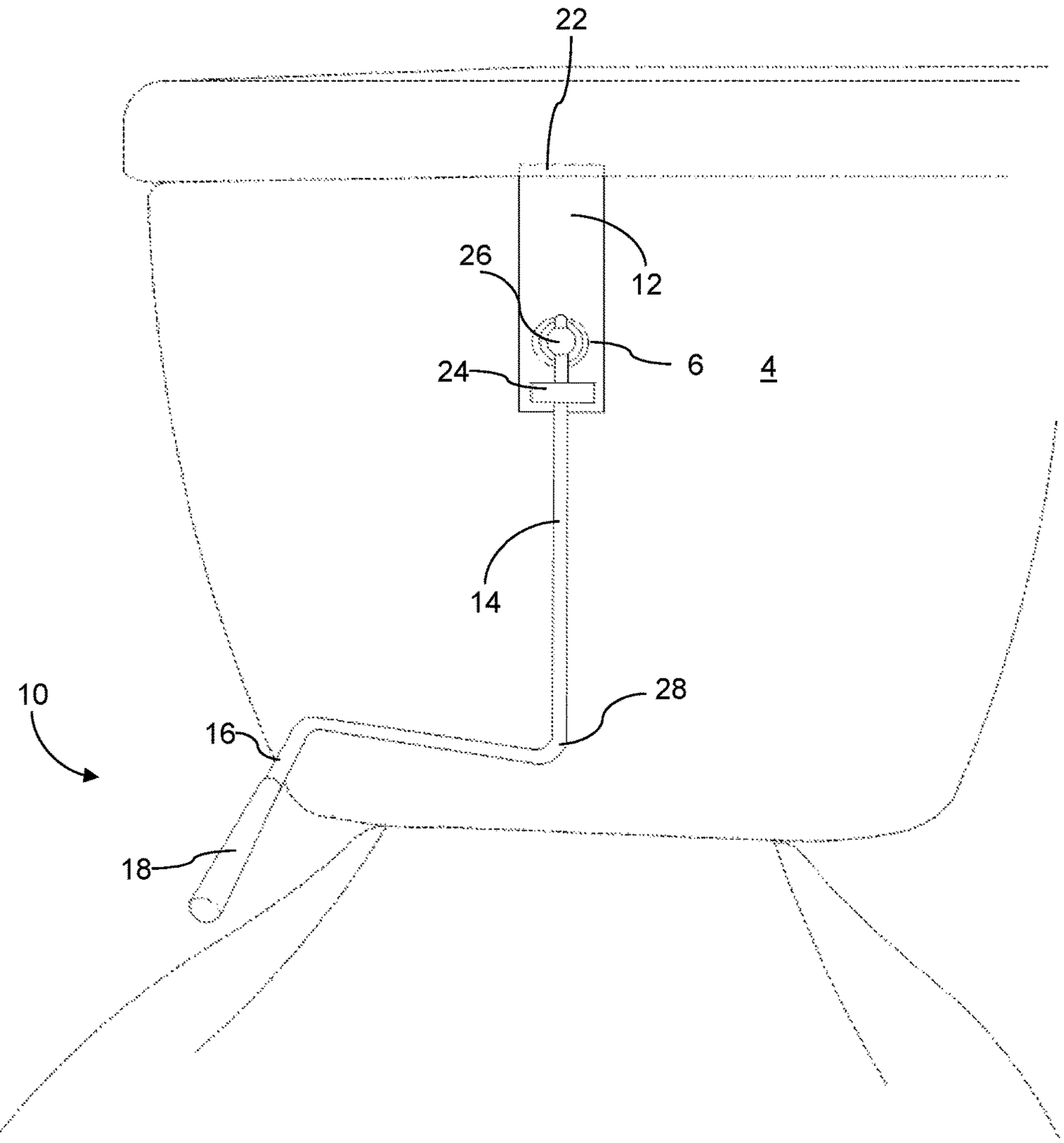


FIG. 2

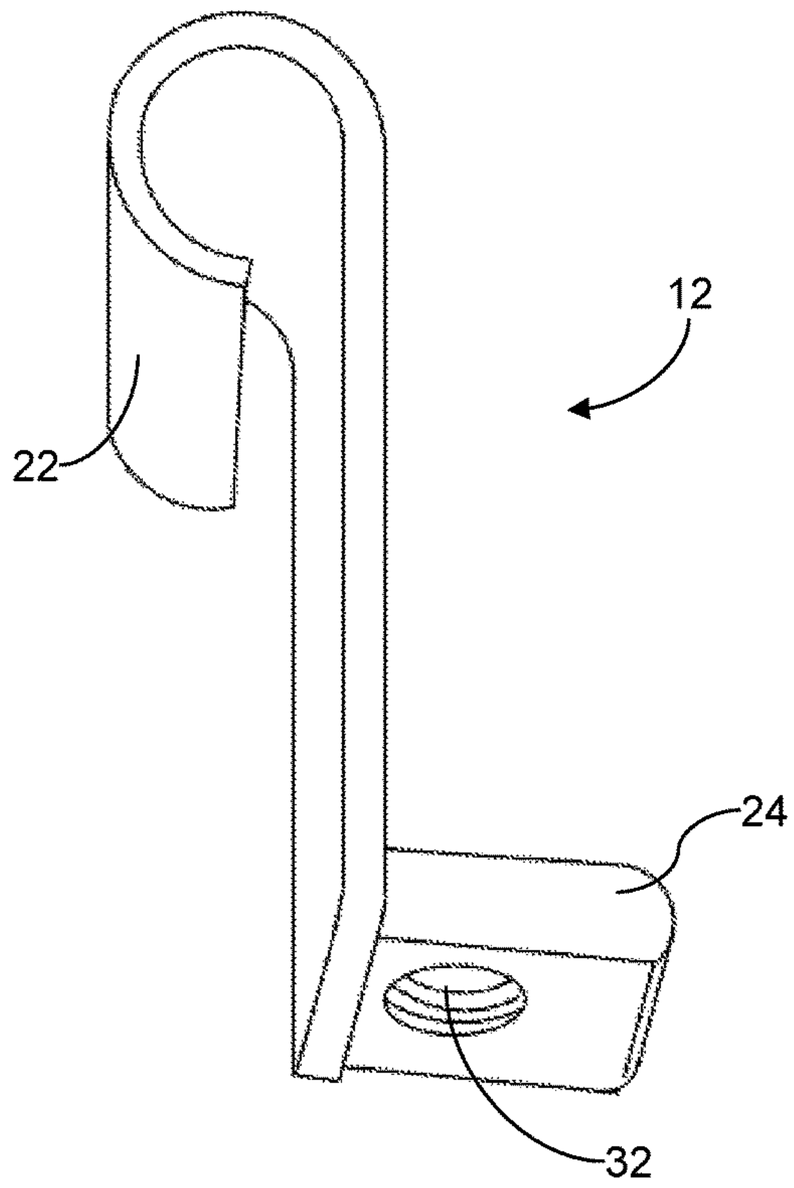


FIG. 3

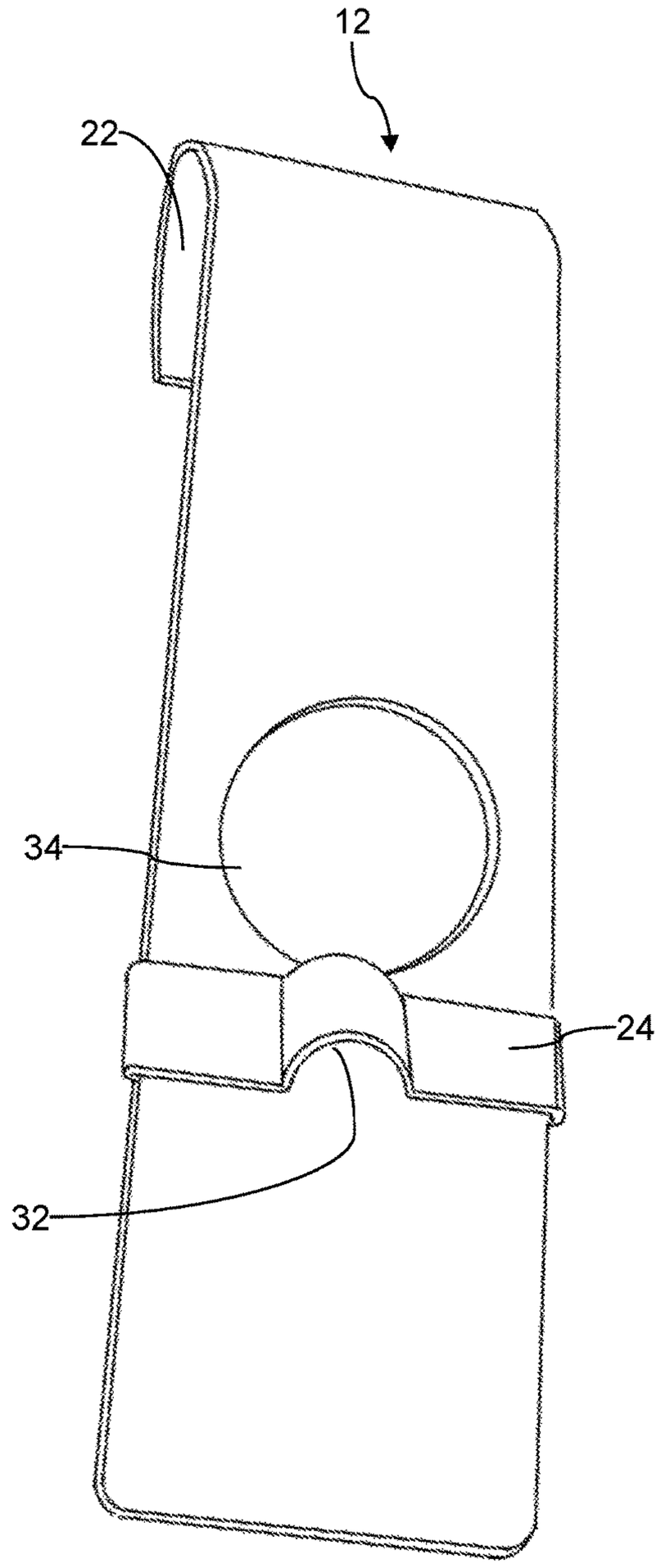


FIG. 4

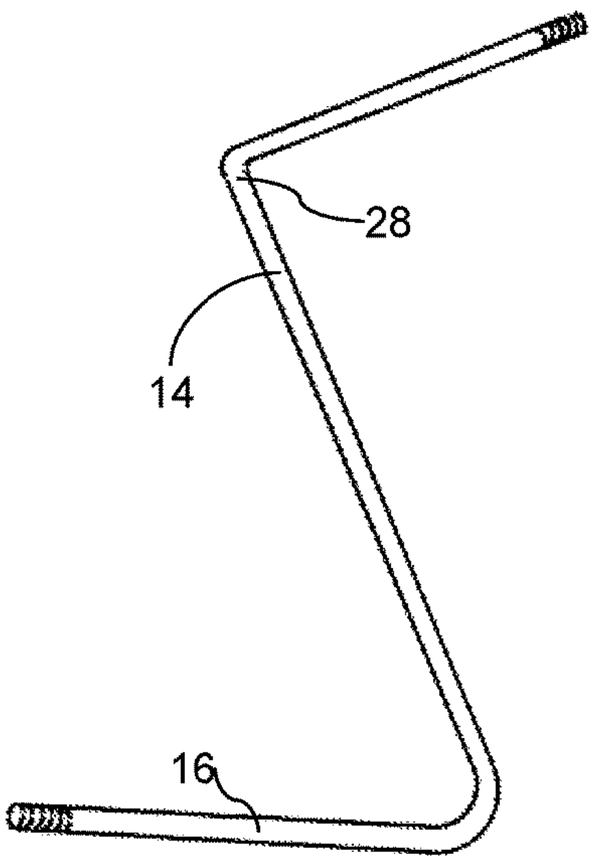


FIG. 5a

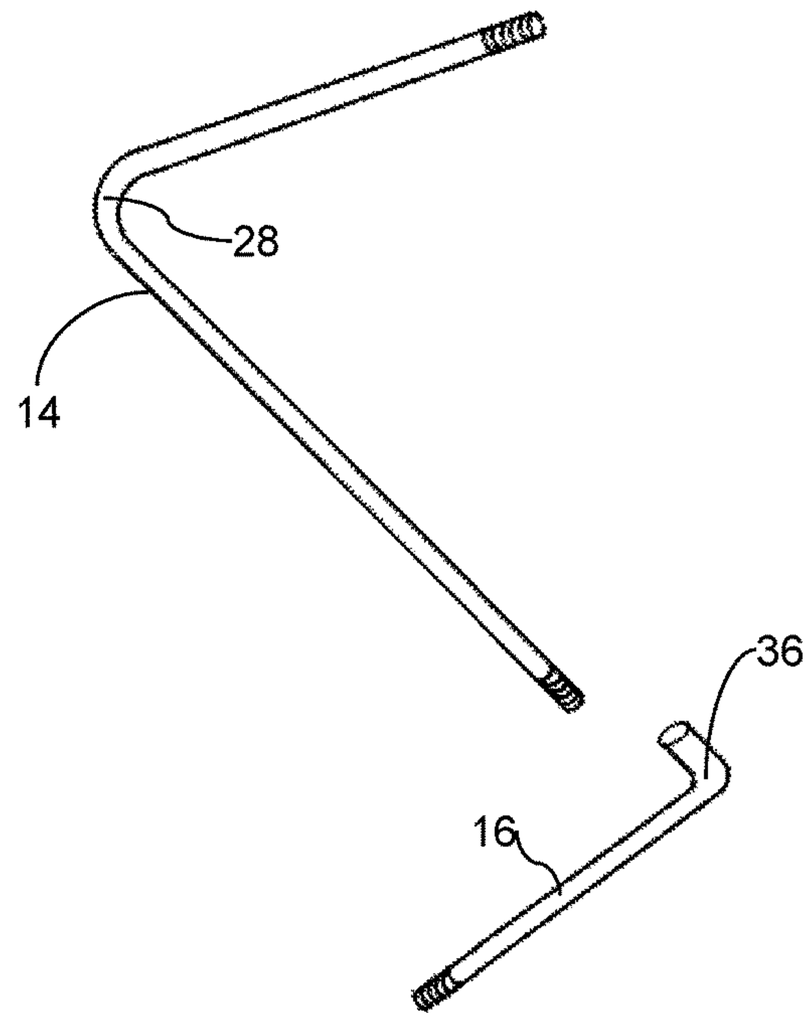


FIG. 5b

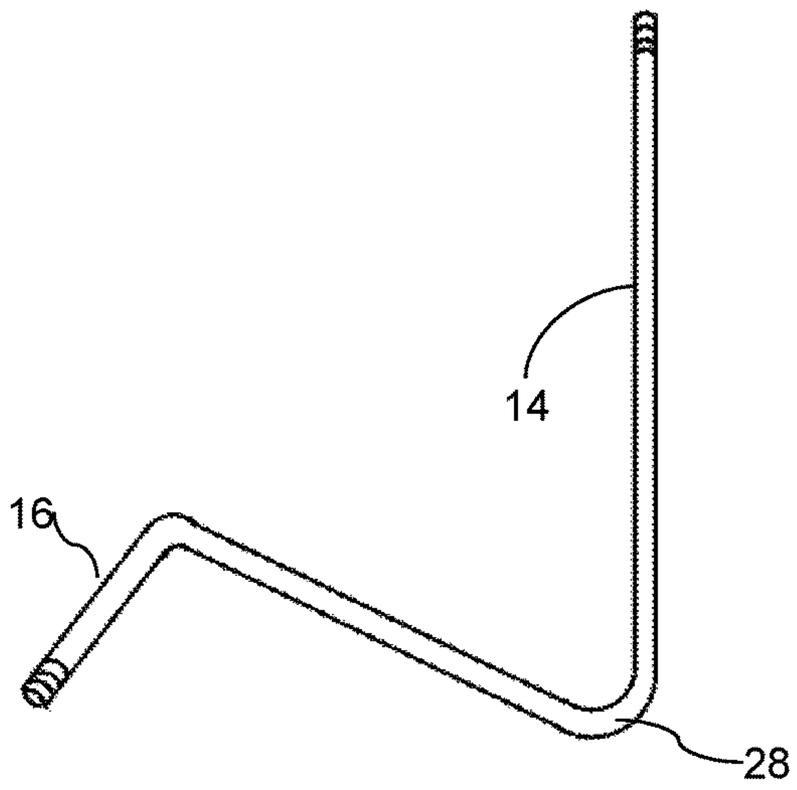


FIG. 6a

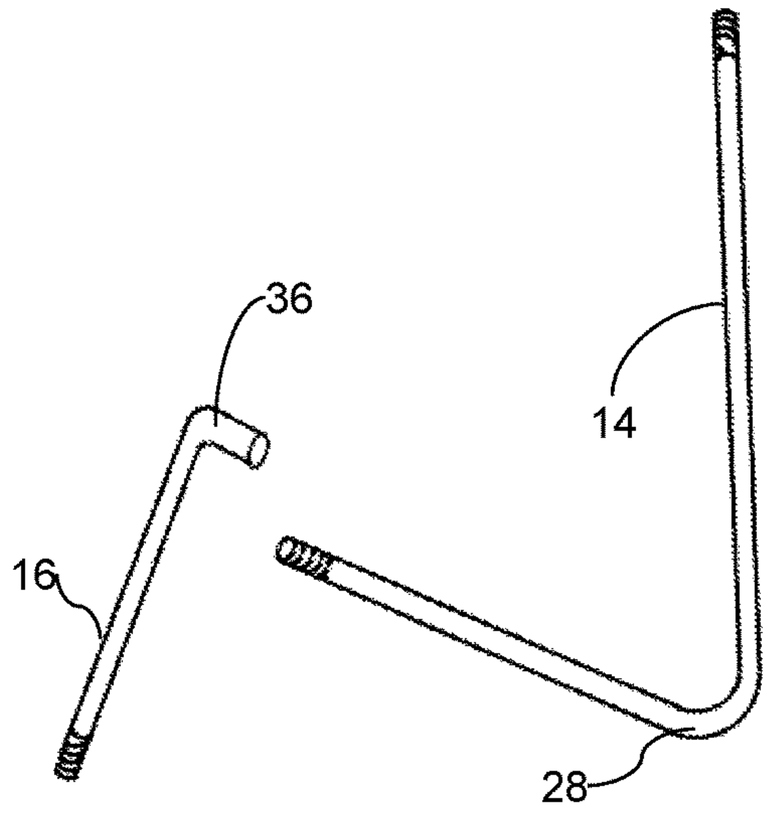
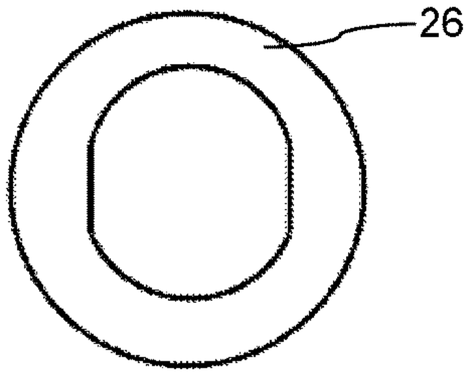


FIG. 6b

FIG. 7c



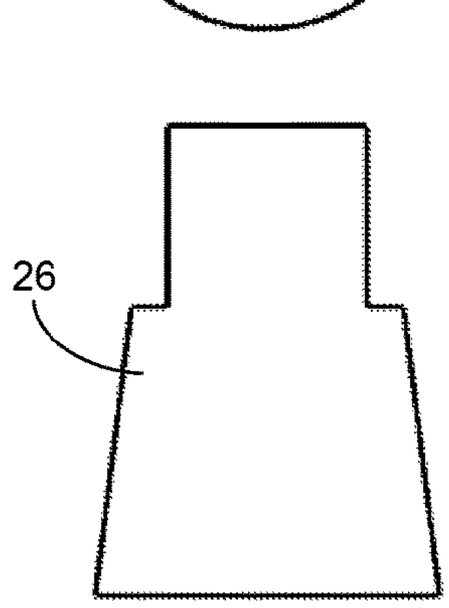


FIG. 7a

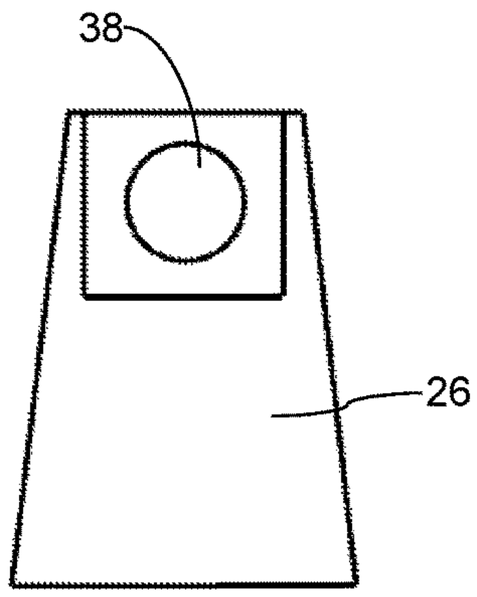


FIG. 7b

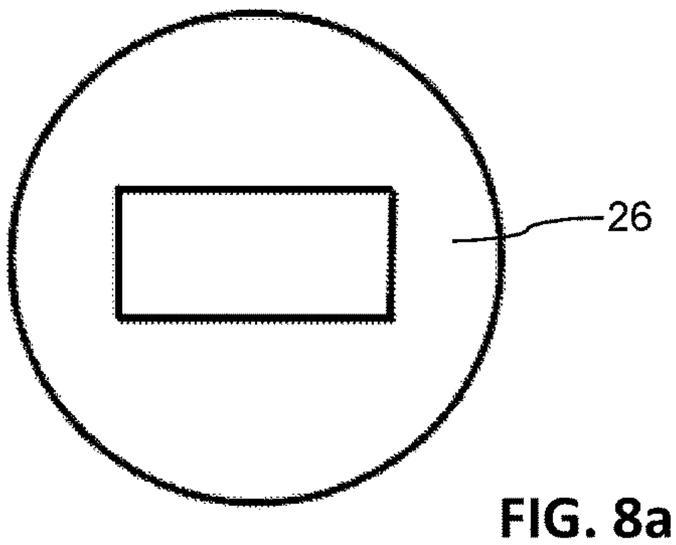


FIG. 8a

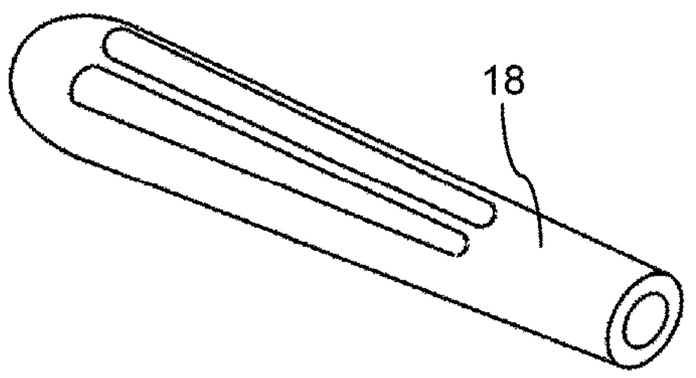


FIG. 9

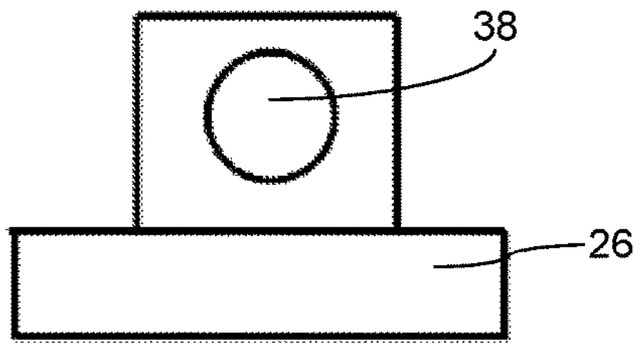


FIG. 8b

EXTENDER FOR TOILET FLUSH ACTIVATOR

RELATED APPLICATION

This application claims priority to U.S. Provisional Application Ser. No. 62/320,535 filed Apr. 10, 2016.

FIELD OF THE INVENTION

The present invention relates to bathroom fixtures and particularly to the push-button and/or motion sensor flush actuators associated with manual flushing of toilets.

BACKGROUND OF THE INVENTION

Toilets come in a large variety of shapes and sizes, but all manually flushable toilets tend to have relatively short, flush actuators, typically in the nature of levers, buttons or knobs, positioned on the side, front or top of the toilet, that fit closely adjacent to the toilet. Top flush actuators tend to be even or level with the top of the tank and operate by pushing inward toward the toilet tank. Side flush actuators tend to be large buttons or levers or knobs that one presses or turns or pulls down, and front flush actuators tend to be positioned near the top of the toilet, adjacent the toilet tank lid or top, that one pulls down. Generally, the pressing, rotating or turning of the flush actuator produces a levered rotation of the flush rod located in the tank, which in turn lifts a chain associated with a flapper or other flushing mechanism to release water from the tank into the toilet bowl. Reaching the flush actuator typically or often requires a person to stretch, twist or reach over the toilet, which can be difficult and impractical for users having a limited range of motion, including handicapped and elderly persons, as well as young children, or when the toilet is installed in a tight or small space. Easier mechanisms for activating a toilet flush are needed.

U.S. Pat. No. 2,908,915 (Holl) describes a flushing device with a lever connected to a water supply line through an intervening rod. A chain is secured at one to the toilet's flush handle with a strap. At the other end, the chain is attached to an intermediate point of the lever in a keyhole slot accepting a bead from the chain.

U.S. Pat. No. 8,726,427B1 (Padron) relates to a commode flushing handle with a cylindrical rod that is rotatably attached to a toilet at the seat hinges and bent at a right angle to form a handle with a spring clip. The other end of the cable is attached to a bracket mounted on the rod. When the rod is raised, the cable is pulled downward to flush the toilet.

U.S. Pat. No. 6,718,562B1 (Saragas) discloses a foot-operated toilet flushing device that has a pivot assembly mounted to the floor. A lever has a foot pedal at one end and, at the other end, is rotatably connected to the pivot assembly. A linkage assembly connects the flush handle to the pivot assembly.

There is a need for a versatile extender for push-button and/or motion sensor flush actuators.

SUMMARY OF THE INVENTION

According to one aspect of the present invention, there is provided an extender for a toilet flush actuator for a toilet, the flush actuator selected from a push-button actuator, a motion sensor actuator, or a combination thereof, comprising: a fulcrum member having a first fulcrum end adapted to be mounted on a rim of a tank of the toilet and a second fulcrum end, the fulcrum member having a sleeve proximate the second fulcrum end; a rigid extension rod having a first rod end and a second rod end, the rigid extension rod slidably received by the sleeve of the fulcrum member, the rigid extension rod having an angular bend between the first rod end and the second rod end; an extender head connected to the first rod end for engaging the flush actuator; and a lever arm having a first lever end and a second lever end, the first lever end adapted to be connected to the second rod end of the rigid extension rod, and the second lever end adapted to be manually operated by a user's upper extremity, so that when the user applies pressure to the second lever end of the lever arm, the rigid extension rod moves to allow the extender head to engage the flush actuator.

According to another aspect of the present invention, there is provided a kit for retrofitting a toilet having a flush actuator selected from a push-button actuator, a motion sensor actuator, or a combination thereof, comprising: a fulcrum member having a first fulcrum end adapted to be mounted on a rim of a tank of the toilet and a second fulcrum end, the fulcrum member having a sleeve proximate the second fulcrum end; a rigid extension rod having a first rod end and a second rod end, the rigid extension rod adapted to be slidably received by the sleeve of the fulcrum member, the rigid extension rod having an angular bend between the first rod end and the second rod end; an extender head adapted to connected to the first rod end for engaging the flush actuator; and a lever arm having a first lever end and a second lever end, the first lever end adapted to be connected to the second rod end of the rigid extension rod.

BRIEF DESCRIPTION OF THE DRAWINGS

The apparatus of the present invention will be better understood by referring to the following detailed description of preferred embodiments and the drawings referenced therein, in which:

FIG. **1** is a perspective view illustrating one embodiment of the present invention applied to a toilet having a push-button and/or motion sensor mounted on a top face of the toilet;

FIG. **2** is a perspective view illustrating another embodiment of an extender of the present invention applied to a toilet having a push-button and/or motion sensor actuator mounted on a front face of the toilet;

FIG. **3** is a perspective view of one embodiment of a fulcrum member of an extender of the present invention;

FIG. **4** is a perspective view of another embodiment of a fulcrum member of an extender of the present invention;

FIGS. **5***a* and **5***b* are perspective views of embodiments of a rigid extension rod and a lever arm of the present invention for a toilet having a push-button and/or motion sensor mounted on a top face of the toilet;

FIGS. **6***a* and **6***b* are perspective views of embodiments of a rigid extension rod and a lever arm of the present invention for a toilet having a push-button and/or motion sensor mounted on a front face of the toilet;

FIG. **7***a* is a front elevation view of one embodiment of an extender head of an extender of the present invention;

FIG. **7***b* is a side elevation view of the extender head of FIG. **7***a;*

FIG. **7***c* is a top plan view of the extender head of FIG. **7***a;*

FIG. **8***a* is a front elevation view of another embodiment of an extender head of an extender of the present invention;

FIG. **8***b* is a top plan view of the extender head of FIG. **8***a*; and

FIG. **9** is a perspective view of an embodiment of a handle of an extender of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention provides an extender for a manual toilet flush actuator, in particular a push-button and/or motion sensor actuator. The extender has the advantage of allowing someone to flush a toilet without have to reach over the toilet or stretch or twist to reach the toilet flush actuator. The invention includes a kit containing the extender and parts for installing the extender on a toilet, and the invention also includes a toilet with the kit components installed thereon.

Referring to FIG. **1**, illustrating one embodiment of an extender **10** of the present invention as applied to a toilet **4** having a push-button and/or motion sensor actuator **6** mounted on a top face of the toilet **4**. The extender **10** of the present invention has a fulcrum member **12** with an end **22** adapted for mounting on a rim of a tank of the toilet **4**. The fulcrum member **12** also has a sleeve **24** proximate the end of the fulcrum member **12**. A rigid extension rod **14** is slidably received in the sleeve **24** of the fulcrum member **12**.

A lever arm **16** is connected to one end of the rigid extension rod **14**. The lever arm **16** is positioned so that a user can operate the flush handle **6** by applying pressure to the lever arm **16** with an upper extremity, such as an arm, elbow, forearm, wrist, hand, finger, prosthetic or combination thereof. Preferably, the lever arm **16** has a lever handle **18**.

An extender head **26** is connected to the other end of the rigid extension rod **14**.

The rigid extension rod **14** has an angular bend **28** intermediate its two ends. The angular bend **28** in the rigid extension rod **14** is at an angle in a range of from about 80 degrees to 120 degrees. Preferably, the angle is in a range from about 85 degrees to 110 degrees. Most preferably, the angular bend **28** of the rigid extension rod **14** is at an angle of 90 degrees.

FIG. **2** illustrates an embodiment of the extender **10** of the present invention as applied to a toilet **4** having a push-button and/or motion sensor actuator **6** mounted on a front face of the toilet **4**. As discussed above for the push-button and/or motion sensor actuator **6** mounted on the top face of the toilet **4**, the extender **10** of the present invention has a fulcrum member **12** with an end **22** adapted for mounting on a rim of a tank of the toilet **4**. The fulcrum member **12** also has a sleeve **24** proximate the end of the fulcrum member **12**. A rigid extension rod **14** is slidably received in the sleeve **24** of the fulcrum member **12**.

A lever arm **16** is connected to one end of the rigid extension rod **14**. The lever arm **16** is positioned so that a user can operate the flush handle **6** by applying pressure to the lever arm **16** with an upper extremity, such as an arm, elbow, forearm, wrist, hand, finger, prosthetic or combination thereof. Preferably, the lever arm **16** has a lever handle **18**.

An extender head **26** is connected to the other end of the rigid extension rod **14**. The rigid extension rod **14** has an angular bend **28** intermediate its two ends.

FIGS. **3** and **4** illustrate embodiments of the fulcrum member **12** of the present invention. The fulcrum member **12** has an end **22** adapted for mounting on a rim of a toilet **4**. A sleeve **24** allows the rigid extension rod **14** to be slidably connected to the fulcrum member **12**. The sleeve **24** in FIG. **4** is shown with an opening **32** for accepting the rigid extension rod **14**. It will be apparent to those skilled in the art that other embodiments of the sleeve **22** are possible without departing from the spirit of the present invention.

The fulcrum member **12** shown in FIG. **4** has an opening **34** for allowing an extender head **26** to engage a push-button and/or motion sensor actuator **6** for an actuator mounted on a front face of a toilet, as shown in FIG. **2**.

The fulcrum member **12** may have a cushioning material (not shown) on all or a portion of the underside of the fulcrum member **12**, so as to reduce scratching, marring or otherwise damaging the toilet **4** when in position.

The fulcrum member **12** may be adjustable in length (not shown) to retrofit flush actuators for toilets having different distances between the rim of a toilet tank and the push-button and/or motion sensor actuator **6**.

The lever arm **16** is connected to the rigid extension rod **14** at an angle in a range of from about 80 degrees to 120 degrees. Preferably, the angle is in a range from about 85 degrees to 110 degrees. Most preferably, the lever arm **16** is connected to the rigid extension rod **14** at an angle of 90 degrees.

In the embodiment shown in FIGS. **1** and **2**, the lever arm **16** is integrated with the rigid extension rod **14**. An integrated rigid extension rod **14** and lever arm **16** is shown in FIG. **5***a* for a top mounted push-button and/or motion sensor. Another embodiment of an integrated rigid extension rod **14** and lever arm **16** is shown in FIG. **6***a* for a front-mounted push-button and/or motion sensor. In the FIG. **5***a* and FIG. **6***a* embodiments, the integrated rigid extension rod **14** and lever arm **16** are threaded at one end for connecting to the extender head **26** and at the other end for receiving the lever handle **18**.

Alternatively, the rigid extension rod **14** and lever arm **16** may be provided in a two-piece set for a kit of the present invention. For example, FIG. **5***b* illustrates a two-piece set, with a lever arm **16** having an integrated elbow **38** for connecting to a rigid extension rod **14** for a top mounted push-button and/or motion sensor. FIG. **6***b* illustrates another two-piece embodiment with a lever arm **16** having an integrated elbow **38** for connecting to a rigid extension rod **14** for a front-mounted push-button and/or motion sensor.

FIGS. **7***a*-**7***c* illustrate one embodiment of an extender head **26** suitable for a push-button and/or motion sensor flush actuator **6** mounted on a top face of the toilet **4**, for example as shown in FIG. **1**. FIGS. **8***a*-**8***b* illustrate another embodiment of an extender head **26** suitable for a push-button and/or motion sensor flush actuator **6** mounted on a front face of the toilet **4**, for example as shown in FIG. **2**. The extender heads **26** shown in FIGS. **7***a*-**7***c* and **8***a*-**8***b* have a hole **38** for connection to the rigid extension rod **14**.

The extender head **26** may have a cushioning material (not shown) on the underside of the extender head **26**, so as to reduce scratching, marring or otherwise damaging the toilet **4** when in position. Alternatively, the extender head **26** may be made of a material that would reduce scratching, marring or otherwise damaging the toilet **4**.

The extender head **26** may have a flat face for contacting the push-button flush actuator **6**. Alternatively, the extender head **26** may have a stepped face for contacting a dual push-button flush actuator **6**, the dual push-button flush actuator capable of activating a flush of two different amounts of water. It will be apparent to those skilled in the art how to contour the face of the extender head **26** to complement the contours of a dual push-button flush actuator **6**.

The extender head **26** may be installed by providing a fixative, for example, without limitation, double-sided tape, to hold the extender head **26** in position on a face of a push-button flush actuator **6**. For a motion sensor actuator **6**, the extender **10** of the present invention is installed to allow the extender head **25** to be moved over the motion sensor actuator **6**, thereby engaging the actuator to activate the flush mechanism.

FIG. **9** illustrates an embodiment of a decorative lever handle **18** for the extender **10** of the present invention. Alternatively, the lever handle **18** may be a flat plate or bowl-shaped for assisting a user who is not able to grab a lever handle **18**.

Once installed, the lever arm **16** protrudes outward from a tank of the toilet **4** as shown in FIGS. **1** and **2**, as discussed above. In use, a user may grab the lever handle **18** or otherwise apply pressure with an upper extremity to the extender **10**, for example downward and/or sideways, to cause the extender head **26** to engage the push-button and/or motion sensor actuator **6** by applying pressure or moving in front of or over the actuator, respectively, thereby activating a toilet flush.

While preferred embodiments of the present disclosure have been described, it should be understood that various changes, adaptations and modifications can be made therein without departing from the spirit of the invention(s) as claimed below.

I claim:

1. An extender for a toilet flush actuator for a toilet, the flush actuator selected from a push-button actuator, a motion sensor actuator, or a combination thereof, comprising:

a fulcrum member having a first fulcrum end adapted to be mounted on a rim of a tank of the toilet and a second fulcrum end, the fulcrum member having a sleeve proximate the second fulcrum end and an opening overlying the flush activator;

a rigid extension rod having a first rod end and a second rod end, the rigid extension rod slidably received by the sleeve of the fulcrum member, the rigid extension rod having an angular bend between the first rod end and the second rod end;

an extender head connected to the first rod end for engaging the flush actuator;

a lever arm having a first lever end and a second lever end, the first lever end adapted to be connected to the second rod end of the rigid extension rod, and the second lever end adapted to be manually operated by a user's upper extremity, so that when the user applies pressure to the second lever end of the lever arm, the rigid extension rod moves to allow the extender head to be slidably received into the opening of the fulcrum member overlying the flush activator to engage the flush actuator.

2. An extender according to claim **1**, further comprising a lever handle connected to the second lever end.

3. An extender according to claim **1**, wherein the lever arm is connected to the rigid extension rod at an angle in a range of from 80 degrees to 120 degrees.

4. An extender according to claim **1**, wherein the lever arm is connected to the rigid extension rod at an angle of 90 degrees.

5. An extender according to claim **1**, wherein the angular bend of the rigid extension rod is at an angle in a range of from 80 degrees to 120 degrees.

6. An extender according to claim **1**, wherein the angular bend of the rigid extension rod is at an angle of 90 degrees.

7. An extender according to claim **1**, wherein the lever arm and the rigid extension rod are integrated into a unitary structure.

8. An extender according to claim **1**, wherein the first end of the lever arm is threadably connected to the second end of the rigid extension rod.

9. An extender according to claim **1**, wherein the first end of the lever arm and the second end of the extension rod are interconnected by an elbow member.

10. An extender according to claim **1**, wherein the flush actuator is mounted on a top face of the toilet.

11. An extender according to claim **1**, wherein the flush handle is mounted on a front face of the toilet.

12. A kit for retrofitting a toilet having a flush actuator selected from a push-button actuator, a motion sensor actuator, or a combination thereof, comprising:

a fulcrum member having a first fulcrum end adapted to be mounted on a rim of a tank of the toilet and a second fulcrum end, the fulcrum member having a sleeve proximate the second fulcrum end and an opening overlying the flush activator;

a rigid extension rod having a first rod end and a second rod end, the rigid extension rod adapted to be slidably received by the sleeve of the fulcrum member, the rigid extension rod having an angular bend between the first rod end and the second rod end;

an extender head adapted to be connected to the first rod end for engaging the flush actuator; and

a lever arm having a first lever end and a second lever end, the first lever end adapted to be connected to the second rod end of the rigid extension rod and the second lever end adapted to be manually operated by a user's upper extremity, so that when the user applies pressure to the second lever end of the lever arm, the rigid extension rod moves to allow the extender head to be slidably received into the opening of the fulcrum member overlying the flush activator to engage the flush actuator.

13. A kit according to claim **12**, further comprising a lever handle adapted to be connected to the second lever end.

14. A kit according to claim **12**, wherein the lever arm is adapted to be connected to the rigid extension rod at an angle in a range of from 80 degrees to 120 degrees.

15. A kit according to claim **12**, wherein the lever arm is adapted to be connected to the rigid extension rod at an angle of 90 degrees.

16. A kit according to claim **12**, wherein the angular bend of the rigid extension rod is at an angle in a range of from 80 degrees to 120 degrees.

17. A kit according to claim **12**, wherein the angular bend of the rigid extension rod is at an angle of 90 degrees.

18. A kit according to claim **12**, wherein the lever arm and the rigid extension rod are integrated into a unitary structure.

19. A kit according to claim **12**, wherein the first end of the lever arm is adapted to be threadably connected to the second end of the rigid extension rod.

20. A kit according to claim **12**, further comprising elbow member connectable to the first end of the lever arm and the second end of the rigid extension rod.

21. A kit according to claim **12**, wherein the flush actuator is mounted on a top face of the toilet.

22. A kit according to claim **12**, wherein the flush actuator is mounted on a front face of the toilet.

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