



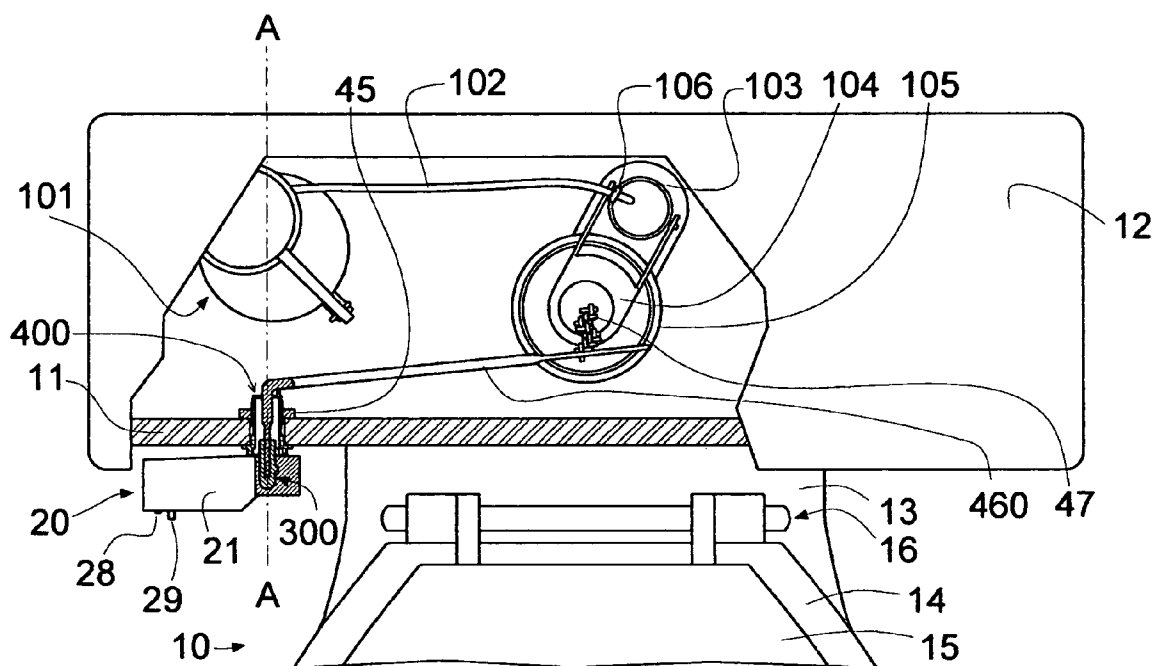
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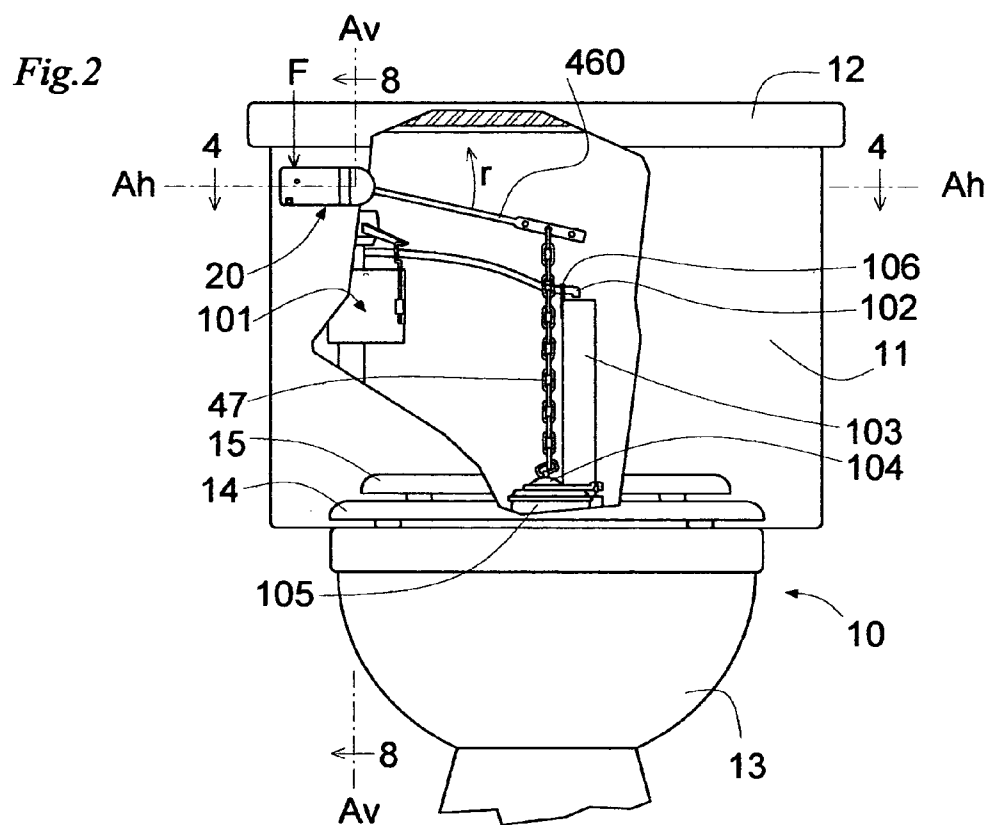
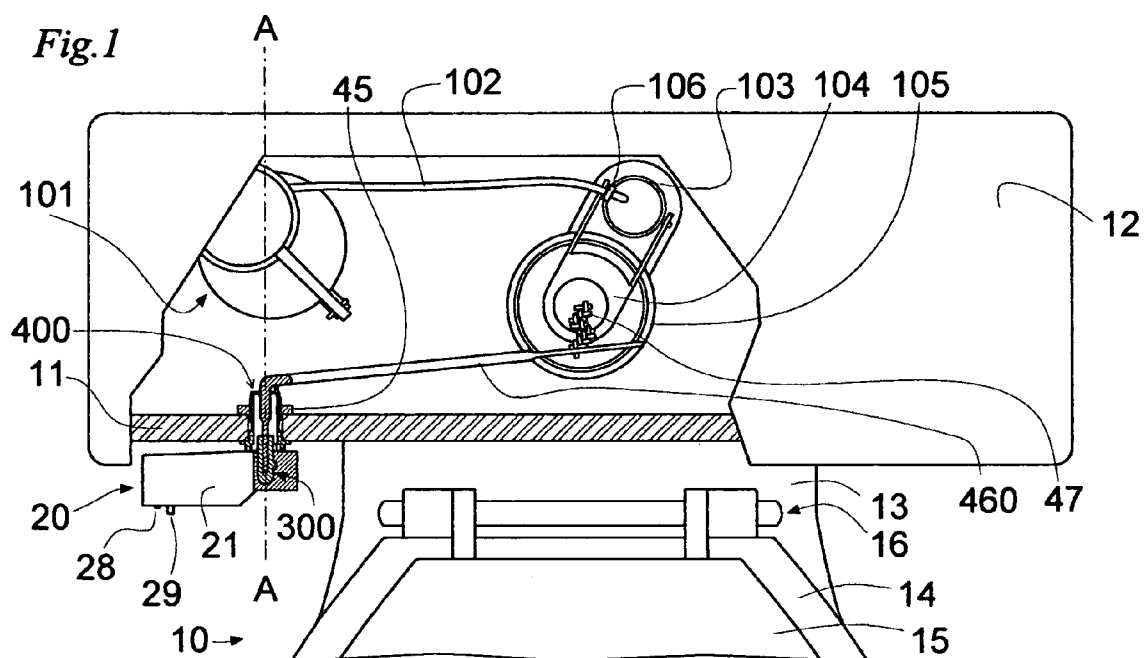
(19) **United States**(12) **Patent Application Publication**
Olshausen(10) **Pub. No.: US 2006/0080765 A1**(43) **Pub. Date: Apr. 20, 2006**(54) **MEANS FOR REMOVABLY ATTACHING A
FLUSH ACTUATOR TO A TOILET****Publication Classification**(51) **Int. Cl.***E03D 1/14* (2006.01)*E03D 3/12* (2006.01)*E03D 5/00* (2006.01)(52) **U.S. Cl.** 4/405(76) Inventor: **Michael Cohnitz Olshausen,**
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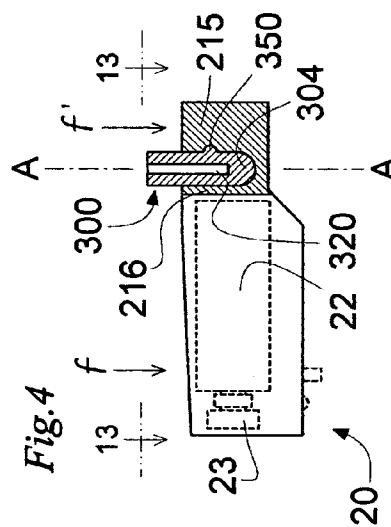
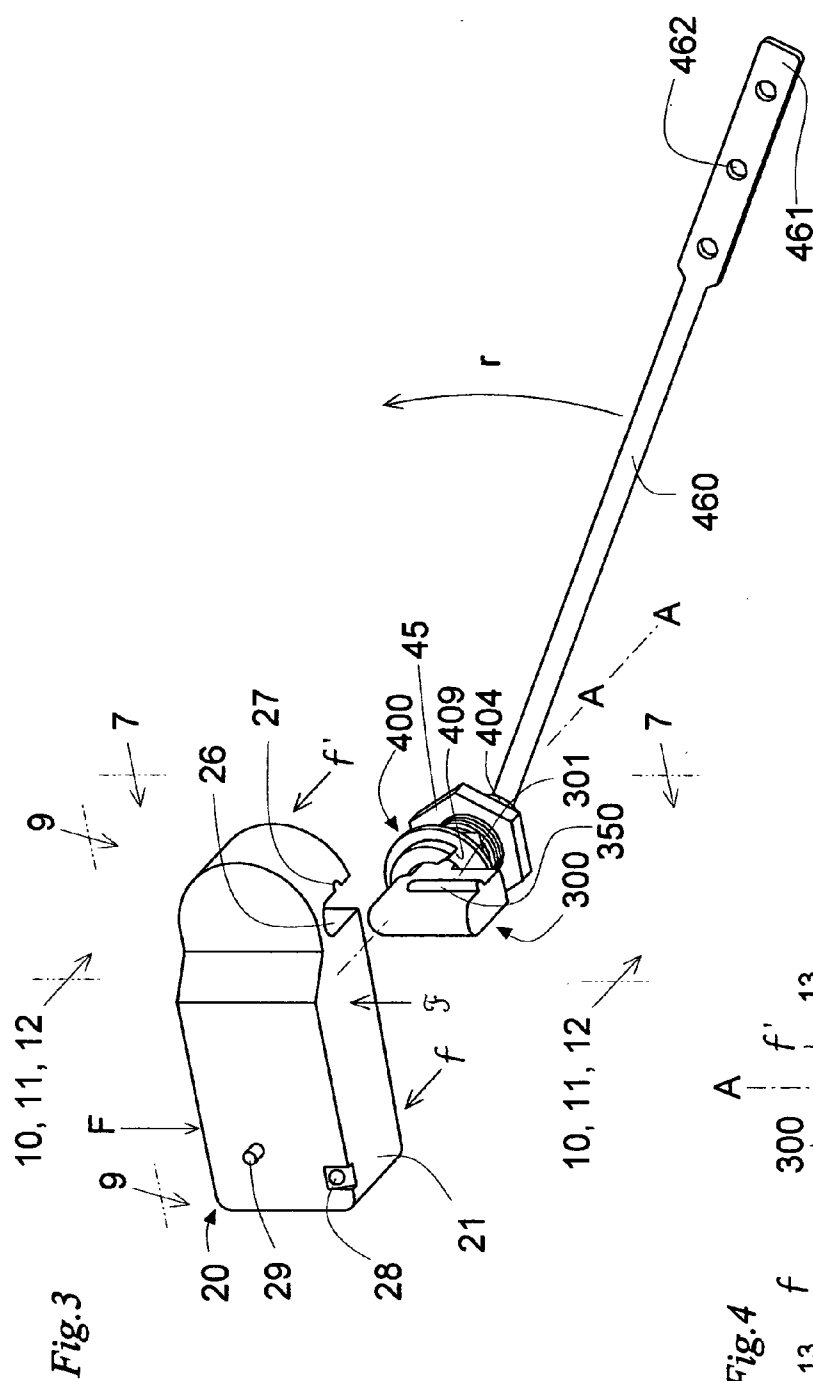
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Michael Olshausen**P.O. Box 18653****Washington, DC 20036 (US)**(21) Appl. No.: **10/967,227**(22) Filed: **Oct. 19, 2004**(57) **ABSTRACT**

A means for attaching a toilet flush actuator to a toilet that allows for quick, easy removal of the actuator from the toilet without the use of a tool or tools. Simultaneously, the means of attachment prevents the actuator from inadvertently slipping off the toilet during everyday use, over many months and years. The means of attachment permits such possible contents of the actuator as, for example, a battery or an air freshener pack, to be changed and/or serviced readily, and further permits the toilet to be flushed even though the actuator itself has been removed.







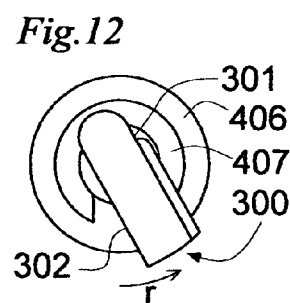
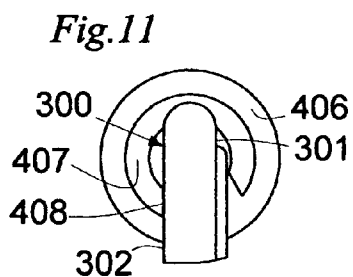
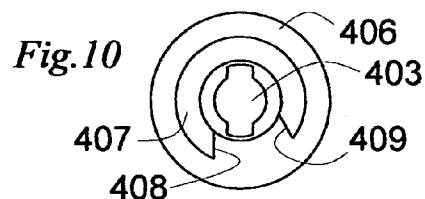
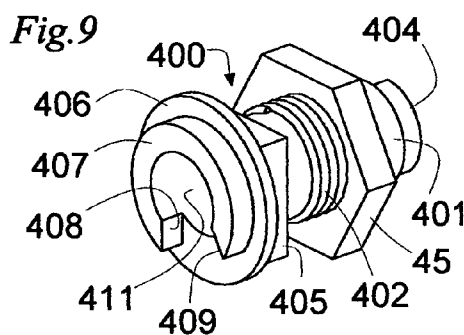
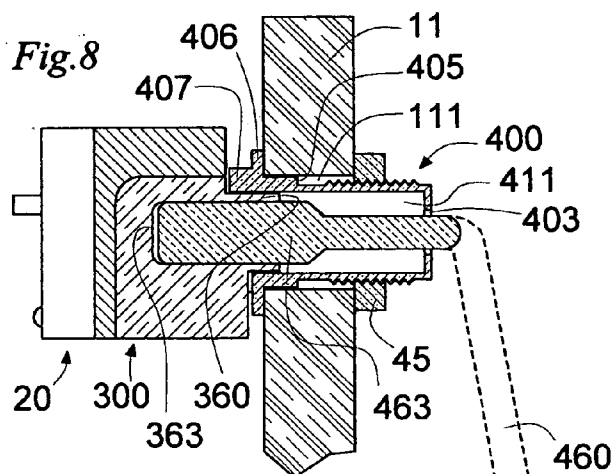
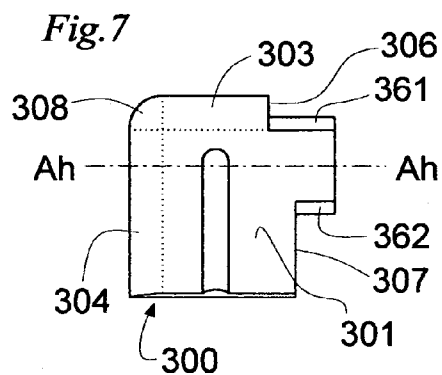
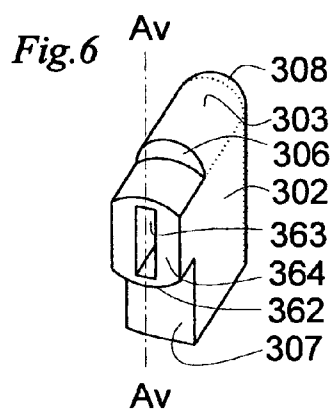
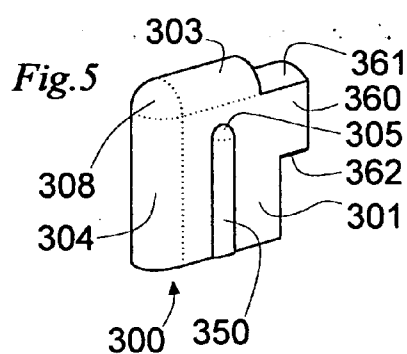


Fig.13

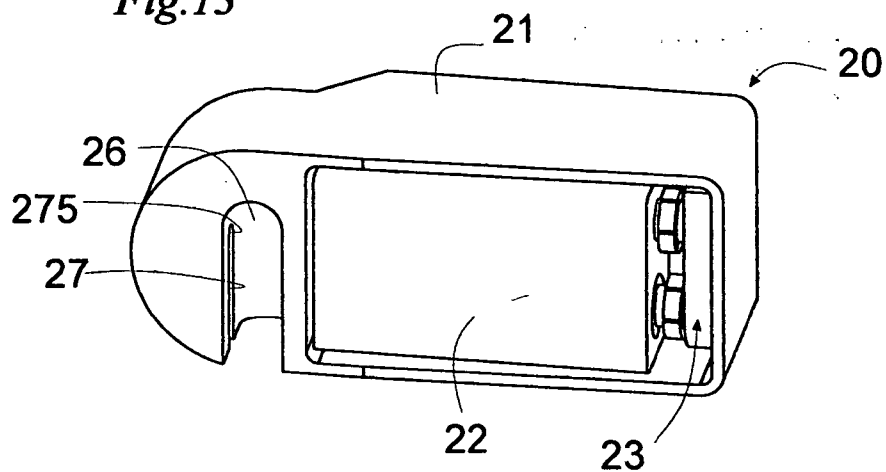


Fig.14

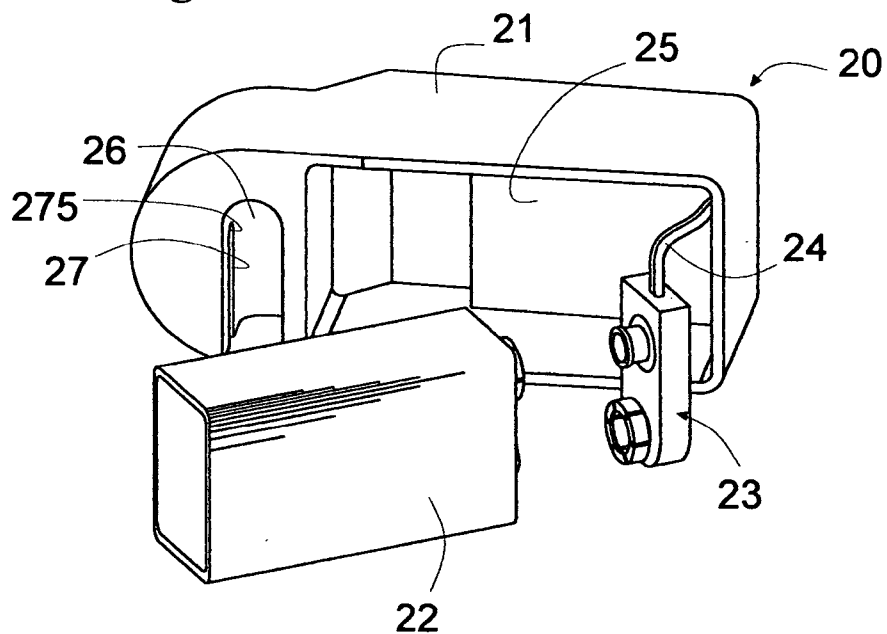
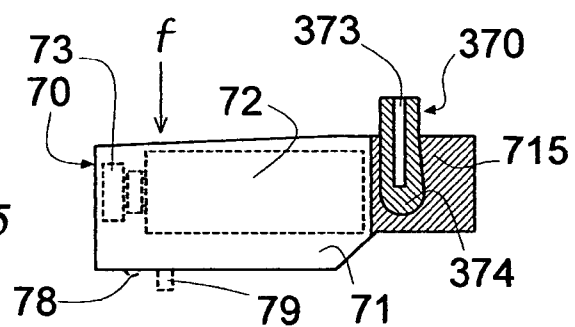


Fig.15



MEANS FOR REMOVABLY ATTACHING A FLUSH ACTUATOR TO A TOILET

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

REFERENCE TO A MICROFICHE APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] This unassuming invention relates to the means used to attach toilet flush actuators to toilets. The most common toilet flush actuator by a wide margin is the small, front-mounted lever found in tens of millions of American homes, though side-mounted push-button actuators are also occasionally found on high-end, designer commodes. Both styles of flush actuator can be manufactured to contain a night-light. The battery-operated flush-handle night-light disclosed in U.S. Pat. No. 6,231,203 to Olshausen (2001) is an example of the first type. Battery replacement for such a night-light should never require the use of a tool. As night follows day, the tool will slip from the hand holding it and drop right into the toilet bowl. A toilet night-light for which no tools are required to change the battery is disclosed in U.S. Pat. No. 5,150,962 to Rauschenberger (1992). U.S. Pat. No. 6,231,203 to Olshausen, by contrast, fails to disclose a means for battery replacement without the use of a tool. The present invention, applied to Olshausen's flush-handle night-light, happily supplies the night-light with the wanting, user-friendly means for tool-less battery replacement.

SURVEY OF BACKGROUND ART

[0005] As far as this applicant is aware, the patent literature fails to disclose a means for attaching toilet flush actuators to toilets that anticipates the present invention. U.S. Pat. No. 2,475,881 to Crampton (1946) discloses a flush handle with "an inner body" (Column 3, line 38) having a "permanent and inseparable connection" (Column 4, lines 27-28) to a "lift arm 9" via "notch 11" therein, and furthermore discloses a "covering" for said "inner body," said "covering" being attached with "tabs bent toward each other . . . thereby retaining the cover in place" (Column 4, lines 40-42). However, Crampton's **FIG. 3** makes plain that removal of his "covering" without a specialized tool will not be a practical possibility in such cramped quarters after Crampton's tank lever has been securely attached to a toilet. Before Crampton's tank lever has been attached to a toilet, his "tabs 26" might possibly be unbent by using only one's fingers, depending on the gauge of the metal. But, before being attached to a toilet, Crampton's tank lever obviously will not be able to activate a toilet flush mechanism. Also obvious is that, if Crampton's "tabs 26" were simply to be removed, then Crampton's invention could no longer function properly, because his "covering" could work itself loose and fall off. For successful, day-to-day operation Crampton's "covering" must be deformed from its original, manufactured state into another state that guarantees the "cover-

ing's" secure, mechanical attachment to Crampton's "inner body." The required deformation is the bending through approximately 90 degrees of Crampton's metal "tabs 26," shown bent and unbent in Crampton's **FIGS. 3 and 4** and **FIG. 5**, respectively. If Crampton's covering were somehow to be provided with internal electronic components, and Crampton's "inner body" were to be provided with a pocket or a cavity sufficient in size and shape to accept such components, then servicing and/or replacement of such components after Crampton's "covering" had been attached to his "inner body" and the combination, namely Crampton's "tank lever," had been attached to a toilet could not be guaranteed to proceed without some inadvertent flushing of the toilet, as well. Very little force is typically required to trigger the release of water by the water valve of a toilet. The inevitable fumbling with tools that accompanies tank lever disassembly by the average person would quite likely result in the toilet flushing at least once.

BRIEF SUMMARY OF THE INVENTION

[0006] Garden-variety, toilet flushers have at least one visible element, hereinafter called the actuator, that is easily worked by nothing more than a single, adult finger, plus some generally hidden elements that limit the motion of the actuator relative to the toilet tank. By far the most common actuator is the front-mounted "handle" or "lever." Motion-limitation of the actuator, i.e., of the finger-operable, visible element of a toilet. flusher, in turn limits the motion of a valve controller, commonly a bent metal shaft called a lift arm, that is permanently connected to the actuator and that extends unseen from the actuator through the wall of the toilet tank and into the tank cavity. This permanent connection of lift arm to actuator is typically produced by press-fitting the lift arm into a cross-sectionally smaller aperture for it in the actuator. If their connection were not permanent, then the lift arm, which is located almost wholly within the toilet tank, would loosen, and gravity, exerting a torque upon the loosened lift arm, would eventually draw the lift arm into the tank, disabling the flush mechanism. The lift arm is removably linked to a water valve within the tank, typically by a chain. The water valve, when opened by the limited motion of the lift arm, allows the water stored in the tank to flow down rapidly into the toilet bowl, flushing the bowl of its contents.

[0007] The motion-limiting elements of a conventional toilet flusher are found both on the actuator, which is movable, and on a so-called spud, which is securely attached to the toilet tank so that it, the spud, is rendered immovable, unable either to translate or rotate, relative to the tank. The cooperation of the movable motion-limiting element on the actuator and the immovable motion-limiting element on the spud is what effects the motion-limitation of the actuator relative to the tank. An example of a movable motion-limiting element integrally formed with an actuator is "rotation socket 74" located between "ribs 72 and 73" of "flush handle 10" in **FIGS. 5, 9, and 10** of U.S. Pat. No. 6,231,203 to Olshausen [column 6, lines 30-35]. An example of an immovable, motion-limiting element is "rotation finger 85" shown in **FIGS. 6 and 9** of the same patent and trapped between "ribs 72 and 73." Both the movable and immovable motion-limiting elements are generally concealed behind the visible body of the actuator.

[0008] The present invention severs the permanent connection between the actuator and the valve controller (typi-

cally a lift arm), and instead transfers the permanent connection to a new element that is able both removably to engage the now freed-up actuator and also to limit the motion of the freed-up actuator when the freed-up actuator is engaged with the new element. In the present invention, the actuator, in and of itself, is no longer essential to motion limitation, but instead removably attaches to and engages the motion-limiting elements. The actuator removably attaches to and engages the motion-limiting elements by a mechanical means that requires no tool or tools to work. If a person wishes to disengage and remove the actuator from the motion-limiting elements, he/she simply does so by sliding the actuator off them. The actuator may, of course, comprise a night-light, including the electronics and battery(ies) thereof. Any battery, or batteries, contained in the actuator may thus be replaced without first having to disassemble the toilet-flusher with a tool or tool(s). Additionally, the toilet can still be flushed by manipulating the new, movable, motion-limiting element on its own, albeit not with a single finger. Should an inquisitive five-year old happen to commandeer the family's flush-handle night-light, for example, family members will still be able to flush their toilet.

[0009] In the particular case of a flush-handle night-light, the means of attachment of the actuator to the remaining elements of the toilet comprise a mortise-and-tenon-like construction that cannot loosen, despite repeated use of the flush-handle in flushing the toilet over many months or years. This mortise-and-tenon-like construction has, additionally, a non-uniform cross-section, so that the flush handle cannot work itself loose inadvertently and slip off the motion-limiting elements.

[0010] The present invention has several important objects, among which are:

[0011] 1) a means of attachment for a toilet flush actuator that prevents the actuator from eventually working loose and falling off while simultaneously providing for quick and easy removal of the actuator from the toilet,

[0012] 2) the ability to flush a toilet even though the actuator that is used every day for that purpose has been removed,

[0013] 3) battery replacement for an actuator that comprises a toilet night-light without using tools, and

[0014] 4) quick and easy removal of a toilet flush actuator without inadvertent flushing of the toilet.

[0015] These and still-further objects and advantages of the present invention will become apparent from a consideration of the following drawing, detailed description, and appended claims.

DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0016] Referring to the drawing, wherein like reference characters indicate like parts or elements throughout the several views, and wherein arrowheads indicate physically-composite objects whose numbered resolution into constituent parts occurs only when it is germane to the discussion:

[0017] FIG. 1 is a partial, top plan view, partly broken away, of a conventional toilet with the present invention attached thereto and shown in partial cross-section taken in the plane Ah-Ah of FIG. 2.

[0018] FIG. 2 is a partial, front plan view, partly broken away, of the toilet in FIG. 1.

[0019] FIG. 3 is an oblique, partly exploded view of the present invention, taken from an altitude of -25 degrees relative to the horizontal plane Ah-Ah of FIG. 2 and an azimuth of +20 degrees relative to the normal to FIG. 2.

[0020] FIG. 4 is a partial cross-sectional view taken as in FIG. 1 of two elements of the present invention, with optional components depicted using broken lines.

[0021] FIG. 5 is an oblique view of one of the elements of the present invention shown in FIG. 3, taken from an altitude of +15 degrees and an azimuth of +60 degrees.

[0022] FIG. 6 is an oblique view of the element shown in FIG. 5 taken from an altitude of +35 degrees and an azimuth of +200 degrees.

[0023] FIG. 7 is a side plan view of the element shown in FIG. 5 taken along line 7-7 of FIG. 3.

[0024] FIG. 8 is a cross-sectional view of the present invention taken along line 8-8 of FIG. 2, and shown attached to a broken-away, partial, cross-sectional portion of the wall of the conventional toilet in FIG. 2.

[0025] FIG. 9 is an oblique view of a third element of the present invention shown in FIG. 3 and taken from an altitude of +25 degrees and an azimuth of +55 degrees.

[0026] FIG. 10 is a front plan view of the element in FIG. 9 taken along line 10-10 of FIG. 3.

[0027] FIG. 11 is a front plan view of the element in FIG. 9 in engagement with the element in FIG. 5 taken along line 11-11 of FIG. 3.

[0028] FIG. 12 is a front plan view of the element in FIG. 9 in engagement with the element in FIG. 5, the element in FIG. 5 having been rotated 30 degrees relative to its position in FIG. 11, and taken along line 12-12 of FIG. 3.

[0029] FIG. 13 is an oblique view of one element of the present invention taken from an altitude of +25 degrees and an azimuth of +190 degrees and showing optional, internal components.

[0030] FIG. 14 is an oblique view of the element of the present invention shown in FIG. 13 and taken from the same perspective and with the internal components shown in FIG. 13 removed and exploded.

[0031] FIG. 15 is an alternate embodiment of the two elements of the present invention shown in FIG. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0032] FIG. 1 shows toilet 10 having tank 11, tank lid 12 and base 13. Attached to base 13 by hinge 16 are toilet seat 14 and seat lid 15. Attached to toilet 10 is toilet flush actuator 20 comprising housing 21, and optional LED 28 and push-button 29. Tenon 300 and lift arm 460 are permanently connected, as by press fitting during manufacture. Spud 400, which communicates with both tenon 300 and lift arm 460, is attached to toilet 10 with spud nut 45. Lift arm 460 communicates by means of chain 47 with flapper valve 104 seated in valve seat 105. Water inflow control mechanism

101 allows water to flow into tank 11 and also into base 13 via tube 102 attached to overflow pipe 103 by clip 106. Spud 400 and spud nut 45 together constitute the fixed, motion-limiting element of this embodiment of the present invention. Tenon 300 and lift arm 460, to which tenon 300 is permanently joined, together constitute the movable, motion-limiting element of this embodiment of the present invention. Housing 21 removably attaches to and engages tenon 300, such that rotational movement of housing 21 causes lift arm 47 to rotate, subject only to the limitation on rotation jointly imposed by spud 400, fixed in place by spud nut 45, and tenon 300. The axis A-A of rotation passes centrally through tenon 300, spud 400, spud nut 45, and a horizontal portion of lift arm 460.

[0033] FIG. 2 shows the same items as in FIG. 1 and shows in addition limited rotation r of lift arm 460. Were rotation of lift arm 460 not limited, lift arm 460 would bang into lid 12 every time toilet 10 was flushed. Horizontal plane Ah-Ah and vertical plane Av-Av intersect in axis A-A of rotation.

[0034] FIG. 3 shows actuator 20 translated vertically by force \mathfrak{S} applied to actuator 20, as by a person lifting actuator 20, until actuator 20 has just been disengaged from tenon 300. Actuator 20 comprises mortise 26 and sub-mortise 27, into which, respectively, tenon 300 and anti-slip-off rib 350 snugly slide. Force F applied downward on actuator 20, as by an adult finger, is sufficient to rotate actuator 20 about axis A-A an amount r to flush toilet 10. Inasmuch as force F and force \mathfrak{S} are oppositely directed, the action of flushing toilet 10 will not even tend to slide actuator 20 off tenon 300, but will instead tend to urge actuator 20 into tighter engagement with tenon 300. Conversely, force \mathfrak{S} applied to disengage actuator 20 will not result in inadvertent flushing of toilet 10. Incidental forces f and f' substantially orthogonal to force F and parallel to axis A-A arise whenever actuator 20 is rotated to flush toilet 10 or else is jiggled to un-snag chain 460 in cases where chain 460, attached to lift arm 460 through hole 462, such as by an S-hook, happens to get hung up a bit on end 461 of lift arm 460 or on flapper valve 104. Were tenon 300 to have a uniform cross-section, actuator 20 would in time slip off tenon 300, under the cumulative urging forward of relatively small (compared to force F) incidental forces f and f' . Tenon 300 is therefore provided with anti-slip-off rib 350 which, when slid into engagement with sub-mortise 27, prevents actuator 20 from sliding off tenon 300 in the direction of incidental forces f and f' .

[0035] Spud 400 has facet 409 (preview FIGS. 9 and 10) which obstructs side 301 of tenon 300 from rotating about axis A-A upon the application of force F farther than counterclockwise rotation r . Spud 400 has rear projection 404 to provide a bearing surface against which lift-arm 460 can turn without binding.

[0036] FIG. 4 shows, in partial cross-section, actuator 20 in engagement with tenon 300 and subject to incidental forces f and f' . FIG. 4 is illustrative rather than realistic, in that lift arm 460, normally permanently joined to tenon 300, is not shown. The purpose of FIG. 4 is to show that, if actuator 20 were to comprise a flush-handle night-light, then 9-volt battery 22 plus snap-on battery connector 23 will occupy such a substantial amount of room within actuator 20 that insufficient material will remain available in region 216 of actuator 20, namely between tenon 300 and battery 22, to

locate anti-slip-off rib 350. In FIG. 4 tenon 300 has a uniform cross-section along axis A-A as far as half-cylindrical end 304 except for anti-slip-off rib 350. Region 215 of actuator 20 offers the only available practical space within actuator 20 in which to accommodate an asymmetry of tenon 300, such as rib 350, by the necessary mating recess 27.

[0037] FIG. 5 shows tenon 300 which, having half-cylindrical end 304, half-cylindrical top 303 and quarter-hemispherical portion 308, resembles in shape of the apse of a Romanesque Church (the Church of San Martin, Fuentiduena, Segovia, Spain, shown at http://www.metmuseum.org/toah/ho/07/eusi/hod_L.58.86.htm, is a beautiful example). Half-cylindrical, anti-slip-off rib 350 has quarter-hemispherical portion 305. Tenon 300 has projection 360 with top rounded surface 361 and bottom rounded surface 362. Projection 360 fits just inside spud 400 (preview FIG. 8 and review FIG. 3) to smooth the rotation r of tenon 300 and, when actuator 20 is engaged with tenon 300, of actuator 20.

[0038] FIG. 6 shows crescent-moon shaped, top bearing surface 306, bottom bearing surface 307, flat side 302, and lift-arm socket 363 of tenon 300. Vertical plane Av-Av passes centrally through lift-arm socket 363. Tenon projection 360 has end surface 364.

[0039] FIG. 7 shows horizontal plane Ah-Ah passing centrally through tenon projection 360. Note that crescent-moon shaped, top bearing surface 306 is not coplanar with bottom bearing surface 307, but rather is set back therefrom in the direction of half-cylindrical end 304. This allows surface 306 to bear on collar 407 of spud 400 while surface 307 bears on flange 406 of spud 400 (preview FIGS. 8-12 and review FIG. 3).

[0040] FIG. 8 shows in partial cross-section all of the elements of the present invention in engagement with one another and attached as a single assembly to tank 11 through square aperture 111 therein. Square boss 405 of spud 400 (preview FIG. 9) prevents spud 400 from turning in square aperture 111, while spud nut 45, being tightened against the resistance of flange 406, fixes spud 400 in place relative to tank 11. Projection 360 of tenon 300 fits without frictional engagement into round cavity 411 of spud 400. Lift arm 460 passes through keyhole aperture 403 (preview FIG. 10) in spud 400. Flattened end 463 of lift arm 460 fits with some slight frictional engagement into cavity 363 of tenon 300. In practice, if tenon 300 is manufactured of a plastic material, then lift arm 460 can be permanently glued or ultrasonically welded in place.

[0041] FIG. 9 shows spud 400 with rear projection 404, barrel 401, left-handed threading 402 on barrel 401, square boss 405, flange 406, cavity 411, and interrupted collar 407. Interrupted collar 407 has the form of a square-cross section ring with a portion thereof removed, thus exposing vertical face 408 and angled face 409. Nut 45 affixes spud 400 to toilet tank 11.

[0042] FIG. 10 shows spud 400 end on, with keyhole aperture 403 plainly visible through which arm 460 and flat portion 463 easily pass. The planes of faces 408 and 409 do not intersect on axis A-A, but are offset in order to accommodate the width of tenon 300 when tenon 300 is inserted into spud 400, as shown in FIGS. 3 and 8. Some slight

amount of looseness along axis A-A must be allowed in this insertion so that tenon 300 does not bind in spud 400. Bearing surfaces 306 and 307 will thus make contact at times, respectively, with collar 407 and flange 406; while at other times lift arm 460 will make contact with projection 404. See FIG. 8.

[0043] FIG. 11 shows tenon 300 with flat side 302 (review FIG. 6) in contact with collar face 408 of spud 400. The contact of tenon side 302 with collar face 408 limits the clockwise rotation, i.e., limits the motion, of tenon 300, thereby keeping actuator 20 horizontal when toilet 10 is not being used.

[0044] FIG. 12 shows tenon 300 with flat side 301 (review FIG. 5) in contact with collar face 409 of spud 400. Note that because FIG. 12 is a front plan view face 409 is hidden behind rib 350. FIG. 3 shows tenon side 301 relative to collar face 409 before the counter-clockwise rotation r that will bring side 301 and face 409 into contact. The contact of tenon side 301 with collar face 409 limits the counter-clockwise rotation, i.e., limits the motion, of tenon 300, thereby preventing actuator 20 from striking toilet lid 12 when actuator 20 is depressed by a finger to flush toilet 10.

[0045] From FIGS. 3, 8, 11 and 12 it is apparent that toilet 10 can still be flushed, albeit not with a single finger, even when actuator 20 is not engaged with tenon 300. All that a person must do is grasp tenon 300 firmly between thumb and forefinger and turn tenon 360 counter-clockwise.

[0046] FIG. 13 shows actuator 20 after it has been disengaged from tenon 300. Actuator 20 in the example shown in FIG. 13 comprises an optional, flush-handle night-light, which in turn comprises battery 22 and snap connector 23. Quarter-hemispherical end 275 of recess 27 of actuator 20 makes recess 27 congruent to anti-slip-off rib 350, with which it mates.

[0047] FIG. 14 shows battery 22 and snap connector 23 attached by wires 24 to electronics hidden behind panel 25. Actuator 20 has been bumped a few times against the ball of a person's hand to dislodge battery 22 and snap connector 23. Thus battery 22 may easily be replaced and returned to its stored position, shown in FIG. 13.

[0048] FIG. 15 shows actuator 70 and tenon 370 of an alternate embodiment of the present invention, wherein the anti-slip-off function of rib 350 is carried out now by asymmetrically rounded end 374 of tenon 370. Rounded end 374 is asymmetric relative to the axis of lift arm cavity 373, such that region 715 of housing 71 of actuator 70 has a congruent, asymmetric, i.e., non-uniform cross-section. By such asymmetric means actuator 70 will not slip off tenon 370, despite the application of incidental force f through many months or years of use. Like actuator 20, actuator 70 may also comprise an optional, flush-handle night-light having battery 72, snap connector 73, LED 78, and push-button 79. An air freshener pack might be installed along with or instead of battery 72.

[0049] FIGS. 1, 3-8, and 11-15 show that the tenon and the corresponding, mating mortise of the flush actuator in the various embodiments of the present invention herein depicted have generally rounded cross-sections, surfaces, and elevations. Such rounding prevents stress from concentrating in the molded plastic from which most, if not all, of these parts are likely to be manufactured. If stress is pre-

vented from concentrating, then the plastic will be less likely to crack from fatigue, and thus customer product satisfaction will be promoted.

[0050] Inasmuch as modifications and alterations apparent to one skilled in the art may be made to the herein described embodiments of the present invention without departing from the scope and spirit thereof, it is intended that all matter contained herein be interpreted in an illustrative, and not in a limiting, sense with respect to the invention claimed in the following claims and equivalents thereto.

I claim:

1. A toilet comprising a flush mechanism, said flush mechanism comprising an actuator and a means of attachment for said actuator, said actuator being capable of causing said flush mechanism to flush said toilet when said actuator is engaged with said means of attachment and said actuator is worked by a human being, and said actuator, after said actuator has been engaged with said means of attachment, can be disengaged from said means of attachment without the use of a tool or tools.

2. A toilet as in claim 1 wherein said actuator can be slid off said means of attachment.

3. A toilet as in claim 1 wherein said actuator cannot be slid off said means of attachment by incidental forces roughly orthogonal to a force sufficient to flush said toilet when said force is applied to said actuator.

4. A toilet as in claim 1 wherein said actuator cannot be slid off said means of attachment except by a force applied substantially oppositely to a force sufficient to flush said toilet when said force is applied to said actuator.

5. A toilet as in claim 1 wherein said means of attachment has a portion capable of engagement with said actuator and said portion of said means of attachment has at least one asymmetric cross-section.

6. A toilet as in claim 1 wherein said toilet further comprises a water valve controller and said water valve controller is permanently attached to said means of attachment.

7. A toilet as in claim 1 wherein said actuator comprises a night light.

8. A toilet as in claim 1 wherein said actuator comprises an air freshener.

9. A toilet comprising a flush mechanism, said flush mechanism comprising an actuator and a means of attachment for said actuator, said actuator being capable of causing said flush mechanism to flush said toilet when said actuator is engaged with said means of attachment and said actuator is worked by a human being, and said means of attachment is capable of causing said flush mechanism to flush said toilet after said actuator has been disengaged from said means of attachment and said means of attachment is worked by a human being.

10. A toilet as in claim 9 wherein said actuator can be slid off said means of attachment.

11. A toilet as in claim 9 wherein said actuator cannot be slid off said means of attachment by incidental forces roughly orthogonal to a force sufficient to flush said toilet when said force is applied to said actuator.

12. A toilet as in claim 9 wherein said actuator cannot be slid off said means of attachment except by a force applied substantially oppositely to a force sufficient to flush said toilet when said force is applied to said actuator.

13. A toilet as in claim 9 wherein said means of attachment has a portion capable of engagement with said actuator and said portion of said means of attachment has at least one asymmetric cross-section.

14. A toilet as in claim 9 wherein said toilet further comprises a water valve controller and said water valve controller is permanently attached to said means of attachment.

15. A toilet as in claim 9 wherein said actuator comprises a night light.

16. A toilet as in claim 9 wherein said actuator comprises an air freshener.

17. A toilet comprising a flush mechanism, said flush mechanism comprising an actuator and a means of attachment for said actuator, said actuator being capable of causing said flush mechanism to flush said toilet when said actuator is engaged with said means of attachment and said actuator is worked by a human being, said actuator comprising at least one electronic component, and said electronic component can be replaced without causing said actuator to flush said toilet.

18. A toilet as in claim 17 wherein said actuator can be slid off said means of attachment.

19. A toilet as in claim 17 wherein said actuator cannot be slid off said means of attachment by incidental forces roughly orthogonal to a force sufficient to flush said toilet when said force is applied to said actuator.

20. A toilet as in claim 17 wherein said actuator cannot be slid off said means of attachment except by a force applied substantially oppositely to a force sufficient to flush said toilet when said force is applied to said actuator.

21. A toilet as in claim 17 wherein said means of attachment has a portion capable of engagement with said actuator and said portion of said means of attachment has at least one asymmetric cross-section.

22. A toilet as in claim 17 wherein said toilet further comprises a water valve controller and said water valve controller is permanently attached to said means of attachment.

23. A toilet as in claim 17 wherein said actuator comprises a night light.

24. A toilet as in claim 17 wherein said electronic component is a battery.

25. A toilet as in claim 17 wherein said actuator comprises an air freshener.

26. A toilet comprising a flush mechanism, said flush mechanism comprising an actuator and a means of attachment for said actuator, said actuator being capable of causing said flush mechanism to flush said toilet when said actuator is engaged with said means of attachment and said actuator is worked by a human being, said actuator comprising at least one internal electronic component, and said electronic component can be replaced without the use of a tool or tools.

27. A toilet as in claim 26 wherein said actuator can be slid off said means of attachment.

28. A toilet as in claim 26 wherein said actuator cannot be slid off said means of attachment by incidental forces roughly orthogonal to a force sufficient to flush said toilet when said force is applied to said actuator.

29. A toilet as in claim 26 wherein said actuator cannot be slid off said means of attachment except by a force applied substantially oppositely to a force sufficient to flush said toilet when said force is applied to said actuator.

30. A toilet as in claim 26 wherein said means of attachment has a portion capable of engagement with said actuator and said portion of said means of attachment has at least one asymmetric cross-section.

31. A toilet as in claim 26 wherein said toilet further comprises a water valve controller and said water valve controller is permanently attached to said means of attachment.

32. A toilet as in claim 26 wherein said actuator comprises a night light.

33. A toilet as in claim 26 wherein said electronic component is a battery.

34. A toilet as in claim 26 wherein said actuator comprises an air freshener.

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