Oct. 28, 1969 R. E. WATSON 3,474,470

SELF-SUSTAINING HINGED TOILET SEAT INSTALLATION

Filed Sept. 19, 1966

FIG. 4

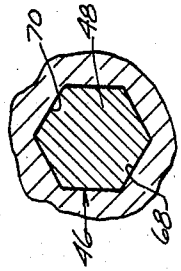


FIG. 3

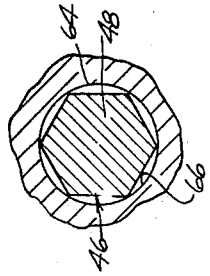


FIG. 2

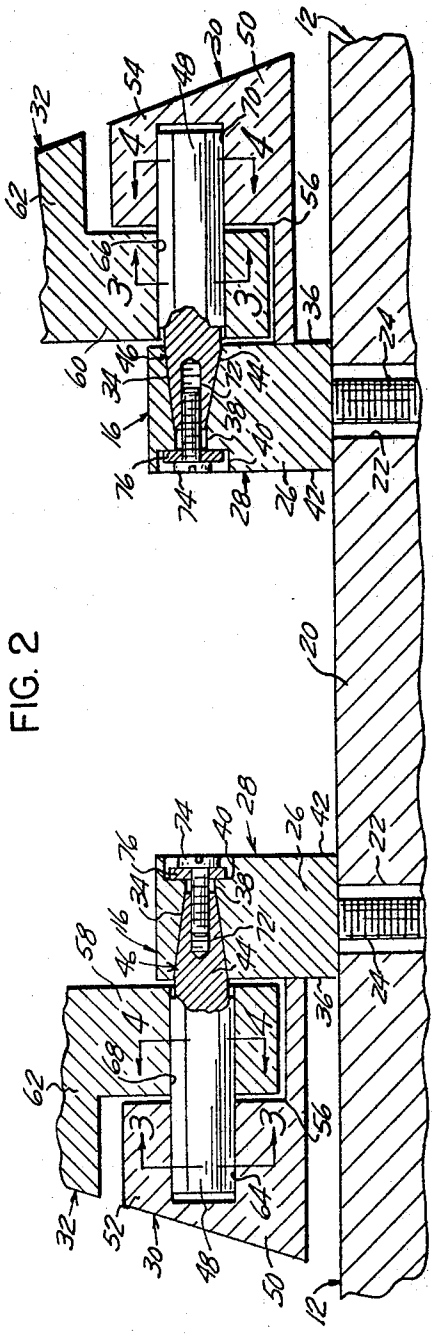
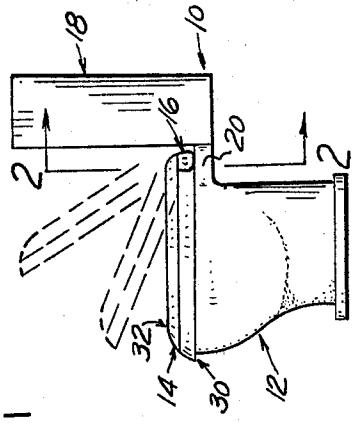


FIG. 1



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SELF-SUSTAINING HINGED TOILET SEAT INSTALLATION

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U.S. Cl. 4—240 5 Claims

ABSTRACT OF THE DISCLOSURE

A toilet seat ring and a toilet seat cover have adjacent extensions projecting rearwardly therefrom to one side of respective hinge posts and are pivoted thereto by elongated coaxial hinge pins having their end portions provided with conical braking surfaces seated in conical bores in said hinge posts. Said hinge pins pass through the extensions adjacent their respective hinge posts into the extensions remote from their respective hinge posts. One of the hinge pins has a driven connection with and extending into the ring extension but passing relatively rotatably through its adjacent cover extension, whereas the other hinge pin has a driven connection with and extending into said cover extension but passing relatively rotatably through its adjacent ring extension. Threaded fasteners threaded into the ends of the hinge pins and engaging the hinge posts retain the hinge pin in position and at the same time enable adjustment of the frictional braking engagement between each hinge pin and its respective hinge post. Hitherto certain toilet seats have been provided with self-sustaining hinges for holding the toilet seat, consisting of the so-called "ring" and "cover," in various positions between their fully-lowered and fully-raised positions. Prior self-sustaining toilet seat hinges have been found objectionable because of their squeaking noises or their rapid wear or corrosion where they have been constructed of metal, particularly brass; and some such hinges have depended for their action upon a firm connection with the toilet bowl, which later failed because the loosening of the bolts cerated a clearance which in turn loosened the braking action of the hinge. The present invention by the above construction provides a self-sustaining hinged toilet seat of simple and durable construction with a minimum of parts, which is free from these defects of prior hinges and which brakes either the cover or the ring or both independently of each other so as to render them self-sustaining in any raised position, without requiring a tight connection to the toilet bowl; also which has parts that are interchangeable between the right-hand and left-hand sides of the seat for braking either the cover or the ring or both.

In the drawing, FIGURE 1 is a diagrammatic side elevation of a conventional toilet bowl and tank installation equipped with a self-sustaining hinged toilet seat, according to one form of the present invention;

FIGURE 2 is an enlarged fragmentary vertical section taken along the line 2—2 in FIGURE 1;

FIGURE 3 is an enlarged fragmentary vertical cross-section through the toilet seat and hinge, taken along either of the lines 3—3 in FIGURE 2; and

FIGURE 4 is an enlarged fragmentary vertical cross-section through the toilet seat and hinge, taken along either of the lines 4—4 in FIGURE 2.

Referring to the drawing in detail, FIGURES 1 and 2 show a bathroom toilet installation, generally designated 10, including a toilet bowl 12 equipped with a self-sustaining hinged toilet seat 14 of the present invention having a novel self-sustaining toilet seat hinge construction 16. The bowl 12 and flushing tank 18 are of conventional

construction and their details are beyond the scope of the present invention. The bowl 12 has the usual rearwardly-extending platform 20 which is provided with spaced holes 22 to receive the threaded studs 24 by which the toilet seat hinge 16 is held down against the platform 20 of the toilet bowl 12. The studs 24 for this purpose carry the usual nuts and washers (not shown) at their lower ends and at their upper ends are embedded in the heads 26 of the hinge posts 28, if the studs 24 are of different material from the heads 26. If, however, the studs 24 are of the same material as the heads 26, such as, for example, being formed of the polyamide synthetic plastic known commercially as nylon, they may be molded integrally in one piece. Frequently, however, the threaded studs 24 are formed of brass with their upper ends embedded in the synthetic plastic heads 26 of the hinge posts 28 in order that the material of the heads 26 will have the same appearance as that of the ring 30 and cover 32 of the toilet seat 14 when all are made of the same synthetic plastic, such as polystyrene.

Each of the heads 26 of the hinge posts 28 (FIGURE 2) is provided with a frusto-conical bore 34 converging from the outer surface 36 thereof toward a cylindrical bore 38 and counterbore 40 extending to the outer surface 42. Seated in each frusto-conical bore 34 is the correspondingly-tapered adjacent frusto-conical end portion 44 of a hinge pin or pivot pin 46, the opposite end portion 48 of which is of non-circular cross-section, for example, hexagonal although not limited to hexagonal cross-section (FIGURES 3 and 4).

The toilet seat ring 30 is provided with the usual rearward extension 50 which projects over the toilet bowl platform 20 and which has opposite portions 52 and 54 containing recesses 56. The recesses 56 receive the correspondingly-shaped downwardly-extending ears 58 and 60 integral with and depending from the rearward extension 62 of the toilet seat cover 32. The left-hand portion 52 of the rearward extension 50 of the ring 30 is provided with a cylindrical bore 64 whereas the right-hand ear 60 of the rearward extension 62 of the cover 32 has a similar cylindrical bore 66 (FIGURE 3). Both are shown in FIGURE 3 because FIGURE 3 represents cross-sections on two different section lines 3—3 in FIGURE 2. In a similar manner, the left-hand ear 58 of the rearward extension 62 is provided with a bore 68 of non-circular cross-section, here being shown as of hexagonal cross-section, and the right-hand portion 54 of the rearward extension 50 of the toilet seat ring 30 has a similar bore 70 of hexagonal cross-section, both being shown in FIGURE 4 since both are of similar construction and since each receives the similar portion 48 of the hinge pin 46.

Each of the frusto-conical portions 44 of the hinge pins 46 is provided with an axial threaded bore 72 which receives the correspondingly-threaded shank of an adjusting screw 74. The latter is preferably of the so-called Allen type, well known to those skilled in the fastener industry, and passes through a washer 76 seated in the counterbore 40. The hinge pins 46 may be either of metal or plastic—if of metal, they may be of brass and if of plastic, they are preferred to be of glass-filled nylon because of its rigidity and prevention of excessive torque or twisting. The washers 76 are preferably of molybdenum-filled nylon because of the very slippery, self-lubricating characteristics of molybdenum-filled nylon.

In the operation of the invention, let it be assumed that the installer or maintenance man, by means of a suitable screwdriver or Allen wrench, has previously adjusted the adjusting screws 74 so that they draw the frusto-conical portions 44 of the hinge pins 46 into sufficient frictional engagement with their respective frusto-conical bores 34 that the ring 30 and cover 32 of the toilet seat 14 will re-

main self-sustained in a partially-raised position as shown in the dotted line positions of FIGURE 1. If, now, the user lifts the cover **32** to such a partly-raised position, this action through the driving connection established between the hexagonal bore **68** in the left-hand ear **58** of the cover extension **62** and the hexagonal portion **48** of the left-hand hinge pin **46** causes rotation of the frusto-conical portion **44** thereof which is sufficient to overcome its frictional braking engagement with the frusto-conical bore **34** in the head **26** of the left-hand hinge post **28**. When the user releases his grip upon the cover **32**, the braking frictional engagement reasserts itself to hold the cover **32** in its partially-raised position. At the same time, no lifting torque is applied to the ring **30** because the hexagonal portion **48** of the right-hand hinge pin **46** passes through the cylindrical bore **66** of the right-hand ear **60** of the cover **32** without establishing a driving engagement therewith.

On the other hand, assuming that the cover **32** has been raised, the user by lifting the forward edge of the ring **30** imparts a torque to the right-hand pivot pin **46** through the driving connection established between the hexagonal bore **70** in the right-hand ring extension portion **54** and the hexagonal portion **48** of the right-hand hinge pin **46**. As a result, the right-hand hinge pin **48** rotates, and this rotation temporarily overcomes its frictional braking engagement of its frusto-conical portion **44** with the correspondingly-tapered frusto-conical bore **34** in the head **26** of the right-hand hinge post **28**. When the user relinquishes his grip upon the ring **30**, this braking engagement is re-established automatically, and the ring **32** remains in its partially-raised position.

What I claim is:

1. A self-sustaining hinged toilet seat installation for attachment to a toilet bowl, said installation comprising
- a toilet seat unit,
- hinge post means adapted to be secured to the toilet bowl,
- pivot means engaging said hinge post means and having a driven connection with said toilet seat unit for rotation thereby in response to upward swinging thereof,
  - one of said means having an internal conical braking surface therein and the other means having a corresponding external conical braking surface thereon disposed in mating engagement with said internal conical braking surface,
- and means for holding said braking surfaces in releasable frictional braking engagement with one another,
  - said pivot means including an elongated hinge pin having said external conical braking surface therein, and said hinge post means having said internal conical braking surface therein,
  - said holding means including a threaded bore in said pivot means and a threaded friction-adjusting fastener extending through said hinge post means into said pivot means.

2. A self-sustaining hinged toilet seat installation according to claim **1**, wherein said fastener has an enlarged head thereon and wherein a self-lubricating washer is interposed between said head and said hinge post means.

3. A self-sustaining hinged toilet seat installation for attachment to a toilet bowl, said installation comprising
- a toilet seat including a toilet seat ring and a toilet seat cover,
- hinge post means adapted to be secured to the toilet bowl and including a pair of spaced coaxial braking portions,
- pivot means engaging said hinge post means and including a pair of spaced coaxial pivot elements disposed coaxial with one another and with said braking portions of said hinge post means,
  - one of said pivot elements having a driven connection extending into said ring but passing relatively rotatably through said cover and the other of said pivot elements having a driven connection extending into said cover but passing relatively rotatably through said ring,
  - each of said pivot elements having a braking portion disposed in releasable frictional braking engagement with one of said hinge post means braking portions,
- and means for holding said braking portions in frictional braking engagement with one another.

4. A self-sustaining hinged toilet seat installation, according to claim **3**, wherein said ring and said cover have extensions projecting rearwardly therefrom to one side of adjacent hinge post means, wherein said pivot elements include elongated hinge pins with external braking surfaces thereon disposed within said hinge post means, said hinge pins passing through the extensions adjacent said hinge post means into the extensions remote from said hinge post means, and wherein said hinge post means includes internal braking surfaces frictionally engaging said external braking surfaces of said hinge pins.

5. A self-sustaining hinged toilet seat installation according to claim **4**, wherein said holding means includes threaded bores in said hinge pins and threaded friction-adjusting fasteners extending through said hinge post means into said hinge pins.

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