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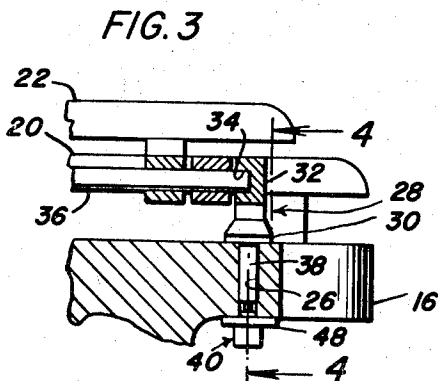
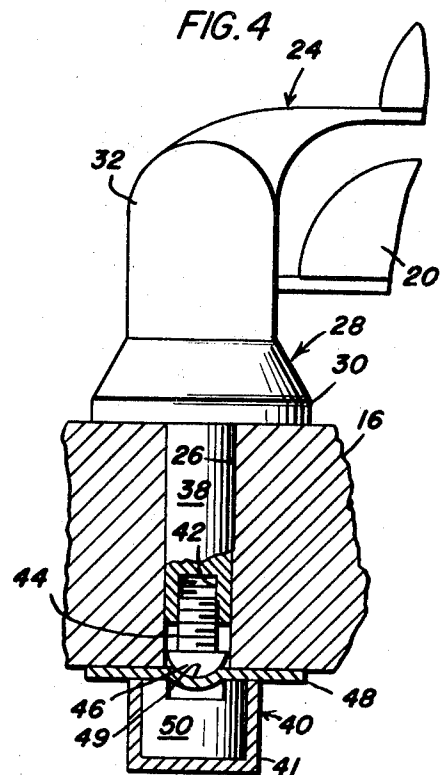
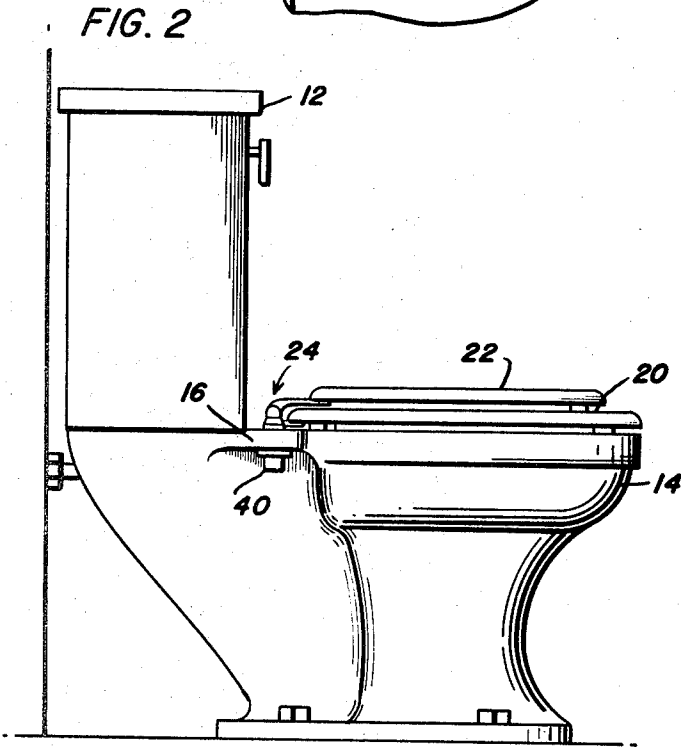
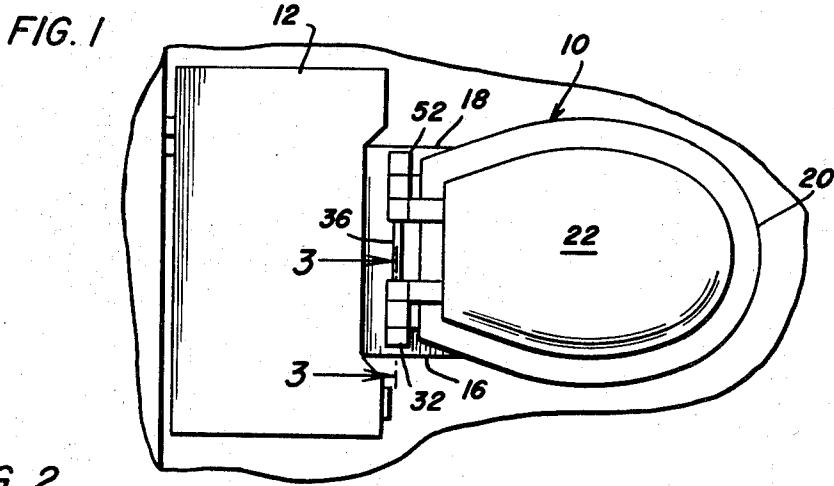
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3,550,164

DETACHABLE SEAT TOILET

Filed April 25, 1968

2 Sheets-Sheet 1



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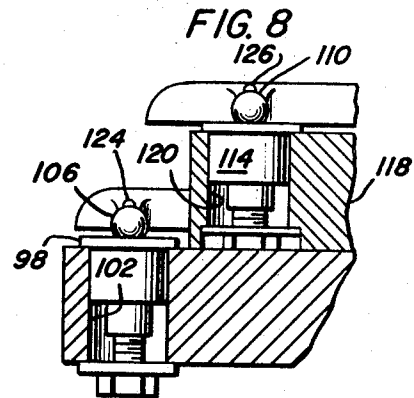
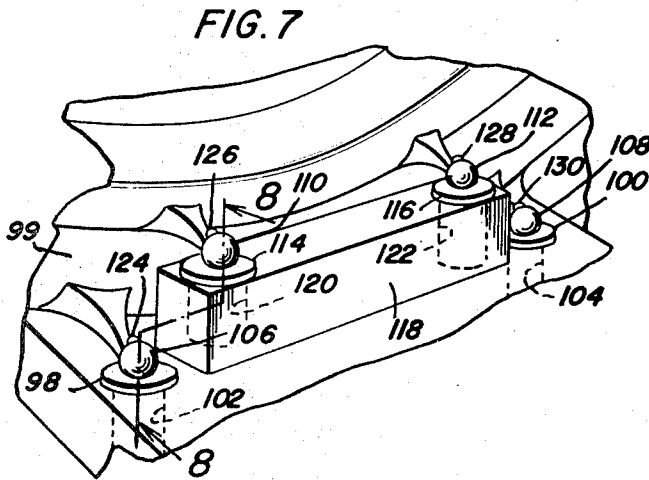
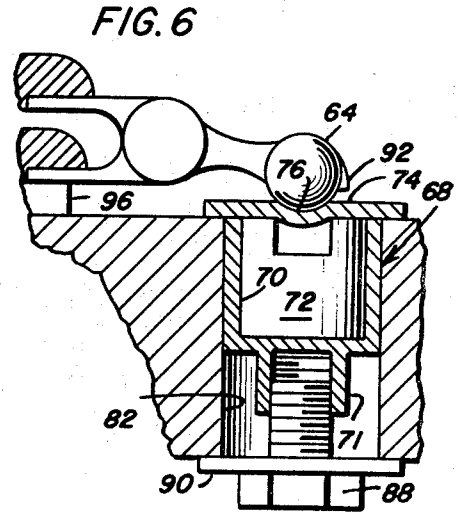
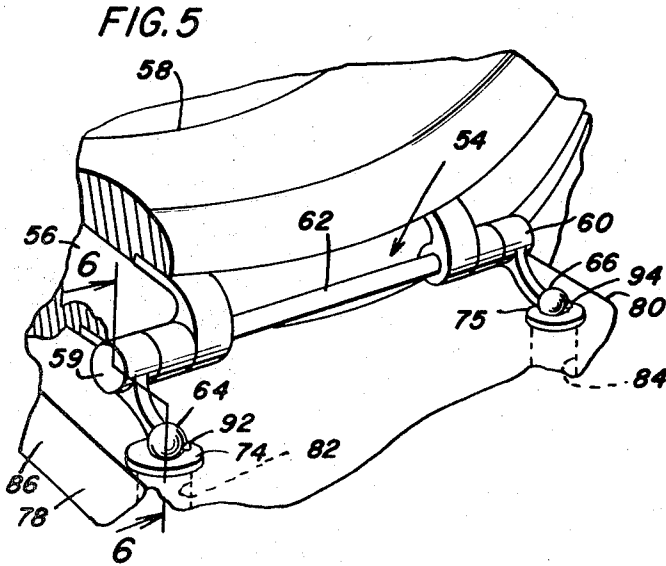
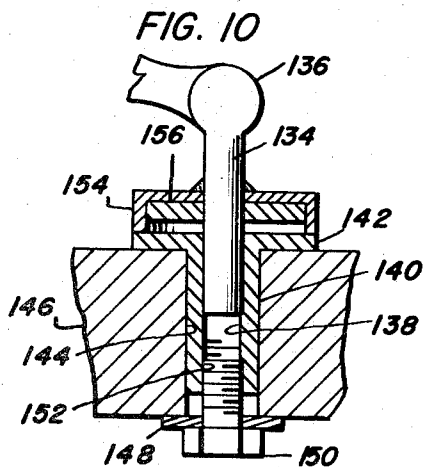
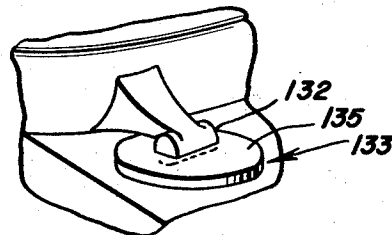


FIG. 9



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DETACHABLE SEAT TOILET

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4 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a detachable seat toilet wherein the seat and seat cover for the toilet may be removed by breaking the magnetic attraction of magnetic devices securing the seats to the toilet, and wherein as a further aspect of the invention the magnetic devices themselves serve as pivot means for raising and lowering the toilet seat and cover.

BACKGROUND OF THE INVENTION

For many years attempts have been made to improve sanitary conditions and facilitate the cleaning of the toilet facilities of bathrooms. In this respect various improved molded hinges have been provided to reduce dirt collecting areas, corners and crevices to facilitate cleaning. However, a satisfactory solution for the cleaning of the toilet seats and in particular the area of the toilet and the seat about the hinge connection remains to be found. Cleaning of the seat usually required kneeling in front of the seat and cleaning of the hinge area requires use of a brush or other small implement to remove dirt from the corners and crevices. One prior art approach has been to make the securing hinge part of plastic with a plastic securing nut alleged to make the hinge easily removable. This has not proved a satisfactory solution for the average housewife.

SUMMARY OF THE INVENTION

In accordance with the subject invention, magnetic elements are provided to detachably secure the toilet seats to the toilet and in one aspect of the invention the magnetic elements are shaped to provide pivotal surfaces such that the magnetic fastener itself serves as a hinge member. Leverage means are also provided to facilitate the release of the magnetic securing force.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages will appear from the following description of examples of the invention, when considered in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appending claims.

FIG. 1 is a top plan view of a detachable seat toilet embodying the invention,

FIG. 2 is a side elevational view of the device of FIG. 1,

FIG. 3 is a sectional view taken on line 3—3 of FIG. 1,

FIG. 4 is a sectional view taken on line 4—4 of FIG. 3,

FIG. 5 is a rear perspective view of a portion of a detachable seat toilet embodying a modified form of the invention,

FIG. 6 is a sectional view taken on line 6—6 of FIG. 5,

FIG. 7 is a rear perspective view of a further modification of the invention,

FIG. 8 is a sectional view taken on line 8—8 of FIG. 7,

FIG. 9 is a fragmentary perspective view similar to FIG. 7, showing a further modification of the invention, and

FIG. 10 is a sectional view similar to FIG. 6, illustrating another modification of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIGS. 1 and 2 is shown a plan and side elevational view of a detachable seat toilet 10 including a water tank 12, toilet bowl 14 with flanged portions 16 and 18, a toilet seat 20 and seat cover 22, connected by hinge means 24 to the flanged portions 16 and 18 of the toilet bowl. The flanged portions 16 and 18 of the bowl 14 are formed with vertical spaced holes therethrough, as for example hole 26 (see FIG. 4).

In accordance with the subject invention, the hinge means 24 is connected to the bowl by cooperating pairs of magnetic detachable fastening means. One pair of fastening means is shown in FIGS. 3 and 4 and includes a fastener 28 having a flanged portion 30 to rest on the upper surface of flange 16, a head portion 32 recessed as at 34 (FIG. 3) to receive a hinge pivot shaft 36 of the hinge 24 and a post portion 38 to be slidably received in the flange hole 26. In accordance with the invention the lower extremity of the post 38 is shaped or adapted to provide interface magnetic locking surfaces with a magnetic holding device 40 secured to the lower face of the flange 16. In the preferred embodiment shown in FIGS. 3 and 4, the post 38 is formed with a threaded hole 42 to receive a threaded adjuster pin 44 having a semispherical head 46. The magnetic holding device 40 is formed with a nonmagnetic plate 48 cemented or otherwise fixed to the lower surface of flange 16 and formed with a curved central portion 49 to receive the head 46 of adjusting pin 44. A magnet 50 is housed in a cup 41 which is fixed by bonding, brazing or other means to the plate 48. The opposite end of hinge pivot shaft 36 is supported and fixed to toilet bowl flange 18 by a duplicate set of magnetic fastenings, the pivot head of a fastener being shown at 52 in FIG. 1.

In assembly of the fastener 28 in flange hole 26, the adjusting pin 44 unscrews sufficiently to engage the nonmagnetic device plate 48. At this moment the flange 30 of fastener 28 may be spaced from the upper surface of flange 16. The fastener 28 is then rotated clockwise to draw the adjusting pin into the shaft 38 until the flange 30 rests on the upper surface of the toilet bowl flange 16. The magnetic attraction of the pin 44 to the magnetic device 40 holds the adjusting pin 44 stationary while the fastener 28 is rotated. The fastener, indicated at 52, on the opposite side of the hinge is adjusted in the same manner. The two fasteners are then removed from the spaced holes in the flanges 16 and 18, attached to opposite ends of the shaft 36 and then reinserted in the flange holes.

The toilet seat 20 and cover 22 and hinge 24 are now magnetically secured to the toilet bowl 14 and may be removed without tools and without unfastening nuts, simply by lifting the toilet seat to vertical position and pulling upwardly to break the magnetic holding force. The hinge area surface of the toilet bowl is then an unobstructed area, easy to clean, and the toilet seat, cover and hinge can be carried to a convenient wash area for cleaning.

MODIFICATIONS

In the modification incorporating the invention and shown in FIGS. 5 and 6, the hinge, indicated generally at 54, is fixed to the respective seat 56 and cover 58 in a conventional manner and the hinge is supported on a pair of magnetic pivot fastenings 59 and 60 in which the hinge shaft 62 is journaled. The fastenings 59 and 60 are formed at the free ends thereof with spherical balls 64 and 66 of magnetic attraction material to be received

in a mating surface of associated magnetic holding devices, one of which is shown in detail at 68 in FIG. 6.

As shown in FIG. 6, the holding device 68 includes a housing 70 having a magnet 72 fitted therein and a non-magnetic plate 74 fixed to the housing 70 and centrally contoured as at 76 to receive the ball 64. The toilet bowl flanges 78 and 80 are formed with spaced holes 82 and 84 for fastening the seats and hinge to the toilet bowl 86.

Referring to FIG. 6, the magnetic device 68 is positioned in the flange hole 82 supported by the plate 74. The device 68 may be secured against upward movement by any suitable means, including force fit or cements. However, as shown in FIG. 6, it is preferred to form a threaded flange 71 on the bottom of the housing 70 and provide a threaded stud 88 and washer 90, the stud being threaded into the flange 71.

To remove the seat and hinge of the modification shown in FIGS. 5 and 6, and thus far described, the hinge is lifted at one side to break one magnetic ball from its hold magnet and then is lifted at its opposite end to break the remaining ball loose.

As a further improvement, it is preferred, according to an aspect of the invention, to provide on the balls 64 and 66 respectively, projecting tabs 92 and 94 to provide leverage means for breaking the holding magnetic force. Thus, by lifting on the hinge 54 the balls 64 and 66 rotate until the tabs 92 and 94 hit the plates 74 and 75 and pry the balls off the plates. Either the hinge or the lower seat is provided with a pad as at 96 to keep weight off the hinge.

In the modification of FIGS. 7 and 8, each seat is hinged on its own pair of magnetic balls and means are provided for accommodating two pairs of magnetic holding devices such that the magnetic devices act both as hinge means and hold-down means, and also provide for separate removal of the seats. Thus, magnetic holding devices 98 and 100 (FIG. 7) are fitted in the usual toilet bowl flange holes 102 and 104 as previously described for FIG. 6, and magnetic balls 106 and 108 connected to the seat 99 pivot on the holding devices 98 and 100. For the seat cover magnet balls 110 and 112 are connected to the cover seat as shown and pivot on hold-down devices 114 and 116 respectively, located in a block 118 having spaced holes 120 and 122 to receive the devices 114 and 116. Here again tabs as indicated at 124, 126, 128, and 130 are provided to break the magnetic holding forces when the seats are pivoted sufficiently to engage the tabs with the holding devices.

FIG. 9 illustrates the use of a cylindrical pivot 132, rather than the spherical ball previously described. The magnetic holding device indicated generally at 133 is identical with the devices shown in FIGS. 6 and 8 except that the plate 135 is formed with a cylindrical socket surface to mate with the cylindrical pivot 132.

FIG. 10 shows a modification of the invention in which a magnetic holding device is fixed to the hinge itself. Thus, in FIG. 10 a post 134 having a hinge socket head 136 is slidably received in a hole 138 of a fitting 150 having a magnetic material flange 142. The fitting is secured in the hole 144 of a toilet bowl flange 146 by suitable means, as for example a washer 148 and stud 150 threaded into a threaded portion 152 of the fitting 140. Fixed to the post 134 as by welding or other suitable means is a magnetic holding device having a housing 154 of flux permeable material fitted with a magnet 156 to circulate flux through the housing 154 and flange 142. In this arrangement, lifting on the post 134 breaks the magnetic holding force to remove the toilet seats (not shown) which are hinge connected to a pair of the posts 134.

It will be understood that various changes in the details, materials, and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in

the art within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. A detachable seat toilet comprising in combination:
 - (a) a toilet seat;
 - (b) a toilet having a flange portion with spaced holes therethrough receiving fastener means securing said toilet seat and having upper and lower surfaces;
 - (c) hinge means connected to said toilet seat;
 - (d) magnetic detachable fastening means securing said hinge means to said toilet, said fastening means including
 - (e) a first pair of magnetic elements and means attaching said elements each within one of the hold portions of said toilet flange to present a substantially unobstructed surface on said toilet flange portion for cleaning;
 - (f) a second pair of magnetic elements connected to said hinge means in spaced relation and received each by an associate of said first pair of magnetic elements whereby said seat may be detachably removed from said toilet by lifting said seat to overcome the holding bias of said magnetic elements and said toilet flange portion may be easily wiped clean.
2. Apparatus according to claim 1:
 - (a) said second pair of magnetic elements each having a spherical surface;
 - (b) said first pair of magnetic elements each having a spherical socket portion to form with said first magnetic elements ball and socket pivot joints.
3. Apparatus according to claim 2:
 - (a) said second pair of magnetic elements each having a projection to provide a leverage element in the lifting of said toilet seat to break said magnetic holding force.
4. Apparatus according to claim 1:
 - (a) each of said first pair of magnetic elements comprising a centrally apertured flanged portion for resting on said upper surface of said toilet flange, a tubular portion to be received in said flange hole, said tubular portion being fixed to said flange portion at one end and internally threaded adjacent its other end;
 - (b) said attaching means for said first magnetic elements including a threaded fastener to be received in said tubular portion and abut against said lower surface of said toilet flange;
 - (c) said hinge means including a pair of hinge support posts slidably received each in an associate of said apertured first magnetic elements;
 - (d) each of said second pair of magnetic elements being fixed to an associate of said posts for magnetic holding engagement with said first magnetic elements.

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