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COMPENSATING HINGE POST AND WASHER UNIT

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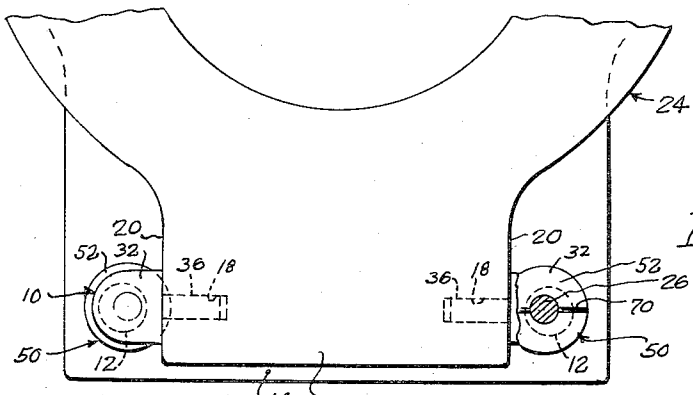


Fig. 1.

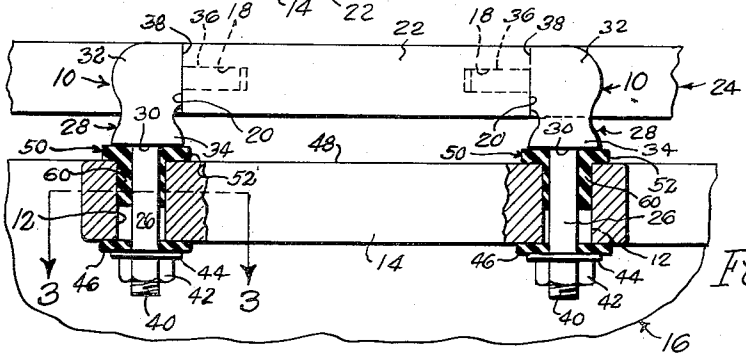


Fig. 2.

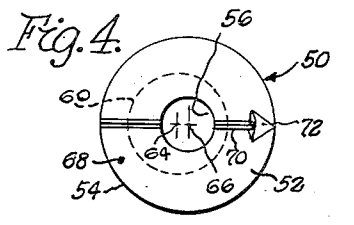


Fig. 4.

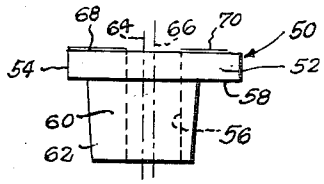


Fig. 5.

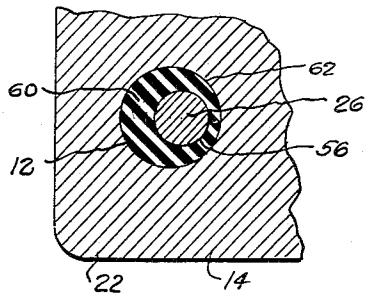


Fig. 3.

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COMPENSATING HINGE POST AND WASHER UNIT

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3 Claims. (Cl. 4—240)

This invention relates to toilet seat hinge posts and, in particular, to toilet seat hinge posts having compensating washers on the shanks thereof for counteracting the variation in the separation of toilet bowl hinge post holes, arising during manufacture.

Hitherto, wide variations have occurred during manufacture of toilet bowls with regard to the distance of separation of the seat hinge post holes at the rearward upper end thereof, thereby causing unsightly gaps to occur between the hinge posts and the sides of the toilet seat. Certain types of washers have been devised hitherto in the attempt to compensate for such variation and eliminate such gaps, but these washers have possessed peripheries which were not concentric with the base of the hinge post and consequently the installation was unsightly as well as engaging the toilet bowl unevenly. The present invention provides hinge post units equipped with eccentric washers so constructed as to enable the hinge posts to be moved closer together or farther apart while maintaining the peripheries of the washers concentric with the circular bases of the hinge posts.

According, one object of this invention is to provide a toilet seat hinge post unit having compensating washers for variation of hinge post hole separation wherein the compensating portion of the washer extends into and is located substantially wholly within the hole, whereas the periphery of the washer is concentric with the washer hinge post hole, with the result that the washers remain concentric with the circular bases of their respective hinge posts regardless of the rotation of the washers to increase or decrease the separation of the hinge posts in order to properly locate the upper ends of the hinge post adjacent the toilet seat and therefore prevent the unsightly appearance of prior hinge post and compensating washer installations.

Another object is to provide a toilet seat hinge post unit wherein the washer is circular and provided with a slightly tapered boss on the bottom thereof which is eccentric to the periphery of the upper portion of the washer and also to the hinge post hole extending through both portions of the washer, the hinge post hole being concentric with the upper portion of the washer.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a top plan view, partly in section, of a toilet bowl and seat assembly provided with hinge posts equipped with compensating washers, according to one form of the invention;

Figure 2 is a rear elevation, partly in vertical section, through the hinge posts of the toilet bowl and seat assembly shown in Figure 1;

Figure 3 is an enlarged horizontal section taken along the line 3—3 in Figure 2;

Figure 4 is a top plan view of one of the eccentric compensating washers used in the assembly shown in Figures 1 and 2; and

Figure 5 is a side elevation of the washer shown in Figure 4.

Referring to the drawings in detail, Figure 1 shows a pair of hinge post units, each generally designated 10, mounted in the hinge post holes 12 of the rearward platform 14 of a toilet bowl, generally designated 16, shown only fragmentarily. At their upper ends, the hinge post units 10 engage oppositely-directed hinge pin holes or sockets 18 in the opposite sides 20 of the rearward extension 22 of the toilet seat, generally designated 24. The separation of the hinge post holes 12 is intended to be standardized at 5½ inches, but due to the difficulty of controlling the locations of these holes in pottery products which not only have to be formed but also heated to high temperatures in kilns, the separations of these holes actually vary greatly, up to as much as 5⅞ inches, whereas the diameters of the holes themselves also vary from ⅜ of an inch to ⅞ of an inch. Since the shanks 26 of the hinge posts 28 of the hinge post units 10 are also intended to be standardized at ⅞ inch in diameter, these variations in the diameters and separations of the hinge post holes require compensation.

The shank 26 of each hinge post 28 terminates at the lower surface 30 of a hinge post head 32, the base 34 of which is ordinarily circular in outline, the head 32 having a hinge pin 36 which fits into its respective hole 18, usually provided with a bearing sleeve (not shown) therebetween in order to compensate for wear. Each hinge pin 36 is of smaller diameter than the hinge post head 32 from which it projects horizontally and which it meets in a flat surface 38 surrounding the pin 36 and disposed adjacent the side 20 of the toilet seat extension 22. The lower end of the hinge post shank 26 is threaded as at 40 to receive a nut 42, metal washer 44 and resilient lower washer 46 of synthetic rubber, synthetic plastic or other suitable material.

Also mounted on each hinge post shank 26 between the lower surface 30 of the hinge post head 32 and the upper surface 48 of the toilet bowl platform 14 is a compensating washer, generally designated 50, also made from resilient or elastic deformable material such as natural or synthetic rubber or synthetic plastic. The lower washer 46 is ordinarily a flat washer whereas the upper washer 50 is of the special construction shown in Figures 4 and 5, in that it has a circular upper portion or disc 52 with a circular periphery 54 and a circular hinge post hole 56 concentric with the circular periphery 54 of the upper portion 52. Extending downwardly from the lower surface 58 of the upper or disc portion 52 is a frusto-conical boss 60 having a conical outer surface 62, the axis of which is located at 64 eccentric of the axis 66 of the hinge post hole 56 and disc portion periphery 54. The boss 60 is thus eccentric to both the hinge post hole 56 and the upper or disc portion 52, and its upper surface 68 is provided with an indexing arrow or other direction indicator 70 with an arrow or direction-indicating tip 72.

In the installation of the compensating hinge post unit 10 of the present invention, let it be assumed that the toilet bowl platform holes 12 are wider apart than their standard separation so that if the hinge posts 28 were mounted in the holes 12 in centered locations, gaps would occur between the side surfaces 20 of the toilet seat extension 22 and the side surfaces 38 of the hinge post heads 32. In order to prevent this, the plumber, having removed the nuts 42 and lower washers 44 and 46 from the hinge post shanks 26, inserts the hinge pins 36 in their respective sockets 18 in the toilet seat extension 22 but, leaving the compensating washers 50 in position thereon, he inserts the hinge post shanks 26 in the hinge post holes 12, pushing the bosses 60 of the washers 50 downward

into the holes 12, after having first rotated them so that the heads 72 of the arrows 70 point toward one another and fall within a straight line.

If, however, the hinge posts are not spaced properly apart from one another to leave no gaps between the hinge post side surfaces 38 and the toilet seat extension side surfaces 20, because of the separations or diameters of the hinge post holes 12 in the toilet bowl platform 14 deviating from the standard separation or diameter respectively, the plumber rotates either or both of the compensating washers 50 in one direction or the other by grasping the peripheries 54 of the upper or disc portions 52 between his thumb and forefingers, so as to move the hinge post shanks 26 toward or away from one another according to the amount necessary to take up any gap which would otherwise occur between the surfaces 38 and 20. At the same time, regardless of the rotation of the compensating washers 50, the peripheries 54 thereof remain concentric with the peripheries of the bases 34, so that the part of the disc portion 52 which projects beyond the base 34 of each hinge post 28 is of constant width throughout its periphery, as shown in the left-hand corner of Figure 1. The lower washers 44 and 46 are then placed upon the lower ends of the hinge post shanks 26 and the nuts 42 threaded onto the threaded portions 40, tightening the assembly when the proper adjustment of the compensating washers 50 has been reached. This action clamps the hinge posts 28 in their adjusted positions with their side surfaces 18 close to the adjacent side surfaces 20 of the toilet seat extension 22.

What I claim is:

1. A compensating hinge post unit for mounting a toilet seat upon a toilet bowl having variably spaced hinge post holes therein, said unit comprising a hinge post having a threaded shank insertable in the toilet bowl hinge post holes, a nut threaded upon the lower end portion of said shank, and a compensating washer of elastic deformable material mounted upon said shank and having a substantially circular upper disc-shaped portion and a boss of substantially circular cross-section extending downwardly from said disc-shaped portion for insertion into the toilet bowl hinge post hole, said washer having a hinge post shank hole therethrough substantially concentric with the axis of said upper portion but eccentric to the axis of said boss, said boss having a downwardly-tapered side surface adapted to be wedged into its respective hinge post hole in response to the tightening of said nut upon said shank.

2. A compensating hinge post unit for mounting a toilet seat upon a toilet bowl having variably spaced hinge post holes therein, said unit comprising a hinge post having a threaded shank insertable in the toilet bowl hinge post holes, a nut threaded upon the lower end portion of said shank, and a compensating washer of elastic deformable material mounted upon said shank and having a substantially circular upper disc-shaped portion and a boss of substantially circular cross-section extending downwardly from said disc-shaped portion for insertion into the toilet bowl hinge post hole, said washer having a hinge post shank hole therethrough substantially concentric with the axis of said upper portion but eccentric to the axis of said boss, said boss having a downwardly-tapered side surface of substantially frusto-conical configuration adapted to be wedged into its respective hinge post hole in response to the tightening of said nut upon said shank.

3. A compensating washer comprising a body of elastic deformable material having an upper substantially circular disc-shaped portion with a hole therethrough disposed substantially concentric with the center of said circular disc-shaped portion and having a boss of substantially circular cross-section projecting downwardly from said upper disc-shaped portion and with its center displaced laterally from the axis of said hole, said boss having a downwardly-tapered side surface thereon of substantially frusto-conical configuration.

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