

[54] TOILET SEAT

[75] Inventors: Alexander Kira, Ithaca, N.Y.;
George R. Scheuring, Pittsburgh, Pa.

[73] Assignee: American Standard Inc., New York,
N.Y.

[22] Filed: Sept. 15, 1970

[21] Appl. No.: 72,466

[52] U.S. Cl. 4/237

[51] Int. Cl. A47k 13/00

[58] Field of Search 4/234, 237, 236, 240

[56] References Cited

UNITED STATES PATENTS

807,305	12/1905	Muckenhirn.....	4/234
49,731	9/1865	Davis	4/237
D172,564	7/1954	Ring.....	D4/5
1,163,149	12/1915	Hooper.....	4/237
2,099,118	11/1937	Kennedy.....	4/98
3,471,874	10/1969	Dixon.....	4/240
3,520,005	7/1970	Downes	4/234

FOREIGN PATENTS OR APPLICATIONS

972,607	8/1950	France.....	4/237
1,267,918	6/1961	France.....	4/237
552,503	11/1956	Belgium.....	4/234
1,200,475	6/1959	France.....	4/236

802,808 2/1951 Germany 4/240

Primary Examiner—John Petrakes

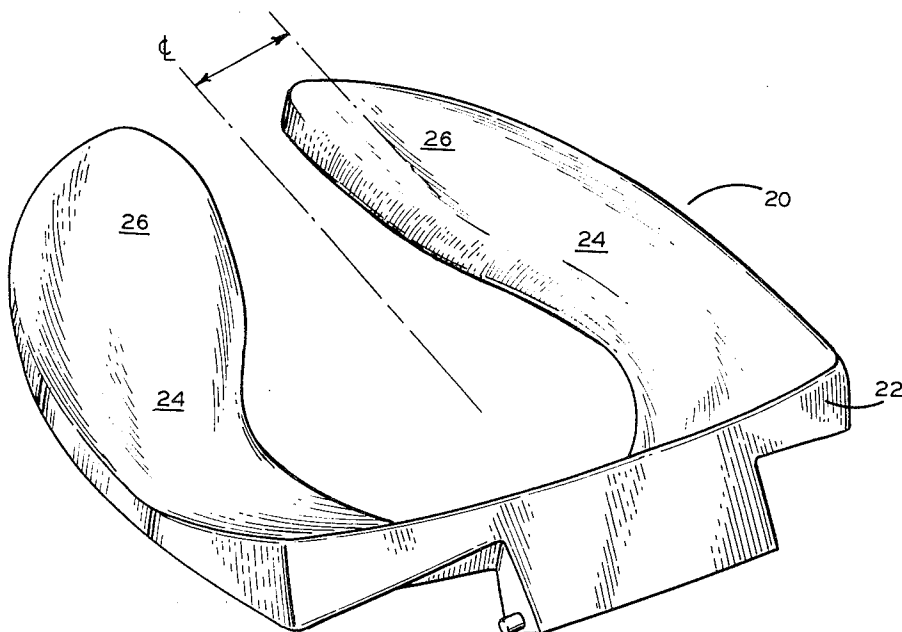
Assistant Examiner—Donald B. Massenberg

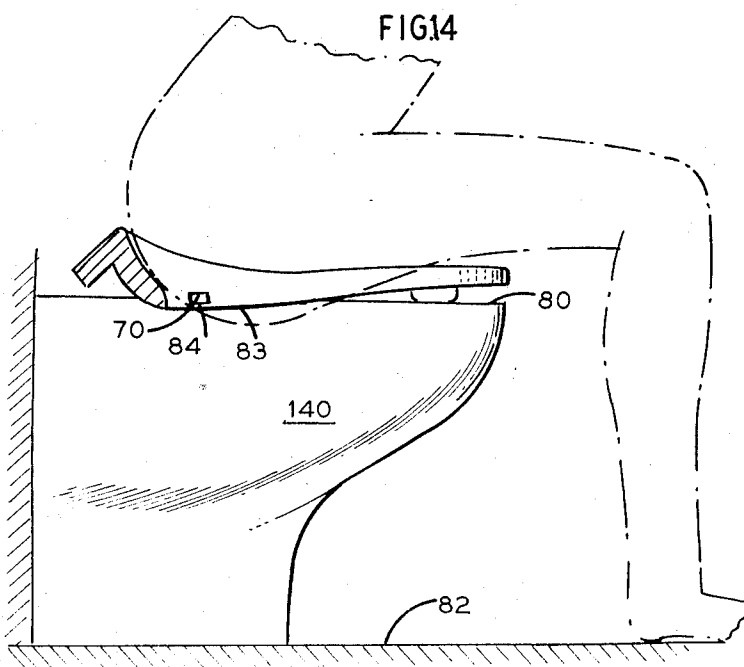
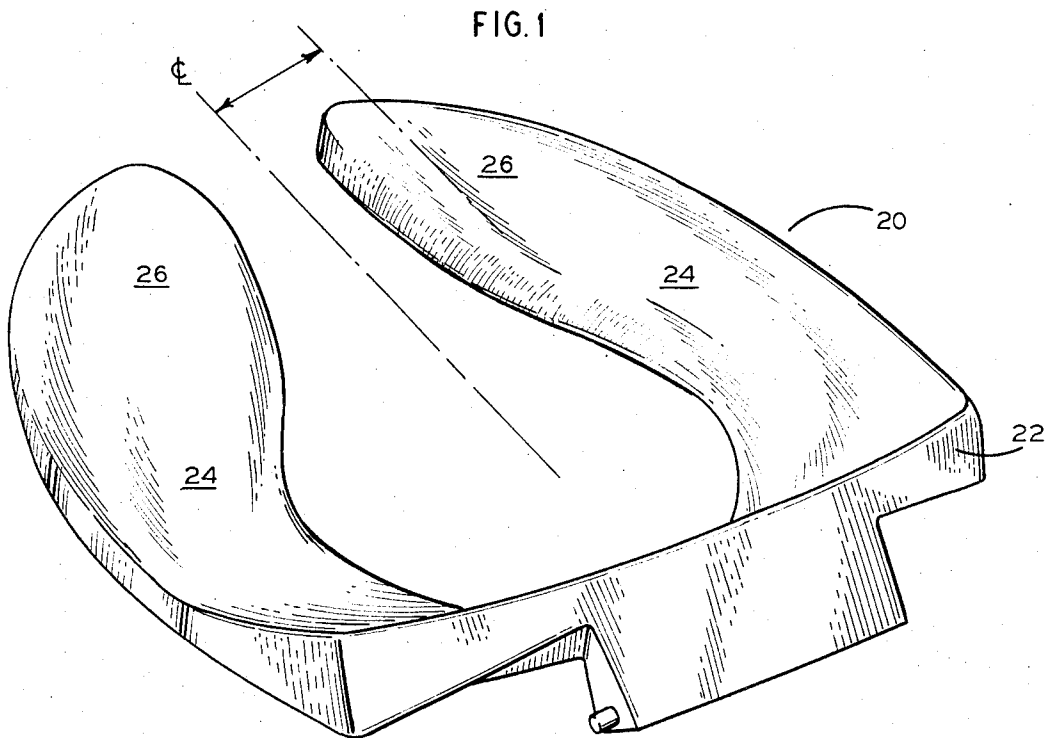
Attorney, Agent, or Firm—Sheldon H. Parker; Tennes
I. Erstad

[57] ABSTRACT

The defecation process can be substantially facilitated by means of a specially contoured toilet seat which is completely adaptable to conventional toilets. The toilet seat has a hinge means for attachment to the toilet and an annular relatively planar section, conforming generally in peripheral configuration to the periphery of the bowl section of the toilet. The hinge post section positioned at the rear end of the toilet. The rear section of the toilet is upwardly and outwardly curved at a steep angle thereby preventing the user from sitting back on the rear section of the toilet seat. The top surfaces of the seat in the rear and side sections slope in an upwardly and outward direction but at a progressively smaller angle than the rear most section. At the front section of the seat particularly in the thigh support region, the surface of the seat is somewhat concave and in a region of the front section the seat slopes in a direction which is the reverse of the slope at the side and rear sections.

13 Claims, 22 Drawing Figures





INVENTORS
Alexander Kira
George R. Scheuring
BY *Sheldon H. Parker*
ATTORNEY

FIG. 2

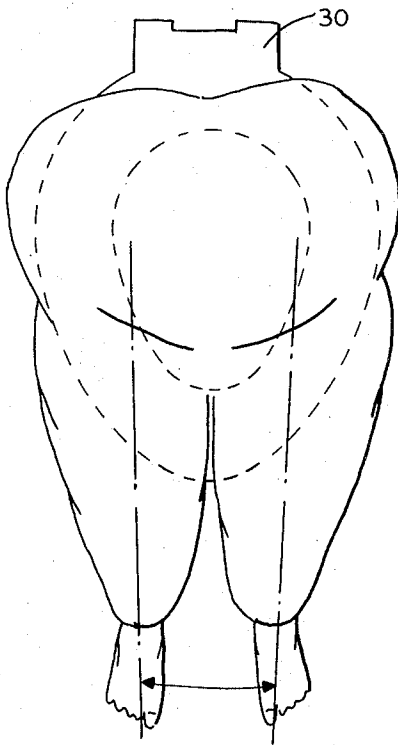


FIG. 4

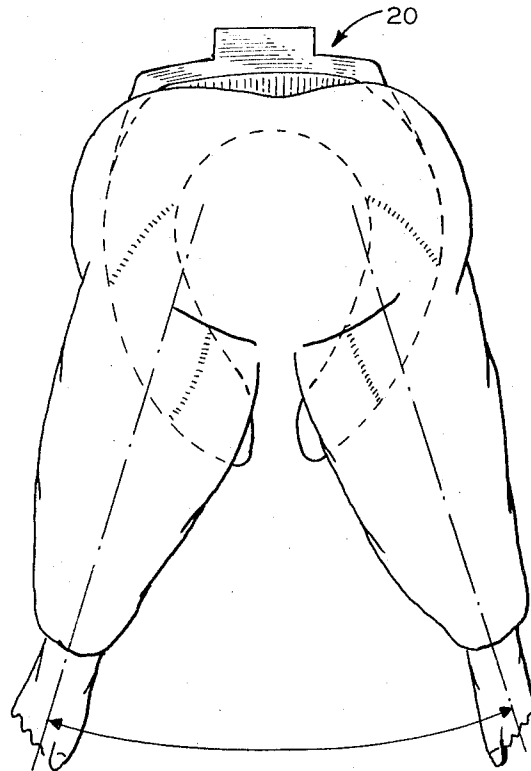


FIG. 3

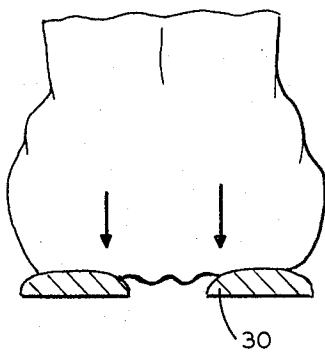


FIG. 5

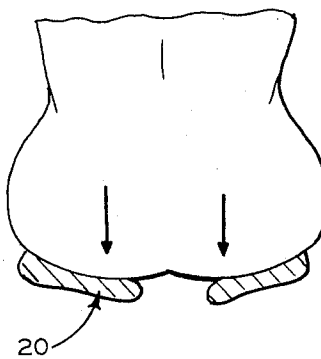


Fig. 6

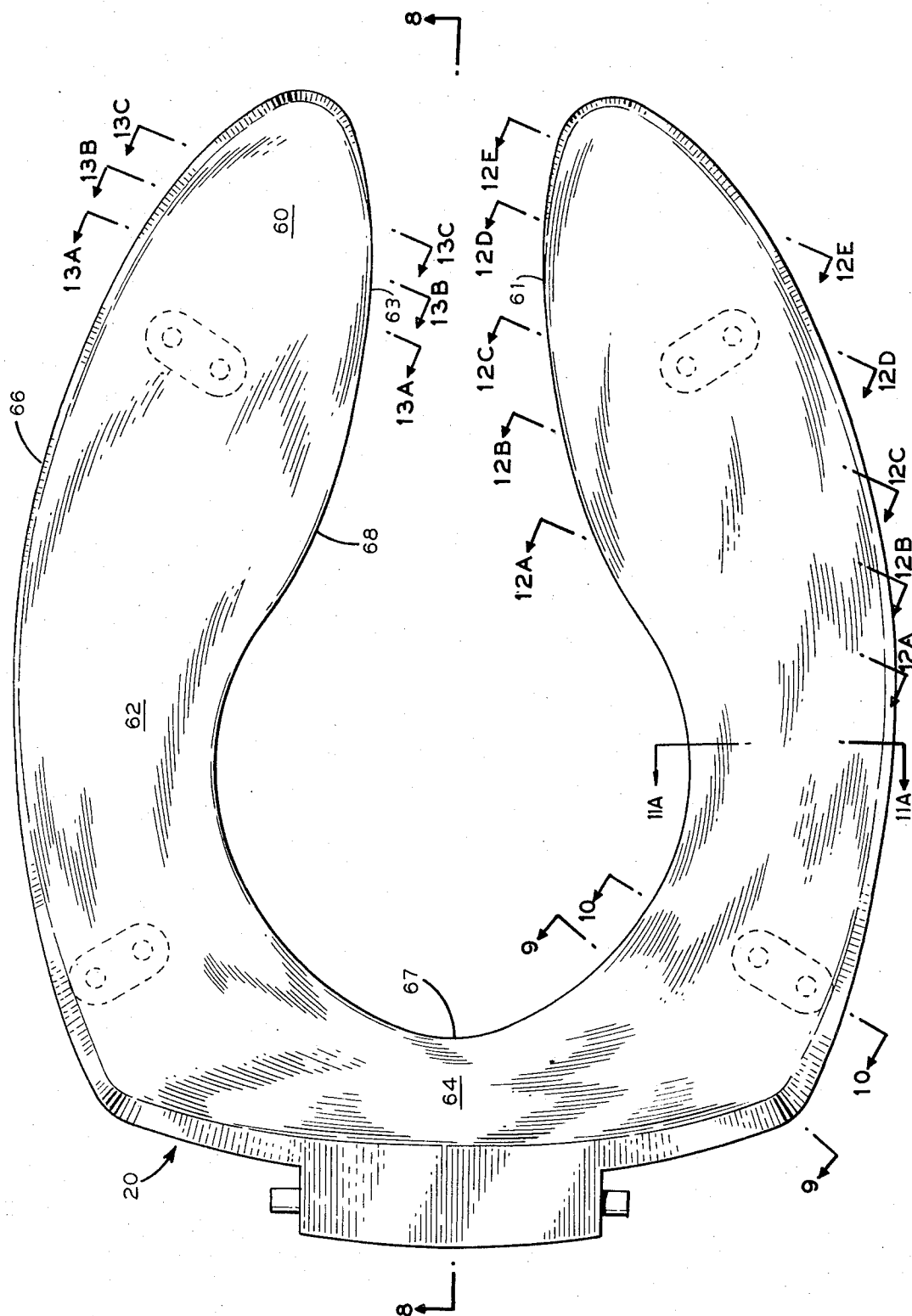


FIG. 7

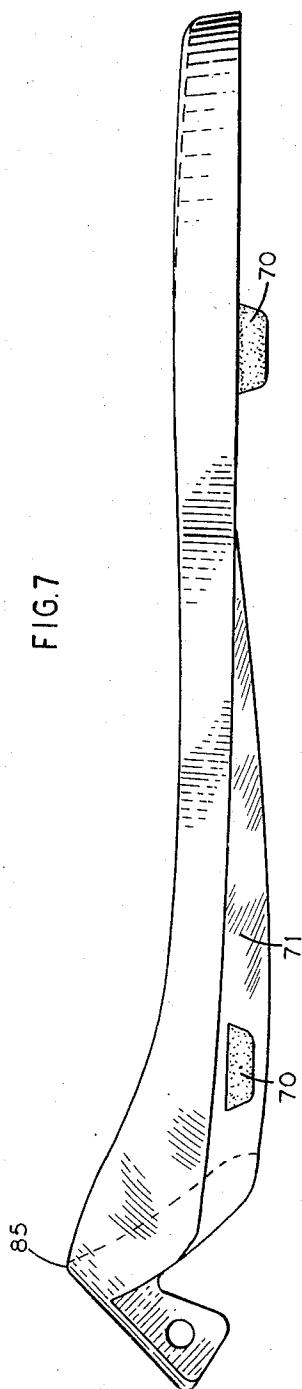


FIG. 8

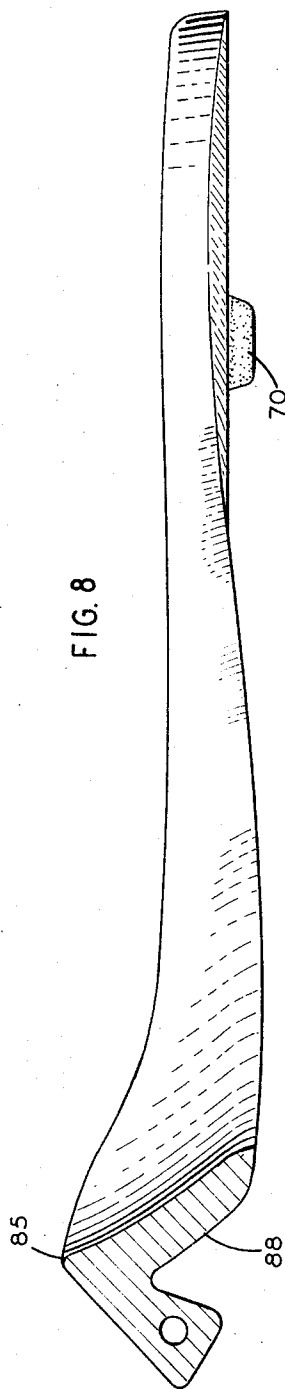
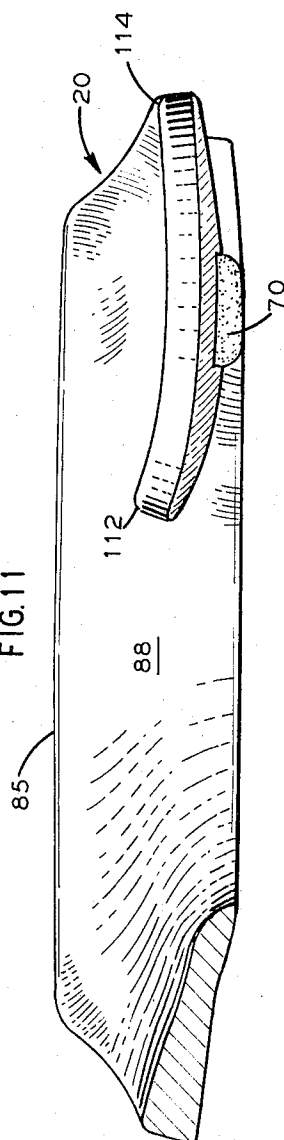


FIG. 11



SHEET 5 OF 6

FIG. 8A

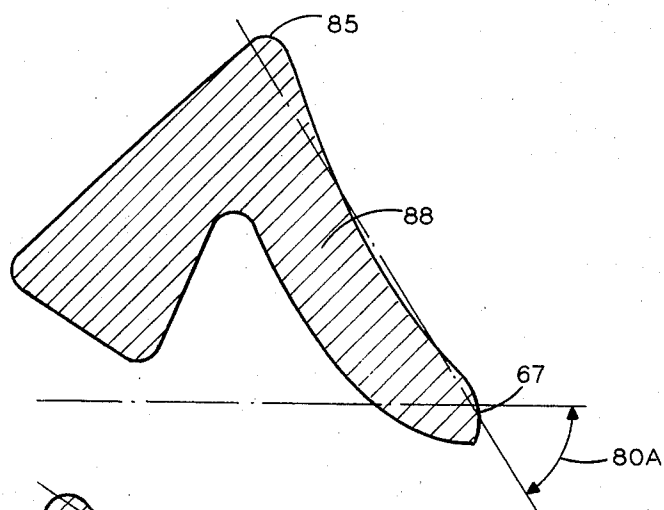


FIG. 9

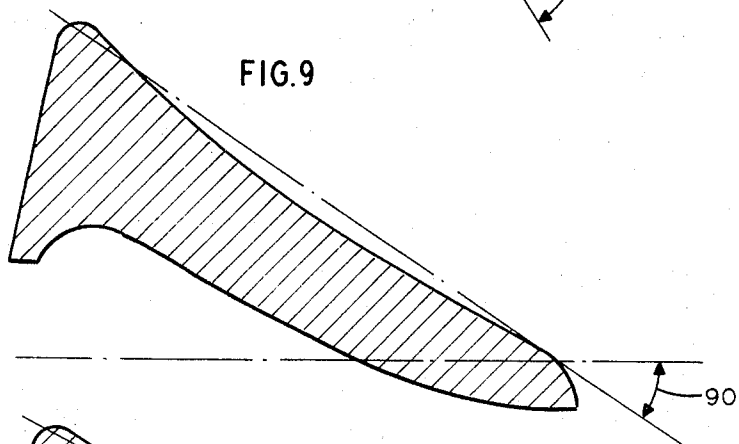


FIG. 10

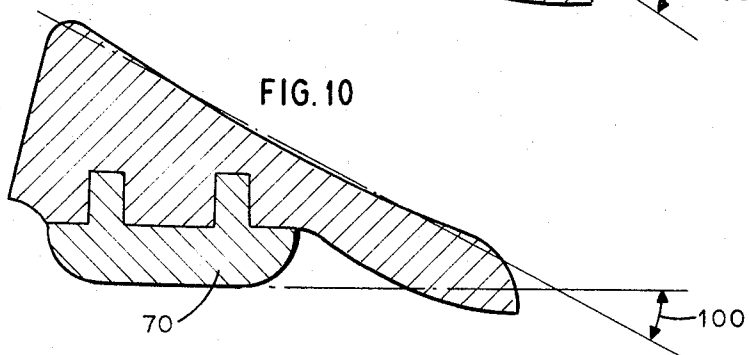
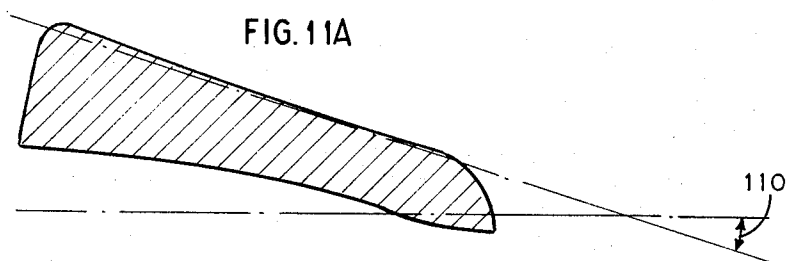
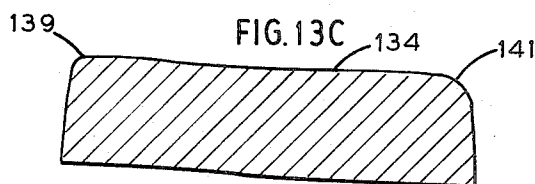
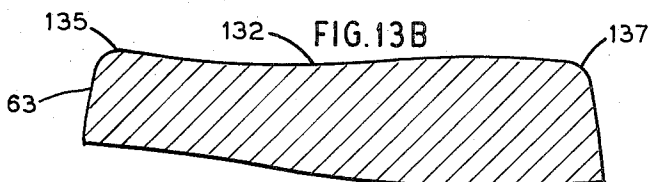
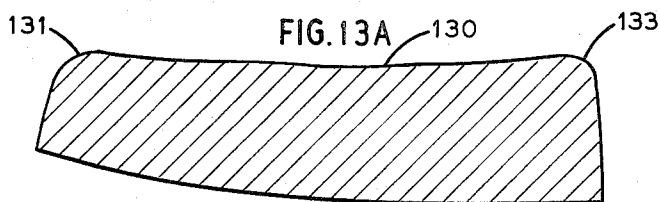
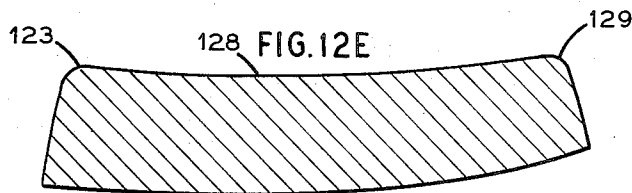
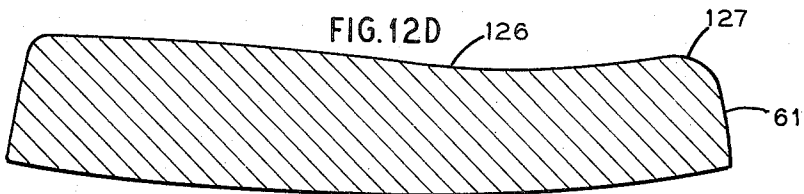
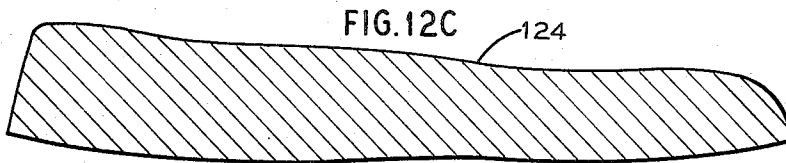
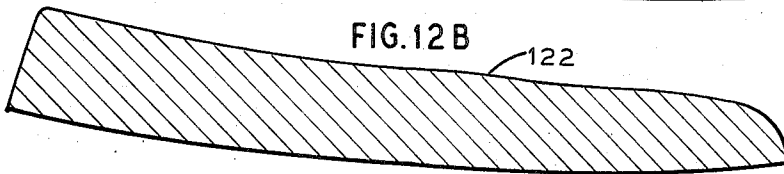
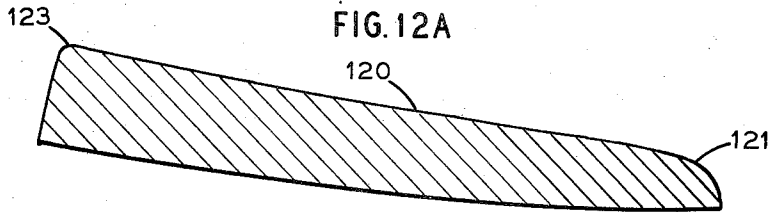


FIG. 11A



SHEET 6 OF 6



TOILET SEAT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a toilet seat and more particularly to a toilet seat which has the top part contoured so as to properly support the body during defecation.

2. Discussion of the Prior Art

Toilet seats have been in use for many years and have not appreciably changed in their configuration. Toilet seats are typically not even contoured so as to conform to the configuration of the anatomy of the user of the toilet seat. Conventional toilet seats typically tend to cause the legs of the user to become numb because of poor circulation after long periods of use and also tend to compress the buttocks so as to hamper the defecation process. The various objectives which should be served by the toilet seat, along with the defecation difficulties encountered in conventional toilet seats is extensively discussed in the book "The Bathroom" by Alexander Kira. Optimum designs of a toilet seat are presented in the book. However, the optimum design requires the redesigning of the conventional toilet. In order to achieve wide spread and immediate acceptance an improved toilet seat would have to be readily adaptable to conventional toilets.

U.S. Pat. No. 3,520,005, also goes into discussions of some of the criteria which go into the design of a toilet seat structure.

As discussed by Mr. Kira in his book, the physiological acts which are involved in the process of defecation include the contracting of the diaphragm and the muscles of the abdominal wall, and the relaxing of the external sphincter muscle which controls the opening of the anal canal. The position of the person greatly affects the ability to contract the proper muscles and relax the external sphincter muscle.

In those places in the world where water closets are not employed a squatting position is used which is physiologically, the most desirable position. It is desirable for the person to assume a doubled over or squatting position as closely resembling that position which would be used if a water closet were not employed. Mr. Kira indicates that from the standpoint of water closet design it would be desirable to provide either a high stand-up or lean-on fixture or to equip standard high water closets with foot rests so that the effects would be to relatively raise the seat so that the body would be assuming a squatting position, or to provide a low fixture so that the user would straddle or squat on the fixture. Although the modern toilet is in effect too high even for some adults, as a practical matter they cannot expect people to substitute a more desirable toilet design for the currently employed water closet nor is it believed that it would be a simple matter to encourage consumers to buy a more ideally designed water closet.

An alternate approach to the redesign of the toilet is a redesign of the toilet seat. Conventionally employed toilet seats in combination with the conventional toilet tend to prevent the spreading of the buttocks and create difficulties in regard to the relaxing of the anal sphincter muscle. As indicated by Mr. Kira, when using conventional water closet seats it is typically "almost impossible to pass wind when normally seated without shifting one's weight so as to allow the buttocks to spread and the sphincter muscles to relax."

One approach that is discussed, is the supporting of the ischial tuberosities, in order to properly support the body rather than supporting the body in the manner of the conventional water closet.

The approach discussed in U.S. Pat. No. 3,520,005, is to provide a toilet seat which has a one-piece generally annular seat provided with a front portion which is elevated relatively to the rear portion of the seat. This will cause the user to assume a position which more nearly resembles a squatting position than is possible with conventional toilet seats.

SUMMARY OF THE INVENTION

It has now been found that the defecation process can be substantially facilitated by means of a specially contoured toilet seat which is completely adaptable to conventional toilets. The toilet seat is provided with a unique contour and configuration so as to enable the user to assume a position more nearly resembling a squatting position than is possible with a conventional toilet seat.

In accordance with the present invention an annular toilet seat is provided with a hinge means for attachment of the seat to the toilet. The hinge post section positioned at rear section of the toilet seat, which is upwardly and outwardly curved at a steep angle.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects and advantages of the invention will become apparent and the invention will be understood as the description of the invention proceeds, particularly when taken together with the accompanying drawings wherein like reference numerals indicate similar parts throughout the several drawings, and wherein:

FIG. 1 is a perspective view of a toilet seat in accordance with the present invention;

FIG. 2 is a diagrammatic plan view, illustration showing a person seated on a conventional toilet seat;

FIG. 3 is a fragmentary rear view, partly in section, corresponding to FIG. 2;

FIG. 4 is a diagrammatic plan view illustrating a person seated on the toilet seat of FIG. 1;

FIG. 5 is a fragmentary rear view, partly in section, corresponding to FIG. 4;

FIG. 6 is a plan view of the toilet seat of FIG. 1;

FIG. 7 is a side view of the toilet seat of FIG. 6;

FIG. 8 is a cross-sectional view taken along lines 8—8, of FIG. 6;

FIG. 8a is an enlarged fragmentary view of the rear section of FIG. 8;

FIG. 9, is a cross-sectional view taken along lines 9—9, of FIG. 6;

FIG. 10, is a cross-sectional view taken along the lines 10—10, of FIG. 6;

FIG. 11, is a partial cross-sectional front view with section taken along lines 11A—11A of FIG. 6;

FIG. 11a is an enlarged view of the portion of FIG. 11 which is in cross-section;

FIGS. 12a, 12b, 12c, 12d and 12e are cross-sectional views taken along lines 12a—12a, 12b—12b, 12c—12c, 12d—12d, 12e—12e, respectively of FIG. 6;

FIGS. 13a, 13b, and 13c are cross-sectional views taken along lines 13a—13a, 13b—13b, and 13c—13c of FIG. 6; and

FIG. 14 is a diagrammatic fragmentary side view illustrating the use of the toilet seat of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

As seen in the perspective view of FIG. 1 a toilet seat 20 is provided with a high curved back region 22, a concavely curved intermediate or side region 24 and an enlarged thigh supporting region 26.

As shown in FIG. 2 a person using a conventional toilet seat may sit with the legs together and receive primary support of the body in the thigh region. This is particularly true of women who tend to be restricted by their clothing. In any event as shown in FIG. 3 the curvature and configuration of the conventional toilet seat 30 is such that pressure is typically applied to the buttocks in such a manner so as to compress the buttocks and keep the sphincter in a tightly contracted state. By way of contrast, as shown in FIG. 4, the user of the toilet seat 20, designed in accordance with the present invention, is encouraged if not actually forced to sit with the legs spread apart, and is encouraged to lean forward to a semi-squat position typically with the arms atop of the thighs as shown in FIG. 14. This posture is desirable for defecation because it shifts the weight emphasis off the buttocks and onto the thighs, allowing the buttocks to be properly spread. Concavature of the seat opening in combination with the aforementioned factors aid in the spreading of the buttocks as illustrated in FIG. 5 thereby enabling the user to relax the sphincter muscle as required in the defecation process.

A proper dimensioning of the various sections of the toilet seat and the contouring of the toilet seat is essential in order to achieve the required seating position for defecation. As shown in FIG. 6 the toilet seat is provided with a front region 60, a side region 62, and a rear region 64. The outer peripheral edge 66 of the generally annular toilet seat conforms approximately to the contour of the toilet with which it is used. The inner peripheral edge 68 is contoured in accordance with physiological requirements. Some departure of the contour of the outer periphery 66 from the contour of the toilet seat 20, from the conventional water closet may be required because of the requirement that the toilet seat provide proper support.

By way of illustration FIG. 6 shows an open front toilet seat. However, it should be understood that this is intended to be a matter of illustrative convenience and a closed front toilet seat can also be employed by simply having a continuous outer periphery 66 and a continuous inner periphery 68.

As shown in FIG. 7, the buttons 70 which support the toilet seat on the top surface of the water closet lie in a plane which is of course parallel to the plane of the top surface of the water closet. It should also be noted that a region 71 of the toilet seat extends below this plane.

FIG. 14 shows a person sitting on a toilet seat which is in position on a conventional toilet. Although the desired height for a water closet would be on the order of 9 inches, conventional water closets typically have a distance from their top surface 80 to the lower height 82 of about 14 or 15 inches. The toilet seat itself raises the height of the person using the water closet an additional inch or two. It is evident from FIG. 14 that a person using the toilet seat of the present invention would have the lower extremity of his body at a height below the top surface 80 of the toilet. The buttocks of the person extend below the bottom edge 83 of the toilet seat which in turn is lower than the bottom surface 84 of the

button 70. The bottom surface 84 of the button 70 coincides in height to the top surface 80 of the water closet. While the user would still not be in the optimum squatting position nevertheless the seat would enable a person to more nearly assume this desired squatting position than is possible with the conventional toilet seats.

As shown in FIG. 8 the rear section of the toilet seat is provided with a high back 88. As evident from FIG. 14, the high back section encourages the user to lean forward in the seat with the hands resting on the legs in a position somewhat resembling a squatting position.

The high back section, as shown in FIG. 8a, forms an acute angle 80a with the plane of the top surface of the toilet seat. The angle progressively increases the steepness in the direction of the upper edge 85 of the high back section 88. The angle is preferably on the order of 55° with respect to the plane of the top surface of the toilet. An angle less than about 45° will permit the user to sit upon the high back region therefore defeating the purpose of this deepening inclined region.

The inclination of the top surface of the seat is seen to decrease when looking at cross-sections through the seat, progressing from the middle of the rear section or towards the front region of the toilet seat.

Thus, as shown in FIG. 9 the slope of angle 90 is on the order of about 35°, as shown in FIG. 10, the slope of the angle 100 is about 25°, and the slope of the angle 110 is about 20°.

As evident from FIGS. 1, 5, 7, 8 and 14, the toilet seat 20, provides a concave seating region in the rear half of the seat. The front half of the seat 20, actually reverse in curvature with respect to the rear half and provides what can be considered to be a convex support surface.

As shown in FIG. 11, the upper inner edge 112 of the seat 20 is higher than the corresponding upper outer edge 114.

The series of cross-sectional views of FIGS. 12a, 12b, 12c, 12d, and 12e are taken along parallel planes which are perpendicular to the center line of the leg, as shown in FIG. 4, which shows the desirable spread leg position.

In FIG. 12a, the top surface 120, is almost flat, and forms a very shallow angle with respect to the plane of the top surface of the toilet.

The top surface 122, as seen in FIG. 12b, is slightly concave as is also true for the top surfaces 124, 126, and 128 of FIGS. 12c, 12d, and 12e respectively. A slight ridge effect 127 is apparent in FIG. 12d, and in FIG. 12e, it is seen that the upper, inner edge 129 of the seat, is higher than the outer upper edge 123.

Obviously, it would not be comfortable to rest the thigh on the ridge portion 127, of the top surface of the toilet seat, so that the user would be discouraged from sitting with the legs closer together, as shown in FIG. 2.

The FIGS. 13a, 13b and 13c are parallel cross-sections which are relatively perpendicular to what might be called the center line of the front section or thigh support region of the seat 20.

The top surface 130 is slightly concave with the inner upper edge 131 and outer upper edge 133 approximately equal in distance from the top surface of the toilet.

The top surface 132 is also slightly concave, but the upper inner edge 135 is slightly higher than the outer upper edge 137. In FIG. 13c, the top surface 134 is seen

to slope in a downward direction, from the upper inner edge 139 to the upper outer edge 141. The slope of the surface 134 is noted to be the reverse of the slope of the surface 120, which slopes upwardly from the upper inner edge 121 to the upper outer edge 123.

The distance between the inner edges 61 and 63, in the open front toilet seat is preferably about 3 inches. An opening of greater than 4 inches substantially subtracts from the region of the seat which is required for support of the thighs.

The width of the pad or thigh support region of the seat, that is the distance between the inner edge 68 and the outer edge 66, in the front quarter of the seat, must be at least 4.5 inches and advantageously about 5 inches in order to provide the requisite comfort for the user. A width of about 6.5 inches has been found to be the maximum which avoids excessive overhang of the seat beyond the toilet without excessively limiting the interior opening of the seat.

The distance between the center of the seat opening and the back ridge 67, must be no greater than about 6.5 inches in order to maintain the tactile feeling which suggests the semisquat position, but must be at least about 6 inches so that the high back region of the seat does not present an obstacle when sitting down.

The horizontal distance between the upper edge 85 of the high back of the seat and the inner edge 67, of the seat opening, should be minimized in order to prevent soiling of the seat and to allow room for wiping oneself after defecation. A distance of less than about 2 inches, preferably about 1.5 inches has been found to provide the desired results.

The hinge means employed for attaching the seat 20, to the toilet 140, is not critical and any conventional hinge can be used. Obviously, a toilet seat cover can be employed if so desired. Also the material from which the seat is constructed is not critical and any of the commonly employed materials such as wood or wood compositions, plastics or even metals can be used.

It should be noted that the term concave has been employed herein to describe the curvature of the toilet seat of the invention. It should be apparent that the term is not intended to describe the incidental concavature which exists in conventional toilet seats of the type shown in FIG. 3. In this case, and in the case of the seat of FIG. 5, the surface of the seat at the region, that is the region immediately adjacent the seat opening is somewhat concave in configuration. However, the seats of FIG. 3 and FIG. 5 are not both considered to be categorizable as concave. The principle support surface of the seat of FIG. 3 is itself substantially planar or convex, so that both a concave and convex support configuration is present. By way of contrast, the thigh and buttocks supporting surfaces of the seat 20, as seen in FIGS. 5 and 11, for example, are concave and the overall support configuration in the buttocks support region, as seen in FIG. 5, is concave.

What is claimed is:

1. In association with a conventional toilet bowl having a horizontal upper face located the normal chair-height distance above floor level: an improved toilet seat connected to the bowl to overlie the bowl upper face;

the upper surface of said seat including a steeply-sloped dishd upper rear surface area for supportive engagement with the user's pelvis, two shallowly-sloped dishd upper side surface areas extending

forwardly upper the rear surface area for supportive engagement with the user's buttocks, and two generally flat horizontal upper front surface areas extending forwardly and inwardly from the side surface areas for supportive engagement with the user's thighs.

2. The seat of claim 1 wherein the side and front upper surface areas are on approximately the same horizontal level so that the user's thighs extend generally horizontally.

3. The seat of claim 1 wherein the rear surface area extends an appreciable distance above the side surface areas whereby the rear surface area exerts an extensive stress urging the user to bend forwardly at the waist.

4. The seat of claim 1 wherein the rear upper surface area has a slope angle of about 55°, and the upper side surface areas have slope angles of about 20°.

5. The seat of claim 1 wherein the thigh-supporting surfaces, measured from the inner edge of the seat to the outer edge, are about 5 inches in the horizontal direction; said thigh-supporting surfaces being spaced apart about 3 inches.

6. The seat of claim 1 wherein the upper rear surface area has a front-to-rear dimension, measured in a horizontal direction, of about one and one-half inches.

7. The seat of claim 1 wherein the front outer edges of the seat conform generally to the plan contour of the bowl to provide substantially no seat overhang; the thigh-supporting surfaces extending inwardly from the seat outer edge for a distance of about 5 inches; said thigh-supporting surfaces being spaced apart about 3 inches.

8. An improved toilet seat connectable to a conventional toilet bowl to overlie the bowl upper face; said seat being located on a generally horizontal level, and being generally u-shaped in top plan outline;

the upper surface of said seat including a steeply-sloped dishd upper rear surface area for supportive engagement with the user's pelvis, two shallowly-sloped dishd upper side surface areas extending forwardly from the rear surface area for supportive engagement with the user's buttocks, and two generally flat horizontal upper front surface areas extending forwardly and inwardly from the side surface areas for supportive engagement with the user's thighs; said front surface areas being spaced apart about 3 inches, and said front surface areas having inner surface zones that extend considerable distances rearwardly from the front edge of the seat to provide extensive supportive areas for the user's thighs.

9. The seat of claim 8 wherein the rear upper surface area has a slope angle of about 55°, and the upper side surface areas of about 20°; the upper rear surface area having a front-to-rear dimension, measured in a horizontal direction, of about 1½ inches; the space circumscribed by the aforementioned upper surface areas being a generally circular opening having a radius of about 4½ inches; and said upper front surface areas extending forwardly of said circular opening for a distance of about 4 inches.

10. The seat of claim 9 wherein the steeply-sloped surface area has slope angle of about 55°, and the shallowly-sloped surface areas have slope angles of about 20°.

7

11. The seat of claim 10 wherein the thigh-supporting surfaces measure about 5 inches from the seat inner edge to the seat outer edge.

12. A toilet seat for positioning a conventional bowl, said seat having an outer peripheral edge and an inner peripheral edge; the upper surface of the seat including a steeply-sloped dishd upper rear surface area extending from the seat outer edge to the seat inner edge for supportive engagement with the user's pelvis; two shallowly-sloped dishd upper side surface areas extending from the outer seat edge to the inner seat edge for sup-

8

portive engagement with the user's buttocks; and generally flat horizontal upper front surface areas extending rearwardly from the outer front seat edge to the inner seat edge for supportive engagement with the user's thighs.

13. The seat of claim 12 wherein the steeply-sloped rear surface area extends upwardly a further distance than the shallowly-sloped side surface areas, whereby the rear surface area urges the user to bend forwardly at the waist.

* * * * *

15

20

25

30

35

40

45

50

55

60

65

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,786,522 Dated January 22, 1974

Inventor(s) Alexander Kira, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 6, claim 1, line 1, after "forwardly" delete
"upper" and insert -- from --.

Signed and sealed this 14th day of May 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents