LINING TOILET TRAINING SEAT CHAMBERS

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Appl. No.: 10/367,003
Filed: Feb. 14, 2003

Publication Classification

Int. Cl. ................................. A47K 11/06
U.S. Cl. ................................. 4/484

ABSTRACT

A liner for a toilet training seat chamber and a method for manufacturing the liner are described. The liner has a cup-shaped body, sized to line a toilet training seat chamber. The material of the liner is a biodegradable and water-dispersible material. The liner allows for easy cleaning of the toilet training seat after use.
LINING TOILET TRAINING SEAT CHAMBERS

TECHNICAL FIELD

[0001] This invention relates to lining a toilet training seat.

BACKGROUND

[0002] When a child is being trained to use the toilet there is a need for the toilet to be located in a quickly accessible location. This has brought about the need for toilet training seats that can be moved to locations of easy accessibility. In order to do this the plumbing of a conventional toilet is replaced with a chamber that allows for the waste to be deposited temporarily. After use of the training toilet, the waste must be removed from the chamber and the chamber sanitized. This becomes a routine chore throughout the training cycle. Bowel movements can be particularly difficult to clean from the chamber walls.

[0003] Chamber liners have been developed to aid in the process of cleaning the training toilet. The chamber liners are placed in the chamber prior to use. Once the training toilet has been used the liner is removed and deposited in the trash. The chamber is cleaned, and a new liner is placed in the chamber for the next use of the toilet training seat. Along with chamber liners, others have suggested lining chamber pots with standard coffee filters.

SUMMARY

[0004] The present invention relates to a liner and a method for lining a toilet training seat chamber that is disposable by means of a toilet. In one aspect, the invention features a liner for a toilet training seat chamber. The liner has a cup-shaped body sized to line a toilet training seat chamber and consisting essentially of a biodegradable, flushable, and water dispersible material.

[0005] By “water dispersible” we mean that the material breaks apart in the presence of excess water, for example, the amount found in the conventional flushable toilet. The material must also be biodegradable. By “biodegradable” we mean that the items are capable of being broken down by action of living things. By “flushable”: we mean the item is capable of passing through a throat of a standard toilet without clogging, and is relative to the size, thickness, and weight of the material. Such a material can be advantageously introduced to conventional septic systems and dispensed without clogging or backing up the septic system.

[0006] Embodiments may include one or more of the following. The material may be made of a non-woven substrate with an applied stiffening agent. Starch could be one material used as a stiffening agent. The material may have a thickness when dry of between about 450 and 700 microns. The material may have a wet tensile strength between about 100 and 350 Newton per meter. The material may have a dry tensile strength between about 250 and 800 Newton per meter. The material may have a basis weight between about 50 to 70 grams per meter. The material may also break apart in the turbulent water or excess water. With a flush tube test the first break may occur between about 5 and 9 turns. The many break test may occur between about 12 and 18 turns. The material is dispersible in water and will break apart if subjected to excess water (the amount of water typically found in a standard toilet 1 1/2 gallons).

[0007] In another aspect, the invention features a body that is dimensionally stable and has generally smooth perimeter walls. The liner bottom may define non-planer features. The body may have a ridge running around a perimeter wall of the cup-shaped body. The ridge may also be disposed near a midway point between upper and lower edges of the wall. The body may have an unpleated distal rim. The rim may be substantially circular and extending outwardly from an upper edge of a peripheral wall of the body. The body may have a graspable tab extending from one side of a perimeter wall.

[0008] In another embodiment an aesthetic pattern can be printed on the liner. Dyeing the material of the liner can be used to create a pattern on the liner. The material can be dyed with a color reacting dye that changes color when exposed to different environments.

[0009] Implementations in making the liner may include one or more other features. The forming process could involve pressing the material into the cup-shaped body otherwise known as cold forming. The process could include trimming excess material from the cup-shaped body after forming. The process could also include applying a stiffening agent to the material. The stiffening agent may be applied by spraying the agent as a wet dispersion onto the material, and then drying the stiffener on the material after or during the forming of the material.

[0010] Various embodiment of the present invention can have the advantage of being disposable in a conventional toilet without affecting the performance of standard sewer and septic systems, even in rural areas. Once the liner is deposited in the toilet, the excess water of the toilet starts to break down the liner. The liner can safely be flushed down the toilet without clogging. Along with the ability to flush the liner down conventional sewer systems, the liner is also biodegradable. This provides the advantage of disposal in toilets that use septic systems to dispose of wastewater.

[0011] The shape and structure of various embodiments of the invention can prevent waste from being deposited between the liner and the toilet training seat chamber. In many cases, the user can grip the liner and remove the liner without coming into contact with the portions of the liner that are saturated with waste.

[0012] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description, drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0013] FIG. 1 is a perspective view of a liner and a toilet training seat.

[0014] FIG. 2 is a perspective, front view of the toilet training seat chamber liner.

[0015] FIG. 3 is a perspective, bottom view of the toilet training seat chamber liner.

[0016] FIG. 4 sequentially illustrates a method of making the chamber liners. Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0017] A toilet training seat liner 10 with a toilet training seat 12 is shown in FIG. 1. The toilet training seat 12...
includes a body or support structure 14, a seat 16, and a chamber 18. The body 14 supports a seat 12 that houses a chamber 18. The liner 10 is sized to fit within the chamber 18. The liner 10 is placed into the chamber 18 through an opening 20 in the seat 16. The opening 20 also allows for human waste to be deposited into the chamber 18 when a person uses the toilet training seat. After use, the liner 10 and the contents within the liner are removed from the chamber 18. The liner 10 and the contents are deposited into a toilet. The chamber is then cleaned if necessary and a new liner is inserted into the chamber.

[0018] The liner 10 is not limited to use of the above toilet training seats 12. The liner 10 can be used with other types of toilet training seats. For example, some toilet training seats have removable chambers. After use these training seats allow the chamber containing the liner and contents to be removed and dumped into a toilet. The chamber is then cleaned and a new liner is inserted into the chamber. The chamber is then connected back to the training seat, and the seat is ready for use.

[0019] Referring to FIG. 2, toilet training seat liner 10 is essentially a cup-shaped body with a lateral wall 22 and a bottom 24. The bottom 24 has a diameter of about 10 centimeters (cm) and is sized to fit within a chamber 18 of a toilet training seat 12. The wall 22 extends upward about 6 cm and is sized to fit within the chamber. An opening 26 of about 12 cm in diameter at the top of the liner allows for human waste to be deposited within the liner and is sized to fit the chamber opening 20.

[0020] The cup shaped body of the liner could be constructed in a variety of shapes and size. For example, the shape of the liner could be oval, square, or any shape required to fit within the chamber of a toilet training seat.

[0021] In one embodiment the liner 10 can be used without a toilet training seat. The walls 22 provide enough stability that the liner 10 can be used without the support of the toilet training seat chamber 18.

[0022] The walls 22 of the liner are preferably unplated and have a smooth texture. This provides for efficient stacking and prevents waste from sticking to the walls of the liner. The absence of pleats allow the liner to fit snugly within the chamber. In addition, the wall 22 has an outwardly slope to allow the top of the walls to fit snugly within the top of the chamber. This prevents any solid deposits from falling between the chamber 18 and the liner 10. A ridge 28 or other structural discontinuity can be added to the wall 22 to aid in sloping the walls 22 outward and to provide structural support. An outwardly extending rim 30 is provided around the top of the liner 10. This also helps direct solid deposits into the liner 10 and prevents solid deposits from coming into contact with the chamber 18 inner surfaces.

[0023] The rim 30 can have an additional purpose of providing a graspable area of the liner 10 for cleaning the chamber 18 after it has been used. In the illustrated embodiment, a tab 32 extends from the rim 30 of the liner 10. This tab 32 enables the user to grasp the liner 10 without coming into contact with the portion of the liner that has become saturated with liquid waste after use. The user can then grasp the tab 32 to remove the liner 10 from the chamber 18 and deposit it in a flushable toilet. A liner 10 with a single tab 30 is shown in FIG. 2. The liner 10 can be constructed with multiple tabs to provide the user with additional area to grasp the liner.

[0024] Referring to FIG. 3, a perspective, bottom view of the liner is shown. From this angle the bottom surface 24 of the liner 10 is visible. Indentations 34 on the bottom surface 24 help to prevent a suction barrier from forming between a waste-saturated liner 10 and the bottom of the chamber 18. The prevention of a suction barrier aids the user when removing a liner 10 filled with waste. The indentations 34 are shown as oval shaped, but can be of other shapes.

[0025] Since the user disposes of the used liner 10 into a flushable toilet, the material characteristics of the liner 10 are important. The liner must not only be flushable but should also be water-dispersible and biodegradable. A biodegradable material must have no harmful chemicals or additives that would inhibit the growth of the bacteria that would be found in an active septic system (i.e. bleach). A flushable material must also be of a size and type of material that can be place in the toilet and transferred to the septic system.

[0026] The thickness of the sheet of material when dry is preferably between about 450 to about 700 microns. The material is a hydroentangled, non-woven fabric. The basis weight of the material is preferably between about 50 to about 70 gram/meter². The tensile strength of the material dramatically decreases in the presence of excess amounts of water. In this specific embodiment, the material has a dry tensile strength along the machine direction of 570 Newton/meter (N/m) and along the cross direction 270 N/m. When the material is saturated with water the tensile strength decreases in the machine direction to 160 N/m and along the cross direction to 100 N/m. Suitable materials should have a dry tensile strength between about 100 to about 350 N/m and a wet tensile strength between about 250 to about 800 N/m. When a flush tube test is conducted suitable material should have a first break between about 5 and 9 turns. The material should also have a many break between about 12 and 18 turns. An example of a material with these characteristics is the Hydraspun grade 8555 available from Ahlstrom Fibercomposites.

[0027] A stiffening agent can also be applied to the material to give the liner 10 greater structural stability. The stiffening agent must be an agent that breaks down in water to allow the liner 10 to be water-dispersible. Starch is an example of a stiffening agent that adds to the structural stability and is also water-soluble.

[0028] In one embodiment an aesthetic pattern can be printed on the liner 10. The liner material can be treated with dye to create patterns on the liner 10. Additionally, the liner can be treated with a color changing dye. A color changing dye changes color when exposed to different environments. The color changing dye can be used to create a design on the liner 10 in the presence of water or urine. In another aspect the liner 10 can be treated with chemicals to produce a scented liner or provide a deodorizer. The chemicals used to produce a scent can also be chemicals that react to changes in the environment. Similarly the chemical produces a scent in the presence of water or urine.

[0029] FIG. 4 depicts the process involved in constructing the liner. The sequence of stages used to manufacture the
liner are not limited to the exact sequence depicted in FIG. 4. Stage 1 involves providing a sheet of water-dispersible and biodegradable material 40 with a dry thickness 570 microns and basis weight of 55 grams/meter². In Stage 2, a wet stiffening agent 42 is applied with sprayers 44 to the dry material 40. Stage 3 involves pressing the sheet of material 40 into a cup-shape with die 46. A cutter 48 in Stage 4 then trims the edges of the cup-shaped material 40. Finally at Stage 5 the cup-shaped material 40 is dried with blowers 50 to form a toilet training chamber liner 10.

[0030] Possible variations in the stages of manufacturing the liner 10 could include but are not limited to the following variations. One variation would be to remove the stage of applying a wet stiffening agent. In this variation the liner 10 could be made without adding an additional stiffening agent. Also within this variation the stiffening agent could be applied in a variety of methods that would include applying a dry stiffening agent. Another variation of the manufacturing process would be to cut the material prior to pressing the material.

[0031] A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1. A liner for a toilet training seat chamber, the liner comprising a cup-shaped body, sized to line a toilet training seat chamber and consisting essentially of a biodegradable and water dispersible material.

2. The liner of claim 1, wherein the material has a thickness when dry of between about 450 and 700 microns.

3. The liner of claim 1, wherein the material has a wet tensile strength between about 100 and 350 Newton per meter.

4. The liner of claim 1, wherein the material has a dry tensile strength between about 250 and 800 Newton per meter.

5. The liner of claim 1, wherein the material has a basis weight between about 50 to 70 grams per meter.

6. The liner of claim 1, wherein the material has a flush tube test-first break between about 5 and 9 turns.

7. The liner of claim 1, wherein the material has a flush tube test-many break between about 12 and 18 turns.

8. The liner of claim 1, wherein the body is dimensionally stable and has generally smooth perimeter walls.

9. The liner of claim 1 wherein the liner bottom defines non-planer features.

10. The liner of claim 1, wherein the body has a ridge running around a perimeter wall of the cup-shaped body.

11. The liner of claim 10, wherein the ridge is disposed near a midpoint between upper and lower edges of the wall.

12. The liner of claim 1, wherein the material comprises a non-woven substrate with an applied stiffening agent.

13. The liner of claim 12, wherein the stiffening agent comprises starch.

14. The liner of claim 1, wherein the body has an unpleated distal rim.

15. The liner of claim 14, wherein the rim is substantially circular.

16. The liner of claim 14 wherein the rim forms a lip extending outwardly from an upper edge of a peripheral wall of the body.

17. The liner of claim 1 wherein the body has a graspable tab extending from one side of a perimeter wall.

18. The liner of claim 1 wherein the body has perimeter walls with a height of about ½ to 5 inches.

19. The liner of claim 1 wherein the body has a bottom diameter of about 5 to 7 inches.

20. The liner of claim 1 wherein the body has a total surface area of about 10 to 450 cubic inches.

21. A method for making a child's potty training chamber liner, the method comprising of:

   providing a sheet of water dispersible and biodegradable material and

   forming the material into a cup-shaped body sized to line a toilet training seat chamber.

22. The method of claim 21 wherein the forming process involves pressing the material into the cup-shaped body.

23. The method of claim 21 including trimming excess material from the cup-shaped body after forming.

24. The method of claim 21 further comprising applying a stiffening agent to the material.

25. The method of claim 24 wherein the stiffening agent is applied by spraying the agent as a wet dispersion onto the material, and then drying the stiffener on the material after the material has been formed.

26. The method of claim 21 further comprising: printing a pattern on the material.

27. The method of claim 26 wherein the pattern is produced from a color changing dye.

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