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(54) **A DEVICE FOR WASTE DISPOSAL**

(57) Some examples of a refillable plastic tube holder device for a waste storage device. The refillable plastic tube holder device comprises a base; a first tubular projection arranged to extend from the base in a substantially perpendicular direction and to define a first cavity of the device; a second tubular projection arranged to extend from the base and disposed in the first cavity of the device; and one or more resilient holders positioned along a contour of the first tubular projection and arranged to project towards the second tubular projection. In use, a plastic tube is inserted between the first tubular projection and the second tubular projection within the first cavity so that the one or more resilient holders holds the plastic tube in place inside the device and the second tubular projection function as a core of a refill holder for the plastic tube and as a guide to feed the plastic tube for waste collection.

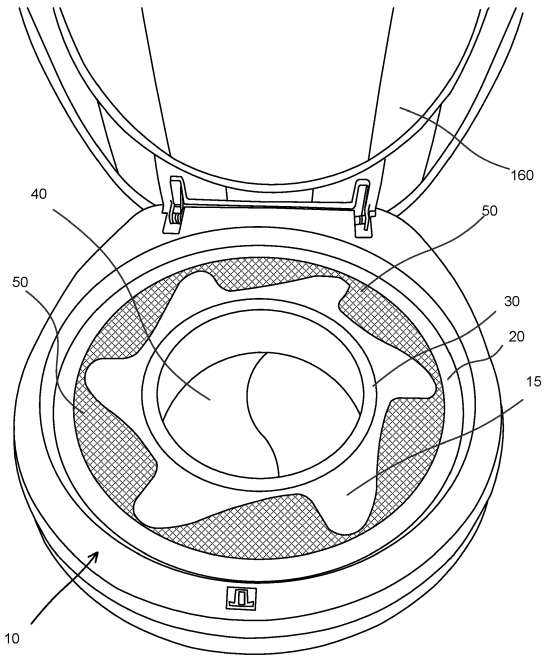


FIGURE 1

EP 3 984 916 A1

Description

[0001] The present disclosure relates to a device for waste disposal. In particular, but not exclusively, the present disclosure relates to a refillable plastic tube holder device for a waste storage device. Aspects of the invention relate to a refillable plastic tube holder device, a portable disposal device and a waste storage device.

BACKGROUND

[0002] In general, a waste bin used for disposal of all kind of waste, particularly for disposal of baby and/or adult diaper and/or other personal waste material has a container with an opening which can be opened and closed and a lid of the container and a mechanism to seal a waste bag. For use with such waste bin, a waste bag can be individually replaced by users or be a part of a replaceable cartridge of the waste bag. For example, the users can place the cartridge of the waste bag in a specific location in the container so that a waste bag can be manually or automatically accessed for waste disposal. One known example of the waste bin provides a mechanism to hold the waste bag during usage so that a user can manually twist the waste bag to seal it between usages. In this case, replacing individual waste bag is not desirable. Instead, a replaceable cartridge of the waste bag has been provided for such waste bin. However, one drawback of using the replaceable cartridge is that the user is unable to tell how much of the waste bag has been used and how much of the waste bag is left for future usages. Also, once used the cartridges are unusable, creating further environmentally unfriendly waste.

[0003] It is an aim of the present invention to address disadvantages associated with the prior art.

[0004] The examples described herein are not limited to examples which solve problems mentioned in this background section.

SUMMARY

[0005] Examples of preferred aspects and embodiments of the invention are as set out in the accompanying independent and dependent claims.

[0006] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

[0007] According to an aspect of the invention, there is provided a refillable plastic tube holder device for a waste storage device. The refillable plastic tube holder device comprises a base; a first tubular projection arranged to extend from the base in a substantially perpendicular direction and to define a first cavity of the device; a second tubular projection arranged to extend from the base and disposed in the first cavity of the device; and one or more resilient holders positioned along a contour of the first tubular projection and arranged to project towards the second tubular projection, wherein, in use, a plastic tube is inserted between the first tubular projection and the second tubular projection within the first cavity so that the one or more resilient holders holds the plastic tube in place inside the device and the second tubular projection function as a core of a refill holder for the plastic tube and as a guide to feed the plastic tube for waste collection.

[0008] In this way, the holder device can receive a continuous length of flexible, substantially non-resilient plastic tube in its given space in an environmentally friendly manner. The user can replace the plastic tube without having to buy a separate cartridge of plastic tube. It is also easy to determine when further plastic tube needs to be inserted for a refill.

[0009] In some preferred example embodiments, the second tubular projection is centrally located in the first cavity. The space between the first tubular projection and the second tubular projection defines a storage space of the plastic tube. In this way, the plastic tube with different opening sizes can be accommodated. Also, significant length of the plastic tube can be accommodated. The second tubular projection acts as a core of a refill holder for the plastic tube such that the second tubular projection is inserted to the plastic hoses and ensures that maximum amount of the plastic tube can be inserted in the portable disposal device. The size of the opening of the plastic tube is bigger than the size of the opening of the second tubular projection.

[0010] In some preferred example embodiments, the second tubular projection comprises one or more detachable pushing plates disposed in the second tubular projection. In use, the plastic tube is guided into the second tubular projection through the pushing plates. The pushing plates ensure that the waste is securely disposed, and at least temporarily sealed and reduces leaking of the unwanted smell of the waste. The pushing plates are detachable so that the refillable plastic tube holder device can be adapted for a particular usage or a particular type of the waste being collected in the plastic tube.

[0011] In some preferred example embodiments, the one or more detachable pushing plates are shaped collectively to reflect the shape of the cross-section of the second tubular projection so that when the pushing plates are closed the second tubular projection is substantially sealed. In this way, the pushing plates ensure that the plastic hose is at least temporarily sealed and reduce leaking of the unwanted smell of the waste.

[0012] In some preferred example embodiments, the second tubular projection has a substantially circular cross-section. In this way, any damage that may be caused by friction against the plastic hose is minimised.

[0013] In some preferred example embodiments, the first tubular projection has a substantially circular cross-section. In this way, any damage that may be caused by friction against the plastic hose is minimised.

[0014] In some preferred example embodiments, the one or more resilient holders are thin pliable material. In this way, the plastic hoses are securely placed the refillable plastic tube holder device. Also, the users are able to insert the plastic hose with ease.

[0015] In some preferred example embodiments, the one or more resilient holders are aligned in substantially the same plane. In this way, insertion of the plastic hose is easier.

[0016] In some preferred example embodiments, the one or more resilient holders are formed on the same sheet of pliable material. In this way the resilient holders can be manufactured easily. Consequently, the manufacturing of the refillable plastic tube holder device is also simpler.

[0017] According to a further aspect of the invention, there is provided a portable disposal device comprising the refillable plastic tube holder device as described in any one of the preceding paragraphs.

[0018] In some preferred example embodiments, the portable disposal device further comprises a housing wherein the refillable plastic tube holder device is located in the housing and the first tubular projection forms the inner wall of the housing; and a lid, the lid pivotably attached to the housing. The housing is mountable on a container for waste collection or used as an independent unit for waste collection.

[0019] In some preferred example embodiments, the portable disposal device is portable.

[0020] In some preferred example embodiments, the portable disposal device further comprises attachable means located at the back of the portable disposal device for fastening onto an object. In this way, the portable disposal device can be fastened to an object such as a side of bed so that the users can keep the portable disposal device in a close proximity during use.

[0021] According to a further aspect of the invention, there is provided a waste storage device comprising the refillable plastic tube holder device as described in any one of the preceding paragraphs.

[0022] According to a further aspect of the invention, there is provided a waste storage device comprising a container for defining a storage area for waste collection; and the portable disposal device as described in any one of the preceding paragraphs, wherein the portable disposal device is detachably mounted on top of the container.

[0023] In some preferred example embodiments, the housing of the portable disposal device is configured to snap fit into a receiving end of the container. In this way, the users can easily mount the portable disposal device on the container in a secure manner.

[0024] It will also be apparent to anyone of ordinary skill in the art, that some of the preferred features indicated above as preferable in the context of one of the aspects of the disclosed technology indicated may replace one or more preferred features of other ones of the preferred aspects of the disclosed technology. Such apparent combinations are not explicitly listed above under each such possible additional aspect for the sake of conciseness.

[0025] Other examples will become apparent from the following detailed description, which, when taken in conjunction with the drawings, illustrate by way of example the principles of the disclosed technology.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] One or more embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

FIG. 1 illustrates a diagram of a portable disposal device with a refillable plastic tube holder device from the top view;
FIG. 2 illustrates a diagram of a part of portable disposal device with a refillable plastic tube holder device from its bottom view;
FIG. 3 illustrates a diagram of a portable disposal device with a refillable plastic tube holder device;
FIG. 4 illustrates a diagram showing the back of a portable disposal device with a refillable plastic tube holder device;
FIG. 5 illustrates a diagram showing a portable disposal device with pushing plates removed;
FIG. 6 illustrates an exploded view of an example of the portable disposal device;
FIG. 7 illustrates a diagram of a portable disposal device and a container of a waste storage device;
FIG. 8 is a diagram of a waste storage device without a plastic hose;
FIG. 9 is a diagram of a waste storage device with a plastic hose;
FIG. 10 illustrates a diagram of a waste storage device;
FIG. 11 illustrates a diagram of a waste storage device with a lid and a removal door open; and
FIG. 12 illustrates a diagram of a waste storage device with a lid and a removal door closed.

[0027] The accompanying drawings illustrate various examples. The skilled person will appreciate that the illustrated element boundaries (e.g., boxes, groups of boxes, or other shapes) in the drawings represent one example of the boundaries. It may be that in some examples, one element may be designed as multiple elements or that multiple elements may be designed as one element. Common reference numerals are used throughout the figures, where appropriate, to indicate similar features.

DETAILED DESCRIPTION

[0028] The following description is made for the purpose of illustrating the general principles of the present technology and is not meant to limit the inventive con-

cepts claimed herein. As will be apparent to anyone of ordinary skill in the art, one or more or all of the particular features described herein in the context of one embodiment are also present in some other embodiment(s) and/or can be used in combination with other described features in various possible combinations and permutations in some other embodiment(s).

[0029] Figure 1 shows an example of a refillable plastic tube holder device 10 for a waste storage device 200. The refillable plastic tube holder device 10 is arranged for a waste disposal. The refillable plastic tube holder device 10 comprises a base 15, a first tubular projection 20 and a second tubular projection 30. The first tubular projection 20 is arranged to extend from the base 15 in a substantially perpendicular direction. The first tubular projection 20 and the base 15 define a first cavity of the refillable plastic tube holder device 10. The first tubular projection 20 forms a wall of the refillable plastic tube holder device 10. The first tubular projection 20 and the base 15 create a housing for the refillable plastic tube holder device 10.

[0030] The shape of the cross-section of the first tubular projection 20 may vary. For example, but not limited, the shape of the cross-section of the first tubular projection 20 is circular, oval, or polygon shape. In some embodiments, the first tubular projection 20 has a substantially circular cross-section. In some embodiments, the first tubular projection has a substantially circular cross-section.

[0031] In some embodiments, the shape of the cross-section of the first tubular projection 20 is substantially similar to the shape of the cross-section of the second tubular projection 30. In some embodiments, the shape of the cross-section of the first tubular projection 20 is different to the shape of the cross-section of the second tubular projection 30.

[0032] In use, a plastic tube or a plastic hose 400 (shown in Figures 9 and 11) is inserted between the first tubular projection 20 and the second tubular projection 30 within the first cavity. The plastic tube 400 is a continuous length of flexible, substantially non-resilient plastic tubing. This plastic tube 400 is compressible. The plastic tube 400 is used for waste collection. The plastic tube 400 can be tied at an end to create a plastic bag. The plastic bag is then used as a waste bag. In use, after an insertion of the plastic tube 400 the user can tie the end of the plastic tube 400 for it use. The user can then insert the tied end into an opening of the second tubular projection 30.

[0033] In some embodiments, the inserted plastic tube or the plastic hose is compressed plastic tube or compressed plastic hose. The compressed plastic tube is inserted between the first tubular projection 20 and the second tubular projection 30 within the first cavity. This allows the maximum amount of the plastic tube to be contained in the refillable plastic tube holder device 10. The size of the first tubular projection 20 and the size of the second tubular projection 30 determine the capacity of the plastic tube 400 that can be held in a holding cavity of the refillable plastic tube holder device 10. The holding cavity is defined by the base 15, the inner dimension of the first tubular projection 20 and the outer dimension of the second tubular projection 30. In use, the compressed plastic tube 400 is inserted in the holding cavity.

[0034] The second tubular projection 30 is arranged to extend from the base 15. The second tubular projection 30 is arranged to extend from the base 15 in substantially perpendicular direction. The second tubular projection is disposed in the first cavity of the refillable plastic tube holder device 10. In use, the second tubular projection 30 functions as a core of a refill holder for the plastic tube 400. In use, the second tubular projection 30 also functions as a guide to feed the plastic tube 400 for waste collection. The plastic tube 400 is fed into a second cavity. The second cavity is defined by the inner dimension of the second tubular projection 30. The refill holder allows storage of layers of plastic tube 400 in an organised manner. The plastic tube 400 may be compressed. In use, the second tubular projection 30 is inserted into the opening of the compressed plastic tube 400.

[0035] In some embodiments, the second tubular projection 30 is centrally located in the first cavity. The second tubular projection is positioned in the middle of the base 15. In use, the second tubular projection 30 is inserted into the opening of the plastic tube 400. Being centrally located in the first cavity ensures that the plastic tube with different opening sizes can be accommodated. Also, significant length of the plastic tube can be accommodated. The size of the opening of the plastic tube 400 is bigger than the size of the opening of the second tubular projection 30. The size of the opening of the second tubular projection 30 may vary.

[0036] The shape of the opening, the cross-section of the second tubular projection 30 may vary. For example, but not limited, the shape of the cross-section of the second tubular projection 30 is circular, oval, or polygon shape. In some embodiments, the second tubular projection 30 has a substantially circular cross-section.

[0037] In some embodiments, the shape of the cross-section of the second tubular projection 30 is substantially similar to the shape of the cross-section of the first tubular projection 20. In some embodiments, the shape of the cross-section of the second tubular projection 30 is different to the shape of the cross-section of the first tubular projection 20.

[0038] The refillable plastic tube holder device 10 further comprises one or more resilient holders 50. The one or more resilient holders 50 are positioned along a contour of the first tubular projection 20. The one or more resilient holders 50 are arranged to project towards the second tubular projection 30. The one or more resilient holders 50 are within the boundary created by the first tubular projection 20. The one or more resilient holders 50 are within the housing of the refillable plastic tube holder device 10. In use, the one or more resilient holders 50 holds the plastic tube 400 in place inside the refillable

plastic tube holder device 10.

[0039] In some embodiments, the one or more resilient holders 50 are aligned in substantially the same plane. In some embodiment, the one or more resilient holders are thin pliable material. In this way, the plastic tubes 400 are securely placed within the refillable plastic tube holder device 10. The one or more resilient holders 50 deform when the user puts pressure on them to refill the refillable plastic tube holder device 10 with the plastic tube 400 to allow insertion of the plastic tube 400. The one or more resilient holders 50 return to their respective positions and shapes when no pressure has been applied to them, holding the inserted plastic tubes 400 in place.

[0040] In some embodiments, the one or more resilient holders 50 are formed on the same sheet of pliable material. This makes the manufacturing of the one or more resilient holders 50 more efficient for the one or more resilient holders 50 can to be cut from the sheet of pliable material.

[0041] The refillable plastic tube holder device 10 further comprises one or more detachable pushing plates 40. The second tubular projection 30 comprises the one or more detachable pushing plates 40. The one or more detachable pushing plates 40 is disposed in the second tubular projection 30. The one or more detachable pushing plates 40 is disposed in the second cavity formed by the second tubular projection 30.

[0042] In use, the plastic tube 400 is guided into the second tubular projection 30 through the one or more pushing plates 40. The one or more pushing plates 40 ensure that the waste is securely disposed and collected avoiding spreading of bad odour. The one or more pushing plates 40 are particularly useful when the waste has bad odour, such as diapers and food wastes. In use, the user can push through the one or more pushing plates 40 to insert empty plastic tube for use a waste bag. The one or more pushing plates 40 closes automatically. The pushing plates 40 are biasedly attached to shut automatically when no pressure is applied. One or more springs 44 (shown in Figure 5) bias the pushing plates 40. In use, the user puts the rubbish through the one or more pushing plates 40 for waste collection. The weight of the rubbish may automatically open the one or more pushing plates 40 for disposal. The one or more pushing plates 40 return to their original, default positions when a pressure is not applied to keep them open.

[0043] Figure 2 shows a part of the refillable plastic tube holder device 10 from a bottom view. The size of the refillable plastic tube holder device 10 varies. The diagram shows a user holding an example refillable plastic tube holder device 10. An example of a size of the refillable plastic tube holder device 10 relative to a user's hand can be seen in the diagram. The pushing plates 40 are attached to the refillable plastic tube holder device 10 by a plurality of fastening means. In some embodiments, the pushing plates 40 are attached to the base 15 of the refillable plastic tube holder device 10 by a plurality of fastening means. In some embodiments, the pushing plates 40 are attached to a housing of a portable disposal device 100. For example, but not limited, the plurality of fastening means is a plurality of screws 42 (as shown in Figures 2 and 5). These pushing plates 40 can be detached from the device by removing the plurality of fastening means. In some embodiments, the plurality of screws 42 are removed to remove the pushing plates 40. The one or more detachable pushing plates are removed completely. If the pushing plates 40 are detached, then the refillable plastic tube holder device 10 may be used as a part of general waste bin.

[0044] In some embodiments, the one or more detachable pushing plates 40 are shaped collectively to reflect the shape of the cross-section of the second tubular projection 30 so that when the one or more detachable pushing plates 40 are closed the second tubular projection 30 is substantially sealed. In some embodiment, if there are more than one pushing plates 40, when all the pushing plates 40 are in the closed position, the shape the pushing plates 40 formed is substantially the same as the shape of the cross-section (opening) of the second tubular projection 30. The one or more pushing plates 40 may have different shapes. In some embodiment, the one or more pushing plates 40 are S-shaped. An edge of the one or more pushing plates 40 are S-shaped. In use, the edge of the one or more pushing plates fit together.

[0045] Figures 3 and 6 show a portable disposal device 100 comprising the refillable plastic tube holder device 10. The portable disposal device 100 is arranged for a waste disposal. The portable disposal device 100 comprises a housing 101. The refillable plastic tube holder device 10 is located in the housing 101 and the first tubular projection 30 forms the inner wall of the housing 101. In some embodiments, the first tubular projection 30 integrally forms the housing of the portable disposal device 100. In some embodiments, the refillable plastic tube holder device 10 is an integral part of the portable disposal device 100. The portable disposal device 100 further comprises a lid 160. The lid 160 is pivotably attached to the housing 101 of the portable disposal device 100. The lid is pivotably attached to a first body 101a or a second body 101b of the housing 101. In some embodiments, the lid 160 comprises a push to open mechanism. The lid 160 is arranged to open and close by pushing on the lid 160 on an end distal to the pivotably attached end in a substantially closed position. In some embodiments, the housing 101 is mountable on a container for waste collection. In some embodiments, the housing 101 supports use of the portable disposal device 100 as an independent unit for waste collection.

[0046] Figure 4 shows the portable disposal device 100 comprises one or more attachable means 111 located at the back of the portable disposal device 100 for fastening onto an object. The one or more attachable means allow the portable disposal device 100 to be affixed to protruding ledges such as, but not limited to, the sides of a bed. In this way, the portable disposal device 100 is place at the most convenient location for its use. In some embod-

iments, the one or more attachable means is hooks or clips.

[0047] In some embodiments, the one or more resilient holders 50 are positioned around the rim of the portable disposal device 100. The one or more resilient holders 50 are thin flaps. The one or more resilient holders 50 are aligned in the same plane and integrally formed. An outer boundary of the one or more resilient holders 50 matches the shape of the housing 101 of the portable disposal device 100, such that when manufactured the sheet comprising the one or more resilient holders 50 are placed between a flange 102 and the first tubular projection 20. The one or more resilient holders 50 located between the lid 160 and the housing 101 of the portable disposal device 100.

[0048] Figure 5 shows the portable disposal device 100 from a bottom view. Figure 5 shows an example of, but not limited to, the pushing plates 40 that are attachable to the portable disposal device 100 by a plurality of fastening means. The pushing plates 40 is attached to the base 15 of the refillable plastic tube holder device 10. The base 15 of the refillable plastic tube holder device 10 forms a part of the housing 101 of the portable disposal device 100. The plurality of fastening means is, for example but not limited to, a plurality of screws 42. These pushing plates 40 is detachable from the portable disposal device 100 by removing the plurality of fastening means. In some embodiments, the plurality of screws 42 are removed to remove the pushing plates 40. The one or more detachable pushing plates 40 is removed completely. If the pushing plates are detached, then the portable disposal device 100 may be used as a part of general waste bin. Each of the one or more detachable pushing plates 40 are biased by one or more springs 44 so that it is in a closed position by default. In use, the pushing plates 40 returns to the closed position when a pressure is not applied.

[0049] Figure 6 shows an exploded view of an example of the portable disposal device 100. The one or more attachable means 111 is not shown in Figure 6. The portable disposal device 100 comprises the refillable plastic tube holder device 10. The housing of the portable disposal device 100 comprises a first body 101a and a second body 101b. The first tubular projection 20 is integral to the first body 101a of the housing. The first tubular projection 20 defines an inner dimension of the housing 101. A plurality of fastener is arranged to secure the one or more resilient holders 50 to the first body 101a of the housing 101. The one or more resilient holders 50 are formed in a sheet of a material and are arranged to insert between the first body 101a and a flange 102 during assembly. The second body 101b defines an outer dimension the housing 101. The base 15 of the refillable plastic tube holder device 10 forms a part of the housing 101 of the portable disposal device 100. In some embodiments, the base 15 forms a part of a base of the housing 101. The pushing plates 40 are arranged to attach to the base 15. The fastening means are arranged to fit through the base 15 to secure the pushing plates 40 on the portable disposal device 100. A part of the second body 101b is arranged to insert into the first body 101a to form the housing 101. In some embodiments, the first tubular projection 20 is a separate component from the first body 101a of the housing 101. In some embodiments, the base 15 is integral to the housing 101. During an assembly, the components shown in Figure 6 are fitted together to form the portable disposal device 100,

[0050] Figure 7 shows the portable disposal device 100 comprising the refillable plastic tube holder device 10 and a container 280. Mounting the portable disposal device 100 on the container 280 forms a waste storage device 200. The housing 101 of the portable disposal device 100 is configured to snap fit 170 into a receiving end of the container 280.

[0051] Figures 8 and 10 show the waste storage device 200 without the plastic tube 400. Figures 9 and 11 show the waste storage device 200 with the plastic tube 400. The plastic tube 400 is arranged to be placed in the first cavity of the refillable plastic tube holder device 10. The plastic tube 400 is arranged to be placed between the first tubular projection 20 and the second tubular projection 30. The plastic tube 400 is arranged to be inserted into a holding cavity of the refillable plastic tube holder device 10. In some embodiments, the inserted plastic tube 400 is a compressed plastic tube. In use, the second tubular projection 30 functions as a core of a refill holder for the plastic tube 400. In use, the second tubular projection 30 also functions as a guide to feed the plastic tube 400 for waste collection. Figures 6 and 8 show that the plastic tube 400 has been fed through the second tubular projection 30 and dropped into the container 280 of the waste storage device 200.

[0052] Figures 10 and 11 show a waste storage device 200 comprising the refillable plastic tube holder device 10. The waste storage device 200 is arranged for a waste disposal. The waste storage device 200 comprises the portable disposal device 100. The waste storage device 200 further comprises a container 280 for defining a storage area for waste collection. The portable disposal device 100 is detachably mounted on top of the container 280. The waste storage device 200 further comprises a removal door 290. The removal door 290 is pivotably mounted on the container 280. The users can remove the collected waste by accessing the removal door 290.

[0053] Figure 12 shows a waste storage device 200 in a closed position. The lid 160 of the waste storage device 200 is closed. The lid 160 of the portable disposal device 100 acts as a lid for the waste storage device 200. The users can push open the lid 160 to access the waste storage device 200. The users can open the lid 160 to refill the plastic tube 400 and/or to dispose waste. The removal door 209 of the container 280 is closed to keep the collected waste hidden. This also prevent leakage of undesirable odour.

[0054] Any reference to 'an' item refers to one or more of those items. The term 'comprising' is used herein to

mean including the blocks or elements identified, but that such blocks or elements do not comprise an exclusive list and an apparatus may contain additional blocks or elements. Furthermore, the blocks, elements and operations are themselves not impliedly closed.

[0055] Where the description has explicitly disclosed in isolation some individual features, any apparent combination of two or more such features is considered also to be disclosed, to the extent that such features or combinations are apparent and capable of being carried out based on the present specification as a whole in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or combinations of features solve any problems disclosed herein. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention.

Claims

1. A refillable plastic tube holder device (10) for a waste storage device comprising

a base (15);
a first tubular projection (20) arranged to extend from the base in a substantially perpendicular direction and to define a first cavity of the device;
a second tubular projection (30) arranged to extend from the base and disposed in the first cavity of the device; and
one or more resilient holders (50) positioned along a contour of the first tubular projection and arranged to project towards the second tubular projection,

wherein, in use, a plastic tube (400) is inserted between the first tubular projection and the second tubular projection within the first cavity so that the one or more resilient holders holds the plastic tube in place inside the device and the second tubular projection function as a core of a refill holder for the plastic tube and as a guide to feed the plastic tube for waste collection.

2. The refillable plastic tube holder device (10) according to claim 1, wherein the second tubular projection (30) is centrally located in the first cavity.

3. The refillable plastic tube holder device (10) according to claim 1 or claim 2, wherein the second tubular projection (30) comprises one or more detachable pushing plates (40) disposed in the second tubular projection, wherein, in use, the plastic tube is guided into the second tubular projection through the one or more pushing plates.

4. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the one or more detachable pushing plates (40) are shaped collectively to reflect the shape of the cross-section of the second tubular projection (30) so that when the pushing plates are closed the second tubular projection is substantially sealed.

5. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the second tubular projection (30) has a substantially circular cross-section.

6. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the first tubular projection (20) has a substantially circular cross-section.

7. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the one or more resilient holders (50) are thin pliable material.

8. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the one or more resilient holders (50) are aligned in substantially the same plane.

9. The refillable plastic tube holder device (10) according to any one of preceding claims, wherein the one or more resilient holders (50) are formed on the same sheet of pliable material.

10. A portable disposal device (100) comprising the refillable plastic tube holder device (10) as claimed in any one of the claims 1 to 9.

11. The portable disposal device (100) according to claim 10 comprising:

a housing (101) wherein the refillable plastic tube holder device (10) is located in the housing and the first tubular projection (20) forms the inner wall of the housing; and
a lid (160), the lid pivotably attached to the housing;

wherein the housing is mountable on a container for waste collection or used as an independent unit for waste collection.

12. The portable disposal device (100) as claimed in claim 10 or claim 11 comprises one or more attachable means (111) located at the back of the portable disposal device for fastening onto an object.

13. A waste storage device (200) comprising the refillable plastic tube holder device (10) as claimed in claims 1 to 9.

14. A waste storage device (200) comprising

a container (280) for defining a storage area for waste collection; and
the portable disposal device (100) as claimed in any one of claims 10 to 12, wherein the portable disposal device is detachably mounted on top of the container.

15. The waste storage device (200) according to claim 14, wherein the housing (101) of the portable disposal device (100) is configured to snap fit into a receiving end of the container (280).

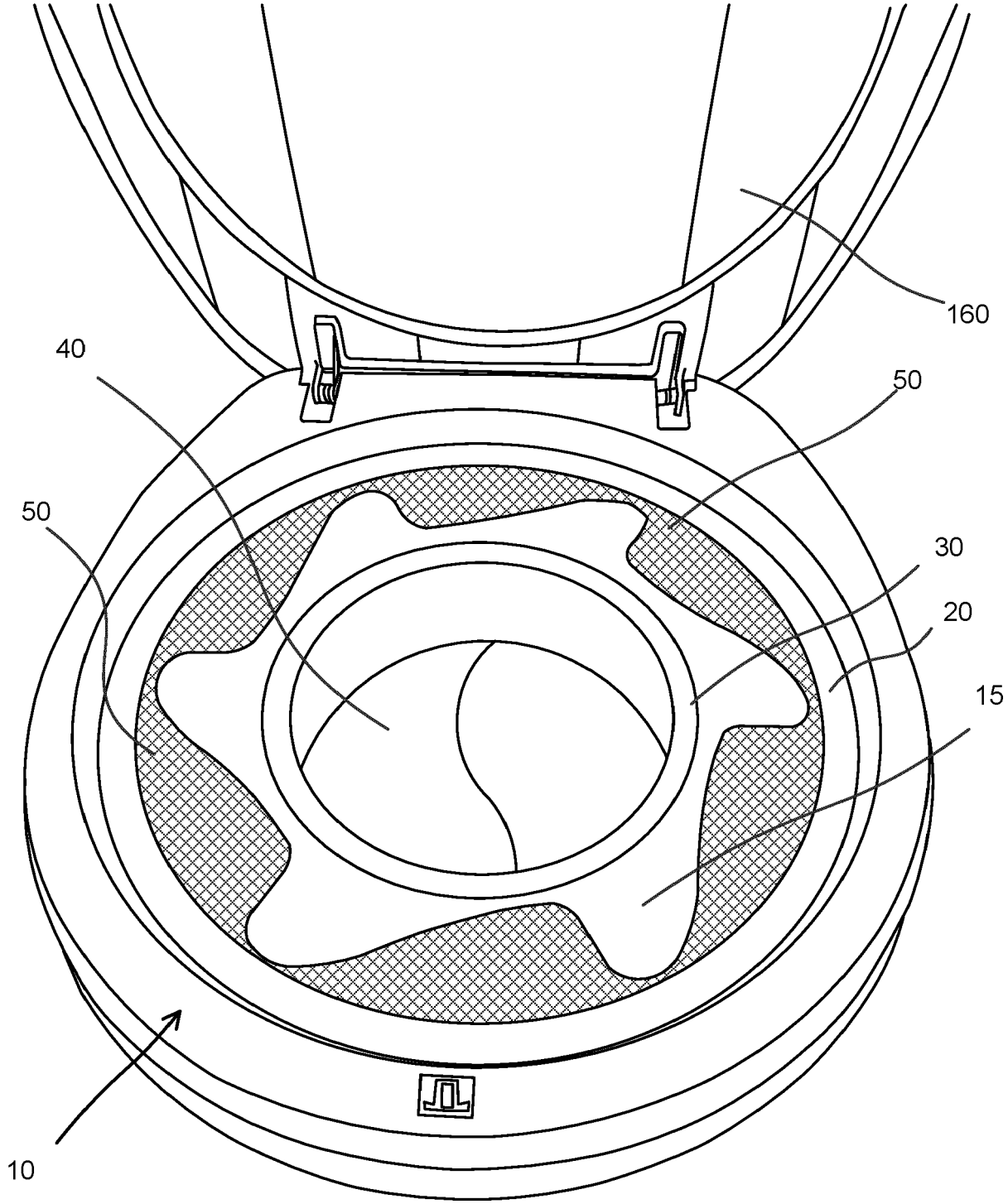


FIGURE 1

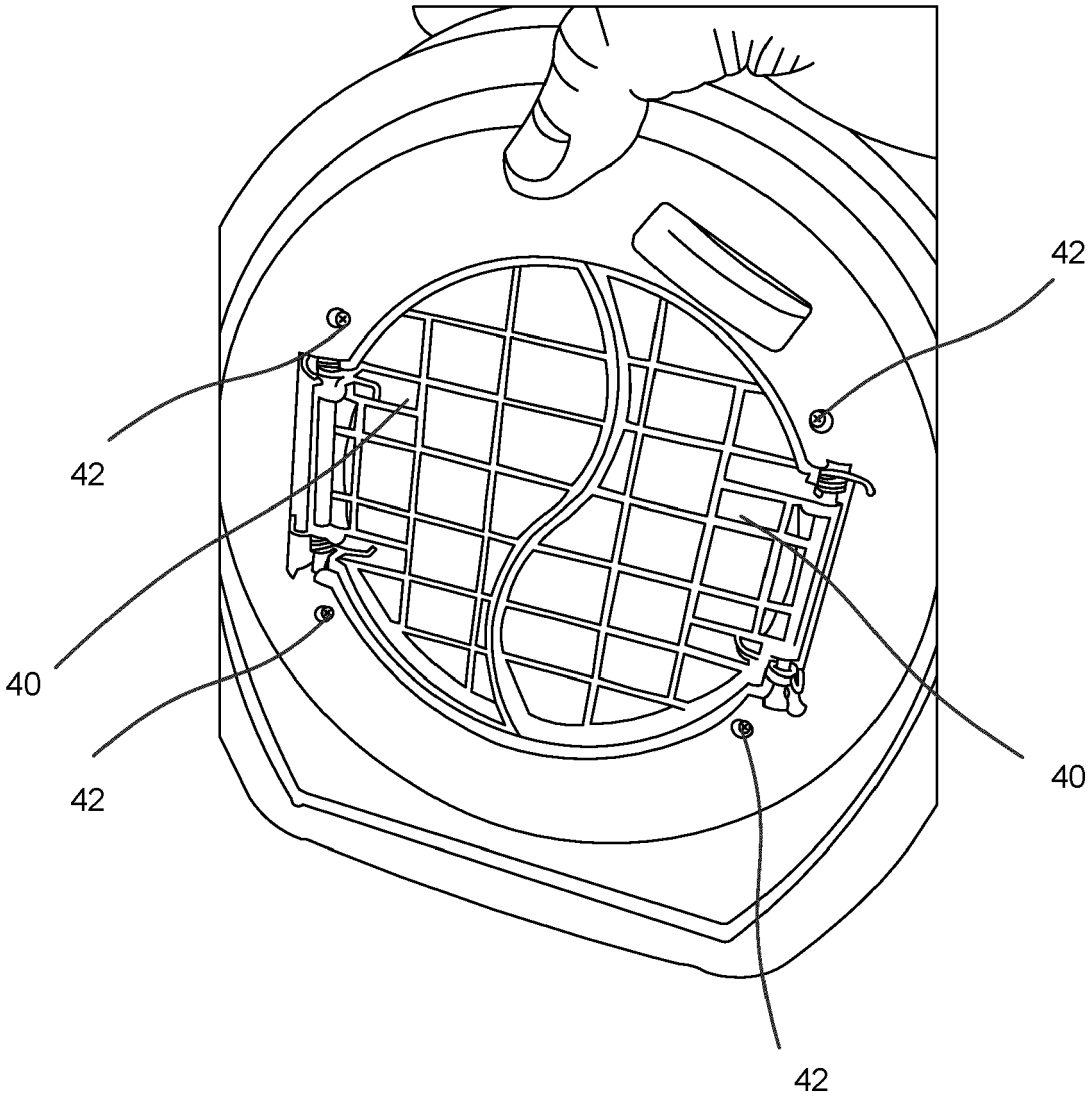


FIGURE 2

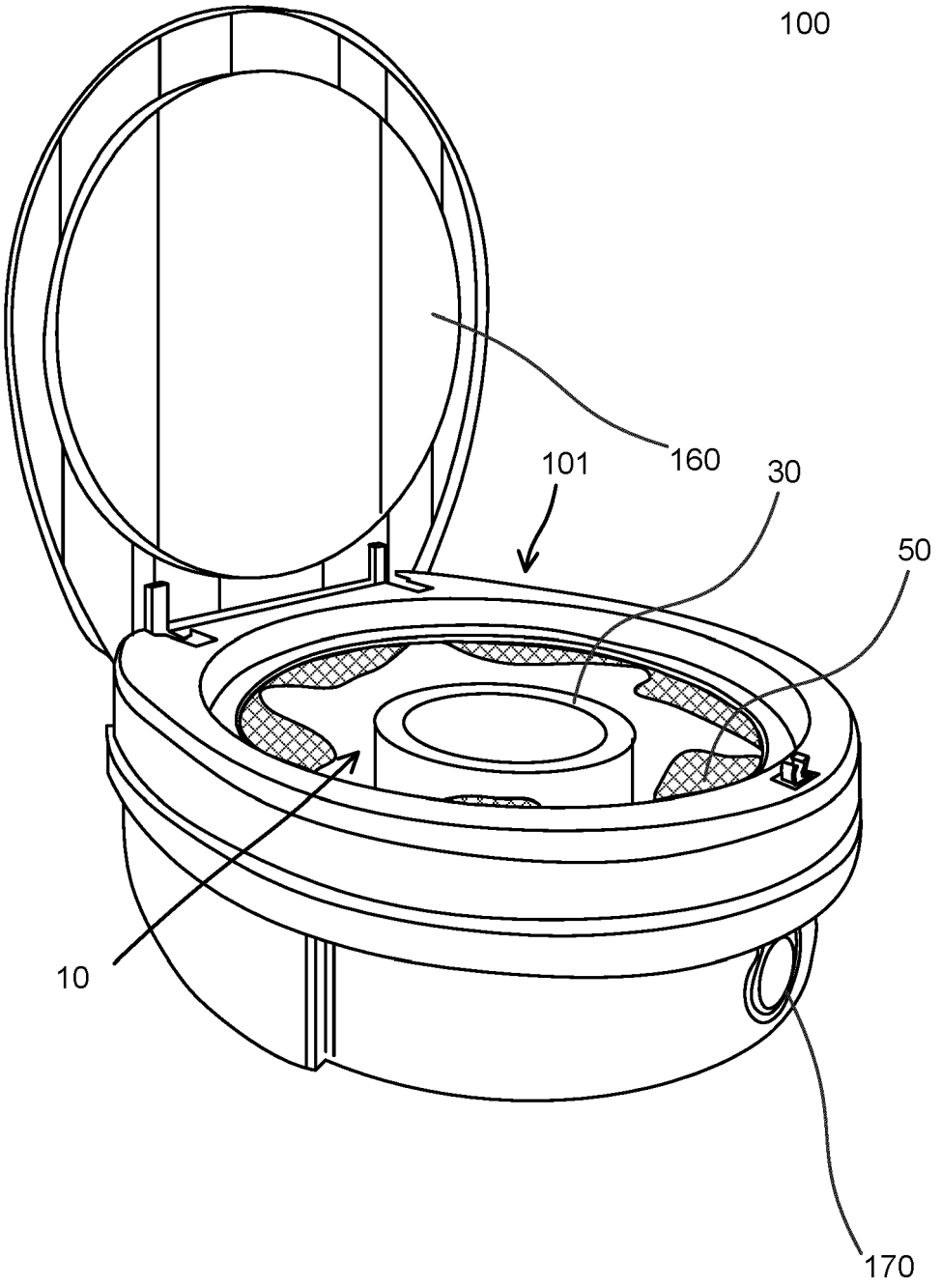


FIGURE 3

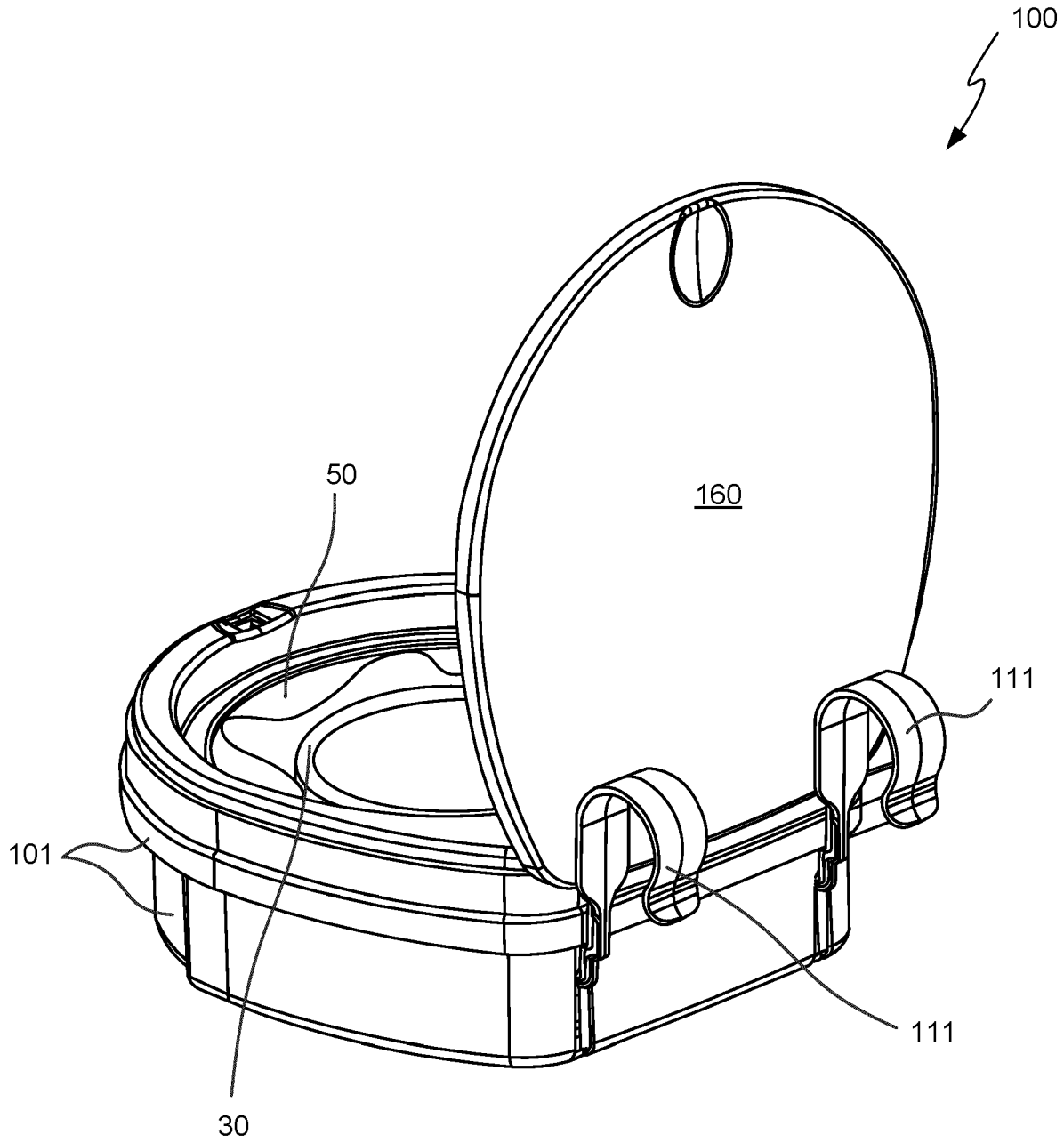
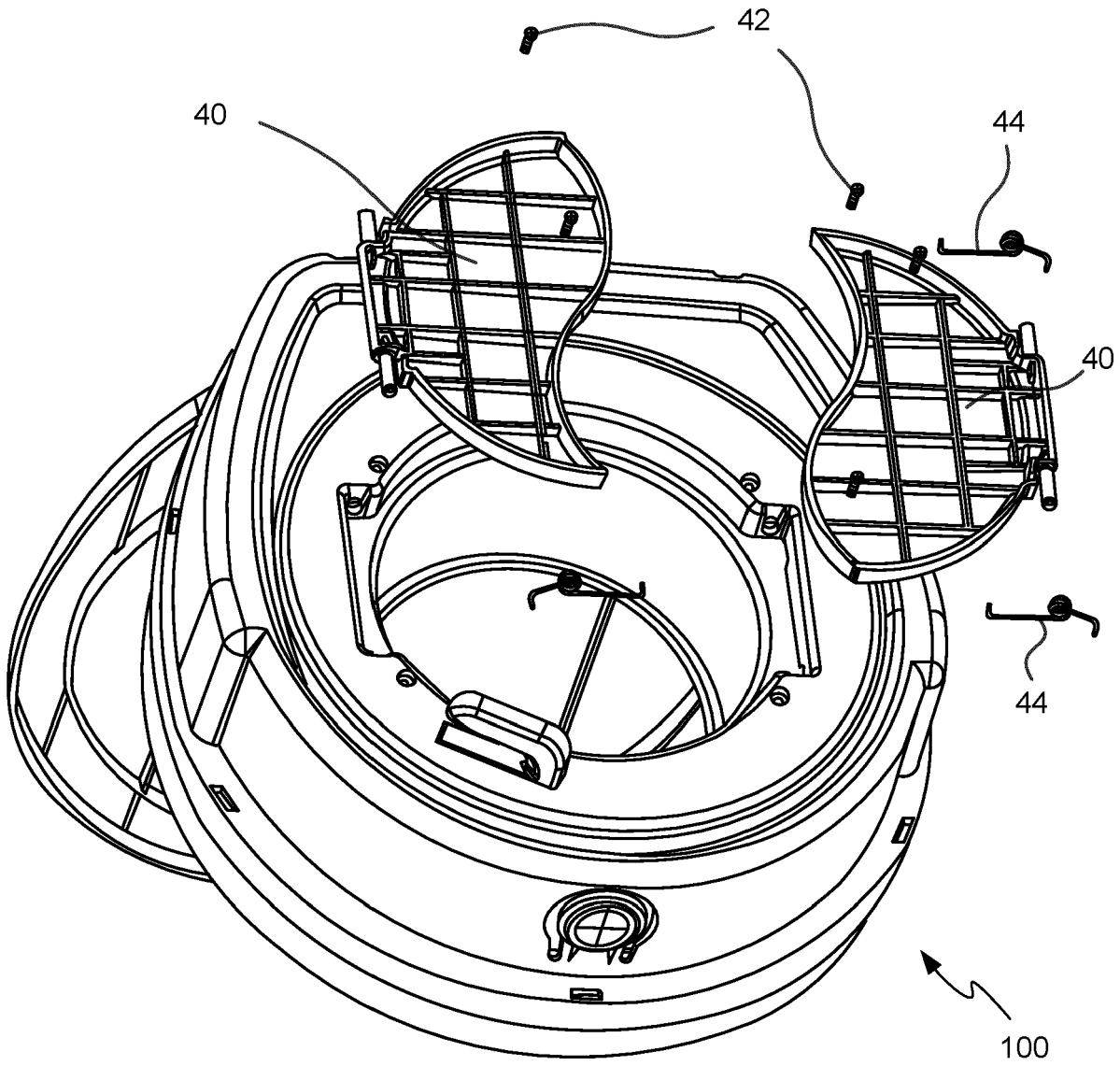


FIGURE 4



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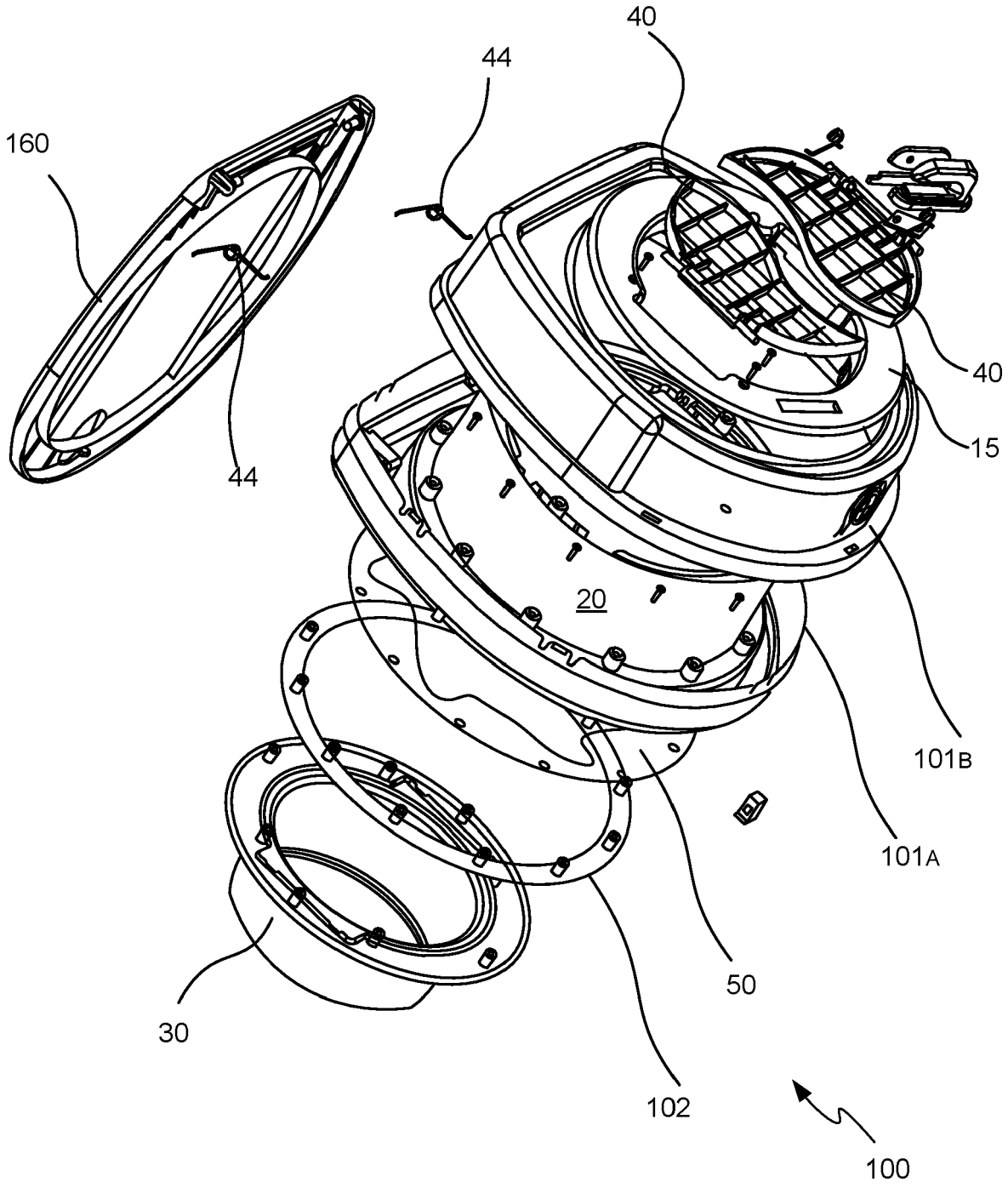

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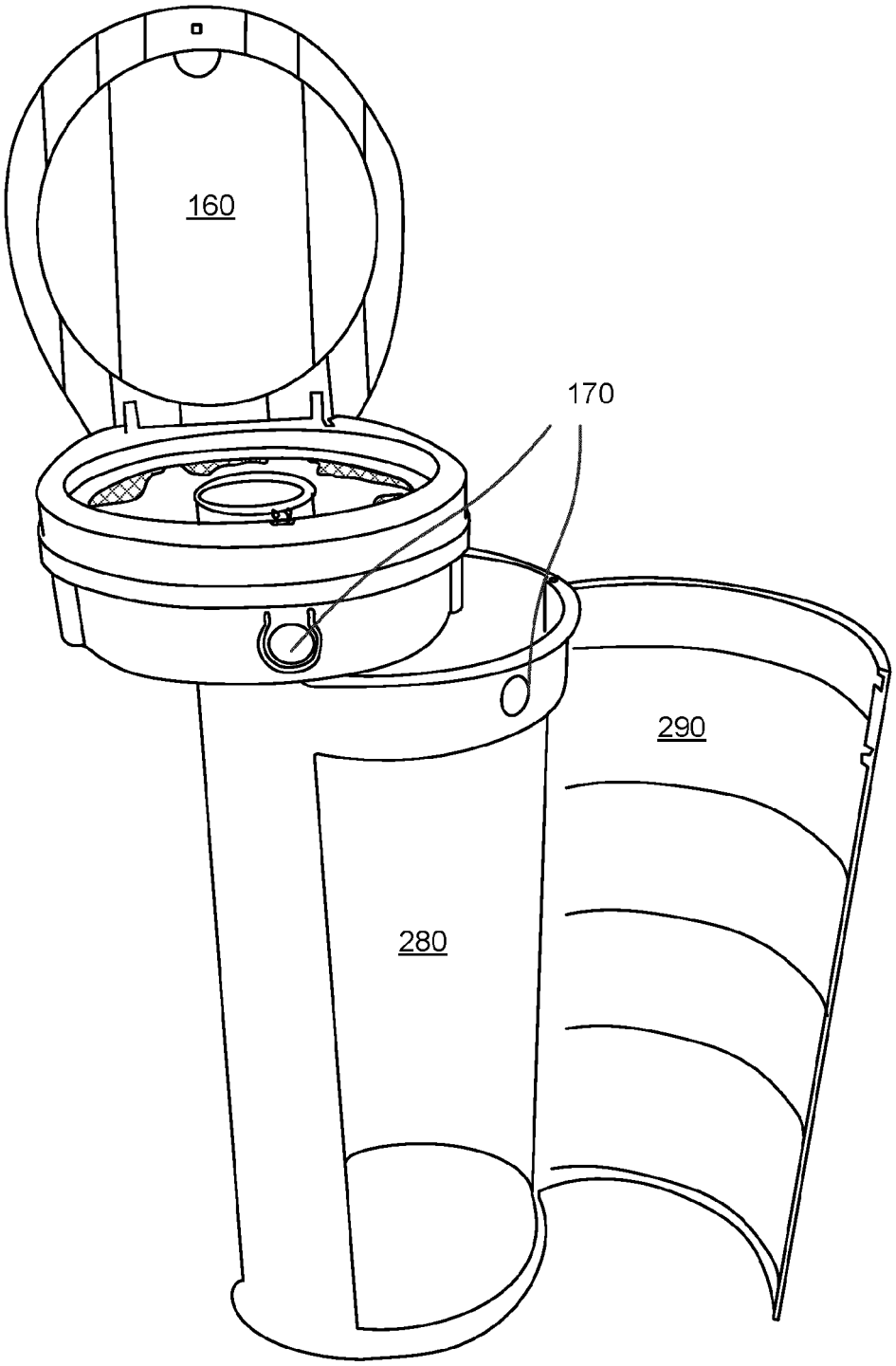

FIGURE 7

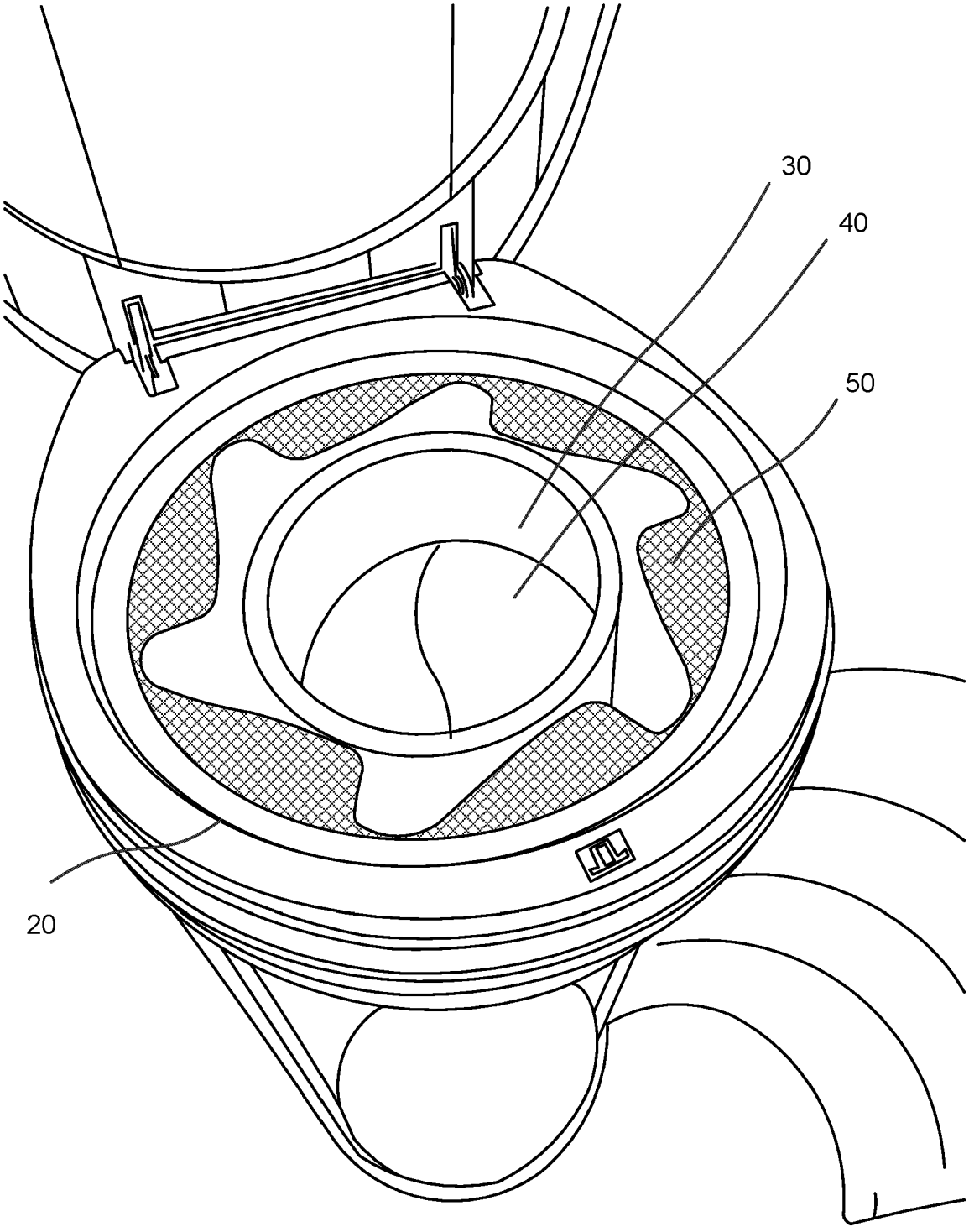

FIGURE 8

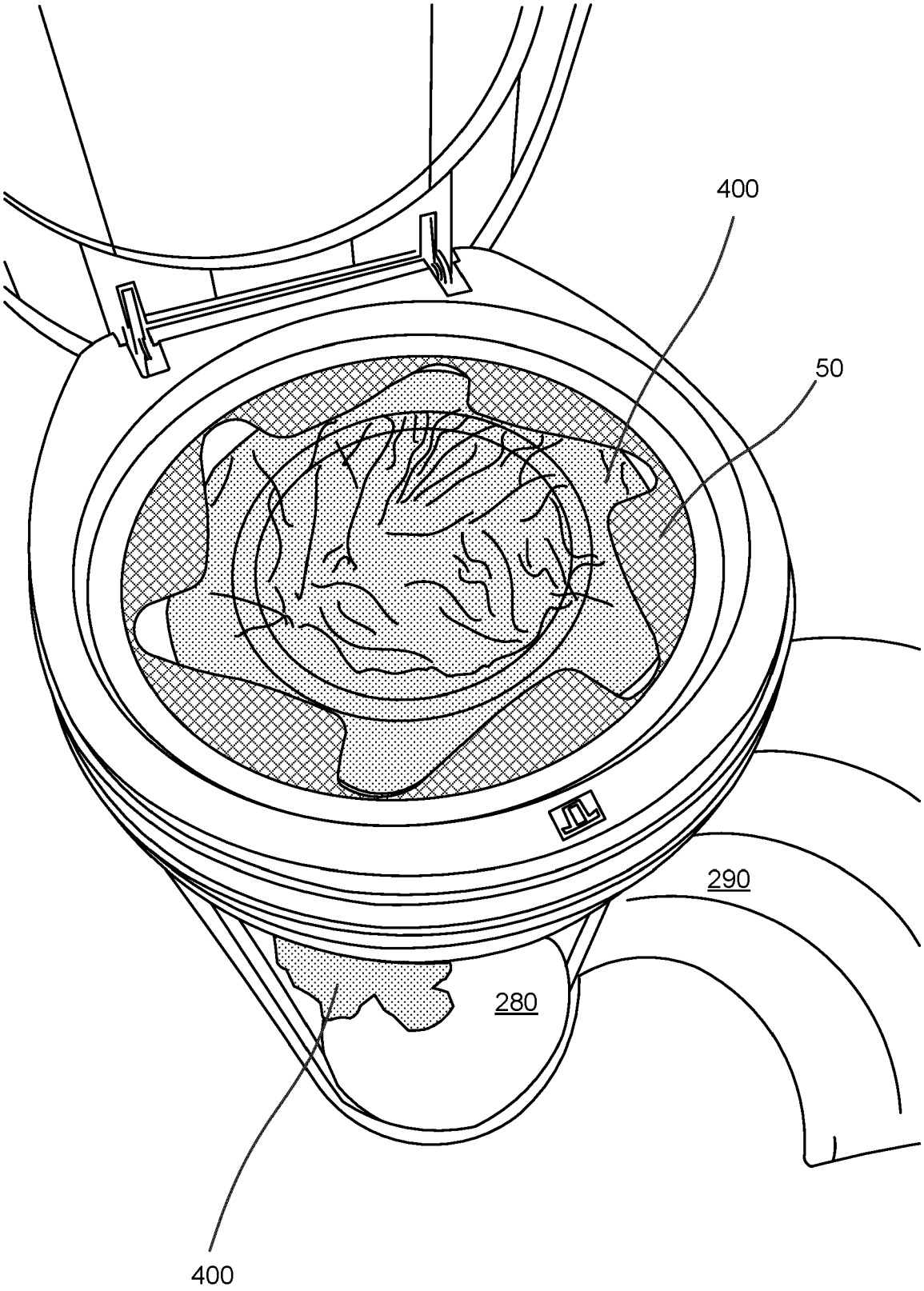

FIGURE 9

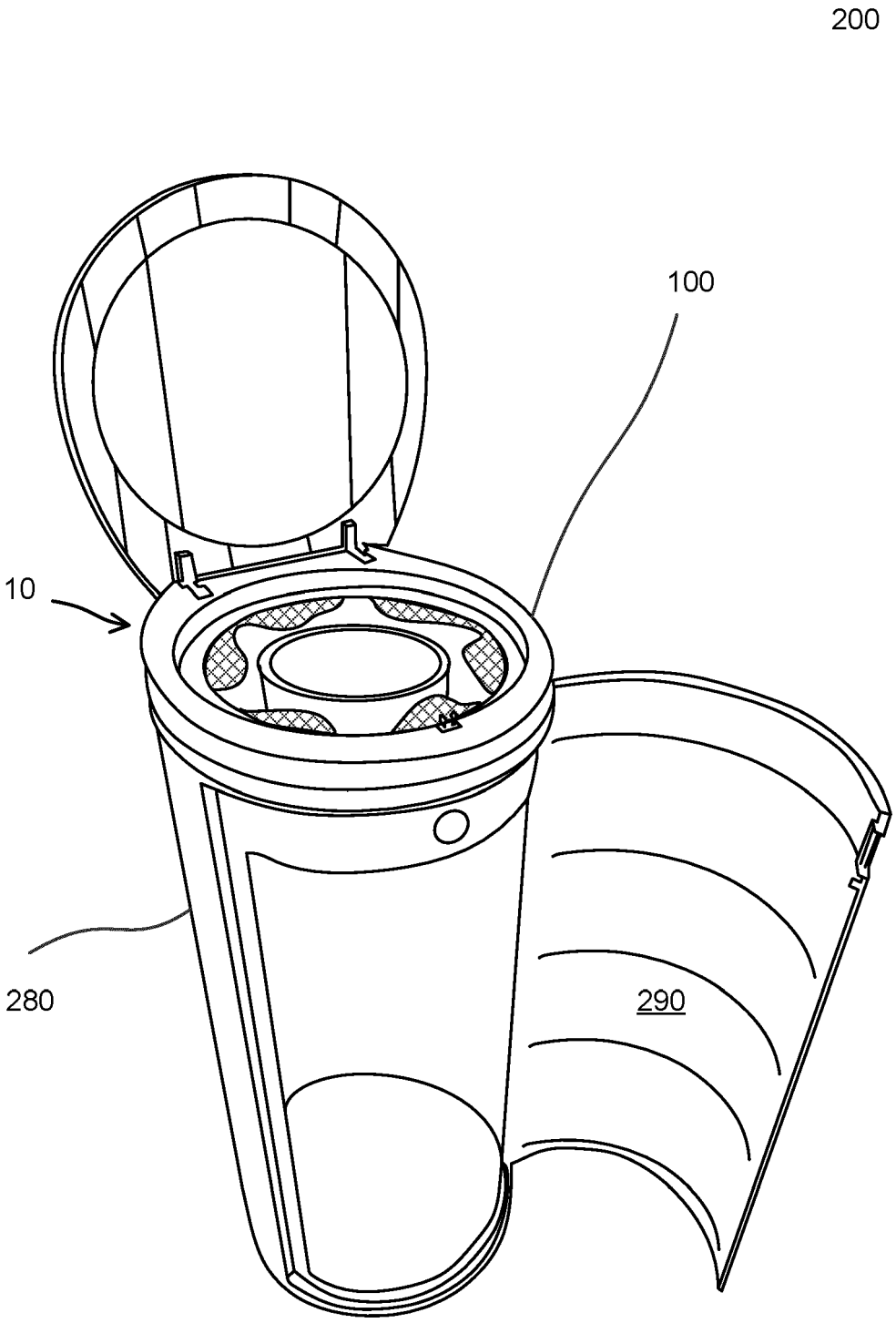

FIGURE 10

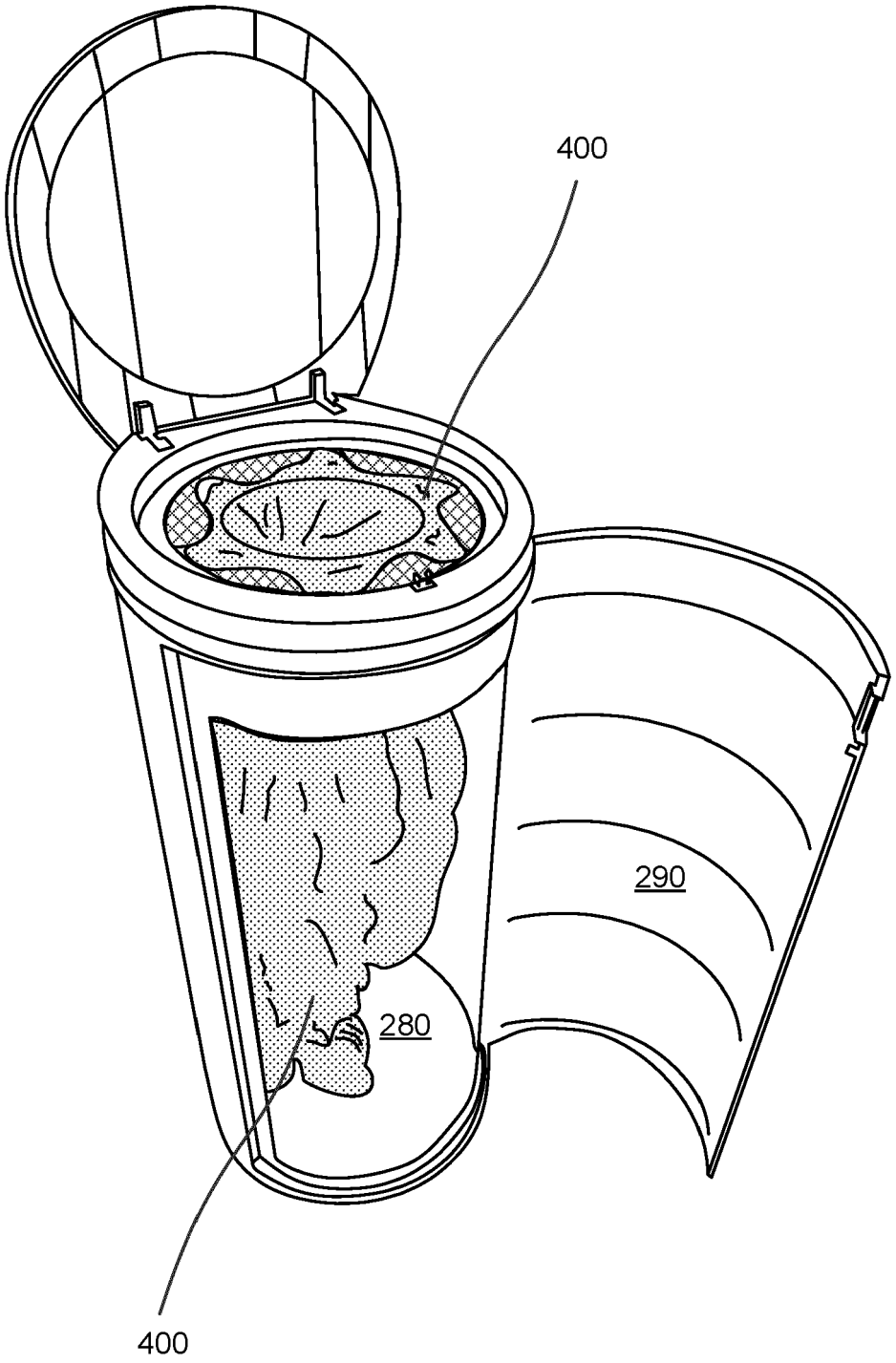

FIGURE 11

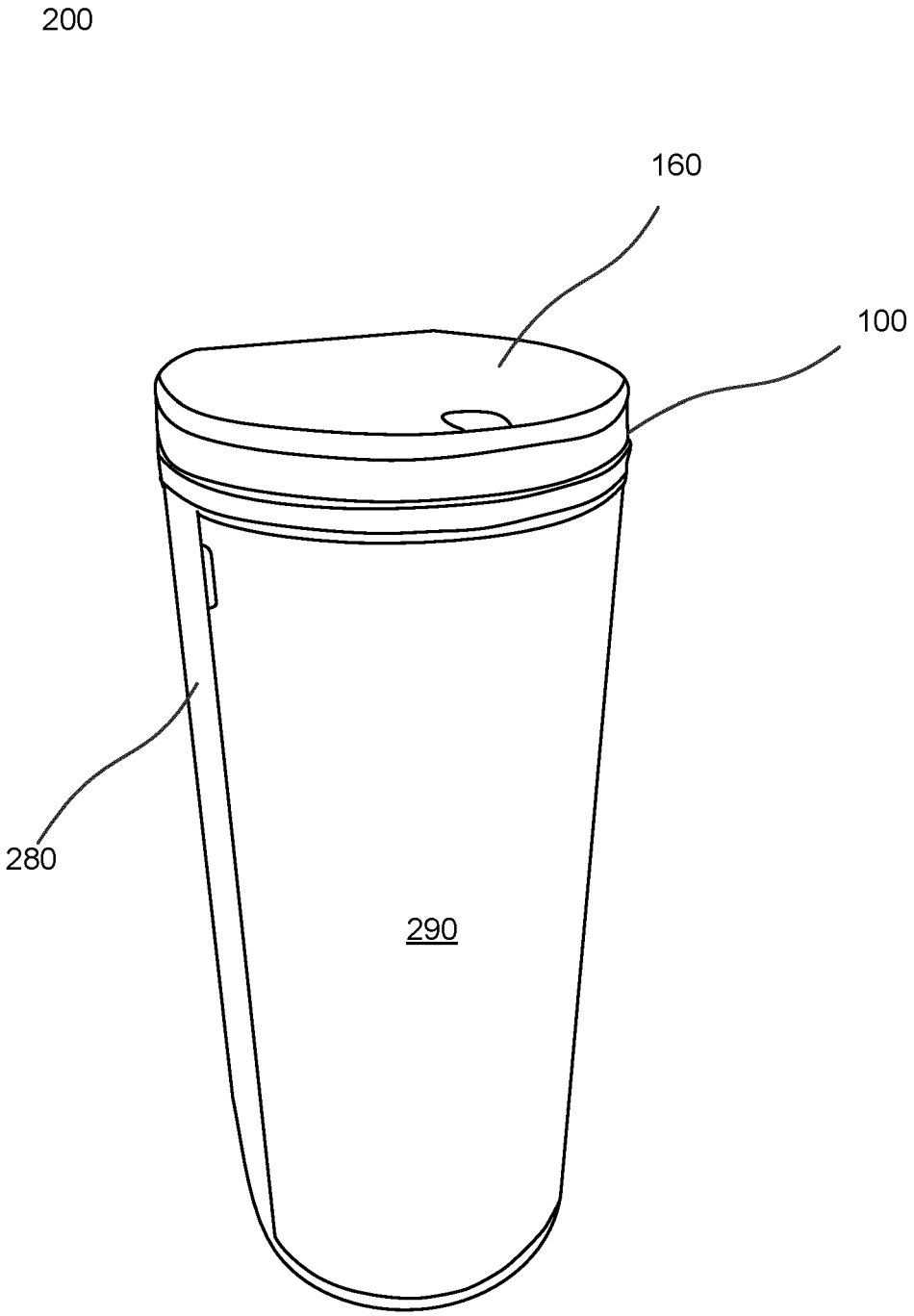

FIGURE 12

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EUROPEAN SEARCH REPORT

Application Number
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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 April 2021	Luepke, Erik

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