

DESCRIPTION
RUBBISH ACCUMULATION DEVICE

[Technical Field]

5 [0001]

The present invention relates to a rubbish accumulation device for compressing and accumulating rubbish.

[Background Art]

[0002]

10 A rubbish accumulation device recited in PTL 1 includes a rotatable tube (drum) that accumulates rubbish, a front fixing stand, and a rear fixing stand. The front fixing stand is in contact with a front part of the rotatable tube and the rear fixing stand is in contact with a rear part of the rotatable tube. A sealant is provided between the rotatable tube and the front fixing stand and a sealant is provided between the
15 rotatable tube and the rear fixing stand. Provision of the sealants prevents leakage of waste liquid, such as waste water, from the rotatable tube.

[Citation List]

[Patent Literature]

[0003]

20 [PTL 1]

Japanese Patent Application Laid-Open Publication No. 2005-200209

[Summary of Invention]

[Technical Problem]

[0004]

25 Embodiments of the present invention seek to provide a rubbish accumulation device that can effectively prevent leakage of waste liquid from a drum in which rubbish is accumulated.

[Solution to Problem]

[0005]

A rubbish accumulation device according to one aspect of the present invention compresses and accumulates rubbish. The rubbish accumulation device includes a drum, a first blocking section, and a first sealing section. Rubbish is loaded into the drum which rotates. The first blocking section partially blocks an opening at a first end of the drum that is one of two ends of the drum. The first sealing section seals between the first end of the drum and the first blocking section. The first sealing section includes ring-shaped packing and a limiting section. The packing is located along an outer circumferential surface of the drum at the first end of the drum. The limiting section is located outward of the packing in terms of a radial direction of the drum and limits movement of the packing in the radial direction. The outer circumferential surface of the drum at the first end of the drum applies pressure on the packing in a direction toward the limiting section.

[0006]

In the rubbish accumulation device according to embodiments of the present invention, the first sealing section preferably further includes a pressing section. The pressing section is preferably located outward of the drum in terms of the radial direction and preferably applies pressure on the packing in a direction toward the first blocking section.

[0007]

In the rubbish accumulation device according to embodiments of the present invention, the pressing section preferably includes a protrusion. The protrusion preferably protrudes toward and extends along the packing.

[0008]

In the rubbish accumulation device according to embodiments of the present invention, the first sealing section preferably further includes a flange. The flange is preferably bound to the limiting section and is preferably located opposite to the pressing section. The flange is preferably linked to the pressing section.

[0009]

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In the rubbish accumulation device according to embodiments of the present invention, the first sealing section preferably further includes a projection. The projection preferably protrudes from the pressing section and is preferably inserted into the packing.

5 [0010]

In the rubbish accumulation device according to embodiments of the present invention, the first sealing section preferably further includes a foundation section. The foundation section is preferably bound to the first blocking section. The limiting section preferably protrudes from the foundation section. The pressing section preferably applies pressure on the packing in a direction toward the foundation section.

10 [0011]

In the rubbish accumulation device according to embodiments of the present invention, the first blocking section is preferably plate-shaped and the foundation section is preferably plate-shaped. The foundation section preferably has a thickness that is greater than a thickness of the first blocking section.

15 [0012]

In the rubbish accumulation device according to embodiments of the present invention, the first sealing section preferably further includes a belt-shaped section. The belt-shaped section is preferably bound to the outer circumferential surface of the drum at the first end of the drum. The belt-shaped section preferably applies pressure on the packing in a direction toward the limiting section.

20 [0013]

In the rubbish accumulation device according to embodiments of the present invention, the belt-shaped section preferably has a thickness that is greater than a thickness of the drum at the first end of the drum.

25 [0014]

In the rubbish accumulation device according to embodiments of the present invention, the drum preferably has a hollow cylindrical shape. The rubbish accumulation device preferably further includes a second blocking section and a second sealing section.

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The second blocking section preferably partially blocks an opening at a second end of the drum that is the other of the two ends of the drum. The second sealing section preferably seals between the second end of the drum and the second blocking section. The second sealing section preferably includes ring-shaped packing and a limiting
5 section. The packing is preferably located along the outer circumferential surface of the drum at the second end of the drum. The limiting section is preferably located outward of the packing in terms of the radial direction of the drum and preferably limits movement of the packing in the radial direction. The outer circumferential surface of the drum at the second end of the drum preferably applies pressure on the packing of the
10 second sealing section in a direction toward the limiting section of the second sealing section.

[Advantageous Effects of Invention]

[0015]

The present invention may enable effective prevention of leakage of waste
15 liquid from a drum in which rubbish is accumulated.

[Brief Description of Drawings]

[0016]

[FIG. 1]

20 FIG. 1 is a perspective view illustrating a rear side of a rubbish accumulation device according to a first embodiment of the present invention.

[FIG. 2]

FIG. 2 is a perspective view illustrating a front side of the rubbish accumulation device according to the first embodiment of the present invention.

25 [FIG. 3]

FIG. 3 is an exploded perspective view illustrating a main body of the rubbish accumulation device according to the first embodiment of the present invention.

[FIG. 4]

FIG. 4 is a perspective view illustrating a rear side of a loading-side blocking section in the rubbish accumulation device according to the first embodiment of the present invention.

[FIG. 5]

5 FIG. 5 is a cross-sectional perspective view illustrating a loading-side sealing section in the rubbish accumulation device according to the first embodiment of the present invention.

[FIG. 6]

10 FIG. 6 is a cross-sectional view illustrating the loading-side sealing section in the rubbish accumulation device according to the first embodiment of the present invention.

[FIG. 7]

FIG. 7 is a cross-sectional perspective view illustrating a loading-side sealing section in a conventional rubbish accumulation device.

15 [FIG. 8]

FIG. 8 is a cross-sectional view illustrating the loading-side sealing section in the conventional rubbish accumulation device.

[FIG. 9]

20 FIG. 9 is an exploded perspective view illustrating a main body of a rubbish accumulation device according to a second embodiment of the present invention.

[FIG. 10]

FIG. 10 is a perspective view illustrating a rear side of a loading-side blocking section in the rubbish accumulation device according to the second embodiment of the present invention.

25 [FIG. 11]

FIG. 11 is a cross-sectional perspective view illustrating a loading-side sealing section in the rubbish accumulation device according to the second embodiment of the present invention.

[FIG. 12]

FIG. 12 is a cross-sectional view illustrating the loading-side sealing section in the rubbish accumulation device according to the second embodiment of the present invention.

5 [FIG. 13]

FIG. 13 is a perspective view illustrating a pressing section and projections of a loading-side sealing section in a rubbish accumulation device according to a third embodiment of the present invention.

[FIG. 14]

10 FIG. 14 is a cross-sectional perspective view illustrating the loading-side sealing section in the rubbish accumulation device according to the third embodiment of the present invention.

[FIG. 15]

15 FIG. 15 is a cross-sectional view illustrating the loading-side sealing section in the rubbish accumulation device according to the third embodiment of the present invention.

[Description of Embodiments]

[0017]

20 The following explains embodiments of the present invention with reference to the drawings. Note that elements that are the same or equivalent are marked by the same reference signs in the drawings and explanation thereof is not repeated. Also, in the embodiments of the present invention, the X axis, the Y axis, and the Z axis are perpendicular to one another, the X axis and the Y axis are approximately parallel to the
25 horizontal plane, and the Z axis is approximately parallel to a vertical line.

[0018]

(First Embodiment)

FIG. 1 is a perspective view illustrating a rear side of a rubbish accumulation

device 1 according to a first embodiment of the present invention. FIG. 2 is a perspective view illustrating a front side of the rubbish accumulation device 1.

[0019]

As illustrated in FIGS. 1 and 2, the rubbish accumulation device 1 includes a main body 1A and a support 1B. The main body 1A compresses and accumulates rubbish therein. The main body 1A is supported by the support 1B. The support 1B is for example a stand.

[0020]

The main body 1A includes a drum 2, a chain 4, a loading-side blocking section 6 (first blocking section) having a loading inlet 6a therein, a loading-side sealing section 8 (first sealing section), a loading guide 10, a discharge-side blocking section 12 (second blocking section) having a discharge outlet 12a therein, a discharge-side sealing section 14 (second sealing section), a discharge-side cover 16, a discharge guide 18, and a frame F. The frame F surrounds the drum 2.

[0021]

The drum 2 is supported by the frame F in a rotatable manner. The drum 2 rotates in a rotation direction R. In the first embodiment, the rotation direction R corresponds to clockwise when the main body 1A is viewed from the front side thereof. The drum 2 has a hollow cylindrical shape and has an internal diameter that is approximately uniform along a direction of a rotational axis of the drum 2. Rubbish is loaded into the drum 2.

[0022]

The chain 4 is wound against a large-diameter sprocket located on an outer circumferential surface of the drum 2 and a small-diameter sprocket connected to a rotatable shaft of a motor. Rotation of the motor causes the drum 2 to rotate in the rotation direction R through the small-diameter sprocket, the chain 4, and the large-diameter sprocket. When the drum 2 rotates in the rotation direction R, rubbish loaded into the drum 2 is moved toward the discharge-side blocking section 12 from the

loading-side blocking section 6 and is pressed against the discharge-side blocking section 12 and the discharge-side cover 16 by a plurality of blade members located inside of the drum 2. As a result, the rubbish is compressed and accumulated in the drum 2. Note that in order to simplify the drawings, the large-diameter sprocket, the motor, the small-diameter sprocket, and the blade members are not illustrated therein.

[0023]

The loading-side blocking section 6 is attached to one of two ends of the frame F. The loading-side blocking section 6 partially blocks an opening at a loading-side end (first end) of the drum 2. The loading-side end is one of two ends of the drum 2.

The loading-side blocking section 6 has the loading inlet 6a therein for loading of rubbish into the drum 2.

[0024]

The loading-side sealing section 8 seals between the loading-side blocking section 6 and the loading-side end of the drum 2.

[0025]

The loading guide 10 is connected to the loading side blocking section 6 and guides rubbish to the loading inlet 6a. The loading guide 10 has an upper surface that is open and a lower surface that is inclined. The loading guide 10 is for example connected to a rubbish chute and guides rubbish that falls along the rubbish chute to the loading inlet 6a.

[0026]

The discharge-side blocking section 12 is attached to the other of the two ends of the frame F. The discharge-side blocking section 12 partially blocks an opening at a discharge-side end of the drum 2. The discharge-side end is the other of the two ends of the drum 2. The discharge-side blocking section 12 has the discharge outlet 12a therein for discharge of rubbish from the drum 2.

[0027]

The discharge-side sealing section 14 seals between the discharge-side

blocking section 12 and the discharge-side end of the drum 2.

[0028]

The discharge-side cover 16 moves between a closed position at which the discharge-side cover 16 blocks the discharge outlet 12a and an open position at which
5 the discharge-side cover 16 exposes the discharge outlet 12a by moving in an approximately vertical direction. FIG. 2 illustrates the discharge-side cover 16 as positioned at the closed position. The discharge-side cover 16 is for example driven by a motor such as to move in the vertical direction. When rubbish accumulated in the drum 2 is to be discharged from the drum 2, the discharge-side cover 16 is moved to the
10 open position, thereby exposing the discharge outlet 12a. When the drum 2 rotates in the rotation direction R, the blade members located inside of the drum 2 cause the rubbish to be discharged externally to the drum 2 through the discharge outlet 12a.

[0029]

The discharge guide 18 is connected to the discharge-side blocking section 12
15 and guides rubbish that is discharged through the discharge outlet 12a externally to the rubbish accumulation device 1. The discharge guide 18 for example guides the rubbish to a loading inlet of a rubbish collection vehicle.

[0030]

The following provides a rough explanation of the loading-side sealing section
20 8 with reference to FIGS. 3 and 4. FIG. 3 is an exploded perspective view illustrating the main body 1A. Among the various elements of the main body 1A, FIG. 3 illustrates the drum 2, the loading-side sealing section 8, and the loading-side blocking section 6. A rotational axis AX of the drum 2 and a rear side of the loading-side blocking section 6 are also illustrated in FIG. 3. FIG. 3 also illustrates the loading-side
25 end 20 of the drum 2, the opening OP1 at the loading-side end 20, the discharge-side end 22 of the drum 2, and the opening OP2 at the discharge-side end 22 of the drum 2.

[0031]

As illustrated in FIG. 3, the loading-side sealing section 8 includes a pressing

section 30, packing 32, and a position determining section 35A. The pressing section 30 is a ring-shaped plate member. The packing 32 is a ring-shaped member and has an approximately rectangular cross-sectional shape. In the first embodiment, the packing 32 is gland packing (for example, braided packing) that is formed through braiding of
5 fibers (threads) to which a lubricant is added. The position determining section 35A is ring-shaped and is bound to a rear surface 6b of the loading-side blocking section 6. The position determining section 35A positions the packing 32 such that the packing 32 is located along an outer circumferential surface 29 of the drum 2 at the loading-side end 20.

10 [0032]

FIG. 4 is an enlarged perspective view illustrating the position determining section 35A. As illustrated in FIG. 4, the position determining section 35A includes a limiting section 34a and a flange 34b. The limiting section 34a is a ring-shaped plate member that protrudes from the rear surface 6b of the loading-side blocking section 6.
15 The flange 34b is a ring-shaped plate member that extends along the rear surface 6b of the loading-side blocking section 6 from a protruding end of the limiting section 34a. The flange 34b and the limiting section 34a are at approximately a right angle to one another.

[0033]

20 The following provides a detailed explanation of the loading-side sealing section 8 with reference to FIGS. 5 and 6. FIG. 5 is a cross-sectional perspective view illustrating the loading-side sealing section 8. FIG. 6 is a cross-sectional view illustrating the loading-side sealing section 8. FIGS. 5 and 6 illustrate a region around a lowest part of the ring-shaped loading-side sealing section 8. As illustrated in FIGS.
25 5 and 6, the packing 32 is sandwiched between the limiting section 34a and the outer circumferential surface 29 of the drum 2 at the loading-side end 20, and is also sandwiched between the pressing section 30 and the loading-side blocking section 6. The following provides a more specific explanation.

[0034]

The packing 32 is located along the outer circumferential surface 29 of the drum 2 at the loading-side end 20. The limiting section 34a protrudes along the rotational axis AX (FIG. 3) of the drum 2 from the rear surface 6b of the loading-side blocking section 6. The limiting section 34a is located opposite to the outer circumferential surface 29 of the drum 2 at the loading-side end 20 with the packing 32 therebetween. The limiting section 34a is located outward of the packing 32 in terms of a radial direction A of the drum 2 and limits movement of the packing 32 in the radial direction A. The outer circumferential surface 29 of the drum 2 at the loading-side end 20 applies pressure on the packing 32 in a direction toward the limiting section 34a. The flange 34b is bound to the limiting section 34a and is located opposite to the pressing section 30. More specifically, the flange 34b extends in the radial direction A of the drum 2 from the protruding end of the limiting section 34a. In other words, the position determining section 35A has an approximately L-shaped cross-section.

[0035]

The pressing section 30 is located outward of the drum 2 in terms of the radial direction A at a position opposite to the packing 32. The pressing section 30 is linked to the flange 34b and the pressing section 30 is tightened by inserting a bolt 44 through the pressing section 30 and the flange 34b and by screwing a nut 42 onto the bolt 44. As a result, the pressing section 30 applies pressure on the packing 32 in a direction toward the loading-side blocking section 6. More specifically, the pressing section 30 includes protrusions 30a that each have an approximately circular cross-section. In the first embodiment, two protrusions 30a are present. Each of the protrusions 30a is a ring-shaped member that protrudes toward and extends along the packing 32. The protrusions 30a apply pressure on the packing 32 in a direction toward the loading-side blocking section 6.

[0036]

The following explains the loading-side sealing section 8 through comparison

to a conventional loading-side sealing section 102 with reference to FIGS. 5-8. FIG. 7 is a cross-sectional perspective view illustrating the loading-side sealing section 102 of a conventional rubbish accumulation device 100. FIG. 8 is a cross-sectional view illustrating the loading-side sealing section 102. As illustrated in FIGS. 7 and 8, the conventional rubbish accumulation device 100 includes the loading-side sealing section 102, a drum 104, and a loading-side blocking section 106. The loading-side sealing section 102 includes packing 108, a groove section 110, and a pressing section 112.

[0037]

The packing 108 is ring-shaped. The groove section 110 is ring-shaped and is located on a rear surface 106a of the loading-side blocking section 106. The packing 108 is fitted into the groove section 110. The groove section 110 and the packing 108 are located toward a rotational axis of the drum 104 relative to an inner circumferential surface 116a of the drum 104 at a loading-side end 116 of the drum 104.

[0038]

The pressing section 112 is a ring-shaped member that has an approximately L-shaped cross-section. The pressing section 112 is located opposite to the packing 108 and toward the rotational axis of the drum 104 relative to the inner circumferential surface 116a of the drum 104 at the loading-side end 116. The drum 104 has a ring-shaped inner wall section 104a located thereon. The inner wall section 104a is a plate-shaped member that protrudes from the inner circumferential surface 116a of the drum 104 toward the groove section 110. The inner wall section 104a is linked to the pressing section 112 by a bolt 114. The pressing section 112 is tightened by the bolt 114. As a result, the pressing section 112 applies pressure on the packing 108 in a direction toward the loading-side blocking section 106.

[0039]

Pressing of the pressing section 112 against the packing 108 prevents leakage of waste liquid, such as waste water, from the drum 104. However, the drum 104 may move slightly away from the loading-side blocking section 106 in a direction B toward

a discharge-side blocking section during rubbish compression or rubbish discharge. In such a situation, the pressing section 112 also moves slightly in the direction B with the drum 104 as a consequence of the pressing section 112 being linked to the inner wall section 104a of the drum 104. As a result, the pressure that the pressing section 112 applies on the packing 108 is decreased and a situation may arise in which the packing 108 does not function effectively.

[0040]

In contrast, according to the first embodiment, the packing 32 is pressed in a direction toward the limiting section 34a by the outer circumferential surface 29 of the drum 2 as illustrated in FIGS. 5 and 6. Therefore, it is possible to inhibit reduction in pressure applied on the packing 32 by the outer circumferential surface 29 of the drum 2 even in a situation in which the drum 2 moves away from the loading-side blocking section 6 in the direction B toward the discharge-side blocking section 12. As a result, the packing 32 effectively seals the drum 2, thereby effectively preventing leakage of waste liquid, such as waste water, from the drum 2 in which rubbish is accumulated.

[0041]

Also, according to the first embodiment, in addition to the packing 32 being pressed in the direction toward the limiting section 34a by the outer circumferential surface 29 of the drum 2, the packing 32 is also pressed in a direction toward the loading-side blocking section 6 by the pressing section 30. As a result, the packing 32 seals the drum more effectively, thereby more effectively preventing leakage of waste liquid from the drum 2.

[0042]

Also, according to the first embodiment, the pressing section 30 is linked to the flange 34b and is not linked to the drum 2. Therefore, it is possible to inhibit reduction in pressure applied on the packing 32 from the pressing section 30 even in a situation in which the drum 2 moves in the direction B. As a result, the packing 32 seals the drum 2 more effectively, thereby more effectively preventing leakage of waste liquid from the

drum 2.

[0043]

Also, according to the first embodiment, the pressing section 30 applies pressure on the packing 32 via the protrusions 30a. Therefore, pressure on the packing
5 32 per unit surface area can be increased. As a result, the packing 32 seals the drum 2 more effectively, thereby more effectively preventing leakage of waste liquid from the drum 2.

[0044]

Also, according to the first embodiment, configuration of the discharge-side
10 sealing section 14 explained with reference to FIG. 1 is the same as configuration of the loading-side sealing section 8 explained with reference to FIGS. 3-6. In other words, the discharge-side sealing section 14 includes a pressing section 30, packing 32, and a position determining section 35A that includes a limiting section 34a and a flange 34b. Therefore, leakage of waste liquid from the drum 2 can also be effectively prevented at
15 the discharge-side end 22 of the drum 2. Note that the discharge-side sealing section 14 can be explained by in the above explanation of the loading-side sealing section 8: replacing the loading-side end 20 of the drum 2 with the discharge-side end 22 of the drum 2; replacing the outer circumferential surface 29 of the drum 2 at the loading-side end 20 with the outer circumferential surface 29 of the drum 2 at the discharge-side end
20 22; replacing the loading-side blocking section 6 with the discharge-side blocking section 12; and replacing the rear surface 6b of the loading-side blocking section 6 with a rear surface of the discharge-side blocking section 12.

[0045]

Also, according to the first embodiment, as shown in FIGS. 1-4, the rubbish
25 accumulation device 1 further includes an inclined gutter 40 under each of the loading-side sealing section 8 and the discharge-side sealing section 14. Therefore, even theoretically supposing a situation in which waste liquid does leak from either or both of the loading-side end 20 and the discharge-side end 22 of the drum 2, the waste

liquid can be guided to a waste liquid collector by the gutters 40. As a result, contamination of the rubbish accumulation device 1 and the surrounding environment by the waste liquid can be inhibited.

[0046]

5 (Second Embodiment)

The following explains a rubbish accumulation device 1 according to a second embodiment of the present invention with reference to FIGS. 1, 2, and 9-12. The rubbish accumulation device 1 according to the second embodiment has the same configuration as explained for the rubbish accumulation device 1 according to the first
10 embodiment with reference to FIGS. 1 and 2. However, a loading-side sealing section 8 and a discharge-side sealing section 14 of the rubbish accumulation device 1 according to the second embodiment have a different configuration to the loading-side sealing section 8 and the discharge-side sealing section 14 according to the first embodiment. The difference in configuration is that the loading-side sealing section 8
15 and the discharge-side sealing section 14 of the rubbish accumulation device 1 according to the second embodiment each further include a belt-shaped section 37 and a foundation section 34c, whereas the loading-side sealing section 8 and the discharge-side sealing section 14 of the rubbish accumulation device 1 according to the first embodiment do not include the aforementioned sections. The following
20 explanation focuses on differences between the second embodiment and the first embodiment.

[0047]

The following provides a rough explanation of the loading-side sealing section 8 according to the second embodiment with reference to FIGS. 9 and 10. FIG. 9 is an
25 exploded perspective view illustrating the main body 1A. As illustrated in FIG. 9, the loading-side sealing section 8 includes a pressing section 30, packing 32, a position determining section 35B, and the belt-shaped section 37. The belt-shaped section 37 is a plate-shaped member that is bound to the outer circumferential surface 29 of the drum

2 at the loading-side end 20. The position determining section 35B is ring-shaped and is bound to the rear surface 6b of the loading-side blocking section 6. The position determining section 35B positions the packing 32 such that the packing 32 is located along the belt-shaped section 37 of the drum 2.

5 [0048]

FIG. 10 is an enlarged perspective view illustrating the position determining section 35B. As illustrated in FIG. 10, the position determining section 35B includes a limiting section 34a, a flange 34b, and the foundation section 34c. The foundation section 34c is a ring-shaped plate member that is bound to the rear surface 6b of the loading-side blocking section 6. The limiting section 34a is a ring-shaped plate member that protrudes from the foundation section 34c.

[0049]

The following provides a detailed explanation of the loading-side sealing section 8 according to the second embodiment with reference to FIGS. 11 and 12. FIG. 11 is a cross-sectional perspective view illustrating the loading-side sealing section 8. FIG. 12 is a cross-sectional view illustrating the loading-side sealing section 8. FIGS. 11 and 12 illustrate a region around a lowest part of the ring-shaped loading-side sealing section 8. As illustrated in FIGS. 11 and 12, the packing 32 is sandwiched between the belt-shaped section 37 and the limiting section 34a and is also sandwiched between the pressing section 30 and the foundation section 34c. The following provides a more specific explanation.

[0050]

The packing 32 is located along the belt-shaped section 37. The belt-shaped section 37 applies pressure on the packing 32 in a direction toward the limiting section 34a. The following explains the reason for providing the belt-shaped section 37. In the first embodiment, the outer circumferential surface 29 of the drum 2 applies pressure on the packing 32 as explained with reference to FIG. 5. Therefore, a small gap may form between the outer circumferential surface 29 and the packing 32 due to warping of

the drum 2. In contrast, in the second embodiment, the drum 2 applies pressure on the packing 32 through the belt-shaped section 37 without being in contact with the packing 32, and thus formation of a gap due to warping of the drum 2 is inhibited. As a result, leakage of waste liquid from the drum 2 can be more effectively prevented compared to a configuration in which the belt-shaped section 37 is not provided. In particular, the belt-shaped section 37 preferably has a greater thickness t_1 than a thickness t_2 of the drum 2 at the loading-side end 20 in order to inhibit warping of the drum 2 from also causing warping of the belt-shaped section 37. Such a configuration can more effectively prevent leakage of waste liquid from the drum 2.

[0051]

The pressing section 30 applies pressure on the packing 32 in a direction toward the foundation section 34c. More specifically, protrusions 30a of the pressing section 30 apply pressure on the packing 32 in the direction toward the foundation section 34c. The following explains the reason for providing the foundation section 34c. In the first embodiment, the packing 32 is pressed against the rear surface 6b of the loading-side blocking section 6 as explained with reference to FIG. 5. Therefore, a small gap may form between the rear surface 6b and the packing 32 due to warping of the loading-side blocking section 6. In contrast, in the second embodiment, the packing 32 is pressed against the foundation section 34c without there being contact between the loading-side blocking section 6 and the packing 32, and thus formation of a gap due to warping of the loading-side blocking section 6 is inhibited. As a result, leakage of waste liquid from the drum 2 can be more effectively prevented compared to a configuration in which the foundation section 34c is not provided. In particular, the foundation section 34c preferably has a greater thickness t_3 than a thickness t_4 of the loading-side blocking section 6 in order to inhibit warping of the loading-side blocking section 6 from also causing warping of the foundation section 34c. Such a configuration can more effectively prevent leakage of waste liquid from the drum 2.

[0052]

As explained above with reference to FIGS. 9-12, the rubbish accumulation device 1 according to the second embodiment enables effective prevention of leakage of waste liquid from the drum 2 in which rubbish is accumulated. In addition to the above, the second embodiment also achieves the same effects as the first embodiment.

5 [0053]

Also, according to the second embodiment, configuration of the discharge-side sealing section 14 is the same as the configuration of the loading-side sealing section 8 explained with reference to FIGS. 9-12. In other words, the discharge-side sealing section 14 includes a pressing section 30, packing 32, and a position determining
10 section 35B that includes a limiting section 34a, a flange 34b, and a foundation section 34c. Therefore, leakage of waste liquid from the drum 2 can also be effectively prevented at the discharge-side end 22 of the drum 2. Note that the discharge-side sealing section 14 can be explained by in the above explanation of the loading-side sealing section 8: replacing the loading-side end 20 of the drum 2 with the
15 discharge-side end 22 of the drum 2; replacing the outer circumferential surface 29 of the drum 2 at the loading-side end 20 with the outer circumferential surface 29 of the drum 2 at the discharge-side end 22; replacing the loading-side blocking section 6 with the discharge-side blocking section 12; and replacing the rear surface 6b of the loading-side blocking section 6 with a rear surface of the discharge-side blocking
20 section 12.

[0054]

(Third Embodiment)

The following explains a rubbish accumulation device 1 according to a third embodiment of the present invention with reference to FIGS. 13-15. The rubbish
25 accumulation device 1 according to the third embodiment has the same configuration as the rubbish accumulation device 1 according to the second embodiment. However, in addition to the configuration of the rubbish accumulation device 1 according to the second embodiment, the rubbish accumulation device 1 according to the third

embodiment further includes projections 31 as illustrated in FIG. 13. The following explanation focuses on differences between the third embodiment and the second embodiment.

[0055]

5 FIG. 13 is a perspective view illustrating a pressing section 30 and projections 31 of a loading-side sealing section 8 in the rubbish accumulation device 1 according to the third embodiment. As illustrated in FIG. 13, the loading-side sealing section 8 further includes a plurality of the projections 31. In the third embodiment, each of the projections 31 is a headless nail. The projections 31 are for example welded to the pressing section 30. The projections 31 are arranged at equal intervals along a circumferential direction of the pressing section 30. The projections 31 protrude from a side of the pressing section 30 at which protrusions 30a are located. More specifically, the projections 31 protrude between one of the protrusions 30a and the other of the protrusions 30a. Therefore, a base end portion of each of the projections 15 31 is supported by the protrusions 30a, thereby enabling reinforcement of the projections 31.

[0056]

 FIG. 14 is a cross-sectional perspective view illustrating the loading-side sealing section 8. FIG. 15 is a cross-sectional view illustrating the loading-side sealing section 8. As illustrated in FIGS. 14 and 15, each of the projections 31 is located 20 closer than a bolt 44 to the drum 2 and is approximately parallel to the bolt 44. Furthermore, the projection 31 is located opposite to the bolt 44 with the protrusion 30a therebetween.

[0057]

25 The projections 31 protrude from the pressing section 30 toward the packing 32. The projections 31 are inserted into the packing 32. For example, the projections 31 may pierce into the packing 32. Therefore, according to the third embodiment, shifting and unevenness of the packing 32 relative to the position determining section

35B and detachment of the packing 32 away from the position determining section 35B can inhibited. In addition, the third embodiment also has the same effects as the second embodiment.

[0058]

5 It should be noted that a discharge-side sealing section 14 (FIG. 1) according to the third embodiment includes a plurality of the projections 31 in the same way as the loading-side sealing section 8.

[0059]

Through the above, embodiments of the present invention have been explained
10 with reference to the drawings. However, the present invention is not limited to the embodiments and the present invention can be implemented in various different forms within the intended scope thereof (for example, as explained below in sections (1) to (4)). Also, a plurality of elements of configuration disclosed in the above embodiments can be combined as appropriate to form various inventions. For example,
15 some of the elements of configuration included in the embodiments may be omitted. Also, elements of configuration included in different embodiments may be combined as appropriate. The drawings are schematic illustrations for facilitating explanation of elements of configuration shown therein and properties of the elements of configuration in the drawings such as thickness, length, number, and spacing may differ from actual
20 properties thereof in order to facilitate illustration. Also, properties of the elements of configuration indicated in the above embodiments such as materials, shapes, and dimensions are non-limiting examples thereof and various alterations thereof are possible so long such alterations do not substantially deviate from the effects of the present invention

25 [0060]

(1) The drum 2 is not limited in terms of shape to being a hollow cylinder having a uniform internal diameter. The drum 2 may for example alternatively be formed by joining a hollow truncated cone-shaped member to either or both of two ends

of a hollow cylinder having a uniform internal diameter. The support 1B may be omitted.

[0061]

(2) Each of the pressing section 30, the limiting section 34a, the flange 34b,
5 and the foundation section 34c may be a single member that is ring-shaped or may be a plurality of members that form a ring in combination.

[0062]

(3) In the second embodiment it is not essential that the rubbish accumulation device 1 includes both the belt-shaped section 37 and the foundation section 34c. The
10 rubbish accumulation device 1 may for example only include the belt-shaped section 37 or may only include the foundation section 34c. Also, the number of protrusions 30a in the first to third embodiments may alternatively be only one or may be three or more. No particular limitations are placed on the shape of the protrusions 30a. Furthermore, the protrusions 30a may alternatively be omitted.

15 [0063]

(4) Although the projections 31 are arranged at equal intervals in the third embodiment, the projections 31 may be arranged at any appropriate intervals. Furthermore, although there a plurality of the projections 31, alternatively only one projection 31 may be provided. Although the projections 31 are described as being
20 headless nails, the projections 31 are not limited to being headless nails. For example, the projections 31 may be headed nails or screws. In a configuration in which the projections 31 are screws, the projections 31 are inserted into the packing 32 by screwing the projections 31 into the packing 32. Furthermore, the loading-side sealing section 8 and the discharge-side sealing section 14 in the rubbish accumulation device
25 according to the first embodiment and the second embodiment may each include one or a plurality of the projections 31.

[Industrial Applicability]

[0064]

The present invention relates to rubbish accumulation devices and is industrially applicable thereto.

5 [Reference Signs List]

[0065]

- 1 rubbish accumulation device
- 1A main body
- 1B support
- 10 2 drum
- 6 loading-side blocking section (first blocking section)
- 6a loading inlet
- 8 loading-side sealing section (first sealing section)
- 12 discharge-side blocking section (second blocking section)
- 15 12a discharge outlet
- 14 discharge-side sealing section (second sealing section)
- 30 pressing section
- 30a protrusion
- 31 projection
- 20 32 packing
- 34a limiting section
- 34b flange
- 34c foundation section
- 35A, 35B position determining section
- 25 37 belt-shaped section

CLAIMS

1. A rubbish accumulation device that compresses and accumulates rubbish, comprising:

a drum that is configured to rotate and into which rubbish is loaded;

a first blocking section partially blocking an opening at a first end of the drum that is one of two ends of the drum; and

a first sealing section sealing between the first end of the drum and the first blocking section, wherein

the first sealing section includes:

packing that is ring-shaped and that is located along an outer circumferential surface of the drum at the first end of the drum; and

a limiting section that is located outward of the packing in terms of a radial direction of the drum and that limits movement of the packing in the radial direction, and

the outer circumferential surface of the drum at the first end of the drum applies pressure on the packing in a direction toward the limiting section.

2. The rubbish accumulation device of claim 1, wherein

the first sealing section further includes a pressing section that is located outward of the drum in terms of the radial direction and that applies pressure on the packing in a direction toward the first blocking section.

3. The rubbish accumulation device of claim 2, wherein

the pressing section includes a protrusion that protrudes toward and extends along the packing.

4. The rubbish accumulation device of either claim 2 or 3, wherein

the first sealing section further includes a flange that is bound to the limiting section and that is located opposite to the pressing section, and
the flange is linked to the pressing section.

5. The rubbish accumulation device of any one of claims 2 to 4, wherein

the first sealing section further includes a projection that protrudes from the pressing section and is inserted into the packing.

6. The rubbish accumulation device of any one of claims 2 to 5, wherein
the first sealing section further includes a foundation section that is bound to the first
blocking section,

the limiting section protrudes from the foundation section, and
the pressing section applies pressure on the packing in a direction toward the
foundation section.

7. The rubbish accumulation device of claim 6, wherein
the first blocking section is plate-shaped,
the foundation section is plate-shaped, and
the foundation section has a thickness that is greater than a thickness of the first
blocking section.

8. The rubbish accumulation device of any one of claims 1 to 7, wherein
the first sealing section further includes a belt-shaped section that is bound to the
outer circumferential surface of the drum at the first end of the drum, and
the belt-shaped section applies pressure on the packing in a direction toward the
limiting section.

9. The rubbish accumulation device of claim 8, wherein
the belt-shaped section has a thickness that is greater than a thickness of the drum at
the first end of the drum.

10. The rubbish accumulation device of any one of claims 1 to 9, wherein
the drum has a hollow cylindrical shape,
the rubbish accumulation device further comprises:
a second blocking section partially blocking an opening at a second end of the drum
that is the other of the two ends of the drum; and
a second sealing section sealing between the second end of the drum and the second
blocking section,
the second sealing section includes:
packing that is ring-shaped and that is located along the outer circumferential surface
of the drum at the second end of the drum; and

a limiting section that is located outward of the packing in terms of the radial direction of the drum and that limits movement of the packing in the radial direction, and

the outer circumferential surface of the drum at the second end of the drum applies pressure on the packing of the second sealing section in a direction toward the limiting section of the second sealing section.