

DESCRIPTION

BLOOD COLLECTION DEVICE

Technical Field

5 [0001]

The present invention relates to a blood collection device.

Background Art

[0002]

10 For example, Japanese Patent No. 5785423 discloses a blood collection device that collects blood from a donor into a blood bag by using negative pressure. The blood collection device includes a housing and a partition wall that partitions the inside of the housing into a first
15 chamber and a second chamber located below the first chamber. A tray for disposing the blood bag is provided in the first chamber, and a rocking mechanism (Swirling mechanism) for rocking the tray is provided in the second chamber. An opening portion, which interconnects the first
20 chamber and the second chamber, is formed in the partition wall. An attachment/detachment portion provided in the rocking mechanism and formed so that the tray can be attached and detached is inserted into the opening portion.

Summary of Invention

25 [0003]

Meanwhile, when a blood collecting operator operates the blood collection device, a small article (foreign article) such as a pen or a clamp may fall into the housing. At this time, when the fallen foreign article enters the second chamber from the first chamber through the opening portion, there is a possibility that precision parts of the rocking mechanism are damaged.

[0004]

The present invention has been made in view of such a problem, and an object thereof is to provide a blood collection device capable of preventing a foreign article from entering a rocking mechanism.

[0005]

According to an aspect of the present invention, there is provided a blood collection device that collects blood from a donor into a blood bag by using negative pressure, the blood collection device including: a housing; a partition wall that partitions an inside of the housing into a first chamber and a second chamber located below the first chamber; a tray that is provided in the first chamber and configured to dispose the blood bag; a rocking mechanism that is provided in the second chamber and rocks the tray; and an attachment/detachment portion that is provided in the rocking mechanism and formed so that the tray is capable of being attached and detached, in which an

opening portion that interconnects the first chamber and the second chamber and into which the attachment/detachment portion is inserted is formed in the partition wall, and the blood collection device further includes a wall

5 structure that prevents a foreign article from entering the second chamber from the first chamber through the opening portion.

[0006]

According to the present invention, since the foreign
10 article can be prevented from entering the second chamber from the first chamber through the opening portion by the wall structure, the foreign article can be prevented from entering the rocking mechanism provided in the second chamber.

15 Brief Description of Drawings

[0007]

Fig. 1 is a perspective view of a blood collection device according to an embodiment of the present invention.

Fig. 2 is a longitudinal sectional view of the blood
20 collection device of Fig. 1.

Fig. 3 is a cross-sectional view taken along line III-III of Fig. 2.

Fig. 4 is a cross-sectional view taken along line IV-IV of Fig. 2.

25 Fig. 5 is an explanatory view of work of removing a

tray from an attachment/detachment portion.

Description of Embodiments

[0008]

Hereinafter, preferred embodiments of a blood
5 collection device according to the present invention will
be described with reference to the accompanying drawings.

[0009]

A blood collection device 10 according to an embodiment
of the present invention is configured as a vacuum blood
10 collection device that collects blood from a donor into a
blood bag 200 by using negative pressure.

[0010]

As illustrated in Figs. 1 and 2, the blood collection
device 10 includes a box-shaped housing 12, a lid 14
15 provided so as to be openable and closable in an upper
portion of the housing 12, a tray 16, a rocking mechanism
(Swirling mechanism) 18, and an attachment/detachment
portion 20.

[0011]

20 In the housing 12, a length dimension along a front and
back direction (direction of an arrow A) is longer than a
width dimension along a right and left direction (direction
of an arrow B). However, the length dimension of the
housing 12 may be shorter than the width dimension. An
25 operation panel 21 for collecting blood is provided on a

front surface (front surface directed in a direction of an arrow A1) of the housing 12.

[0012]

An accommodation chamber 24 opened upward is formed in the housing 12. That is, the accommodation chamber 24 is formed by a bottom wall portion 26 and a peripheral wall portion 28. The peripheral wall portion 28 includes a front wall portion 28a located in a direction of an arrow A1, a rear wall portion 28b located in a direction of an arrow A2, and right and left side wall portions 28c and 28d connecting the front wall portion 28a and the rear wall portion 28b to each other (see Fig. 4).

[0013]

The lid 14 is provided at an upper end portion of the rear wall portion 28b via a hinge 30 (see Fig. 1). The lid 14 covers the blood bag 200 placed on the tray 16 from above in a closed state. The lid 14 is preferably configured to be transparent so that the blood bag 200 into which the blood is being collected can be visually recognized from the outside through the lid 14.

[0014]

As illustrated in Figs. 1 to 3, a seal portion 32 that hermetically seals a portion between the lid 14 and an upper end portion of the peripheral wall portion 28 in a closed state of the lid 14 is provided at the upper end

portion of the peripheral wall portion 28. The seal
portion 32 is formed of an elastically deformable resin
material such as rubber. The seal portion 32 extends
annularly (in a rectangular annular shape) so as to go
5 around the upper end portion of the peripheral wall portion
28.

[0015]

In Figs. 1 and 2, a partition wall 34 that partitions
the accommodation chamber 24 into a first chamber 24a and a
10 second chamber 24b in a vertical direction is provided in
the housing 12. The partition wall 34 is a flat plate
extending in parallel (substantially horizontal) to the
bottom wall portion 26. The partition wall 34 extends in a
rectangular shape in the direction of the arrow A.

15 [0016]

The partition wall 34 is located substantially at the
center of the peripheral wall portion 28 in a height
direction. In FIG. 4, a quadrangular (rectangular) opening
portion 36 that interconnects the first chamber 24a and the
20 second chamber 24b is formed in the partition wall 34. The
opening portion 36 is located closer to the rear wall
portion 28b. Specifically, the opening portion 36 extends
from a position shifted in the direction of the arrow A2
from one end of the partition wall 34 (intermediate
25 position of the partition wall 34 in the longitudinal

direction) to the other end of the partition wall 34. The opening portion 36 is located substantially at the center of the partition wall 34 in the width direction (direction of the arrow B).

5 [0017]

In Figs. 1 to 3, the tray 16 for disposing the blood bag 200 is accommodated in the first chamber 24a located above the partition wall 34. The blood collection device 10 sets the inside of the first chamber 24a to negative pressure. A magnet 38 is provided on a lower surface of the tray 16. That is, the tray 16 is disposed in the first chamber 24a in a state of being mounted on the attachment/detachment portion 20. In this state, a predetermined gap S is formed between the tray 16 and the peripheral wall portion 28 so that the tray 16 can rock in the first chamber 24a.

[0018]

The tray 16 is provided with a handle 40 in order to easily attach and detach the tray to and from the rocking mechanism 18. The handle 40 is formed in a shape close to a U shape by using a wire or the like. Opposite end portions of the handle 40 are rotatably attached to right and left side portions of the tray 16. The handle 40 also functions as a pressing portion that presses the blood bag 200 against the tray 16.

[0019]

In Fig. 2, the rocking mechanism 18 for rocking the tray 16 is accommodated in the second chamber 24b located below the partition wall 34. The rocking mechanism 18 moves, for example, the tray 16 in two axial directions (direction of the arrow A and the direction of the arrow B). However, the rocking mechanism 18 may three-dimensionally rock the tray 16.

[0020]

The tray 16 is attachable and detachable to and from the attachment/detachment portion 20. The attachment/detachment portion 20 includes a shaft portion 20a connected to the rocking mechanism 18 and extending from the second chamber 24b into the first chamber 24a through the opening portion 36, and an attachment/detachment main body portion 20b provided at an extending end of the shaft portion 20a. The attachment/detachment main body portion 20b is a metal plate that can be adsorbed to the magnet 38 of the tray 16.

[0021]

As illustrated in Figs. 1 to 4, the blood collection device 10 includes a wall structure 50 that prevents a foreign article from entering the second chamber 24b from the first chamber 24a through the opening portion 36. The wall structure 50 includes a cover portion 52 that prevent

the foreign article from entering the gap S from the outside, and a protruding wall portion 54 that prevents the foreign article that has entered the first chamber 24a from entering the second chamber 24b.

5 [0022]

In Figs. 1 to 3, the cover portion 52 extends inward from the seal portion 32 and extends in a frame shape (annular shape) along the seal portion 32. That is, the cover portion 52 is provided to cover the gap S from above.

10 The cover portion 52 covers an outer edge portion of the tray 16 from above in a state where the tray 16 is mounted on the attachment/detachment portion 20. The cover portion 52 is provided integrally with the seal portion 32. In other words, the cover portion 52 and the seal portion 32

15 are integrally molded products made of rubber or the like. A thickness of the cover portion 52 is smaller than a thickness of the seal portion 32. The cover portion 52 extends substantially horizontally. However, the cover portion 52 may extend upward or downward toward the inside

20 of the seal portion 32.

[0023]

The cover portion 52 has flexibility. Therefore, even in a case where the tray 16 is in contact with the cover portion 52 at the time of removing the tray 16 from the

25 attachment/detachment portion 20, the cover portion 52 can

be bent upward (see Fig. 5). Furthermore, even in a case where the tray 16 is in contact with the cover portion 52 at the time of mounting the tray 16 on a mounting portion, the cover portion 52 can be bent downward. A plurality of
5 slits 53 are formed in the cover portion 52. In the present embodiment, each of the slits 53 is located at a corner portion of the cover portion 52. Accordingly, the cover portion 52 can be divided into a plurality of portions (four portions), and each portion of the cover
10 portion 52 can be smoothly bent in the vertical direction.
[0024]

In Figs. 1, 2, and 4, the protruding wall portion 54 protrudes upward from the partition wall 34. The protruding wall portion 54 is formed in a U shape so as to
15 surround the opening portion 36 from three directions (direction of the arrow A1 and the direction of the arrow B) when viewed from above. A protruding length of the protruding wall portion 54 is smaller than a distance between a lower surface of the tray 16 and an upper surface
20 of the partition wall 34 in a state where the tray 16 is mounted on the attachment/detachment portion 20.
[0025]

The protruding wall portion 54 includes a first wall portion 56a located between the opening portion 36 and the
25 front wall portion 28a, a second wall portion 56b located

between the opening portion 36 and the side wall portion 28c, and a third wall portion 56c located between the opening portion 36 and a side wall portion 28d.

[0026]

5 As illustrated in Fig. 4, the first wall portion 56a extends parallel to the front wall portion 28a. A length (length in the direction of the arrow B) of the first wall portion 56a is longer than a width of the opening portion 36. The second wall portion 56b extends parallel to the
10 side wall portion 28c from one end portion of the longitudinal direction of the first wall portion 56a toward the rear wall portion 28b. The third wall portion 56c extends parallel to the side wall portion 28d from the other end portion of the longitudinal direction of the
15 first wall portion 56a toward the rear wall portion 28b. The second wall portion 56b and the third wall portion 56c extend in parallel to each other.

[0027]

In this case, the blood collection device 10 according
20 to the present embodiment has the following effects.

[0028]

The blood collection device 10 includes a wall structure 50 that prevents a foreign article from entering the second chamber 24b from the first chamber 24a through
25 the opening portion 36.

[0029]

In such a configuration, since the foreign article can be prevented from entering the second chamber 24b from the first chamber 24a through the opening portion 36 by the wall structure 50, the foreign article can be prevented from entering the rocking mechanism 18 provided in the second chamber 24b.

[0030]

The gap S is formed between the peripheral wall portion 28 forming the first chamber 24a and the tray 16, and the wall structure 50 has the cover portion 52 covering the gap S from above.

[0031]

In such a configuration, the foreign article can be prevented from entering the gap S between the peripheral wall portion 28 and the tray 16 from the outside by the cover portion 52.

[0032]

The cover portion 52 is formed in a frame shape along an outer shape of the tray 16.

[0033]

In such a configuration, the foreign article can be effectively prevented from entering the gap S.

[0034]

The cover portion 52 is located above the tray 16 in a

state where the tray 16 is mounted on the attachment/detachment portion 20.

[0035]

In such a configuration, it is possible to prevent the
5 tray 16 from coming into contact with the cover portion 52 when the tray 16 is rocked.

[0036]

The cover portion 52 has flexibility.

[0037]

10 In such a configuration, even in a case where the tray 16 is in contact with the cover portion 52 at the time of attaching and detaching the tray 16 to and from the attachment/detachment portion 20, the cover portion 52 can be bent in the vertical direction. Accordingly, the tray
15 16 can be smoothly attached and detached to and from the attachment/detachment portion 20.

[0038]

The blood collection device 10 includes the lid 14 provided in an upper portion of the housing 12 so as to be
20 openable and closable, and the seal portion 32 that hermetically seals a portion between the lid 14 and an upper end portion of the housing 12 in a closed state of the lid 14 is provided in the upper end portion of the housing 12. The cover portion 52 extends inward from the
25 seal portion 32.

[0039]

In such a configuration, since the cover portion 52 and the seal portion 32 can be integrally molded, the number of parts can be reduced and the cost can be reduced.

5 [0040]

The wall structure 50 has a protruding wall portion 54 that protrudes upward from the partition wall 34 to prevent the foreign article that has entered the first chamber 24a from entering the opening portion 36.

10 [0041]

In such a configuration, the foreign article can be effectively prevented from entering the second chamber 24b.

[0042]

The opening portion 36 is located below the tray 16 in
15 a state where the tray 16 is mounted on the attachment/detachment portion 20. The protruding wall portion 54 extends so as to surround the opening portion 36.

[0043]

In such a configuration, the foreign article can be
20 more effectively prevented from entering the second chamber 24b.

[0044]

The present invention is not limited to the above-described embodiments, and various modifications can be
25 made without departing from the gist of the present

invention.

[0045]

The cover portion 52 may be located above the tray 16 in a state where the tray 16 is mounted on the attachment/detachment portion 20. In this case, the tray 16 can be smoothly attached and detached to and from the attachment/detachment portion 20. The cover portion 52 may not extend from the seal portion 32. That is, the cover portion 52 may be provided on the peripheral wall portion 28. In this case, the cover portion 52 may be made of a metal material. The cover portion 52 may be located below a lower surface of the tray 16 in a state where the tray 16 is mounted on the attachment/detachment portion 20. The protruding wall portion 54 may be provided at an outer edge portion of the opening portion 36.

[0046]

The above embodiments are summarized as follows.

[0047]

The embodiment described above discloses the blood collection device (10) that collects blood from the donor into the blood bag (200) by using negative pressure, the blood collection device including: the housing (12); the partition wall (34) that partitions the inside of the housing into the first chamber (24a) and the second chamber (24b) located below the first chamber; the tray (16) that

is provided in the first chamber and configured to dispose the blood bag; the rocking mechanism (18) that is provided in the second chamber and rocks the tray; and the attachment/detachment portion (20) that is provided in the rocking mechanism and formed so that the tray is capable of being attached and detached, in which the opening portion (36) that interconnects the first chamber and the second chamber and into which the attachment/detachment portion is inserted is formed in the partition wall, and the blood r further includes the wall structure (50) that prevents the foreign article from entering the second chamber from the first chamber through the opening portion.

[0048]

In the blood collection device described above, the gap (S) may be formed between the peripheral wall portion (28) forming the first chamber and the tray, and the wall structure may have the cover portion (52) covering the gap from above.

[0049]

In the blood collection device described above, the cover portion may be formed in the frame shape along the outer shape of the tray.

[0050]

In the blood collection device described above, the cover portion may be located above the tray in a state

where the tray is attached to the attachment/detachment portion.

[0051]

In the blood collection device described above, the
5 cover portion may have flexibility.

[0052]

In the blood collection device described above, the lid
(14) provided so as to be openable and closable may be
provided in the upper portion of the housing, the seal
10 portion (32) that hermetically seals a portion between the
lid and the upper end portion of the housing in the closed
state of the lid may be provided in the upper end portion
of the housing, and the cover portion may extend inward
from the seal portion.

15 [0053]

In the blood collection device described above, the
wall structure may include the protruding wall portion (54)
that protrudes upward from the partition wall and prevent
the foreign article that has entered the first chamber from
20 entering the opening portion.

[0054]

In the blood collection device described above, the
opening portion may be located below the tray in a state
where the tray is attached to the attachment/detachment
25 portion, and the protruding wall portion may extend so as

to surround the opening portion.

CLAIMS

1. A blood collection device that collects blood from a donor into a blood bag by using negative pressure, the blood collection device comprising:

5 a housing;

a partition wall that partitions an inside of the housing into a first chamber and a second chamber located below the first chamber;

a tray that is provided in the first chamber and
10 configured to dispose the blood bag;

a rocking mechanism that is provided in the second chamber and rocks the tray; and

an attachment/detachment portion that is provided in the rocking mechanism and formed so that the tray is
15 capable of being attached and detached,

wherein an opening portion that interconnects the first chamber and the second chamber and into which the attachment/detachment portion is inserted is formed in the partition wall, and

20 the blood collection device further includes a wall structure that prevents a foreign article from entering the second chamber from the first chamber through the opening portion.

2. The blood collection device according to claim 1,
25 wherein a gap is formed between a peripheral wall portion

forming the first chamber and the tray, and

the wall structure has a cover portion covering the gap from above.

3. The blood collection device according to claim 2,

5 wherein the cover portion is formed in a frame shape along an outer shape of the tray.

4. The blood collection device according to claim 2 or 3, wherein the cover portion is located above the tray in a state where the tray is attached to the

10 attachment/detachment portion.

5. The blood collection device according to claim 4, wherein the cover portion has flexibility.

6. The blood collection device according to any one of claims 2 to 5, further comprising a lid provided so as to

15 be openable and closable in an upper portion of the housing,

wherein a seal portion that hermetically seals a portion between the lid and an upper end portion of the housing in a closed state of the lid is provided in the upper end portion of the housing, and

20 the cover portion extends inward from the seal portion.

7. The blood collection device according to any one of claims 1 to 6, wherein the wall structure includes a protruding wall portion that protrudes upward from the partition wall and prevents the foreign article that has

25 entered the first chamber from entering the opening portion.

8. The blood collection device according to claim 7,
wherein the opening portion is located below the tray in a
state where the tray is attached to the
attachment/detachment portion, and

5 the protruding wall portion extends so as to surround
the opening portion.