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(54) **POUCH FOR MICROWAVE OVEN USE**

(57) To provide a microwavable pouch capable of reliably ensuring a large opening in the slit during microwave heating. Provided is a microwavable pouch (10) in which an automatic steam venting mechanism (20) includes a steam venting sealing portion (30), a slit (50) and a flap piece (41), the slit (50) includes a slit intermediate portion (52) formed toward a region closer to a seal peeling start portion (31) than a pair of slit end portions (51), and the automatic steam venting mechanism (20) further includes an unsealed portion (41) formed to cover the entire periphery of the slit (50) and a control sealing portion (70) formed by heat-welding a part of the flap piece (41) to a second film (12).

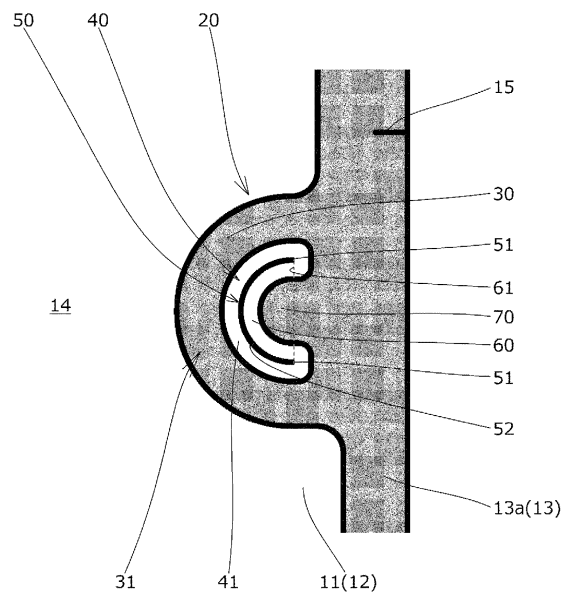


FIG. 2

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Description

Technical Field

[0001] The present invention relates to a microwavable pouch that is provided with an automatic steam venting mechanism that automatically releases internal steam during heating.

Background Art

[0002] Packaged food products have been marketed in which cooked or semi-cooked food is contained in a pouch formed into a bag shape by thermally bonding films that overlap each other, and the food is then cooked in a microwave oven before eating.

[0003] When such a pouch is heated in a microwave oven, the steam generated from the food and the thermal expansion of the internal air increase the internal pressure of the pouch, which may cause the pouch to rupture or deform, and the food inside the pouch to scatter due to the rupturing of the pouch.

[0004] For this reason, in recent years, it has been known that a microwavable pouch is generally provided with an automatic steam venting mechanism that automatically releases internal steam during heating (see, for example, Patent Document 1). As one aspect of such an automatic steam venting mechanism, as illustrated in FIG. 10, there has been known one including a steam venting sealing portion 130 that is formed by heat-welding overlapped films 111 and 112 and isolates a steam releasing portion 140 inside thereof from a content containing portion 114, and a slit 150 that is formed through the first film 111 in the steam releasing portion 140.

[0005] In an automatic steam venting mechanism 120 illustrated in FIG. 10, when the pressure in the content containing portion 114 increases due to heating by the microwave oven, a part of the steam venting sealing portion 130 is peeled off, the content containing portion 114 and the steam releasing portion 140 communicate with each other, and the steam in the content containing portion 114 is emitted to the outside through the slit 150.

Citation List

Patent Literature

[0006] Patent Document 1: JP 2003-192042 A

Summary of Invention

Technical Problem

[0007] However, the automatic steam venting mechanism 120 illustrated in FIG. 10 may have an opening having an insufficient size in the slit 150 depending on the degree of expansion of the pouch during heating. When the opening in the slit 150 is small, a sufficient emitting

amount of steam cannot be secured, and thus the expanded state of the pouch by the steam is maintained for a long time. This may cause a perforation phenomenon to occur in the pouch due to thermal damage to the inner surface material of the pouch or the like.

[0008] It is therefore an object of the present invention to solve these problems, and to provide a microwavable pouch having a simple structure and capable of reliably ensuring a large opening in the slit during microwave heating.

Solution to Problem

[0009] According to an aspect of the present invention, provided is a microwavable pouch comprising an automatic steam venting mechanism,

the automatic steam venting mechanism comprising a steam venting sealing portion that is formed by heat-welding a first film and a second film that overlap each other and isolates a steam releasing portion inside the steam venting sealing portion from a content containing portion,

a slit that is formed in the first film in the steam releasing portion, and

a flap piece that is formed in the first film and is defined by the slit,

the steam venting sealing portion comprising a seal peeling start portion that starts peeling by steam generated in the content containing portion during heating,

the slit comprising

a pair of slit end portions and

a slit intermediate portion that is formed toward a region closer to the seal peeling start portion than the pair of slit end portions and connects both of the pair of slit end portions, and the automatic steam venting mechanism further comprising

an unsealed portion formed to cover an entire periphery of the slit and in which the first film and the second film are not welded, and

a control sealing portion in which a part of the flap piece formed in the first film is heat-welded to the second film,

whereby the above-described problems are solved.

Advantageous Effects of Invention

[0010] According to the present invention, the automatic steam venting mechanism has an unsealed portion formed to cover an entire periphery of the slit and a control sealing portion in which a part of the flap piece formed in the first film is heat-welded to the second film. When the pouch is heated by the microwave oven and the steam venting sealing portion is peeled off and the content containing portion and the steam releasing portion communicate with each other, the first and second films tend to separate from each other due to an increase in

the internal pressure of the pouch on the side closer to the seal peeling start portion than the slit, while the first and second films are prevented from separating from each other by the control sealing portion in the region where the flap piece is formed on the side farther from the seal peeling start portion than the slit. Therefore, the opening of the slit can be reliably ensured to be large, and the steam can be emitted well.

[0011] In addition, since the unsealed portion is formed to cover the entire periphery of the slit, the first and second films can be reliably separated from each other by an increase in the internal pressure of the pouch on the side closer to the seal peeling start portion than the slit.

Brief Description of Drawings

[0012]

FIG. 1 is an explanatory view illustrating a microwavable pouch according to a first embodiment of the present invention.

FIG. 2 is an explanatory view illustrating an automatic steam venting mechanism when viewed from a first film side.

FIG. 3 is an explanatory view illustrating the automatic steam venting mechanism viewed from a second film side opposite to FIG. 2.

FIG. 4 is an explanatory view illustrating a state of the automatic steam venting mechanism during pouch heating.

FIG. 5 is an explanatory view for explaining dimensions of each portion.

FIG. 6 is a photograph showing a state in which the pouch formed with a control sealing portion is heated.

FIG. 7 is a photograph showing a state in which a pouch not formed with the control sealing portion is heated.

FIG. 8 is an explanatory view illustrating an automatic steam venting mechanism according to a second embodiment.

FIG. 9 is an explanatory view illustrating a variation of the automatic steam venting mechanism.

FIG. 10 is an explanatory view illustrating a known automatic steam venting mechanism.

Description of Embodiments

[0013] A microwavable pouch 10 according to the first embodiment of the present invention will be described below with reference to the drawings.

[0014] First, as illustrated in FIG. 1, the pouch 10 is formed into a bag shape by forming a bag-making sealing portion 13 produced by thermally bonding overlapped first and second films 11 and 12 (and a gusset portion film) at predetermined positions, and a content such as food is contained in a content containing portion 14 inside the bag-making sealing portion 13.

[0015] Aspects of the pouch 10 in the present embodiment will be specifically described. As illustrated in FIG. 1, the first and second films 11 and 12 continuously formed as a single film are folded in half at the top portion of the pouch 10. A gusset portion film (not illustrated) is disposed between the first and second films 11 and 12 at the bottom portion of the pouch 10. The first and second films 11 and 12 or the first and second films 11 and 12 and the gusset portion film (not illustrated) are heat-welded on both side portions and the bottom portion of the pouch 10 to form the bag-making sealing portion 13 (side sealing portions 13a and 13b, bottom sealing portion 13c), whereby the pouch 10 is configured as a so-called standing pouch formed into a bag shape.

[0016] As illustrated in FIG. 1, the side sealing portions 13a and 13b are formed with notches 15 for opening the pouch 10 at two positions including a position above a steam venting sealing portion 30 described later and a position opposite thereto.

[0017] The pouch 10 is provided with an automatic steam venting mechanism 20 for automatically releasing steam in the pouch 10 to the outside during heating.

[0018] As illustrated in FIGS. 1 and 2, the automatic steam venting mechanism 20 includes: the steam venting sealing portion 30 formed by heat-welding the overlapped first and second films 11 and 12 to isolate a steam releasing portion 40 in the automatic steam venting mechanism 20 from the content containing portion 14; a slit 50 formed in the first film 11 in the steam releasing portion 40; and a flap piece 60 formed in the first film 11 and defined by the slit 50.

[0019] Each component of the automatic steam venting mechanism 20 will be described below with reference to FIG. 2.

[0020] First, as illustrated in FIG. 2, the steam venting sealing portion 30 is formed continuously with the bag-making sealing portion 13 (the side sealing portion 13a) inside the bag-making sealing portion 13.

[0021] The steam venting sealing portion 30 has a seal peeling start portion 31 that starts peeling (so that the outer peripheral side and the inner peripheral side of the steam venting sealing portion 30 communicate) by the steam generated in the content containing portion 14 during heating in the microwave oven. In the present embodiment, as illustrated in FIGS. 1 and 2, the seal peeling start portion 31 is a portion of the annular steam venting sealing portion 30 that is closest to the center C of the content containing portion 14.

[0022] As illustrated in FIG. 2, the steam releasing portion 40 is a portion isolated from the content containing portion 14 by forming the steam venting sealing portion 30, and in the present embodiment, the periphery of the steam releasing portion 40 is surrounded by the steam venting sealing portion 30 and (the side sealing portion 13a of) the bag-making sealing portion 13.

[0023] As illustrated in FIG. 2, the slit 50 is formed through the first film 11 in the film thickness direction, and includes a pair of slit end portions 51 and a substan-

tially arc-shaped (substantially C-shaped or substantially U-shaped) slit intermediate portion 52 formed toward a region closer to the seal peeling start portion 31 than the pair of slit end portions 51 (a side closer to the seal peeling start portion 31 than an imaginary line passing through the pair of slit end portions 51) and connecting both of the pair of slit end portions 51.

[0024] Note that, in the present embodiment, the positions of the pair of slit end portions 51 are determined such that the imaginary line connecting both of the pair of slit end portions 51 extends along the longitudinal direction (vertical direction in FIG. 1) of the microwavable pouch 10 (parallel to the side sealing portion 13a).

[0025] In the first embodiment, as illustrated in FIG. 3, the second film 12 is not formed with a slit in the steam releasing portion 40.

[0026] As illustrated in FIG. 2, the flap piece 60 is a portion that is partially separated from the peripheral portion of the first film 11 in the steam releasing portion 40 by forming the slit 50.

[0027] The flap piece 60 has a connection portion 61 connected to the peripheral portion of the first film 11 at a position far from the seal peeling start portion 31 in the outer peripheral edge of the flap piece 60.

[0028] As illustrated in FIG. 2, the automatic steam venting mechanism 20 further includes an unsealed portion 41 formed so as to cover the entire periphery of the slit 50 in the steam releasing portion 40, and a control sealing portion 70 formed by heat-welding a part of the flap piece 60 formed in the first film 11 to the second film 12.

[0029] The unsealed portion 41 is a portion where the overlapped first and second films 11 and 12 are not welded, and is formed so as to entirely cover the entire periphery of the slit 50 in the pouch plane direction when the microwavable pouch 10 is viewed in a plan view as illustrated in FIG. 2.

[0030] In the present embodiment, the unsealed portion 41 is formed over the entire region of the steam releasing portion 40 except for the location where the control sealing portion 70 is formed.

[0031] The control sealing portion 70 is a portion formed by welding the overlapped first and second films 11 and 12. As illustrated in FIG. 2, the control sealing portion 70 is formed continuously with the bag-making sealing portion 13 (side sealing portion 13a) so as to protrude laterally from the bag-making sealing portion 13 (side sealing portion 13a) toward the inside of the pouch, and a part of the flap piece 60 is heat-welded to the second film 12 at a part (distal end portion) of the control sealing portion 70.

[0032] Next, the dimensions of each portion are set as follows.

[0033] First, as illustrated in FIG. 5, in the direction perpendicular to the virtual line connecting both of the pair of slit end portions 51 (in other words, the direction in which the connection portion 61 extends) (in the case of the example illustrated in FIG. 1 or 5, the lateral direction

of the microwavable pouch 10), a distance γ between a location of the slit 50 that is located innermost of the pouch (apex location) in the above-described direction and the control sealing portion 70 is preferably 4 mm or less, and more preferably 3 mm or less, from the viewpoint of satisfactorily exhibiting the effect of the control sealing portion 70 (that is, the effect of preventing the first and second films 11 and 12 from separating from each other by the control sealing portion 70 and reliably ensuring a large opening in the slit 50).

[0034] As illustrated in FIG. 5, in the direction perpendicular to the imaginary line connecting both of the pair of slit end portions 51 (in other words, the direction in which the connection portion 61 extends) (in the case of the example illustrated in FIG. 1 or 5, the lateral direction of the microwavable pouch 10, the horizontal direction of the drawing), the distance β between a location of the slit 50 that is located innermost of the pouch (apex location) in the above-described direction and the steam venting sealing portion 30 is preferably 4 mm or less, and more preferably 3 mm or less, from the viewpoint of, when the steam venting sealing portion 30 is peeled off during pouch heating, preventing the passage of steam formed between the peeled location of the steam venting sealing portion 30 and the slit 50 from being clogged again and releasing the steam well.

[0035] In addition, as illustrated in FIG. 5, a distance σ between the pair of slit end portions 51 is preferably set to 5 mm or more, and more preferably set to from 7 to 10 mm or less from the viewpoint of ensuring a large opening in the slit 50 during pouch heating.

[0036] Next, the state of each portion when the pouch 10 of the present embodiment is heated will be described below.

[0037] First, when the pouch 10 is heated by a microwave oven, the internal pressure of the pouch 10 increases due to steam generated from the content such as food or the like and thermal expansion of internal air, and a force is applied radially from the center C (see FIG. 1) of the content containing portion 14.

[0038] Next, the steam venting sealing portion 30 starts peeling from the vicinity of a location (seal peeling start portion 31) close to the center C of the content containing portion 14 by the force spreading radially, and the peeling of the steam venting sealing portion 30 progresses in a direction away from the center C of the content containing portion 14.

[0039] In addition, when the peeling of the steam venting sealing portion 30 progresses, the peeling of the unsealed portion 41 of the steam releasing portion 40 also progresses in a direction away from the center C of the content containing portion 14.

[0040] That is, in the unsealed portion 41 of the steam releasing portion 40, the first and second films 11 and 12 are in close contact with each other before the start of peeling of the steam venting sealing portion 30, but after the start of peeling of the steam venting sealing portion 30, peeling proceeds in a direction away from the center

C of the content containing portion 14 due to the above-described force spreading radially.

[0041] Next, when the peeling between the first and second films 11 and 12 in the steam venting sealing portion 30 and the unsealed portion 41 reaches the position of the slit 50, the steam in the content containing portion 14 is released to the outside of the pouch 10 through the slit 50.

[0042] At this time, the first and second films 11 and 12 tend to separate from each other due to the internal pressure of the pouch 10 on the side closer to the seal peeling start portion 31 than the slit 50 (region A illustrated in FIG. 4), whereas the first and second films 11 and 12 are prevented from separating from each other by the control sealing portion 70 in the region where the flap piece 60 is formed on the side farther from the seal peeling start portion 31 than the slit 50 (region B illustrated in FIG. 4). Therefore, with the slit 50 as a boundary, the first film 11 in the region A and the first film 11 in the region B are greatly separated in the front and back direction of the pouch. As a result, as illustrated in FIG. 6, a large opening can be ensured in the slit 50, and a sufficient amount of steam can be emitted. Therefore, the internal pressure of the pouch after the pouch is heated in a microwave oven and steam starts to be released from the pouch (after steam is released) can be maintained at a low internal pressure of 1.10 kgf/cm² or less, and there is no risk of bag breakage.

[0043] As a comparative example, FIG. 7 shows an example in which a pouch not formed with the control sealing portion 70 as illustrated in FIG. 10 is heated and an opening having a sufficient size cannot be ensured in the slit 150. As shown in FIG. 7, when a sufficiently large opening cannot be ensured in the slit 150, the emitting amount of steam cannot be sufficiently ensured. For this reason, the internal pressure of the pouch after releasing steam tends to be higher than 1.10 kgf/cm² or less, and the risk of bag breakage increases.

[0044] At this time, since the unsealed portion 41 is formed so as to cover the entire periphery of the slit 50, the first and second films 11 and 12 can be reliably separated from each other on the side closer to the seal peeling start portion 31 than the slit 50 (region A illustrated in FIG. 4).

[0045] Next, a microwavable pouch 10 according to a second embodiment of the present invention will be described with reference to FIG. 8. Here, in the second embodiment, excepting a part of the configuration, the configuration is the same as that of the first embodiment described above, and thus, a description will be omitted of the configuration apart from the points of difference.

[0046] Note that, FIG. 8(a) is an explanatory view illustrating the pouch 10 according to the second embodiment when viewed from a first film 11 side, and FIG. 8(b) is an explanatory view illustrating the pouch 10 when viewed from a second film 12 side opposite to FIG. 8(a).

[0047] First, in the first embodiment described above, as illustrated in FIGS. 2 and 3, the slit 50 has been de-

scribed as being formed only in the first film 11 and no slit is formed in the second film 12 in the steam releasing portion 40. While, in the second embodiment, as illustrated in FIG. 8, a slit (second slit 53) is also formed in a second film 12 in a steam releasing portion 40.

[0048] That is, in the second embodiment, as illustrated in FIG. 8, the second film 12 is formed with the second slit 53 formed in the same shape and at the same position as the slit 50 formed in a first film 11 so as to completely overlap the slit 50 formed in the first film 11 in the front and back direction.

[0049] Similarly to the slit 50 formed in the first film 11, the second slit 53 formed in the second film 12 is formed so as to pass through the second film 12 in the film thickness direction, and as illustrated in FIG. 8(b), includes a pair of slit end portions 54 and a substantially arc-shaped (substantially C-shaped or substantially U-shaped) slit intermediate portion 55 formed toward a region closer to a seal peeling start portion 31 than the pair of slit end portions 54 to connect both of the pair of slit end portions 54.

[0050] In the second embodiment, as illustrated in FIG. 8(b), a second flap piece 62 is formed in the second film 12 in the same manner as the flap piece 60 formed in the first film 11.

[0051] As illustrated in FIG. 8(b), the second flap piece 62 is a portion partially separated from the peripheral portion of the second film 12 in the steam releasing portion 40 by the formation of the second slit 53, and has a connection portion 63 connected to the peripheral portion of the second film 12 at a position far from the seal peeling start portion 31 in the outer peripheral edge of the second flap piece.

[0052] In the second embodiment, a part of the flap piece 60 formed in the first film 11 is heat-welded to a part of the second flap piece 62 formed in the second film 12 by a control sealing portion 70.

[0053] In the pouch 10 according to the second embodiment produced as described above, since a slit is also formed in the second film 12 as the second slit 53, even when steam cannot be ejected only from the slit 50 formed in the first film 11, for example, when the pouch 10 is placed in a microwave oven with the first film 11 side down, steam can be emitted from the second slit 53 formed in the second film 12, thereby improving the reliability of steam emitting. In addition, compared to a case where a slit is formed only in the first film 11 as the slit 50, the slits 50 and 53 can be formed at a time after the steam venting sealing portion 30 is formed by welding the first film 11 and the second film 12, and thus the slits 50 and 53 can be reliably disposed at a predetermined position in the steam venting sealing portion 30.

[0054] The embodiments of the present invention have been described in detail above, but the present invention is not limited to the embodiments described above, and various design modifications can be made insofar as they do not depart from the scope of the claims of the present invention.

[0055] For example, the pouch 10 may be configured by any combination of configurations of the above-described plurality of embodiments and variations.

[0056] Specifically, the films constituting the pouch 10 (the first and second films 11 and 12 and the gusset portion film) may be formed by laminating synthetic resin films such as polyester, polypropylene, polyamide, or known synthetic resin films such as a coating film or a steam-deposited film produced by imparting gas barrier properties or moisture barrier properties to the synthetic resin films, or laminating paper or aluminum foil on the synthetic resin film.

[0057] Although the pouch 10 is formed as a so-called standing pouch in the above-described embodiment, specifically, the pouch 10 may be formed in any form such as a pouch in which a gusset film is not disposed between the first and second films 11 and 12 as long as the pouch 10 includes the first and second films 11 and 12 disposed to overlap each other.

[0058] Although the first and second films 11 and 12 have been described as being integrally formed as one film in the above-described embodiment, the first and second films 11 and 12 may be formed separately.

[0059] Although the content of the pouch 10 has been described as being food in the above-described embodiment, specifically, the content is not limited to food.

[0060] In the above-described embodiment, the steam venting sealing portion 30 has been described as being formed continuously with (the side sealing portion 13a of) the bag-making sealing portion 13. However, a specific aspect of the steam venting sealing portion 30 is not limited to the above, and the steam venting sealing portion 30 may be independently formed inside the bag-making sealing portion 13 as illustrated in FIG. 9(a).

[0061] As a variation of the steam venting sealing portion 30, the position of the seal peeling start portion 31 that starts peeling by the steam generated in the content containing portion 14 during microwave heating may be adjusted by providing peeling resistance (resistance performance against communication between the outer peripheral side and the inner peripheral side of the steam venting sealing portion 30 due to the progress of peeling) having different strength to each portion of the steam venting sealing portion 30 by forming a strong sealing portion and a weak sealing portion, or the like in the steam venting sealing portion 30.

[0062] Although the control sealing portion 70 has been described as being formed continuously with the bag-making sealing portion 13 in the above-described embodiment, a specific aspect of the control sealing portion 70 is not limited to the above. As illustrated in FIG. 9(b), the control sealing portion 70 may be formed as a point seal for heat-welding a part of the flap piece 60 to the second film 12 at a position independent from the bag-making sealing portion 13.

[0063] In the above-described embodiment, the slit intermediate portion 52 of the slit 50 has been described as being formed in a substantially arc shape (substan-

tially C shape or substantially U shape). However, the slit intermediate portion 52 may be formed in any shape as long as it is formed from the pair of slit end portions 51 toward a region closer to the seal peeling start portion 31 and connects both of the pair of slit end portions 51. For example, the intermediate slit portion 52 may be formed of a plurality of straight lines or curved lines, such as a V-shape or a U-shape.

[0064] In the above-described embodiment, the slit 50 has been described as being a linear cut (a cut having no width). However, a specific aspect of the slit 50 is not limited thereto, and the slit 50 may be formed to have a predetermined width (a width in a direction orthogonal to the extending direction of the slit 50).

Reference Signs List

[0065]

- 10 Pouch (Microwavable pouch)
- 11 First film
- 12 Second film
- 13 Bag-making sealing portion
- 13a Side sealing portion
- 13b Side sealing portion
- 13c Bottom sealing portion
- 14 Content containing portion
- 15 Notch
- 20 Automatic steam venting mechanism
- 30 Steam venting sealing portion
- 31 Seal peeling start portion
- 40 Steam releasing portion
- 41 Unsealed portion
- 50 Slit
- 51 A pair of slit end portions
- 52 Slit intermediate portion
- 53 Second slit
- 54 A pair of slit end portions
- 55 Slit intermediate portion
- 60 Flap piece
- 61 Connection portion
- 62 Second flap piece
- 63 Connection portion
- 70 Control sealing portion
- C Center of content containing portion

Claims

1. A microwavable pouch comprising an automatic steam venting mechanism,
 - the automatic steam venting mechanism comprising
 - a steam venting sealing portion that is formed by heat-welding a first film and a second film that overlap each other and isolates a steam releasing portion inside the steam venting sealing por-

tion from a content containing portion,
 a slit that is formed in the first film in the steam
 releasing portion, and
 a flap piece that is formed in the first film and is
 defined by the slit, 5
 the steam venting sealing portion comprising a
 seal peeling start portion that starts peeling by
 steam generated in the content containing por-
 tion during heating,
 the slit comprising 10
 a pair of slit end portions and
 a slit intermediate portion that is formed toward
 a region closer to the seal peeling start portion
 than the pair of slit end portions and connects
 both of the pair of slit end portions, and 15
 the automatic steam venting mechanism further
 comprising
 an unsealed portion formed to cover an entire
 periphery of the slit and in which the first film and
 the second film are not welded, and 20
 a control sealing portion in which a part of the
 flap piece formed on the first film is heat-welded
 to the second film.

2. The microwavable pouch according to claim 1, 25
 wherein the microwavable pouch is formed into a
 bag shape by heat-welding the first film and the sec-
 ond film to form a bag-making sealing portion,

the steam venting sealing portion is formed con- 30
 tinuously with the bag-making sealing portion,
 and
 the control sealing portion is formed to protrude
 from the bag-making sealing portion toward an
 inside of the microwavable pouch. 35

3. The microwavable pouch according to claim 1 or 2,
 wherein the second film is formed with a second slit
 formed in the same shape and the same position as
 the slit formed in the first film to overlap the slit formed 40
 in the first film in a front-back direction in the steam
 releasing portion.

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50

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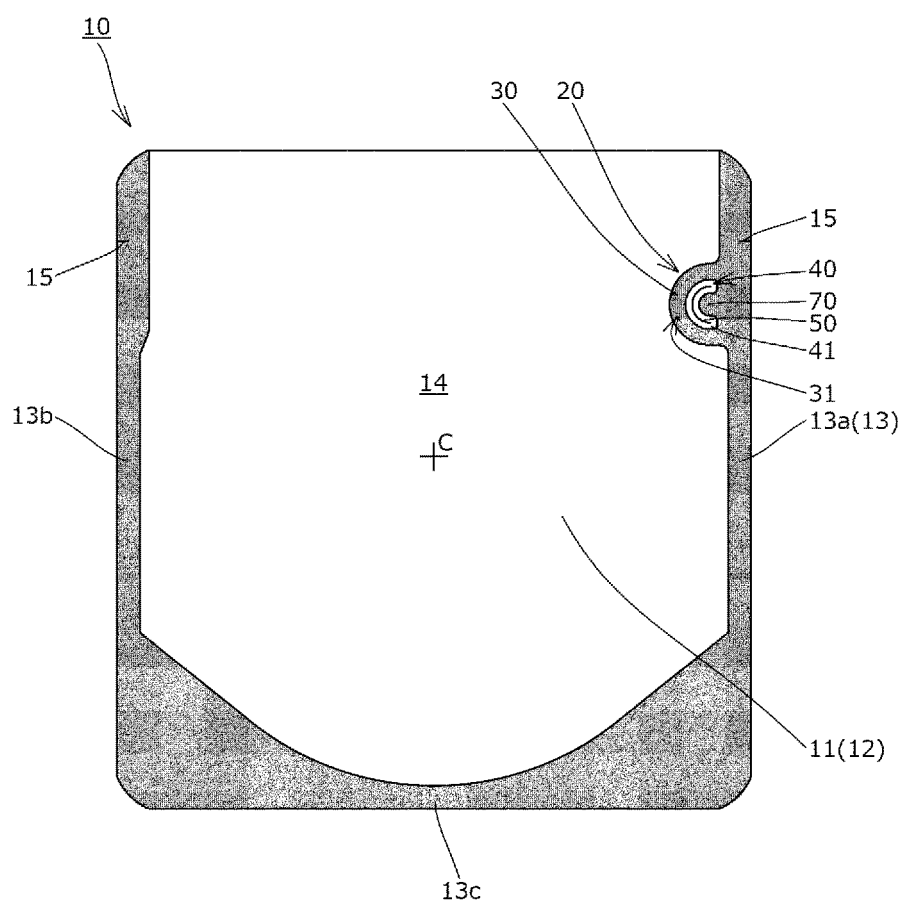


FIG. 1

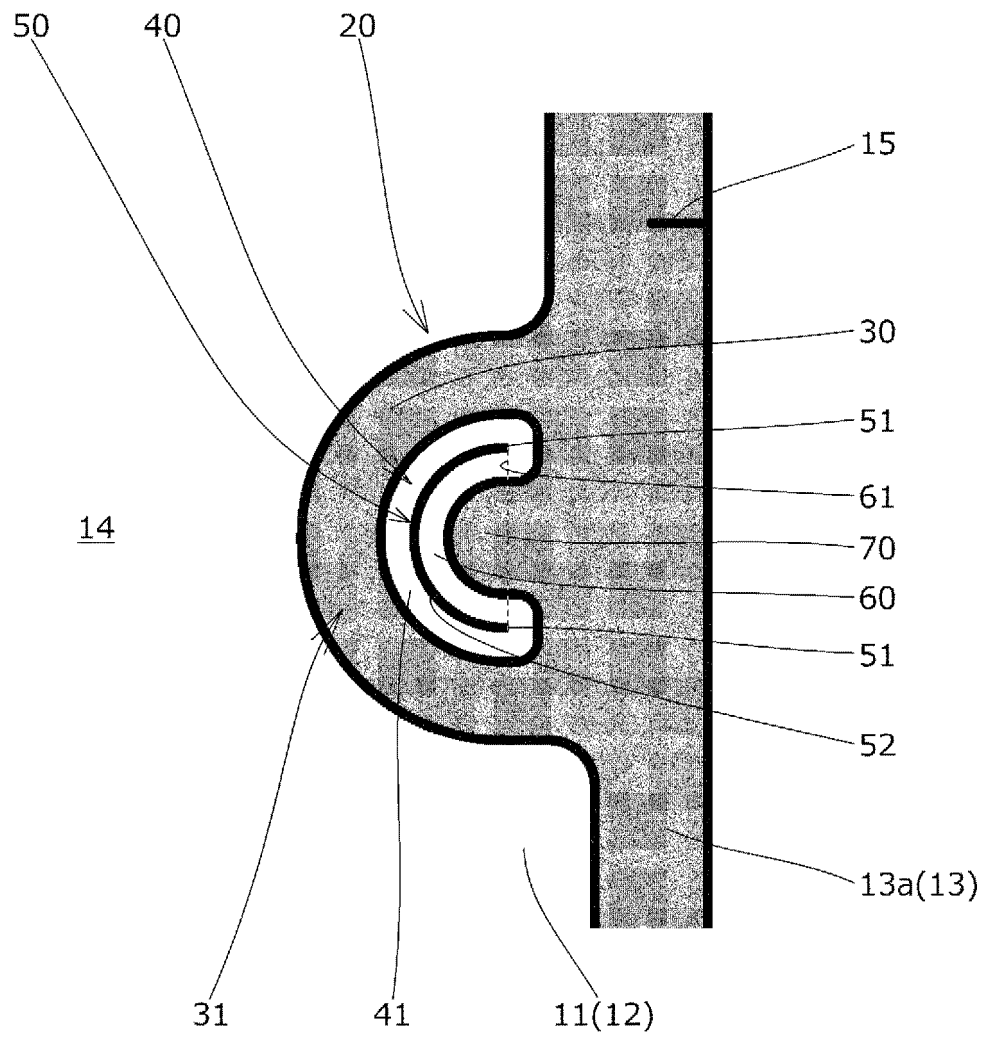


FIG. 2

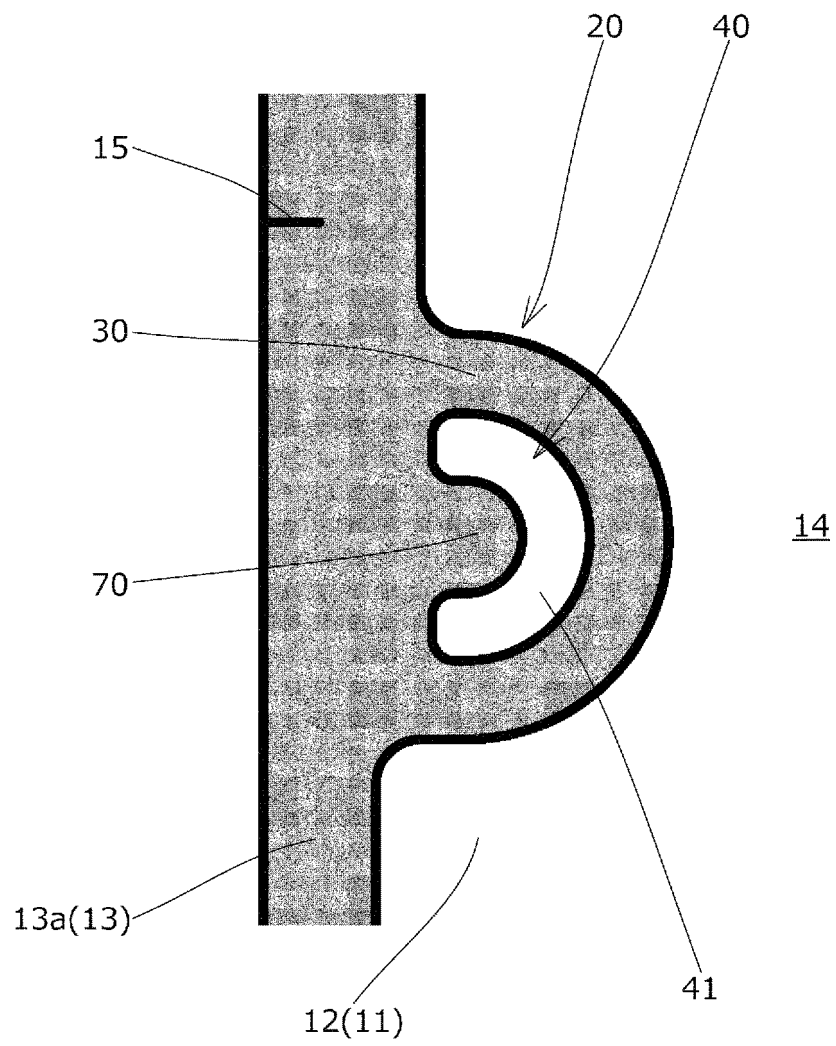


FIG. 3

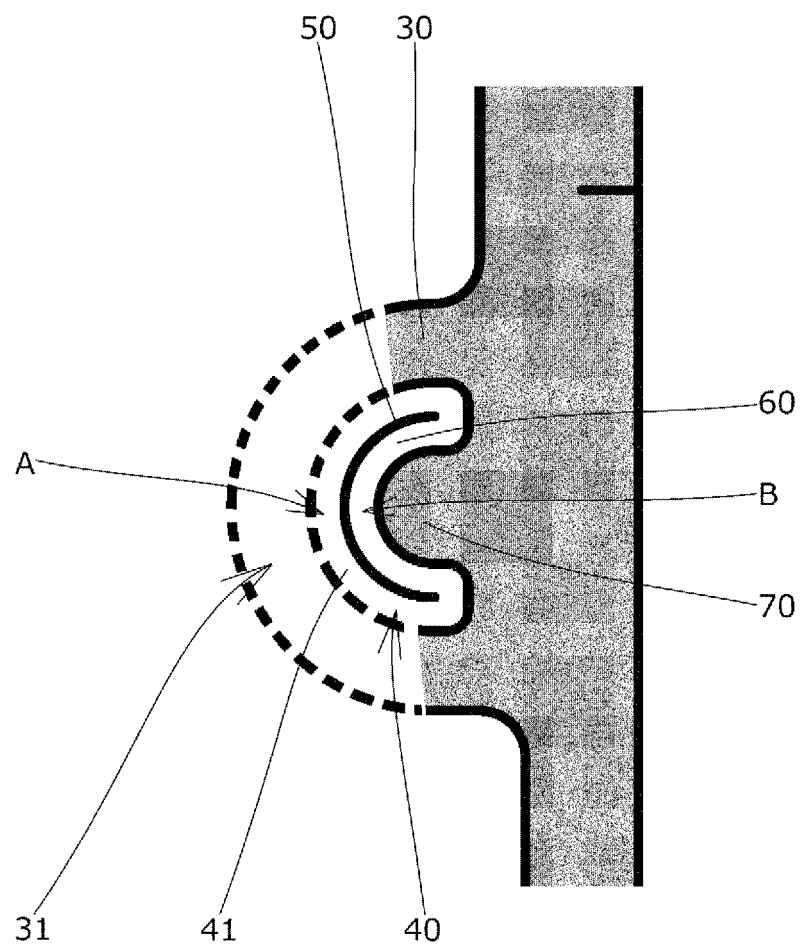


FIG. 4

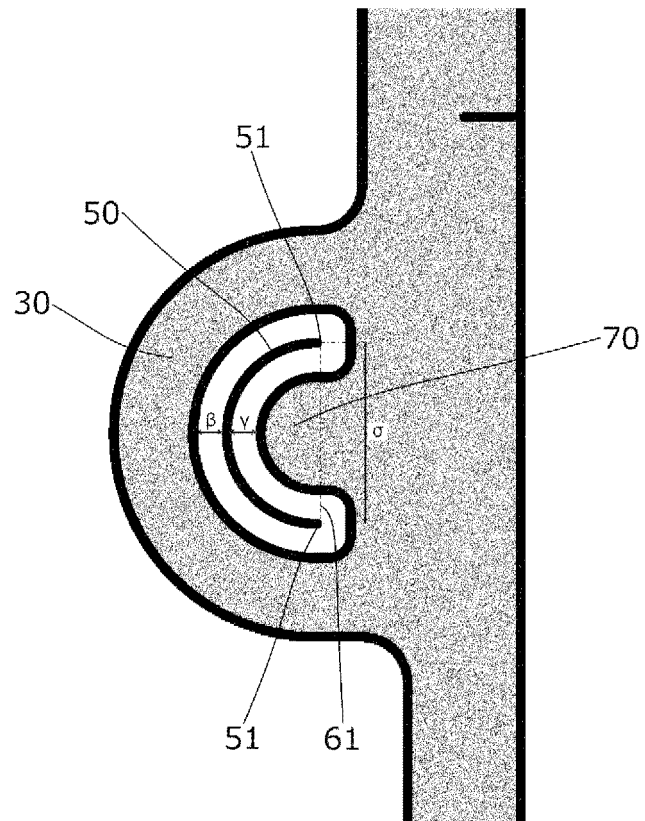


FIG. 5

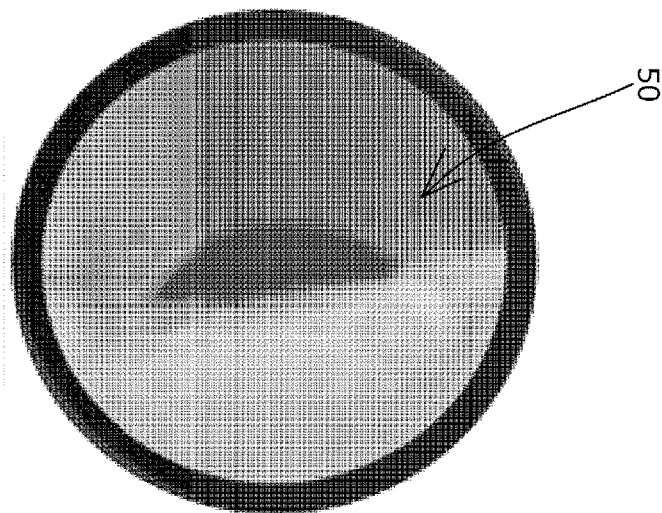
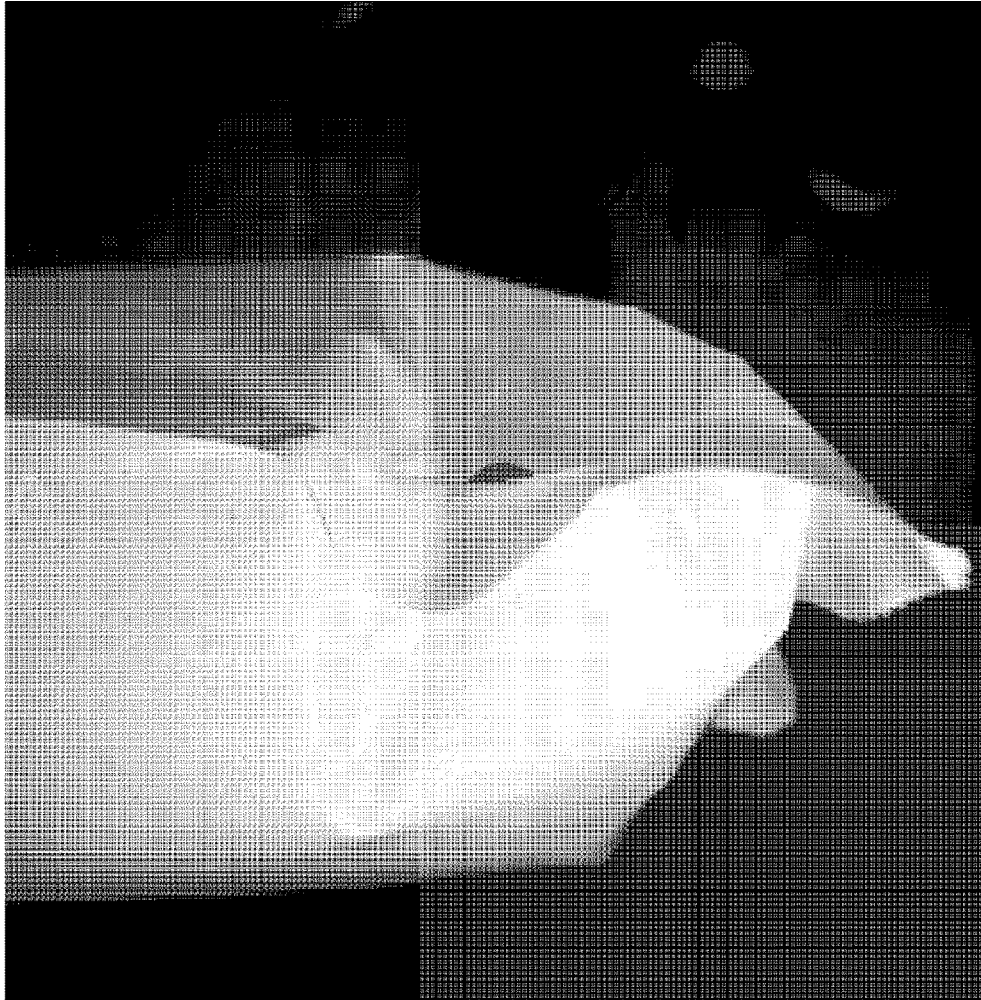


FIG. 6

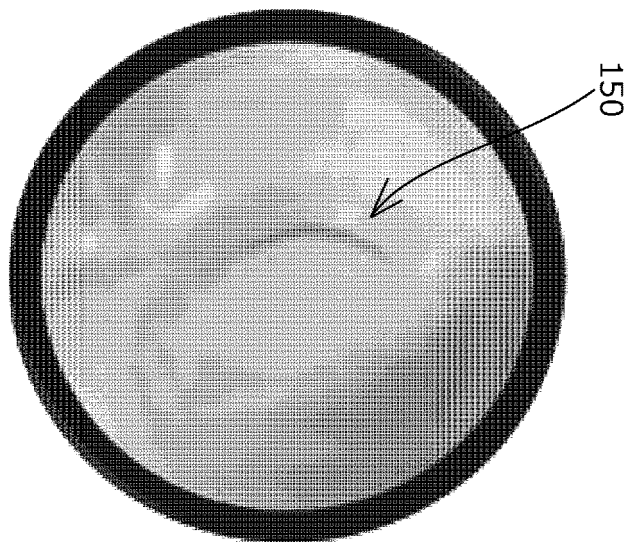
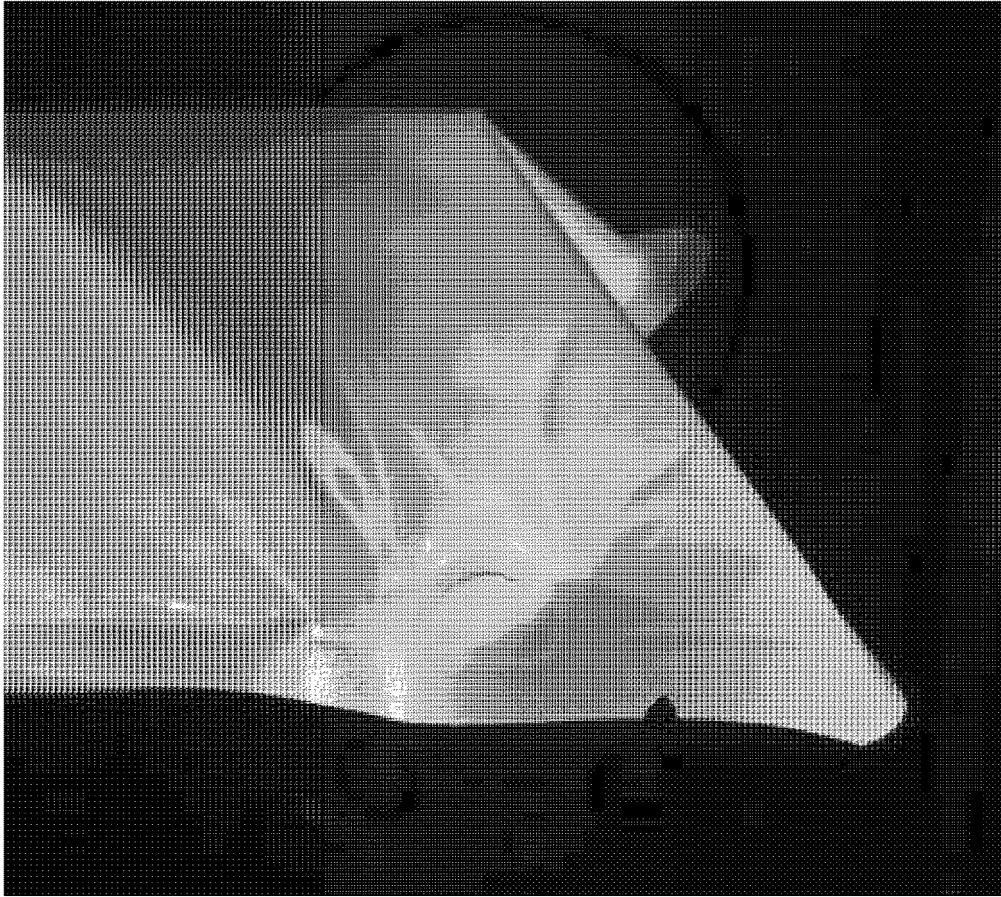


FIG. 7

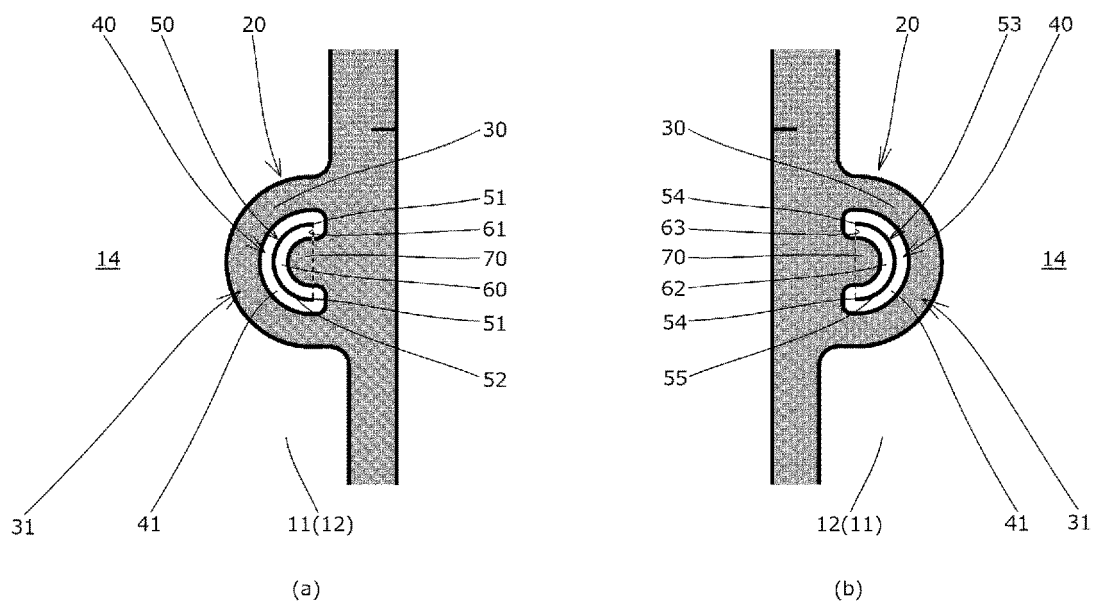


FIG. 8

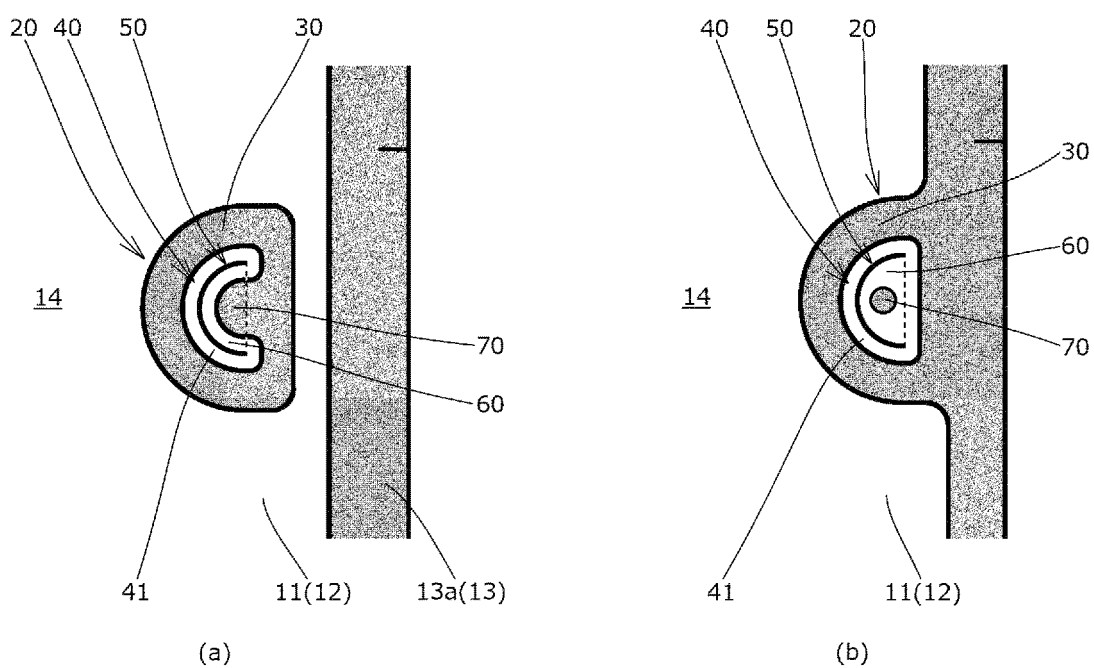


FIG. 9

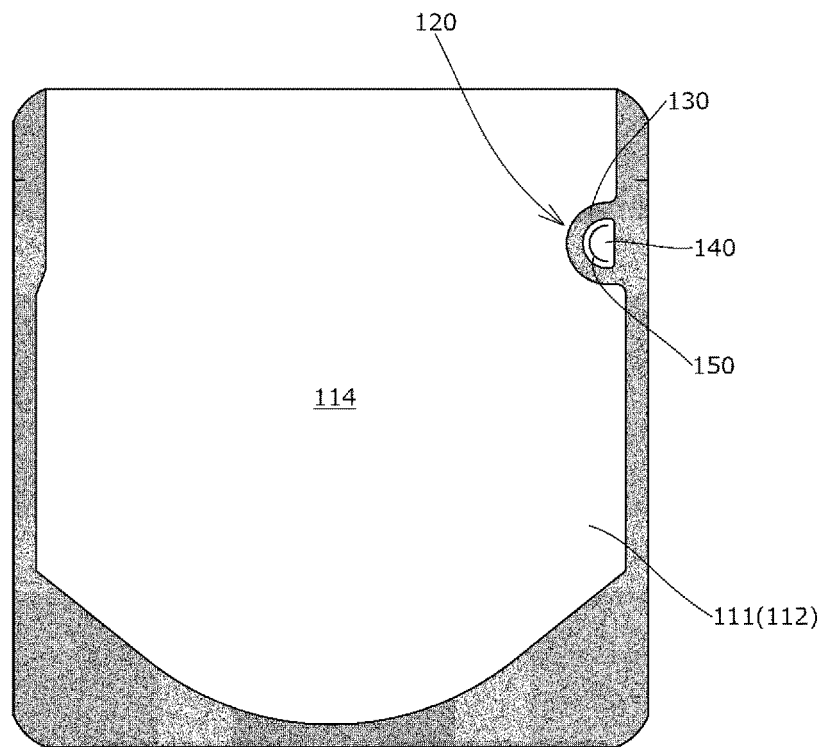


FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2022/004434

A. CLASSIFICATION OF SUBJECT MATTER

B65D 81/34(2006.01)i

FI: B65D81/34 U

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D81/34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2022
 Registered utility model specifications of Japan 1996-2022
 Published registered utility model applications of Japan 1994-2022

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2020-055628 A (DAINIPPON PRINTING CO., LTD.) 09 April 2020 (2020-04-09) paragraphs [0022]-[0049], [0118], [0119], fig. 1, 2, 14, 16	1, 3
A		2
Y	WO 2017/208864 A1 (TOYO SEIKAN CO.,LTD.) 07 December 2017 (2017-12-07) paragraphs [0018]-[0035], [0038], fig. 3-6, 7(f)	1, 3
A		2
A	JP 2019-031032 A (KUMAGAI CO., LTD.) 28 February 2019 (2019-02-28)	1-3
A	JP 2017-024733 A (KYORAKU CO., LTD.) 02 February 2017 (2017-02-02)	1-3
A	JP 2017-214129 A (TOYO SEIKAN CO.,LTD.) 07 December 2017 (2017-12-07)	1-3
A	JP 2007-131302 A (DAINIPPON PRINTING CO., LTD.) 31 May 2007 (2007-05-31)	1-3
A	JP 2005-306426 A (DAINIPPON PRINTING CO., LTD.) 04 November 2005 (2005-11-04)	1-3

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

23 March 2022

Date of mailing of the international search report

17 May 2022

Name and mailing address of the ISA/JP

Japan Patent Office (ISA/JP)
 3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915
 Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/JP2022/004434

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 2020-055628 A	09 April 2020	(Family: none)	
WO 2017/208864 A1	07 December 2017	US 2019/0135521 A1 paragraphs [0056]-[0082], [0097], fig. 3-6, 7(F) EP 3466835 A1 KR 10-2018-0132878 A CN 109153488 A	
JP 2019-031032 A	28 February 2019	(Family: none)	
JP 2017-024733 A	02 February 2017	(Family: none)	
JP 2017-214129 A	07 December 2017	(Family: none)	
JP 2007-131302 A	31 May 2007	(Family: none)	
JP 2005-306426 A	04 November 2005	(Family: none)	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2003192042 A [0006]