



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
20.07.2016 Bulletin 2016/29

(51) Int Cl.:
B65D 57/00 (2006.01) B65D 85/42 (2006.01)

(21) Application number: **14843559.7**

(86) International application number:
PCT/JP2014/070310

(22) Date of filing: **01.08.2014**

(87) International publication number:
WO 2015/037361 (19.03.2015 Gazette 2015/11)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

• **ICHIKAWA Masahiro**
Otsu-shi
Shiga 520-8639 (JP)
• **HOSHIBA Kenichi**
Otsu-shi
Shiga 520-8639 (JP)

(30) Priority: **13.09.2013 JP 2013190912**

(74) Representative: **Tetzner, Michael et al**
TETZNER & PARTNER mbB
Patent- und Rechtsanwälte
Van-Gogh-Strasse 3
81479 München (DE)

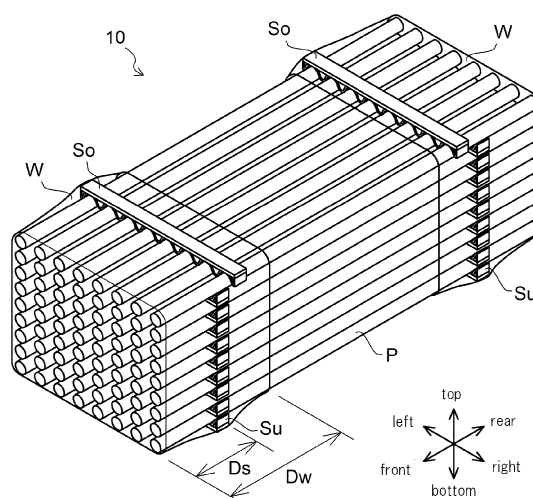
(71) Applicant: **Nippon Electric Glass Co., Ltd.**
Otsu-shi, Shiga 520-8639 (JP)

(72) Inventors:
• **HAYASHI Hitoshi**
Otsu-shi
Shiga 520-8639 (JP)

(54) **GLASS TUBE PACKAGE**

(57) Provided is a glass tube package that can suppress the occurrence of damage to glass tubes and prevent degradation of the quality of glass tubes. A glass tube package (10) is provided with: a plurality of glass tubes (P) that are arrayed in a plurality of rows and a plurality of columns; a plurality of spacer members (S) (bottom side spacer members (Su) and top side spacer members (So)) that are arranged on the bottom side and/or top side of each column of the plurality of glass tubes (P); and a film wrapping (W) that is obtained by shrinking and that covers at least both ends of the plurality of glass tubes (P).

Fig. 1



Description

Technical Field

[0001] The present invention relates to an art of a glass tube package in which a plurality of glass tubes are arrayed in a plurality of rows and a plurality of stages.

Background Art

[0002] For example, glass tubes used as a medical ampule, a fluorescent tube or the like are packaged as one glass tube package by arranging the plurality of the glass tubes with the same length in a plurality of rows and a plurality of stages. As an art configuring such a glass tube package, an art shrinking and binding both ends of a plurality of glass tubes with wrappings is known (for example, see the Patent Literature 1).

Prior Art Reference

Patent Literature

[0003] Patent Literature 1: the Japanese Patent Laid Open Gazette Hei. 10-114382

Disclosure of Invention

Problems to Be Solved by the Invention

[0004] According to the prior art, since the glass tubes in the glass tube package contact each other, the glass tubes may be damaged at the time of conveying the glass tube package so as to degrade qualities of the glass tubes such as mechanical strength and external appearance.

[0005] The present invention is provided in consideration of the above problem, and the purpose of the present invention is to provide a glass tube package which suppress damage of glass tubes so as to prevent degradation of quality of the glass tubes.

Means for Solving the Problems

[0006] The problems to be solved by the present invention have been described above, and subsequently, the means of solving the problems will be described below.

[0007] According to claim 1 of the present invention, a plurality of glass tubes arrayed in a plurality of rows and a plurality of stages, a plurality of spacer members arranged on a bottom side and/or top side of each stage of the plurality of the glass tubes, and film wrappings covering at least both ends of the plurality of the glass tubes and shrunk are provided.

[0008] According to claim 2 of the present invention, the spacer members are arranged at top sides of the glass tubes of an uppermost stage and/or bottom sides of the glass tubes of a lowermost stage.

[0009] According to claim 3 of the present invention, the spacer members are arranged at positions covered by the film wrappings.

[0010] According to claim 4 of the present invention, centers of the glass tubes constituting each row of the plurality of the glass tubes are arrayed straightly in a vertical direction.

[0011] According to claim 5 of the present invention, each of the spacer members has a planar member and a plurality of projections which are provided in at least one of surfaces of the planar member so as to be projected perpendicularly to the surface, and the plurality of the glass tubes are arranged respectively between the plurality of the projections.

[0012] According to claim 6 of the present invention, the spacer members are made by paper.

[0013] According to claim 7 of the present invention, an outer diameter of each of the glass tubes is 5mm to 12mm.

Effect of the Invention

[0014] The present invention configured as the above brings the following effects.

[0015] According to the glass tube package concerning claim 1 of the present invention, damage of the glass tubes can be suppressed so as to prevent degradation of quality of the glass tubes.

[0016] According to the glass tube package concerning claim 2 of the present invention, damage of the glass tubes can be suppressed certainly so as to prevent degradation of quality of the glass tubes.

[0017] According to the glass tube package concerning claim 3 of the present invention, binding of the glass tubes can be strengthened.

[0018] According to the glass tube package concerning claim 4 of the present invention, shift of the position of the glass tubes in the horizontal direction can be prevented.

[0019] According to the glass tube package concerning claim 5 of the present invention, damage of the glass tubes in the horizontal direction and the vertical direction can be suppressed so as to prevent degradation of quality of the glass tubes.

[0020] According to the glass tube package concerning claim 6 of the present invention, damage of the glass tubes by the spacer member can be suppressed.

[0021] According to the glass tube package concerning claim 7 of the present invention, damage of the glass tubes of which quality and accuracy are required is suppressed so as to prevent degradation of quality of the glass tubes.

Brief Description of Drawings

[0022]

[Fig. 1] Fig. 1 is a perspective view of an entire con-

figuration of a glass tube package according to a first embodiment of the present invention.

[Fig. 2] Fig. 2 is a front view of the glass tube package according to the first embodiment.

[Fig. 3] Fig. 3 is a perspective view of a spacer member used in the glass tube package according to the first embodiment.

[Fig. 4] Fig. 4 is a perspective view of an entire configuration of a glass tube package according to a second embodiment.

[Fig. 5] Fig. 5 is a front view of the glass tube package according to the second embodiment.

[Fig. 6] Fig. 6 is a perspective view of a spacer member used in the glass tube package according to the second embodiment.

[Fig. 7] Fig. 7 is a perspective view of an entire configuration of a glass tube package according to a third embodiment.

[Fig. 8] Fig. 8 is a front view of the glass tube package according to the third embodiment.

[Fig. 9] Fig. 9 is a perspective view of a spacer member used in the glass tube package according to the third embodiment.

[Fig. 10] Fig. 10 is a perspective view of an entire configuration of a glass tube package according to a fourth embodiment.

[Fig. 11] Fig. 11 is a front view of the glass tube package according to the fourth embodiment.

Detailed Description of the Invention

[0023] Next, embodiments of the present invention are explained.

[Glass tube package 10]

[0024] Firstly, a configuration of a glass tube package 10 according to a first embodiment of the present invention is explained referring to Figs. 1 to 3. In below explanation, for convenience, a vertical direction, a lateral direction and a longitudinal direction of the glass tube package are defined by arrows shown in each of drawings.

[0025] The glass tube package 10 of this embodiment is configured by packaging a plurality of glass tubes P while accumulating the glass tubes P into a stable form. The glass tube package 10 has the plurality of the glass tubes P arrayed in a plurality of rows and a plurality of stages. Each of the glass tubes P is a long hollow glass tube used as a medical amble, a fluorescent tube or the like for example, and has a cylindrical shape whose outer diameter is 5mm to 12mm. The glass tube package 10 of this embodiment is configured by arranging the eight glass tubes P laterally and the nine glass tubes P vertically so as to package the seventy two glass tubes P. In other words, the glass tube package 10 is configured by packaging the seventy two glass tubes P which are arrayed in eight rows and nine stages. The method for arraying the glass tubes P in the glass tube package is not

limited to this embodiment.

[0026] The glass tube package 10 has a plurality of spacer members S arranged at a bottom side and/or a top side of each stage of the plurality of the glass tubes P (bottom side spacer members Su and top side spacer members So). The bottom side spacer members Su and the top side spacer members So are configured by reversing vertically the spacer members S of the same shape (see Fig. 3). The glass tube package 10 according to this embodiment is configured so that the bottom side spacer members Su (the spacer members S in which projections 22 are projected upward) are arranged at the bottom sides of the glass tubes P of each stage, and the top side spacer members So (the spacer members S in which projections 22 are projected downward) are arranged at the top sides of the glass tubes P of the uppermost stage. The top side spacer members So may be omitted. A configuration in which the bottom side spacer members Su are arranged at the bottom sides of the glass tubes P of the lowermost stage and the top side spacer members So are arranged at the top sides of the glass tubes P of each stage (a configuration made by reversing vertically this embodiment) may be adopted. It may be configured that the bottom side spacer members Su are arranged at the bottom sides of the glass tubes P of the lowermost stage, the top side spacer members So are arranged at the top sides of the glass tubes P of the uppermost stage, and both the bottom side spacer members Su and the top side spacer members So are arranged between the glass tubes P of each stage. In this embodiment, the top side spacer members So are shifted longitudinally so as not to interfere the bottom side spacer members Su.

[0027] Each of the spacer members S is made by paper (for example, corrugated paper), and as shown in Fig. 3, the plurality of the projections 22, which are projected perpendicularly to one of surfaces (upper surface in Fig. 3) of a planar member 21 (upward in Fig. 3), are provided in the surface. Each of intervals between the projections 22 is a little larger than the outer diameter of the glass tube P so as to arrange the glass tube P therebetween. Since the eight glass tubes P are arranged in the one spacer member S in this embodiment, the nine projections 22 are formed in the spacer member S including ends thereof. Though the spacer members S are made by paper in this embodiment, another material such as styrene foam or plastic may be used.

[0028] In the glass tube package 10 of this embodiment, as shown in Figs. 1 and 2, the eight glass tubes P are arrayed between the projections 22 of each of the spacer members S, and the rows of the glass tubes P are stacked into nine stages so as to configure a bundle of the glass tubes P. In other words, the plurality of the glass tubes P are arranged respectively between the projections 22 of the spacer members S. In this state, both ends of the bundle of the glass tubes P are covered by film wrappings W, and the film wrappings W are shrunk so as to bind the glass tubes P. In other words, the glass

tube package 10 has the film wrappings W configured by shrinking and covering both ends of the plurality of the glass tubes P. Concretely, the film wrappings W which are heat-shrinkable plastic films are heated while covering the ends of the bundle of the glass tubes P and the film wrappings W are shrunk so as to adhere the film wrappings W to the ends of the bundle of the glass tubes P as shown in Fig. 1.

[0029] The bundle of the glass tubes P may be bound by shrinking the film wrappings W while the whole bundle of the glass tubes P is covered by the film wrappings W. Namely, any state in which both the ends of the glass tubes P are closed by the film wrappings W is required for preventing foreign matters from entering insides of the glass tubes P.

[0030] A material of the film wrappings W is not limited especially and may be any heat-shrinkable plastic such as PVC (polyvinyl chloride), PP (polypropylene), or PE (polyethylene).

[0031] In the glass tube package 10 of this embodiment, as shown in Fig. 2, the projections 22 of the spacer members S are interposed between the glass tubes P in the lateral direction, and the planar members 21 of the spacer members S are interposed between the glass tubes P in the vertical direction. Accordingly, the glass tubes P are prevented from contacting each other at the time of conveying the glass tube package 10. Namely, the glass tube package 10 of this embodiment can suppress damage of the glass tubes P so as to prevent degradation of quality of the glass tubes P.

[0032] In the glass tube package 10 of this embodiment, as shown in Fig. 1, the spacer members S are arranged at positions covered by the film wrappings W (positions bound by the film wrappings W) at the longitudinal ends of the plurality of the glass tubes P. Concretely, each of the spacer members S is arranged so that a distance Ds from the end of the glass tube package 10 is shorter than a length Dw of the film wrapping W after shrunk from the end of the glass tube package 10. Accordingly, the spacer members are fixed in the film wrappings W so as to strengthen the binding of the glass tubes P in the glass tube package 10. As the above, from a viewpoint of strengthening the binding of the glass tubes P in the glass tube package 10, preferably, the spacer members S are arranged a little inside from the ends of the glass tubes P in the longitudinal direction.

[0033] In the glass tube package 10 of this embodiment, as shown in Fig. 2, the rows of the glass tubes P in the vertical direction are arranged lattice-like so that the centers of the glass tubes P constituting each row are arrayed straightly in the vertical direction. Accordingly, load of the glass tubes P is applied on the glass tubes P just below them via the planar member 21 of the spacer member S and is not distributed laterally. Then, shift of the position of the glass tubes P in the horizontal direction (lateral direction) can be prevented.

[0034] In the glass tube package 10 of this embodiment, the spacer members S are made by the paper.

Since the paper is softer than the glass tubes P, damage of the glass tubes P by the spacer members S can be suppressed. Since dirt of the paper is hardly to move to the glass tubes P and any binding member does not adhere to the glass tubes such as styrene foam, the spacer members S are preferably made by the paper.

[0035] In the glass tube package 10 of this embodiment, the outer diameter of each of the glass tubes P is 5mm to 12mm. Namely, in the glass tube package 10 of this embodiment, damage of the small-diameter glass tubes P having the outer diameter of 5mm to 12mm of which quality and accuracy are required is suppressed so as to prevent degradation of quality of the glass tubes P.

[Glass tube package 110]

[0036] Next, a configuration of a glass tube package 110 according to a second embodiment of the present invention is explained referring to Figs. 4 to 6.

[0037] In below explanation, the same configurations as the glass tube package according to the above embodiment are shown by the same reference letters and explanations thereof are omitted, and different configurations are explained mainly.

[0038] The glass tube package 110 of this embodiment has a plurality of spacer members arranged at a bottom side and/or a top side of each stage of the plurality of the glass tubes P (bottom side spacer members Su, top side spacer members So and middle spacer members Sm). The bottom side spacer members Su and the top side spacer members So are configured by reversing vertically the spacer members S of the same shape. As shown in Fig. 6, each of the middle spacer members Sm is configured so that two spacer members each of which is formed by projecting a plurality of projections 122 from one of surfaces of a planar member 121 are reversed vertically and longitudinal ends of the planar members 121 are connected to each other. In the glass tube package 110 of this embodiment, as shown in Fig. 4, the bottom side spacer members Su are arranged at the bottom sides of the glass tubes P of the lowermost stage, the top side spacer members So are arranged at the top sides of the glass tubes P of the uppermost stage, and the middle spacer members Sm are arranged between the stages of the glass tubes P.

[0039] Each of the middle spacer members Sm is made by paper (for example, corrugated paper), and as shown in Fig. 6, the plurality of the projections 122, which are projected perpendicularly to both surfaces (upper and lower surfaces in Fig. 6) of the planar member 121 (upward and downward in Fig. 6), are provided in the surface. Each of intervals between the projections 122 is a little larger than the outer diameter of the glass tube P so as to arrange the glass tube P therebetween.

[0040] According to the glass tube package 110 of this embodiment, each stage of the glass tubes P cannot be displaced laterally by the middle spacer members Sm.

Accordingly, at the time of conveying the glass tube package 110, change of the shape of the glass tube package 110 caused by sliding relatively the stages of the glass tubes P can be prevented. Namely, in the glass tube package 110 of this embodiment, the binding of the glass tubes P in the glass tube package 110 can be strengthened further.

[Glass tube package 210]

[0041] Next, a configuration of a glass tube package 210 according to a third embodiment of the present invention is explained referring to Figs. 7 to 9.

[0042] The glass tube package 210 of this embodiment has a plurality of spacer members arranged at a bottom side and/or a top side of each stage of the plurality of the glass tubes P (bottom side spacer members Su, top side spacer members So and middle spacer members Sm'). The bottom side spacer members Su and the top side spacer members So are configured by reversing vertically the spacer members S of the same shape. As shown in Fig. 9, each of the middle spacer members Sm' is configured so that a plurality of projections 222 are projected from both surfaces of a planar member 221. In the glass tube package 210 of this embodiment, the bottom side spacer members Su are arranged at the bottom sides of the glass tubes P of the lowermost stage, the top side spacer members So are arranged at the top sides of the glass tubes P of the uppermost stage, and the middle spacer members Sm' are arranged between the stages of the glass tubes P. Namely, in the glass tube package 210, the upward projections 222 and the downward projections 222 of each spacer member are arranged so as to face each other. Heights of each of the upward projections 222 and each of the downward projections 222 are substantially the same as a radius of the glass tube P so as to prevent the projections from interfering the middle spacer members Sm'. In the glass tube package 210 of this embodiment, as shown in Fig. 7, the bottom side spacer members Su are arranged at the bottom sides of the glass tubes P of the lowermost stage, the top side spacer members So are arranged at the top sides of the glass tubes P of the uppermost stage, and the middle spacer members Sm' are arranged between the stages of the glass tubes P.

[0043] Each of the middle spacer members Sm' is made by paper (for example, corrugated paper), and as shown in Fig. 9, the plurality of the projections 222 are provided in both surfaces (upper and lower surfaces in Fig. 9) of the planar member 221 so as to be projected perpendicularly to both surfaces (along the vertical direction in Fig. 9). Each of intervals between the projections 222 is a little larger than the outer diameter of the glass tube P so as to arrange the glass tube P therebetween. Heights of each of the projections 222 are substantially the same as the radius of the glass tube P so as to prevent the projections from interfering each other.

[0044] According to the glass tube package 210 of this

embodiment, each stage of the glass tubes P cannot be displaced laterally by the middle spacer members Sm'. Accordingly, at the time of conveying the glass tube package 210, change of the shape of the glass tube package 210 caused by sliding relatively the stages of the glass tubes P can be prevented. Namely, in the glass tube package 210 of this embodiment, the binding of the glass tubes P in the glass tube package 210 can be strengthened further.

[Glass tube package 310]

[0045] Next, a configuration of a glass tube package 310 according to a fourth embodiment of the present invention is explained referring to Figs. 10 and 11.

[0046] The glass tube package 310 of this embodiment has a plurality of spacer members Sw arranged at a bottom side and/or a top side of each stage of the plurality of the glass tubes P. Each of the spacer members Sw is made by paper (for example, corrugated paper), and as shown in Fig. 11, a section thereof is wave-like shaped. In the glass tube package 310 of this embodiment, as shown in Fig. 10, the glass tubes P adjacent in the vertical direction are arranged alternately between the glass tubes P.

[0047] According to the glass tube package 310 of this embodiment, intervals between the glass tubes P can be made small, whereby the many glass tubes P can be arrayed in a limited space. In other words, arrangement efficiency of the glass tubes P can be improved. Accordingly, when the glass tubes P of the same number are packaged, the glass tube package 310 can be made compact so as to improve efficiency of conveyance of the glass tubes P.

Industrial Applicability

[0048] The glass tube package of the present invention can be used for conveying a plurality of glass tubes with the same length used as a medical amble, a fluorescent tube or the like for example.

Description of Notations

[0049]

10	glass tube package
110	glass tube package
210	glass tube package
310	glass tube package
P	glass tube
S	spacer member
Sm	middle spacer member
Sm'	middle spacer member
So	top side spacer member
Su	bottom side spacer member
Sw	spacer member
W	film wrapping

Claims

1. A glass tube package comprising:
 - a plurality of glass tubes arrayed in a plurality of rows and a plurality of stages; 5
 - a plurality of spacer members arranged on a bottom side and/or top side of each stage of the plurality of the glass tubes; and
 - film wrappings covering at least both ends of the plurality of the glass tubes and shrunk. 10
2. The glass tube package according to claim 1, wherein the spacer members are arranged at top sides of the glass tubes of an uppermost stage and/or bottom sides of the glass tubes of a lowermost stage. 15
3. The glass tube package according to claim 1 or 2, wherein the spacer members are arranged at positions covered by the film wrappings. 20
4. The glass tube package according to one of claims 1 to 3, wherein centers of the glass tubes constituting each row of the plurality of the glass tubes are arrayed straightly in a vertical direction. 25
5. The glass tube package according to one of claims 1 to 4,
 - wherein each of the spacer members has a planar member and a plurality of projections which are provided in at least one of surfaces of the planar member so as to be projected perpendicularly to the surface, and 30
 - wherein the plurality of the glass tubes are arranged respectively between the plurality of the projections. 35
6. The glass tube package according to one of claims 1 to 5, wherein the spacer members are made by paper. 40
7. The glass tube package according to one of claims 1 to 6, wherein an outer diameter of each of the glass tubes is 5mm to 12mm. 45

45

50

55

Fig. 1

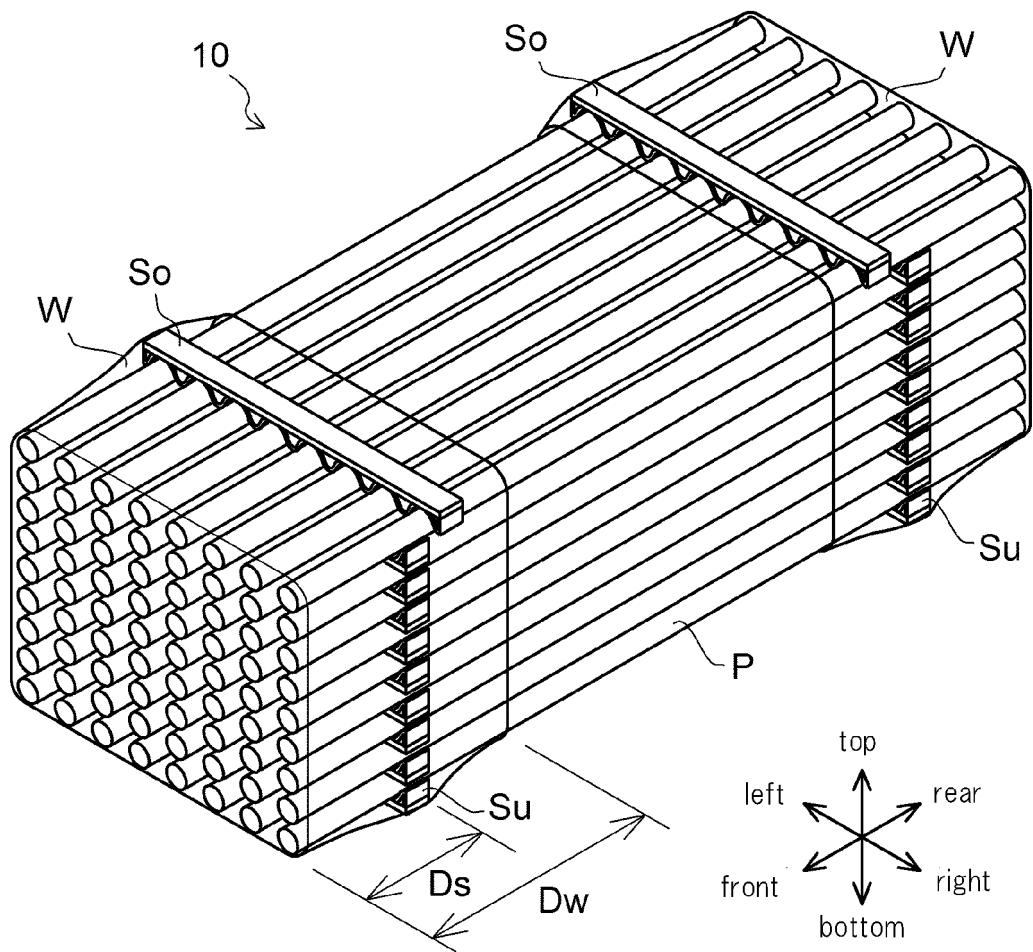


Fig. 2

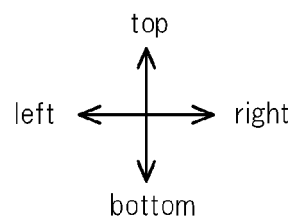
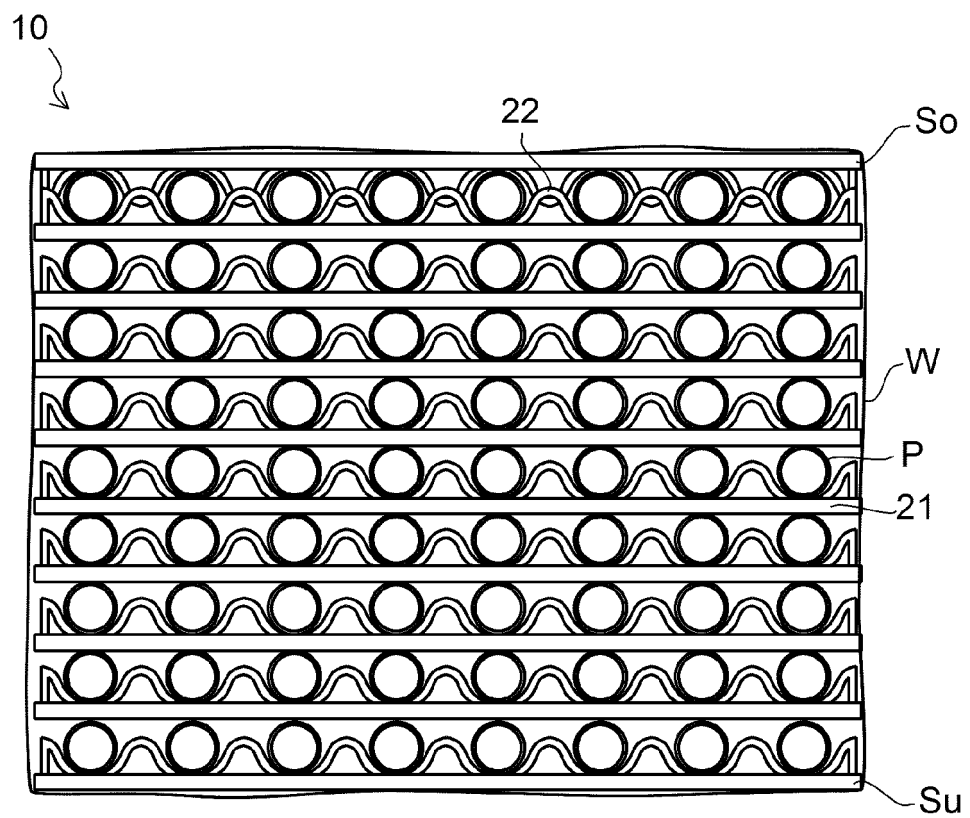


Fig. 3

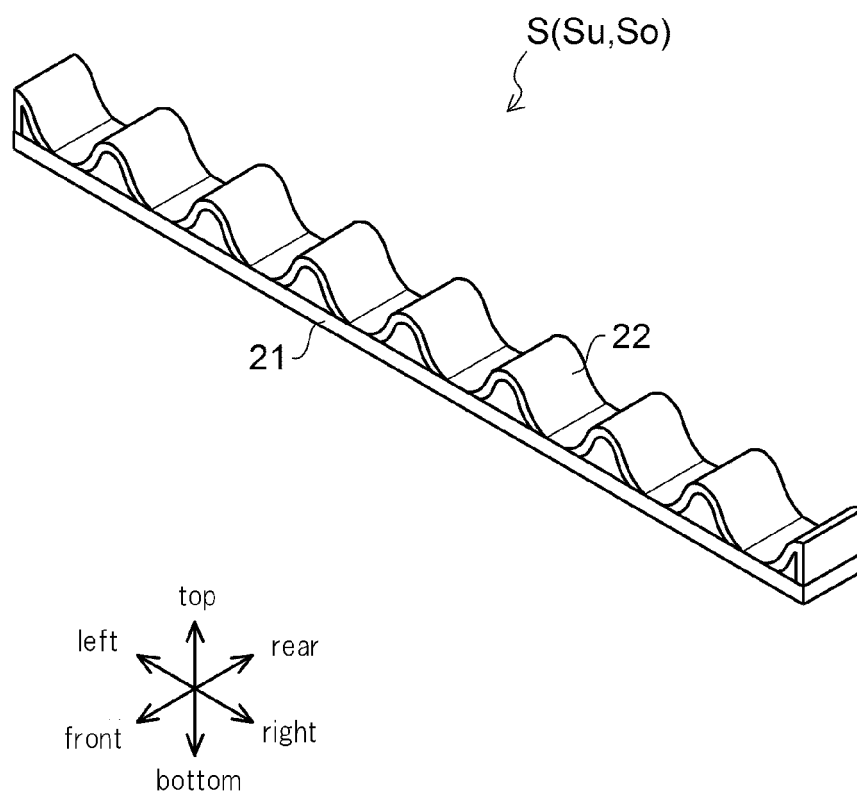


Fig. 4

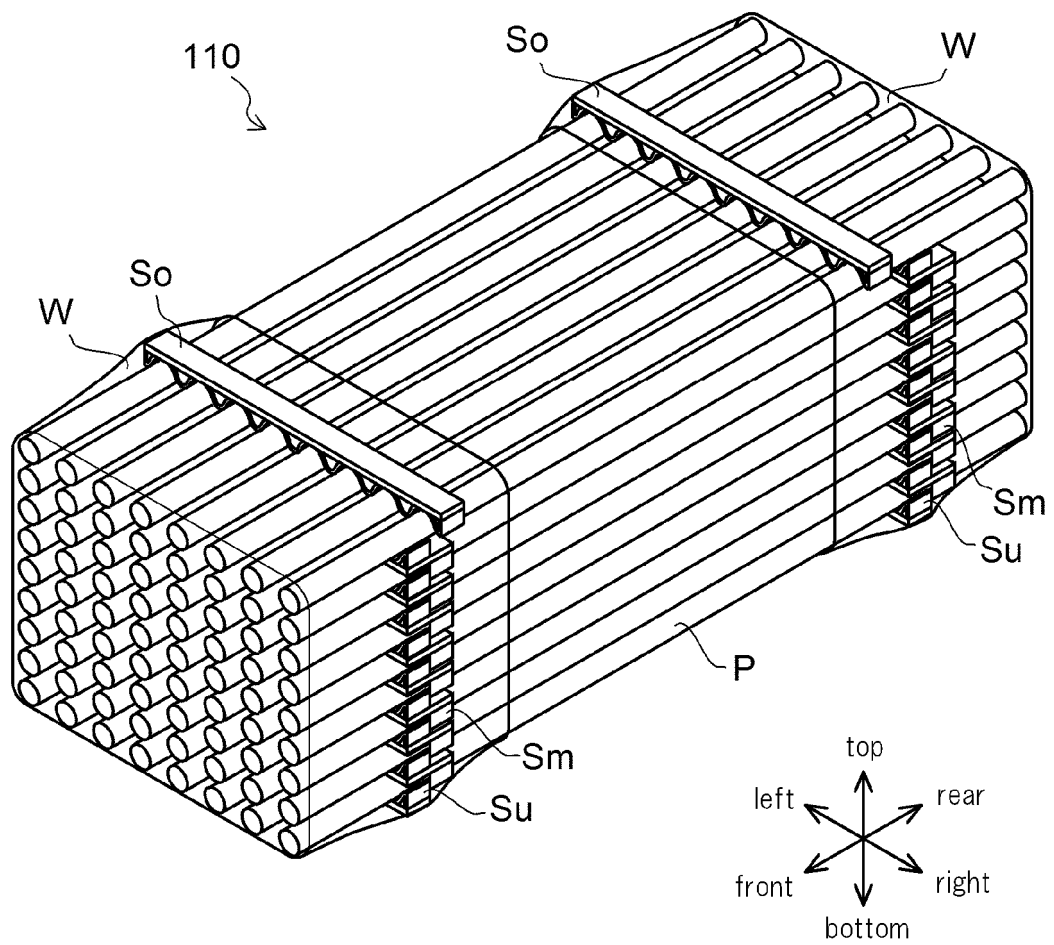


Fig. 5

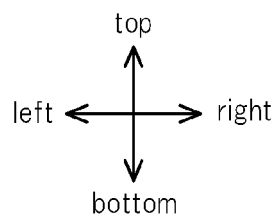
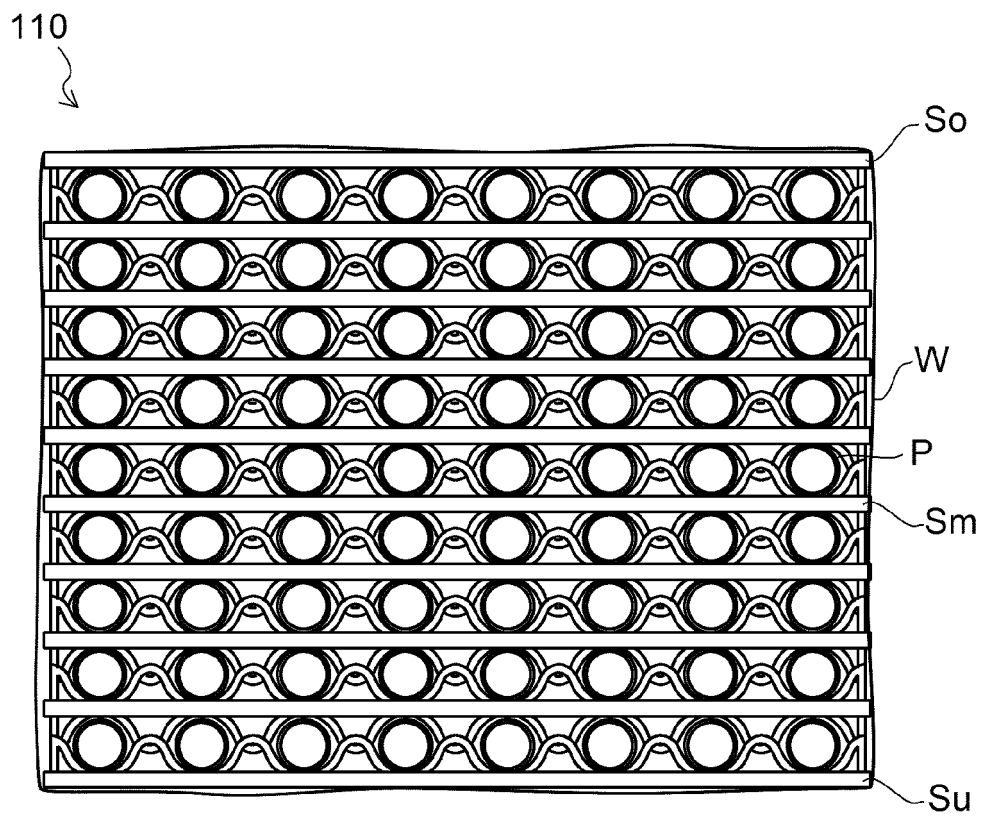


Fig. 6

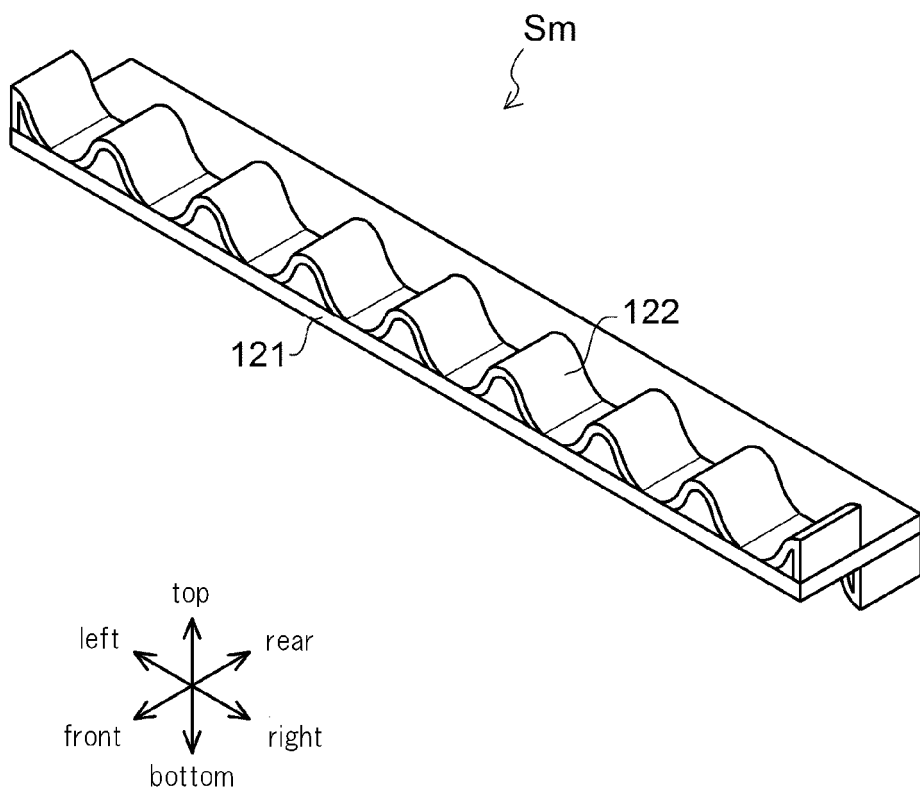


Fig. 7

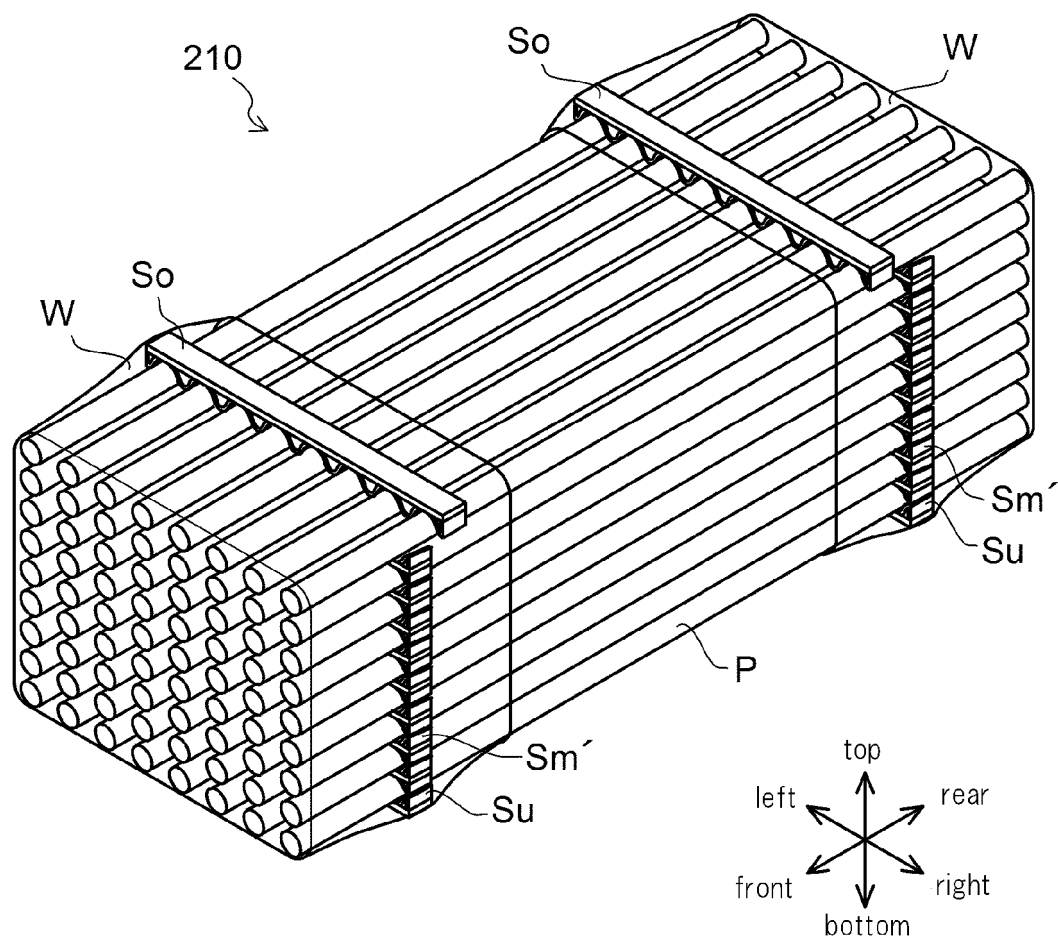


Fig. 8

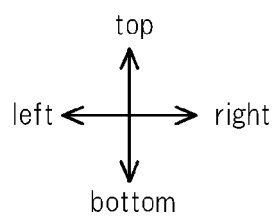
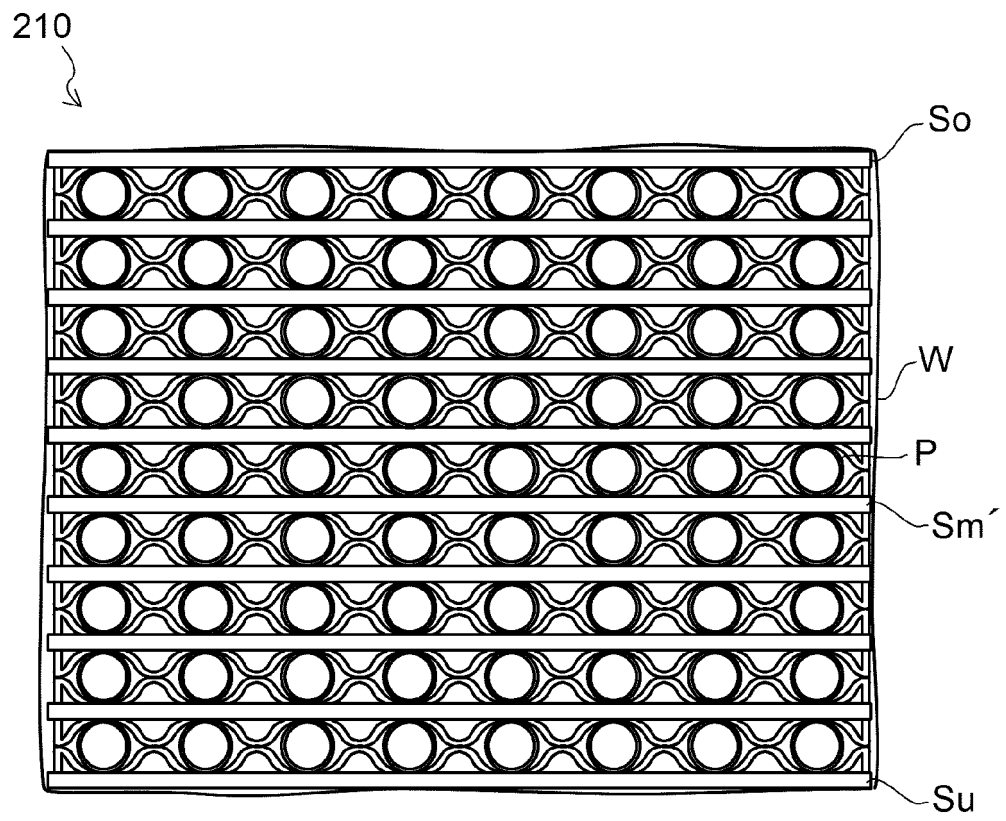


Fig. 9

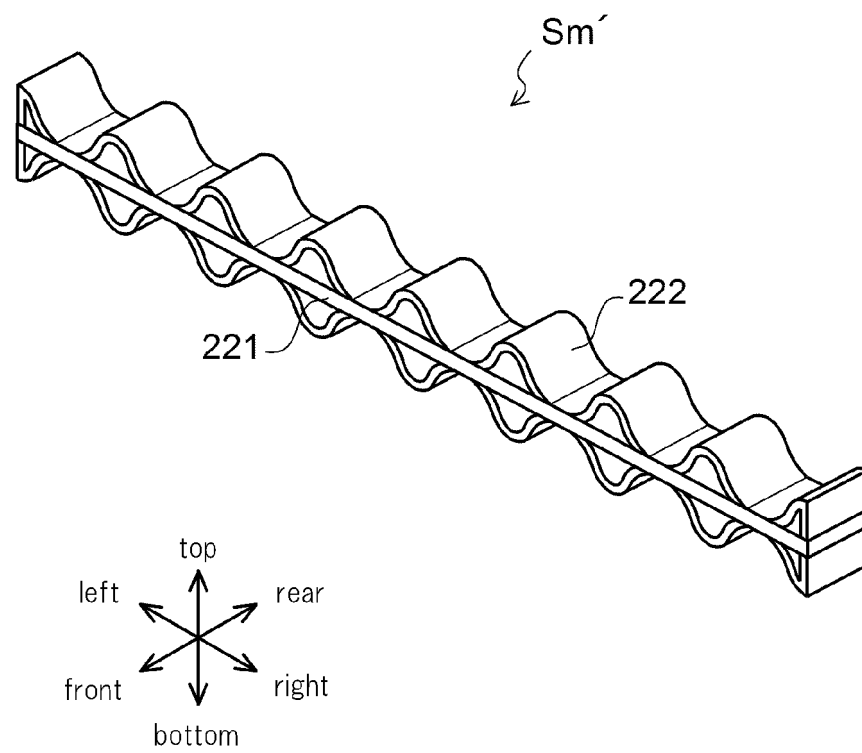


Fig. 10

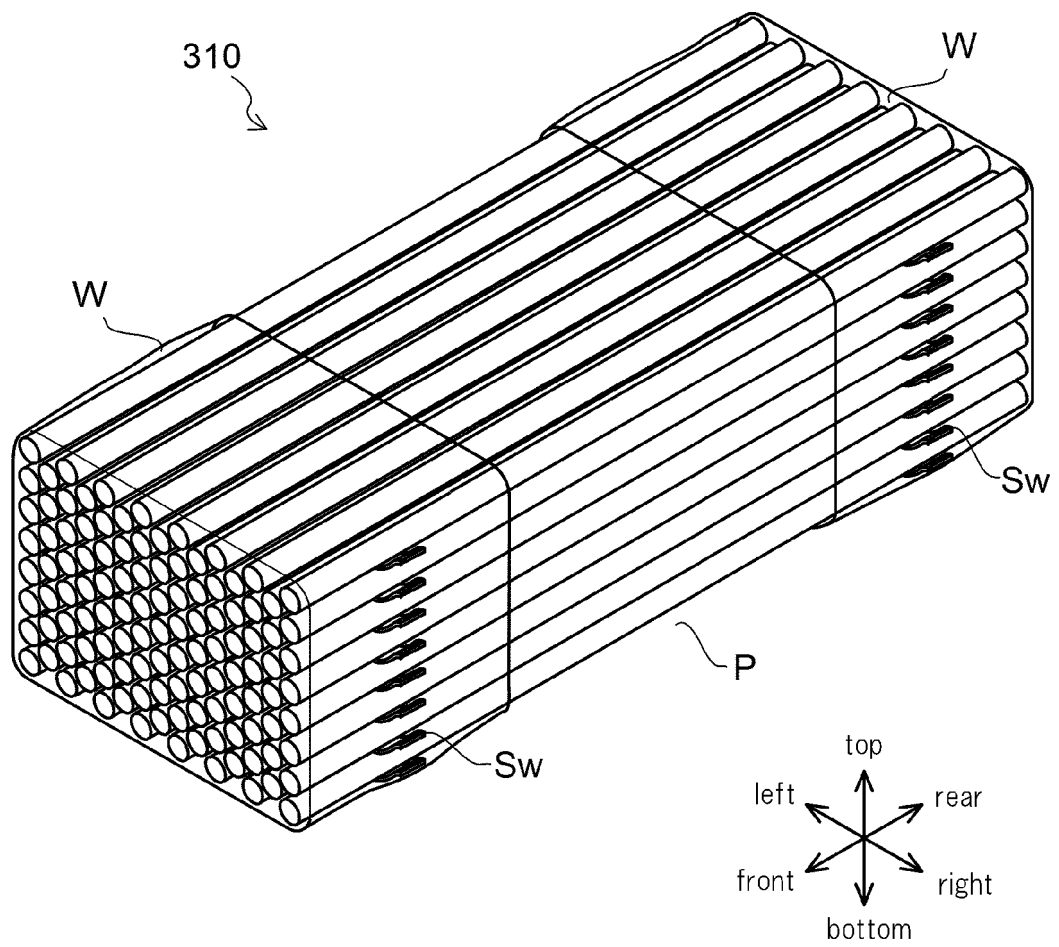
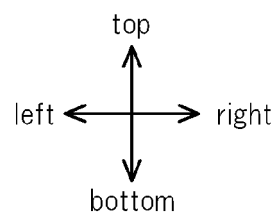
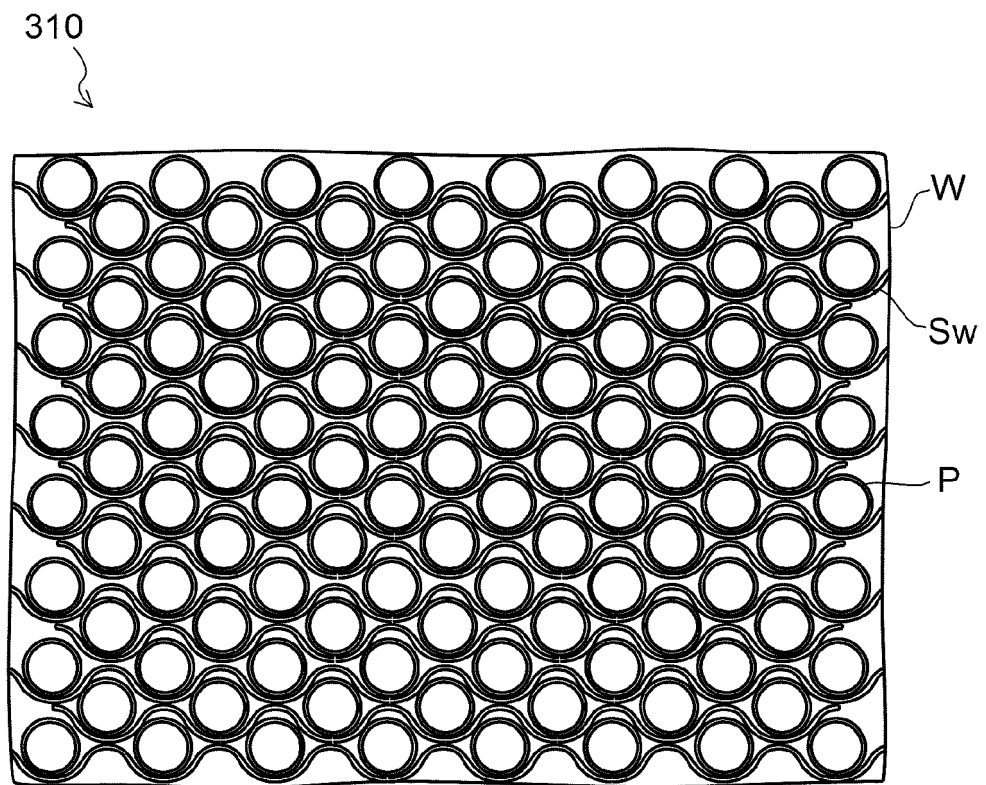


Fig. 11



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2014/070310

A. CLASSIFICATION OF SUBJECT MATTER

B65D57/00(2006.01)i, B65D85/42(2006.01)i

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)

B65D57/00, B65D85/42

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

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2014

Kokai Jitsuyo Shinan Koho 1971-2014 Toroku Jitsuyo Shinan Koho 1994-2014

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 10-114382 A (Nippon Electric Glass Co., Ltd.), 06 May 1998 (06.05.1998), entire text; all drawings (Family: none)	1-7
Y	JP 9-295686 A (Nippon Electric Glass Co., Ltd.), 18 November 1997 (18.11.1997), paragraphs [0003], [0010]; fig. 1 to 4 (Family: none)	1-7
Y	JP 2005-335811 A (Showa Denko Kabushiki Kaisha), 08 December 2005 (08.12.2005), fig. 1 to 5 (Family: none)	1-7

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

20 October, 2014 (20.10.14)

Date of mailing of the international search report

04 November, 2014 (04.11.14)

Name and mailing address of the ISA/

Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2014/070310

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 86144/1982 (Laid-open No. 188878/1983) (Hitachi, Ltd.), 15 December 1983 (15.12.1983), fig. 1 to 5 (Family: none)	1-7
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 8425/1982 (Laid-open No. 113646/1983) (Shinwa Kogyo Kabushiki Kaisha), 03 August 1983 (03.08.1983), fig. 1 to 7 (Family: none)	1-7

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP HEI10114382 B [0003]