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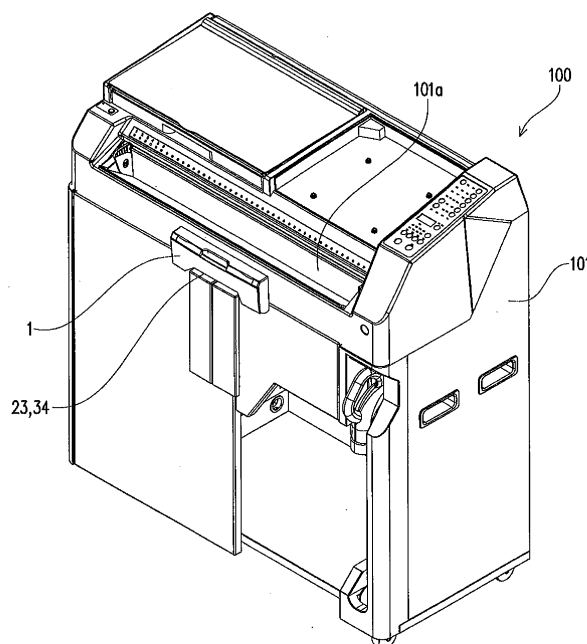
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(54) MEDICINE SUPPLYING DEVICE

(57) A medicine supply apparatus (100) including a powder medicine dispensing portion (101a) that houses and dispenses a powder medicine is provided. The medicine supply apparatus (100) includes: a leveling tool for leveling a surface of the housed powder medicine; and

a leveling tool holder (1) that holds the leveling tool. This configuration prevents the leveling tool from being easily lost, and eliminates the need to look for the leveling tool in every leveling. This allows an operator to quickly take out the leveling tool when needed, thereby providing good workability.

FIG. 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a medicine supply apparatus including a powder medicine dispensing portion that houses and dispenses a powder medicine.

BACKGROUND ART

[0002] A medicine dispensing and packing apparatus or the like includes a medicine supply apparatus including a powder medicine dispensing portion. The medicine supply apparatus dispenses and supplies a powder medicine among medicines. For example, an apparatus by the present applicant is described in Patent Document 1.

[0003] A powder medicine dispensing portion in Patent Document 1 has a powder medicine housing groove having a V-shaped vertical section. An operator such as a pharmacist places a powder medicine into the powder medicine housing groove. The placed powder medicine drops onto a dispenser provided below the powder medicine housing groove. Thus, the powder medicine is dispensed, for example, into each dose for one package.

[0004] A surface of the powder medicine placed into the powder medicine housing groove by the operator projects or is recessed immediately after the powder medicine is placed. Since an irregular height of the surface of the powder medicine prevents the powder medicine from being equally dispensed, the surface needs to be leveled. In order to level the surface of the powder medicine, a leveling tool such as a spatula accompanies the medicine supply apparatus. The operator holds the leveling tool and levels the surface of the powder medicine so as to obtain an even height of the surface.

CITATION LIST

PATENT DOCUMENT

[0005]

Patent Document 1: Japanese Patent Laid-Open No. Hei-7-61402

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0006] The conventional medicine supply apparatus does not include a space for holding the leveling tool. Thus, the operator places the leveling tool around the medicine supply apparatus at an operator's discretion. At that time, a case such as a pencil case is used as a case for the leveling tool in some cases. An upper cover of the medicine supply apparatus is openable/closable for maintenance or the like. Thus, in a case where the leveling tool is placed on the upper cover, the leveling

tool sometimes drops onto a floor or the like when the upper cover is opened.

[0007] In the conventional medicine supply apparatus, a relationship between the medicine supply apparatus and a storage space of the leveling tool is not established. Thus, the leveling tool is sometimes lost or needs to be looked for in every leveling, which reduces workability of the operator.

[0008] Therefore, it is an object of the present invention to provide a medicine supply apparatus that allows an operator to quickly take out a leveling tool when needed, thereby providing good workability

SOLUTION TO PROBLEM

[0009] The present invention provides a medicine supply apparatus including a powder medicine dispensing portion that houses and dispenses a powder medicine, wherein the medicine supply apparatus further includes: a leveling tool for leveling a surface of the housed powder medicine; and a leveling tool holder that holds the leveling tool.

[0010] According to this configuration, the medicine supply apparatus can hold the leveling tool. This prevents the leveling tool from being easily lost, and eliminates the need for an operator to look for the leveling tool in every leveling.

[0011] As one aspect, the leveling tool holder may be provided near the powder medicine dispensing portion, and on a front surface of the medicine supply apparatus.

[0012] According to this configuration, the leveling tool can be held near the powder medicine dispensing portion, and on the front surface of the medicine supply apparatus. This can reduce a distance when the operator takes out the leveling tool from the leveling tool holder and carries the leveling tool to the powder medicine dispensing portion. This also allows the operator to quickly perform leveling.

[0013] As another aspect, the leveling tool holder includes a base mounted to a body of the medicine supply apparatus, a cover openable and closable with respect to the base, and an inner space between the base and the cover, in which a plurality of leveling tools can be arranged in parallel.

[0014] According to this configuration, the leveling tools are arranged in the inner space between the base and the cover. This provides good hygiene of the leveling tool. Also, the plurality of leveling tools are arranged in parallel, and thus one leveling tool can be easily taken out from the leveling tool holder.

[0015] As a further aspect, the cover includes a support surface that supports the leveling tools arranged in the inner space.

[0016] As a further aspect, the plurality of leveling tools are arranged in a short direction of the leveling tools in the inner space.

[0017] As a further aspect, the leveling tool includes a leveling portion for leveling a powder medicine at least

at one end of a rod-like grip, and the leveling tool holder includes a recess for preventing interference of the leveling portion.

[0018] As a further aspect, the medicine supply apparatus further includes an openable and closable upper cover, and the leveling tool holder also serves as a handle for opening the upper cover.

[0019] As a further aspect, the support surface has a step for supporting the plurality of leveling tools.

ADVANTAGEOUS EFFECT OF INVENTION

[0020] According to the present invention, a medicine supply apparatus can be provided that prevents a leveling tool from being easily lost, eliminates the need to look for the leveling tool in every leveling, thus allows an operator to quickly take out the leveling tool when needed, thereby providing good workability.

BRIEF DESCRIPTION OF DRAWINGS

[0021]

FIG. 1 is a perspective view, seen from front, of a medicine dispensing and packing apparatus including a leveling tool holder of this embodiment, with an inner mechanism being omitted.

FIG. 2 is a perspective view showing the leveling tool holder.

FIG. 3 is a perspective view showing the leveling tool holder with a cover being opened.

FIG. 4 is a perspective view, seen from back, showing the cover of the leveling tool holder.

FIG. 5 is a perspective view, seen from back, showing the cover of the leveling tool holder, FIG. 5(A) shows one leveling tool being arranged, and FIG. 5 (B) shows two leveling tools being arranged.

DESCRIPTION OF EMBODIMENT

[0022] Now, an embodiment of the present invention will be described. For wordings of directions in the below description, "upper or lower" refers to a positional relationship in a state shown in FIG. 1, "front" refers to a front side and "back" refers to a back side in the state shown in FIG. 1. The wordings of the directions are used for convenience of description, and not used for construing the invention in a limited manner.

[0023] A medicine supply apparatus 100 of this embodiment is shown in FIG. 1, and includes a powder medicine dispensing portion 101a in a front portion of an upper surface of a body 101. An operator places a powder medicine into the powder medicine dispensing portion 101a. The "body" refers to a portion of the medicine supply apparatus 100 except a leveling tool holder 1 for description.

[0024] As shown in FIG. 1, the leveling tool holder 1 of this embodiment is provided on the body 101 of the medicine supply apparatus and has a box shape. The leveling tool holder 1 can house a plurality of leveling tools S ...

S therein. As shown in FIG. 3, the leveling tool holder 1 has a width slightly larger than a length of the leveling tool S so as to house the leveling tool S with room. The leveling tool holder 1 is provided near the powder medicine dispensing portion 101a and on a front surface of the body 101 of the medicine supply apparatus. Since the leveling tool holder 1 is provided in such a positional relationship, an operator can take out a desired leveling tool S from the leveling tool holder 1, and immediately perform leveling in the powder medicine dispensing portion 101a. In this embodiment, the leveling tool holder 1 is provided on the front surface of the body 101 of the medicine supply apparatus, but may be provided on various positions such as on an inside of a front door of the medicine supply apparatus 100. However, from aspects of hygiene (adhesion of dust or the like) or workability (ease of taking out the leveling tool S), the leveling tool holder 1 is desirably provided close to an upper portion of the medicine supply apparatus 100.

[0025] As shown in FIG. 2, the leveling tool holder 1 of this embodiment includes a base 2 mounted to the body 101 of the medicine supply apparatus, and a cover 3 openable/closable with respect to the base 2. The cover 3 is pivotably supported by a lower portion of the base 2. As shown in FIG. 3, the cover 3 is pivoted so that the cover 3 can be opened about 50° with respect to the base 2. An opening recess 21 is provided in an upper front portion of the base 2. The operator can insert his/her finger into the opening recess 21 to easily open the cover 3. In this embodiment, no means for closing the cover 3 is provided, and the leveling tool holder 1 may be used with the cover 3 being opened. A spring or the like may be provided in the base 2 or the cover 3 so that the cover 3 is automatically closed after the operator opens the cover 3.

[0026] As shown in FIG. 3, magnets 22, 22 are provided at opposite ends in a width direction (longitudinal direction) in an upper portion of the base 2. Attraction portions 35, 35 made of steel sheets are mounted to the cover 3. Thus, each magnet 22 in the base 2 attracts each attraction portion 35 in the cover 3 to keep a closed state. The magnet 22 and the attraction portion 35 thus provided prevent the cover 3 from being unexpectedly opened unless the operator places his/her hand on the cover 3 to open the cover 3. Also, dust or the like is prevented from adhering to the leveling tool S. As such, in order to keep the closed state of the cover 3, various means may be used such as means using a magnetic force as in this embodiment and also means using projection and recess fitting or a hook and loop fastener.

[0027] A cutout 23 is formed in a middle of a lower end of the base 2. The cutout 23 also serves as a handle for opening the upper cover provided with the powder medicine dispensing portion 101a or the like in the medicine supply apparatus 100. The operator can place his/her hand in the cutout 23 to open the upper cover.

[0028] As shown in FIG. 3, the plurality of leveling tools S ... S can be arranged in parallel in an inner space formed by the base 2 and the cover 3. The wording "parallel" herein refers to the leveling tools S ... S being arranged in a short direction (arranged laterally) rather than in a longitudinal direction (arranged vertically). In the leveling tool holder 1 of this embodiment, two leveling tools Sa and Sb can be arranged so that leveling portions S2 are parallel to each other as shown.

[0029] The leveling tool S used in this embodiment has a shape shown in FIGS. 5(A) and 5(B), and includes plate-like leveling portions S2 at opposite ends of a rod-like grip S1. The operator can use the leveling portion S2 to level a surface of the powder medicine placed in the powder medicine dispensing portion 101a of the medicine supply apparatus so as to obtain an even height of the surface of the powder medicine. Depending on manners of insertion of the leveling portion S2 into the powder medicine dispensing portion 101a, in this embodiment, leveling of four patterns can be performed for each leveling tool S. A leveling tool S including a leveling portion S2 only at one end of a rod-like grip S1 is also conceivable.

[0030] The leveling tool S is supported by support surfaces 31, 32 as inner lower surfaces of the cover 3. More specifically, as shown in FIGS. 5(A) and 5(B), the grip S1 of the leveling tool S is placed on the support surfaces 31, 32. The first support surface 31 is formed one step above the second support surface 32, and there is a step between the support surfaces 31, 32. One leveling tool Sa can be placed on the first support surface 31, and the other leveling tool Sb can be placed on the second support surface 32. Thus, as shown in FIGS. 3 and 5(B), one leveling tool Sa and the other leveling tool Sb can be placed on different levels. Thus, the operator can easily take out one leveling tool S from the plurality of leveling tools S ... S housed in the leveling tool holder 1.

[0031] Recesses 33 recessed downward are formed on opposite sides in a width direction of the support surfaces 31, 32. Thus, the leveling portion S2 of the leveling tool S does not interfere with the cover 3. The support surfaces 31, 32 and the recesses 33 are thus formed to form a cutout 34 in a middle of a lower end of the cover 3. The cutout 34 matches the cutout 23 in the base 2 when the cover 3 is closed.

[0032] The leveling tool holder 1 of this embodiment has a box shape, and houses the plurality of leveling tools S ... S, but a leveling tool holder 1 holding the leveling tools S ... S using other various means is conceivable. For example, the various means include pocket-like means (holding by insertion), hook-like means (holding by hanging), means using a magnet (holding by attraction), means using a hook and loop fastener or the like (holding by attachment), fitting, holding with a band or the like, or tray-like means (placement). The support surfaces 31, 32 and the recess 33 may be provided in the base 2, and the leveling tool S may be supported by the base 2.

REFERENCE SIGNS LIST

[0033]

5	1	leveling tool holder
	2	base
	3	cover
10	100	medicine supply apparatus
	101	body of medicine supply apparatus
15	101a	powder medicine dispensing portion
	S	leveling tool

20 Claims

1. A medicine supply apparatus comprising a powder medicine dispensing portion that houses and dispenses a powder medicine,
 25 wherein the medicine supply apparatus further comprises:
 - a leveling tool for leveling a surface of the housed powder medicine; and
 - 30 a leveling tool holder that holds the leveling tool.
2. The medicine supply apparatus according to claim 1, wherein the leveling tool holder is provided near the powder medicine dispensing portion, and on a front surface of the medicine supply apparatus.
3. The medicine supply apparatus according to claim 1 or 2, wherein the leveling tool holder includes a base mounted to a body of the medicine supply apparatus, a cover openable and closable with respect to the base, and an inner space between the base and the cover, in which a plurality of leveling tools can be arranged in parallel.
4. The medicine supply apparatus according to claim 3, wherein the cover includes a support surface that supports the leveling tools arranged in the inner space.
5. The medicine supply apparatus according to claim 3, wherein the plurality of leveling tools are arranged in a short direction of the leveling tools in the inner space.
6. The medicine supply apparatus according to claim 3, wherein the leveling tool includes a leveling portion for leveling a powder medicine at least at one end of a rod-like grip, and the leveling tool holder includes

a recess for preventing interference of the leveling portion.

7. The medicine supply apparatus according to claim 3, wherein the medicine supply apparatus further comprises an openable and closable upper cover, and the leveling tool holder also serves as a handle for opening the upper cover. 5
8. The medicine supply apparatus according to claim 4, wherein the support surface has a step for supporting the plurality of leveling tools. 10

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FIG. 1

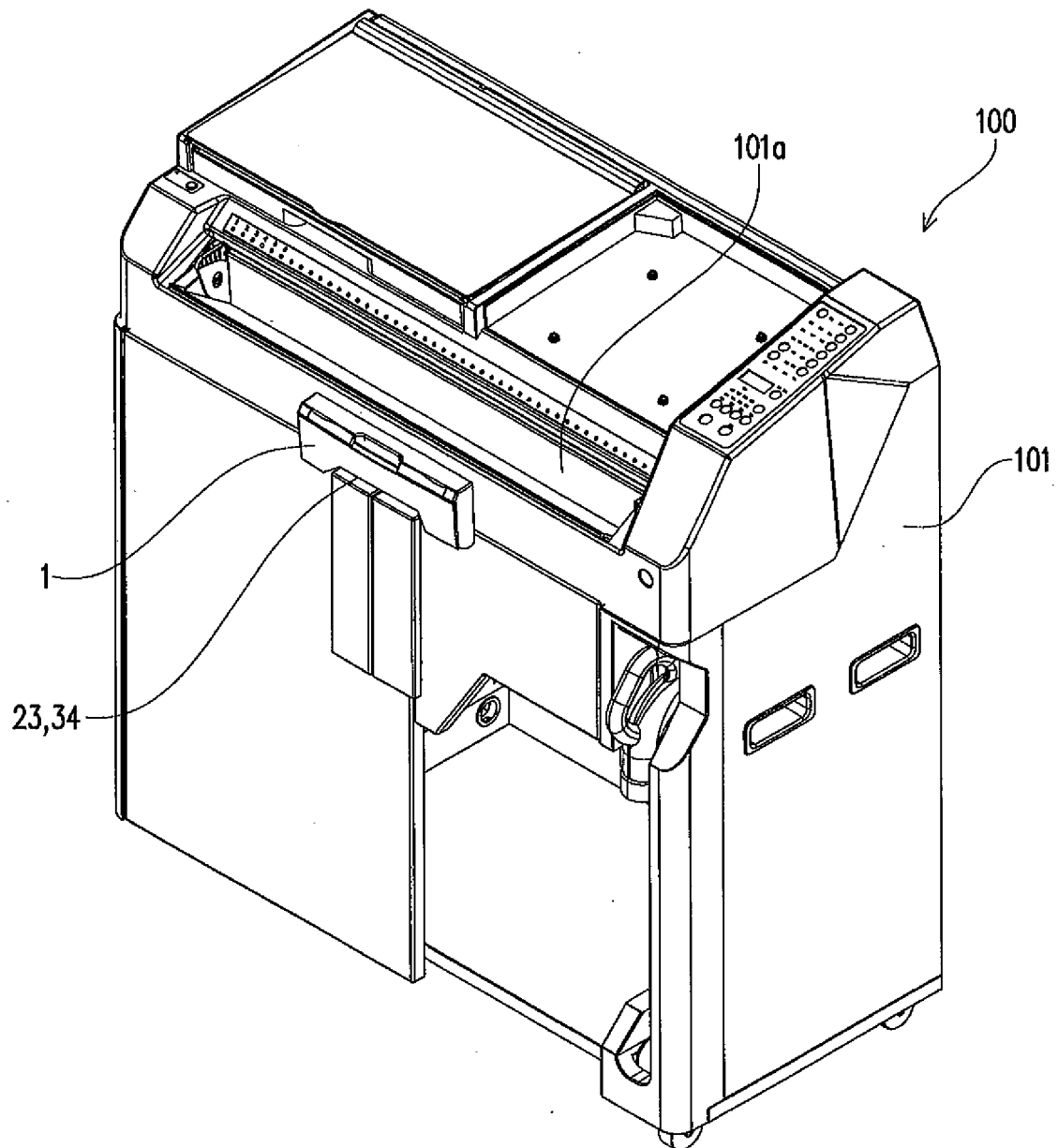


FIG. 2

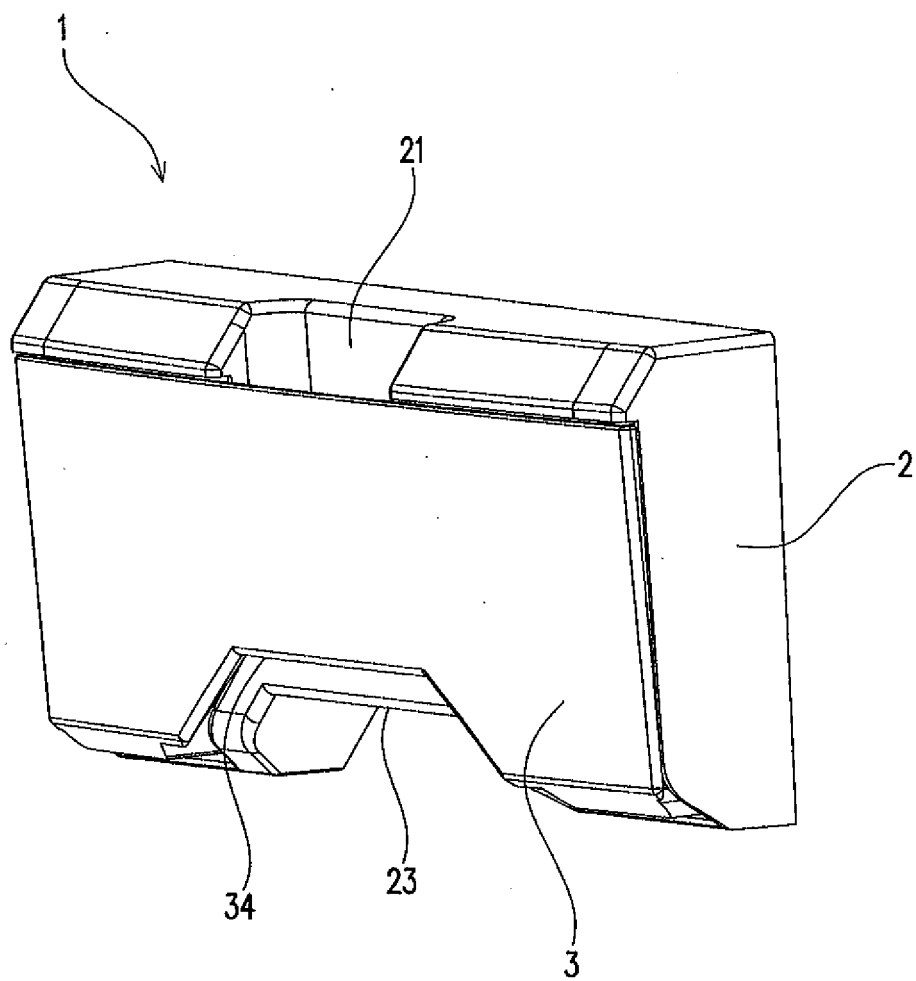


FIG. 3

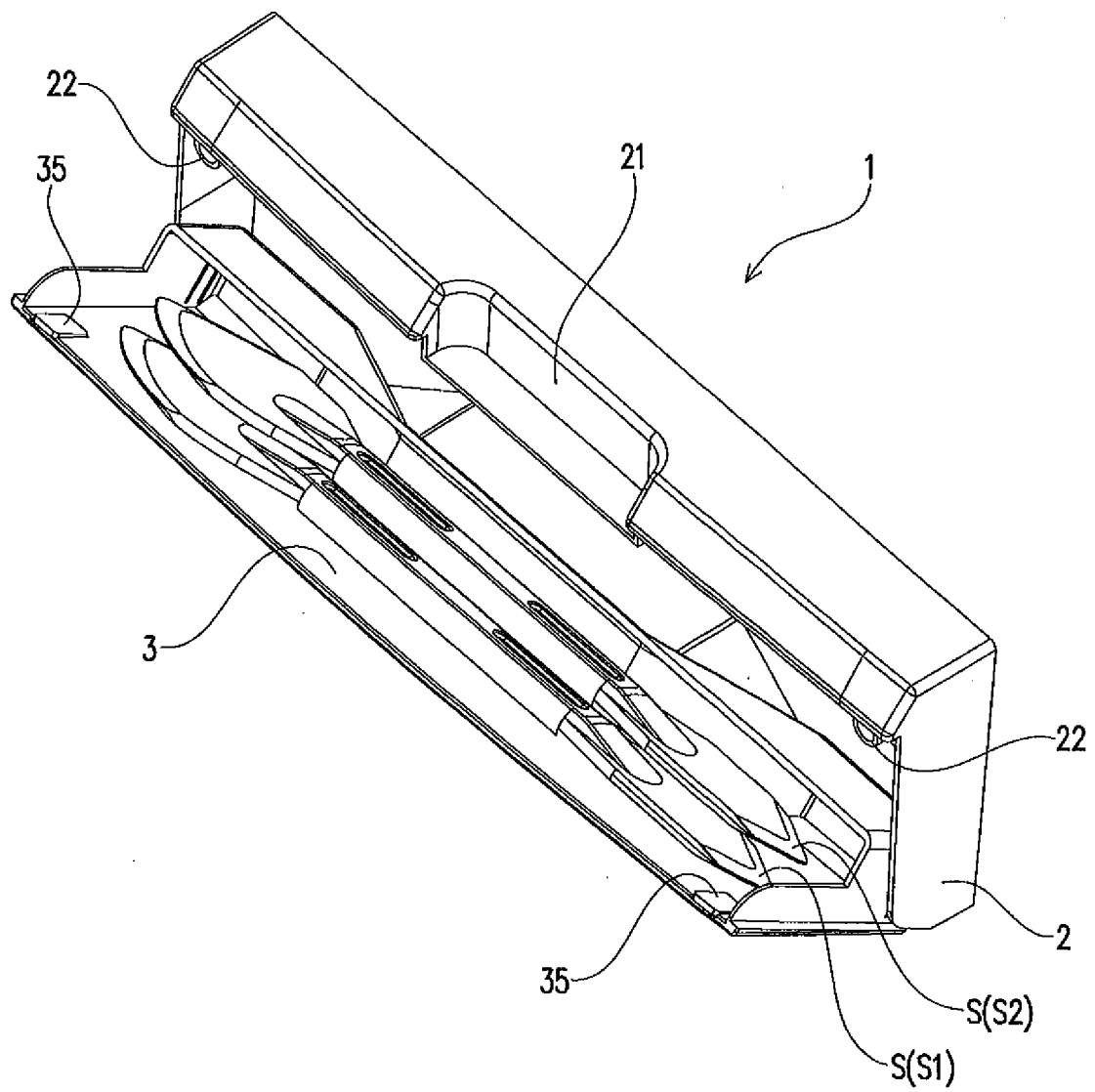


FIG. 4

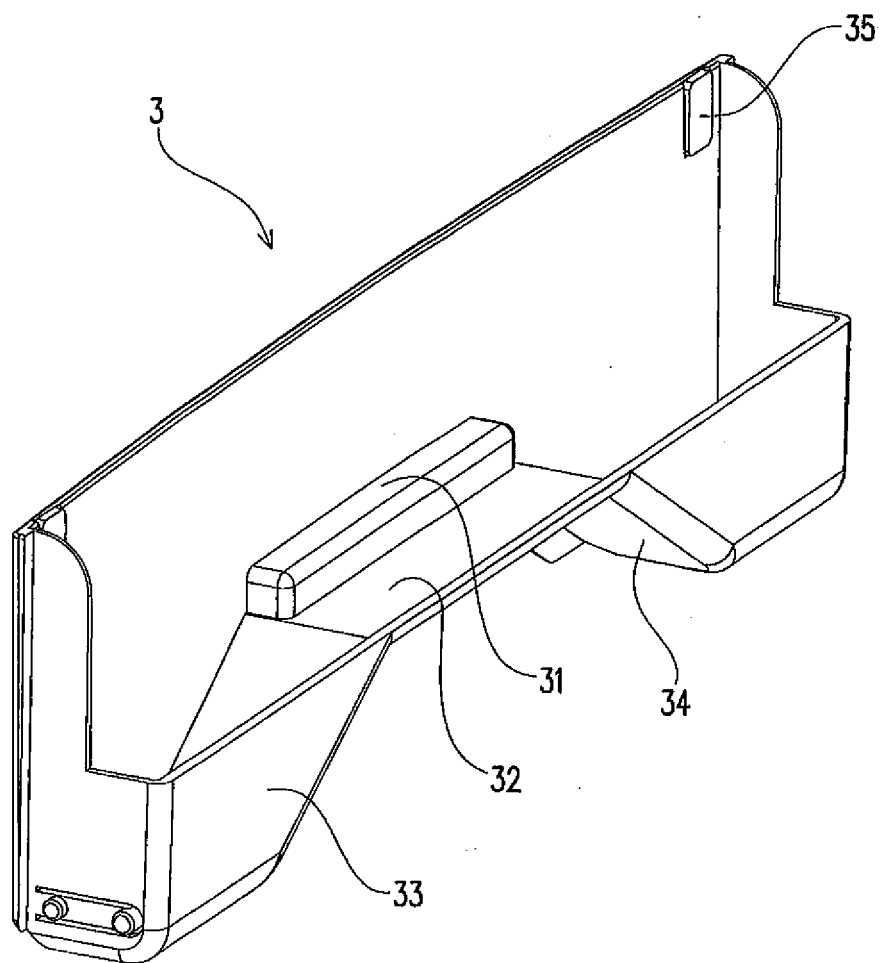


FIG. (5A)

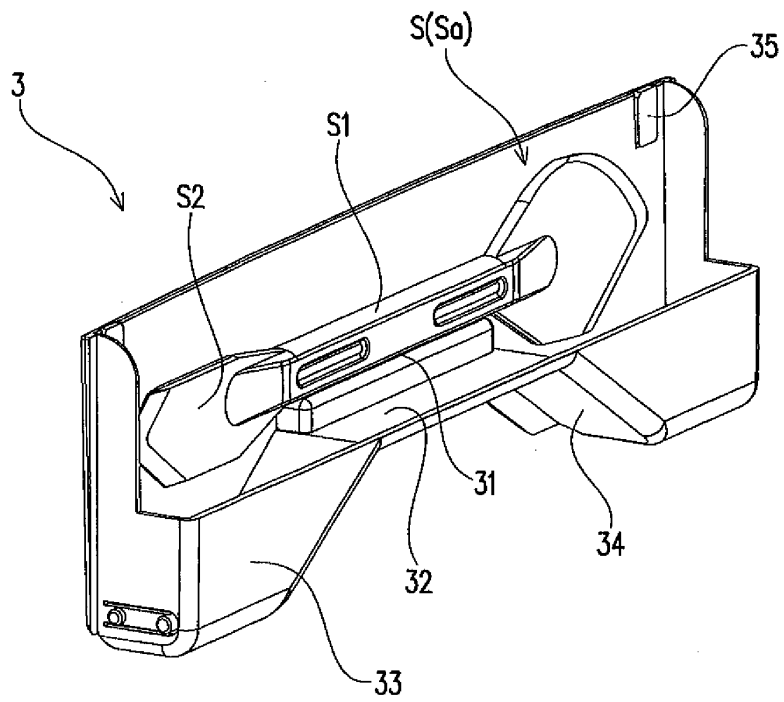
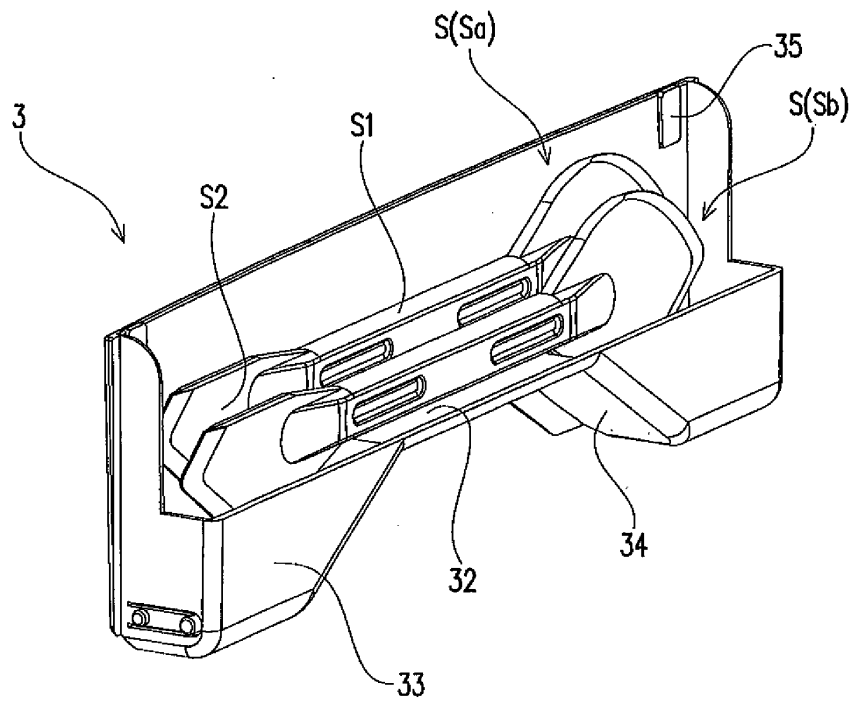


FIG. (5B)



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/072554

A. CLASSIFICATION OF SUBJECT MATTER

B65B65/00 (2006.01) i, B65B37/20 (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)

B65B65/00, B65B37/20

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 1996-2011

Kokai Jitsuyo Shinan Koho 1971-2011 Toroku Jitsuyo Shinan Koho 1994-2011

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 2003-334235 A (Munekuni MACHIYA), 25 November 2003 (25.11.2003), paragraph [0006]; fig. 3 (Family: none)	1-8
Y	JP 8-133201 A (Takazono Corp.), 28 May 1996 (28.05.1996), paragraph [0014]; fig. 1 (Family: none)	1-8
A	JP 2009-189718 A (Takazono Corp.), 27 August 2009 (27.08.2009), fig. 1 (Family: none)	1-8



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

26 October, 2011 (26.10.11)

Date of mailing of the international search report

08 November, 2011 (08.11.11)

Name and mailing address of the ISA/

Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/072554

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-096802 A (Ueda Avanse Kabushiki Kaisha), 02 April 2002 (02.04.2002), paragraph [0003]; fig. 4 (Family: none)	1-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 067267/1993(Laid-open No. 030927/1995) (Hiroe SUZUKI), 13 June 1995 (13.06.1995), entire text; all drawings (Family: none)	1-8

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP HEI761402 B [0005]