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(54) PAPER FEED CASSETTE

(75) Inventors: **Atsushi Mushimoto**, Daito-shi (JP); **Takahiro Naito**, Daito-shi (JP)

Correspondence Address:
CROWELL & MORING LLP
INTELLECTUAL PROPERTY GROUP
P.O. BOX 14300
WASHINGTON, DC 20044-4300

(73) Assignee: **Funai Electric Co., Ltd.**, Daito-shi (JP)

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B65H 1/04 (2006.01)

(52) **U.S. Cl.** **271/160**

(57) **ABSTRACT**

A paper feed cassette includes a second press member for pressing the center in a width direction of an upper surface of a paper. The second press member integrally includes a flat portion mounted on the lower surface of the lid member, an inclined portion integrally bonded with the flat portion on a region other than an end in a lower surface of the flat portion, extending in an oblique direction toward an inner bottom surface of the cassette body, and having at least an elastically deformable bonding portion between the inclined portion and the flat portion and a press portion provided on a forward end of the inclined portion, and the press portion is brought into contact with the inner bottom surface of the cassette body when the lid member is arranged on the upper portion of the cassette body.

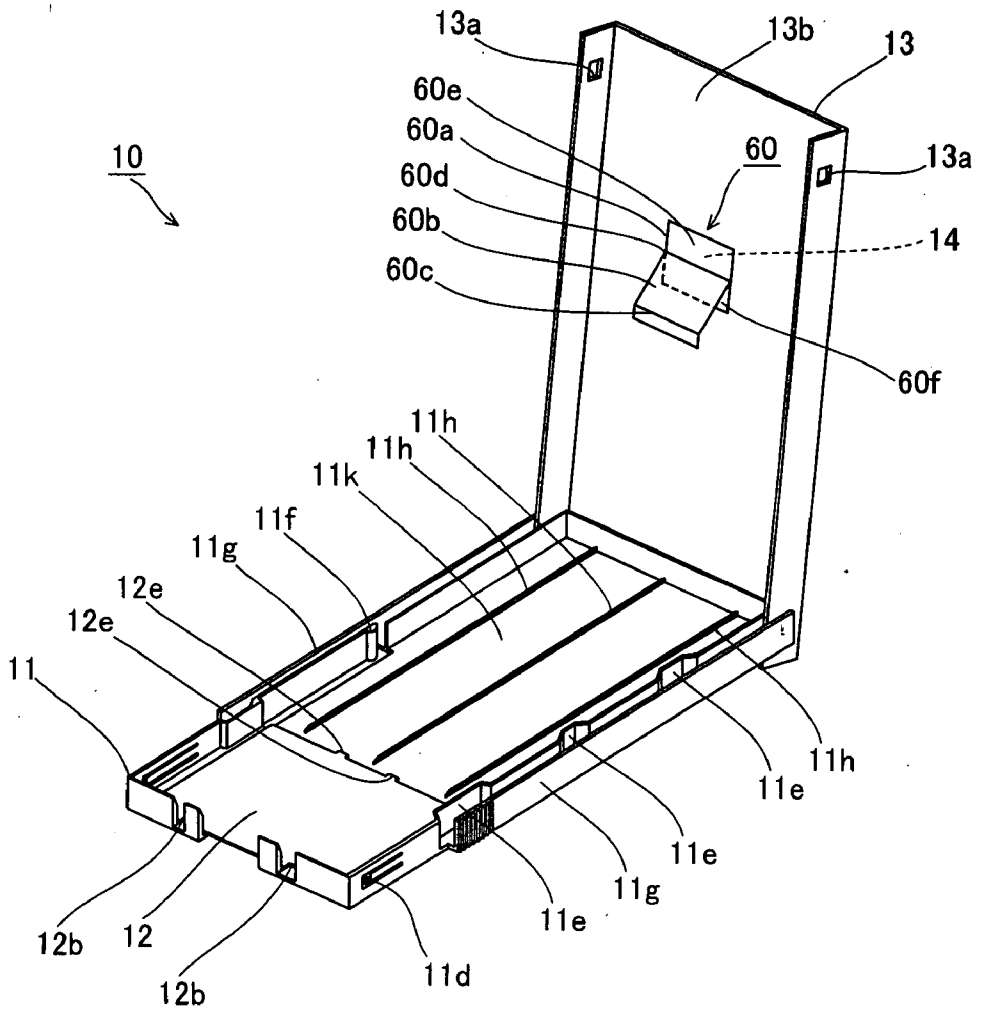
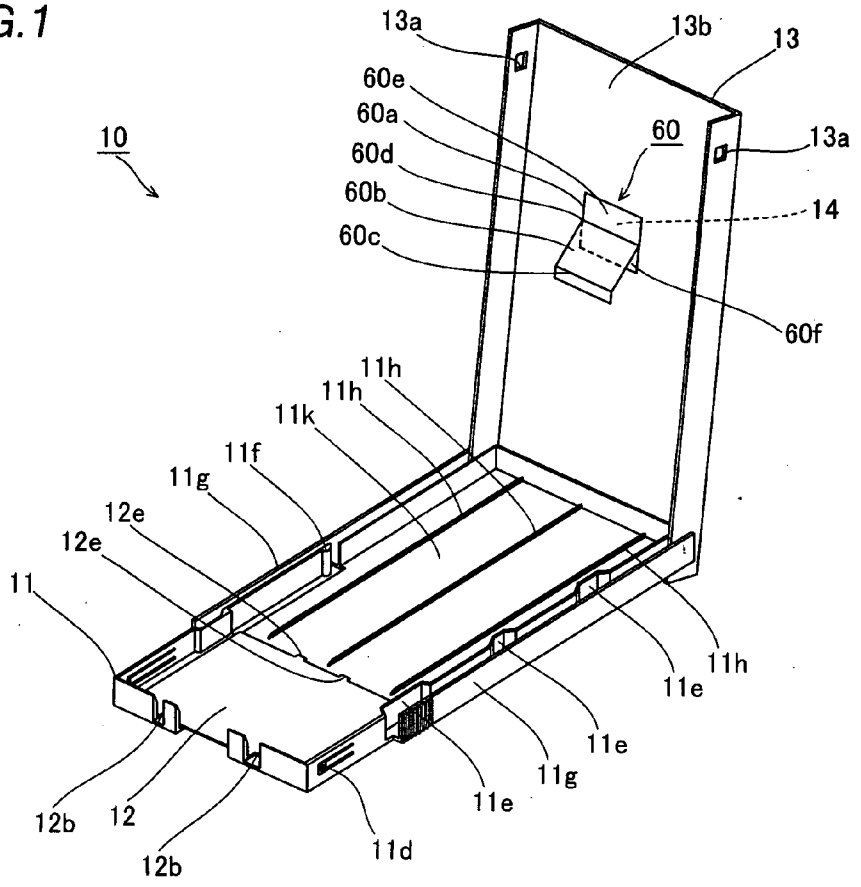


FIG.1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13b
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60e
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13a
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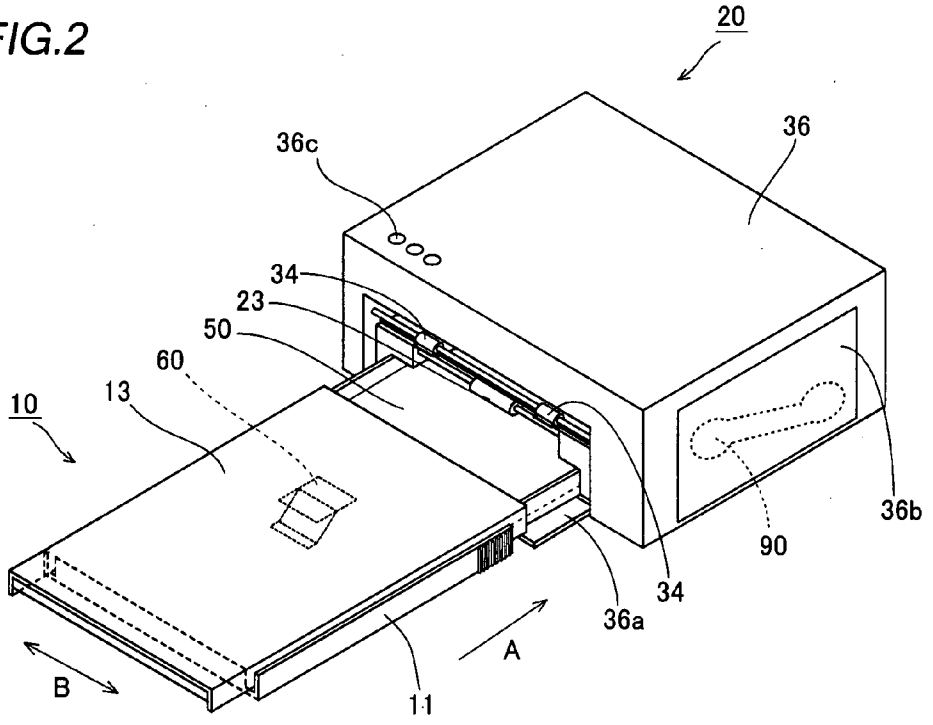
60d
60b
14
60c
60f
11h
11h
11k
11f
11g
12e
12e
11
11h
11e
11e
11g
11e
12b
12
11d
12b

FIG.2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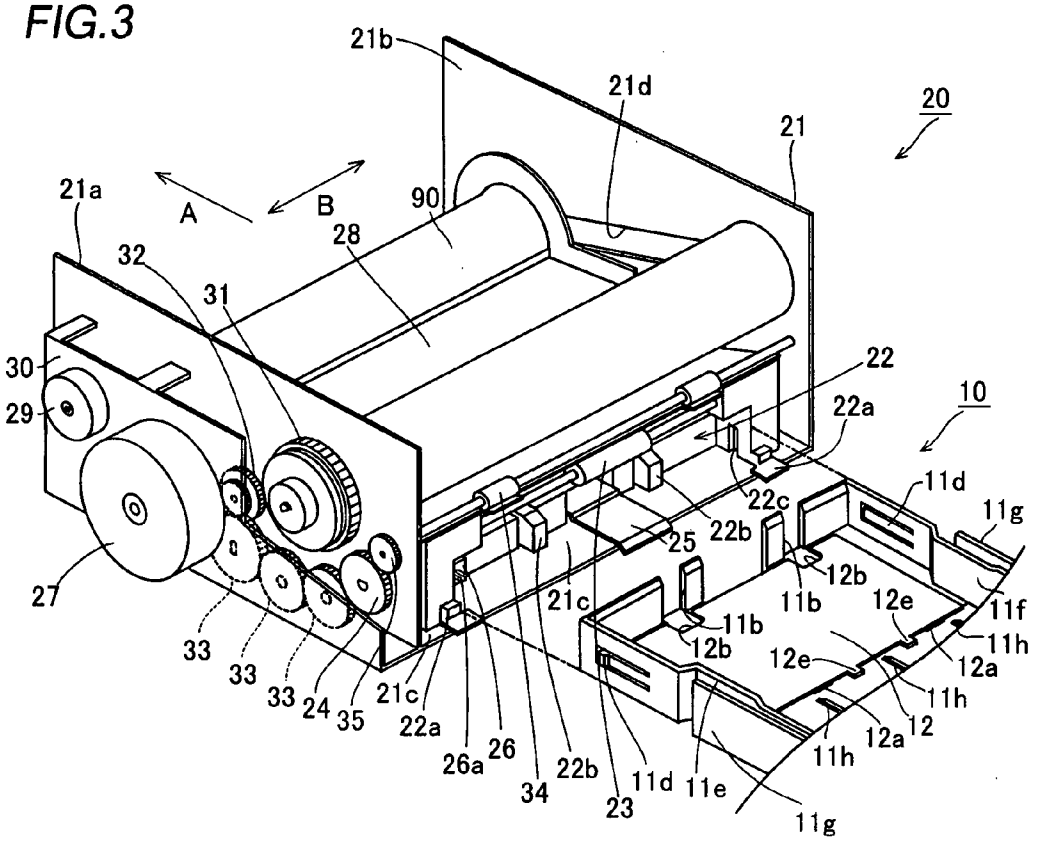
36c
36
34
23
50
60
10
13
36b
90
34
36a
A
B
11

FIG.3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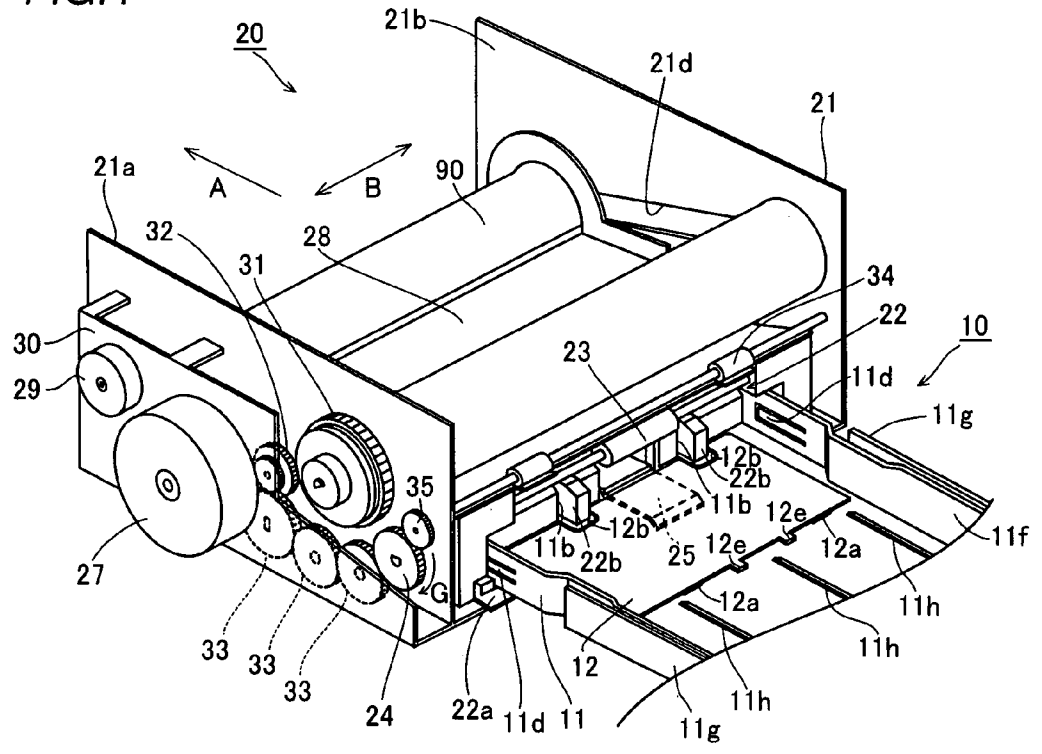
21d
21
20
21a
A
B
90
28
32
31
30
29
22
22a
10
11d
11g
22c
22b
25
12b
11b
12e
11f
11h
12a
27
21c
33
33
33
24
35
22a
26a
26
34
22b
11d
11e
23
11g
12
11h

FIG.4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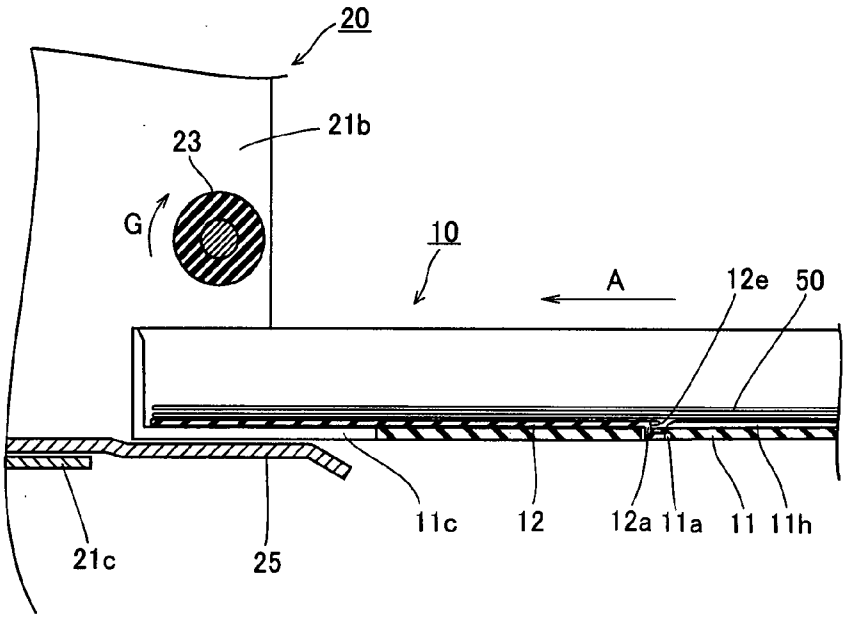
21b
21d
21
21a
A
B
90
28
32
31
34
22
10
30
29
23
11d
11g
12b
22b
11b
12e
12a
11f
35
27
25
11h
33
33
33
24
22a
11d
11
12
11h
11g

FIG.5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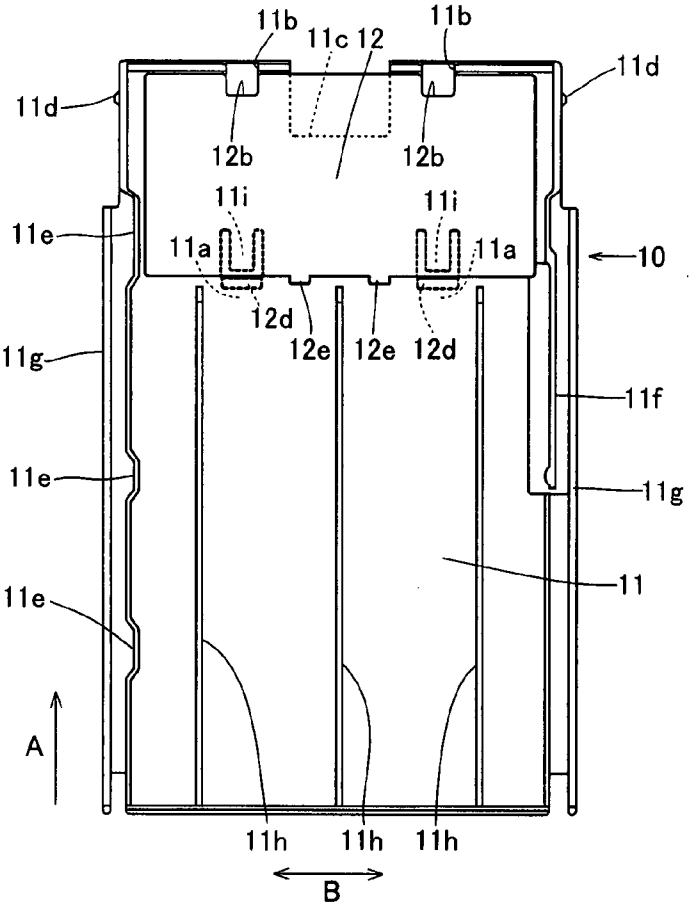
21b
23
G
10
A
12e
50
11c
12
12a
11a
11
11h
21c
25

FIG.6


11b
11c
12
11b
11d
11d
12b
12b
11i
11i
11e
11a
11a
10
12d
12e
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12d
11g
11f
11e
11g
11
11e
A
11h
11h
11h
B

FIG.7

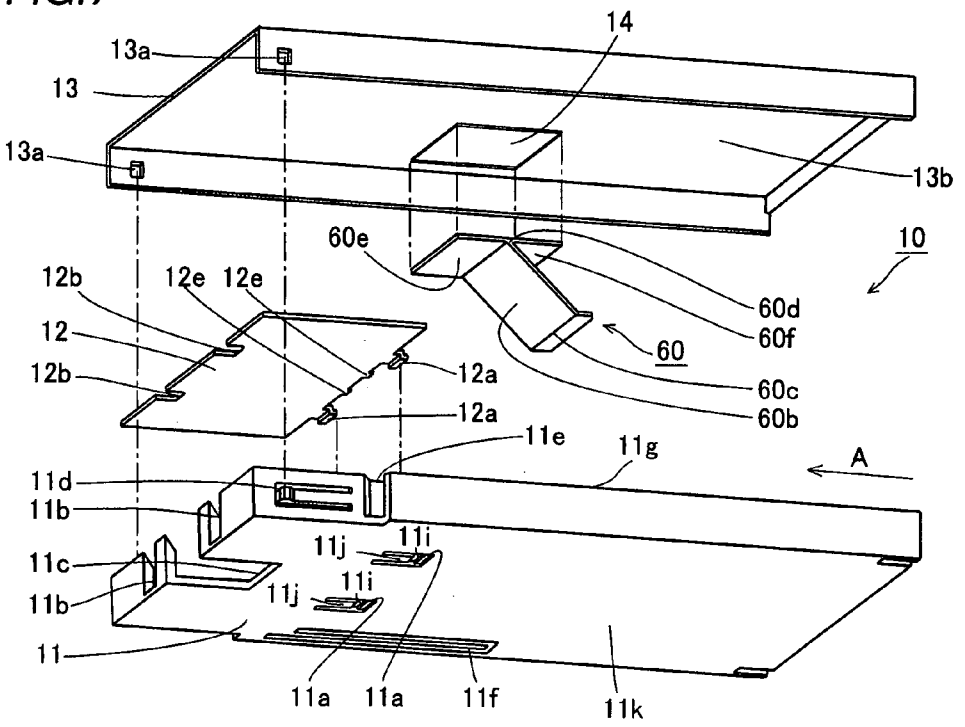
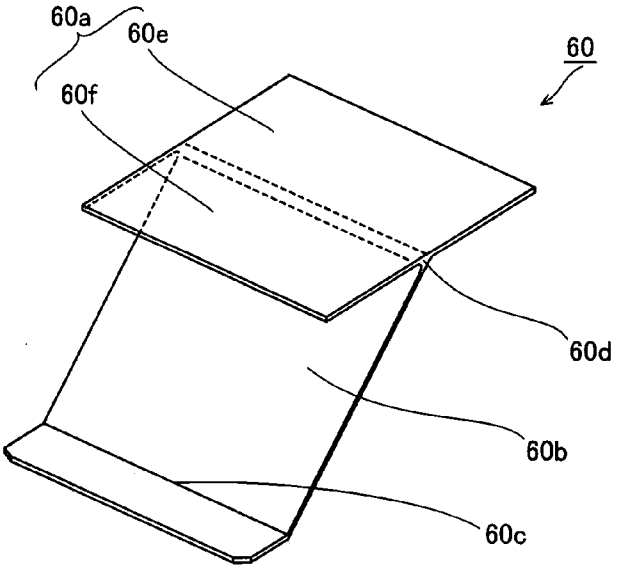

14
13a
13
13a
13b
10
60e
60d
60f
60
60c
60b
12b
12e 12e
12
12b
12a
12a
11e
11g
A
11d
11b
11j
11i
11c
11b
11j
11i
11
11a
11a
11f
11k

FIG.8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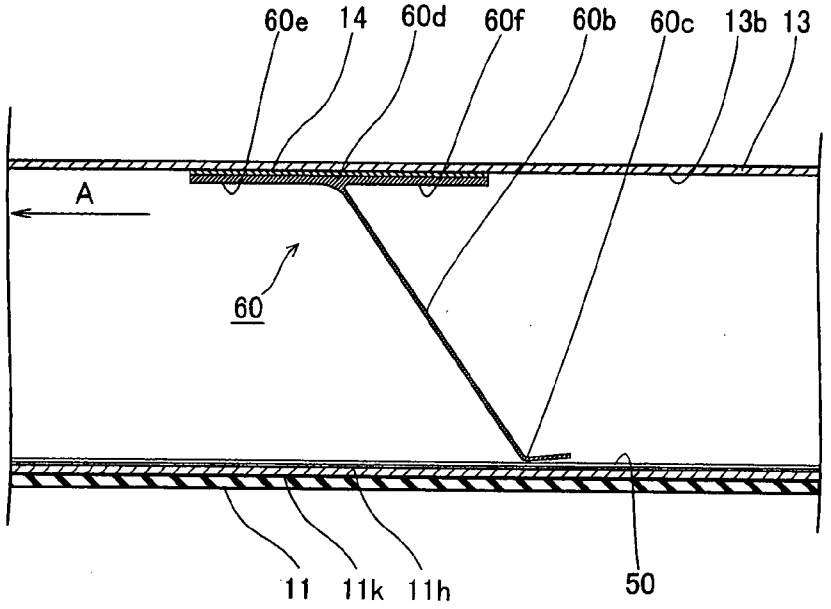
60
60f
60d
60b
60c

FIG.9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60d
60f
60b
60c
13b
13
A
60
11
11k
11h
50

FIG.10

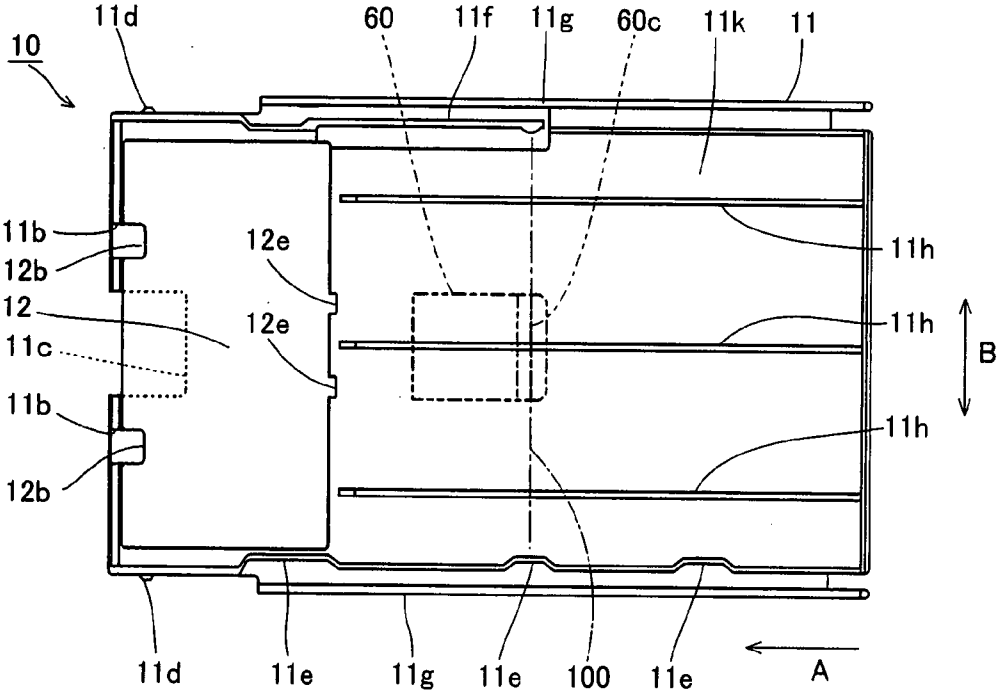
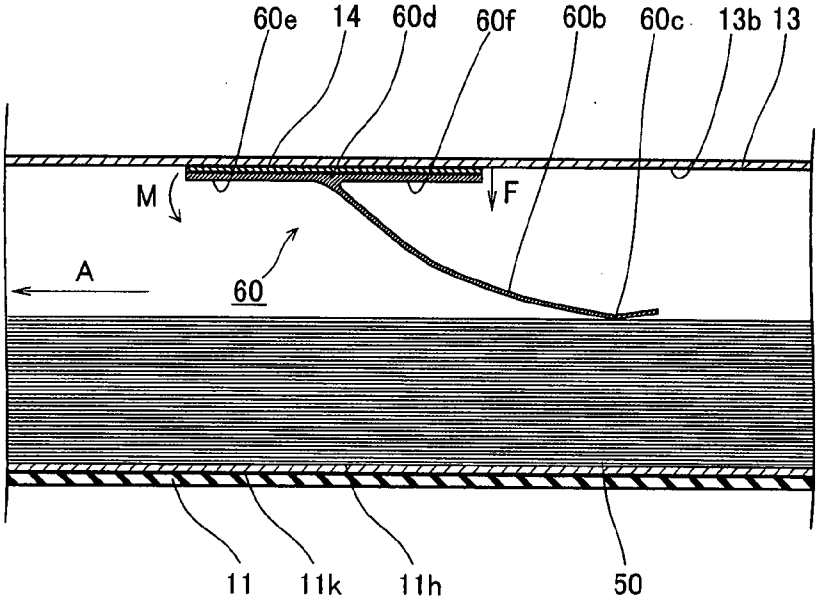

11d
60
11f
11g
60c
11k
11
10
11b
12b
12
11c
11b
12b
12e
12e
11h
11h
11h
B
11d
11e
11g
11e
100
11e
A

FIG. 11


60e
14
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60f
60b
60c
13b
13
M
F
A
60
11
11k
11h
50

FIG. 12

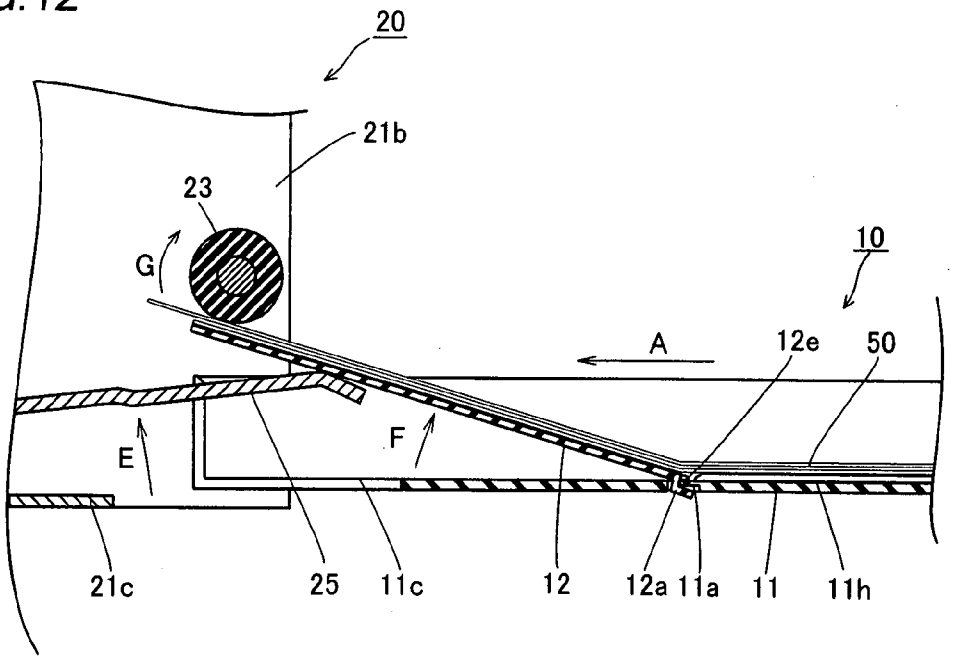

20
21b
23
G
10
A
12e
50
E
F
21c
25
11c
12
12a
11a
11
11h

FIG. 13

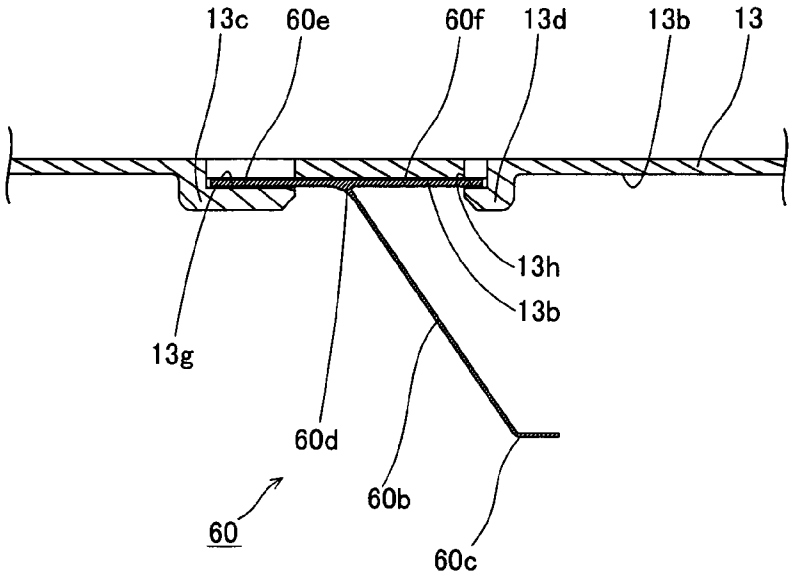

13c
60e
60f
13d
13b
13
13h
13b
13g
60d
60b
60
60c

FIG. 14

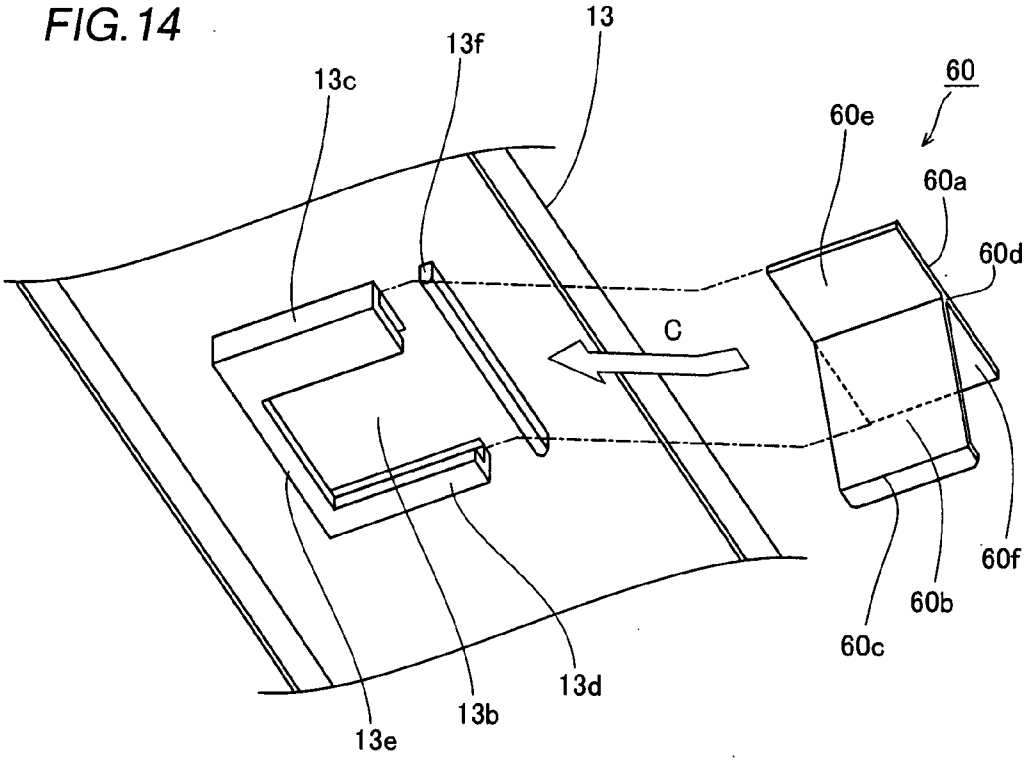

13
13f
13c
60
60e
60a
60d
C
60f
60b
60c
13d
13b
13e

FIG. 15

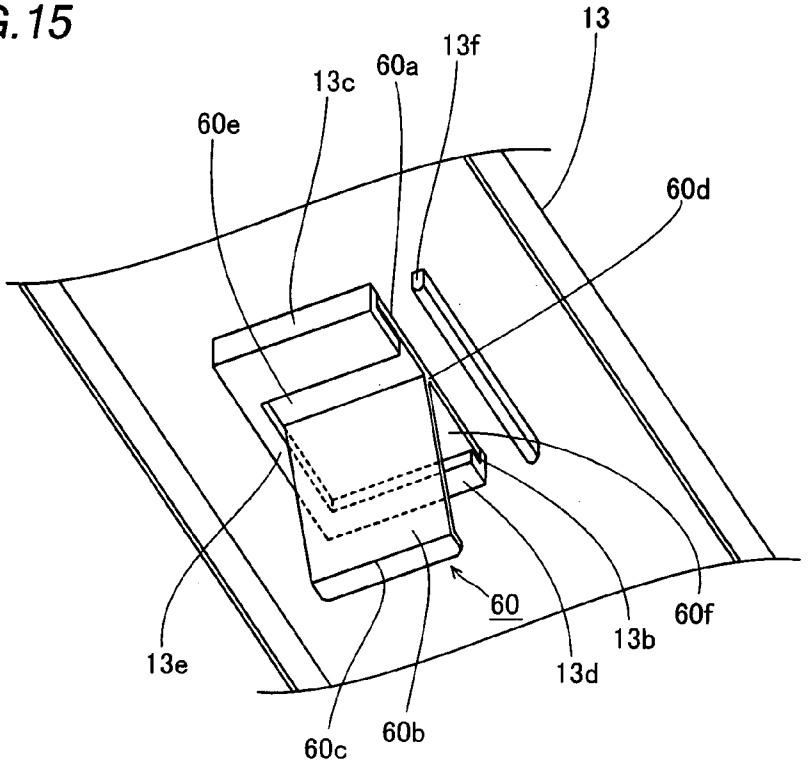

13
13f
60a
13c
60e
60d
60
60f
13b
13d
13e
60c
60b

FIG. 16

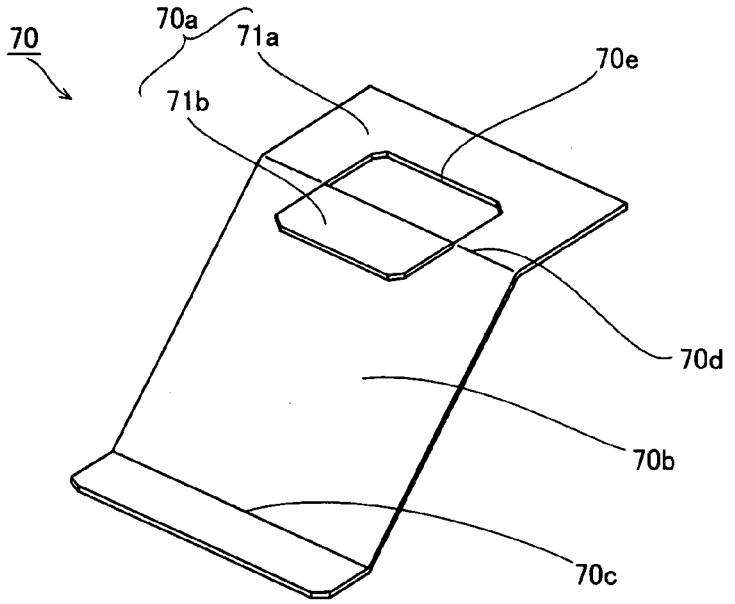

70
70a
71a
70e
71b
70d
70b
70c

FIG. 17

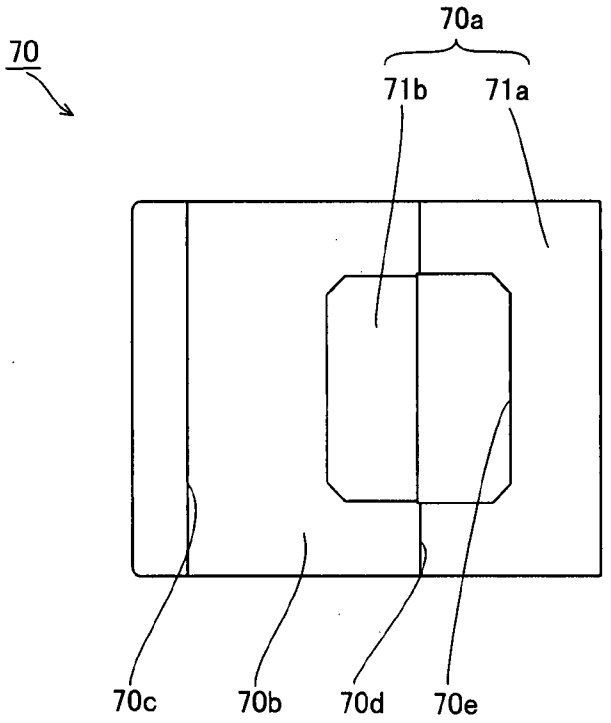
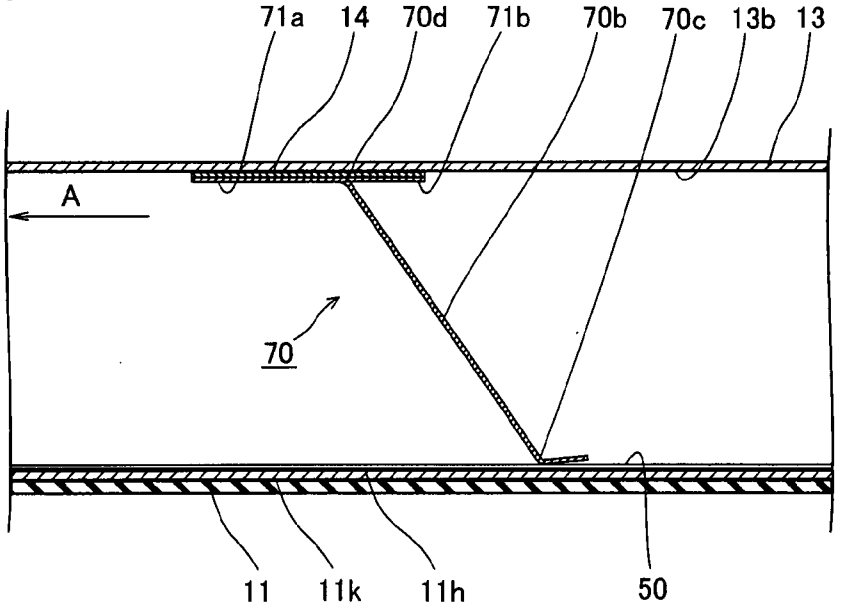

70
70a
71b
71a
70c
70b
70d
70e

FIG. 18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70d
71b
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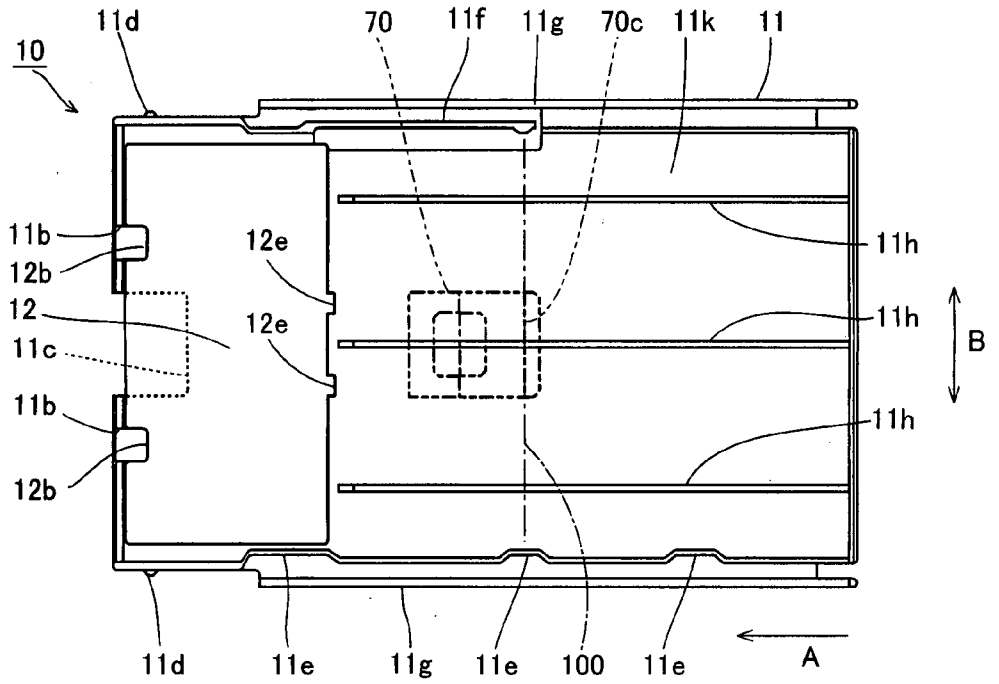
70c
13b
13
A
70
11
11k
11h
50

FIG.19


11d
70
11f
11g
70c
11k
11
10
11b
12b
12
11c
11b
12b
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12e
11h
11h
11h
B
11d
11e
11g
11e
100
11e
A

FIG.20

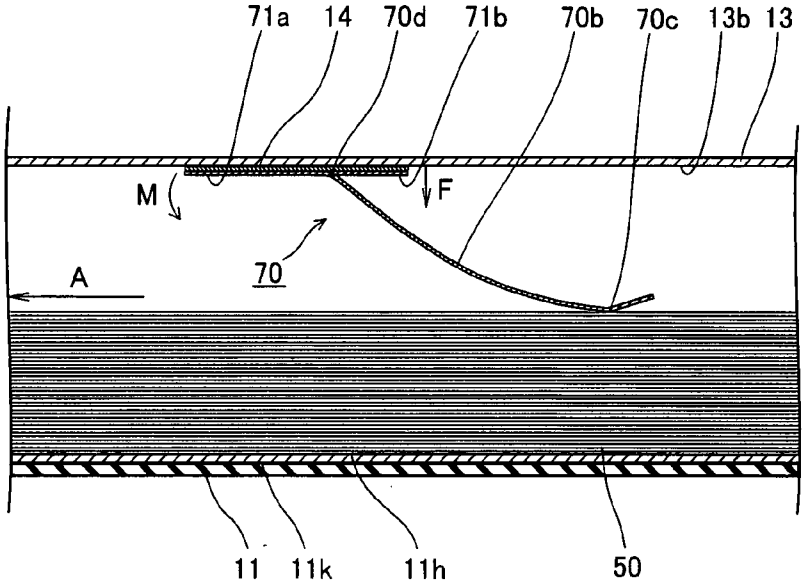

71a
14
70d
71b
70b
70c
13b
13
M
F
A
70
11
11k
11h
50

FIG.21

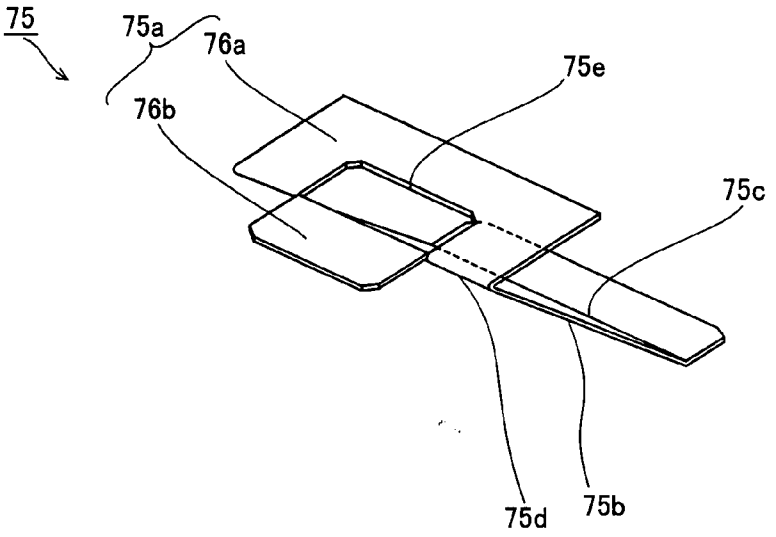


FIG.22

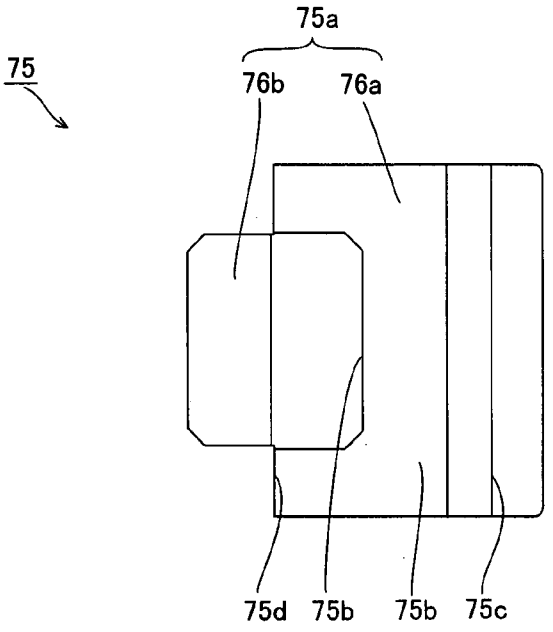
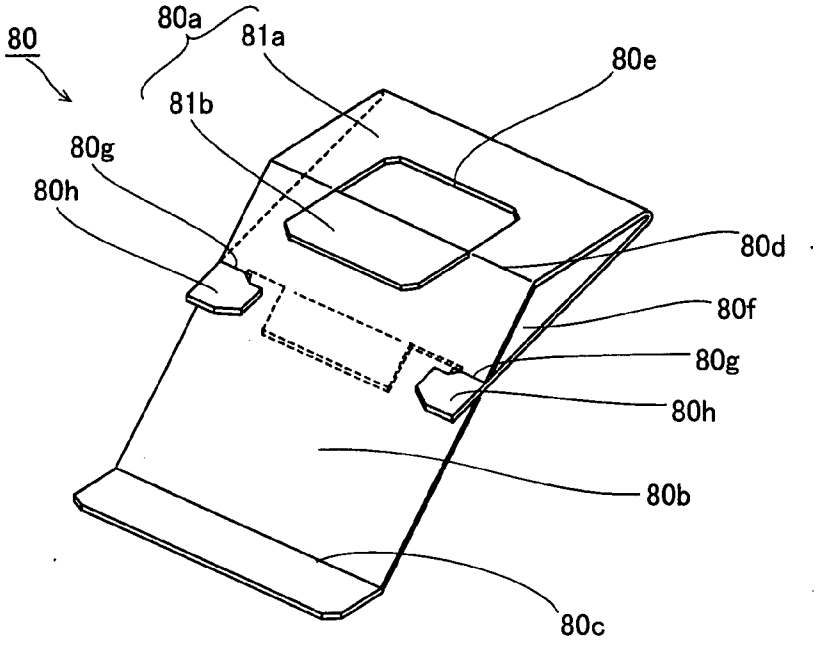


FIG.23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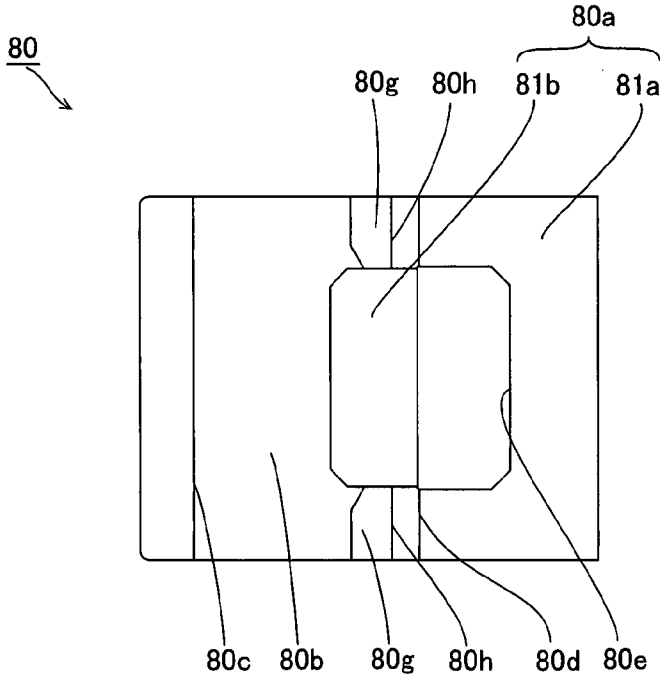
81a
80e
81b
80g
80h
80d
80f
80g
80h
80b
80c

FIG.24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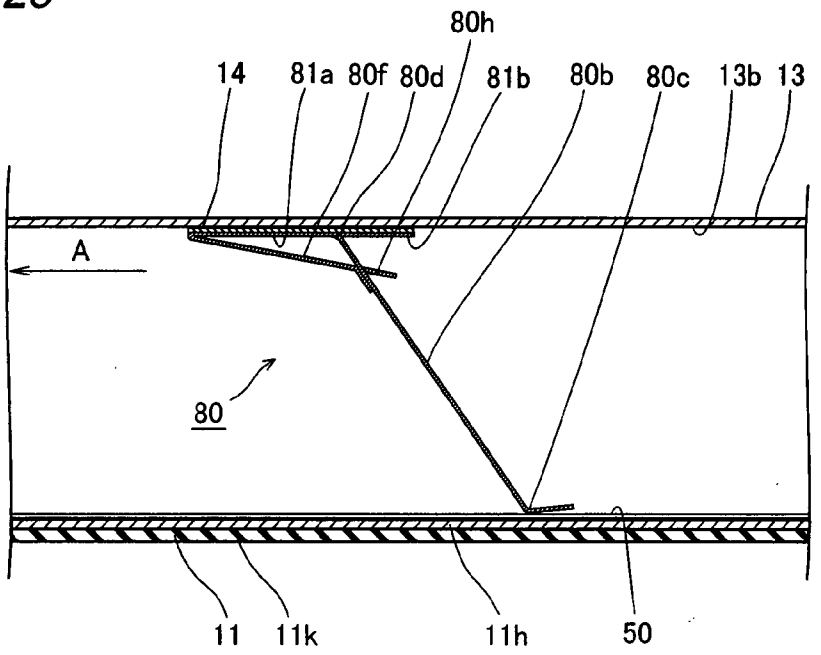
80a
80g
80h
81b
81a
80c
80b
80g
80h
80d
80e

FIG.25


80h
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81a
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81b
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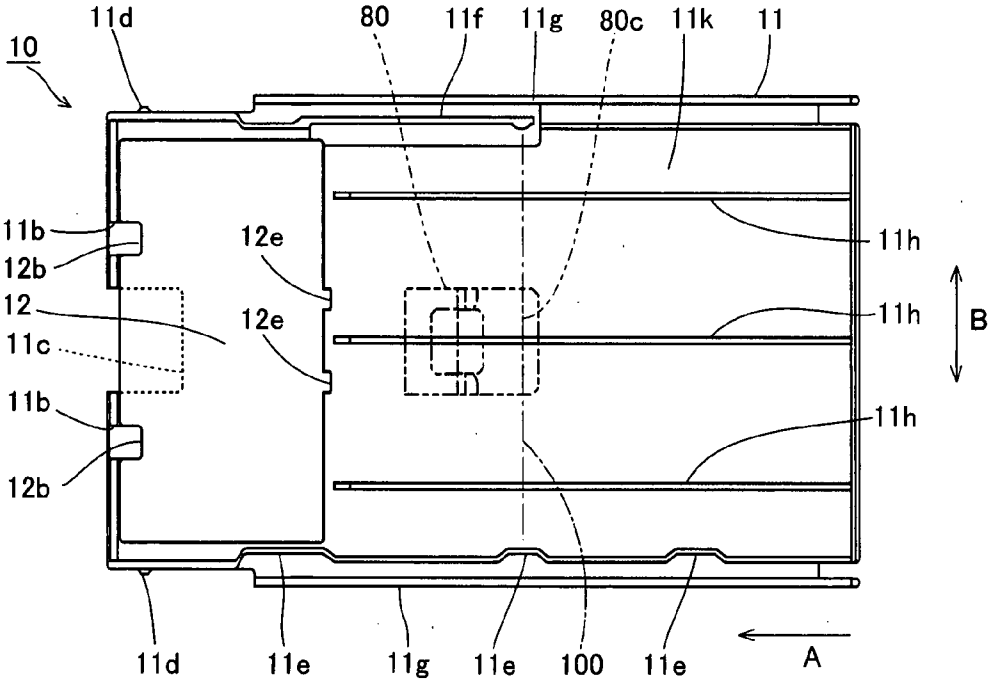
80c
13b
13
A
80
11
11k
11h
50

FIG.26


11d
80
11f
11g
80c
11k
11
10
11b
12b
12
11c
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12e
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11h
11h
11h
B
11d
11e
11g
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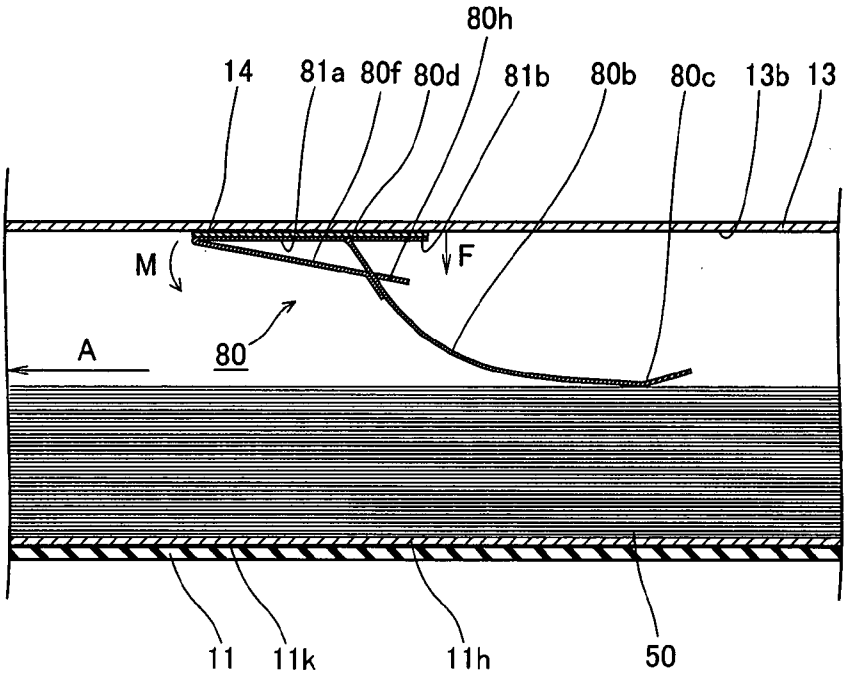
100
11e
A

FIG.27


80h
14
81a
80f
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81b
80b
80c
13b
13
M
F
A
80
11
11k
11h
50

FIG.28

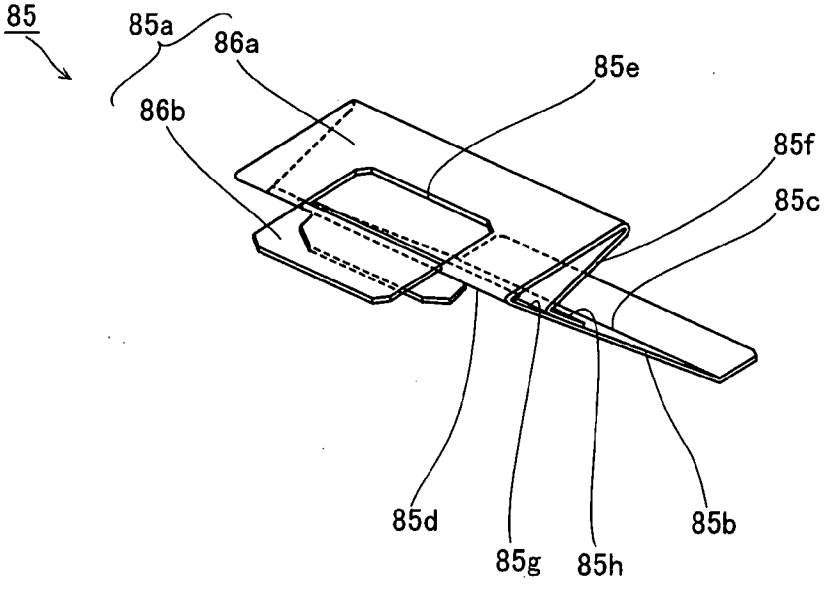
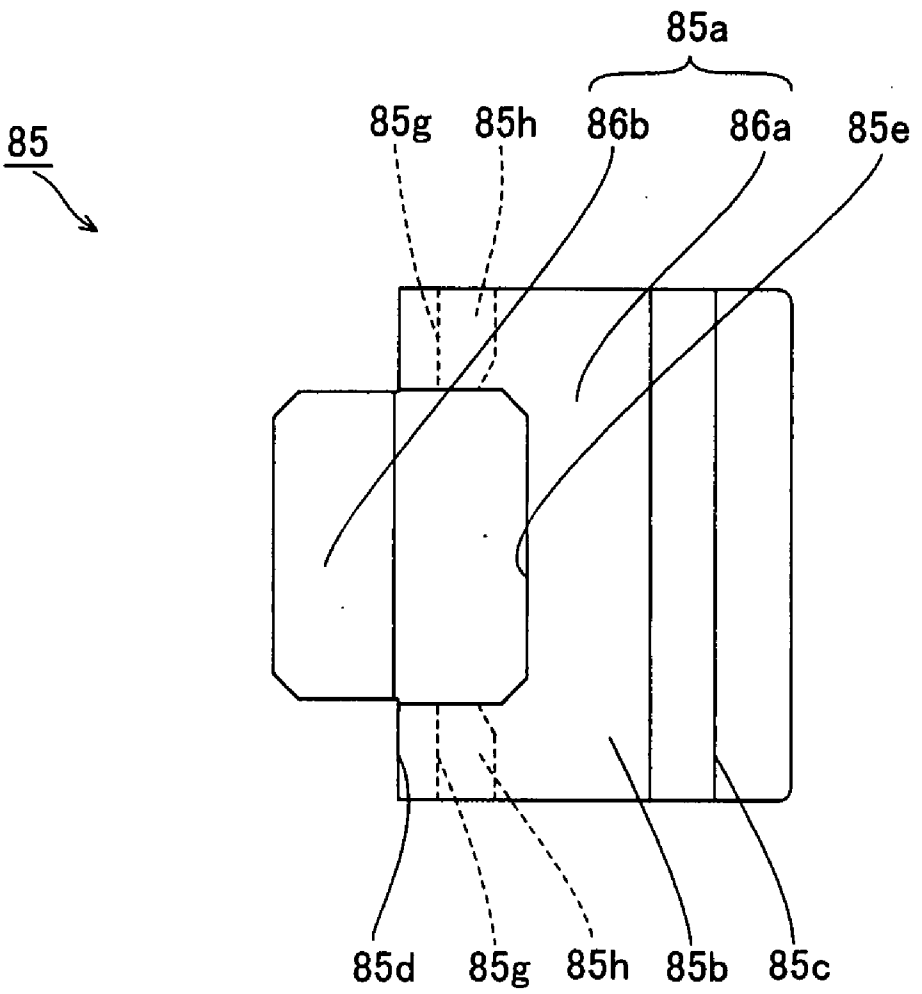

85
85a
86a
85e
86b
85f
85c
85d
85g
85h
85b

FIG.29



PAPER FEED CASSETTE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a paper feed cassette, and more particularly, it relates to a paper feed cassette mounted on an image generating apparatus.

[0003] 2. Description of the Background Art

[0004] Paper feed cassettes mounted on image generating apparatuses are known in general, as disclosed in Japanese Patent Laying-Open Nos. 2002-332122, 2003-276863, 2004-83175 and 5-229676 (1993), for example.

[0005] The aforementioned Japanese Patent Laying-Open No. 2002-332122 discloses the paper feed cassette comprising a width approaching member (plate spring) pressing a side surface of a paper parallel to a paper feed direction of the paper stored in a paper tray to approach the paper to one side of the paper tray, and a rotatable lid covering an upper surface of the paper tray, in which a press member (plate spring) pressing a vicinity of both ends in a width direction of an upper surface of the paper is conceivably bonded to the inside of the lid. In the paper feed cassette, the press member (plate spring) pressing the upper surface of the paper against the inside of the lid is constituted by a flat portion mounted on the lid, a press portion pressing the upper surface of the paper when the lid is closed, and one inclined portion linking the flat portion and the press portion. A bonding portion between the inclined portion and the flat portion is provided on a first end of the flat portion.

[0006] The aforementioned Japanese Patent Laying-Open No. 2003-276863 discloses the paper feed cassette comprising wall portions (curl forcing portions) provided on ends of the paper tray storing a paper in a direction perpendicular to a paper feed direction of the paper, and a press member (plate spring) pulled up to an center in a width direction of a paper tray covering an upper surface of the paper and pressing the upper surface of the paper. The paper feed cassette is so formed as to properly curl the paper (form a curl) by pressing the ends of the paper downward with the wall portions (curl forcing portions) to feed the same in a paper feed roller while the press member (plate spring) properly pressing the upper surface of the paper downward is provided in order to avoid an excessive curl. The press plate and the spring member (coil spring) for urging the paper stored in the paper tray against the paper feed roller on a device body side are provided on the device body side, and the press plate and the spring member (coil spring) on the device body side press both the wall portions (curl forcing portions) and the press member (plate spring) on a paper tray side when the paper feed cassette is mounted on the device body.

[0007] The aforementioned Japanese Patent Laying-Open No. 2004-83175 discloses the paper feed cassette comprising a first press member (plate spring) pressing a side surface of a stored paper against an inner side surface of a paper tray to approach the paper to one side of the paper tray, and a second press member (plate spring) integrally formed on right and left inner side surfaces of the paper tray and pressing an upper surface of the paper. The paper feed cassette is so formed as to upwardly rotate a pushing up plate for urging the stored paper against a paper feed roller on a device body side for bringing the paper into contact with the second press member (plate spring) on the upper surface of the paper in the case where the paper tray is mounted on the device body.

[0008] The aforementioned Japanese Patent Laying-Open No. 5-229676 discloses the paper feed cassette comprising a paper tray, a rotatable lid covering an upper surface of a paper tray, and a roller rotating with carrying the paper while being in contact with an center in a width direction of an upper surface of a paper inside the lid at a small area. In the paper feed cassette, a spring member (coil spring) and a pushing up plate for pressing the paper stored in the plate paper tray against a roller mounted on a lid are provided on a bottom portion of the paper tray.

[0009] In the conventional paper feed cassette proposed in the aforementioned Japanese Patent Laying-Open No. 2002-332122, however, the press member (plate spring) pressing the upper surface in the vicinity of the end in the width direction of the paper is integrally formed on the left and right inner surfaces of the paper tray, whereby the center in the width direction of the paper is not pressed, and the paper is disadvantageously likely to be curved (warped) at the center in the width direction thereof. Thus, the paper feed cassette does not eliminate the warpage in the width direction of the paper, whereby the paper is disadvantageously likely to be carried in a direction oblique to a carrying direction due to the warpage in the width direction of the paper. In the paper feed cassette proposed in the aforementioned Japanese Patent Laying-Open No. 2002-332122, in the case where the lid is closed in a state where a large number of papers are stored in the paper tray, loads from the papers and the above thereof is applied to the press member (plate spring) by coming into contact with the papers, and the inclined portion is further warped in a fallen direction, thereby causing deformation. In this case, in the case where the press member is bonded to the inside of the lid with a bonding layer, bending moment occurs in the bonding portion between the flat portion and the inclined portion of the press member (plate spring) about the bonding portion of an end of the flat portion of the press member (plate spring) and the inclined portion as a central axis, and the flat portion is always urged in a direction (downward) for peeling from the inside of the lid. Thus, in the case where the press member presses a large number of papers, the flat portion disadvantageously peels and comes off from a lower surface of the lid as time advances.

[0010] In the conventional paper feed cassette proposed in the aforementioned Japanese Patent Laying-Open No. 2003-276863, the press member (plate spring) pressing the upper surface of the paper suppresses the excessive curl (warpage) in the width direction of the paper and does not eliminate the warpage in the width direction of the paper, whereby the paper is disadvantageously likely to be carried in the direction oblique to the carrying direction due to the warpage in the width direction of the paper.

[0011] In the conventional paper feed cassette proposed in the aforementioned Japanese Patent Laying-Open No. 2004-83175, the second press member (plate spring) pressing the upper surface in the vicinity of the end in the width direction of the paper is integrally formed on the right and left inner side surfaces of the paper tray, whereby the curvature (warpage) is disadvantageously likely to occur in the center in the width direction of the paper. Thus, the paper is

disadvantageously likely to be carried in the direction oblique to the carrying direction due to the warpage in the width direction of the paper.

[0012] In the conventional paper feed cassette proposed in the aforementioned Japanese Patent Laying-Open No. 5-229676, the spring member (coil spring) and the pushing up plate for pressing the paper stored in the paper tray against the roller mounted on the lid is required in addition to the roller, whereby the number of components is disadvantageously increased.

SUMMARY OF THE INVENTION

[0013] The present invention has been proposed in order to solve the aforementioned problems, and an object of the present invention is to provide a paper feed cassette capable of suppressing curvature (warpage) in a width direction of a paper for inhibiting the paper from being carried in an oblique direction, and inhibiting a press member pressing the paper from coming off from a paper feed cassette also in a state of a large number of the papers, while inhibiting the number of components from increase.

[0014] A paper feed cassette according to a first aspect of the present invention comprises a cassette body mounted on an image generating apparatus including a paper feed roller and storing a paper, a first press member provided on at least a first side surface inside the cassette body and pressing a side surface of the paper when the paper is stored, a lid member arranged on an upper portion of the cassette body, and a second press member provided independently of the lid member, mounted on a lower surface of the lid member, and pressing the vicinity of the center in a width direction of an upper surface of the paper stored in the cassette body, wherein the second press member integrally includes a flat portion mounted on the lower surface of the lid member, an inclined portion integrally bonded with the flat portion on a region other than an end in a lower surface of the flat portion, extending in an oblique direction toward an inner bottom surface of the cassette body, and having at least an elastically deformable bonding portion between the inclined portion and the flat portion, and a press portion provided on a forward end of the inclined portion, and the press portion is brought into contact with the inner bottom surface of the cassette body when the lid member is arranged on the upper portion of the cassette body.

[0015] In the paper feed cassette according to the first aspect, as hereinabove described, the second press member integrally includes the inclined portion integrally bonded with the flat portion on the region other than the end in the lower surface of the flat portion mounted on the lower surface of the lid member, extending in an oblique direction toward an inner bottom surface of the cassette body, and having at least an elastically deformable bonding portion between the inclined portion and the flat portion, whereby in the case where bending moment occurs about the bonding portion between the inclined portion and the flat portion of the second press member as a central axis with reaction from the papers when the second press member presses the papers in a state of a large number of the papers, a region of the flat portion in which an angle formed by the inclined portion and the flat portion is an acute angle can generate reaction having a direction to counteract the aforementioned bending moment. Thus, also in the case of a large number of the papers, the flat portion can be inhibited from peeling and coming off from the lower surface of the lid member. The second press member is so formed as to press the vicinity of the center in the width direction of the upper surface of the paper stored in the cassette body, whereby the second press member can press the center in the width direction of the upper surface of the paper, and hence curvature (warpage) in the width direction of the paper can be effectively suppressed. Thus, the paper can be inhibited from being carried in the oblique direction due to the warpage in the width direction of the paper. In addition, the second press member integrally includes the flat portion mounted on the lower surface of the lid member, the inclined portion integrally bonded with the flat portion on the region other than the end in the lower surface of the flat portion, and the press portion provided on the forward end of the inclined portion, and the press portion is so formed as to come into contact with the inner bottom surface of the cassette body when the lid member is located on an upper portion of the cassette body. Thus, no push up mechanism for bringing the upper surface of the paper into contact with the press portion may be provided below the paper, whereby the number of components can be inhibited from increase.

[0016] In the aforementioned paper feed cassette according to the first aspect, the press portion is preferably so formed as to have a substantially L-shaped section and linearly press the paper with a corner of the L-shape. According to this structure, the contact area between the paper and the press portion can be reduced, thereby allowing reduce in frictional resistance between the paper and the press portion. Thus, it is possible to suppress a paper feed error caused by the frictional resistance between the paper and the press portion in paper feeding, thereby allowing smooth paper feeding.

[0017] In the aforementioned paper feed cassette according to the first aspect, the flat portion of the second press member is preferably mounted on the lower surface of the lid member with an adhesive layer. According to this structure, the second press member can be easily mounted on the lid member.

[0018] In the aforementioned paper feed cassette according to the first aspect, the inclined portion is preferably bonded at the substantial center of the flat portion. According to this structure, it is possible to increase the area of the region generating the reaction having the direction to counteract the bending moment in pressing the paper with the second press member. Thus, the flat portion can be reliably inhibited from peeling and coming off from the lower surface of the lid member.

[0019] In the aforementioned paper feed cassette according to the first aspect, the flat portion of the second press member preferably includes a first flat portion on the right and a second flat portion on the left, between which a bonding line between the flat portion and the inclined portion is a boundary line, and the second flat portion is preferably formed by providing a U-shaped cutout portion in a prescribed region of a bonding portion between the first flat portion and the inclined portion and folding back an inner region of the U-shaped cutout portion of the first flat portion along the bonding line of the bonding portion. According to this structure, a structure in which the inclined portion is integrally bonded on the region other than the end in the lower surface of the flat portion can be easily obtained.

[0020] In this case, the second press member preferably includes a support portion integrally coupled with the first flat portion on an end of the first flat portion, extending in an

oblique direction toward the inclined portion, and supporting the inclined portion. According to this structure, the inclined portion of the second press member is supported by the support portion, thereby improving rigidity of the inclined portion. Thus, in the case where the second press member presses the papers especially in a state of a large number of the papers, displacement (deforming degree) of the inclined portion in the bonding portion between the inclined portion and the first flat portion can be reduced, whereby a basic form of the inclined portion can be easily held.

[0021] In the aforementioned paper feed cassette according to the first aspect, the bonding portion between the inclined portion and the flat portion of the second press member is preferably so formed as to have a thickness larger than those of the inclined portion and the flat portion. According to this structure, the mechanical strength of the bonding portion is improved, whereby the bonding portion can be inhibited from breaking also in the case where stress is applied to the bonding portion due to the deformation of the inclined portion when the press portion of the second press member presses the paper.

[0022] In the aforementioned paper feed cassette according to the first aspect, the second press member may be mounted on the lower surface of the lid member such that the inclined portion of the second press member is inclined from the bonding portion between the inclined portion and the flat portion toward a direction opposite to a paper feed direction of the paper.

[0023] In the aforementioned paper feed cassette according to the first aspect, an engaging portion engaging with the flat portion of the second press member is preferably integrally provided on the lower surface of the lid member. According to this structure, the second press member can be mounted on the lid member by engaging the flat portion of the second press member with the engaging portion of the lid member without increasing the number of the component.

[0024] In the aforementioned paper feed cassette according to the first aspect, the press portion of the second press member is preferably arranged substantially on a line of action of pressing force in pressing the paper with the first press member in plan view. According to this structure, the first press member can press the paper in the width direction and the second press member can press the upper surface of the paper along the line of action of the pressing force of the first press member in pressing the paper. Therefore, curvature (warpage) in the width direction of the paper can be reliably suppressed. Thus, the paper can be reliably inhibited from being carried in the oblique direction due to the warpage in the width direction of the paper.

[0025] A paper feed cassette according to a second aspect of the present invention comprises a cassette body mounted on an image generating apparatus including a paper feed roller and storing a paper, a lid member arranged on an upper portion of the cassette body, a first press member provided on at least a first side surface inside the cassette body and pressing a side surface of the paper when the paper is stored, and further comprises a second press member provided independently of the lid member, mounted on a lower surface of the lid member, and pressing the vicinity of the center in a width direction of an upper surface of the paper stored in the cassette body, wherein the second press member integrally includes a flat portion mounted on the lower surface of the lid member, an inclined portion integrally bonded with the flat portion on a region other than an end in a lower surface of the flat portion, extending in an oblique direction toward an inner bottom surface of the cassette body, and having at least an elastically deformable bonding portion between the inclined portion and the flat portion, and a press portion provided on a forward end of the inclined portion, the press portion is brought into contact with the inner bottom surface of the cassette body when the lid member is arranged on the upper portion of the cassette body, the press portion is so formed as to have a substantially L-shaped section and linearly press the paper with a corner of the L-shape, the flat portion of the second press member is mounted on the lower surface of the lid member with an adhesive layer, and the inclined portion is bonded at the substantial center of the flat portion.

[0026] The paper feed cassette according to the second aspect, as hereinabove described, the second press member integrally includes the inclined portion integrally bonded with the flat portion on the region other than the end in the lower surface of the flat portion mounted on the lower surface of the corner member, extending in an oblique direction toward an inner bottom surface of the cassette body, and having at least an elastically deformable bonding portion between the inclined portion and the flat portion, whereby in the case where bending moment occurs about the bonding portion between the inclined portion and the flat portion of the second press member as a central axis with reaction from the papers when the second press member presses the papers in a state of a large number of the papers, a region of the flat portion in which an angle formed by the inclined portion and the flat portion is an acute angle can generate reaction having a direction to counteract the aforementioned bending moment. Thus, also in the case of a large number of the papers, the flat portion can be inhibited from peeling and coming of f from the lower surface of the lid member. The second press member is so formed as to press the vicinity of the center in the width direction of the upper surface of the paper stored in the cassette body, whereby the second press member can press the center in the width direction of the upper surface of the paper, and hence curvature (warpage) in the width direction of the paper can be effectively suppressed. Thus, the paper can be inhibited from being carried in the oblique direction due to the warpage in the width direction of the paper. In addition, the second press member integrally includes the flat portion mounted on the lower surface of the lid member, the inclined portion integrally bonded with the flat portion on the region other than the end in the lower surface of the flat portion, and the press portion provided on the forward end of the inclined portion, and the press portion is so formed as to come into contact with the inner bottom surface of the cassette body when the lid member is located on the upper portion of the cassette body. Thus, no push up mechanism for bringing the upper surface of the paper into contact with the press portion may be provided below the paper, whereby the number of components can be inhibited from increase.

[0027] In the aforementioned paper feed cassette according to the second aspect, the bonding portion between the inclined portion and the flat portion of the second press member is preferably so formed as to have a thickness larger than those of the inclined portion and the flat portion. According to this structure, the mechanical strength of the bonding portion is improved, whereby the bonding portion can be inhibited from breaking also in the case where stress

is applied to the bonding portion due to the deformation of the inclined portion when the press portion of the second press member presses the paper.

[0028] In the aforementioned paper feed cassette according to the second aspect, the second press member may be mounted on the lower surface of the lid member such that the inclined portion of the second press member is inclined from the bonding portion between the inclined portion and the flat portion toward a direction opposite to a paper feed direction of the paper.

[0029] In the aforementioned paper feed cassette according to the second aspect, an engaging portion engaging with the flat portion of the second press member is preferably integrally provided on the lower surface of the lid member. According to this structure, the second press member can be mounted on the lid member by engaging the flat portion of the second press member with the engaging portion of the lid member without increasing the number of the component.

[0030] In the aforementioned paper feed cassette according to the second aspect, the press portion of the second press member is preferably so formed as to be arranged substantially on a line of action of pressing force in pressing the paper with the first press member in plan view. According to this structure, the first press member can press the paper in the width direction and the second press member can press the upper surface of the paper along the line of action of the pressing force of the first press member in pressing the paper. Therefore, curvature (warpage) in the width direction of the paper can be reliably suppressed. Thus, the paper can be reliably inhibited from being carried in the oblique direction due to the warpage in the width direction of the paper.

[0031] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. **1** is a perspective view showing an overall structure of a paper feed cassette according to a first embodiment of the present invention;

[0033] FIG. **2** is a perspective view showing an overall structure of a dye sublimation printer mounted with the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1**;

[0034] FIGS. **3** and **4** are perspective views showing an internal structure of the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1** and the dye sublimation printer;

[0035] FIG. **5** is a sectional view of the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1** and the dye sublimation printer;

[0036] FIG. **6** is a plan view of a cassette body of the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1**;

[0037] FIG. **7** is an exploded perspective view of the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1**;

[0038] FIG. **8** is a perspective view showing a structure of a second press member according to the first embodiment of the present invention shown in FIG. **1**;

[0039] FIG. **9** is a sectional view showing a structure of the second press member according to the first embodiment of the present invention shown in FIG. **1**;

[0040] FIG. **10** is a plan view showing a mounting position of the second press member according to the first embodiment of the present invention shown in FIG. **1** on the paper feed cassette;

[0041] FIG. **11** is a sectional view showing the pressed second press member according to the first embodiment of the present invention shown in FIG. **1**;

[0042] FIG. **12** is a sectional view for illustrating a paper feed operation of the paper feed cassette according to the first embodiment of the present invention shown in FIG. **1** and the dye sublimation printer;

[0043] FIG. **13** is a sectional view showing a mounting structure of the second press member according to a modification of the first embodiment of the present invention on the paper feed cassette;

[0044] FIG. **14** is a perspective view showing a method of mounting the second press member on the paper feed cassette according to a modification of the first embodiment of the present invention;

[0045] FIG. **15** is a perspective view showing the second press member according to the modification of the first embodiment of the present invention, which is mounted on the paper feed cassette;

[0046] FIG. **16** is a perspective view showing a structure of a second press member according to a second embodiment of the present invention;

[0047] FIG. **17** is a plan view showing a structure of a second press member according to the second embodiment of the present invention;

[0048] FIG. **18** is a sectional view showing a structure of a second press member according to the second embodiment of the present invention;

[0049] FIG. **19** is a plan view showing a mounting position of the second press member according to the second embodiment of the present invention on the paper feed cassette;

[0050] FIG. **20** is a sectional view showing the pressed second press member according to the second embodiment of the present invention;

[0051] FIG. **21** is a perspective view showing a structure of the second press member according to a modification of the second embodiment of the present invention;

[0052] FIG. **22** is a plan view showing a structure of the second press member according to the modification of the second embodiment of the present invention;

[0053] FIG. **23** is a perspective view showing a structure of a second press member according to a third embodiment of the present invention;

[0054] FIG. **24** is a plan view showing a structure of a second press member according to the third embodiment of the present invention;

[0055] FIG. **25** is a sectional view showing a structure of a second press member according to the third embodiment of the present invention;

[0056] FIG. **26** is a plan view showing a mounting position of the second press member according to the third embodiment of the present invention to the paper feed cassette;

[0057] FIG. **27** is a sectional view showing the pressed second press member according to the third embodiment of the present invention;

[0058] FIG. **28** is a perspective view showing a structure of a second press member according to a modification of the third embodiment of the present invention; and

[0059] FIG. **29** is a plan view showing a structure of the second press member according to the modification of the third embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0060] Embodiments of the present invention will be hereinafter described with reference to the drawings.

First Embodiment

[0061] With reference to FIGS. **1** to **10**, a structure of a paper feed cassette according to a first embodiment of the present invention will be now described. According to the embodiment, the present invention is applied to the paper feed cassette of a dye sublimation printer which is an exemplary image generating apparatus.

[0062] A paper feed cassette **10** according to the first embodiment of the present invention is so formed as to be detachably mounted on a dye sublimation printer **20** as shown in FIG. **2**.

[0063] The paper feed cassette **10** comprises a cassette body **11** made of resin, a lift member **12** made of resin and a lid member **13** made of resin as shown in FIGS. **1** and **2**. The lid member **13** made of resin is provided for inhibiting dust or the like from adhering to papers **50** and slidably mounted on the cassette body **11** as shown in FIG. **2**. As shown in FIGS. **3** to **7**, the cassette body **11** has a pair of engaging portions **11***a* (see FIG. **5**) rotatably engaged with the lift member **12**, a pair of notches **11***b* for relieving an after-mentioned pair of paper separating walls **22***b*, a notch **11***c* for relieving after-mentioned push-up member **25**, a pair of mounting portions **11***d* elastically deformably engaged with a dye sublimation printer **20** in mounting the paper feed cassette **10**, three projecting portions **11***e* for aligning a position in a direction B (see FIG. **3**) of the papers **50** (see FIG. **2**), a first press member **11***f* for urging the papers **50** (see FIG. **2**) against the projecting portions **11***e*, guide portions **11***g* slidably guiding the lid member **13** with respect to the cassette body **11**, and three ribs **11***h* extending in a paper feed direction (along arrow A in FIG. **3**) for supporting the papers **50** (see FIG. **2**).

[0064] As shown in FIG. **6**, the pair of mounting portions **11***d* is integrally provided on the cassette body **11** of the paper feed cassette **10** so as to have outer protrusions protruding from outer side surfaces of the cassette body **11** of the paper feed cassette **10** respectively. Each mounting portions lid has a function of fixing the paper feed cassette **10** to the dye sublimation printer **20** by engaging with an after-mentioned mounting portion **22***c* of the dye sublimation printer **20** when the paper feed cassette **10** is mounted on the dye sublimation printer **20**. Each of the three ribs **11***h* has a function as a guide for carrying the papers **50** (see FIG. **2**) in paper feeding and is so formed as to extend from a rear end of the cassette body **11** to the vicinity of a pair of engaging portions **11***a* of the cassette body **11**.

[0065] According to the first embodiment, receiving holes **11***i* receiving the engaging portions **12***a* of the lift member **12** respectively and plate springs **11***j* integrally provided in the cassette body **11** so as to adjacent to the receiving holes **11***i* respectively are provided on a bottom portion of the cassette body **11** as shown in FIG. **1** and FIGS. **3** to **7**. The lift member **12** is so formed as to engage with the engaging portions **11***a* of the cassette body **11** through the receiving holes **11***i* by utilizing deflection of the plate springs **11***j*. The lift member **12** has the pair of engaging portions **12***a* engaging with the pair of engaging portions **11***a* of the cassette body **11** and the pair of notches **12***b* for relieving the pair of paper separating walls **22***b* when the paper feed cassette **10** is mounted on the dye sublimation printer **20**, as shown in FIG. **1** and FIGS. **3** to **7**.

[0066] As shown in FIGS. **1** and **7**, the lid member **13** has mount engaging portions **13***a* engaging with the mounting portions lid of the cassette body **11** when the lid member **13** is mounted on the cassette body **11**. When the paper feed cassette **10** is not mounted on the dye sublimation printer **20**, the mount engaging portions **13***a* of the lid member **13** engage with the mounting portions lid of the cassette body **11**. On the other hand, when the paper feed cassette **10** is mounted on the dye sublimation printer **20**, a user detaches the mount engaging portions **13***a* of the lid member **13** from the mounting portions lid of the cassette body **11** respectively as shown in FIG. **4**. Then the paper feed cassette **10** is mounted on the dye sublimation printer **20** in a state of sliding the lid member **13** in a direction opposite to the paper feed direction (direction A) with respect to the cassette body **11** along the guide portions **11***g* of the cassette body **11**. Thus, the paper feed cassette **10** is formed such that the lid member **13** has no influence on the paper feed operation.

[0067] According to the first embodiment, a second press member **60** made of resin pressing an upper surface of the papers **50** against a lower surface **13***b* of the lid member **13** is provided independently of the lid member **13** as shown in FIG. **7**. The second press member **60** integrally includes a flat portion **60***a*, an elastically deformable inclined portion **60***b* and a press portion **60***c* as shown in FIG. **8**. The inclined portion **60***b* is integrally bonded with the flat portion **60***a* at the substantially center of a lower surface of the flat portion **60***a* and extends in a direction oblique to an inner bottom surface **11***k* (see FIG. **7**) of the cassette body **11** (see FIG. **7**), while the press portion **60***c* is provided on a forward end of the inclined portion **60***b*.

[0068] According to the first embodiment, in the second press member **60**, the inclined portion **60***b* of the second press member is so mounted on the lower surface of the lid member **13** as to be inclined from a bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* to a direction opposite to the paper feed direction (along arrow A in FIG. **9**) of the papers **50**, as shown in FIG. **9**.

[0069] The flat portion **60***a* includes a first region **60***e* in which the inclined portion **60***b* and the flat portion **60***a* form an obtuse angle and a second region **60***f* in which the inclined portion **60***b* and the flat portion **60***a* form an acute angle, between which the bonding portion **60***d* is a boundary.

[0070] According to the first embodiment, the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* of the second press member **60** have a thickness larger than the inclined portion **60***b* and the flat portion **60***a*, as shown in FIGS. **8** and **9**.

[0071] As shown in FIG. **9**, when the lid member **13** is mounted on the cassette body **11**, the press portion **60***c* of the second press member **60** comes close to the ribs **11***h* on the inner bottom surface **11***k* of the cassette body **11**.

[0072] According to the first embodiment, the press portion **60***c* of the second press member **60** has an L-shaped

section as shown in FIG. **9**. The second press member **60** is mounted on the lower surface **13***b* of the lid member **13** with an adhesive tape **14** (two-sided tape). The adhesive tape **14** is an example of the "adhesive layer" in the present invention.

[0073] According to the first embodiment, the press portion **60***c* of the second press member **60** is arranged on a line of action **100** (alternate long and short dash line) of pressing force in pressing the papers **50** with the first press member **11***f*, at the substantial center in a width direction of the papers **50** (see FIG. **2**) of the cassette body **11** in plan view, as shown in FIG. **10**.

[0074] The dye sublimation printer **20** has a chassis **21** made of metal, a paper feed cassette mounting portion **22**, a paper feed roller **23** made of rubber for carrying the papers **50** (see FIG. **2**) inside the dye sublimation printer **20**, a paper feed roller gear **24**, the push-up member **25** pushing up the lift member **12** with the papers **50** (see FIG. **2**) stacked thereon and pressing the papers **50** (see FIG. **2**) against the paper feed roller **23**, a sensor portion **26** sensing that the paper feed cassette **10** is mounted on the dye sublimation printer **20**, a stepping motor **27** for driving the paper feed roller **23** and the like, a print head **28** for printing an image on the papers **50** (see FIG. **2**), a stepping motor **29** for driving a print head press member (not shown) and the push-up member **25** pressing the print head **28**, a motor bracket **30** for mounting the stepping motor **27** and the stepping motor **29**, a take-up reel **31** for taking up an ink sheet (not shown), a swingable swing gear **32**, a plurality of intermediate gears **33** for transmitting driving force of the stepping motor **27** to the paper feed roller gear **24**, discharge rollers **34** made of rubber and a discharge roller gear **35**, as shown in FIGS. **3** and **4**.

[0075] The dye sublimation printer **20** is detachably mounted with an ink sheet cartridge **90** storing the ink sheet (not shown) as shown in FIGS. **3** and **4**.

[0076] The chassis **21** has a first side surface **21***a* on which the motor bracket **30** is mounted, a second side surface **21***b* and a bottom surface **21***c* connecting the first and second side surfaces **21***a* and **21***b* with each other, as shown in FIGS. **3** and **4**. The second side surface **21***b* of the chassis **21** is provided with an ink sheet cartridge receiving hole **21***d* for mounting the ink sheet cartridge **90** storing the ink sheet (not shown).

[0077] As shown in FIG. **3**, the paper feed cassette mounting portion **22** has a pair of guide portions **22***a* for mounting the paper feed cassette **10** on the dye sublimation printer **20**, a pair of paper separating walls **22***b* for preventing double feeding of the papers **50** (see FIG. **2**), and a pair of the mounting portions **22***c* engaging with the pair of mounting portions **11***d* of the cassette body **11** when the paper feed cassette **10** is mounted on the dye sublimation printer **20**. When the paper feed cassette **10** is mounted on the dye sublimation printer **20** as shown in FIG. **2**, the pair of paper separating walls **22***b* are located in the pair of notches **11***b* of the cassette body **11** and a pair of the notches **12***b* of the lift member **12** as shown in FIG. **4**. As shown in FIGS. **4** and **5**, when the paper feed cassette **10** is mounted on the dye sublimation printer **20**, the paper feed roller **23** is located above the lift member **12** and the push-up member **25** is located below the lift member **12**. The paper feed roller **23** has a function of carrying the papers **50** (see FIG. **2**) pushed up by the push-up member **25** inside the dye sublimation printer **20** by rotation. The paper feed roller gear **24** is mounted on a first end of the paper feed roller **23**, and the paper feed roller **23** is rotated following the rotation of the paper feed roller gear **24**.

[0078] As shown in FIG. **3**, the sensor portion **26** is located in the vicinity of the first end of the paper feed cassette mounting portion **22**. The sensor portion **26** has a protrusion **26***a*. When the paper feed cassette **10** is mounted on the paper feed cassette mounting portion **22** of the dye sublimation printer **20**, the protrusion **26***a* is pushed in with the paper feed cassette **10** as shown in FIG. **4** and therefore the sensor portion **26** senses that the paper feed cassette **10** has been mounted. A housing **36** includes lid members **36***a* and **36**, and push-button switches **36***c* as shown in FIG. **2**. The lid member **36***a* of the housing **36** is provided for mounting the paper feed cassette **10** on the dye sublimation printer **20**. The lid member **36***b* of the housing **36** is provided for mounting the ink sheet cartridge **90** on the dye sublimation printer. The push-button switches **36***c* of the housing **36** is provided as operation buttons used when the user starts printing.

[0079] With reference to FIGS. **9** and **11**, a description will be now made of a pressing state of the second press member **60** of the paper feed cassette **10** according to the first embodiment with respect to the papers **50**.

[0080] As shown in FIG. **9**, in the case of a small number of the papers **50**, the first press member **11***f* (see FIG. **6**) of the cassette body **11** (see FIG. **6**) presses a side surface of the papers **50**, while the press portion **60***c* of the second press member **60** presses the upper surface of the papers **50** with prescribed pressing force. As shown in FIG. **11**, in the case of a large number of the papers **50** in the second press member **60**, in the second press member **60**, the press portion **60***c* presses the upper surface of the papers **50** with the prescribed pressing force while the inclined portion **60***b* and the bonding portion **60***d* are elastically deformed.

[0081] According to the first embodiment, as shown in FIG. **11**, in the case where bending moment M occurs about the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* of the second press member **60** as a central axis with reaction F from the papers **50** when the second press member **60** presses the papers **50** in a state of a large number of the papers **50**, the second region **60***f* of the flat portion **60***a* in which an angle formed by the inclined portion **60***b* and the flat portion **60***a* is an acute angle can generate reaction F having a direction to counteract the aforementioned bending moment M. Thus, the deforming degree of the inclined portion **60***b* becomes small in the vicinity of the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a*, while the papers **50** are pressed deforming (downwardly curving) the inclined portion **60***b* in a region far from the bonding portion **60***d* and close to the press portion **60***c* in the inclined portion **60***b*.

[0082] With reference to FIGS. **3** to **5** and FIG. **12**, a description will be now made of a paper feed operation of the paper feed cassette according to the first embodiment of the present invention and the dye sublimation printer.

[0083] As shown in FIG. **4**, the paper feed cassette **10** is mounted on the dye sublimation printer **20** from a state shown in FIG. **3**. In the paper feed cassette **10**, the papers **50** are stacked on an upper surface of the lift member **12** as shown in FIG. **5**. In the case where the paper feed cassette **10** is mounted on the dye sublimation printer **20**, the paper feed roller **23** is located above the lift member **12** on which the papers **50** are stacked as shown in FIG. **5**. The push-up

member **25** is located below the lift member **12** (position corresponding to the notch **11***c* of the cassette body **11**). In this state, the stepping motor **29** (see FIG. **4**) drives. The driving force of the stepping motor **29** rotates the push-up member **25** through a driving force transfer mechanism (not shown) in a direction E (upward) as shown in FIG. **12**. The push-up member **25** is located below the lift member **12** in mounting the paper feed cassette **10**, whereby the push-up member **25** rotates in the direction E (upward), thereby rotating the lift member **12** about the engaging portions **12***a* in a direction F shown in FIG. **13**. Thus, the papers **50** stacked on the lift member **12** are pushed up to come into contact with the paper feed roller **23**.

[0084] At this time, the stepping motor **27** (see FIG. **4**) also drives and the driving force of the stepping motor **27** rotates the paper feed roller gear **24** through the plurality of intermediate gears **33** in a direction G in FIG. **4**. Thus, the paper feed roller **23** is rotated in the direction G as shown in FIG. **12**.

[0085] The aforementioned pushed up papers **50** are pressed by the paper feed roller **23** rotating in the direction G as shown in FIG. **12**. The papers **50** are carried inside the dye sublimation printer **20** with frictional force between the paper feed roller **23** and the papers **50**.

[0086] According to the first embodiment, also during the papers **50** are carried (fed) inside the dye sublimation printer **20**, the second press member **60** (see FIG. **1**) always presses the upper surface of the papers **50**, thereby performing the paper feed operation with no curvature (warpage) in the width direction of the papers **50** without any difficulty.

[0087] According to the first embodiment, as hereinabove described, the second press member **60** is integrally bonded with the flat portion **60***a* on a region other than an end in the lower surface of the flat portion **60***a* mounted on the lower surface **13***b* of the lid member **13** and extends in an oblique direction toward the inner bottom surface **11***k* of the cassette body **11**, and at least the bonding portion **60***d* between the flat portion **60***a* and the inclined portion **60***b* integrally includes the elastically deformable inclined portion **60***b*, whereby the second region **60***f* of the flat portion **60***a* in which the angle formed by the inclined portion **60***b* and the flat portion **60***a* is an acute angle can generate reaction F having a direction to counteract the aforementioned bending moment M, in the case where bending moment M occurs about the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* of the second press member **60** as a central axis with reaction from the papers **50** when the second press member **60** presses the papers **50** in a state of a large number of the papers **50**. Thus, also in the state of a large number of the papers **50**, the flat portion **60***a* can be inhibited from peeling and coming off from the lower surface **13***b* of the lid member **13**. The second press member is formed to press the vicinity of the center in the width direction of the upper surface of the papers stored in the cassette body, so that the second press member can press the center in the width direction of the upper surface of the papers, whereby curvature (warpage) in the width direction of the papers can be effectively suppressed. Thus, the papers can be inhibited from being carried in the oblique direction due to the warpage in the width direction of the papers. In addition, the second press member **60** integrally includes the flat portion **60***a* mounted on the lower surface **13***b* of the lid member **13**, the inclined portion **60***b* integrally bonded with the flat portion **60***a* on the region other than the end in the lower surface of the flat portion **60***a*, and the press portion **60***c* provided on the forward end of the inclined portion **60***b*, and the press portion **60***c* is so formed as to come into contact with the inner bottom surface **11***k* of the cassette body **11** when the lid member **13** is located on an upper portion of the cassette body **11**. Thus, no push up mechanism for bringing the upper surface of the papers **50** into contact with the press portion **60***c* may be provided below the papers **50**, whereby the number of components can be inhibited from increase.

[0088] According to the first embodiment, the press portion **60***c* has a substantially L-shaped section, and is so formed as to linearly press the papers with an L-shaped corner, whereby the contact area between the papers **50** and the press portion **60***c* can be reduced, thereby allowing reduce in frictional resistance between the papers **50** and the press portion **60***c*. Thus, it is possible to suppress a paper feed error caused by the frictional resistance between the papers **50** and the press portion **60***c* in paper feeding, thereby allowing smooth paper feeding.

[0089] According to the first embodiment, the flat portion **60***a* of the second press member **60** is mounted on the lower surface **13***b* of the lid member **13** with the adhesive tape **14** (two-sided tape), whereby the second press member **60** can be easily mounted on the lid member **13**.

[0090] According to the first embodiment, the inclined portion **60***b* is bonded to the substantial center of the flat portion **60***a*, whereby it is possible to increase an area of the region generating the reaction F having the direction counteract the bending moment M in pressing the papers **50** with the second press member **60**. Thus, the flat portion **60***a* can be reliably inhibited from peeling and coming off from the lower surface **13***b* of the lid member **13**.

[0091] According to the first embodiment, the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* of the second press member **60** is so formed as to become larger than the thicknesses of the inclined portion **60***b* and the flat portion **60***a*, whereby the mechanical strength of the bonding portion **60***d* is improved. Thus, the bonding portion can be inhibited from breaking also in the case where stress is applied to the bonding portion **60***d* due to the deformation of the inclined portion **60***b* when the press portion **60***c* of the second press member **60** presses the papers **50**.

[0092] According to the first embodiment, the second press member **60** may be formed such that the inclined portion **60***b* is so mounted on the lower surface of the lid member **13** as to be inclined from the bonding portion **60***d* between the inclined portion **60***b* and the flat portion **60***a* to the direction opposite to the paper feed direction of the papers **50**.

[0093] According to the first embodiment, the press portion **60***c* of the second press member **60** is so formed as to be arranged substantially on the line of action **100** of the pressing force in pressing the papers **50** with the first press member **11***f* in plan view, whereby the first press member **11***f* can press the papers **50** in the width direction and the second press member **60** can press the upper surface of the papers **50** along the line of action **100** of the pressing force of the first press member **11***f* in pressing the papers **50**. Therefore, curvature (warpage) in the width direction of the papers **50** can be reliably suppressed. Thus, the papers **50** can be reliably inhibited from being carried in the oblique direction due to the warpage in the width direction of the papers **50**.

[0094] According to a modification of the first embodiment, a structure in which a second press member **60** is mounted on a lower surface **13***b* of a lid member **13** is provided as shown in FIGS. **13** to **15**.

[0095] According to the modification of the first embodiment, a lid member **13** is integrally provided with a first engaging portion **13***c*, a second engaging portion **13***d* and a coupling portion **13***e* so as to protrude from the lower surface **13***b* of the lid member **13** as shown in FIG. **13**. The first engaging portion **13***c* and the second engaging portion **13***d* are coupled with each other through the coupling portion **13***e* as shown in FIG. **14**.

[0096] A rib **13***f* is provided in the vicinity of a first engaging portion **13***c* and a second engaging portion **13***d*. According to the modification of the first embodiment, a first region **60***e* and a second region **60***f* of a flat portion **60***a* of the second press member **60** are fitted into a clearance between the first engaging portion **13***c* and the lower surface **13***b* of the lid member **13** and a clearance between the second engaging portion **13***d* and the lower surface **13***b* of the lid member **13** respectively by sliding the flat portion **60***a* of the second press member **60** along arrow C while bringing the flat portion **60***a* into contact with the rib **13***f* as shown in FIG. **14**, whereby the second press member **60** is mounted on the lower surface **13***b* of the lid member **13**. At this time, the first region **60***e* of the flat portion **60***a* of the second press member **60** is brought into contact with an inner surface **13***g* of the first engaging portion **13***c* of the lid member **13**. The region second **60***f* of the flat portion **60***a* of the second press member **60** is brought into contact with a lower surface **13***h* of the second engaging portion **13***d* of the lid member **13**. An upper surface of the flat portion **60***a* of the second press member **60** is brought into contact with the lower surface **13***b* of the lid member **13**. Thus, the flat portion **60***a* of the second press member **60** is fixed on the lower surface **13***b* of the lid member **13**. The rib **13***f* has a function of inhibiting the second press member **60** from falling off from the lid member **13** in the case of sliding in a falling off direction (direction opposite to a direction C).

[0097] According to the modification of the first embodiment, as hereinabove described, an engaging portion constituted by the first engaging portion **13***c*, the second engaging portion **13***d* and the coupling portion **13***e* engaged with the flat portion **60***a* of the second press member **60** is integrally provided on the lower surface of the lid member **13**, whereby the second press member **60** can be mounted on the lid member **13** by engaging the flat portion **60***a* of the second press member **60** with the engaging portion of the lid member **13** without increasing the number of the component. The remaining effects of this modification are similar to those of the first embodiment.

Second Embodiment

[0098] A second press member **70** according to a second embodiment has a different structure from that of the first embodiment with reference to FIGS. **16** to **19**. Structures other than the second press member **70** according to the second embodiment are similar to those according to the aforementioned first embodiment, and hence the description thereof will not be repeated.

[0099] According to the second embodiment, a second press member **70** made of resin pressing an upper surface of papers **50** is provided on a lower surface **13***b* of a lid member **13** independently of the lid member **13** as shown in FIG. **18**. As shown in FIG. **16**, a flat portion **70***a* of the second press member **70** includes a first flat portion **71***a* on the right and a second flat portion **71***b* on the left, between which a bonding line of the flat potion **70***a* and the inclined portion **70***b* is a boundary line. The second flat portion **71***b* is provided with a U-shaped cutout portion **70***e* in a prescribed region of a bonding portion **70***d* between the first flat portion **71***a* and the inclined portion **70***b*, and is formed by folding back an inner region of the U-shaped cutout portion **70***e* of the first flat portion **71***a* by 180 degrees along the bonding line of the bonding portion **70***d*. As shown in FIG. **18**, a press portion **70***c* of the second press member **70** is so formed as to come close to ribs **11***h* of an inner bottom surface **11***k* of the cassette body **11** when the lid member **13** is mounted on a cassette body **11**. According to the second embodiment, the press portion **70***c* of the second press member **70** has an L-shaped section, and the second press member **70** is mounted on the lower surface **13***b* of the lid member **13** through an adhesive tape **14** as shown in FIG. **18**. As shown in FIG. **19**, the press portion **70***c* of the second press member **70** is provided at the center in a width direction of the papers **50** (see FIG. **2**) of the cassette body **11** on a line of action **100** (alternate long and short dash line) pressing the papers **50** from a side surface with a first press member **11***f* of the cassette body **11**.

[0100] With reference to FIGS. **18** to **20**, a description will be now made of a pressing state of the second press member **70** of the paper feed cassette **10** according to the second embodiment with respect to the papers **50**.

[0101] As shown in FIG. **18**, in the case of a small number of the papers **50**, the first press member **11***f* (see FIG. **19**) of the cassette body **11** (see FIG. **19**) presses a side surface of the papers **50**, while the press portion **70***c* of the second press member **70** presses the upper surface of the papers **50** with prescribed pressing force. As shown in FIG. **20**, in the case of a large number of the papers **50** in the second press member **70**, in the second press member **70**, the press portion **70***c* presses the upper surface of the papers **50** with the prescribed pressing force while the inclined portion **70***b* and the bonding portion **70***d* are elastically deformed.

[0102] According to the second embodiment, as shown in FIG. **20**, in the case where bending moment M occurs about the bonding portion **70***d* between the inclined portion **70***b* and the flat portion **70***a* of the second press member **70** as a central axis with reaction from the papers **50** when the second press member **70** presses the papers **50** in a state of a large number of the papers **50**, the second flat portion **71***b* in which an angle formed by the inclined portion **70***b* and the flat portion **70***a* is an acute angle can generate reaction F having a direction to counteract the aforementioned bending moment M. Thus, the deforming degree of the inclined portion **70***b* is reduced in the vicinity of the bonding portion **70***d* between the inclined portion **70***b* and the flat portion **70***a*, while the papers **50** are pressed deforming (downwardly curving) the inclined portion **70***b* in a region far from the bonding portion **70***d* and close to the press portion **70***c* in the inclined portion **70***b*.

[0103] A paper feed operation of the paper feed cassette according to the second embodiment and the dye sublimation printer is similar to that according to the aforementioned first embodiment, and hence the description thereof will not be repeated.

[0104] According to the second embodiment, as hereinabove described, the flat portion **70***a* of the second press

member **70** includes the first flat portion **71***a* on the right and the second flat portion **71***b* on the left, between which the bonding line of the flat potion **70***a* and the inclined portion **70***b* is the boundary line, and the second flat portion **71***b* is formed by providing the U-shaped cutout portion **70***e* in the prescribed region of the bonding portion **70***d* between the first flat portion **71***a* and the inclined portion **70***b* and folding back an inner region of the U-shaped cutout portion **70***e* of the first flat portion **71***a* by 180 degrees along the bonding line of the bonding portion **70***d*. Thus, it is possible to easily obtain a structure in which the inclined portion **70***b* is integrally bonded on a region other than an end in a lower surface of the flat portion **70***a*.

[0105] According to a modification of the second embodiment, a flat portion **75***a* of a second press member **75** pressing papers **50** in a paper feed cassette **10** includes a first flat portion **76***a* on the right and a second flat portion **76***b* on the left, between which a bonding line of the flat potion **75***a* and the inclined portion **75***b* is a boundary line, as shown in FIGS. **21** and **22**. The second flat portion **76***b* is formed by providing a U-shaped cutout portion **75***e* in a prescribed region of a bonding portion **75***d* between the first flat portion **76***a* and the inclined portion **75***b* and folding back an inner region of the U-shaped cutout portion **75***e* of the first flat portion **76***a* by 180 degrees along the bonding line of the bonding portion **75***d*. The inclined portion **75***b* is inclined toward the first flat portion **76***a* dissimilarly to the inclined portion **70***b* of the second press member **70** according to the second embodiment. Also in this structure, effects similar to the effects in the second embodiment can be obtained.

Third Embodiment

[0106] With reference to FIGS. **23** to **26**, according to a third embodiment, an inclined portion **80***b* of the second press member **80** is supported by a support portion **80***f* dissimilarly to the aforementioned first and second embodiments. Structures other than the second press member **80** according to the third embodiment are similar to those according to the aforementioned first embodiment, and hence the description thereof will not be repeated.

[0107] In a paper feed cassette **10** according to the third embodiment, a second press member **80** made of resin pressing an upper surface of papers **50** is provided on a lower surface **13***b* of a lid member **13** independently of the lid member **13** as shown in FIG. **25**. The second press member **80** includes the support portion **80***f* integrally bonded with a first flat portion **81***a* on an end on a lower surface of the first flat portion **81***a*, extending a direction oblique to the inclined portion **80***b* and bonding with the inclined portion **80***b*. The support portion **80***f* supports an inclined portion **80***c* by engaging a pair of engaging portions **80***h* provided on ends of the support portion **80***f* with a pair of notches **80***g* provided in the inclined portion **80***b*

[0108] As shown in FIG. **25**, a press portion **80***c* of the second press member **80** is so formed as to come close to ribs **11***h* on an inner bottom surface **11***k* of the cassette body **11** when the lid member **13** is mounted on a cassette body **11**.

[0109] According to the third embodiment, the press portion **80***c* of the second press member **80** has an L-shaped section and the second press member **80** is mounted on the lower surface **13***b* of the lid member **13** with an adhesive tape **14** as shown in FIG. **25**. As shown in FIG. **26**, the press portion **80***c* of the second press member **80** is provided at the center in a width direction of the papers **50** (see FIG. **2**) of the cassette body **11** on a line of action **100** (alternate long and short dash line) pressing the papers **50** from a side surface with a first press member **11***f* of the cassette body **11**.

[0110] With reference to FIGS. **25** and **27**, a description will be now made of a pressing state of the second press member **80** of the paper feed cassette **10** according to the third embodiment with respect to the papers **50**.

[0111] As shown in FIG. **25**, in the case of a small number of the papers **50**, the press portion **80***c* of the second press member **80** presses the upper surface of the papers **50** with prescribed pressing force. As shown in FIG. **27**, in the case of a large number of the papers **50** in the second press member **80**, the press portion **80***c* presses the upper surface of the papers **50** with the prescribed pressing force while the inclined portion **80***b* and a bonding portion **80***d* are elastically deformed.

[0112] According to the third embodiment, as shown in FIG. **27**, in the case where bending moment M occurs about the bonding portion **80***d* between the inclined portion **80***b* and the flat portion **80***a* of the second press member **80** as a central axis with reaction from the papers **50** when the second press member **80** presses the papers **50** in a state of a large number of the papers **50**, the second flat portion **81***b* in which an angle formed by the inclined portion **80***b* and the flat portion **80***a* is an acute angle can generate reaction F having a direction to counteract the aforementioned bending moment M. Thus, the deforming degree of the inclined portion **80***b* is reduced in the vicinity of the bonding portion **80***d* between the inclined portion **80***b* and the flat portion **80***a*, while the papers **50** are pressed deforming (downwardly curving) the inclined portion **80***b* in a region far from the bonding portion **80***d* and close to the press portion **80***c* in the inclined portion **80***b*.

[0113] A paper feed operation of the paper feed cassette according to the third embodiment and the dye sublimation printer is similar to that according to the aforementioned first embodiment, and hence the description thereof will not be repeated.

[0114] According to the third embodiment, as hereinabove described, the second press member **80** includes the support portion **80***f* integrally bonded with the first flat portion **81***a* on the end of the first flat portion **81***a*, extending the oblique direction toward the inclined portion **80***b* and supporting the inclined portion **80***b*, so that the inclined portion **80***b* of the second press member **80** is supported by the support portion **80***f*, thereby improving rigidity of the inclined portion **80***b*. Thus, in the case where the second press member **80** presses the papers **50** especially in a state of a large number of the papers **50**, displacement (deforming degree) of the inclined portion **80***b* in the bonding portion **80***d* between the inclined portion **80***b* and the first flat portion **81***a* can be reduced, whereby a basic form of the inclined portion **80***b* can be easily held.

[0115] According to a modification of the third embodiment, a second press member **85** pressing the papers **50** in the paper feed cassette **10** is provided with a support portion **85***f* integrally bonded with a first flat portion **86***a* on an end on a lower surface of the first flat portion **86***a*, extending an oblique direction toward the inclined portion **85***b* and bonding with the inclined portion **85***b*. The support portion **85***f* is bonded with an inclined portion **85***b* by engaging a pair of engaging portions **85***h* provided on ends of the support portion **85***f* with a pair of notches **85***g* provided in the

inclined portion **85***b*. While the inclined portion **85***b* is inclined toward the first flat portion **86***a* dissimilarly to the inclined direction of the inclined portion **80***b* of the second press member **80** according to the third embodiment, effects similar to those in the third embodiment can be obtained.

[0116] Although the present invention has been described and illustrated in detail, it is clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of the present invention being limited only by the terms of the appended claims.

[0117] For example, while the aforementioned embodiments are applied to the paper feed cassette of the dye sublimation printer employed as an exemplary image generating apparatus, the present invention is not restricted to this but is also applicable to a paper feed cassette of an image generating apparatus other than the dye sublimation printer.

[0118] While the press portion **60***c* of the second press member **60** has the L-shaped section in the aforementioned first embodiment, the present invention is not restricted to this but may alternatively have a U-shaped section.

[0119] While the flat portion **60***a* of the second press member **60** is mounted on the lower surface **13***b* of the lid member **13** with the adhesive tape **14** (two-sided tape) in the aforementioned first embodiment, the present invention is not restricted to this but may be alternatively mounted on the lower surface **13***b* of the lid member **13** with an adhesive or the like.

[0120] While the inclined portion **60***b* is bonded at the substantial center of the flat portion **60***a* in the aforementioned first embodiment, the present invention is not restricted to this but the inclined portion **60***b* and the flat portion **60***a* may be alternatively bonded with each other at a dividing line dividing the flat portion **60***a* such that the area of the first region **60***e* in which the angle formed by the inclined portion **60***b* and the flat portion **60***a* between which the bonding portion **60***d* is a boundary is an obtuse angle is larger than that of the second region **60***f* in which the angle formed by the inclined portion **60***b* and the flat portion **60***a* is an acute angle.

[0121] While the second press member **60** made of resin is mounted on the lower surface **13***b* of the lid member **13** in the aforementioned first embodiment, the present invention is not restricted to this but a second press member **60** made of metal may be alternatively mounted on the lower surface **13***b* of the lid member **13**.

What is claimed is:

1. A paper feed cassette comprising:

a cassette body mounted on an image generating apparatus including a paper feed roller and storing a paper;

a first press member provided on at least a first side surface inside said cassette body and pressing a side surface of said paper when said paper is stored;

a lid member arranged on an upper portion of said cassette body; and

a second press member provided independently of said lid member, mounted on a lower surface of said lid member, and pressing the vicinity of the center in a width direction of an upper surface of said paper stored in said cassette body, wherein

said second press member integrally includes:

a flat portion mounted on said lower surface of said lid member,

an inclined portion integrally bonded with said flat portion on a region other than an end in a lower surface of said flat portion, extending in an oblique direction toward an inner bottom surface of said cassette body, and having at least an elastically deformable bonding portion between said inclined portion and said flat portion, and

a press portion provided on a forward end of said inclined portion, and

said press portion is brought into contact with said inner bottom surface of said cassette body when said lid member is arranged on said upper portion of said cassette body.

2. The paper feed cassette according to claim **1**, wherein said press portion is so formed as to have a substantially L-shaped section and linearly press said paper with a corner of said L-shape.

3. The paper feed cassette according to claim **1**, wherein said flat portion of said second press member is mounted on said lower surface of said lid member with an adhesive layer.

4. The paper feed cassette according to claim **1**, wherein said inclined portion is bonded at the substantial center of said flat portion.

5. The paper feed cassette according to claim **1**, wherein said flat portion of said second press member includes a first flat portion on the right and a second flat portion on the left, between which a bonding line between said flat portion and said inclined portion is a boundary line, and

said second flat portion is formed by providing a U-shaped cutout portion in a prescribed region of a bonding portion between said first flat portion and said inclined portion and folding back an inner region of said U-shaped cutout portion of said first flat portion along said bonding line of said bonding portion.

6. The paper feed cassette according to claim **8**, wherein said second press member includes a support portion integrally coupled with said first flat portion on an end of said first flat portion, extending in an oblique direction toward said inclined portion, and supporting said inclined portion.

7. The paper feed cassette according to claim **1**, wherein said bonding portion between said inclined portion and said flat portion of said second press member is so formed as to have a thickness larger than those of said inclined portion and said flat portion.

8. The paper feed cassette according to claim **1**, wherein said second press member is mounted on said lower surface of said lid member such that said inclined portion of said second press member is inclined from said bonding portion between said inclined portion and said flat portion toward a direction opposite to a paper feed direction of said paper.

9. The paper feed cassette according to claim **5**, wherein an engaging portion engaging with said flat portion of said second press member is integrally provided on said lower surface of said lid member.

10. The paper feed cassette according to claim **1**, wherein said press portion of said second press member is so formed as to be arranged substantially on a line of action of pressing force in pressing said paper with said first press member in plan view.

11. A paper feed cassette comprising:

a cassette body mounted on an image generating apparatus including a paper feed roller and storing a paper;

a lid member arranged on an upper portion of said cassette body;

a first press member provided on at least a first side surface inside said cassette body and pressing a side surface of said paper when said paper is stored; and

a second press member provided independently of said lid member, mounted on a lower surface of said lid member, and pressing the vicinity of the center in a width direction of an upper surface of said paper stored in said cassette body, wherein

said second press member integrally includes:

a flat portion mounted on said lower surface of said lid member,

an inclined portion integrally bonded with said flat portion on a region other than an end in a lower surface of said flat portion, extending in an oblique direction toward an inner bottom surface of said cassette body, and having at least an elastically deformable bonding portion between said inclined portion and said flat portion, and

a press portion provided on a forward end of said inclined portion,

said press portion is brought into contact with said inner bottom surface of said cassette body when said lid member is arranged on said upper portion of said cassette body,

said press portion is so formed as to have a substantially L-shaped section and linearly press said paper with a corner of said L-shape,

said flat portion of said second press member is mounted on said lower surface of said lid member with an adhesive layer, and

said inclined portion is bonded at the substantial center of said flat portion.

12. The paper feed cassette according to claim **11**, wherein

said bonding portion between said inclined portion and said flat portion of said second press member is so formed as to have a thickness larger than those of said inclined portion and said flat portion.

13. The paper feed cassette according to claim **11**, wherein

said second press member is mounted on said lower surface of said lid member such that said inclined portion of said second press member is inclined from said bonding portion between said inclined portion and said flat portion toward a direction opposite to a paper feed direction of said paper.

14. The paper feed cassette according to claim **11**, wherein

an engaging portion engaging with said flat portion of said second press member is integrally provided on said lower surface of said lid member.

15. The paper feed cassette according to claim **11**, wherein

said press portion of said second press member is so formed as to be arranged substantially on a line of action of pressing force in pressing said paper with said first press member in plan view.

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