(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 354 067 A1**

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

(43) Date of publication:
10.08.2011 Bulletin 2011/32

(21) Application number: **09830438.9**

(22) Date of filing: **03.12.2009**

(51) Int Cl.:
B65H 31/00 *(2006.01)*

(86) International application number:
PCT/JP2009/070292

(87) International publication number:
WO 2010/064672 (10.06.2010 Gazette 2010/23)

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

(30) Priority: **05.12.2008 JP 2008311378**

(71) Applicants:
- **Kokuyo Co., Ltd.**
  Osaka 537-8686 (JP)
- **Sekonic Corporation**
  Tokyo 1788686 (JP)

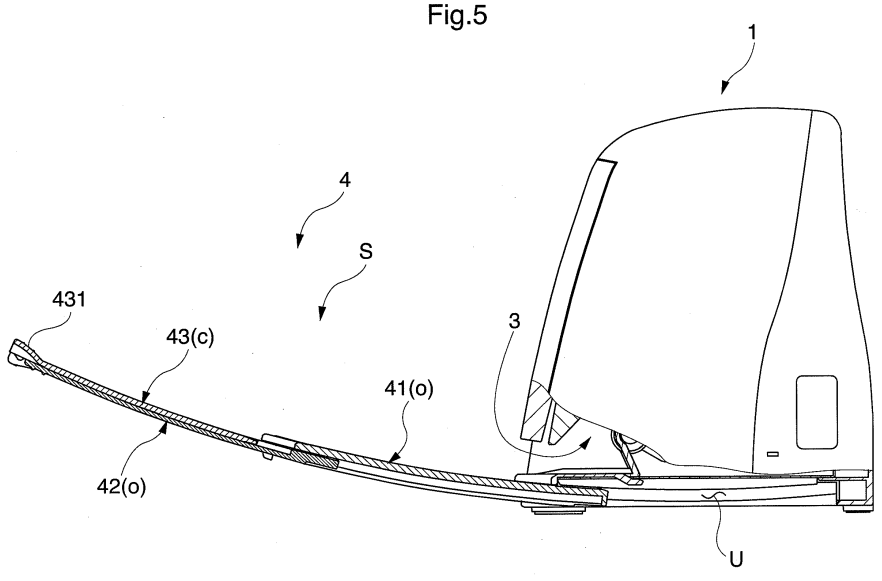
(72) Inventors:
- **KAWAI, Shigehiro**
  Osaka-shi
  Osaka 537-8686 (JP)
- **OKUZUMI, Tsubasa**
  Osaka-shi
  Osaka 537-8686 (JP)
- **SHIRATSUCHI, Hiroki**
  Tokyo 178-8686 (JP)
- **TAMURA, Makoto**
  Tokyo 178-8686 (JP)

(74) Representative: **TBK**
Bavariaring 4-6
80336 München (DE)

(54) APPARATUS AND PAPER EJECTION TRAY

(57) There are provided an apparatus body 1 including a paper ejection slot 3 through which a sheet of paper P is ejected in a substantially horizontal direction, and a paper ejection tray 4 that is provided on a side of a bottom wall 11 of the apparatus body 1 and can be pulled out in a paper ejection direction. The paper ejection tray 4 is provided with a paper guiding surface S. A proximal side of the paper guiding surface S for receiving the sheet of paper P first is arranged in substantially parallel with the bottom wall 11, and the paper guiding surface S is curved gradually upward as a position thereof becomes closer to a front end side thereof.

Fig.5



EP 2 354 067 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to an apparatus provided with a paper ejection tray at a paper ejection slot.

BACKGROUND ART

[0002] A Scanner, printer, or facsimile machine is known as an apparatus provided with a paper ejection tray at a paper ejection slot.

[0003] Conventionally, the paper ejection tray provided with this type of apparatus has a paper guiding surface which is planar, guides, and receives thereon a sheet of paper ejected substantially horizontally from the paper ejection slot (see, for example, Patent Document 1).

[0004] However, with such a structure, there are some cases in which a sheet of paper ejected from the paper ejection slot with momentum is guided on the paper guiding surface, slides thereon farther forward, and falls from the paper ejection tray. In addition, if a leading edge of a sheet of paper placed on the planar paper guiding surface protrudes forward from the paper ejection tray even by a small amount, the protruding portion tends to hang down by its own weight. This kind of problem can be prevented by enlarging the paper ejection tray. However, enlarging the paper ejection tray is restricted to a certain degree in view of how much of peripheral area it occupies.

PRIOR-ART DOCUMENT

PATENT DOCUMENT

[0005] Patent Document 1: Japanese Patent Application Laid-Open No. H9-323856

SUMMARY OF THE INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0006] It is an object of the present invention to solve the problems, without enlarging the paper ejection tray, in which paper tends to fall off from the paper ejection tray, and protruding portion of the paper tends to hang down.

APPROACH TO SOLVE THE PROBLEMS

[0007] To solve the problem identified above, the present invention adopts the following structure. An apparatus according to the present invention is provided with an apparatus body including a paper ejection slot through which a sheet of paper is ejected in a substantially horizontal direction, and a paper ejection tray that is provided on a side of a bottom wall of the apparatus body and can be pulled out in a paper ejection direction, wherein the paper ejection tray is provided with a paper guiding surface, a proximal side of the paper guiding surface for receiving the sheet of paper first is arranged in substantially parallel with the bottom wall, and the paper guiding surface is curved gradually upward as a position thereof becomes closer to a front end side thereof.

[0008] With this structure, first, the leading edge of the sheet of paper that is lead out from the paper ejection slot of the apparatus body is guided and supported by a horizontal portion of the paper guiding surface and, thereafter, is gradually lifted upward and ejected. For this reason, deceleration acted upon the sheet of paper becomes larger, which effectively suppresses a probability in which the sheet of paper moves forward over the paper ejection tray and slides down in front, as compared with the case in which the sheet of paper is guided in a planar posture. In addition, the front end portion of the sheet of paper is cambered toward obliquely upward and forward, and protrudes from the tray. This means that it is possible to reduce a probability in which the protruding portion hangs down than in the case in which the sheet of paper protrudes in a planar posture without warping upwardly. Thus, it is possible to properly receive a sheet of paper having a relatively larger size by using the paper ejection tray having a relatively smaller pullout distance. Further, since a proximal side of the paper ejection tray is substantially parallel with the bottom wall of the apparatus body, the sheet of paper can be smoothly guided from the paper ejection slot onto the paper ejection tray.

[0009] Further, since the paper ejection tray is provided with a plurality of tray members that can be pulled out telescopically, when the apparatus is not in use, the paper ejection tray is pushed inside the apparatus body so that a whole of the paper eject tray can be retracted under the bottom wall almost entirely. In contrast, when the apparatus is used, it is possible to select the number of tray members according to a size of the sheet of paper and pull out the tray members telescopically so that the paper guiding surface is exposed.

[0010] As such a paper ejection tray, the following paper ejection tray can be preferably used. The paper ejection tray is provided with a first tray member that is slidable from a retracted position in which the first tray member is held by the apparatus body and overlaps with the bottom wall to a used position in which the sheet of paper is guided through, and a second tray member that is slidable from a retracted position in which the second tray member is held by the first tray member and overlaps with the first tray member to a used position in which the sheet of paper is guided through.

[0011] As a paper ejection tray to be used for a relatively larger sheet of paper, the following paper ejection tray can be preferably used. The paper ejection tray is provided with an auxiliary tray member that is fitted to an extreme front end edge of the tray member by means of a hinge and capable of being flipped over from a retracted position in which the auxiliary tray member is fitted into a concave recess portion formed on a part of an upper

surface of the tray member to a used position in which the paper guiding surface can be extended. With this paper ejection tray, even if a relatively large sheet of paper is used, the auxiliary tray member is flipped over from the retracted position according to the size of the sheet of paper. This makes it possible to lower a probability in which the leading edge of the sheet of paper protrudes forward from the paper ejection tray and the protruding portion hangs down.

[0012] As a paper ejection tray for receiving a sheet of paper ejected from the paper ejection slot, it is preferable that the paper ejection tray include a paper guiding surface that is gradually curved upward from a proximal side thereof for receiving the sheet of paper first toward a front end side thereof.

EFFECTS OF THE INVENTION

[0013] According to the present invention, the present invention can solve the problems, without enlarging the paper ejection tray, in which paper tends to fall off from the paper ejection tray, and protruding portion of paper tends to hang down.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

[FIG. 1] An overall right-side cross sectional view of an apparatus according to an embodiment of the present invention.

[FIG. 2] A perspective view of the apparatus according to the embodiment with a paper ejection tray being retracted.

[FIG. 3] A partial cross sectional view of the apparatus according to the embodiment with the paper ejection tray being retracted.

[FIG. 4] A perspective view of the apparatus according to the embodiment with first and second tray members being pulled out.

[FIG. 5] A partial cross sectional view of the apparatus according to the embodiment with first and second tray members being pulled out.

[FIG. 6] A perspective view of the apparatus according to the embodiment with an auxiliary tray member being pulled out.

[FIG. 7] A partial cross sectional view of the apparatus according to the embodiment with the auxiliary tray member being pulled out.

[FIG. 8] A bottom perspective view of the apparatus according to the embodiment with the first tray member being pulled out.

MODES FOR CARRYING OUT THE INVENTION

[0015] Hereinafter, an embodiment in the case where a scanner is taken as an apparatus according to the present invention will be described with reference to the drawings.

[0016] As illustrated in FIGs. 1 to 8, the scanner is provided with an apparatus body 1 including a paper ejection slot 3 that ejects a sheet of paper P in a substantially horizontal direction, and a paper ejection tray 4 that is provided on a side of a bottom wall 11 of the apparatus body 1 and can be pulled out in a paper ejection direction.

[0017] As illustrated in FIG. 1, the apparatus body 1 includes a paper feeding slot 2 in an upper-rear portion thereof, a paper ejection slot 3 in a front-bottom portion thereof, and a paper path T formed inside so that the paper feeding slot 2 communicates with the paper ejection slot 3. The paper path T is formed between wall bodies 13 and 14 formed as a pair in front and rear provided inside the apparatus body 1. A receiving region T1 that can receive a plurality of sheets of paper P separably bundled together is provided on a side of the paper feeding slot 2 of the paper path T. Provided along the paper path T are a sheet separation device 6 that separates front end portions of the plurality of sheets of paper P received in the receiving region T1, a paper feeding device 7 that uses a paper feed roller 71 to pull in, sheet by sheet, the sheets of paper P separated by the sheet separation device 6, a transport device 8 that transports, by means of transport rollers 81 and 82, the sheet of paper P pulled in by the paper feeding device 7 toward the paper ejection slot 3, and an image pickup device 9 that takes images on both sides of the sheet of paper P while it is transported by the transport device 8. The sheet of paper P whose image has been taken is fed toward the paper ejection slot 3 by the transport rollers 81 and 82 and is ejected onto the paper ejection tray 4 from the paper ejection slot 3. As illustrated in FIG. 8, the apparatus body 1 includes a bottom space U having a flat shape surrounded by inner side surfaces of two side walls 12 and a lower surface of the bottom wall 11 installed between lower end vicinities of the two side walls 12. The paper ejection tray 4 is stored in the bottom space U in a manner to be pulled out forward.

[0018] As illustrated in FIGs. 2 to 8, the paper ejection tray 4 includes a paper guiding surface S that has a proximal side for receiving the sheet of paper P first, is formed substantially parallel with the bottom wall 11, and bends gradually upward toward a front end side thereof. The paper eject tray 4 is provided with tray members 41 and 42 that can be telescopically pulled out. To be specific, the paper eject tray 4 is constructed of: the first tray member 41 that can be slid from a retracted position 41(c) in which the first tray member 41 is held by the apparatus body 1 and overlaps with the bottom wall 11 as illustrated in FIGs. 2 and 3 to a used position 41(o) in which the sheet of paper P can be guided through as illustrated in FIGs. 4 and 5; and the second tray member 42 that can be slid from a retracted position (42c) in which the second tray member 42 is held by the first tray member 41 and overlaps therewith to a used position 42 (o) in which the sheet of paper P can be guided through. Accordingly, the paper guiding surface S is formed of an upper surface of

the first tray member 41 and an upper surface of the second tray member 42.

[0019] As illustrated in FIGs. 4, 5, and 8, the first tray member 41 includes an upper plate 411 that curves in a partial circular arc shape in side view, and side plates 412 that are individually formed near two side edges of a lower surface of the upper plate 411. Both the right and left side edges of the upper plate 411 are slidably supported by curved rails 121 arranged individually on inner surfaces of the side walls 12 of the apparatus body 1. Guide rails (not illustrated) that slidably support the second tray member 42 are formed on inner sides of the two side plates 412 of the first tray member 41. The guide rails are formed in parallel with the side plates 412 and formed integrally with the second tray member 42 on a lower surface of the second tray member 42. The side plates 412 and the guide rails also function as reinforcement ribs for reinforcing the upper plate 411.

[0020] As illustrated in FIGs . 4, 5, and 8, the second tray member 42 includes an upper plate 421 that bends in a partial circular arc shape in side view, and side plates 422 that are individually formed at two side edges of a lower surface of the upper plate 421. Both the right and left side edges of the upper plate 421 are slidably supported by the guide rails formed on the inner surfaces of the side plates 412 of the first tray member 41. The side plates 422 and the guide rails also function as reinforcement ribs for reinforcing the upper plate 421. The upper plate 421 of the second tray member 42 is curved at a curvature substantially identical with that of the lower surface of the upper plate 411 of the first tray member 41. An auxiliary tray member 43 is fitted to a front end edge of the second tray member 42 by means of a hinge 423.

[0021] As illustrated in FIGs. 4 to 7, the auxiliary tray member 43 has a breadth narrower than that of the second tray member 42 and can be flipped over from a retracted position 43(c) in which the auxiliary tray member 43 overlaps with the second tray member 42 to a used position 43 (o) in which the sheet of paper P can be guided through. The auxiliary tray member 43 has a plate-like shape and overlaps with the second tray member 42 by being fitted into a concave recess portion 424 formed on the upper surface of the second tray member 42. The second tray member 42 can be retracted under the first tray member 41 while the auxiliary tray member 43 overlaps with the second tray member 42.

[0022] As illustrated in FIG. 7, a knob 431 that bulges out in a thickness direction of the auxiliary tray 43 is provided in a center portion of the proximal edge of the auxiliary tray 43. Specifically, the knob 431 is formed by bulging out, in a partial spherical shape, the center portion of the proximal edge of the auxiliary tray 43 toward a side opposite to the paper guiding surface S. As illustrated in FIG. 2, the end of the knob 431 is arranged to become substantially continuous with front end edges of the two tray members 41 and 42 in plan view in the complete retracted state of the paper eject tray 4. In other words, the knob 431 has a shape so that it does not protrude frontward from the two tray members 41 and 42 when they are retracted. Accordingly, as illustrated in FIG. 8, a notch 425 allowing a motion of holding the knob 431 from above and below is formed in a center portion of a front end edge of the second tray member 42. Also, as illustrated in FIG. 6, a receiving recess portion 413 for receiving the knob 431 when the trays are retracted is formed in a center portion of a front end edge of the first tray member 41. Further, in this embodiment, it is arranged in such a way that the entire paper ejection tray 4 can be retracted in a position in which the front end edges of the two tray members 41 and 42 are substantially aligned with a front edge of the bottom wall 11 of the apparatus body 1 in plan view. Therefore, a receiving recess portion 111 for receiving the knob 431 is formed also in a center portion of a front edge of the bottom wall 11. In addition, a height of the front end edge of the knob 431 is arranged to be either lower than the upper surface of the bottom wall 11 or substantially equal thereto. Therefore, as illustrated in FIG. 3, when the paper ejection tray 4 is entirely retracted, the knob 431 can be fitted into the receiving recess portions 111 and 413. To state it differently, the knob 431 has a shape which does not protrude above the bottom wall 11 when the tray is retracted. Accordingly, despite the fact that the knob 431 bulges out in a thickness direction, it is possible to suppress the height thereof in a thickness direction when the tray is retracted.

[0023] With this structure, it is possible to retract a whole of the paper eject tray 4 under the bottom wall 11 almost entirely by pushing the paper eject tray 4 into the apparatus body 1. When the knob 431, in this state, is held from above and below and pulled out nearer, the first tray member 41 and the second tray member 42 of the paper eject tray 4 can be pulled out telescopically, and thus the curved paper guiding surface S is exposed.

[0024] When the scanner is used in this state, the leading edge of the sheet of paper P that is lead out from the paper ejection slot 3 of the apparatus body 1 is, first, guided and supported by a horizontal portion of the paper guiding surface S and, thereafter, is gradually lifted upward and ejected. For this reason, deceleration acted upon the sheet of paper P becomes larger, which effectively can suppress a probability in which the sheet of paper P moves forward over the paper ejection tray 4 and slides down in front, as compared with the case in which the sheet of paper P is guided in a planar posture. To state it differently, by using such a paper ejection tray 4, the front end portion of the sheet of paper P is cambered obliquely upward and forward, and protrudes from the tray. This means that it is possible to reduce a probability in which the protruding portion hangs down than in the case in which the sheet of paper P protrudes in a planar posture without warping upwardly. Thus, it is possible to properly receive a sheet of paper P having a relatively larger size by using the paper ejection tray 4 having a relatively smaller pullout distance.

[0025] With this paper ejection tray 4, as compared

with a case in which the paper guiding surface S is angled immediately from the vicinity of the paper ejection slot 3, it is also possible to suppress the resistance caused by the sheet of paper P that is ejected from the paper ejection slot 3 by making contact with the paper guiding surface S having some angle from the horizontal position, and minimize the adverse effect inflicted upon the scanning speed.

[0026] In addition, since the sheet of paper P is ejected and runs on the knob 431, a gap is formed between the sheet of paper P and peripheries of the knob 431. This can prevent the ejected sheet of paper P from making close contact with the ejection tray 4 and making it difficult to be removed.

[0027] When a sheet of paper P having a further larger size is scanned, the auxiliary tray member 43 of the paper ejection tray 4 can be flipped over to the used position 43(o). To be specific, the first and second tray members 41 and 42 are pulled out to the used position 42 (o) by holding the knob 431 from above and below, and thereafter the edge of the knob 431 is pulled down toward a near side by a finger that was placed on the upper side of the knob 431. Then, the knob 431 functions as a lever so that the auxiliary tray member 43 flips over, at a stroke, to the used side 43(o). This is because the edge of the knob 431 deviates from the rotation center of the hinge 423 since the knob 431 is bulged out in a thickness direction of the auxiliary member 43 so that the knob 431 also functions as an operation lever for flipping.

[0028] In this way, the scanner according to this embodiment can be adapted to various circumstances by selecting a mode of the paper ejection tray 4 in accordance with the size of the sheet of paper P to be ejected, such as a first mode in which only the first tray member 41 is pulled out, a second mode in which the second tray member 42 is further pulled out, a third mode in which the auxiliary tray member 43 is flipped over to the used position 43(o), a medium mode in which the tray members 41 and 42 are not fully pulled out but to a position between the retracted state and the first mode, or another medium mode between the first and second modes.

[0029] With the foregoing structure, the scanner according to this embodiment includes the apparatus body 1 having the paper ejection slot 3 for ejecting the sheet of paper P in a substantially horizontal direction, and the paper ejection tray 4 that is provided on a side of the base wall 11 of the apparatus body 1 and can be pulled out in a paper ejection direction. The ejection tray 4 is provided with the paper guiding surface S that has a proximal side thereof for receiving the sheet of paper P first and substantially parallel with the base wall 11, and is gradually curved upward toward a front end side. The leading edge of the sheet of paper P led out from the paper ejection slot 3 of the apparatus body 1 is guided and supported by the horizontal portion of the paper guiding surface S in the vicinity of the proximal portion of the first tray member 41, and, thereafter, the sheet of paper P is ejected while it is gradually lifted upward. Therefore, as compared with the case in which the sheet of paper P is guided in a planar posture, deceleration acted upon the sheet of paper P becomes larger, which effectively suppresses a probability in which the sheet of paper P moves forward over the paper ejection tray 4 and slides down in front.

[0030] Also, the front end portion of the sheet of paper P is cambered toward obliquely upward and forward, and protrudes from the tray. This means that it is possible to reduce a probability in which the protruding portion hangs down than in the case in which the sheet of paper P protrudes in a planar posture without warping upwardly. Thus, it is possible to properly receive a sheet of paper P having a relatively larger size by using the paper ejection tray 4 having a relatively smaller pullout distance. Furthermore, as compared with the case in which the sheet of paper P having the same size is ejected and the sheet of paper P is guided in a planar posture, it is possible to make the space provided in a near side of the paper ejection slot 3 of the apparatus body 1 smaller, and use the space formed between the front side of the paper ejection tray 4 and a desk as desired by the user.

[0031] Since the paper ejection tray 4 is provided with the two tray members 41 and 42 that can be pulled out telescopically, when the apparatus is not in use, the two tray members 41 and 42 are pushed inside the apparatus body 1 so that a whole of the paper eject tray 4 can be retracted under the bottom wall 11 almost entirely. In addition, when the paper ejection tray 4 is pulled out from the retracted position 43(c) by holding the knob 431 from above and below, the curved paper guiding surface S which is the upper surface of the two tray members 41 and 42 can be exposed.

[0032] The paper eject tray 4 is constructed of: the first tray member 41 that can be slid from the retracted position 41(c) in which the first tray member 41 is held by the apparatus body 1 and overlaps with the bottom wall 11 to a used position 41 (o) in which the sheet of paper P can be guided through; and the second tray member 42 that can be slid from the retracted position (42c) in which the second tray member 42 is held by the first tray member 41 and overlaps therewith to a used position 42(o) in which the sheet of paper P can be guided through. Accordingly, only the first tray member 41, or the first tray member 41 and the second tray member 42 of the paper ejection tray 4 can be selectively pulled out from the retracted position 42(c) under the bottom wall 11 in which the paper ejection tray 4 is almost entirely retracted to the used position 41 (o) or 42(o), and the curved paper guiding surface S can be exposed in accordance with the size of the sheet of paper P to be ejected.

[0033] The paper ejection tray 4 is further provided with the auxiliary tray member 43 which is fitted to the extreme front end edges of the tray members 41 and 42, i.e., the extreme front end edge of the second tray member 42, by means of the hinge 423 and can be flipped over from the retracted position 43(c) in which the auxiliary tray member 43 is fitted into the concave recess portion 424

formed on a part of the upper surface of the tray member 42 to the used position 43(o) in which the paper guiding surface S can be extended. Accordingly, when a relatively large-sized sheet of paper P (for example, the sheet of paper P of A3 size) is scanned, the auxiliary tray member 43 of the paper ejection tray 4 can be flipped over to the used position 43(o) for use. Furthermore, even if a relatively large sheet of paper P is used, by flipping over the auxiliary tray to the used position 43 (o) , it is possible to lower a probability in which the leading edge of the sheet of paper P protrudes from the paper ejection tray 4 and the protruding portion hangs down. When the auxiliary tray member 43 is not in use, the second tray member 42 can be retracted under the first tray member 41 while the auxiliary tray member 43 overlaps with the second tray member 42 and is fitted into the concave recess portion 424 formed on the upper surface of the second tray member 42. In this way, use of the auxiliary tray member 43 can be selected in accordance with the size of the sheet of paper P.

[0034] The present invention can be varied and modified in various forms without limiting to the embodiments described above.

[0035] The paper ejection tray 4 is not limited to what is described in the embodiment, and may have such a structure that does not include the auxiliary tray member. In addition to a combination of the two tray members, three or more tray members may be combined telescopically, or a tray constructed of a single tray member may also be used.

[0036] In addition, in the embodiment, although the apparatus that is placed on a table for use is described, the present invention can be applied to other types, too, similarly. However, if the present invention is applied to desktop apparatuses, the desktop space which is limited can be efficiently used. Specifically, since the front end side of the paper ejection tray 4 is cambered obliquely upward and forward, as compared with the case in which the sheet of paper P having the same size is ejected and the sheet of paper P is guided in a planar posture, it is possible to make the space provided in a near side of the paper ejection slot of the apparatus body smaller. Further, the bottom space provided below the front side of the paper ejection tray can be used as desired. Accordingly, when the apparatus is placed on a desk, and if writing tools, documents, or the like are placed near the ejection slot of the apparatus, these items can be accommodated in the bottom space, which is advantageous since there is no need to clear the vicinity of the paper ejection slot of the apparatus.

[0037] The present invention is applicable not only to the scanner but also to such apparatuses as printers and facsimile machines that are provided with paper ejection trays at paper ejection slots thereof.

[0038] The embodiment has been heretofore described. However, the invention is not limited to the specific structures of the individual portions in the embodiment, and it should be understood that the various changes could be made hereto without departing from the spirit of the invention.

INDUSTRIAL APPLICABILITY

[0039] The present invention can be used as apparatuses and paper ejection trays, without enlarging the paper ejection tray, to solve the problems in which paper tends to fall off from the paper ejection tray, and protruding portion of paper tends to hang down.

EXPLANATION OF REFERENCE NUMERALS

[0040]

1	... Apparatus body
11	... Bottom wall
3	... Paper ejection slot
4	... Paper ejection tray
41	... First tray member
42	... Second tray member
423	... Hinge
424	... Concave recess portion
43	... Auxiliary tray member
P	... Sheet of paper
S	... Paper guiding surface
(c)	... Retracted position
(o)	... Used position

Claims

1. An apparatus comprising:

an apparatus body including a paper ejection slot through which a sheet of paper is ejected in a substantially horizontal direction; and

a paper ejection tray that is provided on a side of a bottom wall of the apparatus body and can be pulled out in a paper ejection direction,

wherein the paper ejection tray is provided with a paper guiding surface,

a proximal side of the paper guiding surface for receiving the sheet of paper first is arranged in substantially parallel with the bottom wall, and

the paper guiding surface is curved gradually

upward as a position thereof becomes closer to a front end side thereof.

2. The apparatus according to claim 1, wherein the paper ejection tray is provided with a plurality of tray members that can be pulled out telescopically.

3. The apparatus according to claim 2, wherein the paper ejection tray comprises:

a first tray member that is slidable from a retracted position in which the first tray member is held by the apparatus body and overlaps with the bottom wall to a used position in which the sheet of paper is guided through; and
a second tray member that is slidable from a retracted position in which the second tray member is held by the first tray member and overlaps with the first tray member to a used position in which the sheet of paper is guided through.

4. The apparatus according to any one of claims 1, 2, and 3, wherein the paper ejection tray further comprises an auxiliary tray member that is fitted to an extreme front end edge of the tray member by means of a hinge and capable of being flipped over from a retracted position in which the auxiliary tray member is fitted into a concave recess portion formed on a part of an upper surface of the tray member to a used position in which the paper guiding surface can be extended.

5. A paper ejection tray for receiving a sheet of paper ejected from a paper ejection slot, the paper ejection tray comprising a paper guiding surface that is gradually curved upward from a proximal side thereof for receiving the sheet of paper first toward a front end side thereof.

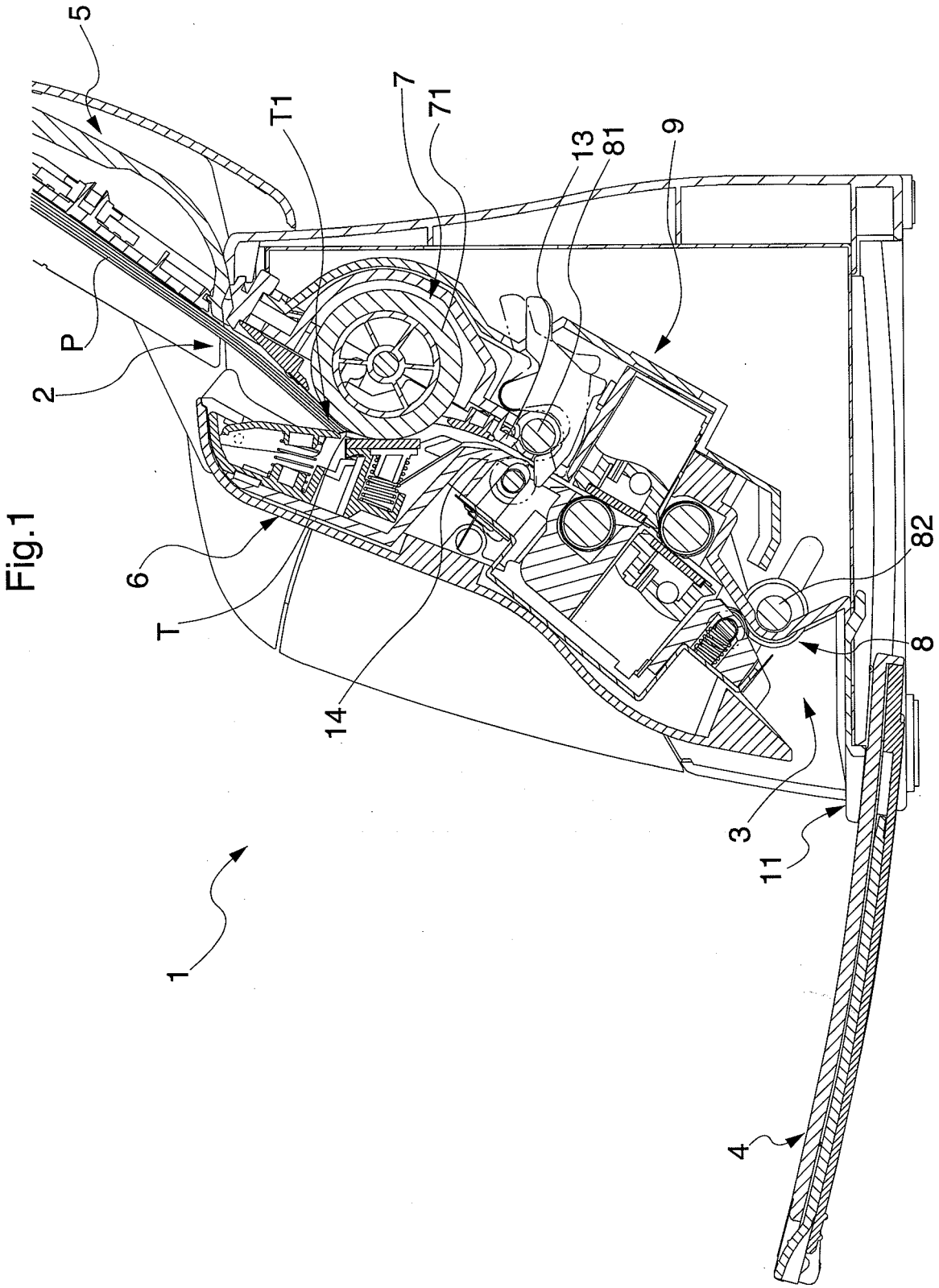


Fig.1

Fig.2

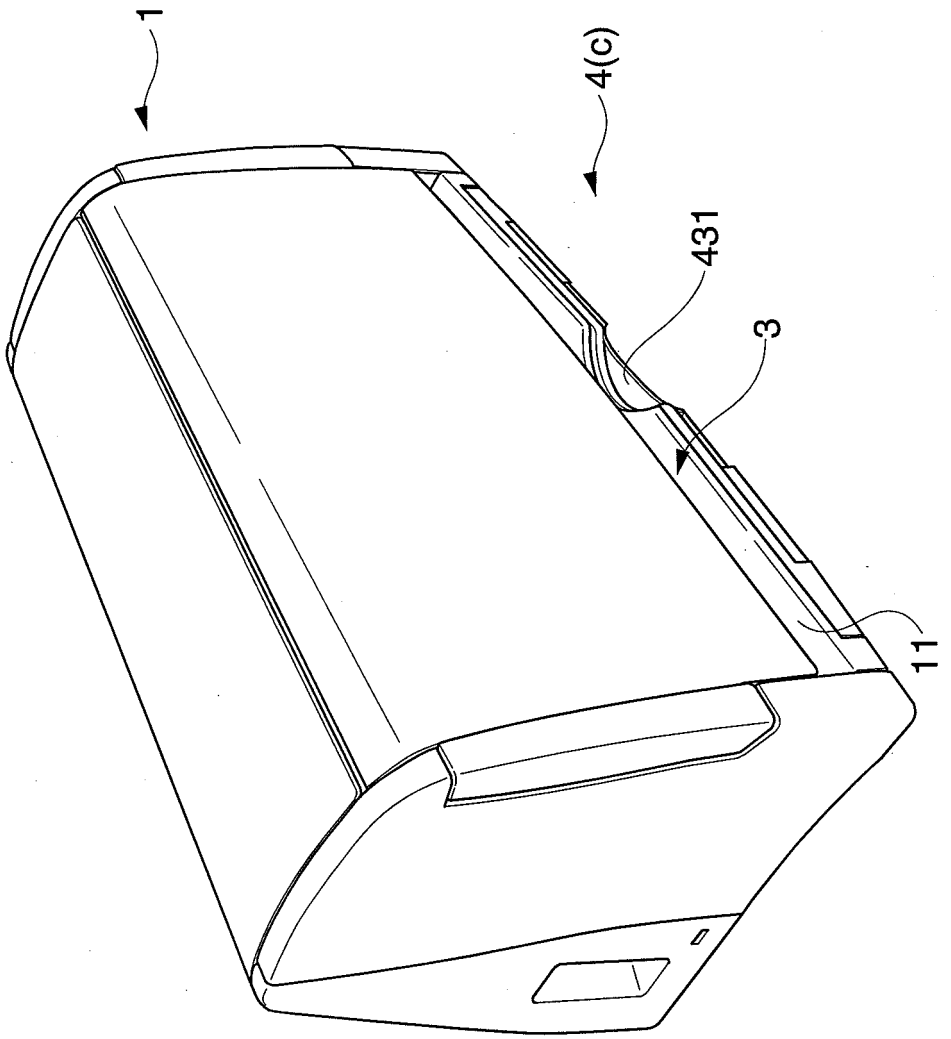


Fig.3

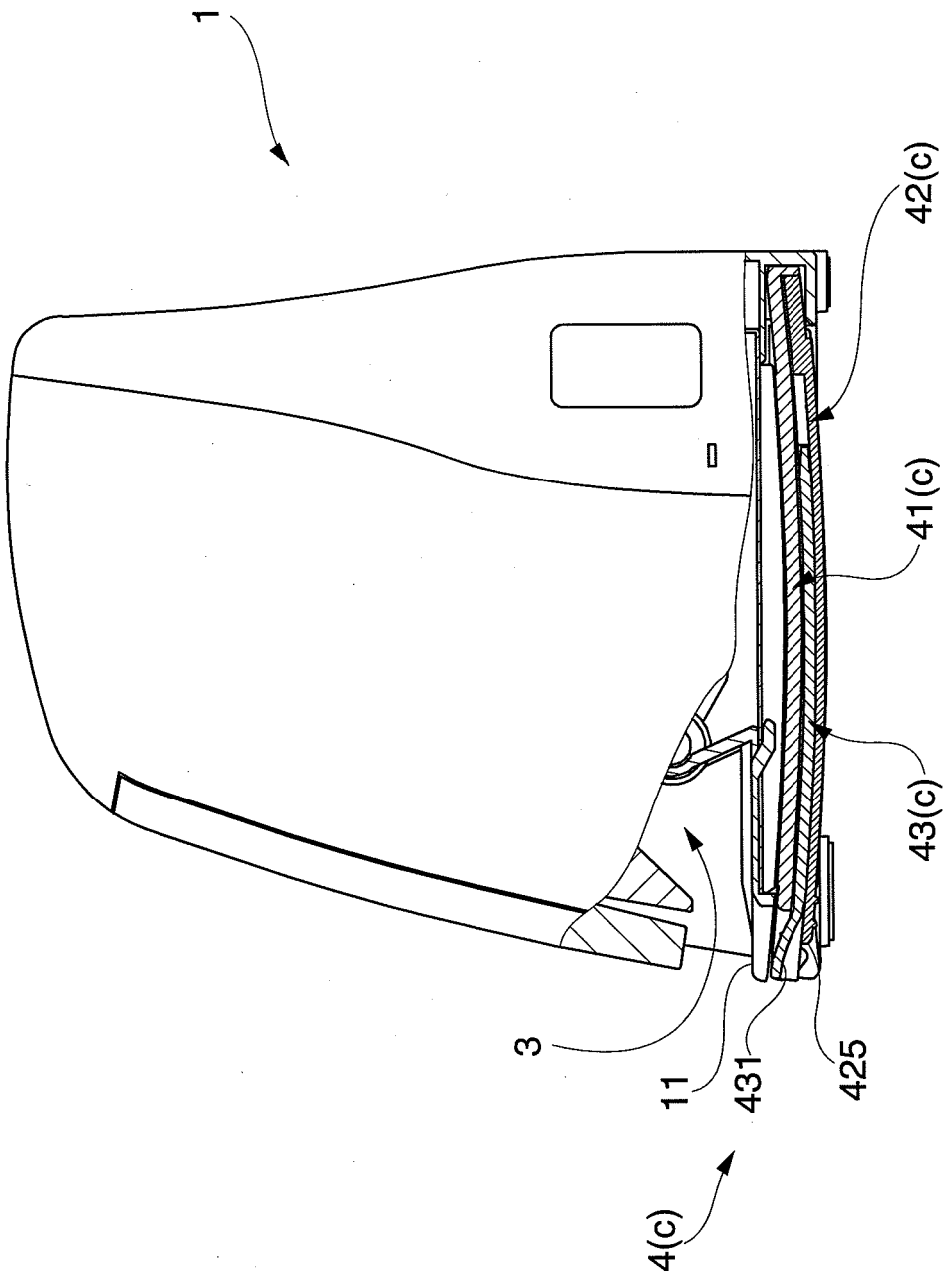
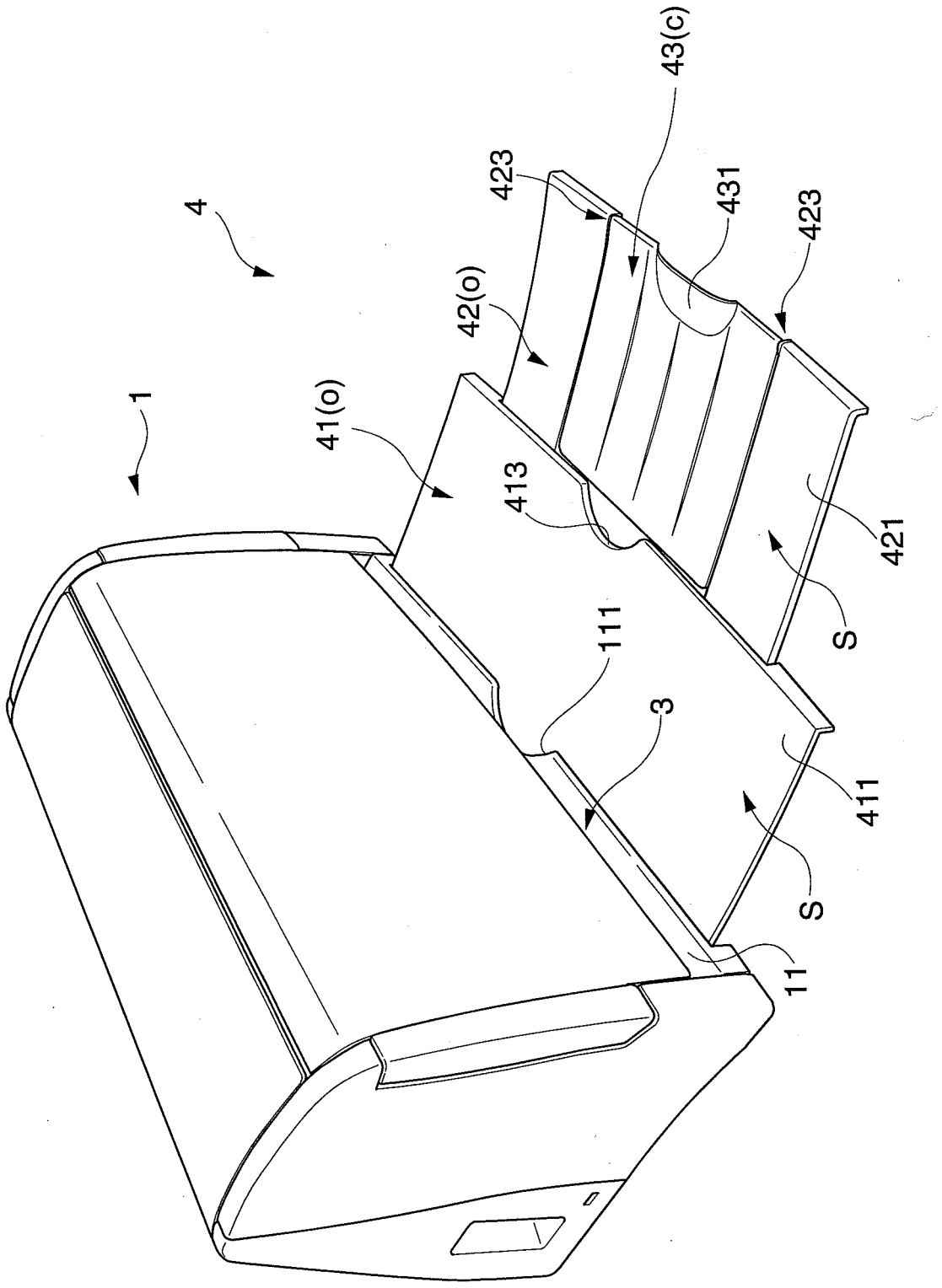


Fig.4



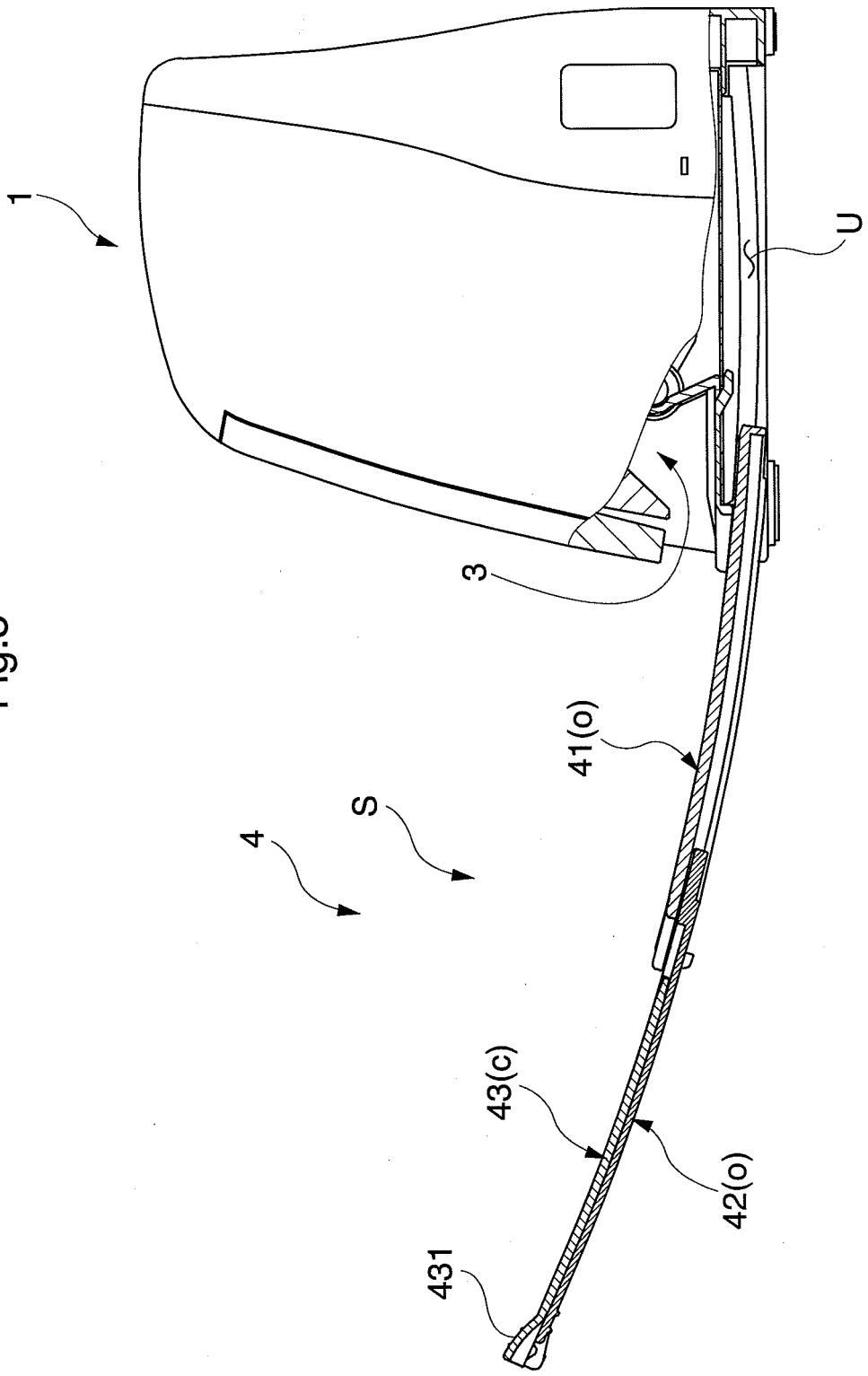


Fig.5

Fig.6

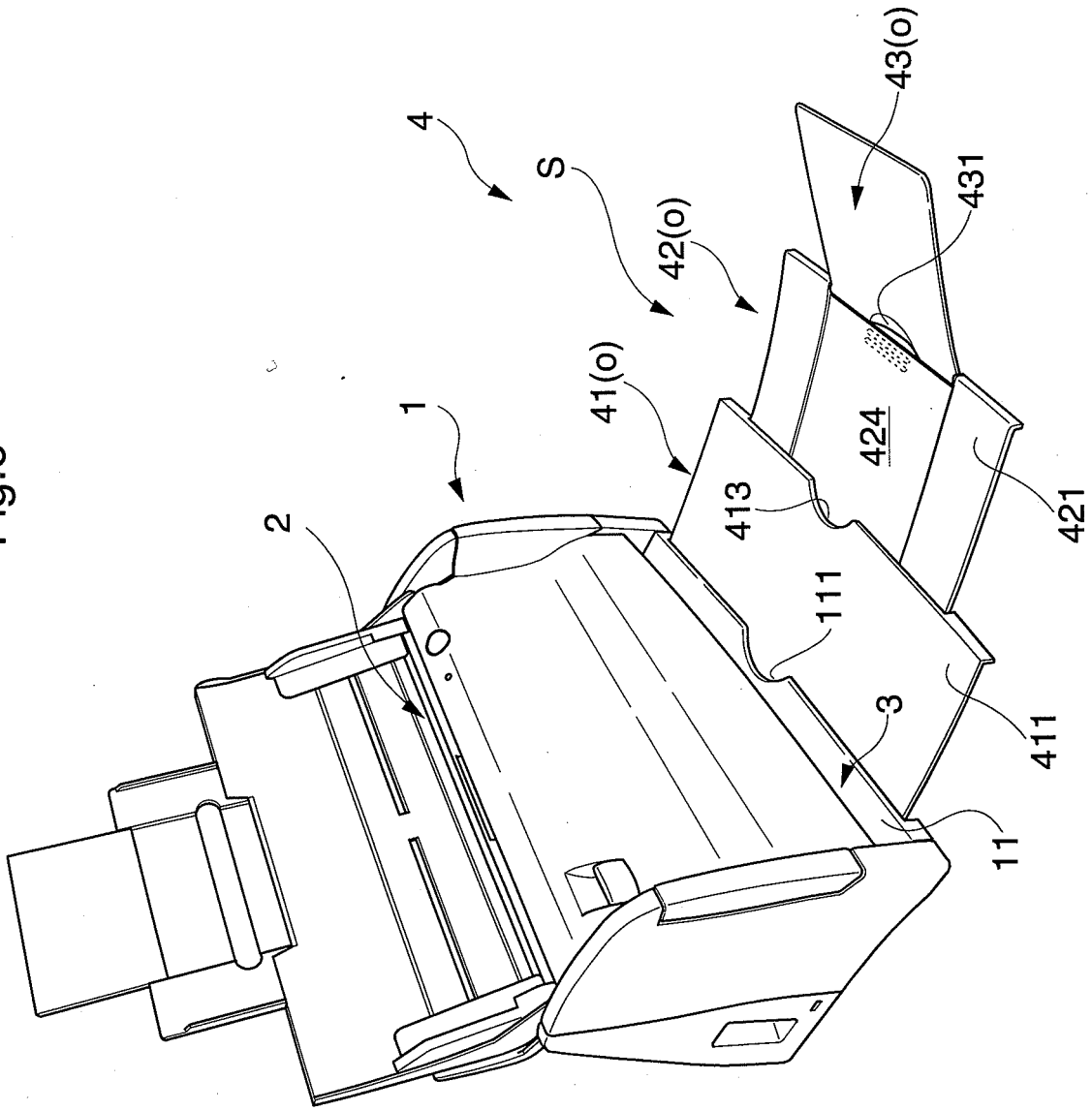


Fig.7

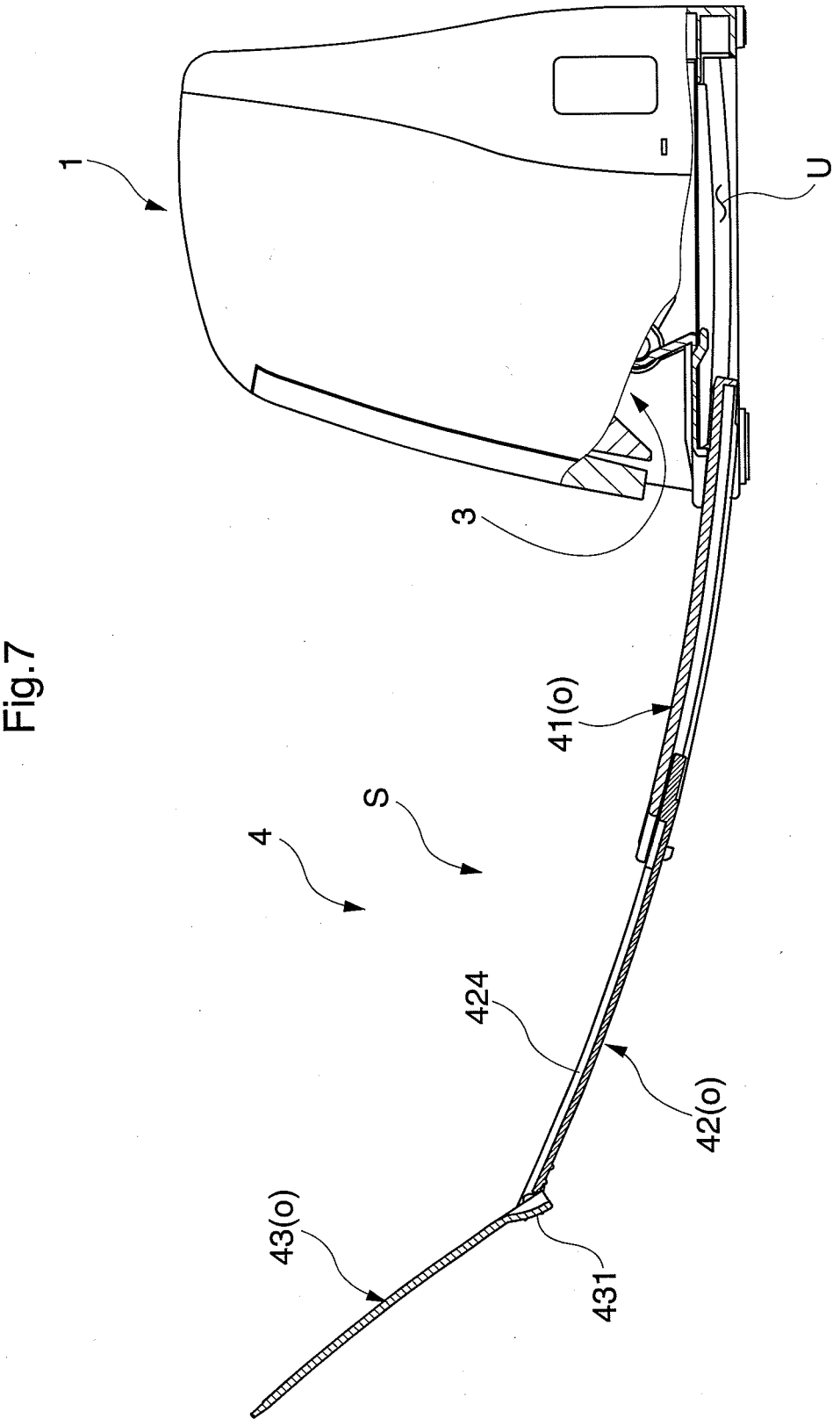
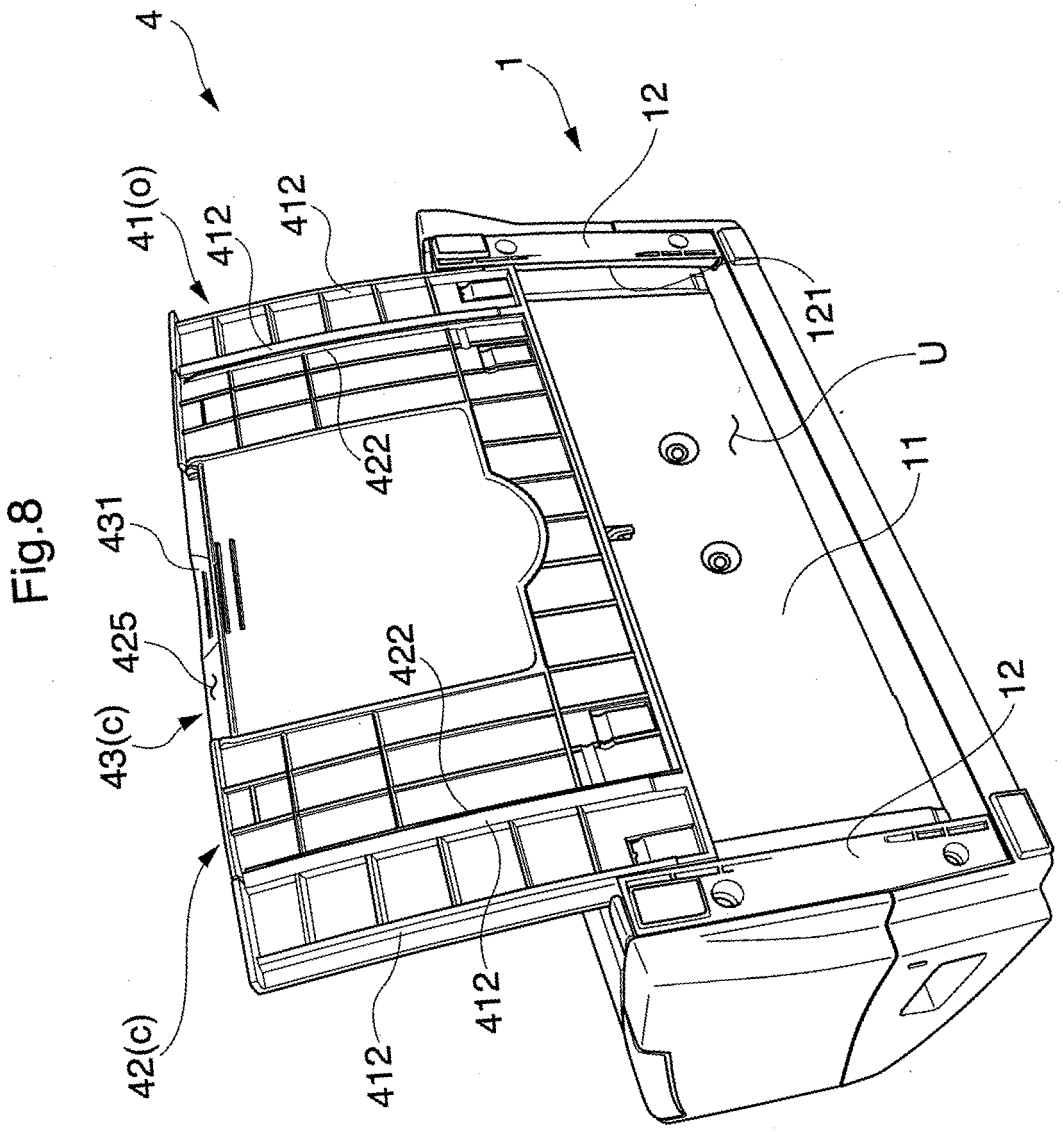


Fig.8



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2009/070292

A. CLASSIFICATION OF SUBJECT MATTER
B65H31/00(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)
B65H31/00

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 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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.
X Y	JP 2004-59214 A (Seiko Epson Corp.), 26 February 2004 (26.02.2004), paragraphs [0030], [0037], [0038]; fig. 6 (Family: none)	1,5 2-4
X Y	JP 11-130316 A (Ricoh Co., Ltd.), 18 May 1999 (18.05.1999), paragraphs [0007], [0010]; fig. 4 (Family: none)	1,5 2-4
Y	JP 2003-95511 A (Seiko Epson Corp.), 03 April 2003 (03.04.2003), paragraphs [0024], [0037], [0039], [0049], [0051]; fig. 1 to 5 (Family: none)	2-4

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 December, 2009 (24.12.09)	12 January, 2010 (12.01.10)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2007)

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- JP H9323856 B **[0005]**