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**(54) PRINTING DEVICE**

(57) [Problem] A printing apparatus is provided in which the height of a platen or the like is adjusted and fixed.

[Means for Resolution] The height adjustment screw 41 adjusts the height of the platen 40 relative to the bracket 50, the position fixing screw 42 fixes the position of the platen 40 relative to the bracket 50 at a height that is adjusted by the height adjustment screw 41, and a portion where the height adjustment screw 41 is operated for adjustment and a portion where the position fixing screw 42 is operated for fixing are on the same side as viewed from the platen 40.

**Figure 2A**

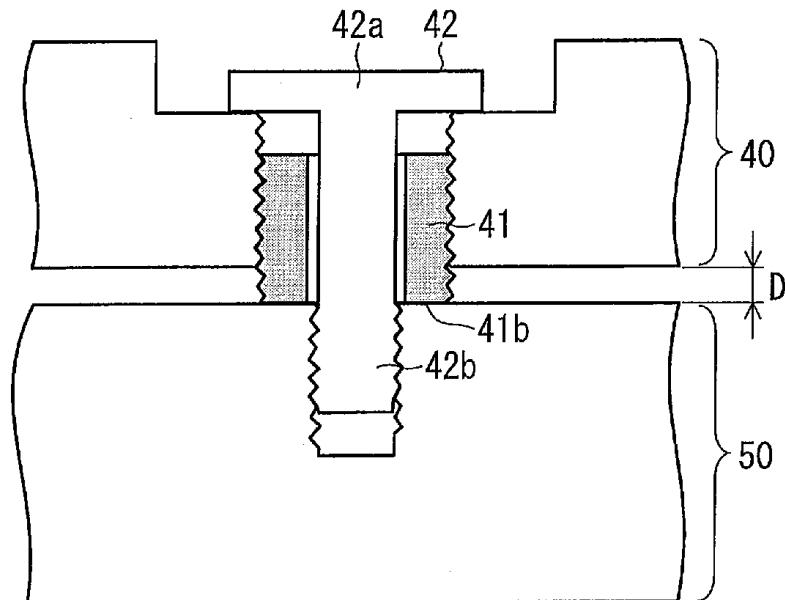


Figure 2B

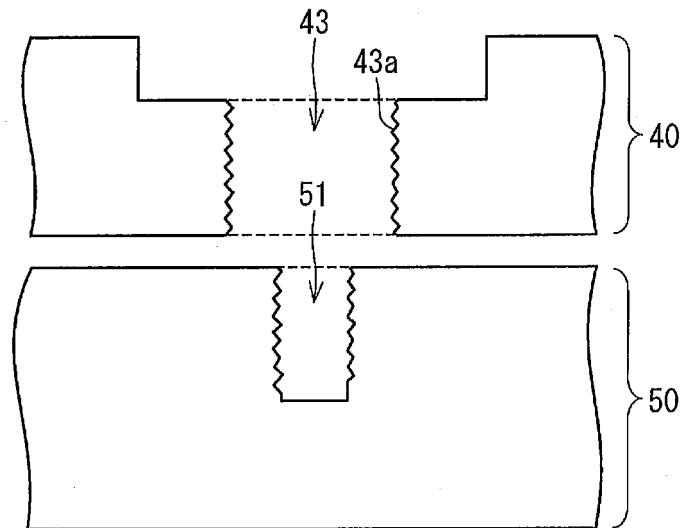
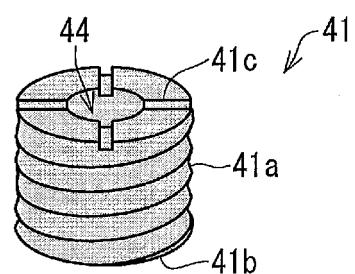


Figure 2C



**Description**

## Technical Field

**[0001]** The present invention relates to a printing apparatus.

## Background Art

**[0002]** Patent Document 1 describes an ink jet printer that is intended to adjust the parallelism of a carriage shaft relative to a platen.

## Citation List

## Patent Literature

**[0003]** PTL 1: JP-A-11-208052 (Date of Publication of Unexamined Patent Application: August 3, 1999)

## Summary of Invention

## Technical Problem

**[0004]** Patent Document 1 describes a technique for adjusting the height of a carriage, and the carriage is usually fixed to the Y bar with high accuracy.

**[0005]** In contrast, the position of the platen is usually fixed with not very high accuracy.

**[0006]** The present invention was made in the light of the circumstances as described above, and it is an object of the present invention to provide a technique for fixing the mounting table for a recording medium such as a platen with high positional accuracy and with high workability.

## Solution to Problem

**[0007]** A printing apparatus according to the present invention is characterized by including a mounting table on which a recording medium is placed, a support base for supporting the mounting table, a height adjustment mechanism for adjusting the height of the mounting table relative to the support base, and a position fixing mechanism for fixing the position of the mounting table relative to the support base at a height that is adjusted by the height adjusting mechanism, wherein a portion where the height adjustment mechanism is operated for adjustment and a portion where the position fixing mechanism is operated for fixing are on the same side as viewed from the mounting table.

**[0008]** According to the configuration described above, since a mechanism for adjusting the height of the mounting table such as a platen and a mechanism for fixing it relative to the support base are provided, it is possible to adjust the height of the mounting table and fix it with high accuracy.

**[0009]** Further, since the operation of height adjust-

ment and position fixing can be performed from the same side as viewed from the mounting table such as a platen, it is possible to perform height adjustment and position fixing easily. For example, in the circumstances where the mechanism for height adjustment and the mechanism for position fixing are in different positions and one of them is hidden in the back of another member, it may be necessary to remove the other member in order to perform height adjustment and position fixing. In such a case, the operation for height adjustment and position fixing becomes very complicated. According to the configuration described above, since a portion where the height adjustment mechanism is operated and a portion where the position fixing mechanism is operated are on the same side as viewed from the mounting table, it suffices that work space is provided only in one direction of the mounting table in order to adjust the respective mechanisms. Therefore, it is possible to perform height adjustment and position fixing more easily.

**[0010]** In the printing apparatus according to the present invention, it is more desirable that the height adjustment mechanism and the position fixing mechanism are on the same straight line.

**[0011]** Since it is not necessary to provide, for each mechanism, space where each mechanism is provided, space is saved. Thus, for example, it is possible to improve flexibility of the placement of a cutter, a suction hole and the like in a printing apparatus with a cutter, a printing apparatus with a suction hole on a platen and the like. Therefore, the configuration described above is useful for a printer with a cutter and the like. Further, since adjustment and fixing can be performed with reference to the same straight line, the accuracy of height adjustment is improved.

**[0012]** In the printing apparatus according to the present invention, more preferably, the height adjustment mechanism is a height adjustment screw including a contact part which passes through a through hole for height adjustment screw provided in the mounting table so that a side wall of the screw is screwed to an inner wall of the through hole for height adjustment screw, and which is brought into contact with the support base, by turning the height adjustment screw, the protrusion height of the contact part protruding from the mounting table to the support base side is adjusted, so that the height of the mounting table relative to the support base is adjusted, and the position fixing mechanism is a position fixing screw which passes through a through hole for position fixing screw provided in the mounting table.

**[0013]** Since the height adjustment mechanism and the position fixing mechanism can be realized with a simple member, a screw, it is possible to simplify the configuration of the apparatus.

**[0014]** In the printing apparatus according to the present invention, more preferably, the through hole for height adjustment screw and the through hole for position fixing screw are the same through hole, an inner through hole of which center axis is a straight line parallel to the

depth direction of the through hole for position fixing screw is provided in the height adjustment screw, and the position fixing screw has a flange portion having a diameter larger than the diameter of the inner through hole, and an extended portion which passes through the inner through hole and is screwed to a female screw provided in the support base.

**[0015]** It is possible to perform height adjustment and position fixing with a simple configuration and with a high degree of accuracy.

#### Advantageous Effects of Invention

**[0016]** According to the present invention, there is an effect that the height of a mounting table such as a platen can be adjusted and fixed.

#### Brief Description of Drawings

**[0017]**

[Fig. 1] Fig. 1 is a side sectional view schematically showing a schematic configuration of a printing apparatus according to an embodiment of the present invention.

[Fig. 2] Fig. 2 (a) is a side sectional view schematically showing a schematic configuration of an adjustment mechanism in the printing apparatus according to the embodiment of the present invention, Fig. 2 (b) is a side sectional view schematically showing a schematic configuration of a mounting table and a support base around the adjustment mechanism, and Fig. 2 (c) is a perspective view schematically showing a schematic configuration of the height adjustment mechanism.

[Fig. 3] Fig. 3 is a top view showing an example of the placement of the adjustment mechanism in the printing apparatus according to the embodiment of the present invention.

[Fig. 4] Fig. 4 is a side sectional view schematically showing a schematic configuration of an adjustment mechanism according to a variation of the present invention.

#### Description of Embodiments

**[0018]** Hereafter, an embodiment of the present invention will be described in detail with reference to the drawings.

#### (Overview of Printing Apparatus)

**[0019]** Fig. 1 is a side sectional view schematically showing a schematic configuration of a printing apparatus 100 according to an embodiment of the present invention. As shown in Fig. 1, the printing apparatus 100 is provided with a head 10, a carriage 20, a guide mechanism 30, a platen (mounting table) 40, a bracket (support

base) 50 and a conveying roller 60, and is an ink jet recording apparatus for recording (printing) an image on a medium (recording medium) 1 such as paper and cloth.

**[0020]** The head 10 is a recording head for discharging ink to the medium 1. When the carriage 20 drives the head 10 and the conveying roller 60 conveys the medium 1, the head 10 and/or the medium 1 move relatively to the scanning direction and the sub scanning direction. Note that the guide mechanism 30 is a member for guiding the moving direction of the carriage 20.

**[0021]** Further, the platen 40 is a mounting table which is disposed immediately below the head 10 and on which the medium 1 is placed. That is, in a state where the medium 1 is placed on the platen 40, the printing apparatus 100 records (prints) an image on the medium (recording medium) 1 by discharging ink from the head 10 while relatively moving the head 10 and/or the medium 1.

**[0022]** In addition, the bracket 50 is fixed to the printing apparatus 100, and serves as a support base of the platen 40. And, the platen 40 is supported by the bracket 50, and is adjustable by an adjustment mechanism described later in a direction approaching to the head 10 and in a direction separating from the head 10. By constituting the platen 40 so as to be adjustable in a direction approaching to or separating from the head 10 in this manner, it is possible to adjust the distance between the head 10 and the medium 1, and improve the recording quality on the medium 1.

#### 30 (Adjustment Mechanism)

**[0023]** The adjustment mechanism includes a height adjustment mechanism for adjusting the height of the platen 40 relative to the bracket 50, and a position fixing mechanism for fixing the position of the platen 40 relative to the bracket 50 at a height that is adjusted by the height adjustment mechanism. The printing apparatus 100 is provided with the mechanism for adjusting the height of the platen 40 and the mechanism for fixing it relative to the bracket 50, thus, the height of the platen 40 can be adjusted and fixed.

**[0024]** Hereinafter, the configuration of the adjustment mechanism according to the present embodiment will be described with reference to the drawings. Fig. 2 (a) is a

45 side sectional view schematically showing a schematic configuration of the adjustment mechanism in the printing apparatus 100. Further, Fig. 2 (b) is a side sectional view schematically showing a schematic configuration of the platen 40 and the bracket 50 around the adjustment mechanism. In addition, Fig. 2 (c) is a perspective view 50 schematically showing a schematic configuration of the height adjustment mechanism.

**[0025]** As shown in Fig. 2 (a), in the present embodiment, the height adjustment mechanism is constituted by a height adjustment screw 41, and the position fixing mechanism is constituted by a position fixing screw 42.

**[0026]** The height adjustment screw 41 passes through a through hole (through hole for height adjust-

ment screw and through hole for position fixing screw 43 provided in the platen 40, so that a side wall 41a of the screw is screwed to an inner wall 43a of the through hole 43. The axis of the height adjustment screw 41 is a straight line parallel to the depth direction of the through hole 43, and the height adjustment screw 41 moves in the depth direction of the through hole 43 relative to the platen 40 when the height adjustment screw 41 is turned about the axis. That is, an engaging groove 41c with which a screwdriver or the like is engaged is formed in the upper surface (the end opposite to the bracket 50) of the height adjustment screw 41, and when the height adjustment screw 41 is turned using a screwdriver or the like, the height adjustment screw 41 moves in the depth direction of the through hole 43. Then, the height adjustment screw 41 is protruded from the surface of the bracket 50 side of the platen 40, and a lower surface (contact part, the end of the bracket 50 side) 41b of the height adjustment screw 41 is brought into contact with the bracket 50, thus, the height of the platen 40 relative to the bracket 50 can be adjusted (distance D between the platen 40 and the bracket 50).

**[0027]** Further, an inner through hole 44 of which center axis is a straight line parallel to the depth direction of the through hole 43 is provided in the height adjustment screw 41. The position fixing screw 42 has a flange portion 42a having a diameter larger than the diameter of the inner through hole 44, and an extended portion 42b which passes through the inner through hole 44 and is screwed to a female screw 51 provided in the bracket 50. Thus, the inner through hole 44 serves as an opening hole allowing the position fixing screw 42 to pass through, so that the position fixing screw 42 is screwed to the bracket 50. Thus, it is possible to fix the position of the platen 40 relative to the bracket 50 at a height that is adjusted by the height adjustment screw 41. That is, an engaging groove with which a screwdriver or the like is engaged is formed in the upper surface (the end opposite to the bracket 50) of the flange portion 42a, and when the position fixing screw 42 is turned using a screwdriver or the like, the platen 40 is sandwiched between the lower surface (the end of the bracket 50 side) of the flange portion 42a of the position fixing screw 42 and the upper surface of the bracket 50 so as to fix the bracket 50 and the platen 40.

**[0028]** Note that the diameter of the flange portion 42a may not necessarily be larger than the through hole 43 as long as the diameter of the flange portion 42a is larger than the diameter of the inner through hole 44. Note that, in the case that the diameter of the flange portion 42a is smaller than the diameter of the through hole 43, when the lower surface of the flange portion 42a is brought into contact with the upper surface of the height adjustment screw 41, the platen 40 and the bracket 50 can be fixed.

**[0029]** For example, height adjustment and position fixing using the adjustment mechanism according to the present embodiment may be performed as follows. First, the height adjustment screw 41 is inserted into the

through hole 43 in the platen 40 in the state shown in Fig. 2 (b) in order to adjust the height of the platen 40 relative to the bracket 50. That is, the engaging groove 41c with which a Phillips head screwdriver or the like is engaged is formed in the upper surface of the height adjustment screw 41, and when the height adjustment screw 41 is turned using a screwdriver or the like, the protrusion height of the lower surface 41b of the height adjustment screw 41 protruding from the platen 40 through the bracket 50 side can be adjusted. Thus, the height of the platen 40 relative to the bracket 50 can be adjusted from the upper surface side of the platen 40 (opposite side of the bracket 50). Subsequently, the position fixing screw 42 is inserted into the inner through hole 44 in the height adjustment screw 41 and the female screw 51 in the bracket 50 in order to fix the position of the platen 40 relative to the bracket 50 at a height that is adjusted by the height adjustment screw 41. Note that fixing can be performed by turning the position fixing screw 42 using a screwdriver or the like from the upper surface side of the platen 40 and sandwiching the platen 40 between the lower surface of the flange portion 42a of the position fixing screw 42 and the upper surface of the bracket 50 to fix the platen 40 and the bracket 50.

**[0030]** Note that one or more adjustment mechanisms may be provided on the platen 40. Fig. 3 shows an example of the placement of the adjustment mechanism in the platen 40. Fig. 3 is a top view of the platen 40 as viewed from the opposite side of the bracket 50. As shown in Fig. 3, for example, a plurality of adjustment mechanisms may be provided on the outer edge of the platen 40.

(Effects of the Present Embodiment)

**[0031]** As described above, in the present embodiment, the operation of height adjustment and position fixing can be performed from the same side as viewed from the platen 40. Therefore, it is possible to perform height adjustment and position fixing easily. Such a configuration is highly advantageous compared to other configurations.

**[0032]** This is because, for example, if the mechanism for height adjustment and the mechanism for position fixing are in different positions, it is difficult in design to provide work space for both mechanisms, and one of them may be hidden in the back of another member. In such a case, it is necessary to remove the other member in order to perform height adjustment and position fixing, and the operation for height adjustment and position fixing becomes very complicated.

**[0033]** In contrast, according to the configuration of the present embodiment, since a portion where the height adjustment mechanism (height adjustment screw 41) is operated and a portion where the position fixing mechanism (position fixing screw 42) is operated are on the same side in the platen 40 (the opposite side to the bracket 50 in the platen 40), it suffices that work space is pro-

vided only in one direction of the platen 40 in order to adjust the respective mechanisms. Therefore, it is possible to perform height adjustment and position fixing more easily.

**[0034]** Further, in the present embodiment, the position fixing screw 42 is adapted to be inserted into the height adjustment screw 41, so that the height adjustment mechanism (height adjustment screw 41) and the position fixing mechanism (position fixing screw 42) are on the same straight line.

**[0035]** With such a configuration, since it is not necessary to provide, for each mechanism, space where each mechanism is provided, space is saved. Further, since adjustment and fixing can be performed with reference to the same straight line, the accuracy of height adjustment is improved.

**[0036]** In particular, such a configuration is advantageous when the printing apparatus 100 is provided with a member (e.g., a cutter, a heater and a suction fan) to be provided in the vicinity of the platen 40. That is, when a special structure such as a cutter groove, heater wire and a hole for suction fan is required to be provided in the platen 40, it is undesirable to provide many structures for height adjustment and position fixing on the platen 40. This is because the flexibility of the placement of the member is significantly limited. Therefore, as in the present embodiment, it is preferred that the height adjustment mechanism (height adjustment screw 41) and the position fixing mechanism (position fixing screw 42) are placed on the same straight line for space saving.

(Variation)

**[0037]** Note that, in the present embodiment, although both of a portion where the height adjustment screw 41 is operated for adjustment and a portion where the position fixing screw 42 is operated for fixing are on the side opposite to the bracket 50 as viewed from the platen 40, the present invention is not limited thereto. For example, both of a portion where the height adjustment screw 41 is operated for adjustment and a portion where the position fixing screw 42 is operated for fixing may be on the bracket 50 side as viewed from the platen 40.

**[0038]** Further, the height adjustment mechanism and the position fixing mechanism may not be placed on the same straight line. For example, a configuration is possible in which a through hole for height adjustment screw and a through hole for position fixing screw are provided in different positions on the platen 40, the height adjustment screw 41 is inserted into the through hole for height adjustment screw, the position fixing screw 42 is inserted into the through hole for position fixing screw, and portions where respective screws are operated are on the same side as viewed from the platen 40.

**[0039]** Even in a configuration described above, as long as a portion where the height adjustment screw 41 is operated for adjustment and a portion where the position fixing screw 42 is operated for fixing are on the same

side as viewed from the platen 40, it suffices that work space is provided only in one direction of the platen 40 in order to adjust the respective mechanisms, thus, it is possible to perform height adjustment and position fixing easily as in the present embodiment.

**[0040]** In addition, in the present embodiment, although each of the height adjustment mechanism and the position fixing mechanism is constituted by a screw, the present invention is not limited thereto. For example, a configuration shown in Fig. 4 is possible. That is, as shown in Fig. 4, as the position fixing mechanism, instead of the position fixing screw 42, a nut 45 which is screwed to a male screw 52 extending from the bracket 50 may be provided.

<Supplementary Information>

**[0041]** As described above, a printing apparatus 100 according to one embodiment of the present invention includes the platen 40 on which the medium 1 is placed, the bracket 50 for supporting the platen 40, the height adjustment screw 41 for adjusting the height of the platen 40 relative to the bracket 50, and the position fixing screw 42 for fixing the position of the platen 40 relative to the bracket 50 at a height that is adjusted by the height adjustment screw 41, wherein a portion where the height adjustment screw 41 is operated for adjustment and a portion where the position fixing screw 42 is operated for fixing are formed on the same side as viewed from the platen 40.

**[0042]** According to the configuration described above, since a mechanism for adjusting the height of the platen 40 and a mechanism for fixing it relative to the bracket 50 are provided, it is possible to adjust the height of the platen 40 and fix it with high accuracy.

**[0043]** Further, since the operation of height adjustment and position fixing can be performed from the same side as viewed from the platen 40, it is possible to perform height adjustment and position fixing easily. For example, in the circumstances where the mechanism for height adjustment and the mechanism for position fixing are in different positions and one of them is hidden in the back of another member, it may be necessary to remove the other member in order to perform height adjustment and position fixing. In such a case, the operation for height adjustment and position fixing becomes very complicated. According to the configuration described above, since a portion where the height adjustment screw 41 is operated and a portion where the position fixing screw 42 is operated are on the same side as viewed from the platen 40, it suffices that work space is provided only in one direction of the platen 40 in order to adjust the respective mechanisms. Therefore, it is possible to perform height adjustment and position fixing more easily.

**[0044]** In addition, in the present embodiment, the height adjustment screw 41 and the position fixing screw 42 are formed on the same straight line.

**[0045]** Since it is not necessary to provide, for each

mechanism, space where each mechanism is provided, space is saved. Further, since adjustment and fixing can be performed with reference to the same straight line, the accuracy of height adjustment is improved.

**[0046]** Further, in the present embodiment, the height adjustment screw 41 includes the lower surface 41b which passes through a through hole (e.g., through hole 43) for height adjustment screw provided in the platen 40 so that the side wall of the screw is screwed to the inner wall of the through hole for height adjustment screw, and is brought into contact with the bracket 50, by turning the height adjustment screw 41, the protrusion height of the lower surface 41b of the height adjustment screw 41 protruding from the platen 40 through the bracket 50 side is adjusted, so that the height of the platen 40 relative to the bracket 50 is adjusted, and the position fixing screw 42 is formed to pass through a through hole (e.g., through hole 43) for position fixing screw provided in the platen 40.

**[0047]** Since the height adjustment screw 41 and the position fixing screw 42 can be realized with a simple member, a screw, it is possible to simplify the configuration of the apparatus.

**[0048]** Further, in the present embodiment, the through hole for height adjustment screw and the through hole for position fixing screw are the same through hole (through hole 43), the inner through hole 44 of which center axis is a straight line parallel to the depth direction of the through hole 43 is provided in the height adjustment screw 41, and the position fixing screw 42 has the flange portion 42a having a diameter larger than the diameter of the inner through hole 44, and the extended portion 42b which passes through the inner through hole 44 and is screwed to the female screw 51 provided in the bracket 50.

**[0049]** Therefore, it is possible to perform height adjustment and position fixing with a simple configuration and with a high degree of accuracy.

**[0050]** The present invention is not limited to each embodiment described above, various modifications may be made within the scope of the claims, and embodiments obtained by combining technical means disclosed in respective different embodiments are also included in the technical scope of the present invention.

#### Industrial Applicability

**[0051]** The present invention may be utilized in the manufacturing field of a printing apparatus.

#### Reference Signs List

#### **[0052]**

- 1: Medium (Recording medium)
- 10: Head
- 20: Carriage
- 30: Guide mechanism
- 40: Platen (Mounting table)

- 41: Height adjustment screw (Height adjustment mechanism)
- 41a: Side wall
- 41b: Lower surface (Contact part)
- 5 41c: Engaging groove
- 42: Position fixing screw (Position fixing mechanism)
- 42a: Flange portion
- 42b: Extended portion
- 43: Through hole (Through hole for height adjustment screw, Through hole for position fixing)
- 10 43a: Inner wall
- 44: Inner through hole
- 45: Nut (Position fixing mechanism)
- 50: Bracket (Support base)
- 15 51: Female screw
- 52: Male screw
- 60: Conveying roller
- 100: Printing apparatus

#### Claims

1. A printing apparatus, **characterized by** comprising:
  - 25 a mounting table on which a recording medium is placed;
  - a support base for supporting the mounting table;
  - a height adjustment mechanism for adjusting the height of the mounting table relative to the support base; and
  - 30 a position fixing mechanism for fixing the position of the mounting table relative to the support base at a height that is adjusted by the height adjusting mechanism,
  - 35 wherein a portion where the height adjustment mechanism is operated for adjustment and a portion where the position fixing mechanism is operated for fixing are on the same side as viewed from the mounting table.
2. The printing apparatus according to claim 1, **characterized in that** the height adjustment mechanism and the position fixing mechanism are on the same straight line.
- 45 3. The printing apparatus according to claim 1 or 2, **characterized in that**,  
 the height adjustment mechanism is a height adjustment screw including a contact part which passes through a through hole for height adjustment screw provided in the mounting table so that a side wall of the screw is screwed to an inner wall of the through hole for height adjustment screw, and which is brought into contact with the support base, by turning the height adjustment screw, the protrusion height of the contact part protruding from the mounting table to the support base side is adjusted,

so that the height of the mounting table relative to  
the support base is adjusted, and  
the position fixing mechanism is a position fixing  
screw which passes through a through hole for po-  
sition fixing screw provided in the mounting table. 5

4. The printing apparatus according to claim 3, **char-  
acterized in that**,  
the through hole for height adjustment screw and the  
through hole for position fixing screw are the same 10  
through hole,  
an inner through hole of which center axis is a straight  
line parallel to the depth direction of the through hole  
for position fixing screw is provided in the height ad-  
justment screw, and 15  
the position fixing screw has a flange portion having  
a diameter larger than the diameter of the inner  
through hole, and an extended portion which passes  
through the inner through hole and is screwed to a  
female screw provided in the support base. 20

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Figure 1

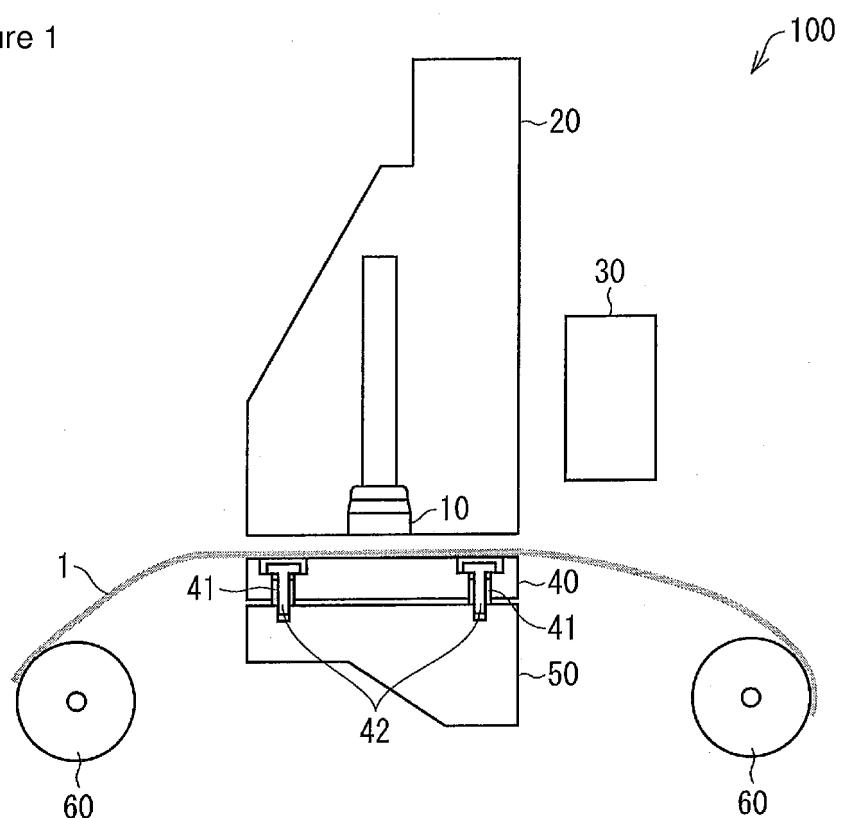


Figure 2

Figure 2A

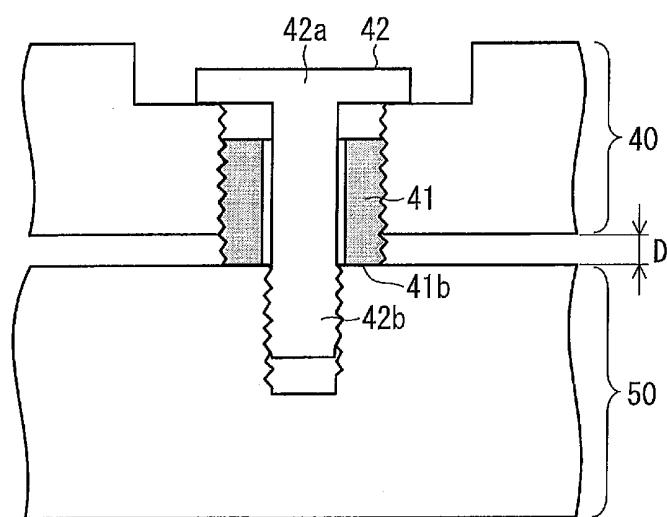


Figure 2B

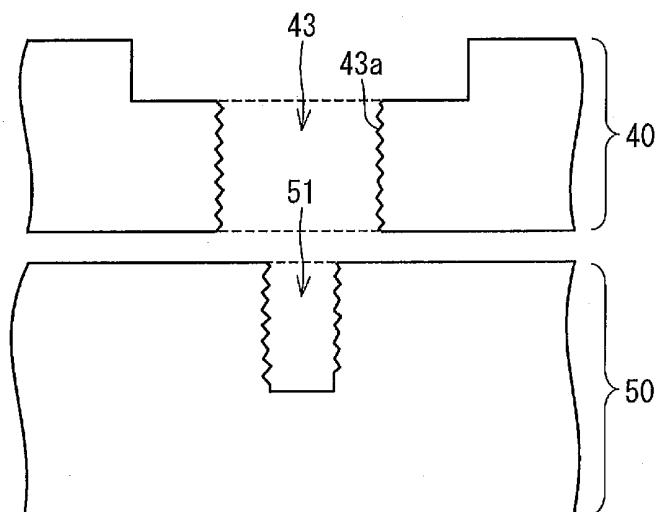


Figure 2C

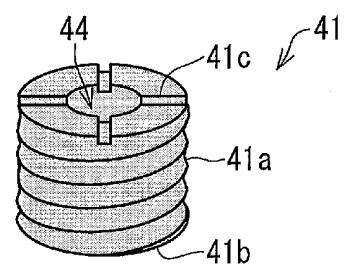


Figure 3

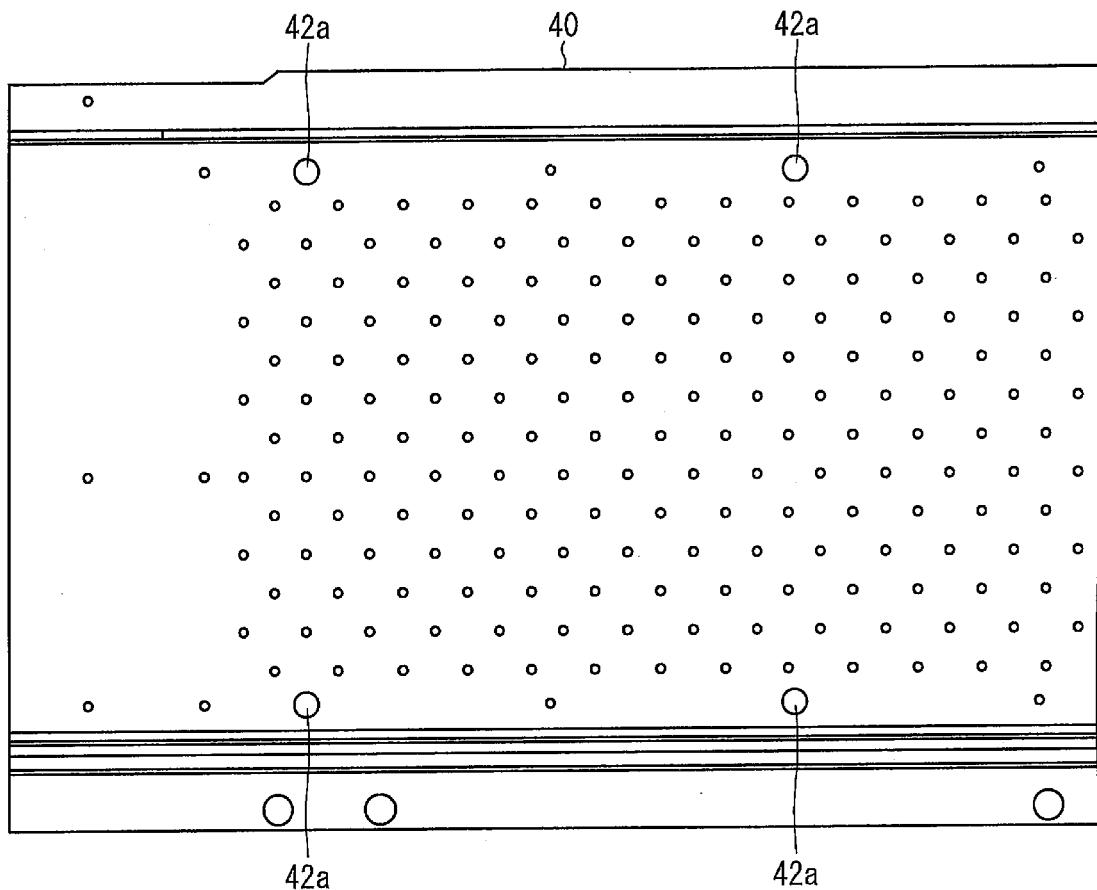
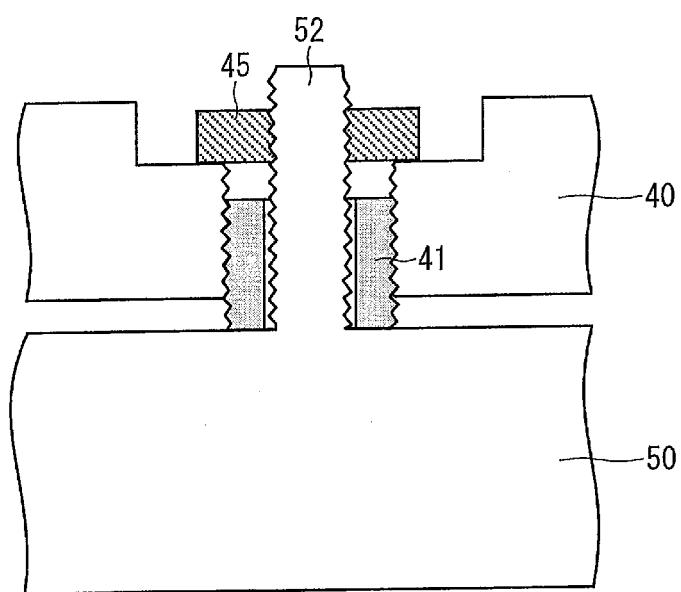


Figure 4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/081709

5	A. CLASSIFICATION OF SUBJECT MATTER B41J11/02 (2006.01) i		
	According to International Patent Classification (IPC) or to both national classification and IPC		
10	B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B41J11/00-11/70		
15	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 1996-2013 Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013		
20	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
25	C. DOCUMENTS CONSIDERED TO BE RELEVANT		
30	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
35	Y A	JP 2009-090640 A (Seiko Epson Corp.), 30 April 2009 (30.04.2009), paragraphs [0067] to [0075], [0082] to [0085]; fig. 6 & US 2009/0079795 A1 & CN 101391520 A	1, 2 3, 4
40	Y A	JP 11-208052 A (Fuji Photo Film Co., Ltd.), 03 August 1999 (03.08.1999), paragraphs [0014] to [0033]; fig. 2 to 5 (Family: none)	1, 2 3, 4
45	A	JP 2000-280545 A (Mutoh Industry Ltd.), 10 October 2000 (10.10.2000), entire text; all drawings & DE 10014010 A	1
50	<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
55	* 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		
55	Date of the actual completion of the international search 04 March, 2013 (04.03.13)	Date of mailing of the international search report 12 March, 2013 (12.03.13)	
	Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer	
	Facsimile No.	Telephone No.	

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

INTERNATIONAL SEARCH REPORT		International application No. PCT/JP2012/081709
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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**Patent documents cited in the description**

- JP 11208052 A [0003]