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(54) **Print carriage assembly and method for mounting a print head holder thereon**

Druckkopfschlittenanordnung und Verfahren um darauf einen Druckkopfhalter zu montieren

Ensemble d'un chariot d'impression et méthode pour le montage d'un support de tête d'impression sur l'ensemble

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Description

FIELD OF THE INVENTION

[0001] The present invention is related to a printing device such as a printing or copying system employing multiple print heads containing discharge elements for image-wise forming dots of a marking substance on an image-receiving member. Examples of such printing devices are inkjet printers and toner-jet printers. Hereinafter reference will be made to inkjet printers. The present invention is also related to a method for mounting at least one print head on a print carriage assembly according to the first part of claim 8.

BACKGROUND OF THE INVENTION

[0002] Print heads employed in inkjet printers and the like usually each contain a plurality of discharge elements arranged in (a) linear array(s) parallel to the propagation direction of the image-receiving member or in other words the sub scanning direction. The discharge elements usually are placed substantially equidistant. In operation, the discharge elements are controlled to image-wise discharge ink droplets on an image-receiving member such as to form columns of image dots of ink in relation to the linear arrays. The discharge activation may be thermally or thermally assisted and/or mechanically or mechanically assisted and/or electrically or electrically assisted, including piezoelectrically. In scanning inkjet printers, the print heads are supported by a print carriage which is movable over a guide member across the image-receiving member, i.e. in the direction perpendicular to the propagation direction of the image-receiving member or in other words the main scanning direction. In operation a scanning inkjet printer forms a matrix of image dots of ink corresponding to a part of an image by scanning the print heads at least once, optionally bi-directionally, over the image-receiving member in the main scanning direction. After a first matrix is completed the image-receiving member is displaced such as to enable the forming of the next matrix. This process may be repeated till the complete image is rendered.

[0003] Alignment of the print head(s) in inkjet printers, particularly in the sub scanning direction, is of utmost importance as dot positioning errors may cause visual disturbances in the image formed. In scanning inkjet printers having multiple print heads, contiguous dots may originate from different print heads. Examples of such inkjet printers include multi-colour printers having at least one print head per colour, and multi-colour printers having at least one print head for the black process colour and at least one print head for the other process colours, and monochrome printers having multiple print heads for the black process colour. Not only alignment of the respective print heads in such printers, particularly in the sub scanning direction, is of utmost importance but also accurate positioning of the print heads relative one to

another. The alignment of the respective print heads relative one to another in the sub scanning direction can be controlled by accurately positioning the print heads with respect to a reference position. This reference position is typically the guide member where the print carriage assembly supporting the print heads is suspended on. This is a challenging problem as the positioning accuracy should be in the range of some hundreds of micrometers, preferably some tens of micrometers, while the distance between the guide member and the respective print heads is typically in the range from a few centimetres to some tens of centimetres. An approach to tackle this problem could be providing a print carriage assembly comprising built-in means for mounting the respective print heads to the assembly. As this built-in mounting means is located at fixed positions within the assembly, the position with respect to the points of suspension of the assembly is also determined. Therefore the positioning accuracy of the print heads depends on the dimensional tolerances used to manufacture the print carriage assembly. Consequently, to obtain a high positioning accuracy for the respective print heads, the print carriage assembly should be manufactured with a high precision, i.e. the respective parts and/or components of the assembly should be manufactured and positioned using dimensional tolerances typically in the order of micrometers or less. Although it may be possible to manufacture print carriage assemblies with such stringent dimensional requirements, the costs involved would be too high to be of commercial use.

[0004] In European patent application EP 1145860, a print head assembly is disclosed which may be easily installed and removed from a fixed position on the printer wall via a snap-fit arrangement using resilient side-fingers.

OBJECTS OF THE INVENTION

[0005] It is an object of the invention to provide a printing device having a print carriage assembly, movable in the main scanning direction, wherein the print head(s) can be mounted on the assembly at such position as to obtain a predetermined alignment and positioning accuracy of the respective print head(s), in particular in the sub scanning direction.

[0006] It is another object of the invention to provide a method for mounting print head(s) on a print carriage assembly to obtain a predetermined alignment and positioning accuracy of the respective print head(s).

[0007] Once the print head holder is attached to the print carriage assembly, displacement of the print head holder should be impossible or at least limited.

SUMMARY OF THE INVENTION

[0008] For the alignment of a print head in a printing or copying device, the print heads should be attached to the print carriage assembly at a predetermined position.

The present invention suggests the use of a print head holder which can be mounted at a predetermined position to obtain proper alignment, particularly in the sub scanning direction. This predetermined alignment position does not coincide with a same fixed position within each assembly but is located at a predetermined distance from a reference position. This reference position may be a fixed position in the print carriage assembly, such as e.g. an edge thereof. The reference position may also be a fixed location within the printing device. In case of scanning printing devices, this reference position may be the guide member where the print carriage assembly supporting the print heads is suspended on. By doing so, it is avoided that differences in the dimensions of the print carriage assembly, e.g. introduced in the manufacturing process, cause a shift in the position of a print head and consequently result in a misalignment which is too large to be compensated for. Therefore according to a first aspect of the present invention, a printing device is defined according to claim 1.

[0009] In case the printing device is a scanning printing device, a guide member is provided extending across the image-receiving member. In the latter case, the print carriage is movable across the guide member in the main scanning direction, Any marking substance can be used including ink and toner.

The image-receiving member may be an intermediate member or a medium. The intermediate member may be an endless member, such as a belt or drum, which can be moved cyclically. The medium can be in web or sheet form and may be composed of e.g. paper, film, cardboard, label stock, plastic or textile.

[0010] According to the invention, the predetermined position of the or each print head for obtaining proper alignment in the sub scanning direction is determined with respect to the guide member. The guide member may comprise at least one rod, extending across said image receiving member in the main scanning direction, for guiding the print carriage assembly in reciprocation across the image-receiving member. To reduce friction, the print carriage assembly may be suspended on the guiding member by means of at least one bearing. For instance, in case the guide member comprises at least one rod, the print carriage assembly may be provided with at least one slide bearing for movably suspending said print carriage assembly on said at least one rod. In the latter case, the predetermined position of the or each print head for obtaining proper alignment in the sub scanning direction may be determined with respect to the at least one slide bearing, as defined in claim 4.

[0011] In another embodiment of the invention, the or each print head holder is mounted on the print carriage assembly by means of at least three resilient members. The use of a resilient member attached to the print head holder to mount the print head holder on the print head assembly at the predetermined position has an advantage as this facilitates the displacement of the print head

holder within the print carriage assembly in order to reach the predetermined position. Moreover, the use of a resilient member ensures that a good contact is provided with the assembly enabling to obtain a robust connection therewith. The use of three or more resilient members has the advantage that the print head holder is stable suspended in the print carriage assembly, or in other words it is difficult to displace the print head holder once mounted to the assembly. By consequence alignment can be maintained even after extended use of the printing device. The resilient member is preferably a spring, more preferable a leaf spring.

[0012] Each print head holder may comprise means for adjusting the position of the print heads attached thereto over a limited distance in the sub scanning direction with respect to the print head holder. This distance may be less than half the discharge element pitch. For instance a discharge element pitch of about 42 μm may be used which enables to print at a resolution of 600dpi. In the latter case the said limited distance is less than 21 μm . An advantage thereof is that one can compensate for dimensional variation from print head to print head, e.g. within the print carriage assembly when employing multiple print heads, or for instance after replacement of a print head.

[0013] In another aspect of the invention, a method is disclosed for mounting at least one print head on a print carriage assembly of a printing device according to claim 8.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Figure 1 depicts a perspective view of a scanning inkjet printer comprising a print carriage assembly according to an embodiment of the present invention.

Figure 2 depicts a more detailed view of the print carriage assembly of figure 1 without print heads and print head holders.

Figure 3 depicts a print head holder according to an embodiment of the present invention.

Figure 4 depicts the print carriage assembly of figure 2 with print head holders as in figure 3.

Figure 5 depicts a perspective view of a mounting set-up for mounting print head holders on a print carriage assembly according to an embodiment of the present invention.

Figure 6 depict the position and release mechanism of the print head holder with respect to the Z-sledge which is part of the mounting set-up of figure 4.

DETAILED DESCRIPTION OF THE INVENTION

[0015] In relation to the appended drawings, the present invention is described in detail in the sequel. Several embodiments are disclosed. It is apparent however

that a person skilled in the art can imagine several other equivalent embodiments or other ways of executing the present invention, the scope of the present invention being limited only by the terms of the appended claims. In particular, the present invention is not limited to inkjet or toner-jet printers of the scanning type, i.e. printers where the print heads are supported by a print carriage which is movable across the image-receiving member, but is also applicable to printers which do not perform a scanning operation in the main scanning direction. The print heads of these latter type printers may have a width, i.e. the maximal distance between discharge elements of a print head in the main scanning direction, equal to or larger than the width, i.e. the dimension in the main scanning direction, of the image-receiving member.

[0016] The printing device of fig.1 is a scanning inkjet printer comprising a print carriage assembly (10) which can be moved in reciprocation in the main scanning direction Y over a guide member. The guide member comprises two rods (12) extending across the image-receiving member (14). In operation, the image-receiving member is fed by feeding means (not shown) in the sub scanning direction X. A number of print heads are mounted on the print carriage assembly using print head holders (not shown). The print head holders as well as the print carriage assembly will be described in more detail in fig. 2 and 3. In this example 10 print heads (16) are mounted on the print carriage assembly for demonstrating the invention. In practice an arbitrary number of print heads may be employed. Each print head (16) is formed integrally with an ink cartridge which is the only part visible in figure 1. On the bottom side of the ink cartridge and on the bottom side of the print carriage assembly (10), i.e. facing the image-receiving member (14), each print head is provided with at least one array of discharge elements, so-called nozzles, and an associated drive system which may for example be formed by piezoelectric actuators and is configured to cause the individual discharge elements to image-wise discharge ink droplets at appropriate timings. As depicted in figure 1, the respective print heads are placed in a particular configuration. The respective print heads may be placed on the print carriage assembly adjacent to each other but such that the discharge elements of the respective print heads are positioned in a staggered configuration instead of in-line. For instance, this may be done to increase the print resolution or to enlarge the effective print area, which can be addressed in a single scan in the main scanning direction. Alternatively the respective print heads may be placed parallel to each other such that corresponding discharge elements of the respective print heads are positioned in-line in the main scanning direction. Such a parallel positioning of the print heads with corresponding in-line placement of the discharge elements is advantageous to increase productivity and/or improve print quality.

[0017] In figures 2 and 4, a perspective view of a print carriage assembly (10) is depicted with its bottom side

up, i.e. the side facing the image receiving member when being mounted on a printing device. Figure 2 depicts the print carriage assembly without print head holders (25), while figure 4 depicts the print carriage assembly with print head holders. For the suspension and accurate positioning of the print carriage assembly on the guide member, i.e. the two parallel rods (12) of the printing device of figure 1, the print carriage is provided with three slide bearings (21) (22) (23). The carriage is manufactured from a sheet metal. The thickness of the sheet metal is typically in the range from 0.5mm to 3 mm, such as e.g. 1 mm. The metal where the carriage is composed of may be steel, or stainless steel or aluminium or any other metal which is readily available and can be easily manufactured. To protect the carriage against wear, corrosion or other external influences, the metal may be coated with a metal coating, such as e.g. Nickel, or a coating of a metal alloy, e.g. NiCr. The coating has typically a thickness from 1 μm to 20 μm , such as e.g. 6 μm . Five sheet metal walls (24), positioned parallel to the sub scanning direction (i.e. the X direction) divide the print carriage assembly into six compartments for accommodating the print head holders (25). The distance A is the distance between two adjacent walls. As indicated in Figure 3, the distance B is the width of the print head holder without resilient members attached thereto, while the distance D is the total width of the print head holder with the resilient members attached thereto in released state. The distance A and the widths B and D of the print head holder are chosen dependent one upon the other in order to enable to accurately insert and position the print head holder in the corresponding compartment of the print carriage assembly defined by two adjacent walls. This means that the width B is chosen smaller than the distance A, while D is chosen equal to or larger than the distance A. Preferably D-A is a number in the range from 0.1 to 0.4mm. By choosing the same width for each print head holder and the same width for each print head, both print head holders and print head can be easily interchanged yielding an increased flexibility. In this example, each compartment accommodates one or two print head holders. In this example, to each print head holder a print head can be detachably attached. Therefore, 10 print head holders are mounted on the print carriage assembly at predetermined positions to ensure proper positioning of 10 print heads (not shown in figure 2) associated therewith. Leaf springs connect the respective print head holders to the respective sheet metal compartment walls (24). The print head holder will be described in more detail in conjunction with figure 3.

Figure 3 depicts a print head holder (25) having three leaf springs (26) attached thereto. Two springs are attached to the upper sides of the print head holder. The third spring is attached to the centre bottom of the print head holder. This configuration with three leaf springs has the advantage to be quite rigid once being mounted on the print carriage assembly, or in other words only very limited displacement such, as tilting, rotating or

translating, of the print head holder can be effectuated after mounting when using substantial force. The print head holder may be composed of a metal such as aluminium and is accommodated such that a print head can be easily attached thereto, e.g. by clicking. The print head holder is manufactured with high precision using injection moulding. The leaf springs are composed of a metal or a metal alloy and have a thickness in the range from 0.2 to 1 mm, preferably 0.4 mm. The width C of the leaf springs is typically in the range from 2 to 10 mm, such as 3 mm. The use of leaf springs as resilient members is advantageous as a well-defined contact area can be created between each spring and the print carriage assembly. A well-defined contact area, enables to create a robust connection between each spring and the print carriage assembly, e.g. by welding, glueing or irradiation. It is observed however that even when there is a gap between the spring and the print carriage assembly which is smaller than 100 μm , or more preferably smaller than 50 μm , a robust connection can still be established therebetween by means of laser welding. Each of the leaf springs attached to an upper side of the print head holder are attached to the side walls or sheet metal walls (24) of the print carriage assembly. The centre bottom leaf spring is attached to the bottom of the print carriage assembly. An example of a suitable metal alloy for the leaf spring is NiCr, but the invention is in no way limited thereto.

[0018] With reference to the drawings, according to the present invention, a method is disclosed for mounting a plurality of print heads on a print carriage assembly of a printing device using a plurality of print head holders. The print carriage assembly to start from is a partially completed one and comprises a metal base frame defining the contours of the assembly, points of suspension for suspending the print carriage assembly on the printing device, and mounting walls dividing the print carriage assembly in compartments for accommodating the print head holders. An example of such a configuration is the print carriage assembly of figure 2 without the print head holders. In the print carriage assembly of figure 2, three points of suspension are provided in the form of slide bearings (21) (22) (23) enabling to move the print carriage assembly in reciprocation across a guide member of a printing device in the main scanning direction. In this example, the guide member, in order to accommodate the print carriage, preferably comprises two parallel rods (12) extending in the main scanning direction for suspending the print carriage thereon by means of the slide bearings. A position in the sub scanning direction can be defined with respect to at least one of the rods or with respect to the point(s) of suspension associated therewith. In particular the imaginary axis connecting the slide bearing (21) with slide bearing (22) may be taken as a reference to determine the position in the sub scanning direction. In order to mount the print head holders at predetermined positions with respect to this reference line on the print carriage assembly, use is made of a mounting set-up

(41) as in figure 4. As shown in figure 4, the mounting set-up comprises mounting means for suspending the print carriage assembly thereon in a well-defined manner. In this example the mounting means comprises a first rod (42) having dimensions matching the dimensions of the slide bearings (21) (22) of the print carriage assembly. The mounting means may further comprise a second rod (not shown) parallel to the rod (42) for accommodating slide bearing (23). Other mounting means may be used provided the print carriage can be mounted on the mounting set-up in a stable and well-defined way enabling to accurately determine a position within the print carriage assembly. Once mounted on the mounting set-up the print carriage assembly can be accurately displaced in the X-Y plane. In order to mount a print head holder, e.g. the print head holder of figure 3, on the print carriage assembly, the print head holder is temporarily clamped on a Z-sledge (44), i.e. a sledge which can be accurately displaced in the Z-direction only. This is described in more detail in conjunction with figure 5. The movement of the Z-sledge with the print head holder attached thereto combined with the displacement capabilities of the mounting set-up in the X-Y plane enables to bring the print head holder at its predetermined position with respect to the reference line. The positioning accuracy is within 5 μm , although in practice a positioning accuracy within 200 μm may be satisfactory as an appropriate discharge element selection on respective print heads reduces the possible gap or overlap between the respective print heads. The alignment requirements for the print head holders in the sub-scanning direction are however more stringent, but nevertheless are met. The maximal misalignment may be 40 μm for a print head holder having a width of 32 mm. Once in place, lasers including focusing optics (43) are used to weld the respective leaf springs attached to the print head holder to the print carriage assembly. Subsequently, the print head holder is released from the Z-sledge thereby ending the mounting process of the print head holder. The lasers used are pulsed Nd:YAG lasers such as for instance HP54p from "Haas Laser". The laser spot is typically a spot with a diameter of 600 μm . It is further observed that the gap between the lug of a leaf spring and the print carriage assembly should be at most 100 μm . Typically one or two spot welds are used to connect each of the leaf springs with the print carriage assembly. To create a spot weld, the pulse duration is typically in the range from 5 to 10 ms, while the pulse energy per spot was typically in the range from 5 to 10 Joule.

[0019] Referring to figure 5, the mechanism to clamp a print head holder to a Z-sledge and afterwards release it therefrom can be described. A print head holder (25) is shown in released state together with a Z-sledge (44). To clamp the print head holder against the Z-sledge, the Z-sledge is provided with pressure pieces, e.g. four spring-loaded pins (52) and a spring loaded pulling hook (51). To release the print head holder from the Z-sledge, the Z-sledge is unlocked and pushed downwards such

that the hook releases the print head holder.

Claims

1. A printing device comprising at least one print head (16) for image-wise forming dots of a marking substance on an image-receiving member (14), at least one print head holder associated with the at least one print head for detachably attaching the at least one print head thereto, a print carriage assembly (10) for supporting the at least one print head holder, and a guide member (12) extending across the image-receiving member for guiding the print carriage assembly,
characterised in that
each of the at least one print head holder is mounted on the print carriage assembly at a predetermined distance from the guide member by means of at least one resilient member.
2. The printing device as recited in claim 1, wherein the guide member comprises at least one rod extending across the image receiving member in the main scanning direction.
3. The printing device as recited in claim 2, wherein the print carriage assembly further comprises at least one slide bearing for movably suspending said print carriage assembly on the at least one rod.
4. A printing device comprising at least one print head for image-wise forming dots of a marking substance on an image-receiving member, at least one print head holder associated with the at least one print head for detachably attaching the at least one print head thereto, a print carriage assembly for supporting the at least one print head holder, and a guide member extending across the image-receiving member for guiding the print carriage assembly,
characterised in that
the guide member comprises at least one rod extending across the image receiving member in the main scanning direction, the print carriage assembly comprises further at least one slide bearing for movably suspending said print carriage assembly on the at least one rod, and further **characterised in that**
each of the at least one print head holder is mounted on the print carriage assembly at a predetermined distance from the at least one slide bearing by means of at least one resilient member.
5. The printing device as recited in claim 1, wherein each of the print head holders is mounted on the print carriage assembly by means of at least three resilient members.
6. The printing device as recited in any preceding claim,

wherein each print head holder comprises means for adjusting the position of the print heads attached thereto.

7. The printing device as recited in any preceding claim, wherein the resilient member is a leaf spring.
8. A method for mounting at least one print head on a print carriage assembly of a printing device using at least one print head holder for detachably attaching the at least one print head thereto, wherein at least one resilient member is attached to each of said at least one print head holder,
characterised in that,
the method comprising the step of mounting each of the at least one print head holder to the print carriage assembly by positioning the print head holder in said print carriage assembly at a predetermined distance from a point of suspension of the print carriage assembly and attaching the at least one resilient member attached to the print head holder to the print carriage assembly.
9. The method as recited in claim 8, wherein the at least one resilient member is attached to the print carriage assembly by means of welding.
10. The method as recited in claim 8, wherein the print carriage assembly further comprises at least one slide bearing for movably suspending the print carriage assembly on the printing device, the method further comprising the step of determining the predetermined distance with respect to the at least one slide bearing.
11. A printing device as recited in one of claims 1-7, wherein said printing device is an ink jet printer.

Patentansprüche

1. Druckvorrichtung, aufweisend wenigstens einen Druckkopf (16) zum bildweisen Bilden von Punkten einer Markierungssubstanz auf einem Bildempfangselement (14), wenigstens einen dem wenigstens einen Druckkopf zugeordneten Druckkopfhalter zum lösbaren Anbringen des wenigstens einen Druckkopfes daran, eine Druckwagenanordnung (10) zum Tragen des wenigstens einen Druckkopfhalters und ein sich über das Bildempfangselement erstreckendes Führungselement (12) zum Führen der Druckwagenanordnung,
dadurch gekennzeichnet, daß
jeder besagte wenigstens eine Druckkopfhalter an der Druckwagenanordnung in einem vorbestimmten Abstand von dem Führungselement mittels wenigstens eines elastischen Elements befestigt ist.

2. Druckvorrichtung nach Anspruch 1, wobei das Führungselement wenigstens einen Stab aufweist, der sich über das Bildempfangselement in der Hauptabtastrichtung erstreckt.
3. Druckvorrichtung nach Anspruch 2, wobei die Druckwagenanordnung weiter wenigstens ein Gleitlager zum bewegbaren Aufhängen der besagten Druckwagenanordnung an dem wenigstens einen Stab aufweist.
4. Druckvorrichtung, aufweisend wenigstens einen Druckkopf zum bildweisen Bilden von Punkten einer Markierungssubstanz auf einem Bildempfangselement, wenigstens einen dem wenigstens einen Druckkopf zugeordneten Druckkopfhalter zum lösbaren Anbringen des wenigstens einen Druckkopfes daran, eine Druckwagenanordnung zum Tragen des wenigstens einen Druckkopfhalters und ein sich über das Bildempfangselement erstreckendes Führungselement zum Führen der Druckwagenanordnung,
dadurch gekennzeichnet, daß
das Führungselement wenigstens einen Stab aufweist, der sich über das Bildempfangselement in der Hauptabtastrichtung erstreckt, daß die Druckwagenanordnung weiter wenigstens ein Gleitlager zum bewegbaren Aufhängen der besagten Druckwagenanordnung an dem wenigstens einen Stab aufweist, und weiter **gekennzeichnet dadurch, daß** jeder besagte wenigstens eine Druckkopfhalter an der Druckwagenanordnung an einem vorbestimmten Abstand von dem wenigstens einem Gleitlager mittels wenigstens eines elastischen Elements befestigt ist.
5. Druckvorrichtung nach Anspruch 1, wobei jeder der Druckkopfhalter an der Druckwagenanordnung mittels wenigstens drei elastischer Elemente befestigt ist.
6. Druckvorrichtung nach einem der vorstehenden Ansprüche, wobei jeder Druckkopfhalter Mittel zum Einstellen der Position der daran angebrachten Druckköpfe aufweist.
7. Druckvorrichtung nach einem der vorstehenden Ansprüche, wobei das elastische Element eine Blattfeder ist.
8. Verfahren zum Befestigen wenigstens eines Druckkopfs an einer Druckwagenanordnung einer Druckvorrichtung, unter Verwenden wenigstens eines Druckkopfhalters zum lösbaren Anbringen des wenigstens einen Druckkopfes daran, wobei wenigstens ein elastisches Element an jedem besagten wenigstens einen Druckkopfhalter angebracht ist,
dadurch gekennzeichnet, daß

das Verfahren den Schritt des Befestigens jedes besagten wenigstens einen Druckkopfhalters an der Druckwagenanordnung durch Positionieren des Druckkopfhalters in der besagten Druckwagenanordnung an einem vorbestimmten Abstand von einem Aufhängepunkt der Druckwagenanordnung und Anbringen des wenigstens einen an dem Druckkopfhalter angebrachten elastischen Elements an der Druckwagenanordnung aufweist.

9. Verfahren nach Anspruch 8, wobei das wenigstens eine elastische Element an der Druckwagenanordnung mittels Schweißen angebracht wird.
10. Verfahren nach Anspruch 8, wobei die Druckwagenanordnung weiter wenigstens ein Gleitlager zum bewegbaren Aufhängen der Druckwagenanordnung an der Druckvorrichtung aufweist und das Verfahren weiter den Schritt des Festlegens des vorbestimmten Abstandes in Bezug auf das wenigstens eine Gleitlager aufweist.
11. Druckvorrichtung nach einem der Ansprüche 1 bis 7, wobei genannte Druckvorrichtung ein Tintenstrahldrucker ist.

Revendications

1. Dispositif d'impression comprenant au moins une tête d'impression (16) pour former, en conformité avec une image, des points d'une substance de marquage sur un organe récepteur d'image (14), au moins un support de tête d'impression étant associé à la au moins tête d'impression pour fixer de façon amovible la au moins tête d'impression à celui-ci, un ensemble de chariot d'impression (10) pour supporter le au moins support de tête d'impression et un organe de guidage (12) s'étendant le long de l'organe récepteur d'image pour guider l'ensemble du chariot d'impression, **caractérisé en ce que** chacun du au moins un support de tête d'impression est monté sur l'ensemble du chariot d'impression à une distance prédéterminée de l'organe de guidage au moyen d'au moins un organe élastique.
2. Dispositif d'impression selon la revendication 1, dans lequel l'organe de guidage comprend au moins une tige s'étendant le long de l'organe récepteur d'image dans la direction principale de balayage.
3. Dispositif d'impression selon la revendication 2, dans lequel l'ensemble du chariot d'impression comprend en outre au moins un palier glisseur pour suspendre de façon mobile ledit ensemble du chariot d'impression sur la au moins une tige.
4. Dispositif d'impression comprenant au moins une tête

- te d'impression pour former, en conformité avec une image, des points d'une substance de marquage sur un organe récepteur d'image, au moins un support de tête d'impression étant associé à la au moins tête d'impression pour y fixer de façon amovible la au moins tête d'impression, un ensemble de chariot d'impression pour supporter le au moins support de tête d'impression et un organe de guidage s'étendant le long de l'organe récepteur d'image pour guider l'ensemble du chariot d'impression, **caractérisé en ce que** l'organe de guidage comprend au moins une tige s'étendant le long de l'organe récepteur d'image dans la direction principale de balayage, l'ensemble du chariot d'impression comprend en outre au moins un palier glisseur pour suspendre de façon mobile ledit ensemble du chariot d'impression sur la au moins une tige, et **caractérisé en outre en ce que** chacun du au moins support de tête d'impression est monté sur l'ensemble du chariot d'impression à une distance prédéterminée du au moins un palier glisseur au moyen d'au moins un organe élastique.
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5. Dispositif d'impression selon la revendication 1, dans lequel chacun des supports de têtes d'impression est monté sur l'ensemble du chariot d'impression au moyen d'au moins trois organes élastiques.
 6. Dispositif d'impression selon l'une quelconque des revendications précédentes, dans lequel chaque support de tête d'impression comprend des moyens pour ajuster la position des têtes d'impression qui y sont fixées.
 7. Dispositif d'impression selon l'une quelconque des revendications précédentes, dans lequel l'organe élastique est un ressort à lames.
 8. Procédé de montage d'au moins une tête d'impression sur un ensemble de chariot d'impression d'un dispositif d'impression utilisant au moins un support de tête d'impression pour y fixer de façon amovible la au moins une tête d'impression, où au moins un organe élastique est fixé sur chacun dudit au moins un support de tête d'impression, **caractérisé en ce que** le procédé comprend l'étape de montage de chacun du au moins support de tête d'impression sur l'ensemble du chariot d'impression en positionnant le support de tête d'impression dans l'ensemble du chariot d'impression à une distance prédéterminée d'un point de suspension de l'ensemble du chariot d'impression et en fixant le au moins organe élastique fixé sur le support de tête d'impression sur l'ensemble du chariot d'impression.
 9. Procédé selon la revendication 8, dans lequel le au moins un organe élastique est fixé sur l'ensemble du chariot d'impression par soudage.
 10. Procédé selon la revendication 8, dans lequel l'ensemble du chariot d'impression comprend en outre au moins un palier glisseur pour suspendre de façon mobile l'ensemble du chariot d'impression sur le dispositif d'impression, le procédé comprenant en outre l'étape de détermination de la distance prédéterminée par rapport à au moins un palier glisseur.
 11. Dispositif d'impression selon l'une quelconque des revendications 1 à 7, dans lequel ledit dispositif d'impression est un imprimante à jet d'encre.

Figure 1

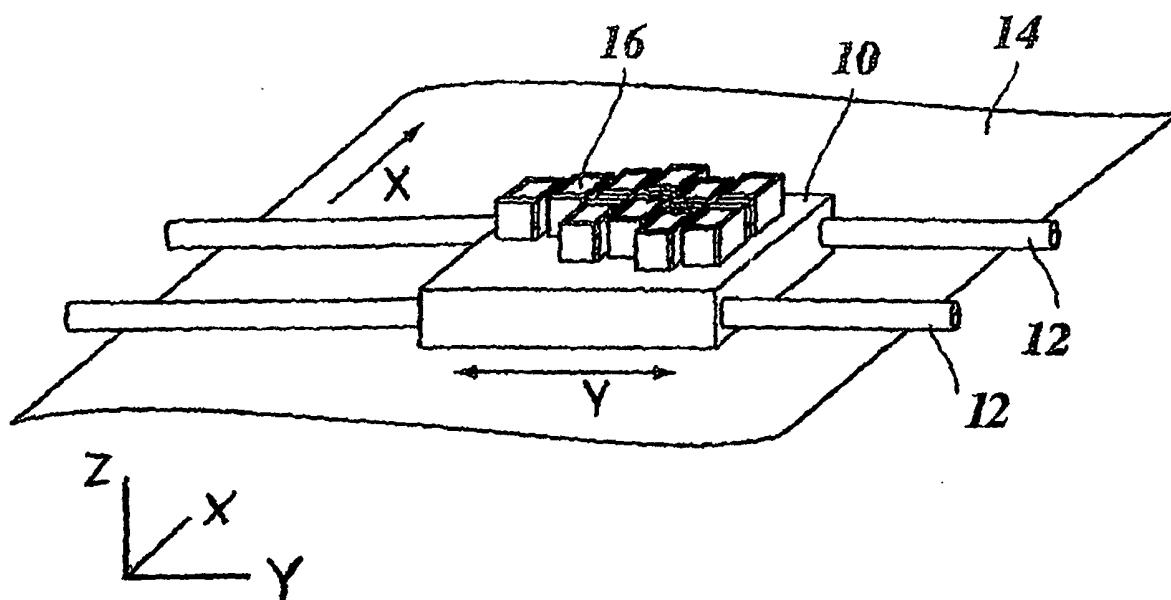


Figure 2

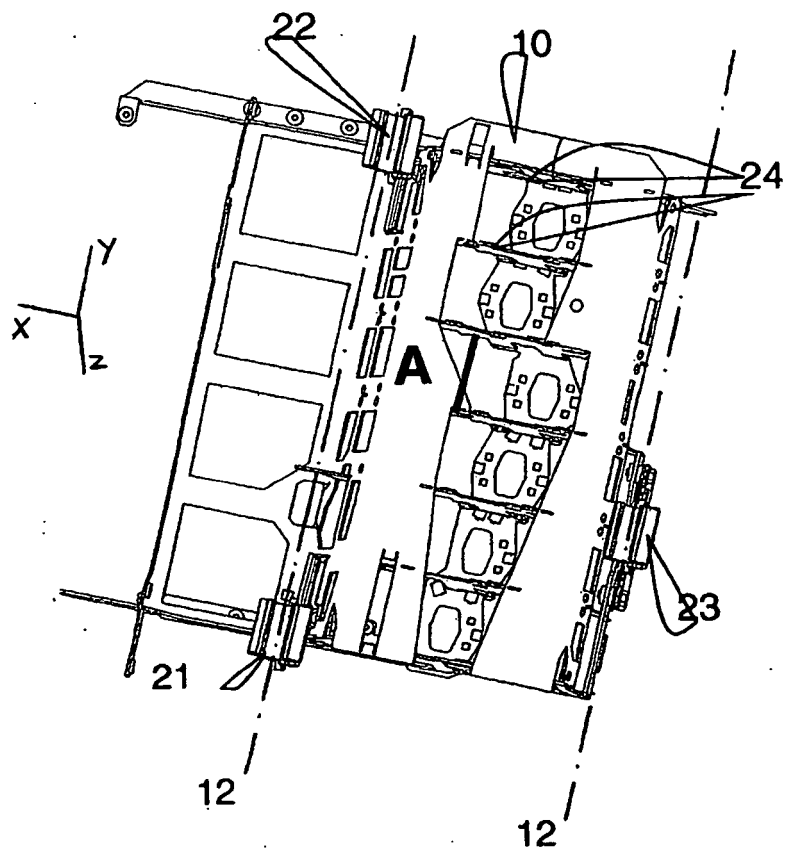


Figure 3

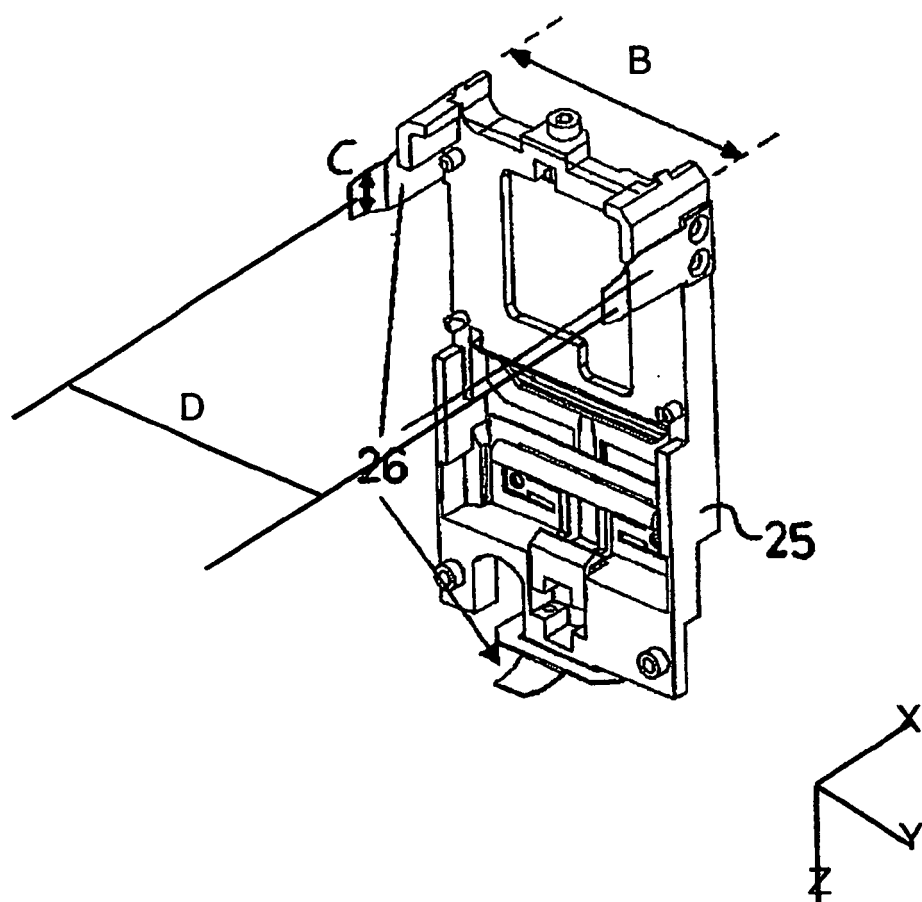


Figure 4

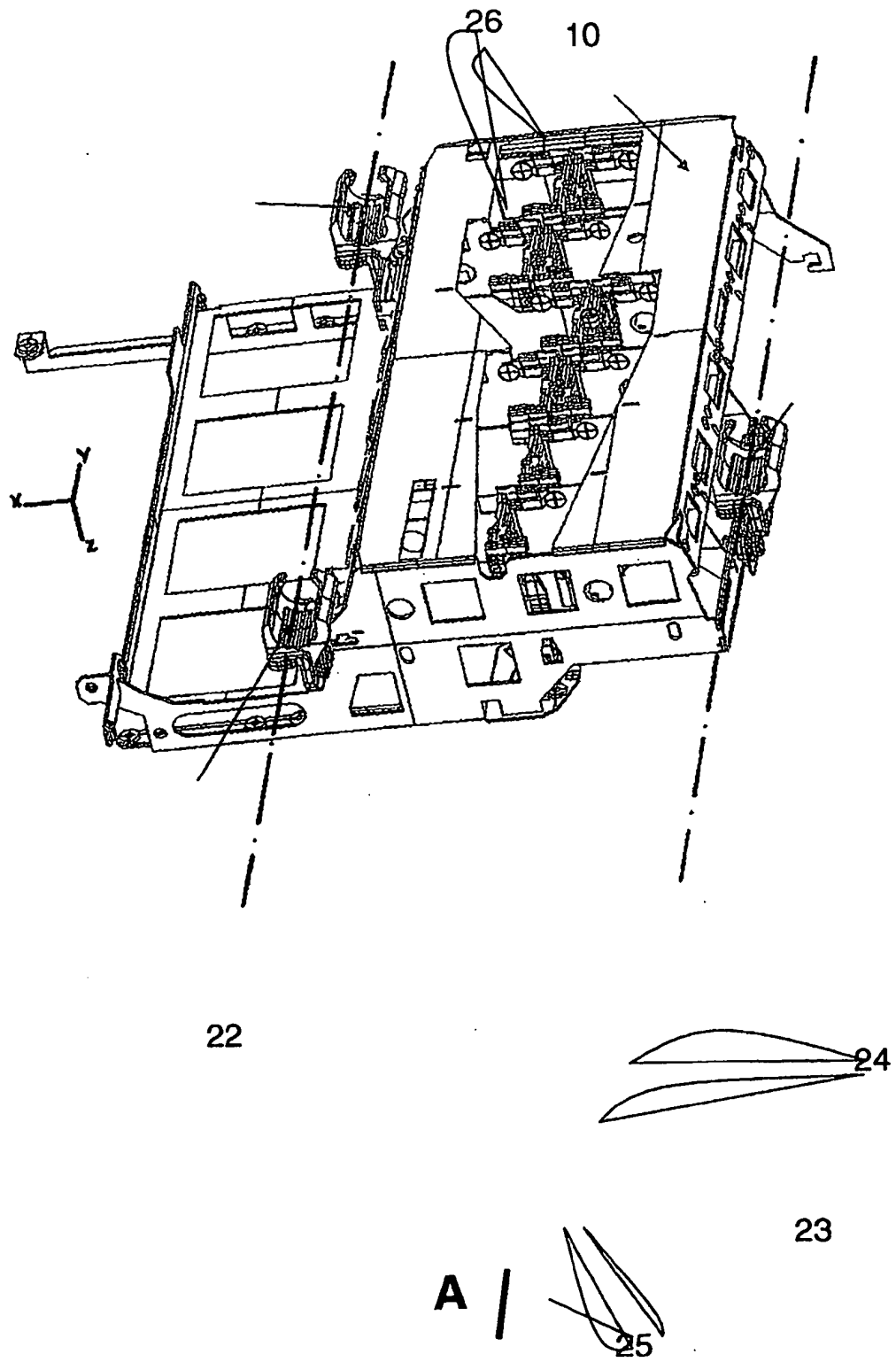


Figure 5

Figure

