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54 **A SHEET CONVEYOR FOR A PRINTER COMPRISING A FASTENER FOR SECURING A ROLLER ONTO A FRAME OF THE CONVEYOR**

57 An inkjet printer comprising a conveyor for transporting image receiving material comprising a roller comprising a support surface mounted rotatably with respect to a frame by means of a bearing and securing means for fixing the bearing to the frame, wherein the securing means comprise a longitudinal fastener secured at two different positions to the frame and extending at least partially around the bearing, such that the bearing is urged towards and/or against the frame, wherein the fastener is releasably secured to the frame at at least one of the two positions. This allows quick and low costs fastening of the rollers to the frame of the printer.

A SHEET CONVEYOR FOR A PRINTER COMPRISING A FASTENER FOR SECURING A ROLLER ONTO A FRAME OF THE CONVEYOR

BACKGROUND OF THE INVENTION

1. Field of the invention

5 The invention relates to a sheet conveyor for a printer, a printer comprising such a sheet conveyor, and a method for assembling a printer.

2. Description of Background Art

10 Rollers are commonly applied in conveyors in printers. A sheet conveyor in a printer may comprise an endless belt conveyor to support the sheet as it passes by a print head assembly. The endless belt conveyor provides a flat yet continuously moving print surface, which allows for productive printing. The belt is supported on a plurality of rollers mounted on a frame of the printer. An endless web printer commonly comprises transport rollers mounted on the printer's frame, which rollers directly contact the web
15 for transport it along the print head assembly for printing. The rollers are mounted rotatably onto the frame by means of bearings.

SUMMARY OF THE INVENTION

20 It is an object of the invention to provide an alternative sheet conveyor for a printer, preferably one which allows for quicker and/or easier assembly of said conveyor and printer.

In accordance with the present invention, a conveyor for transporting an image receiving material according to claim 1, a printer according to claim 9, and a method according to
25 claim 10 are provided. The conveyor comprises a roller comprising a support surface mounted rotatably with respect to a frame by means of a bearing and securing means for fixing the bearing to the frame. The securing means comprise a longitudinal fastener releasably secured at two different positions to the frame and extending at least partially around the bearing, such that the bearing is urged towards and/or against the frame.
30 The fastener is releasably secured to the frame at at least one of the two positions. The fastener allows for quick and easy assembly of the roller into the frame. The fastener may be secured at one end to the frame, after which the fastener may be extended over the bearing. The other end of the fastener is then releasably secured to the frame in such a manner that the fastener presses the bearing securely against the frame. The

fastener may be formed of relatively low costs materials, such as plate metal and provides for easy and quick assembly. Thereby the object of the present invention has been achieved.

5 More specific optional features of the invention are indicated in the dependent claims.

In an embodiment, the fastener is formed of a longitudinal plate with a releasable securing member at one of its longitudinal ends. The fastener is formed of a metal plate or sheet into an elongated strip. One end of the fastener comprises the releasable
10 securing member, such as a hook element, recess, protrusion, click mechanism etc. Preferably, the frame is provided with a complementary securing member for receiving the releasable securing member, for example a recess for engaging the hook element, a complementary shaped hook or protrusion, etc. Preferably, the fastener with its securing members is integrally formed, such that the fastener with its securing members is
15 formed of a single plate or sheet.

In an embodiment, the fastener comprises a spring element, preferably in the form of a leaf spring. The fastener is elastic, such that even in a stationary state it is able to exert a force onto the bearing to secure the bearing in the recess. This may be achieved by
20 providing the fastener with one or more spring elements, such as a leaf spring, gas spring, regular spring, etc. Preferably, the fastener is secured under pretension. The fastener is secured at the two different positions under pretension, i.e. in a different or elongated state with respect to its resting state. The pretension ensures a constant force on the bearing and can be easily achieved by sufficiently pulling on the fastener
25 after securing it at one of its ends to the frame. In another embodiment, the fastener comprises a leaf spring, which can be easily and cheaply formed of a plate or sheet material, such as metal or other suitable materials such as plastics or composite materials.

30 In an embodiment, the fastener extends circumferentially around the bearing between the different positions over an angle greater than 90° with respect to a rotation axis defined by the bearing. The pretensioned fastener presses the bearing into the recess with a force proportional to the pretension and the circumferential contact angle. Said angle is further sufficiently large that it allows for a tapered recess into which the bearing

may be easily inserted prior to securing it with the fastener. Effectively the bearing is surrounded or enclosed by the recess and the fastener.

In an embodiment, the releasable securing member comprises a hook element
5 configured to be received in a recess at a first of the two different positions on the frame. The hook element is configured to be received in and secured at a complementary securing member on the frame, for example a recess, such as a slot, loop, ring, or opening, or a complementary hook element. The hook element preferably
10 comprises a U-shape, wherein one leg of the U-shape forms a free end and the other leg is connected at the first end of the fastener. The pretension in the fastener pulls on the hook element, such that it remains secured at the first position after mounting. Mounting the hook element comprises pulling on the free end of the fastener, thereby simultaneously applying the pretension to the fastener. It will be appreciated that the distance between the different positions on the frame measured along the length of the
15 fastener exceeds a resting or non-tensioned length of the fastener, at least between its securing members or ends.

In an embodiment, the frame comprises a bearing recess dimensioned to fittingly receive the bearing, and wherein the bearing is urged into the bearing recess by means
20 of the fastener. The recess preferably tapers downward during operation and allows for freely positioning the roller in its intended position. The recess is sealed by means of the fastener, such that the bearing is wedged between the fastener and the recess.

In an embodiment, the roller is one of a plurality of rollers, wherein an endless, air
25 permeable belt is supported on the plurality of rollers over a suction chamber in fluid connection to a suction source for applying an underpressure to sheet on the belt. The belt is provided with through-holes which allow air to be drawn in through the belt. This results in an underpressure on any sheet on the belt. Such an endless belt conveyor generally comprises multiple rollers which require securing to the frame. By means of
30 the fastener the time for securing the rollers can be significantly reduced and be performed by a single operator.

The present invention further relates to an inkjet printer comprising the above described conveyor. Preferably, the printer is an inkjet printer comprising a print head assembly

facing the endless belt.

The present invention further relates to a method for assembling a printer, comprising the steps of:

- 5 - securing a first end of a leaf spring element to a frame of the printer;
- extending the secured leaf spring element around a bearing of a roller received in a bearing recess of the frame, such that the bearing is surrounded by the leaf spring element and the frame;
- securing a second end of the leaf spring element to the frame, such that the leaf spring
- 10 element is secured under pretension, thereby urging the bearing into the bearing recess.

The fastener efficiently and easily secures the bearing in the bearing recess, allowing for quick and easy assembly of the conveyor.

- 15 Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the present invention will become apparent
- 20 to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given herein below and the accompanying drawings which are given by way of

25 illustration only, and thus are not limitative of the present invention, and wherein:

Fig. 1 is a schematic cross-sectional side view of a sheet printer comprising a sheet conveyor according to the present invention;

Fig. 2 is a schematic cross-sectional side view of the sheet conveyor of the sheet printer in Fig. 1;

- 30 Fig. 3 is a perspective close-up view a first embodiment of the sheet conveyor in Fig. 2;

Fig. 4 is a schematic side view of the first embodiment of the sheet conveyor in Fig. 3; and

Fig. 5 is a perspective close-up view a second embodiment of the sheet conveyor in Fig. 2;

Fig. 6 is a diagram of the steps of a method for assembling the printer in Fig. 1; and Fig. 7 is a perspective close-up view a second embodiment of the sheet conveyor in Fig. 2.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be described with reference to the accompanying drawings, wherein the same reference numerals have been used to identify the same or similar elements throughout the several views.

10 FIG. 1 shows schematically an embodiment of a printer 1 according to the present invention. The printer 1, for purposes of explanation, is divided into an output section 5, a print engine and control section 3, a local user interface 7 and an input section 4. While a specific printer is shown and described, the disclosed embodiments may be used with other types of printer such as an ink jet print system, an electrographic print
15 system, etc.

The output section 5 comprises a first output holder 52 for holding printed image receiving material, for example a plurality of sheets. The output section 5 may comprise a second output holder 55. While 2 output holders are illustrated in FIG. 1, the number
20 of output holders may include one, two, three or more output holders. The printed image receiving material is transported from the print engine and control section 3 via an inlet 53 to the output section 5. When a stack ejection command is invoked by the controller 37 for the first output holder 52, first guiding means 54 are activated in order to eject the plurality of sheets in the first output holder 52 outwards to a first external output holder
25 51. When a stack ejection command is invoked by the controller 37 for the second output holder 55, second guiding means 56 are activated in order to eject the plurality of sheets in the second output holder 55 outwards to a second external output holder 57.

The output section 5 is digitally connected by means of a cable 60 to the print engine
30 and control section 3 for bi-directional data signal transfer.

The print engine and control section 3 comprises a print engine and a controller 37 for controlling the printing process and scheduling the plurality of sheets in a printing order before they are separated from input holder 44, 45, 46.

The controller 37 is a computer, a server or a workstation, connected to the print engine and connected to the digital environment of the printer, for example a network N for transmitting a submitted print job to the printer 1. In FIG. 1 the controller 37 is positioned inside the print engine and control section 3, but the controller 37 may also be at least
5 partially positioned outside the print engine and control section 3 in connection with the network N in a workstation N1.

The controller 37 comprises a print job receiving section 371 permitting a user to submit a print job to the printer 1, the print job comprising image data to be printed and a plurality of print job settings. The controller 37 comprises a print job queue section 372
10 comprising a print job queue for print jobs submitted to the printer 1 and scheduled to be printed. The controller 37 comprises a sheet scheduling section 373 for determining for each of the plurality of sheets of the print jobs in the print job queue an entrance time in the paper path of the print engine and control section 3, especially an entrance time for the first pass and an entrance time for the second pass in the loop in the paper path
15 according to the present invention. The sheet scheduling section 373 will also be called scheduler 373 hereinafter.

The sheet scheduling section 373 takes the length of the loop into account. The length of the loop corresponds to a loop time duration of a sheet going through the loop dependent on the velocity of the sheets in the loop. The loop time duration may vary per
20 kind of sheet, i.e. a sheet with different media properties.

Resources may be recording material located in the input section 4, marking material located in a reservoir 39 near or in the print head or print assembly 31 of the print engine, or finishing material located near the print head or print assembly 31 of the print
25 engine or located in the output section 5 (not shown).

The paper path comprises a plurality of paper path sections 32, 33, 34, 35 for transporting the image receiving material from an entry point 36 of the print engine and control section 3 along the print head or print assembly 31 to the inlet 53 of the output
30 section 5. The paper path sections 32, 33, 34, 35 form a loop according to the present invention. The loop enables the printing of a duplex print job and/or a mix-plex job, i.e. a print job comprising a mix of sheets intended to be printed partially in a simplex mode and partially in a duplex mode.

The print head or print assembly 31 is suitable for ejecting and/or fixing marking material to image receiving material. The print head or print assembly 31 is positioned near the paper path section 34. The print head or print assembly 31 may be an inkjet print head, a direct imaging toner assembly or an indirect imaging toner assembly.

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While an image receiving material is transported along the paper path section 34 in a first pass in the loop, the image receiving material receives the marking material through the print head or print assembly 31. A next paper path section 32 is a flip unit 32 for selecting a different subsequent paper path for simplex or duplex printing of the image receiving material. The flip unit 32 may be also used to flip a sheet of image receiving material after printing in simplex mode before the sheet leaves the print engine and control section 3 via a curved section 38 of the flip unit 32 and via the inlet 53 to the output section 5. The curved section 38 of the flip unit 32 may not be present and the turning of a simplex page has to be done via another paper path section 35.

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In case of duplex printing on a sheet or when the curved section 38 is not present, the sheet is transported along the loop via paper path section 35A in order to turn the sheet for enabling printing on the other side of the sheet. The sheet is transported along the paper path section 35 until it reaches a merging point 34A at which sheets entering the paper path section 34 from the entry point 36 interweave with the sheets coming from the paper path section 35. The sheets entering the paper path section 34 from the entry point 36 are starting their first pass along the print head or print assembly 31 in the loop. The sheets coming from the paper path section 35 are starting their second pass along the print head or print assembly 31 in the loop. When a sheet has passed the print head or print assembly 31 for the second time in the second pass, the sheet is transported to the inlet 53 of the output section 5.

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The input section 4 may comprise at least one input holder 44, 45, 46 for holding the image receiving material before transporting the sheets of image receiving material to the print engine and control section 3. Sheets of image receiving material are separated from the input holders 44, 45, 46 and guided from the input holders 44, 45, 46 by guiding means 42, 43, 47 to an outlet 36 for entrance in the print engine and control section 3. Each input holder 44, 45, 46 may be used for holding a different kind of image receiving material, i.e. sheets having different media properties. While 3 input holders

are illustrated in FIG. 1, the number of input holders may include one, two, three or more input holders.

The local user interface 7 is suitable for displaying user interface windows for controlling the print job queue residing in the controller 37. In another embodiment a computer N1
5 in the network N has a user interface for displaying and controlling the print job queue of the printer 1.

Fig. 2 shows a schematic cross-sectional view of a conveyor 70 positioned at the paper path section 33. The conveyor 70 comprises a plurality of rollers 72 which support and drive an endless conveyor belt 74. At least of the rollers 72 is provided with a drive or motor for driving the belt 74. The belt 74 is permeable to gas, specifically to air, to apply an underpressure to a sheet of an image receiving member positioned on the belt 74. The sheet is thereby held in position against the belt 74. The holding force applied by
15 the underpressure should be sufficient to prevent displacement of the sheet with respect to the belt 74. Generally, the belt 74 is or has been aligned with respect to the print head assembly 31. The belt 74 is provided with a matrix of through-holes to draw in air through the belt 74. The belt 74 is positioned above a suction chamber 76 which is connected to a suction source 77, such as a pump or fan, via line 78. It will appreciated
20 that the suction source 77 may be positioned remote from the suction chamber 76 by extending the line 78. To achieve good image quality the sheet should be flatly positioned below the print head assembly 31. This prevents any irregularities in the sheet from resulting in print artifacts. It further allows for a narrow print gap between the print head assembly 31 and the sheet, which allows for more accurate ink droplet
25 positioning.

As shown in Fig. 3, the rollers 72 are mounted onto the frame 90. Each roller 72 comprises a cylindrical support surface 72A which is mounted rotatably around a rotation axis 72C by means of rotational bearing 72B. The outer housing of the bearing
30 72B is mounted stationary on the frame 90. The rotation axis 72C is defined by an axial rod 72D which is rotatably received inside the outer housing of the bearing 72B. The support rod 72D is able to rotate with respect to the frame 90 and the outer housing of the bearing 72B. The support surface 72A is mounted onto the axial rod 72D to allow the support surface 72A to rotate with respect to the frame 90. The support surface 72A

may be rigidly or rotatably mounted onto the axial rod 72D. The rollers 72 are preferably mounted onto the frame 90 by means of a bearing 72B at both axial ends of the roller 72, allowing for an unhindered rotational movement of the belt 74.

5 The bearings 72B are secured to the frame 90 by means of a fastener 80. The fastener 80 in Fig. 3 is formed as a longitudinal leaf spring 80. The fastener 80 is a curved plate extending between two mounting points 92, 94 on the frame. The fastener 80 is elastic and mounted under pre-tension between the points 92, 94 and extending
10 circumferentially over the outer housing of the bearing 72B. The fastener 80 in its tensioned state in this position urges the bearing 72B into a recess 96. The bearing 72B is enclosed by the frame 90 in radial direction and by the fastener 80. The bearing 72B is positioned and/or wedged between the frame 90 and the fastener 80. The recess 96 is preferably dimensioned to fittingly receive the bearing 72B. In Fig. 3 and 4, the recess 96 tapers towards an opening having at its end substantially the same or a slightly
15 larger diameter as the bearing 72B. The bearing 72B is supported on the frame 90 at at least two contact points, wherein the fastener 80 contacts a third point on the bearing 72B, thereby rigidly securing the bearing 72B. The recess 96 in Fig. 3 and 4 is configured to support a bottom side of the bearing 72B, such that the bearing 72B under the influence of gravity may be stabilized in the recess 96. This allows the roller 72 to be
20 positioned on the frame 90, while an operator applies the fastener 80 to secure the roller 72 against upwards forces, which could otherwise move the bearing 72B out of the recess 96.

The first end 84 of the fastener 80 is secured or fixed at the first point 92 on the frame
25 90. The first end 84 of the fastener 80 comprises a releasable securing member in the form of a hook (87 in Fig. 5), notch, recess, etc. The releasable securing member at the first end 84 is secured to a complementary securing member on the frame 90. In Fig. 3 and 4 the first position has been provided with a slot 92 for engaging a hook element at the first end 84 of the fastener 80. The fastener 80 is subsequently circumferentially
30 wrapped around the bearing 72B. The fastener 80 is therein pulled to create a pretension which forces and secures the bearing 72B in the recess 96. The fastener 80 is then secured at its second end 86 with a securing member 94 in the form of a screw 94, though other suitable securing members, such as bolts, hooks, adhesives, etc. may be applied. The second end 86 of the fastener 80 is securely fixed to the frame 90 at the

second point 94, after which after which the bearing 72B is fixed in place between the frame 90 and the fastener 80.

This allows for a fast and easy securing of the fastener 80 under pretension thereby
5 securing the bearing 72B between the frame 90 and the fastener 80.

In its secured state the fastener 80 extends circumferentially around the bearing 72B. Preferably, the angle A over which the fastener 80 extends is preferably at least 90°. In Fig. 4, the angle A is measured as the contact angle over which the fastener 80 is in
10 direct contact with the bearing 72B, measured with respect to the rotation axis 72C of the roller 72. The angle A is determined by the position 92, 94 on the frame 90, which are angularly spaced apart at an angle of less than 90°, measured over the smaller angle between the two points 92, 94. The recess 96 contacts the bearing 72B at a point
15 which, at least angularly around axis 72C, is located between the positions 92, 94.

The fastener 80 contacts the bearing 72B on a side opposite to the recess 96. In consequence, the bearing 72B is enclosed and/or surrounded by the recess 96 and the fastener 80, such that the bearing 72B is immobilized in the recess 96. Since the
20 position of the bearing 72B is secured, the roller 72 is fixed, which allows for accurate positioning of the belt 74 with respect to the print head assembly 31. This in turn allows for a high quality printing of an image on a sheet 41 on the conveyor 70.

Fig. 5 illustrates the fastener 80. The fastener 80 in Fig. 5 is formed from a plate of metal, cut, stamped, lasered, and/or milled into the shown shape. The central section of
25 the fastener 80 is formed by a relatively wide portion, which at least partially is formed by a leaf spring. The wider portion 81 further comprises the contact surface, which is in contact with the bearing 72D in the situation in Fig. 3. The fastener 80 is longitudinal in the circumferential direction wherein it extends around the bearing 72B. The first end of the fastener 80 is provided with a releasable securing member 87 formed as a hook
30 element 87, shaped to engage the slot at the first position 92. The opposite, second end 84 of the fastener 80 is provided with a securing member 85 for a relatively permanent fixation, namely an opening for receiving a screw. The securing member 85 is foldable around a fold line F to bend the securing member 85 into an out-of-plane position for easy mounting onto the frame 90 at the second position 94. A small recess is provided

at the fold line F to locally reduce the rigidity. As shown in Fig. 5, the fastener is formed from a single sheet of plate material. The leaf spring with its securing members 85, 87 may be stamped, cut, milled, lasered, or otherwise formed from plate material. Metal plate material such as steel is preferred for its durability, stiffness and costs.

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Fig. 6 shows the steps of a method according to the present invention. In step i the roller 72 is positioned onto the frame 90, wherein the bearing 72B is received in the recess 96. Since the recess 96 extends downwards the bearing 72B is stably positioned at the lower side of the recess 96. Bearings 72B at both ends of the roller 72 are positioned
10 onto the frame 90 in this manner, which allows the roller 72 to be stably supported on the frame 90 without operator interference. In step ii, the first end 84 of the fastener 80 is secured to the frame 90, for example by sliding or hooking the hook element 87 into the slot 92. This allows the fastener 80 to be tensioned by pulling on the fastener 80 (step iii). The second end 86 of the fastener 80 is then secured at the second position
15 94 (step iv), while the fastener 80 is still under tension. In the example in Fig. 3, this step is performed by screwing the second end 86 onto the frame 90 by means of corresponding openings 85 provided in the frame 90 and the fastener 80. The fold line F allows the plate-shaped fastener 80 to be easily extended over or across the bearing 72B, and secured to the frame 90 at the second position 94. The fastener 80 is thereby
20 pulled over and into contact with a side of the bearing 72B opposite the side of the bearing 72B in contact with the frame 90 in the recess 96. The bearing 72B is thereby prevented from movement at least perpendicular to its rotation axis 72C. The pretension in the fastener 80 ensures a constant urging of the bearing 72B into recess 96, thereby securing it in place. In step iv the fastener 80 extends over an angle A greater than 90°
25 along an outer surface of the bearing 72B. Other angles may be applied. An angle A of around 180° is preferred. In step v the conveyor is driven for transporting an image receiving material 41 for printing on said image receiving material 41. In an embodiment, the conveyor 70 comprises an endless belt 74 supported on the rollers 72, which belt 74 holds and supports the image receiving member 41, while in another
30 embodiment the roller 72 directly contacts the image receiving member 41 as a transport roller 72. The printer is preferably an inkjet printer, for example a sheet printer configured to handle a plurality of sheets or a roll printer configured for printing on an endless web or rigid substrates.

Fig. 7 is another embodiment of the conveyor, wherein the fastener 180 has been secured at a circumferential angle of roughly 170° . The recess 196 is wider as compared to Fig. 3, but comprises a similar round or curved edge against which the bearing 172B is pressed due to the pretension in the fastener 180. The folded portion at the second end 186 with the opening for the screw 194 positioned on the same right hand side of the bearing 172B as the slot 192. The slot 192 comprises a larger portion and a narrower portion, wherein the large portion is intended to create room for pulling an the first end 192 to create the pretension in the fastener 180. Under said pretension the hook element 187 is received into the narrow portion of the slot 192, hooking it behind the frame 190. Thereby, the bearing 172B is urged towards a central point in between the different positions 192, 194. Said point is preferably at a similar angular position as the contact surface where the recess 196 contacts the bearing 172B.

Although specific embodiments of the invention are illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations exist. It should be appreciated that the exemplary embodiment or exemplary embodiments are examples only and are not intended to limit the scope, applicability, or configuration in any way. Rather, the foregoing summary and detailed description will provide those skilled in the art with a convenient road map for implementing at least one exemplary embodiment, it being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope as set forth in the appended claims and their legal equivalents. Generally, this application is intended to cover any adaptations or variations of the specific embodiments discussed herein.

It will also be appreciated that in this document the terms "comprise", "comprising", "include", "including", "contain", "containing", "have", "having", and any variations thereof, are intended to be understood in an inclusive (i.e. non-exclusive) sense, such that the process, method, device, apparatus or system described herein is not limited to those features or parts or elements or steps recited but may include other elements, features, parts or steps not expressly listed or inherent to such process, method, article, or apparatus. Furthermore, the terms "a" and "an" used herein are intended to be understood as meaning one or more unless explicitly stated otherwise. Moreover, the terms "first", "second", "third", etc. are used merely as labels, and are not intended to

impose numerical requirements on or to establish a certain ranking of importance of their objects.

5 The present invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

Embodiments

1. A conveyor (70; 170) for transporting image receiving material comprising a roller (72; 172) comprising a support surface (72A; 172A) mounted rotatably with respect to a frame (90; 190) by means of a bearing (72B; 172B) and securing means for fixing the bearing to the frame, characterized in that the securing means comprise a longitudinal fastener (80; 180) secured at two different positions (92, 94; 192, 194) to the frame and extending at least partially around the bearing, such that the bearing is urged towards and/or against the frame, wherein the fastener is releasably secured to the frame at at least one of the two positions.
5
2. The conveyor (70; 170) according to claim 1, wherein the fastener (80; 180) is formed of a longitudinal plate with a releasable securing member (87; 187) at one of its longitudinal ends (84, 86; 184, 186).
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3. The conveyor (70; 170) according to claim 2, wherein the fastener (80; 180) comprises spring element, preferably in the form of a leaf spring.
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4. The conveyor (70; 170) according to claim 2 or 3, wherein the fastener (80; 180) extends circumferentially around the bearing between the different positions over an angle (A) greater than 90° with respect to a rotation axis (72C; 172C) defined by the bearing.
- 20 5. The conveyor (70; 170) according to claim 2, 3, or 4, wherein the fastener (80; 180) is secured under pretension.
6. The conveyor (70; 170) according to any of the claims 2 to 5, wherein the releasable securing member comprises a hook element (87; 187) configured to be received in a recess (92; 192) at a first of the two different positions on the frame (90; 190).
25
7. The conveyor (70; 170) according to any of the previous claims, wherein the frame (90; 190) comprises a bearing recess (96; 196) dimensioned to fittingly receive the bearing (72B; 172B), and wherein the bearing is urged into the bearing recess by means of the fastener (80; 180).

8. The conveyor (70; 170) according to any of the previous claims, wherein the roller (72; 172) is one of a plurality of rollers, wherein an endless, air permeable belt (74) is supported on the plurality of rollers over a suction chamber (76) in fluid connection to a suction source (77) for applying an underpressure to sheet on the belt.
- 5
9. An inkjet printer (1) comprising the conveyor (70; 170) according to any of the previous claims.
10. A method for assembling a printer (1), comprising the steps of:
- securing a first end (86; 186) of a leaf spring element (80; 180) to a frame (90; 190) of the printer;
 - 10 - extending the secured leaf spring element (80; 180) around a bearing (72B; 172B) of a roller (72; 172) received in a bearing recess (96; 196) of the frame, such that the bearing is surrounded by the leaf spring element and the frame;
 - securing a second end (84; 184) of the leaf spring element to the frame, such
 - 15 that the leaf spring element is secured under pretension, thereby urging the bearing into the bearing recess.

Conclusies

1. Transporteur (70; 170) voor het transporteren van een beeldontvangstmateriaal omvattende een roller (72; 172) met een steunvlak (72A; 172A) dat roteerbaar aangebracht is ten opzicht van een raamwerk (90; 190) door middel van een lager (72B; 172B), en bevestigingsmiddelen voor het vastzetten van het lager op het frame, **met het kenmerk, dat** de bevestigingsmiddelen een langwerpige bevestiger (80; 180) omvatten, die is vastgezet op twee verschillende posities (92, 94; 192, 194) op het raamwerk en zich ten minste deels zodanig om het lager uitstrekt, dat het lager gedwongen wordt naar en/of tegen het raamwerk, waarbij de bevestiger losmaakbaar is vastgezet aan het raamwerk op ten minste één van de twee posities.
2. Transporteur (70; 170) volgens conclusie 1, waarbij de bevestiger (80; 180) is gevormd van een langwerpige plaat met een losmaakbaar bevestigingsorgaan (87; 187) aan één van diens longitudinale einden (84, 86; 184, 186).
3. Transporteur (70; 170) volgens conclusie 2, waarbij de bevestiger (80; 180) een veerelement omvat, bij voorkeur in de vorm van een bladveer.
4. Transporteur (70; 170) volgens conclusie 2 of 3, waarbij de bevestiger (80; 180) zich in omtreksrichting om het lager uitstrekt tussen de verschillende posities over een hoek (A) groter dan 90° ten opzichte van een rotatie-as (72C; 172C) die bepaald is door het lager.
5. Transporteur (70; 170) volgens conclusie 2, 3, or 4, waarbij de bevestiger (80; 180) is vastgezet onder voorspanning.
6. Transporteur (70; 170) volgens één van de conclusies 2 t/m 5, waarbij het losmaakbare bevestigingsorgaan een haakelement (87; 187) omvat, die ingericht is om ontvangen te zijn in een uitsparing (92; 192) op een eerste van de twee verschillende posities op het raamwerk (90; 190).
7. Transporteur (70; 170) volgens één van de voorgaande conclusies, waarbij het raamwerk (90; 190) een lageruitsparing (96; 196) omvat, die gevormd is om passend het lager (72B; 172B) te ontvangen, en waarbij het lager in de lageruitsparing wordt gedwongen door de bevestiger (80; 180).
8. Transporteur (70; 170) volgens één van de voorgaande conclusies, waarbij de roller (72; 172) één van een veelheid rollers is, waarbij een eindloze, luchtdoorlatende band (74) ondersteund is door de veelheid rollers boven een zuigkamer (76) die in fluïdumverbinding staat met een zuigbron (77) voor het aanbrengen van een onderdruk op een vel op de band.

9. Inktjetprinter (1) omvattende de transporteur (70; 170) volgens één van de voorgaande conclusies.
10. Werkwijze voor het vervaardigen van een printer (1), omvattende de stappen van:
- het bevestigen van een eerste eind (86; 186) van een bladveerelement (80; 180) aan
5 een raamwerk (90; 190) van de printer;
 - het strekken van het bevestigde bladveerelement (80; 180) om een lager (72B; 172B) van een roller (72; 172) die ontvangen is een lageruitsparing (96; 196) in het raamwerk, zodat het lager omgeven is door het bladveerelement en het raamwerk;
 - het zodanig bevestigen van een twee eind (84; 184) van het bladveerelement op het
10 raamwerk, dat het bladveerelement is vastgezet onder voorspanning, zodat het lager in de lageruitsparing wordt gedwongen.

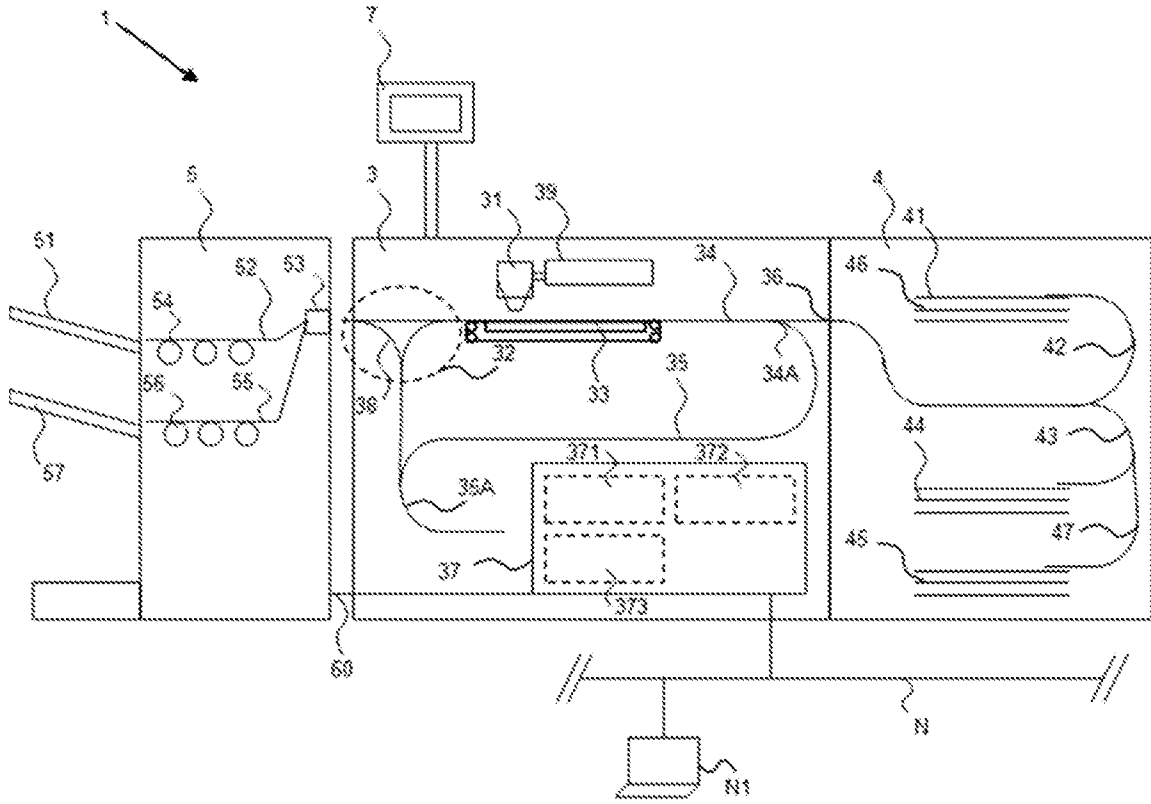


Fig. 1

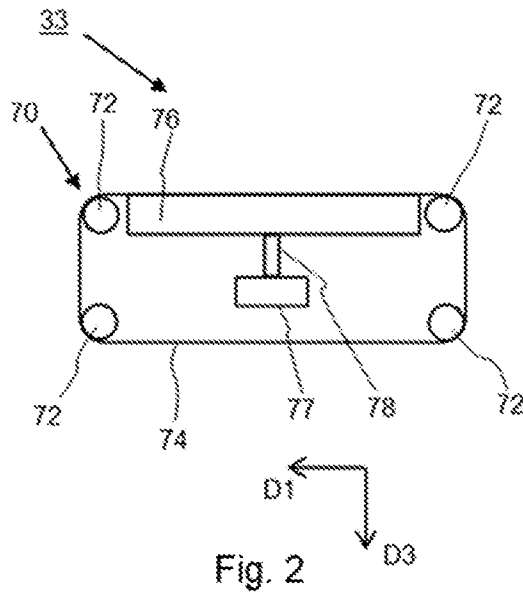


Fig. 2

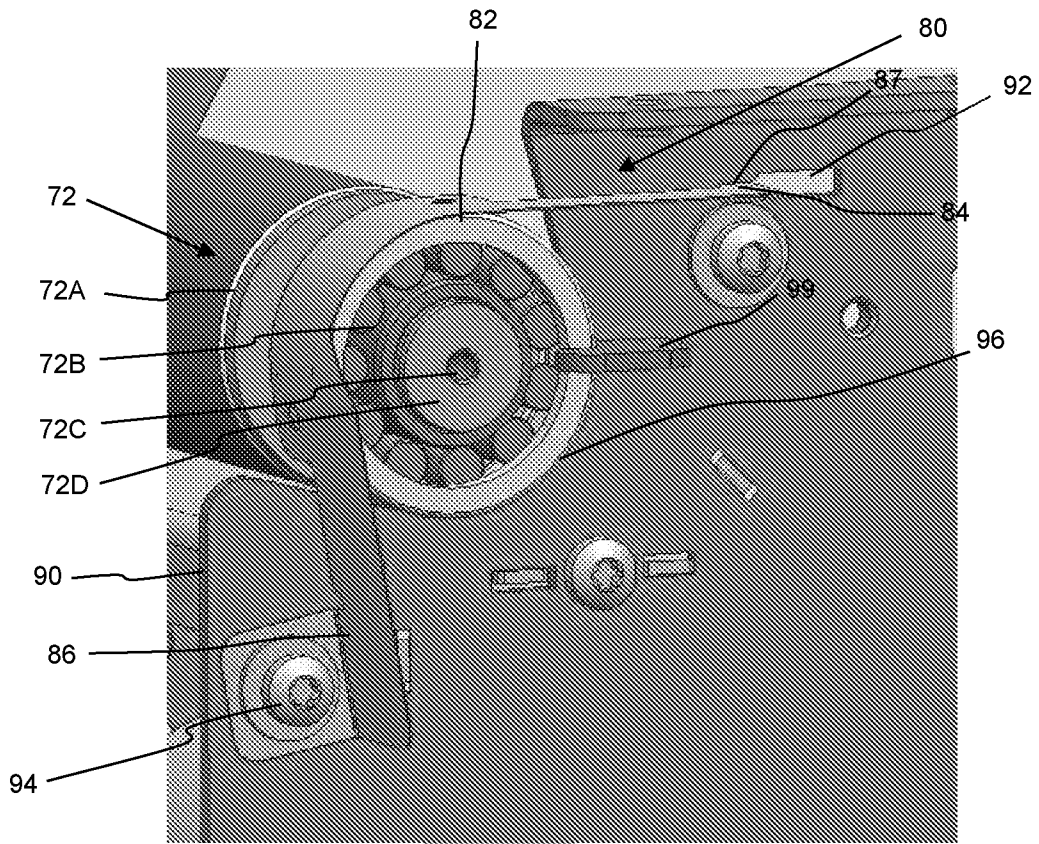


Fig. 3

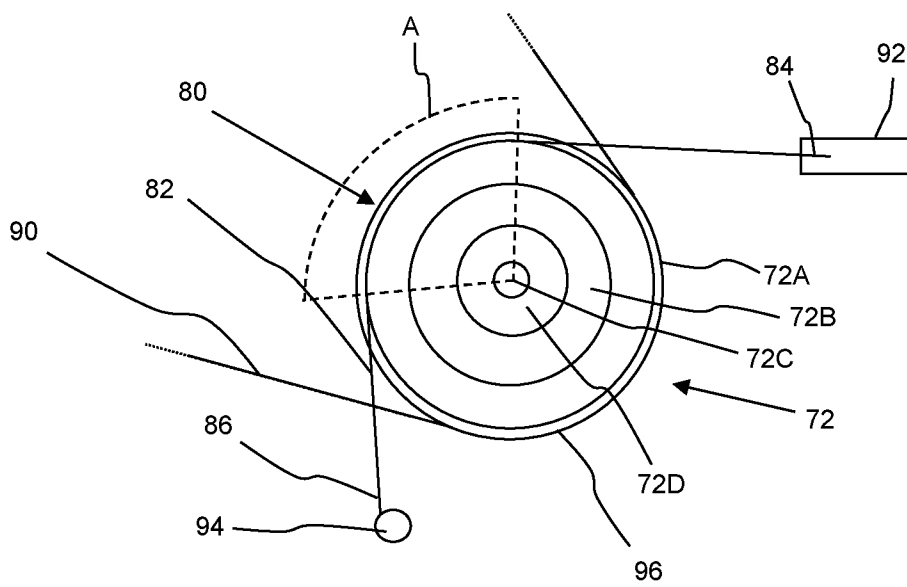


Fig. 4

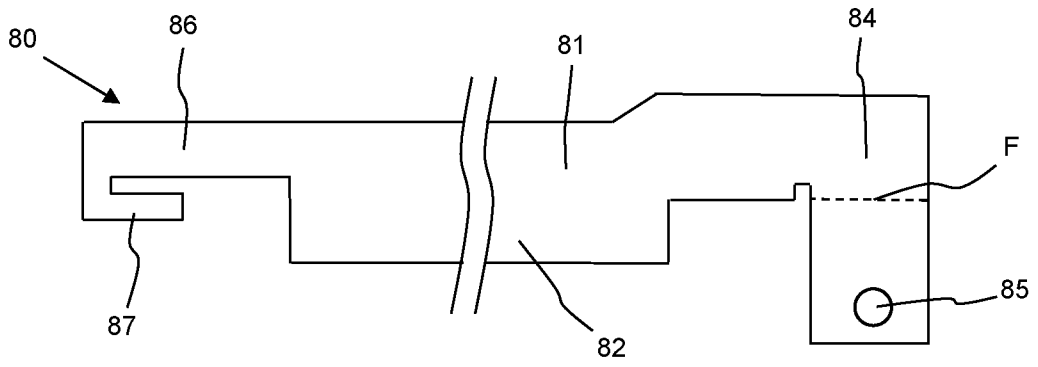


Fig. 5

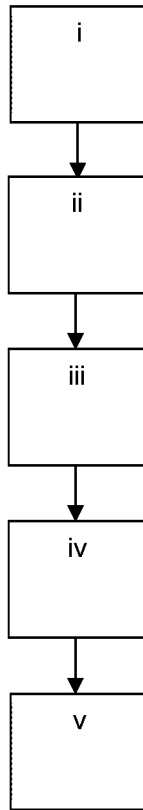


Fig. 6

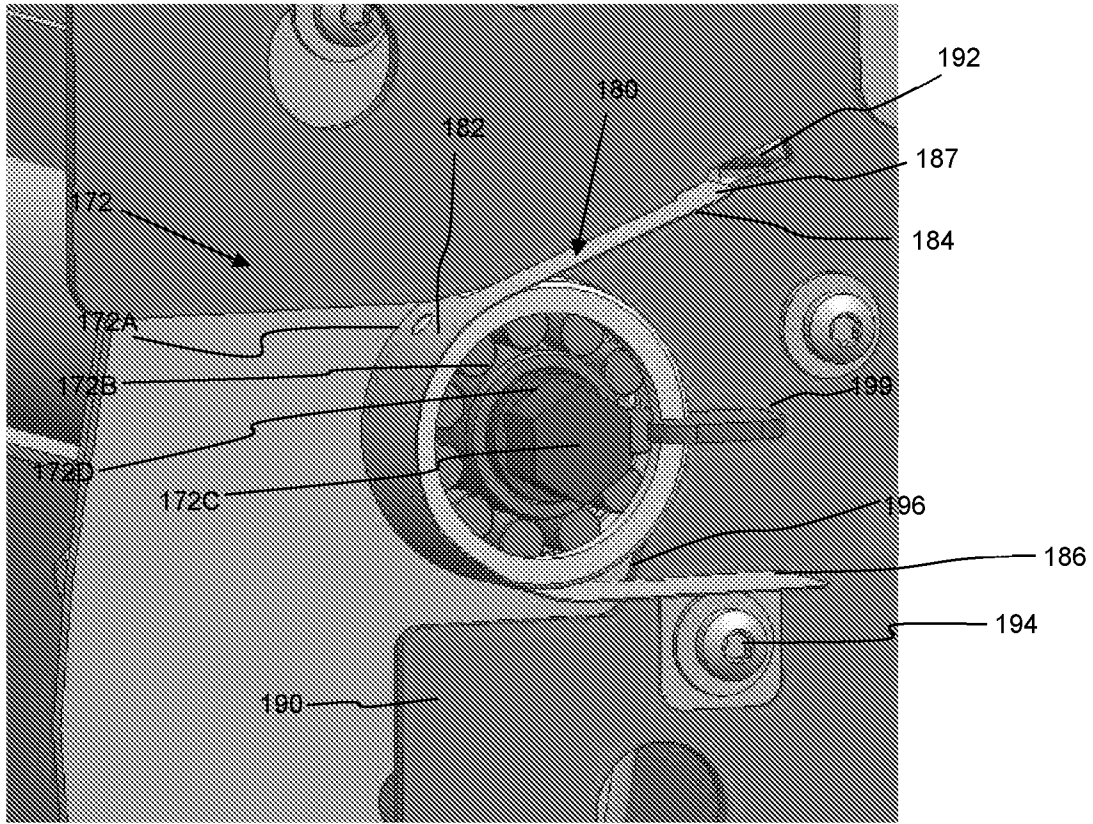


Fig. 7



ONDERZOEKSRAPPORT

BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

RELEVANTE LITERATUUR

Categorie ¹	Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr:	Classificatie(IPC)
X	EP 0 855 626 A2 (XEROX CORP [US]) 29 juli 1998 (1998-07-29) * het gehele document *	1-10	INV. B65H5/06 B65H5/02 B65H5/22
X	US 5 368 290 A (NANBA HIDEYUKI [JP] ET AL) 29 november 1994 (1994-11-29) * het gehele document *	1-10	
X	US 4 850 584 A (WATASHI MASAHIRO [JP]) 25 juli 1989 (1989-07-25) * het gehele document *	1-10	
A	EP 0 324 545 A1 (XEROX CORP [US]) 19 juli 1989 (1989-07-19) * het gehele document *	1	
Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:			Onderzochte gebieden van de techniek
Plaats van onderzoek: 's-Gravenhage			Bevoegd ambtenaar: Athanasiadis, A
Datum waarop het onderzoek werd voltooid: 22 december 2021			B65H

¹ NDERLINCATEGORIE VAN DE VERMELDE LITERATUUR

X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur
Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht
A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft
O: niet-schriftelijke stand van de techniek
P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding
E: eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven
D: in de octrooiaanvraag vermeld
L: om andere redenen vermelde literatuur
&: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

**AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE
HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK,
UITGEVOERD IN DE OCTROOIAANVRAGE NR.**

**NO 141302
NL 2028040**

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octrooifamilie), die overeenkomen met octrooischriften genoemd in het rapport.

De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door het Bureau voor de Industriële eigendom gegarandeerd;; de gegevens worden verstrekt voor informatiedoeleinden.

22-12-2021

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
EP 0855626 A2	29-07-1998	EP 0855626 A2	29-07-1998
		JP H10203688 A	04-08-1998

US 5368290 A	29-11-1994	DE 4300939 A1	22-07-1993
		US 5368290 A	29-11-1994
		US 5443255 A	22-08-1995

US 4850584 A	25-07-1989	GB 2180013 A	18-03-1987
		US 4850584 A	25-07-1989

EP 0324545 A1	19-07-1989	CA 1327820 C	15-03-1994
		DE 68903223 T2	06-05-1993
		EP 0324545 A1	19-07-1989
		JP 2569162 B2	08-01-1997
		JP H01214551 A	28-08-1989
		US 4921240 A	01-05-1990

SCHRIFTELIJKE OPINIE

DOSSIER NUMMER NO141302	INDIENINGSDATUM 22.04.2021	VOORRANGSDATUM	AANVRAAGNUMMER NL2028040
CLASSIFICATIE INV. B65H5/06 B65H5/02 B65H5/22			
AANVRAGER CANON PRODUCTION PRINTING HOLDING B.V.			

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- Onderdeel I Basis van de schriftelijke opinie
- Onderdeel II Voorrang
- Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- Onderdeel VI Andere geciteerde documenten
- Onderdeel VII Overige gebreken
- Onderdeel VIII Overige opmerkingen

	DE BEVOEGDE AMBTENAAR Athnasiadis, A
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Onderdeel I Basis van de Schriftelijke Opinie

1. Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.
2. Met betrekking tot **nucleotide en/of aminozuur sequenties** die genoemd worden in de aanvraag en relevant zijn voor de uitvinding zoals beschreven in de conclusies, is dit onderzoek gedaan op basis van:
 - a. type materiaal:
 - sequentie opsomming
 - tabel met betrekking tot de sequentie lijst
 - b. vorm van het materiaal:
 - op papier
 - in elektronische vorm
 - c. moment van indiening/aanlevering:
 - opgenomen in de aanvraag zoals ingediend
 - samen met de aanvraag elektronisch ingediend
 - later aangeleverd voor het onderzoek
3. In geval er meer dan één versie of kopie van een sequentie opsomming of tabel met betrekking op een sequentie is ingediend of aangeleverd, zijn de benodigde verklaringen ingediend dat de informatie in de latere of additionele kopieën identiek is aan de aanvraag zoals ingediend of niet meer informatie bevatten dan de aanvraag zoals oorspronkelijk werd ingediend.
4. Overige opmerkingen:

SCHRIFTELIJKE OPINIE

Aanvraag nr.:
NL2028040

Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

Nieuwheid
Ja: Conclusies 8
Nee: Conclusies 1-7, 9, 10

Inventiviteit
Ja: Conclusies
Nee: Conclusies 1-10

Industriële toepasbaarheid
Ja: Conclusies 1-10
Nee: Conclusies

2. Citaties en toelichting:

Zie aparte bladzijde

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Citations

Reference is made to the following documents:

- D1 EP 0 855 626 A2 (XEROX CORP [US]) 29 juli 1998 (1998-07-29)
- D2 US 5 368 290 A (NANBA HIDEYUKI [JP] ET AL) 29 november 1994 (1994-11-29)
- D3 US 4 850 584 A (WATASHI MASAHIRO [JP]) 25 juli 1989 (1989-07-25)
- D4 EP 0 324 545 A1 (XEROX CORP [US]) 19 juli 1989 (1989-07-19)

2 Claim 1

2.1 Document D1 discloses (the references in parentheses applying to this document):

Transporteur (cf. Fig. 3) voor het transporteren van een beeldontvangstmateriaal omvattende een roller (124, 125) met een steunvlak dat roteerbaar aangebracht is ten opzicht van een raamwerk (131) door middel van een lager (126), en bevestigingsmiddelen voor het vastzetten van het lager op het frame, waarin de bevestigingsmiddelen een langwerpige bevestiger (134) omvatten, die is vastgezet op twee verschillende posities (131, 132, 133) op het raamwerk en zich ten minste deels zodanig om het lager uitstrekt, dat het lager gedwongen wordt naar en/of tegen het raamwerk, waarbij de bevestiger losmaakbaar is vastgezet aan het raamwerk op ten minste één van de twee posities (cf. claim 1).

2.2 Documents D2 and D3 also disclose a device with all the features of claim 1, see in particular Fig. 8-9 of D2 and Fig. 2-6 of D3.

2.3 The present application does not therefore meet the criteria of patentability, because the subject-matter of claim 1 is not new.

3 Claim 10

3.1 Document D1 also implicitly discloses (the references in parentheses applying to this document):

Werkwijze voor het vervaardigen van een printer (cf. Fig. 1), omvattende de stappen van:

- *het bevestigen van een eerste eind van een bladveerelement (134) aan een raamwerk (131) van de printer;*
- *het strekken van het bevestigde bladveerelement (134) om een lager (126) van een roller 124, 125) die ontvangen is een lageruitsparing in het raamwerk, zodat het lager omgeven is door het bladveerelement en het raamwerk;*
- *het zodanig bevestigen van een twee eind (cf. Fig. 3) van het bladveerelement op het raamwerk, dat het bladveerelement is vastgezet onder voorspanning, zodat het lager in de lageruitsparing wordt gedwongen (cf. claim 10).*

The subject-matter of claim 10 is therefore not new.

- 3.2 Claim 10 is also directly derivable from the teachings of D2 or D3, wherein the particular type of spring element (leaf spring) is merely one of several straightforward possibilities that the skilled person would consider, in accordance with circumstances, without the exercise of inventive skill.

4 **Claims 2-9**

Dependent claims 2-9 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, the reasons being as follows:

- The subject matter of claims 2-7, 9 is disclosed in D1-D3.
- The subject matter of claim 8 is directly derivable from the teachings of documents D1-D4 and the general knowledge of the person skilled in the art.
