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(54) **Printer comprising at least one support for a roll of paper**

Drucker mit mindestens einer Halterung für eine Papierrolle

Imprimante comprenant au moins un support pour un rouleau de papier

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(56) References cited:
US-A1- 2002 171 726

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Description

[0001] The invention relates to a printer. In particular, the invention relates to a printer adapted for printing paper sheet provided on a roll; as disclosed, for example, in US 2002/0171726 A1.

[0002] Printers adapted for printing paper sheet provided on rolls are used for printing a sequence of printing jobs. The length of paper web required for the total of printing jobs input in the printer will not be matched by the length of the paper web present on the roll. As a consequence, the printer will still be busy performing a printing job when the end of the paper web approaches the print head.

[0003] Known printers are provided with a sensor for detecting the end of the paper web and with controlling means for stopping the print head when the paper end web has been detected. The sensor is located at a location between the roll and a first set of paper web driving rolls. A further drive/press roll assembly is arranged directly upstream from the printing station.

[0004] After the printer has been stopped the printer must be made ready again for continuing the printing jobs, for which a new roll of paper web has been arranged in the printer (or a second roll already present in the printer is used) and the leading end of the new paper web is fed through the driving rolls and thereby up to the printing station for resuming printing. Before the new paper web can be fed through, the old paper web still present in the printer must be removed from the printer. The old paper web can be conveyed further by the drive/press roll until the end edge has passed that roll. The operator then has to take the end portion from the printer table. This requires special attendance of the operator. In any event, the presence of an operator is required, which makes it impossible to operate the printer in a fully unattended mode for extended periods of use.

An object of the invention is to improve on this.

[0005] A further object of the invention is to provide a printer which can be operated in an unattended mode even during the period of transition from the one roll of paper web to a new roll of paper web.

[0006] From one aspect, the invention provides a printer comprising at least one support for a roll of printing paper web, a printer station including a print head, means for conveying printing paper web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction, a cutting station downstream of the printer station for cutting the printing paper web, means for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, controlling means for controlling the print head including means for entering and storing a printing job, the controlling means further including means for receiving a signal from the detecting means indicating the passage of the end location of the roll of the paper web and then to interrupt the printing job and to deactivate the driving means so as to hold the printed paper web upstream of the cutting means for a drying period, and after that drying period to operate the driving means again for conveying the dried paper web portion located upstream of the cutting means in upstream direction to discharge it from the printer.

[0007] In the printer according to the invention the paper web end portion, which is partly printed, can be pulled backwards by the driving means without the risk of their driving surfaces becoming soiled with ink. As a consequence, there is no need any more to remove the end paper web portion from the printer table at the downstream side of the printer. Immediately after the driving means have discharged the paper web end portion, a leading end portion of a new roll can be brought in engagement with the drive means in a usual manner, the driving rolls then having been reversed again in normal driving direction.

[0008] Advantageously, the detecting means are adapted to detect the passage of the end edge of the paper web.

[0009] In a further development of the printer according to the invention, the printer is moreover provided with means for sensing the degree of drying of the ink present on the paper web portion to be dried, said sensing means being operatively connected to the controlling means for providing a signal indicating that the ink has dried to a sufficient degree. In this way the drying period will be automatically adjusted to the specific actual conditions and thus be kept as short as possible. By way of example, in the case of hotmelt ink the drying period can be as large as several minutes, while other ink types may have a drying period of several seconds.

[0010] Alternatively, or in addition, the controlling means can be provided with means for entering data such as relating to the quality of the paper and/or the ink and means for determining the length of the drying period depending on said data. In that case, the operator can input the required data at the beginning of a series of printing jobs requiring more than one roll of paper web and when the end of the paper web has been detected the required drying time will already be fixed and known to the controlling means.

[0011] In an advantageous further development of the printer according to the invention the controlling means are adapted to operate the print head to restart the interrupted printing job for a subsequent roll of printing paper web after the discharge of said paper web portion of the previous roll. Thus, also in this respect the printer needs no attention from an operator.

[0012] In one embodiment, the printer comprises at least two supports for rolls of printing paper web, and means for feeding the paper web of the one roll into operative engagement with the conveying means after the cut off paper web portion of the previous roll has been discharged.

[0013] From another aspect, the invention provides a

printer comprising at least one support for a roll of printing paper web, a printer station including a print head, means for conveying printing paper web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction, a cutting station downstream of the printer station for cutting the printing paper web, means for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, controlling means for controlling the print head including means for entering and storing a printing job, the controlling means further including means for receiving a signal from the detecting means indicating the passage of the end location of the roll of the paper web and then to interrupt the printing job and to allow removal of the paper web portion upstream of the printer station, wherein the controlling means are adapted to operate the print head to restart the interrupted printing job for a subsequent roll of printing paper web after the removal of said paper web portion of the previous roll.

[0014] From a further aspect, the invention provides a printer comprising at least one support for a roll of printing paper web, a printer station including a print head, means for conveying printing paper web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction, a cutting station downstream of the printer station for cutting the printing paper web, means for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, controlling means for controlling the print head including means for entering and storing a printing job, the controlling means further including means for receiving a signal from the detecting means indicating the passage of the end location of the roll of the paper web, means for determining a first length of paper web present between the detecting means and the print head, means for determining a second length of paper web required for completing the printing job being performed when the controlling means receive said signal, means for comparing the first and the second length, wherein the controlling means are adapted for controlling said conveying means depending on the result of said comparison and -in case the second length is larger than the first length- to stop the driving means and to interrupt the printing job and to hold the printed paper web upstream of the cutting means for a drying period, and after that drying period to operate the driving means again for conveying the dried paper web portion located upstream of the cutting means in upstream direction to discharge it from the printer.

[0015] The invention will be elucidated on the basis of an exemplary embodiment shown in the attached drawings, in which:

Figure 1 shows a schematic front view on a printer according to the invention, showing relevant parts only, during normal operation;

Figure 2 show the printer of figure 1, in a stage of detected end of roll;

Figure 3 shows the printer of figures 1 and 2, during discharge of the end portion of the paper web; and

Figure 4 shows a flow chart of the operation of the printer of figures 1-3.

[0016] In figure 1-3 a printer 1 is schematically shown, which printer 1 comprises a frame 100 in which a web supply station 2 and a printer station 3 can be recognized.

[0017] The printer station 3 comprises a print head 4 which is movable back and forth in the direction A. The print head 4 is arranged above a printer table 11, at the right hand end of which a paper cutter 12 has been positioned.

[0018] In the supply station 2 two rolls 5a,b of paper web W have been arranged above one another, the upper roll 5b being supported by retractable supports 13. The lower paper roll 5a is supported by means that are not shown, and is unwound in the direction of the curved arrow to supply paper web W in the direction B.

[0019] For conveying the paper web W from the supply station 2 to the printer station 3, two driving rolls 6a,b have been arranged at a short distance downstream of the roll 5a, and in addition a drive/pressure roll assembly 7, B has been arranged at a short distance upstream of the printer table 11. Both sets of rolls 6a,b and 7 are driven by motors that are not shown, which motors are controlled by drive means 20, which in turn are controlled by a central control unit 10 arranged in the printer 1. These drive means 20 are operatively connected to the central control unit 10 by line 16.

[0020] Located between the supply roll 5a and the drive rolls 6a,b is an "end of roll" detector 18, such as a photosensor, for detecting the passage of the end edge of the paper web which is wound on roll 5a. The detector 18 is operatively connected to the central control unit 10 by a line 17.

[0021] The roll holders 13 are movable in the directions C, by driving means that are not shown, which are operatively connected to the central control unit 10 by line 23.

[0022] A sensor 19 for sensing the degree of drying of the ink pattern arranged on the paper web W by print head 4 is positioned downstream of the print head 4 and is operatively connected to the central control unit by line 21. Likewise, the cutter 12 is operatively connected to the central control unit 10 by line 20.

[0023] The printer 1 is furthermore provided with a control panel 14, having buttons and alike for entering data into the central control unit 10. The central control unit 10 can furthermore be connected to a another data station providing instructions regarding the printing jobs to be carried out by the printer 1.

[0024] In the situation depicted in figure 1 the paper web W is unwound from roll 5a and printed by the print

head 4, according to a sequence of printing jobs entered in control unit 10.

[0025] In figure 2, the situation is shown in which the roll 5a has been unwound completely, and the end edge S has passed beyond the detector 18. A corresponding signal is provided through line 17 to the central control unit 10, and almost immediately the central control unit 10 commands the drive means 20 through line 16 to stop the driving of the rolls 6a,b and 7. The end edge portion of the web B will then still be engaged between the rolls 6a,b.

[0026] In addition the control unit 10 ceases to activate the print head 4, the web on the printer head is moved to a stationary waiting position alongside the printer table 11. Then the position shown in figure 2 is maintained for a period of time to allow the ink to dry, with or without using additional drying means (not shown). After a while, in case of hotmelt inks several minutes, the sensor 19 senses that the ink has dried to a sufficient degree, and a signal is provided to the central control unit 10 through line 21.

[0027] Then the central control unit 10 activates the cutter 12 through line 20, so that the cutter 12 will be moved downwards in direction D to separate the paper-web portion W' which is present upstream of the cutter 12 from the web located downstream of the cutter 1.

[0028] Next, the central control unit 10 controls the driving means 20 to let the rolls 6a,b and 7 rotate in counter direction. As a result, the web portion W' will be moved backwards, towards the supply station 2, and is discharged in direction E.

[0029] After the web W' has been discharged, in this way automatically, sensed by a further sensor/detector (not shown) the central control unit 10 activates the drive means for the roll holders 13 through line 23, to move away from each other in direction C, so as to allow the roll 5b to move downwards in direction F in order to take the position of roll 5a in figure 1. Means known in the art are provided for entering the leading end of the web W wound on roll 5b into engagement with the drive rolls 6a, b.

[0030] The central control unit 10 then activates the print head 4 again when the leading end of the paper web W has arrived on the printer table 11. The control unit 10 is adapted such that the printing job which was performed when the detector 18 detected the end edge S is put first in the queue of remaining printing jobs, so that that job will be performed first.

[0031] Figure 4 shows a short flow chart of this process. The end of roll behaviour in unattended and attended mode in the printing process starts in 401 with step 402 by "the end of roll detected" event of detector 18 due to that the end edge S has passed beyond the detector 18 and the process continues in the next step 403 with that the printing process stops after printing the current print swath, the paper movement stops, and the printing carriage moves to the home position and stops.

In the next step 404, the printer user interface indicates "stop drying?" and the printer may decide automatically to wait for drying of the paper (no), and the printer operator may intervene on the control panel 14 to stop drying the paper explained later. In step 405 the printer is in the unattended operator mode and checks for whether the time needed for drying the printed matter is expired, so when time < dry time (no) the process continue at step 404. When time > dry time (yes) then the next step 406 is executed. The drying time may depend on the kind of paper.

In step 406, when bit of paper > 450 mm (yes) then the paper is cut with cutter 12 in the next step 407 and thereafter in step 408 the paper upstream is withdraw by rotating in counter direction rolls 6a, b and 7 and lead the paper towards the supply station 2, and discharge the paper in direction E such that the paper path does not contain paper anymore, and otherwise when there is a bit of paper < 450 mm (step 406, no) then in the next step 408 the paper is withdraw immediately without cutting the paper.

Thereafter the printing job which performed when detector 18 detected the paper end edge S is put first, at rank 1, in the queue of the remaining printing jobs in step 409. Finally the print process can continue in step 410 to print on an available paper roll automatically. When appropriate the next paper roll, for example roll 5b is used to supply paper for the print job.

When in step 404 the printer operator intervenes to stop immediately the drying of the paper (yes) by means of the control panel 14 the process enters the attended printing mode and the process continues in step 411. Step 411 puts on the user interface the indication "continue printing on x mm?". The printer user interface indicates the length x of paper available for printing the remainder of the print job.

The operator may command via the operator panel to continue printing on x mm of the current print job (yes) and the print process continues with step 412 or the operator may command via the operator panel to stop printing (no) and the process continues with step 413. As an alternative the printer itself decides how to continue in step 411 the process, depending on a printer default setting, for example the printer decides automatically in step 411 to continue printing (yes) the print job in step 412 where the print quality (PQ) is not guaranteed or the printer decides automatically in step 411 to stop printing the print job (no) and continues the process in step 413. After finishing the print job in step 412 where the print quality is not guaranteed, the process is continued in step 413, where the paper is transported by driving roll 7 clockwise such that the remaining paper can be removed in the next step 414 which results in a user interface indicative message to remove remaining paper from the printer table 11. After the operator removed the remaining paper from the printer table the operator may confirm in the next step 415 on the operator panel that the paper is removed (no) so that the process continues at step 416. Otherwise the process (yes) continues at step 414. Depending on

a default printer setting the printer may decide automatically after some time in step 415 that the paper may be removed (no) and that the process continue at step 416. The scanner checks in step 416 whether there is still paper present on the suction box (not shown) which is part of the printer table 11. When there is still paper on the suction box then the process is continued in step 414. When there is no paper on the suction box (no paper) then the process is continued in step 417 where the user interface indicates whether the print job must be re-queued to the queue. The reason to re-queue the job might be that the print quality is not good enough. The operator can command the printer by means of the operator panel to re-queue the print job (yes) resulting in step 409 where the print job is put to the first position in the queue. After the re-queue of the print job the process continues with printing the first job of the queue in step 410. Or in step 417 the operator can command the printer by means of the operator panel to continue with the next print job (no) of the queue and the process continues in step 410. Finally the process is finished in 418.

[0032] The printer according to the invention is especially suited for use with photogloss paper.

Claims

1. Printer comprising at least one support for a roll of printing paper web (5a, 5b), a printer station including a print head (4), means for conveying printing paper web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction controlling means for controlling the print head (4) including means for entering and storing a printing job, a cutting station downstream of the printer station for cutting the printing paper web, **characterized by** means (18) for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, the controlling means further including means for receiving a signal from the detecting means (18) indicating the passage of the end location of the roll of the paper web and then to interrupt the printing job and to deactivate the driving means so as to hold the printed paper web upstream of the cutting means for a drying period, and after that drying period to operate the driving means again for conveying the dried paper web portion (W') located upstream of the cutting means in upstream direction to discharge it from the printer.

2. Printer according to claim 1, wherein the detecting means are adapted to detect the passage of the end edge of the paper web.

3. Printer according to claim 1 or 2, further provided with means for sensing the degree of drying of the ink present on the paper web portion to be dried, said sensing means being operatively connected to the controlling means for providing a signal indicating that the ink has dried to a sufficient degree.

4. Printer according to any one of the preceding claims, the controlling means being provided with means for entering data such as relating to the quality of the paper and/or the ink and means for determining the length of the drying period depending on said data.

5. Printer according to any one of the preceding claims, wherein the controlling means are adapted to operate the print head to restart the interrupted printing job for a subsequent roll of printing paper web after the discharge of said paper web portion of the previous roll.

6. Printer according to any one of the preceding claims, comprising at least two supports for rolls of printing paper web, and means for feeding the paper web of the one roll into operative engagement with the conveying means after the cut off paper web portion of the previous roll has been discharged.

7. Printer according to any one of the preceding claims, wherein the print head is adapted for delivering hot-melt ink.

8. Printer comprising at least one support for a roll of printing paper web (5a, 5b), a printer station including a print head (4), means for conveying printing paper web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction controlling means for controlling the print head (4) including means for entering and storing a printing job, a cutting station downstream of the printer station for cutting the printing paper web, **characterized by** means (18) for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, the controlling means further including means for receiving a signal from the detecting means (18) indicating the passage of the end location of the roll of the paper web and then to interrupt the printing job and to allow removal of the paper web portion (W') upstream of the printer station, wherein the controlling means are adapted to operate the print head (4) to restart the interrupted printing job for a subsequent roll of printing paper web (5b) after the removal of said paper web portion (W') of the previous roll (5a).

9. Printer comprising at least one support for a roll of printing paper web (5a, 5b), a printer station including a print head (4), means for conveying printing paper

web from the roll to the printer station, driving means adapted for selectively driving the conveying means in a downstream conveying direction or an upstream conveying direction, controlling means for controlling the print head (4) including means for entering and storing a printing job, a cutting station downstream of the printer station for cutting the printing paper web, **characterized by** means (18) for detecting the passage of an end location on the end portion of the printing paper supplied from the roll and conveyed in downstream direction to the printer station, the controlling means further including means for receiving a signal from the detecting means (18) indicating the passage of the end location of the roll of the paper web, means for determining a first length of paper web present between the detecting means and the print head (4), means for determining a second length of paper web required for completing the printing job being performed when the controlling means receive said signal, means for comparing the first and the second length, wherein the controlling means are adapted for controlling said conveying means depending on the result of said comparison and -in case the second length is larger than the first length- to stop the driving means and to interrupt the printing job and to hold the printed paper web upstream of the cutting means for a drying period, and after that drying period to operate the driving means again for conveying the dried paper web portion located upstream of the cutting means in upstream direction to discharge it from the printer.

Patentansprüche

1. Drucker mit wenigstens einer Halterung für eine Rolle (5a, 5b) einer Druckpapierbahn, einer Druckstation einschließlich eines Druckkopfes (4), einer Einrichtung zum Transport der Druckpapierbahn von der Rolle zu der Druckstation, einer Antriebseinrichtung, die dazu ausgebildet ist, die Transporteinrichtung wahlweise in einer stromabwärtigen Transportrichtung oder einer stromaufwärtigen Transportrichtung anzutreiben, einer Steuereinrichtung zur Steuerung des Druckkopfes (4), einschließlich einer Einrichtung zur Eingabe und Speicherung eines Druckauftrags, einer Schneidstation stromabwärts der Druckstation zum Schneiden der Druckpapierbahn, **gekennzeichnet durch** eine Einrichtung (18) zur Detektion des Durchgangs einer Endposition auf einem Endabschnitt des von der Rolle zugeführten und in stromabwärtiger Richtung zu der Druckstation transportierten Druckpapiers, wobei die Steuereinrichtung weiterhin eine Einrichtung zum Empfang eines Signals von der Detektionseinrichtung (18) aufweist, das den Durchgang der Endposition auf der Rolle der Papierbahn anzeigt, um dann den Druckauftrag zu unterbrechen und die Antriebseinrichtung zu deaktivieren, um die bedruckte Papierbahn stromaufwärts der Schneideinrichtung für eine Trocknungsperiode zu halten und nach dieser Trocknungsperiode die Antriebseinrichtung erneut zu betätigen, um den getrockneten Papierbahnabschnitt W', der sich stromaufwärts der Schneideinrichtung befindet, in stromabwärtiger Richtung zu transportieren und ihn aus dem Drucker auszutragen.

2. Drucker nach Anspruch 1, bei dem die Detektionseinrichtung dazu ausgebildet ist, den Durchgang der Endkante der Papierbahn zu detektieren.

3. Drucker nach Anspruch 1 oder 2, mit einer Einrichtung zur Erfassung des Trocknungsgrades der Tinte, die sich auf dem zu trocknenden Papierbahnabschnitt befindet, wobei diese Erfassungseinrichtung funktionsmäßig mit der Steuereinrichtung verbunden ist, um ein Signal zu liefern, daß anzeigt, daß die Tinte in einem ausreichenden Ausmaß getrocknet ist.

4. Drucker nach einem der vorstehenden Ansprüche, bei dem die Steuereinrichtung eine Einrichtung zur Eingabe von Daten aufweist, die sich etwa auf die Qualität des Papiers und/oder der Tinte beziehen, sowie eine Einrichtung zur Bestimmung der Länge der Trocknungsperiode in Abhängigkeit von diesen Daten.

5. Drucker nach einem der vorstehenden Ansprüche, bei dem die Steuereinrichtung dazu ausgebildet ist, den Druckkopf so zu betätigen, daß er den unterbrochenen Druckauftrag für eine nachfolgende Rolle einer Druckpapierbahn wieder aufnimmt, nachdem der Papierbahnabschnitt der vorherigen Rolle ausgetragen worden ist.

6. Drucker nach einem der vorstehenden Ansprüche, mit wenigstens zwei Halterungen für Rollen mit Druckpapierbahnen und einer Einrichtung zur Zufuhr der Papierbahn von der einen Rolle in den Wirkeingriff mit der Transporteinrichtung, nachdem der abgeschnittene Papierbahnabschnitt der vorherigen Rolle ausgetragen worden ist.

7. Drucker nach einem der vorstehenden Ansprüche, bei dem der Druckkopf zur Abgabe von heißschmelzender Tinte ausgebildet ist.

8. Drucker mit wenigstens einer Halterung für eine Rolle (5a, 5b) einer Druckpapierbahn, einer Druckstation einschließlich eines Druckkopfes (4), einer Einrichtung zum Transport der Druckpapierbahn von der Rolle zu der Druckstation, einer Antriebseinrichtung, die dazu ausgebildet ist, die Transporteinrichtung wahlweise in einer stromabwärtigen Transpor-

trichtung oder einer stromaufwärtigen Transportrichtung anzutreiben, einer Steuereinrichtung zur Steuerung des Druckkopfes (4), einschließlich einer Einrichtung zur Eingabe und Speicherung eines Druckauftrags, einer Schneidstation stromabwärts der Druckstation zum Schneiden der Druckpapierbahn, **gekennzeichnet durch** eine Einrichtung (18) zur Detektion des Durchgangs einer Endposition auf einem Endabschnitt des von der Rolle zugeführten und in stromabwärtiger Richtung zu der Druckstation transportierten Druckpapiers, wobei die Steuereinrichtung weiterhin eine Einrichtung zum Empfang eines Signals von der Detektionseinrichtung (18) aufweist, das den Durchgang der Endposition auf der Rolle der Papierbahn anzeigt, um dann den Druckauftrag zu unterbrechen und das Entfernen des Papierbahnabschnitts (W') stromaufwärts der Druckstation zuzulasen, wobei die Steuereinrichtung dazu ausgebildet ist, den Druckkopf (4) so zu betreiben, daß er den unterbrochenen Druckauftrag für eine nachfolgende Rolle (5b) einer Druckpapierbahn wieder aufnimmt, nachdem der Papierbahnabschnitt (W') der vorherigen Rolle (5a) entfernt worden ist.

9. Drucker mit wenigstens einer Halterung für eine Rolle (5a, 5b) einer Druckpapierbahn, einer Druckstation einschließlich eines Druckkopfes (4), einer Einrichtung zum Transport der Druckpapierbahn von der Rolle zu der Druckstation, einer Antriebseinrichtung, die dazu ausgebildet ist, die Transporteinrichtung wahlweise in einer stromabwärtigen Transportrichtung oder einer stromaufwärtigen Transportrichtung anzutreiben, einer Steuereinrichtung zur Steuerung des Druckkopfes (4), einschließlich einer Einrichtung zur Eingabe und Speicherung eines Druckauftrags, einer Schneidstation stromabwärts der Druckstation zum Schneiden der Druckpapierbahn, **gekennzeichnet durch** eine Einrichtung (18) zur Detektion des Durchgangs einer Endposition auf einem Endabschnitt des von der Rolle zugeführten und in stromabwärtiger Richtung zu der Druckstation transportierten Druckpapiers, wobei die Steuereinrichtung weiterhin eine Einrichtung zum Empfang eines Signals von der Detektionseinrichtung (18), das den Durchgang der Endposition auf der Rolle der Papierbahn anzeigt, eine Einrichtung zur Bestimmung einer ersten Länge der Papierbahn, die sich zwischen der Detektionseinrichtung und dem Druckkopf (4) befindet, eine Einrichtung zur Bestimmung einer zweiten Länge der Papierbahn, die zur Vollendung des bei Empfang dieses Signals durch die Steuereinrichtung noch laufenden Druckauftrags benötigt wird, und eine Einrichtung zum Vergleich der ersten und zweiten Längen aufweist, wobei die Steuereinrichtung dazu ausgebildet ist, die Transporteinrichtung in Abhängigkeit von dem Ergebnis des Vergleichs zu steuern und - in dem Fall, in dem die zweite Länge größer ist als die erste Länge - die Antriebseinrichtung anzuhalten und den Druckauftrag zu unterbrechen und die bedruckte Papierbahn stromaufwärts der Schneidstation für eine Trocknungsperiode zu halten und nach dieser Trocknungsperiode die Antriebseinrichtung wieder zu betätigen, um den getrockneten Papierbahnabschnitt, der sich stromaufwärts der Schneideinrichtung befindet, in stromaufwärtiger Richtung zu transportieren, um ihn aus dem Drucker auszutragen.

Revendications

1. Imprimante comprenant au moins un support pour un rouleau de bande de papier d'impression (5a, 5b), un poste d'impression comprenant une tête d'impression (4), des moyens de transport de la bande de papier d'impression du rouleau jusqu'au poste d'impression, des moyens d'entraînement adaptés pour entraîner sélectivement les moyens de transport dans une direction de transport aval ou dans une direction de transport amont, des moyens de commande permettant de commander la tête d'impression (4) comprenant des moyens permettant d'entrer et d'enregistrer un travail d'impression, un poste de coupe en aval du poste d'impression pour couper la bande de papier d'impression, **caractérisé par** des moyens (18) permettant de détecter le passage d'un repère de fin de bande sur la partie terminale du papier d'impression approvisionnée par le rouleau et transportée dans une direction aval jusqu'au poste d'impression, les moyens de commande comprenant en outre des moyens de réception d'un signal provenant des moyens de détection (18) indiquant le passage du repère de fin de bande du rouleau de bande de papier en continu, puis pour interrompre le travail d'impression et pour désactiver les moyens d'entraînement de manière à maintenir la bande de papier imprimée en amont des moyens de coupe pendant une période de séchage, et après cette période de séchage, pour relancer les moyens d'entraînement pour acheminer vers l'amont la partie de la bande de papier séchée (W') située en amont des moyens de coupe dans une direction amont, pour la retirer de l'imprimante.

2. Imprimante selon la revendication 1, dans laquelle les moyens de détection sont conçus pour détecter le passage du bord terminal de la bande de papier en continu.

3. Imprimante selon la revendication 1 ou 2, équipée en outre de moyens de détection du degré de séchage de l'encre présente sur la partie de la bande de papier à sécher, lesdits moyens de détection étant connectés en fonctionnement aux moyens de commande pour transmettre un signal indiquant que l'encre a séchée jusqu'à un degré suffisant.

4. Imprimante selon l'une quelconque des revendications précédentes, les moyens de commande étant équipés de moyens permettant d'entrer des données, telles que en rapport avec la qualité du papier et/ou de l'encre et des moyens de détermination de la durée de la période de séchage en fonction desdites données.

5. Imprimante selon l'une quelconque des revendications précédentes, dans laquelle les moyens de commande sont conçus pour actionner la tête d'impression afin de relancer le travail d'impression interrompu en utilisant un autre rouleau de bande de papier d'impression, après le retrait de ladite portion de bande de papier du précédent rouleau.

6. Imprimante selon l'une quelconque des revendications précédentes comprenant au moins deux supports de rouleaux de bande de papier d'impression et des moyens permettant d'alimenter la bande de papier d'un rouleau dans les moyens de transport dans un engagement de fonctionnement après que la partie coupée de la bande de papier du précédent rouleau ait été retirée.

7. Imprimante selon l'une quelconque des revendications précédentes, dans laquelle la tête d'impression est conçue pour délivrer de l'encre thermofusible.

8. Imprimante comprenant au moins un support pour un rouleau de bande de papier d'impression (5a, 5b), un poste d'impression comprenant une tête d'impression (4), des moyens de transport de la bande de papier d'impression du rouleau jusqu'au poste d'impression, des moyens d'entraînement conçus pour entraîner sélectivement les moyens de transport dans une direction de transport aval ou dans une direction de transport amont, des moyens de commande permettant de commander la tête d'impression (4) comprenant des moyens permettant d'entrer et d'enregistrer un travail d'impression, un poste de coupe en aval du poste d'impression pour couper la bande de papier d'impression, **caractérisé par** des moyens (18) permettant de détecter le passage d'un repère de fin de bande sur la partie terminale du papier d'impression approvisionnée par le rouleau et transportée dans une direction aval jusqu'au poste d'impression, les moyens de commande comprenant en outre des moyens de réception d'un signal provenant des moyens de détection (18) indiquant le passage du repère de fin de bande du rouleau de la bande de papier en continu, puis pour interrompre le travail d'impression et de retirer la partie de la bande de papier (W') en amont du poste d'impression, où les moyens de commande sont conçus pour actionner la tête d'impression (4), afin de relancer le travail d'impression interrompu en utilisant un autre rouleau de bande de papier d'impression (5b), après le retrait de ladite partie de la bande de papier (W) du précédent rouleau (5a).

9. Imprimante comprenant au moins un support pour un rouleau de bande de papier d'impression (5a, 5b), un poste d'impression comprenant une tête d'impression (4), des moyens de transport de la bande de papier d'impression du rouleau jusqu'au poste d'impression, des moyens d'entraînement conçus pour entraîner sélectivement les moyens de transport dans une direction de transport aval ou dans une direction de transport amont, des moyens de commande permettant de commander la tête d'impression (4) comprenant des moyens permettant d'entrer et d'enregistrer un travail d'impression, un poste de coupe en aval du poste d'impression pour couper la bande de papier d'impression, **caractérisé par** des moyens (18) permettant de détecter le passage d'un repère de fin de bande sur la partie terminale du papier d'impression approvisionnée par le rouleau et transportée dans une direction aval jusqu'au poste d'impression, les moyens de commande comprenant en outre des moyens de réception d'un signal provenant des moyens de détection (18) indiquant le passage du repère de fin de bande du rouleau de la bande de papier en continu, des moyens de détermination de la présence d'une première longueur de bande de papier entre les moyens de détection et la tête d'impression (4), des moyens de détermination d'une seconde longueur de bande de papier nécessaire pour achever le travail d'impression en cours de réalisation lorsque les moyens de commande reçoivent ledit signal, des moyens de comparaison de la première et de la seconde longueurs, où les moyens de commande sont adaptés pour commander lesdits moyens de transport en fonction du résultat de ladite comparaison et -dans le cas où la seconde longueur est plus grande que la première longueur - de stopper les moyens d'entraînement, d'interrompre le travail d'impression et de maintenir la bande de papier imprimée en amont des moyens de coupe pendant une période de séchage, et après cette période de séchage, de relancer les moyens d'entraînement pour acheminer vers l'amont la portion de bande de papier séchée située en amont des moyens de coupe, pour la retirer de l'imprimante.

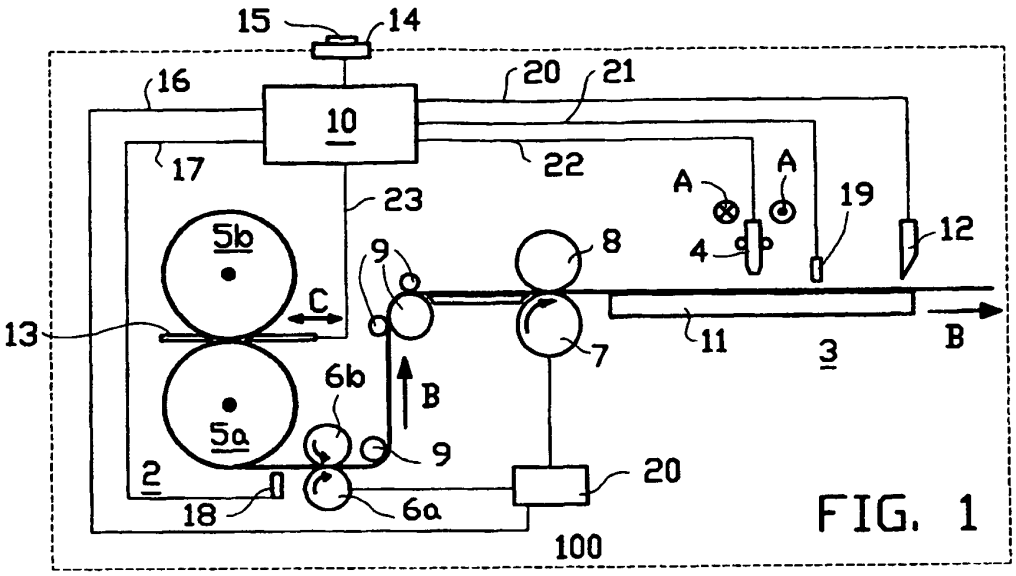


FIG. 1

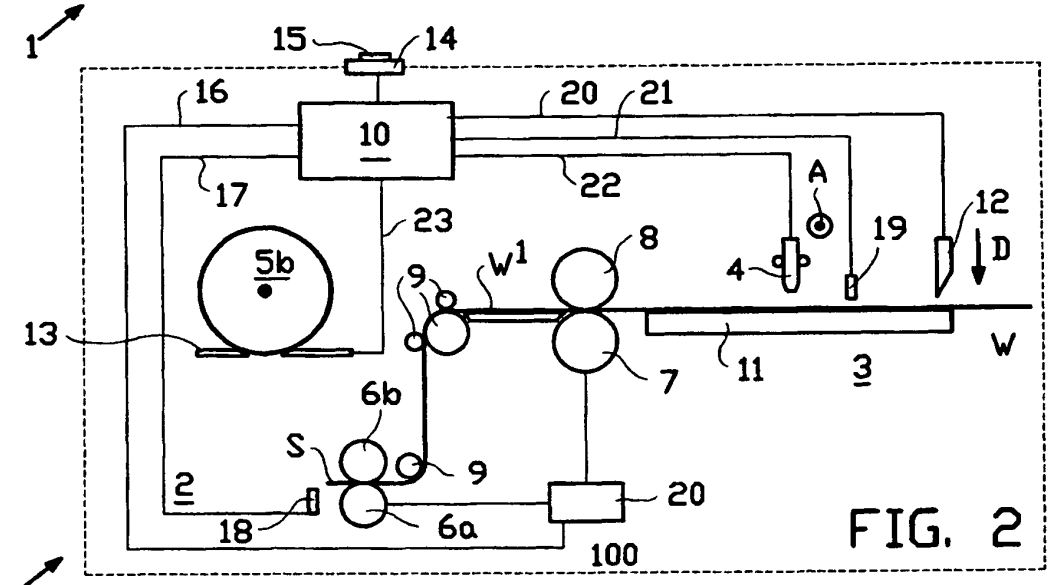


FIG. 2

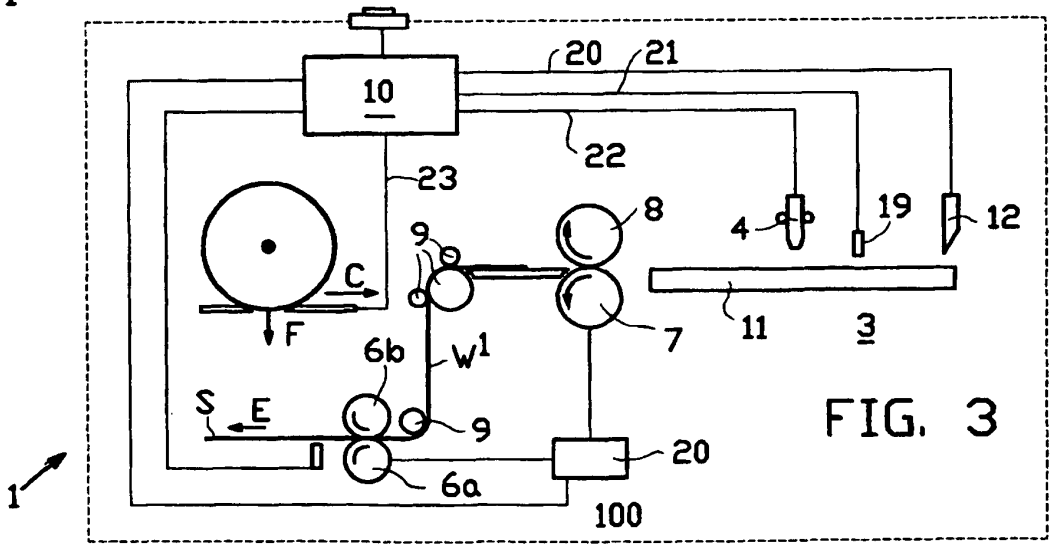


FIG. 3

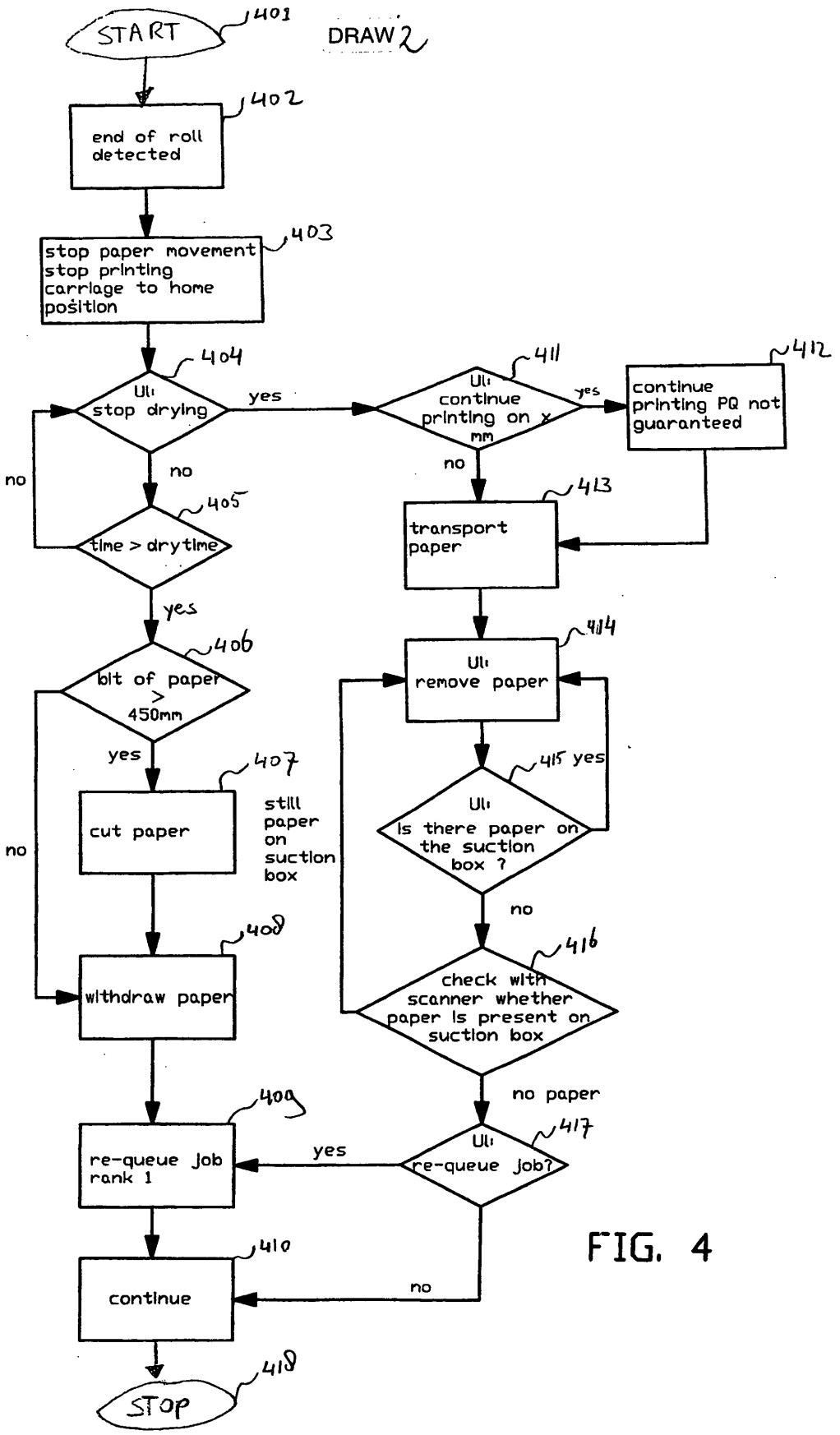

START
401
DRAW 2
end of roll detected
402
stop paper movement
stop printing
carriage to home position
403
UI: stop drying
404
yes
no
time > drytime
405
yes
bit of paper > 450mm
406
yes
cut paper
407
still paper on suction box
no
withdraw paper
408
re-queue job rank 1
409
continue
410
STOP
418
UI: continue printing on x mm
411
yes
continue printing PQ not guaranteed
412
no
transport paper
413
UI: remove paper
414
UI: Is there paper on the suction box ?
415
yes
no
check with scanner whether paper is present on suction box
416
no paper
UI: re-queue job?
417
yes
no

FIG. 4