



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
16.07.2014 Bulletin 2014/29

(51) Int Cl.:
B41J 2/165 (2006.01) **B41J 11/00** (2006.01)
B41J 13/00 (2006.01) **B41J 29/393** (2006.01)

(21) Application number: **14150548.7**

(22) Date of filing: **09.01.2014**

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

(71) Applicant: **Seiko Epson Corporation**
Shinjuku-ku
Tokyo (JP)

(72) Inventor: **Ishizuka, Hirotaka**
Suwa-shi, Nagano 392-8502 (JP)

(30) Priority: **09.01.2013 JP 2013001591**
19.11.2013 JP 2013238588

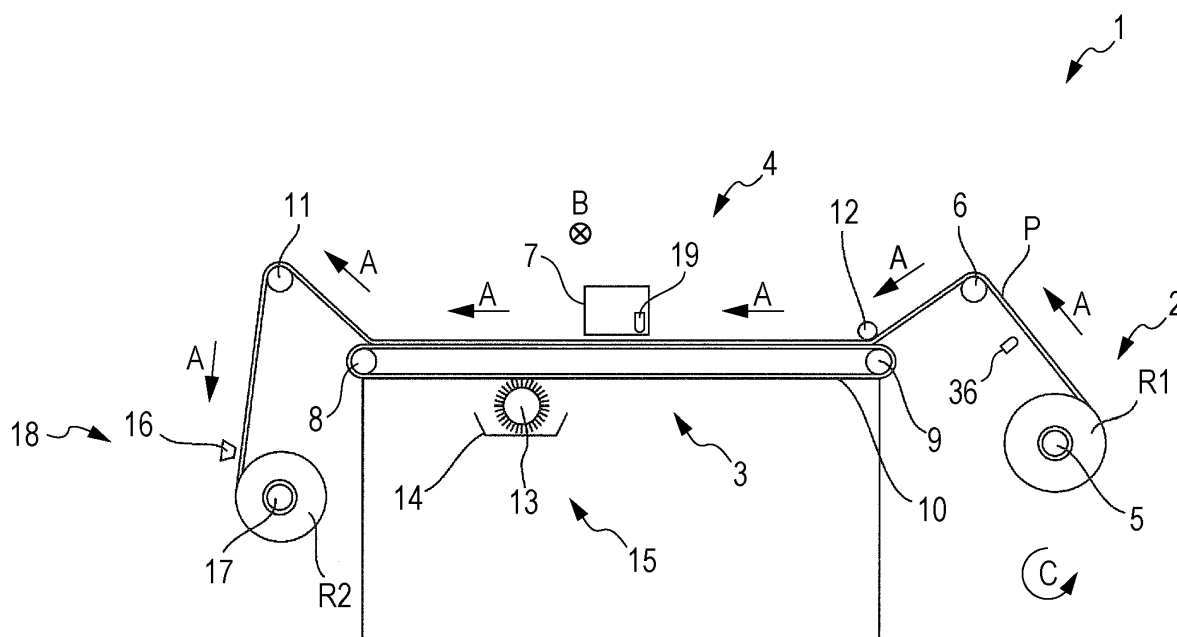
(74) Representative: **Miller Sturt Kenyon**
9 John Street
London WC1N 2ES (GB)

(54) **Recording apparatus and recording method**

(57) A recording method which is performed by using a recording apparatus which includes a movable belt transporting a recording medium, a recording mechanism discharging an ink from a recording head to the recording medium to perform a recording, and a cleaning mechanism of the movable belt, which when performing

a recording on the recording medium, has a recording process of a confirmation image which records a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt.

FIG. 1



Description

BACKGROUND

1. Technical Field

[0001] The present invention relates to a recording apparatus which includes a transport mechanism placing and transporting a recording medium on a movable belt and a recording method.

2. Related Art

[0002] Conventionally, a recording apparatus has been used which includes a transport mechanism placing and transporting a recording medium on a movable belt. When recording an image on the recording medium using the recording apparatus, there is a case, at the time of performing a recording on an end portion of the recording medium, where an ink overflows from the end portion and adheres to the movable belt. In addition, when using a fabric as the recording medium, there is a case where an ink exudes to the back surface from an image forming surface of the fabric and adheres to the movable belt.

[0003] Therefore, for example, in JP-A-11-192694, a recording apparatus is disclosed which includes an endless belt performing a transportation of the recording medium and a cleaning unit having a wiping roller in which the peripheral surface of the endless belt is made of a porous polymer material. In the recording apparatus including the cleaning unit, it is possible to clean off the ink even when the ink adheres to the movable belt such as the endless belt and the like.

[0004] In addition, in the related art, before initiating a recording of a desired image, a confirmation image (check pattern) for confirming that an ink discharge failure does not occur has been recorded. In this way, a recording has been performed after confirming that the ink discharge failure does not occur.

[0005] Furthermore, in the recording apparatus for performing a recording by reciprocally scanning a recording head in a direction intersecting with a transport direction of the recording medium and discharging an ink, in order to suppress an ink discharge failure, an ink discharge operation (flushing) to refresh an ink in the discharge portion of the recording head has been performed during a recording. For example, in JP-A-05-69559, a recording apparatus which can perform the flushing at a position corresponding to recording media with a plurality of types of widths is disclosed.

[0006] However, in the recording apparatus of the related art, in order to confirm whether there is an ink discharge failure during a recording of a desired image, a portion of the recording medium can be wasted by recording a confirmation image on the portion of the recording medium, and the like.

[0007] Additionally, in a recording apparatus which performs a recording by reciprocally scanning a record-

ing head in a direction intersecting with a transport direction of the recording medium and discharging an ink, in order to detect an ink discharge failure during a recording without wasting the recording medium, it is necessary to prepare a dedicated area for confirming the ink discharge failure outside of a transport mechanism of the recording medium. Therefore, there has been a case in which the reciprocal scanning distance of the recording head is made to be longer, and this results in lowering a recording speed.

[0008] The recording apparatuses of JP-A-11-192694 and JP-A-5-69559 do not have a description of suppressing a portion of the recording medium from being wasted and suppressing the recording speed from being lowered.

SUMMARY

[0009] An advantage of some aspects of the invention is to suppress a portion of the recording medium from being wasted, and to suppress the recording speed from being lowered to detect an ink discharge failure during a recording.

[0010] According to an aspect of the present invention, there is provided a recording apparatus which includes a movable belt which transports a recording medium, a recording mechanism which discharges an ink from a recording head to the recording medium to perform a recording, a cleaning mechanism of the movable belt, a width detection unit which detects a width with respect to a transport direction of the recording medium, and when performing a recording on the recording medium, a control unit which controls the recording mechanism so as to record a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt based on a detection result of the width detection unit.

[0011] Here, "an ink discharge failure" includes not only non-discharge of an ink, but also a deviation of an ink discharge direction from a desired direction, an ink discharge amount per droplet not being a desired discharge amount, and the like. In addition, "confirmation image" means an image (check pattern) where an ink discharge failure can be detected visually or by a detection device and the like, and particularly the pattern is not limited.

[0012] According to the aspect, a confirmation image is recorded which is capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt. Therefore, when confirming the ink discharge failure during a recording, it is not necessary to record the confirmation image on the recording medium. In addition, it is not also necessary to prepare a dedicated region for confirming the ink discharge failure outside of a transport mechanism of the recording medium. That is, by reducing a cost of providing the dedicated region, suppressing a portion of the recording medium from being wasted and shortening the scanning distance of the recording head, it is possible to sup-

press a recording speed from being lowered and to detect the ink discharge failure during a recording.

[0013] In particular, according to the aspect, the recording position determined based on a detection result of the width detection unit makes it possible to make the shortest reciprocal scanning distance of the recording head during a recording and to effectively suppress the recording speed from being lowered.

[0014] A confirmation image recorded on the movable belt can be cleaned off by a cleaning mechanism of the movable belt.

[0015] According to another aspect of the invention, there is provided a recording apparatus which includes a movable belt which transports a recording medium, a recording mechanism which discharges an ink from a recording head to the recording medium to perform a recording, a cleaning mechanism of the movable belt, an input unit which inputs a width in the transport direction of the recording medium, and a control unit which controls the recording mechanism so as to record a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt based on an input result of the input unit when performing a recording on the recording medium.

[0016] According to the aspect, the confirmation image capable of confirming the ink discharge failure is recorded outside of the recording medium in the scanning direction of the movable belt. Therefore, when confirming the ink discharge failure during a recording, it is not necessary to record the confirmation image on the recording medium. In addition, it is also not necessary to prepare a dedicated region for confirming the ink discharge failure outside of a transport mechanism of the recording medium. That is, by reducing a cost of providing the dedicated region, suppressing a portion of the recording medium from being wasted and shortening the scanning distance of the recording head, it is possible to suppress a recording speed from being lowered and to detect the ink discharge failure during a recording.

[0017] In particular, according to the aspect, the recording position determined based on an input result of the input unit makes it possible to make the shortest reciprocal scanning distance of the recording head during a recording and to effectively suppress the recording speed from being lowered.

[0018] A confirmation image recorded on the movable belt can be cleaned off by a cleaning mechanism of the movable belt.

[0019] In the recording apparatus according to the aspect of the invention, a meandering detection unit may be included which, when performing a recording on the recording medium, detects meandering in the transport direction of the recording medium, and the control unit may control so that the recording position of the confirmation image is changed based on a detection result of the meandering detection unit.

[0020] According to the aspect, when the recording

medium meanders and is transported, the recording position of the confirmation image can be appropriately changed to a proper position.

[0021] In the recording apparatus according to the aspect of the invention, a recording of the confirmation image also may serve as a flushing.

[0022] Here, "flushing" is a discharge operation of an ink for refreshing an ink of a discharge unit of a recording head so as to suppress an ink discharge failure, and means an ink discharge operation different from an ink discharge for forming an image.

[0023] According to the aspect, the recording of the confirmation image also serves as the flushing, so that it is possible to suppress a recording speed from being lowered, which is caused by performing an additional flushing.

[0024] In the recording apparatus according to the aspect of the invention, the movable belt may be a glue belt.

[0025] In the recording apparatus having the glue belt as the movable belt (belt on which a glue is painted, which detachably bonds the recording medium to a placement surface of the recording medium to hold the medium), the recording medium can be stably supported, so that the glue belt as the movable belt can be preferably used.

[0026] According to the aspect, supporting the recording medium stably can make it possible to improve an image quality of a recorded image.

[0027] In the recording apparatus according to the aspect of the invention, the glue belt may have a region on which a glue is painted and a region on which a glue is not painted, and the control unit may control the recording mechanism so as to record the confirmation image to the region on which a glue is not painted.

[0028] When comparing the region on which a glue is painted and the region on which a glue is not painted, the region on which a glue is not painted has a higher accuracy in detecting an ink discharge failure in the confirmation image, and an easier cleaning off of the confirmation image after confirming an ink discharge failure. Therefore, according to the aspect, the accuracy in detecting the ink discharge failure in the confirmation image is increased and the cleaning off of the confirmation image after confirming the ink discharge failure is facilitated.

[0029] According to still another aspect of the invention, there is provided a recording method which is performed by using a recording apparatus which includes a movable belt transmitting a recording medium, a recording mechanism discharging an ink from a recording head to the recording medium to perform a recording, and a cleaning mechanism of the movable belt, and includes, when performing a recording on the recording medium, a recording process of a confirmation image which records the confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt.

[0030] According to the aspect, the confirmation image which is capable of confirming the ink discharge failure is recorded outside of the recording medium in the scan-

ning direction of the movable belt. Therefore, when confirming the ink discharge failure during a recording, it is not necessary to record the confirmation image on the recording medium. In addition, it is not also necessary to prepare a dedicated region for confirming the ink discharge failure outside of a transport mechanism of the recording medium. That is, by reducing a cost of providing the dedicated region, suppressing a portion of the recording medium from being wasted and shortening the scanning distance of the recording head, it is possible to suppress a recording speed from being lowered and to detect the ink discharge failure during a recording.

[0031] In the recording method according to the aspect of the invention, the recording position of the confirmation image may be determined based on a width in the transport direction of the recording medium.

[0032] According to the aspect, the recording position of the confirmation image may be determined based on the width in the transport direction of the recording medium, so that it is possible to make the shortest reciprocal scanning distance of the recording head during a recording. That is, it is possible to effectively suppress the recording speed from being lowered.

[0033] In the recording method according to the aspect of the invention, a width detection process may be included which detects a width in the transport direction of the recording medium, and the recording position of the confirmation image is determined based on a detection result in the width detection process.

[0034] According to the aspect, the recording position determined based on a detection result in the width detection process makes it possible to make the shortest reciprocal scanning distance of the recording head during a recording and to effectively suppress the recording speed from being lowered.

[0035] In the recording method according to the aspect of the invention, an input process which inputs a width in the transport direction of the recording medium may be included, and the recording position of the confirmation image is determined based on an input result in the input process.

[0036] According to the aspect, the recording position determined based on an input result in the input process makes it possible to make the shortest reciprocal scanning distance of the recording head during a recording and to effectively suppress the recording speed from being lowered.

[0037] In the recording method according to the aspect of the invention, a recording process of the confirmation image may include a detection process which detects meandering in the transport direction of the recording medium when performing a recording on the recording medium, and the recording position of the confirmation image may be changed based on a detection result of the meandering.

[0038] According to the aspect, when the recording medium meanders and is transported, the recording position of the confirmation image can be appropriately

changed to a proper position.

[0039] According to still another aspect of the invention, there is provided a recording apparatus, including a movable belt which transports a recording medium, a recording mechanism which discharges an ink from a recording head to the recording medium to perform a recording, and a control unit which controls the recording mechanism so as to record a confirmation image capable of confirming an ink discharge failure, and in which the movable belt is a glue belt. The glue belt has a region on which a glue is painted and a region on which a glue is not painted, and the control unit controls the recording mechanism so as to record the confirmation image on the region on which a glue is not painted.

[0040] When comparing the region on which a glue is painted and the region on which a glue is not painted, the region on which a glue is not painted has a higher accuracy in detecting an ink discharge failure in the confirmation image, and an easier cleaning off of the confirmation image after confirming the ink discharge failure. Therefore, according to the aspect, the accuracy in detecting an ink discharge failure in the confirmation image is increased and the cleaning off of the confirmation image after confirming the ink discharge failure is facilitated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0041] Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings, wherein like numbers reference like elements.

Fig. 1 is a schematic side diagram showing a recording apparatus according to an embodiment of the invention.

Fig. 2 is a block diagram of a recording apparatus according to an embodiment of the invention.

Fig. 3 is a schematic diagram showing a recording position of a confirmation image.

Fig. 4 is a flowchart showing an embodiment of a recording method of the invention.

Fig. 5 is a flowchart showing another embodiment of the recording method of the invention.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

Embodiment of Recording Apparatus, Figs. 1 to 3

[0042] Hereinafter, a recording apparatus according to embodiments of the invention will be described in detail referring to accompanying drawings.

[0043] First, the recording apparatus according to an embodiment of the invention will be described.

[0044] Fig. 1 shows a schematic side diagram of the recording apparatus 1 according to the embodiment of the invention.

[0045] A recording apparatus 1 of the embodiment includes a set unit 2 which can deliver a roll R1 of a record-

ing medium P for performing a recording, a transport mechanism 3 which transports the recording medium P in a transport direction A using a glue belt 10 as a movable belt, a recording mechanism 4 which reciprocally scans a recording head 7 in a scanning direction B intersecting with the transport direction A of the recording medium P to perform a recording, and a cleaning mechanism 15 of the glue belt 10. The recording apparatus 1 further includes a winding mechanism 18 which has a winding shaft 17 winding the recording medium P and a cutter 16 cutting the wound recording medium P.

[0046] A set unit 2 includes a rotating shaft 5 which also serves as a set position of the roll R1 of the recording medium P for performing a recording, and is configured so that the recording medium P can be delivered to the transport mechanism 3 through a driven roller 6 from the roll R1 set by the rotating shaft 5. When delivering the recording medium P to the transport mechanism 3, the rotating shaft 5 rotates in a rotation direction C.

[0047] In addition, the set unit 2 includes an optical sensor 36 as a meandering detection unit which detects meandering in the transport direction A when performing a recording on the recording medium P.

[0048] The transport mechanism 3 includes a glue belt 10 which places and transports the recording medium P delivered from the set unit 2, and a transport roller 8 and a driven roller 9 which move the glue belt 10. The recording medium P is pressurized and attached to the glue belt 10 by a pressure roller 12 to be placed. When transporting the recording medium P, the transport roller 8 rotates in the rotation direction C.

[0049] The recording mechanism 4 has a recording head 7, a carriage (not shown) which is mounted by the recording head 7, an optical sensor 19 as a width detection unit, which is provided in the carriage and detects a width in the transport direction A of the recording medium P, and a carriage motor 26 (refer to Fig. 2) which causes the carriage to reciprocate in the scanning direction B. The scanning direction B in Fig. 1 is a direction perpendicular to a paper surface.

[0050] Recording is performed by reciprocally scanning the recording head 7 when performing a recording, but the transport mechanism 3 stops a transport of the recording medium P during a recording scan (during the movement of the recording head). In other words, during the recording, the reciprocating scan of the recording head 7 and the transport of the recording medium P are alternately performed. That is, in response to the reciprocating scan of the recording head 7, the transport mechanism 3 causes the recording medium P to be intermittently transported when performing a recording.

[0051] The cleaning mechanism 15 of the glue belt 10 has a cleaning unit 13 configured to have a plurality of cleaning rollers connected thereto in a rotating shaft direction, and a tray 14 in which a detergent as a cleaning mechanism of the cleaning unit 13 is accommodated.

[0052] The winding mechanism 18 is a mechanism which winds the recording medium P transported from

the transport mechanism 3 through a driven roller 11 after a recording is made. By setting a paper tube and the like for winding on the winding shaft 17 and winding the recording medium P therearound, it is possible to perform winding to have a roll R2 of the recording medium P.

[0053] Next, an electrical configuration in a recording apparatus 1 of the embodiment will be described.

[0054] Fig. 2 is a block diagram of the recording apparatus 1 of the embodiment.

[0055] In a control unit 20, a CPU 21 is provided which entirely controls the recording apparatus 1. The CPU 21 is connected to a ROM 23, which stores various types of control programs and the like performed by the CPU 21, and a RAM 24, which is capable of temporarily storing data, through a system bus 22. In addition, the CPU 21 is connected to a head drive unit 25 for driving the recording head 7 through the system bus 22.

[0056] Additionally, the CPU 21 is connected to a motor drive unit 32, which is for driving the carriage motor 26, a transport motor 27, a delivery motor 28, and a winding motor 29, through the system bus 22.

[0057] Here, the carriage motor 26 is a motor for moving a carriage mounted by the recording head 7. In addition, the transport motor 27 is a motor for driving the transport roller 8. In addition, the delivery motor 28 is a rotation mechanism of the rotating shaft 5, and is a motor which drives the rotating shaft 5 so as to deliver the recording medium P to the transport mechanism 3. Then, the winding motor 29 is a drive motor for rotating the winding shaft 17.

[0058] Moreover, the CPU 21 is connected to a cutter drive unit 33, which drives the cutter 16 so as to cut the recording medium P, through the system bus 22.

[0059] Furthermore, the CPU 21 is connected to the optical sensor 19 as a width detection unit, the optical sensor 36 as a meandering detection unit, a monitor 34 and a control panel 35 which are provided in the recording apparatus 1, and an interface 31 for inputting recorded data and the like from an external device such as a PC through an input/output unit 30 for transmitting or receiving data and signals and the system bus 22.

[0060] The control unit 20, when recording a desired image on the recording medium P, controls the recording mechanism 4 so as to record a confirmation image capable of confirming an ink discharge failure outside of the recording medium P in the scanning direction B of the glue belt 10. At this time, the recording position of the confirmation image is determined based on a width in the scanning direction B of the recording medium P along the transport direction A, and the recording mechanism 4 is controlled so as to record the confirmation image to the recording position.

[0061] In the recording apparatus 1 of the embodiment, a recording of the confirmation image serves as a flushing. However, the recording apparatus 1 is not limited to this configuration, and the recording apparatus may be configured to perform the flushing separately from the recording of the confirmation image. Furthermore, for ex-

ample, the recording apparatus may have a configuration in which a nozzle with a low frequency of discharging an ink is preferentially flushed among nozzles for discharging an ink provided at the recording head 7.

[0062] The recording apparatus 1 of the embodiment includes the optical sensor 19 as a width detection unit which detects a width in the scanning direction B of the recording medium P along the transport direction A, so that it is possible to determine the recording position of the confirmation image based on a detection result of the optical sensor 19.

[0063] In addition, the recording apparatus 1 of the embodiment includes the control panel 35 as an input unit to which a user can input a width of recording medium in a direction intersecting with the transport direction A of the recording medium, so that it is possible to determine the recording position of the confirmation image based on an input result in the control panel 35.

[0064] The recording apparatus 1 of the embodiment, when performing a recording on the recording medium P, includes the optical sensor 36 as a meandering detection unit which detects meandering in the scanning direction B as the recording medium P moves in the transport direction. Then, the control unit 20 controls the recording mechanism 4 so as to appropriately change and record the recording position of the confirmation image based on the detection result of the optical sensor 36.

[0065] Therefore, even when the recording medium P meanders and is transported, it is possible to appropriately change the recording position of the confirmation image to a proper position.

[0066] There is no particular limitation to a method of changing the recording position of the confirmation image based on a detection result of the meandering of the recording medium P. However, the recording apparatus of the embodiment provides a threshold for an amount of meandering, and only when meandering of the recording medium exceeds the threshold, is the recording position of the confirmation image caused to be changed depending on the amount of meandering.

[0067] Next, the recording position of the confirmation image will be described.

[0068] Fig. 3 is a schematic diagram showing the recording position of the confirmation image, and a schematic plan diagram of the recording apparatus 1 of the embodiment.

[0069] Fig. 3 shows a recording position I1 of the confirmation image at the time of placing a recording medium P1 having one width on the glue belt 10, and a recording position I2 of the confirmation image at the time of placing a recording medium P2 having a different width from that of the recording medium P1 along the transport direction A. Thus, the control unit 20 of the embodiment determines the recording position of the confirmation image outside of the recording medium P in the scanning direction B of the glue belt 10 based on the width of recording medium in a direction intersecting with the transport direction of the recording medium, and controls the record-

ing mechanism 4 so as to record the confirmation image to the recording position.

[0070] Recording positions I1 and I2 of the confirmation image in Fig. 3 are positioned on the downstream side in the transport direction A from a reciprocal scanning region of the recording head 7 in the scanning direction B. This shows both a transport of the recording medium and a state where the recording positions I1 and I2 of the confirmation image move to the downstream side in the transport direction A, and an actual recording position along the transport direction A is a reciprocal scanning region of the recording head 7 in the scanning direction B.

[0071] The glue belt 10 of the embodiment is configured to have a belt on which a glue is uniformly painted, however, the recording apparatus may be configured to have the glue belt which has a region on which a glue is painted and a region on which a glue is not painted, and to record the confirmation image onto the region on which a glue is not painted.

[0072] When comparing the region on which a glue is painted with the region on which a glue is not painted, the region on which a glue is not painted has a higher accuracy in detecting an ink discharge failure in the confirmation image, and an easier cleaning off of the confirmation image after confirming the ink discharge failure. Therefore, according to this configuration, the accuracy in detecting an ink discharge failure in the confirmation image is increased and the cleaning off of the confirmation image after confirming the ink discharge failure is facilitated.

Embodiment of Recording Method, Fig. 4

[0073] Next, a recording method according to an embodiment of the invention will be described.

[0074] Fig. 4 is a flowchart showing a recording method according to an embodiment of the invention.

[0075] The recording method of the embodiment is an embodiment performed using the recording apparatus 1.

[0076] First, in step S110, a width of the recording medium is detected by the optical sensor 19.

[0077] Next, in step S130, the recording position of the confirmation image is determined based on a result of detecting the width of the recording medium P by the optical sensor 19.

[0078] Next, in step S140, a recording is initiated based on recorded data corresponding to a desired image input to the recording apparatus 1. Then, each of the following steps is performed according to the recording.

[0079] In step S150, using a control of the control unit 20, the recording mechanism 4 records a confirmation image outside of the recording medium P in the scanning direction B based on a width in the transport direction A of the recording medium P.

[0080] Next, in step S160, the confirmation image is observed by an observation unit of the confirmation image which is included in the recording apparatus 1 and

configured to have an optical sensor and the like. Using the recording apparatus with which the observation unit is not provided, the confirmation image may also be visually observed.

[0081] Next, in step S170, the control unit 20 determines whether there is an ink discharge failure from the observation result in step S160.

[0082] Steps S140 to S170 are performed at every scanning in the scanning direction B of the recording head 7.

[0083] When it is determined that there is an ink discharge failure in step S170, a process proceeds to step S180 and a recording for forming a desired image on the recording medium P is stopped, thereby finishing a recording method of the embodiment.

[0084] When it is determined that there is not an ink discharge failure in step S170, the process proceeds to step S190 and the control unit 20 determines whether the recording for forming a desired image is finished or not. More specifically, the control unit 20 determines whether the recording is finished or not based on recorded data corresponding to the desired image input to the control unit 20. Then, as long as it is determined that there is not an ink discharge failure in step S170, each of steps S140 to S190 is repeated until the recording for forming a desired image on the recording medium P is finished, thereby finishing the recording method of the embodiment.

[0085] In the recording method of the embodiment, while repeating each of steps S140 to S190, independently from each of these steps, it is possible to detect meandering of the recording medium P along the transport direction A using the optical sensor 36 and to change the recording position of the confirmation image based on a detection result of the meandering. More specifically, when a threshold for an amount of meandering is provided and the amount of meandering exceeds the threshold, the recording position of the confirmation image is caused to be changed depending on the amount of meandering. Embodiment of another recording method, Fig. 5

[0086] Next, a recording method according to another embodiment of the invention will be described.

[0087] Fig. 5 is a flowchart showing a recording method according to another embodiment of the invention.

[0088] The recording method of the embodiment is an embodiment performed using the recording apparatus 1.

[0089] First, in step S120, a user inputs a width of the recording medium using the control panel 35.

[0090] Next, in step S130, the recording position of the confirmation image is determined based on the width of the recording medium P input using the control panel 35.

[0091] Each of the following steps S140 to S190 is common to the embodiment of the recording method, so that a detailed description will be omitted.

[0092] The foregoing description has been given by way of example only and it will be appreciated by a person skilled in the art that modifications can be made without

departing from the scope of the present invention.

Claims

1. A recording apparatus (1) comprising:

a movable belt (10) for transporting a recording medium (P);
a recording mechanism (4) for discharging an ink from a recording head (7) to the recording medium to perform a recording;
a width detection unit (19) for detecting a width of recording medium in a direction intersecting with a transport direction (A) of the recording medium; and
a control unit (20) for controlling the recording mechanism so as to record a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt based on a detection result of the width detection unit when performing a recording on the recording medium.

2. A recording apparatus (1) comprising:

a movable belt (10) for transporting a recording medium (P);
a recording mechanism (4) for discharging an ink from a recording head (7) to the recording medium to perform a recording;
an input unit (30) for inputting a width of recording medium in a direction intersecting with a transport direction (A) of the recording medium; and
a control unit (20) for, when performing a recording on the recording medium, controlling the recording mechanism so as to record a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt based on an input result of the input unit.

3. The recording apparatus according to claim 1 or claim 2, further comprising:

a meandering detection unit (36) for detecting meandering along the transport direction of the recording medium when performing a recording on the recording medium,
wherein the control unit (20) is adapted to control the recording apparatus so that the recording position of the confirmation image is changed based on a detection result of the meandering detection unit.

4. The recording apparatus according to any one of the preceding claims, wherein a recording of the confir-

mation image also serves as flushing.

5. The recording apparatus according to any one of the preceding claims, wherein the movable belt is a glue belt. 5
6. The recording apparatus according to claim 5, wherein the glue belt has a region on which a glue is provided and a region on which a glue is not provided, and 10
wherein the control unit is adapted to control the recording mechanism so as to record the confirmation image on the region on which a glue is not provided.
7. The recording apparatus according to any one of the preceding claims, further comprising a cleaning mechanism (15) for cleaning the movable belt (10). 15
8. A recording method using a recording apparatus which includes a movable belt (10) transporting a recording medium (P), a recording mechanism (4) discharging an ink from a recording head (7) to the recording medium to perform a recording, and a cleaning mechanism (15) of the movable belt, the method comprising: 20

recording a confirmation image capable of confirming an ink discharge failure outside of the recording medium in the scanning direction of the movable belt when performing a recording on the recording medium. 30
9. The recording method according to claim 8, wherein the recording position of the confirmation image is determined based on a width of recording medium in a direction intersecting with the transport direction of the recording medium. 35
10. The recording method according to claim 9, further comprising: 40

detecting a width of recording medium in a direction intersecting with the transport direction of the recording medium, 45
wherein the recording position of the confirmation image is determined based on a detection result in the detecting.
11. The recording method according to claim 9, further comprising: 50

inputting a width of recording medium in a direction intersecting with the transport direction of the recording medium, 55
wherein the recording position of the confirmation image is determined based on an input result in the inputting.

12. The recording method according to any one of claims 9 to 11, wherein the recording includes detecting meandering along the transport direction of the recording medium when performing a recording on the recording medium, and wherein the recording position of the confirmation image is changed based on a detection result of the meandering.

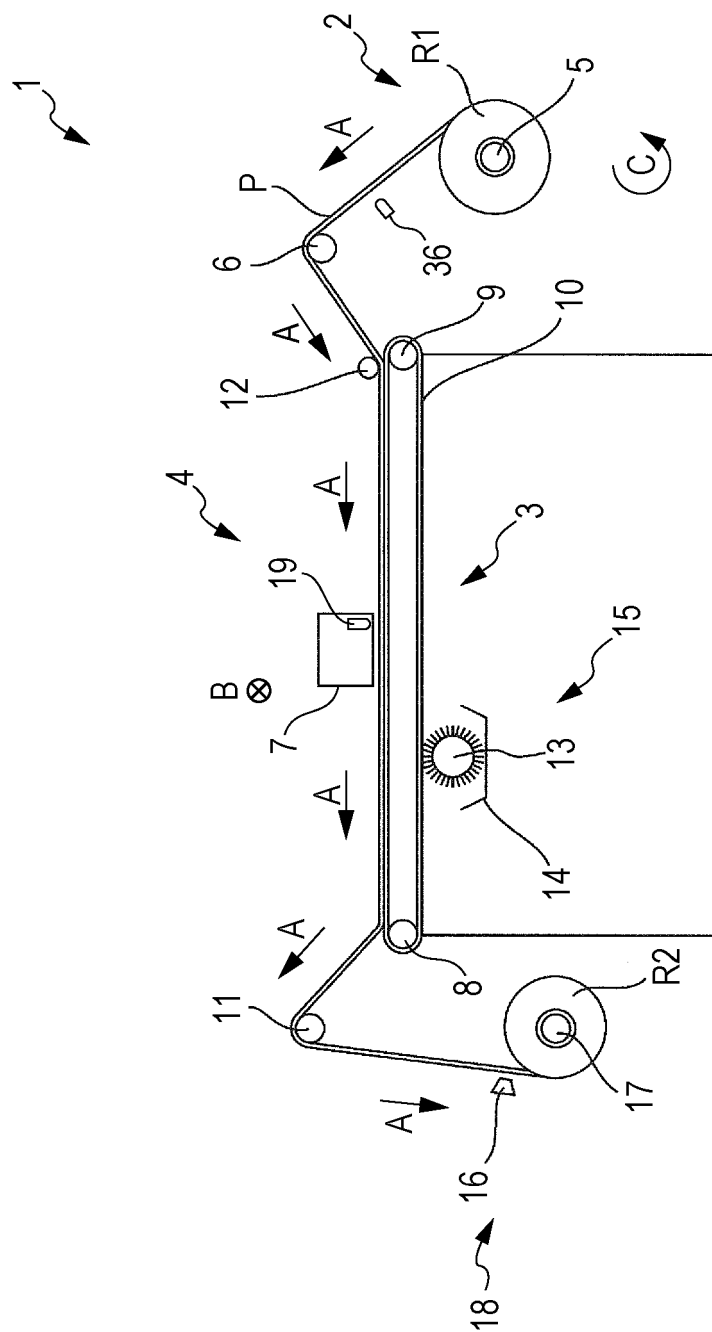


FIG. 1

FIG. 2

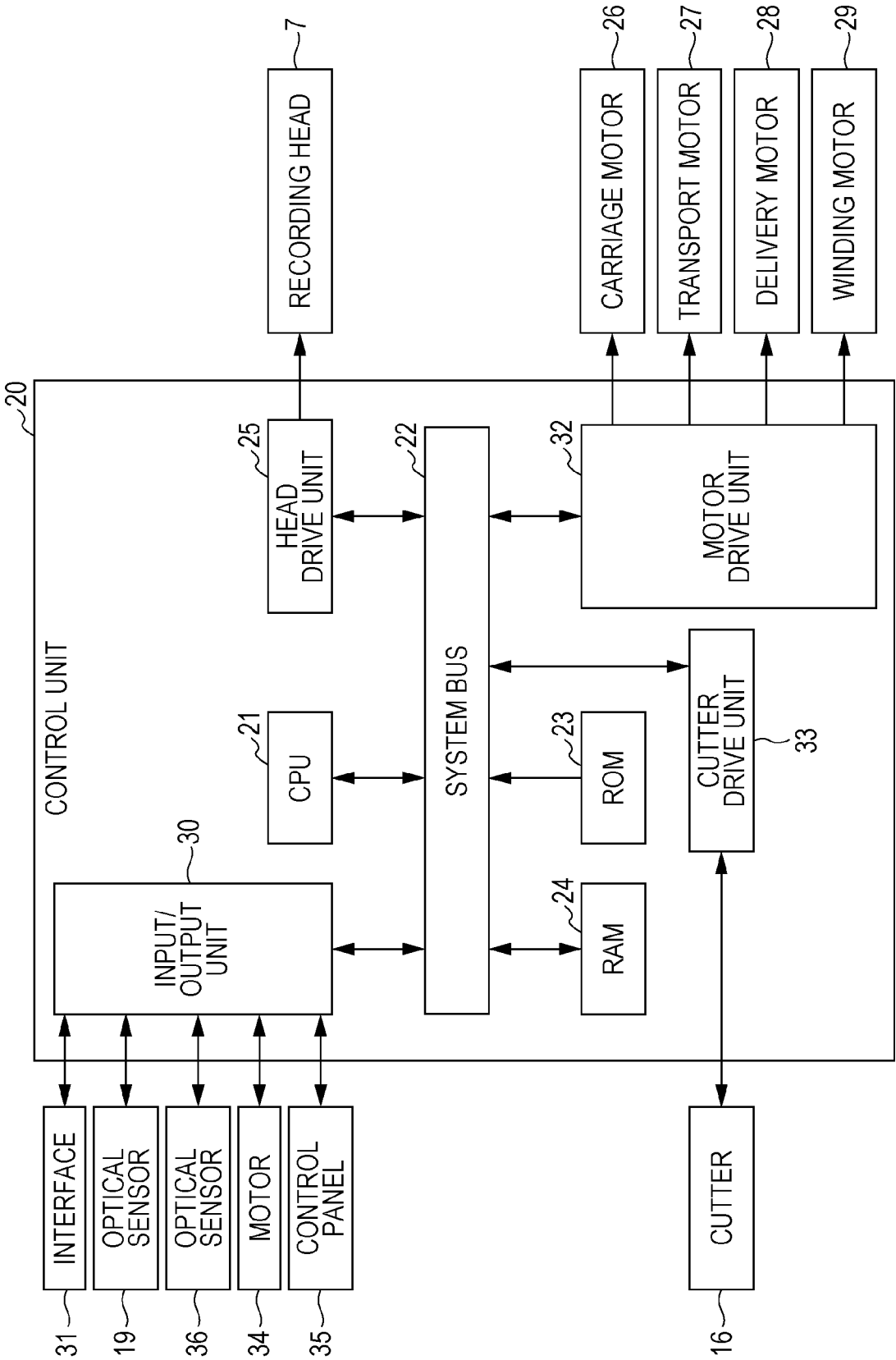


FIG. 3

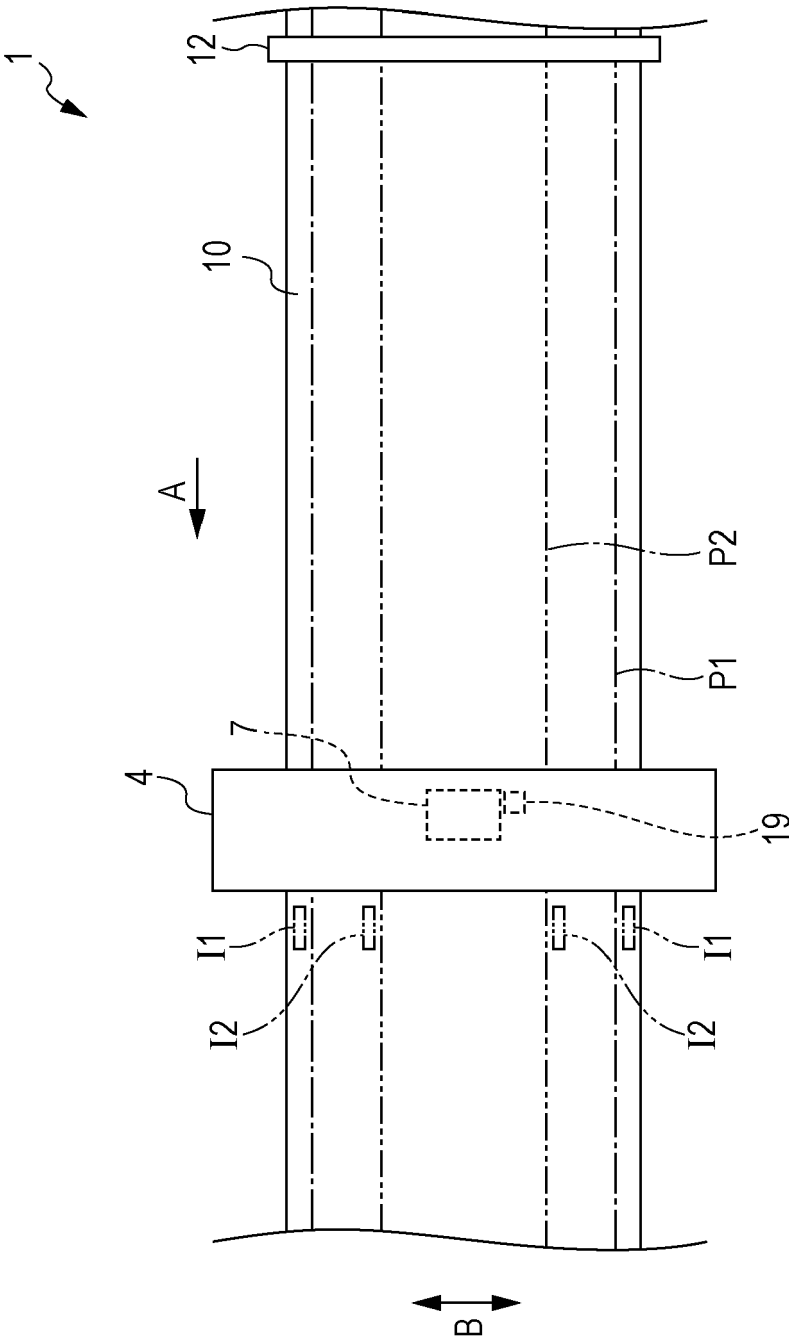


FIG. 4

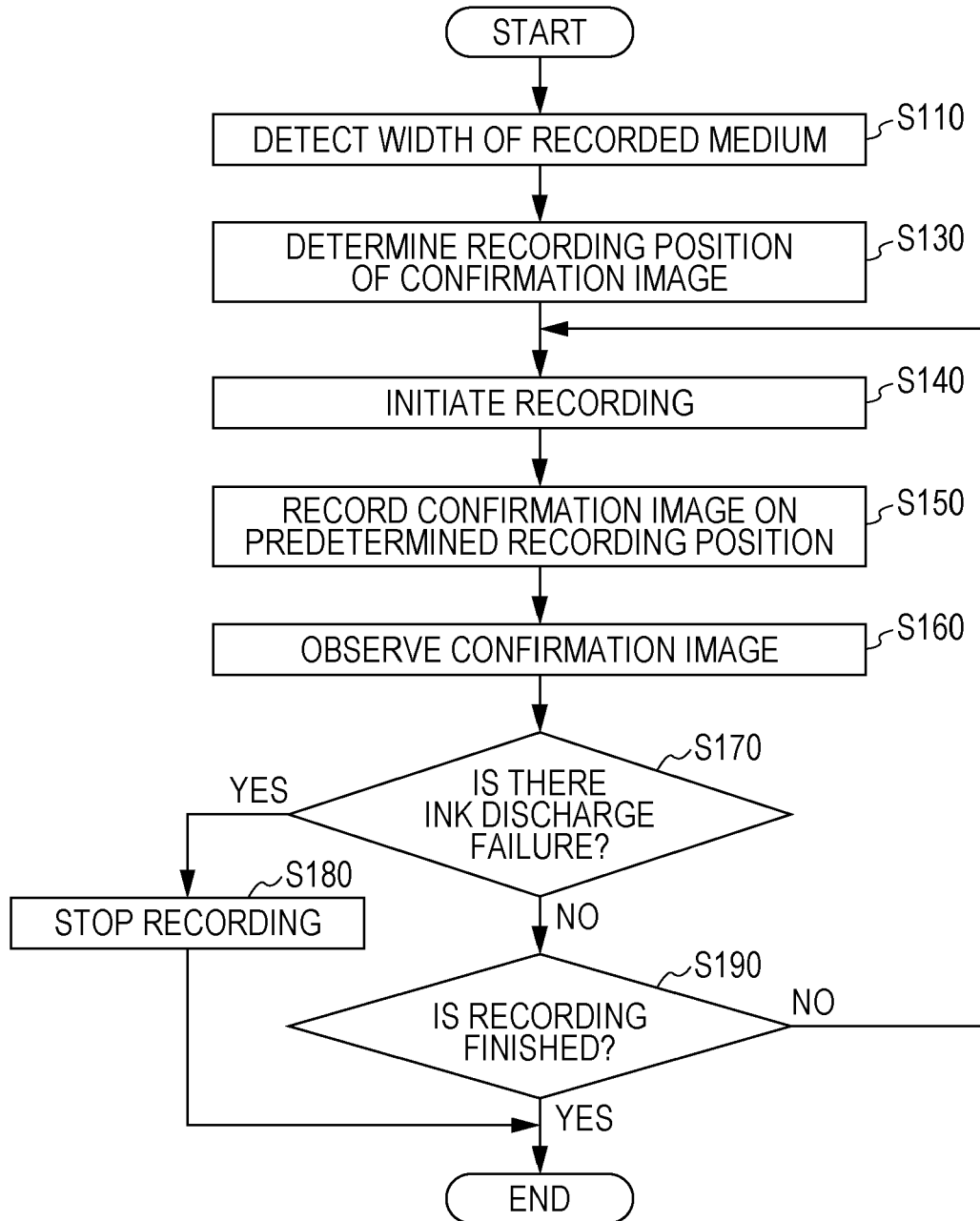
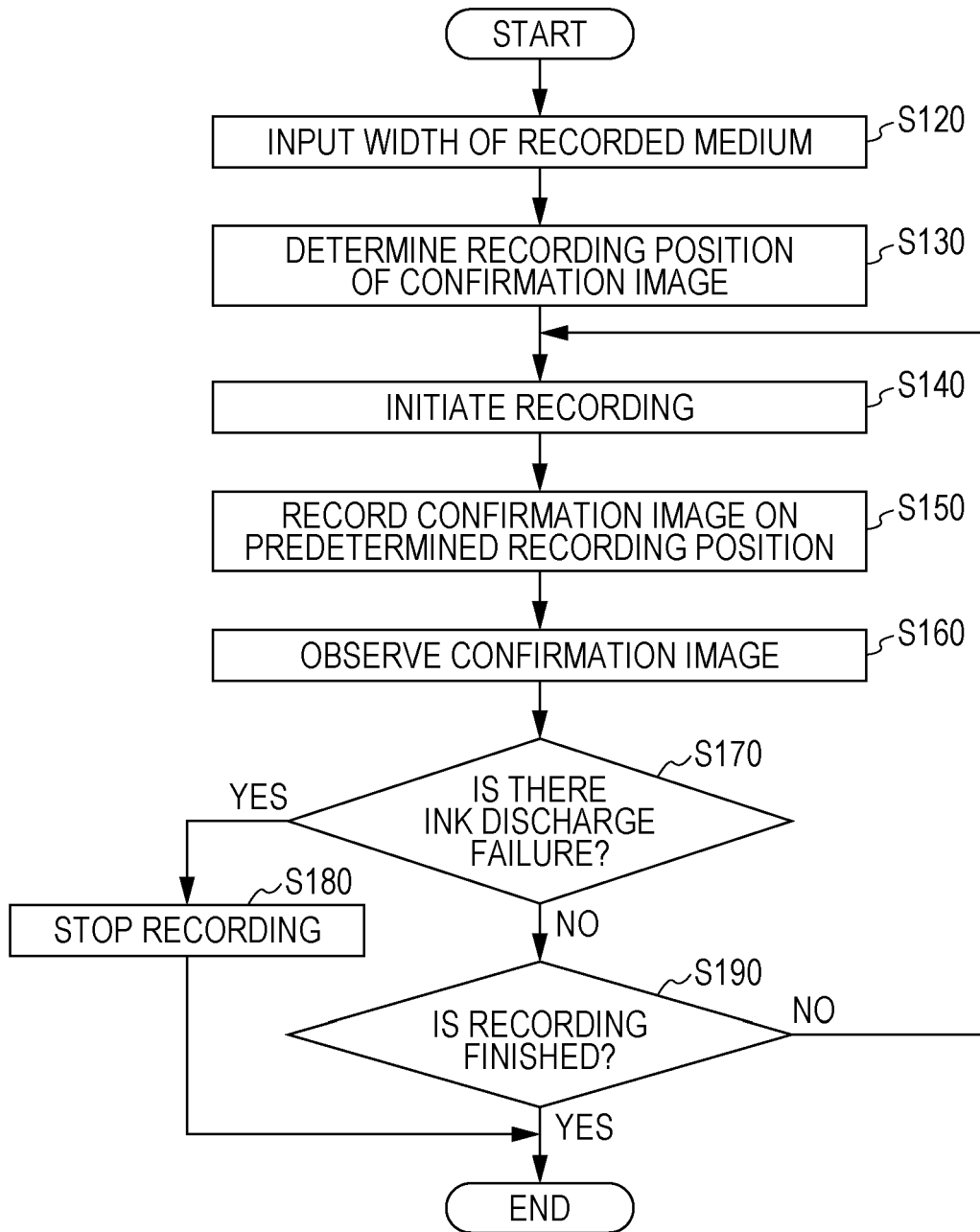


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 14 15 0548

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2005 342899 A (KONICA MINOLTA HOLDINGS INC) 15 December 2005 (2005-12-15) * abstract; figures 1,4,7 *	1-12	INV. B41J2/165 B41J11/00 B41J13/00 B41J29/393
A	US 2009/184993 A1 (YORIMOTO MAMORU [JP] ET AL) 23 July 2009 (2009-07-23) * figures 1,2,5,7,8 * * paragraph [0088] * * paragraph [0095] * * paragraph [0124] *	1-12	
A	US 2005/078145 A1 (INOUE HIROSHI [JP]) 14 April 2005 (2005-04-14) * figures 1,6,11 * * paragraph [0104] * * paragraph [0107] * * paragraph [0170] - paragraph [0171] *	1-12	
A	US 2009/092404 A1 (TASHIRO KAZUYA [JP] ET AL) 9 April 2009 (2009-04-09) * the whole document *	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B41J
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 April 2014	Examiner João, César
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 15 0548

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-04-2014

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2005342899 A	15-12-2005	NONE	
US 2009184993 A1	23-07-2009	JP 5073509 B2 JP 2009166398 A US 2009184993 A1	14-11-2012 30-07-2009 23-07-2009
US 2005078145 A1	14-04-2005	NONE	
US 2009092404 A1	09-04-2009	NONE	

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- JP 11192694 A [0003] [0008]
- JP 5069559 A [0005] [0008]