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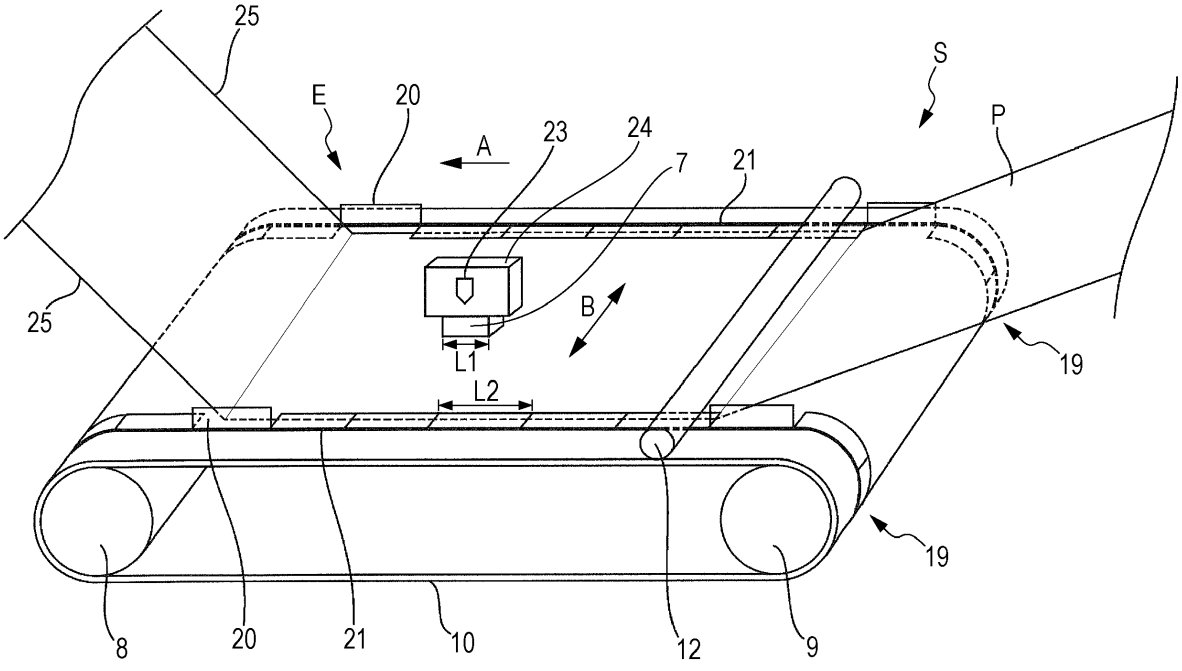
(54) Recording apparatus

(57) A recording apparatus includes an adhesive belt (10) which supports a recording medium (P) in a transportable manner using a supporting surface (F) to which an adhesive is applied; and a recording head (7) which discharges an ink in a recordable manner onto the recording medium that is supported by the supporting surface, in which the adhesive belt includes, on the supporting surface thereof, a retaining portion (19) which retains an end portion (25) of the recording medium in an intersecting direction that intersects a transport direction of the recording medium.

FIG. 2



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Description

BACKGROUND

1. Technical Field

[0001] The present invention relates to a recording apparatus provided with a transport mechanism that transports a recording medium using an adhesive belt.

2. Related Art

[0002] Recording apparatuses provided with a transport mechanism in which a recording medium is placed on a moving belt and transported are used in the related art. Of the recording apparatuses, a recording apparatus is disclosed that is provided with an adhesive belt, in which an adhesive that holds the recording medium by adhering thereto in a detachable manner is applied to a placement surface of the recording medium, as the moving belt. For example, in JP-A-2010-255133, a recording apparatus is disclosed that is provided with an endless belt, which adhesively fixes the recording medium thereto and transports the recording medium. As another example of a recording apparatus that transports the recording medium using an adhesive belt, a recording apparatus provided with a retaining member that retains the recording medium from lifting up is disclosed in JP-A-2010-264596.

[0003] There are various types of recording medium, some of which are easily damaged when a force is applied to the recording medium. In addition, in a recording medium that includes a fibrous material, there is a case in which the end portion is fluffy. When recording is performed on such a recording medium with a fluffy end portion, there is a case in which the fluff interferes with the recording head; thus causing an ink to be discharged poorly.

[0004] However, the recording apparatus disclosed in JP-A-2010-255133 is not configured to suppress the influence of fluff of the end portion of the recording medium. Furthermore, there may be a case in which the recording apparatus disclosed in JP-A-2010-264596 is capable of suppressing the interference of the fluff on the recording head; however, since a friction force from the retaining member is easily applied to the recording medium in this configuration, it is considered that, depending on the recording medium used, the recording medium may sustain damage.

[0005] In this manner, in the recording apparatus of the related art, when recording on the recording medium, the influence of fluff of the end portion of the recording medium is not sufficiently suppressed.

SUMMARY

[0006] Therefore, an advantage of some aspects of the invention is that, when recording on the recording medium, the influence of fluff of the end portion of the recording medium is suppressed.

[0007] According to an aspect of the invention, there is provided a recording apparatus, including an adhesive belt which supports a recording medium in a transportable manner using a supporting surface to which an adhesive is applied; and a recording head which discharges an ink in a recordable manner onto the recording medium that is supported by the supporting surface, in which the adhesive belt includes, on the supporting surface thereof, a retaining portion which retains an end portion of the recording medium in an intersecting direction that intersects a transport direction of the recording medium.

[0008] Here, the term "adhesive belt" refers to a belt with an adhesive applied thereto that holds the recording medium onto a supporting surface of the recording medium by adhering thereto in a detachable manner.

[0009] According to this aspect, the retaining portion is included on the supporting surface of the adhesive belt. In other words, since the retaining portion also moves together with the movement of the adhesive belt, it is possible to suppress an excessive application of force on the recording medium when the end portion of the recording medium is retained. Therefore, it is possible to suppress the influence of fluff of the end portion of the recording medium without damaging the recording medium.

[0010] The retaining portion may include an ink receiving function of receiving the ink that is discharged from the recording head, and the recording apparatus may include a cleaning unit of the adhesive belt, which cleans the supporting surface and the restraining portion.

[0011] Here, the phrase "ink receiving function" means the capability to hold the ink that is discharged from the recording head when the ink is flushed from the recording head, when recording is performed up to the end portion of the recording medium, or the like.

[0012] According to this aspect, since the retaining portion also functions as the ink receiving portion, it is possible to discharge the ink thereto when the ink is flushed from the recording head, when recording is performed up to the end portion of the recording medium, or the like, without providing a new component separately. Furthermore, since the ink receiving portion is adjacent to the recordable region, it is possible to improve productivity.

[0013] Note that, the cleaning unit can clean the retaining portion together with the supporting surface, and that it is possible to clean the ink that is adhered to the retaining portion.

[0014] The recording head may be mounted on a carriage, which is capable of moving reciprocally in the intersecting direction, and may be capable of recording on the recording medium by reciprocally scanning over the recording medium. The carriage may be provided with a sensor, and the sensor may be capable of detecting an end portion of a region on which the recording head is capable of recording in the intersecting direction of the recording medium by detecting the retaining portion.

[0015] According to this aspect, the retaining portion also functions as the detection unit when the recordable region in the intersecting direction is detected by the sensor. Therefore, it is possible to detect the recordable region in the intersecting direction without providing a new component separately, and it is possible to reduce the waste of the margin of the recording medium by performing the recording across the region of the retaining portion.

[0016] The recording head may be mounted on a carriage, which is capable of moving reciprocally in the intersecting direction, and may be capable of recording on the recording medium by reciprocally scanning over the recording medium. The retaining portion may be configured from a plurality of plate-shaped members that are lined up along the transport direction, and a length of the plate-shaped members in the transport direction may be longer than the length in the transport direction in which the recording head is capable of recording in one reciprocal movement.

[0017] According to this aspect, the length of the plate-shaped members, which configure the retaining portion, in the transport direction is longer than the length in the transport direction in which the recording head is capable of recording in one reciprocal movement. Therefore, the frequency in which the ink is discharged from the recording head to a space between adjacent plate-shaped members can be decreased.

[0018] The retaining portion may be configured from a plurality of plate-shaped members that are lined up along the transport direction, and the plate-shaped members may be configured using a flexible material.

[0019] According to this aspect, since the plate-shaped member is configured using a flexible material, it is possible to configure the plate-shaped member in a simple manner, and also to cause the adhesive belt to bend and move without damaging the plate-shaped member. Examples of the flexible material include plastic materials such as an ABS resin, a polycarbonate (PC), a methacrylic resin, and polyethylene terephthalate (PET). It is preferable that these flexible materials contain an antistatic agent; thus, it is possible to prevent the fluff or the like from scattering due to an electrostatic force. Furthermore, due to the static contact angle of the ink on the plate-shaped member being 40° or more, the ink that is discharged when performing the recording or the flushing has poor wettability in relation to the plate-shaped member; thus, it is possible to hold the ink without the recording medium or the adhesive belt becoming dirty, and, it is possible to easily clean the ink using the cleaning unit of the adhesive belt. It is preferable that the color tone of the plate-shaped member be a color tone (white, for example) in which it is easy to recognize the ink that is discharged when performing the flushing. In addition to the state of the cleaning, which is performed by the cleaning unit, of the plate-shaped member being easy to confirm, it is possible to confirm the state of the ink discharging of the nozzles of the recording head by confirming the state of the flushing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Fig. 1 is a schematic side view which represents a recording apparatus of an embodiment of the invention.

Fig. 2 is a schematic perspective view which represents an adhesive belt of the recording apparatus of the embodiment of the invention.

Fig. 3 is a schematic view of a retaining portion of the recording apparatus of the embodiment of the invention.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

Embodiments, Figs. 1 to 3

[0021] Detailed description will be given below of the recording apparatus according to the embodiment of the invention with reference to the attached drawings.

[0022] Fig. 1 is a schematic side view of a recording apparatus 1 according to the embodiment of the invention.

[0023] The recording apparatus 1 of this embodiment is provided with a feed portion 2 that is capable of feeding a roll R1 of the recording medium P for performing recording. The recording apparatus 1 is also provided with a transport mechanism 3 that transports the recording medium P in a transport direction A using an adhesive belt 10, which supports the recording medium P using a supporting surface F on which an adhesive is applied. The recording apparatus 1 is also provided with a recording mechanism 4 that performs recording by causing a recording head 7 to be scanned reciprocally in an intersecting direction B that intersects the transport direction A of the recording medium P. The recording apparatus 1 is also provided with a cleaning mechanism 15 of the adhesive belt 10. Furthermore, the recording apparatus 1 is also provided with a winding shaft 17 that winds the recording medium P, and a winding mechanism 18 that includes a cutter 16, which cuts the recording medium P that is wound onto the winding shaft 17.

[0024] The feed portion 2 is configured to be provided with a rotation axis 5 that also functions as the setting position of the roll R1 of the recording medium P for performing the recording, and it is possible to feed the recording medium P from the roll R1, which is set on the rotation axis 5, to the transport mechanism 3 via a driven roller 6. Note that, when feeding the recording medium P to the transport mechanism 3, the rotation axis 5 rotates in a rotation direction C.

[0025] The transport mechanism 3 is provided with the adhesive belt 10, on which the recording medium P that

is fed from the feed portion 2 is placed and transported, and a transport roller 8 and a driven roller 9 that cause the adhesive belt 10 to move. The recording medium P is placed and stuck to the supporting surface F of the adhesive belt 10 by pressure being applied thereto by a pressure roller 12. Note that, when transporting the recording medium P, the transport roller 8 rotates in the rotation direction C.

[0026] The recording mechanism 4 includes the recording head 7, a carriage 24

[0027] (refer to Fig. 2), on which the recording head 7 is mounted, and a carriage motor (not shown) that causes the carriage 24 to move reciprocally in the intersecting direction B. Note that, in Fig. 1, the intersecting direction B is a perpendicular direction in relation to the surface of the page on which Fig. 1 is illustrated.

[0028] When performing the recording, the recording is performed by causing the recording head 7 to be scanned reciprocally; however, during the recording scanning (during the movement of the recording head), the transport mechanism 3 stops the transporting of the recording medium P. In other words, when performing the recording, the reciprocal scanning of the recording head 7 and the transporting of the recording medium P are performed alternately. That is, when performing the recording, the transport mechanism 3 causes the recording medium P to be transported intermittently corresponding to the reciprocal scanning of the recording head 7.

[0029] The recording apparatus 1 of this embodiment is provided with the recording mechanism 4 that performs recording by causing the recording head 7 to be scanned reciprocally; however, the recording apparatus 1 is not limited to a recording mechanism of this configuration, and may also be provided with a recording mechanism that includes a so-called line head, in which a row of nozzles that discharge an ink is provided in a direction intersecting the transport direction A.

[0030] The cleaning mechanism 15 of the adhesive belt 10 includes a cleaning unit 13, which is configured from a plurality of cleaning rollers that are linked in the rotation axis direction, and a tray 14, which is filled with a cleaning agent for cleaning the cleaning unit 13. A plurality of the cleaning mechanisms 15 may be provided. This is in order to improve the cleaning properties of plate-shaped members 20.

[0031] The winding mechanism 18 is a mechanism that winds the recording medium P, which is recorded on and transported from the transport mechanism 3 via the driven roller 11, and is capable of winding the recording medium P as the roll R2 by setting a paper tube or the like for winding on the winding shaft 17 and winding the recording medium P thereon.

[0032] Next, description will be given of a retaining portion 19, which is provided on the supporting surface F of the adhesive belt 10 of the recording apparatus 1 of this embodiment, which moves together with the movement of the adhesive belt 10, and which retains an end portion 25 of the recording medium P in the intersecting direction B that intersects the transport direction A of the recording medium P.

[0033] Fig. 2 is a schematic perspective view which represents the adhesive belt 10 of the recording apparatus 1 of this embodiment, and Fig. 3 is a schematic view of the retaining portion 19 provided on the supporting surface F of the adhesive belt 10.

[0034] The retaining portion 19 is provided on the supporting surface F of the adhesive belt 10 of the recording apparatus 1 of this embodiment in a position that corresponds to the end portion 25 in the intersecting direction B of the recording medium P. The retaining portion 19 is configured by a plurality of the plate-shaped members 20 that are lined up along the transport direction A.

[0035] As shown in Fig. 3, the retaining portion 19 is provided with the plate-shaped members 20, and fixing portions 21 that fix the plate-shaped members 20 such that the plate-shaped members 20 can move rotationally in a rotation direction D from a direction along the supporting surface F to a direction substantially perpendicular to the direction along the supporting surface F, with a direction along the transport direction A as a rotation axis 22.

[0036] As shown in Fig. 2, the retaining portion 19 is provided on the supporting surface F of the adhesive belt 10 such that the fixing portions 21 are positioned closer to the outside in the intersecting direction B than the plate-shaped members 20.

[0037] The plate-shaped members 20 of this embodiment move in a direction to separate from the supporting surface F by rotating in the rotation direction D around the rotation axis 22 in a position proximal to a support start position S of the recording medium P and a position proximal to a support end position E of the recording medium P. Note that, in other positions, the plate-shaped members 20 of this embodiment are laid down to be positioned along the supporting surface F in the inside direction of the intersecting direction B of the adhesive belt 10.

[0038] The plate-shaped members 20 of this embodiment move in this manner according to the movement of the adhesive belt 10, which is driven by a drive mechanism (not shown). For example, projections may be provided to lift and lower the plate-shaped members 20 as they pass the support start position S and the support end position E. However, the invention is not limited to this configuration. For example, a configuration may also be adopted in which, without providing such a drive mechanism of the plate-shaped members 20, corresponding to the detaching of the recording medium P from the support surface F at the support end position E of the recording medium P, the plate-shaped members 20 are lifted up in a direction to separate from the supporting surface F due to a force received from the recording medium P during the detaching.

[0039] When performing recording on the recording medium P that does not easily receive the influence of

fluff, it is possible for the plate-shaped members 20 to be laid down in the outside direction in the intersecting direction B of the adhesive belt 10 (which includes stood upright) to be positioned along the side ends of and away from the supporting surface F.

[0040] When a plurality of the cleaning mechanisms 15 are provided, a configuration may also be adopted in which the cleaning is performed in a state in which the plate-shaped members 20 are laid down in the inside direction in the intersecting direction B of the adhesive belt 10, and the cleaning is subsequently performed in a state in which the plate-shaped members 20 are laid down in the outside direction (or stood up) in the intersecting direction B of the adhesive belt 10. Accordingly, it is possible to perform the cleaning even when the fluff remains between the plate-shaped members 20 and the adhesive belt 10; thus, it is possible to maintain the adhesiveness of the adhesive belt 10 in a favorable state. It is also possible to prevent the occurrence of poor recording caused by the fluff within the recording apparatus 1.

[0041] Furthermore, in the plate-shaped member 20 of this embodiment, a length L2 of the transport direction A is longer than a length L1 of the transport direction A in which the recording head 7 is capable of recording in one reciprocal movement. Therefore, the frequency in which the ink is discharged from the recording head 7 to a space between adjacent plate-shaped members 20 can be decreased. However, the invention is not limited to this configuration.

[0042] Note that, in this embodiment, the length L1 of the transport direction A, in which the recording head 7 is capable of recording in one reciprocal movement, corresponds to the length, in the transport direction A, of the row of nozzles that is formed from a plurality of nozzles, which are provided on an ink discharge surface of the recording head 7 that opposes the supporting surface F.

[0043] In addition, the plate-shaped member 20 of this embodiment is configured using a flexible material. Therefore, the configuration is such that, even if the adhesive belt 10 bends in the proximity of the transport roller 8 and the driven roller 9, the plate-shaped members 20 also bend corresponding to the bending of the adhesive belt 10. However, the invention is not limited to this configuration; for example, the plate-shaped members 20 that are configured using a non-flexible material and have a short length L2 of the transport direction A may also be used.

[0044] The plate-shaped member 20 of this embodiment includes an ink receiving function, and is capable of holding the ink that is discharged from the recording head 7 when the recording head 7 is flushed, when recording is performed up to the end portion 25 of the recording medium P, or the like. Note that, the ink which is applied to the plate-shaped members 20 is cleaned together with the adhesive belt 10 by the cleaning mechanism 15 of the adhesive belt 10.

[0045] In the recording apparatus 1 of this embodiment, an optical sensor 23 is provided on the carriage 24 on which the recording head 7 is mounted. The optical sensor 23 detects the retaining portion 19 by moving in the intersecting direction B together with the carriage 24; thus, it is possible to detect the end portion of the region to which the recording head 7 is capable of recording in the intersecting direction B of the recording medium P.

[0046] In Fig. 2, the pressure roller is shown downstream of the plate-shaped member 20 stood upright away from the supporting face F at the start position S. However, the pressure roller 20 may be disposed in-line with the start position S in the transport direction A.

[0047] 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 (10, comprising:

   an adhesive belt (10) for supporting a recording medium (P) in a transportable manner using a supporting surface (F) to which an adhesive is applied; and
   a recording head (7) for discharging an ink in a recordable manner onto the recording medium that is supported by the supporting surface,
   wherein the adhesive belt includes, on the supporting surface thereof, a retaining portion (19) for retaining an end portion of the recording medium in an intersecting direction (B) that intersects a transport direction (A) of the recording medium.

2. The recording apparatus according to Claim 1,
   wherein the retaining portion includes an ink receiving function of receiving the ink that is discharged from the recording head, and
   wherein the recording apparatus includes a cleaning unit (15) of the adhesive belt, for cleaning the supporting surface and the restraining portion.

3. The recording apparatus according to Claim 1 or Claim 2,
   wherein the recording head is mounted on a carriage (24), which is capable of moving reciprocally in the intersecting direction, and is capable of recording on the recording medium by reciprocally scanning over the recording medium,
   wherein the carriage is provided with a sensor (23), and
   wherein the sensor is capable of detecting an end portion of a region on which the recording head is capable of recording in the intersecting direction of the recording medium by detecting the retaining portion.

4. The recording apparatus according to any one of the preceding claims,
wherein the recording head is mounted on a carriage (24), which is capable of moving reciprocally in the intersecting direction, and is capable of recording on the recording medium by reciprocally scanning over the recording medium,
wherein the retaining portion is configured from a plurality of plate-shaped members (20) that are lined up along the transport direction, and
wherein a length (L2) of the plate-shaped members in the transport direction is longer than the length (L1) in the transport direction in which the recording head is capable of recording in one reciprocal movement.

5. The recording apparatus according to any one of the preceding claims,
wherein the retaining portion is configured from a plurality of plate-shaped members (20) that are lined up along the transport direction, and
wherein the plate-shaped members are configured using a flexible material.

FIG. 1

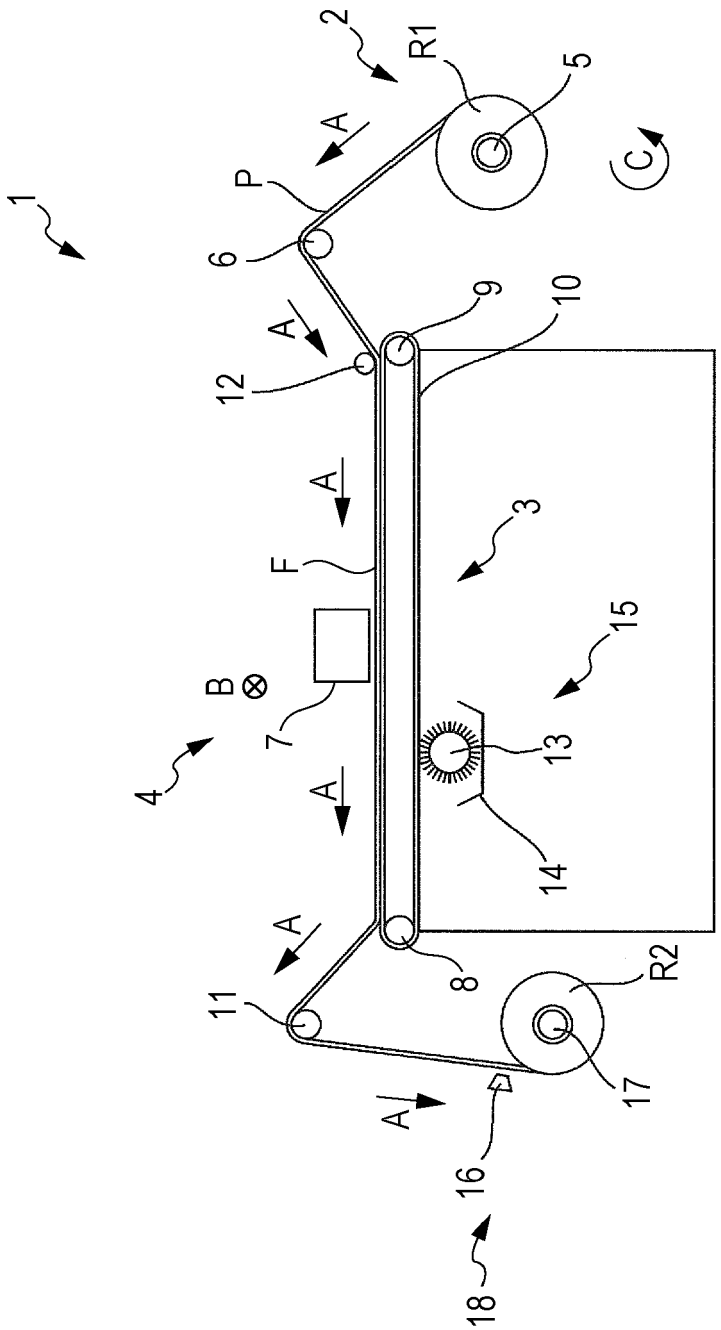


FIG. 2

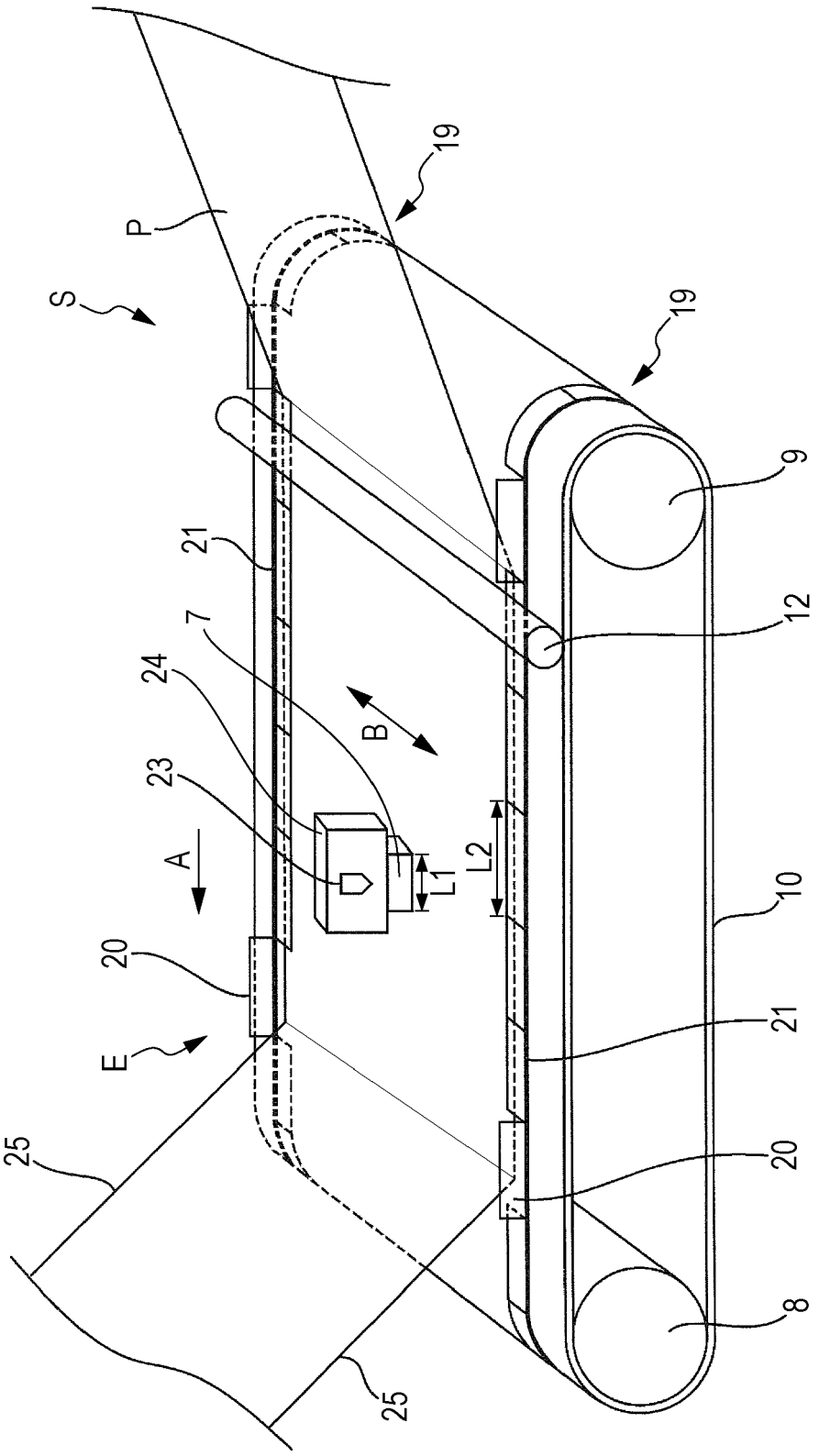
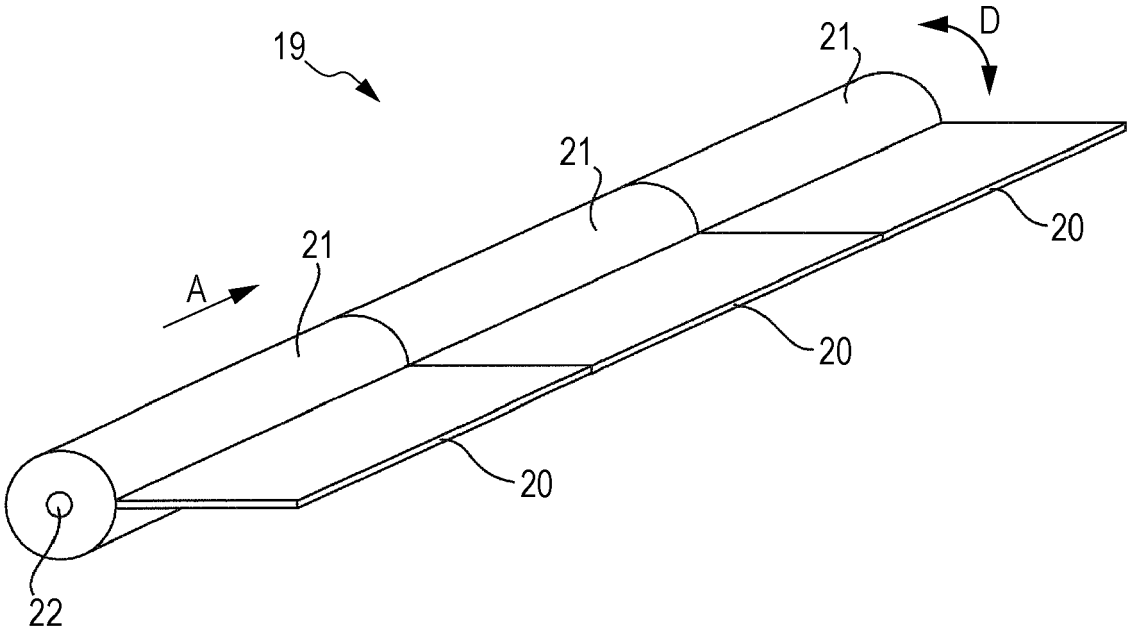


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 7857

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,P	JP 2014 000703 A (SEIKO EPSON CORP) 9 January 2014 (2014-01-09) * paragraphs [0035], [0036] *	1	INV. B41J15/04 B41J3/407 B65H20/08 B65H20/06
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TECHNICAL FIELDS SEARCHED (IPC)

B41J
B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 June 2014	Diaz-Maroto, V

CATEGORY OF CITED DOCUMENTS

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20-06-2014

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REFERENCES CITED IN THE DESCRIPTION

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