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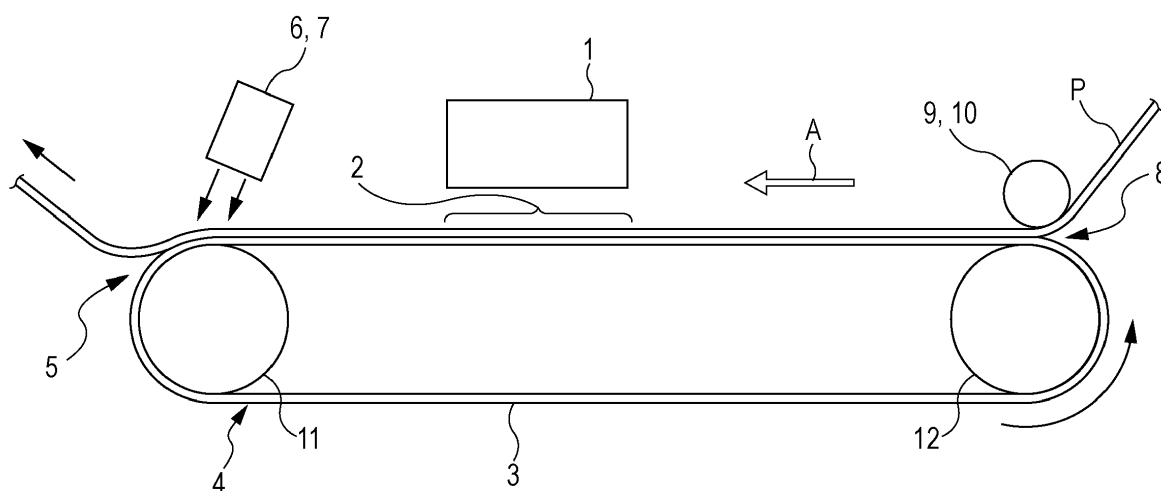
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(54) **Recording apparatus**

(57) A recording apparatus includes: a recording head that records on a recording medium; a transportation element that transports the recording medium that is peelably stuck on an adhesive surface; and a cooling section that cools the adhesive surface on a further downstream side than the recording head, in a transportation

direction of the recording medium. The cooling section is a blower. The cooling section is provided with the blower applying wind to the recording medium on a further upstream side than a peeling portion in the transportation direction.

FIG. 1



Description

BACKGROUND

1. Technical Field

[0001] The present invention relates to a recording apparatus including a recording head for recording on a recording medium and a transportation element that transports the recording medium by peelably sticking the recording medium on an adhesive surface.

2. Related Art

[0002] As technology of this type in the related art, it is possible to include a printing machine described in JP-A-6-240589. A configuration in which an endless belt-shaped transportation element that is a configuration element of the printing machine is heated by a planar heating element from a lower side thereof is described in JP-A-6-240589.

[0003] However, a configuration that actively cools the transportation element is not described or suggested in JP-A-6-240589. It is difficult to peel off the recording medium that is stuck on the adhesive surface of the transportation element at a high temperature and there is a problem that the recording medium is damaged, recording quality is lowered, and the adhesive surface is deteriorated if the recording medium is forcedly peeled off, but such a problem is not considered at all.

SUMMARY

[0004] An advantage of some aspects of the invention is to easily peel off a recording medium that is transported with stuck on an adhesive surface of a transportation element.

[0005] According to an aspect of the invention, there is provided a recording apparatus including: a recording head that records on a recording medium; a transportation element that transports the recording medium that is peelably stuck on an adhesive surface; and a cooling section that cools the adhesive surface on a further downstream side than the recording head, in a transportation direction of the recording medium.

[0006] Regarding ease of peeling when peeling the recording medium stuck on the adhesive surface, the peeling is difficult at a high temperature and the peeling is easy at a low temperature.

[0007] In this case, since the adhesive surface on a further downstream side of the recording head in the transportation direction of the recording medium is cooled by the cooling section, the recording medium can be easily peeled off from the adhesive surface after the recording is performed by the recording head and a problem is unlikely to occur such as damage to the recording medium when forcibly peeling the recording medium.

[0008] Furthermore, since the cooling is not performed

on an upstream side of the recording head, the recording medium can maintain a state of sticking on the adhesive surface until the recording is performed on the recording medium. That is, when the recording medium should be stuck firmly on the adhesive surface (during recording), the state thereof is ensured and it is possible to change the recording medium to be in a state of being easily peeled off when the recording medium is peeled off from the adhesive surface.

[0009] In the recording apparatus, the cooling section may include a blower.

[0010] In this case, since the cooling section includes the blower, it is possible to effectively cool the adhesive surface with a simple structure when cooling the adhesive surface on a downstream side of the recording head.

[0011] In the recording apparatus, as the cooling section, a blower may be provided that applies wind to the recording medium on a further upstream side than a portion in which the recording medium is peeled off from the adhesive surface, in the transportation direction.

[0012] In this case, since the wind is applied to the recording medium on an upstream side of the portion in which the recording medium is peeled off from the adhesive surface, in the transportation direction, a fixing property of ink is enhanced by facilitating evaporation of a solvent of the ink that is ejected and it is possible to change the adhesive surface on which the recording medium is stuck to be in a state where the recording medium is easily peeled off by efficiently cooling the adhesive surface.

[0013] In the recording apparatus, as the cooling section, a blower may be provided that applies wind to the adhesive surface on the further downstream side than a portion in which the recording medium is peeled off from the adhesive surface, in the transportation direction.

[0014] In this case, the wind is applied to the adhesive surface on a downstream side of the portion in which the recording medium is peeled off from the adhesive surface, in the transportation direction, thereby cooling the adhesive surface. That is, the adhesive surface is cooled after the recording medium is peeled off. Even in a case where the portion is cooled, since the adhesive surface can be cooled by heat conduction of the transportation element including the adhesive surface before the recording medium is peeled off on an upstream side in the transportation direction, it is possible to change the recording medium to be in a state of being easily peeled off from the adhesive surface.

[0015] In the recording apparatus, as the cooling section, a blower may be provided that applies wind to a roller on the downstream side among rollers creating a rotation movement of the transportation element, in the transportation direction.

[0016] In this case, the wind is applied to the roller on a downstream side among the rollers creating the rotation movement of the transportation element, in the transportation direction, thereby cooling the roller. Therefore, it is possible to change the recording medium to be in a

state of being easily peeled off from the adhesive surface by cooling the transportation element and the adhesive surface of a region with which the roller comes into contact.

[0017] In the recording apparatus, a roller on the downstream side among rollers transporting the transportation element, in the transportation direction may serve as a cooling roller.

[0018] In this case, since the roller on a downstream side among the rollers transporting the transportation element, in the transportation direction also serves as the cooling roller, it is possible to change the recording medium to be in a state of being easily peeled off by cooling the transportation element and the adhesive surface of the region with which the roller comes into contact.

[0019] In the recording apparatus, the cooling section may be capable of adjusting a degree of cooling.

[0020] In this case, since the cooling section is capable of adjusting the degree of cooling, it is possible to easily realize appropriate cooling.

[0021] For example, the degree of cooling can be adjusted based on information of a type of the recording medium, a degree of an ejection amount of the ink, a recording area (printing area), a temperature of the transportation element, and the like.

[0022] The recording apparatus may further include a heating section that heats a portion in which the recording medium is stuck on the adhesive surface.

[0023] In the recording apparatus, regarding the sticking of the recording medium on the adhesive surface, an adhesive strength tends to be high at a high temperature and to be low at a low temperature.

[0024] In this case, since the heating section heats the portion in which the recording medium is stuck on the adhesive surface, it is possible to easily increase the adhesive strength and to stabilize a posture of the recording medium during recording.

[0025] Furthermore, since the heating is not performed other than on the portion in which the recording medium is stuck, it does not worsen the ease of peeling in a portion in which the recording medium is peeled off. That is, when the recording medium should be stuck firmly on the adhesive surface (during recording), the state thereof is ensured and it is possible to change the recording medium to be in a state of being easily peeled off when the recording medium is peeled off from the adhesive surface.

[0026] In the recording apparatus, a sticking roller provided in the portion in which the recording medium is stuck may serve as a heating section.

[0027] In this case, since the sticking roller provided in the portion in which the recording medium is stuck also serves as the heating section, it is possible to easily realize the heating by the heating section without increasing the number of parts.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Embodiments of the invention will now be de-

scribed by way of example only with reference to the accompanying drawings, wherein like numbers reference like elements.

Fig. 1 is a schematic side view illustrating a part of a recording apparatus according to a first embodiment of the invention.

Fig. 2 is a schematic side view illustrating a part of a recording apparatus according to a second embodiment of the invention.

Fig. 3 is a schematic side view illustrating a part of a recording apparatus according to a third embodiment of the invention.

Fig. 4 is a schematic side view illustrating a part of a recording apparatus according to a fourth embodiment of the invention.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

First Embodiment (Fig. 1)

[0029] Hereinafter, a recording apparatus according to a first embodiment of the invention will be described in detail with reference to Fig. 1. Here, a case where the recording apparatus is an inkjet recording apparatus is described, but the invention is not limited to the embodiment.

[0030] The ink jet recording apparatus of the first embodiment includes a recording head 1 that ejects ink onto a recording medium P and performs recording, a transportation element 4 that transports the recording medium P that is peelably stuck on an adhesive surface 3 in a transportation direction A, and a cooling section 6 that cools the adhesive surface 3 on a downstream side of the recording head 1, in the transportation direction A of the recording medium P.

[0031] In the first embodiment, the cooling section 6 is a blower 7. Then, the blower 7 is configured to apply wind to the recording medium P on the upstream side of a portion 5 in which the recording medium P is peeled off from the adhesive surface 3, in the transportation direction A.

[0032] Furthermore, in the first embodiment, a heating section 9 for heating a portion 8 in which the recording medium P is stuck on the adhesive surface 3 is provided. Here, the heating section 9 is provided in the sticking portion 8 and has a structure that also serves as a sticking roller 10 for pressing and sticking the recording medium P on the adhesive surface. Moreover, the heating section 9 is not limited to the above structure and, for example, may use an infrared heater and the like. Moreover, the heating section 9 need not be provided.

[0033] In Fig. 1, a reference numeral 11 represents a driving roller, a reference numeral 12 represents a driven roller, and a rotation movement of the transportation element 4 is performed by the driving roller 11 and the driven roller 12.

[0034] Next, an operation of the first embodiment will

be described.

[0035] Regarding ease of peeling when peeling the recording medium P stuck on the adhesive surface 3, the peeling is difficult at a high temperature and the peeling is easy at a low temperature.

[0036] In the first embodiment, since the adhesive surface 3 on the downstream side of the recording head 1 in the transportation direction A is cooled by the cooling section 6, the recording medium P can be easily peeled off from the adhesive surface 3 and a problem is unlikely to occur such as damage to the recording medium P when forcibly peeling the recording medium P.

[0037] Furthermore, since the upstream side of the recording head 1 is not cooled, it is possible to maintain a firmly sticking state. That is, when the recording medium P should be stuck firmly on the adhesive surface 3 (during recording), the state thereof is ensured and it is possible to change the recording medium P to be in a state of being easily peeled off when the recording medium P is peeled off from the adhesive surface 3.

[0038] Furthermore, since the blower is used as the cooling section, it is possible to effectively cool the adhesive surface 3 with a simple structure when cooling the adhesive surface 3 on the downstream side of the recording head 1, in the transportation direction A.

[0039] Furthermore, since the cooling is performed by applying the wind to the recording medium P on the upstream side of the peeling portion 5, in the transportation direction A, it is possible to further effectively cool the adhesive surface 3 on which the recording medium P is stuck by heat of vaporization while enhancing fixing property of ink by evaporation of a solvent of the ink that is ejected. Therefore, it is possible to change the recording medium P to be in a state of being easily peeled off from the adhesive surface 3.

[0040] Furthermore, in the first embodiment, since the portion 8 in which the recording medium P is stuck on the adhesive surface 3 is heated by the heating section 9, it is possible to easily increase an adhesive strength and to stabilize a posture of the recording medium P during recording.

[0041] Furthermore, since the heating is not performed other than on the sticking portion 8, it does not worsen the ease of peeling in the peeling portion 5. That is, when the recording medium P should be stuck firmly on the adhesive surface 3 (during recording), the state thereof is ensured and it is possible to change the recording medium P to be in a state of being easily peeled off when the recording medium P is peeled off from the adhesive surface 3.

[0042] Furthermore, since the sticking roller 10 provided in the sticking portion 8 also serves as the heating section 9, it is possible to easily realize the heating by the heating section 9 without increasing the number of parts.

Second Embodiment (Fig. 2)

[0043] Hereinafter, a recording apparatus according to a second embodiment of the invention will be described in detail with reference to Fig. 2.

[0044] The ink jet recording apparatus of the second embodiment is configured such that the blower 7 as the cooling section 6 applies the wind to the adhesive surface 3 on the further downstream side than the portion 5 in which the recording medium P is peeled off from the adhesive surface 3, in the transportation direction A. In other words, the wind is applied to the adhesive surface 3 after the recording medium P is peeled off. Furthermore, the blower 7 that is the cooling section 6 may be further provided in the same position as the first embodiment. Since the configuration other than that is the same as that of the first embodiment, the same reference numerals are given to the same portions and the description thereof will be omitted. Moreover, the heating section 9 need not be provided.

[0045] In the second embodiment, cooling is performed by applying the wind to the adhesive surface 3 after the recording medium P is peeled off in the peeling portion 5. Even in a case of cooling this portion, since the adhesive surface 3 before the recording medium P is peeled off on the upstream side thereof can be cooled by heat conduction of the transportation element 4 including the adhesive surface 3 by cooling the adhesive surface 3 of the transportation element 4, it is possible to change the peeling portion 5 to be in a state of easily peeling off. In this case, it is preferable that the transportation element 4 be configured of a material having high thermal conductivity such as a metal belt.

Third Embodiment (Fig. 3)

[0046] Hereinafter, a recording apparatus according to a third embodiment of the invention will be described in detail with reference to Fig. 3.

[0047] The ink jet recording apparatus of the third embodiment is configured such that the blower 7 as the cooling section 6 applies the wind to the driving roller 11 among the rollers 11 and 12 creating the rotation movement of the transportation element 4 on the downstream side in the transportation direction. Moreover, the blower 7 that is the cooling section 6 may be further provided in the same position as that of the first embodiment or the second embodiment. Since the configuration other than that is the same as that of the first embodiment, the same reference numerals are given to the same portions and the description thereof will be omitted. Moreover, the heating section 9 need not be provided.

[0048] In the third embodiment, since the cooling is performed to the driving roller 11 among the rollers 11 and 12 creating the rotation movement of transportation element 4 on the downstream side in the transportation direction by applying the wind, it is possible to change the recording medium P to be in a state of being easily

peeled off from adhesive surface 3.

Fourth Embodiment (Fig. 4)

[0049] Hereinafter, a recording apparatus according to a fourth embodiment of the invention will be described in detail with reference to Fig. 4.

[0050] The ink jet recording apparatus of the fourth embodiment is configured such that the driving roller 11 among the rollers 11 and 12 creating the rotation movement of the transportation element 4 on the downstream side in the transportation direction also serves as a cooling roller 13. In Fig. 4, a reference numeral 14 represents a control section that controls a cooling state of the cooling roller 13 and the control section 14 controls a cooling mechanism (not illustrated) built into the cooling roller 13. Moreover, the blower 7 that is the cooling section 6 may be further provided in the same position as the first embodiment or the second embodiment. Since the configuration other than that is the same as that of the first embodiment, the same reference numerals are given to the same portions and the description thereof will be omitted. Moreover, the heating section 9 need not be provided.

[0051] For example, the cooling mechanism built into the cooling roller 13 may be a configuration using a mechanism that circulates coolant inside the cooling roller 13 or an electro-thermal conversion element such as a Peltier element, and the cooling mechanism may be configured on the surface of the cooling roller 13 such that heat exchange is performed with the roller surface that is a portion not coming into contact with transportation element 4 or with the roller by coming into contact with both end sides of the roller.

[0052] In the fourth embodiment, since the driving roller 11 among the rollers 11 and 12 creating the rotation movement of the transportation element 4 on the downstream side in the transportation direction also serves as a cooling roller 13, the adhesive surface 3 of the portion in which the transportation element 4 comes into contact with the driving roller 11 is cooled and it is possible to change the recording medium P to be in a state of being easily peeled off from the adhesive surface 3.

Fifth Embodiment

[0053] Hereinafter, a fifth embodiment of the invention will be described.

[0054] In an ink jet recording apparatus of the fifth embodiment, the cooling section 6, 13 of any of the previous embodiments is capable of adjusting a degree of cooling. For example, the degree of cooling may be adjusted based on information of a type of the recording medium, a degree of an ejection amount of the ink, a recording area (printing area), a temperature of the transportation element, and the like. The temperature of the transportation element 4 is measured by a temperature sensor. The adjustment may be performed by an automatic con-

trolling structure based on the information or by a structure which is manually adjusted by a user.

[0055] In the fifth embodiment, since the cooling section 6 is capable of adjusting the degree of cooling, it is possible to easily realize appropriate cooling.

[0056] 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 comprising:

a recording head (1) for recording on a recording medium (P);
a transportation element (4) for transporting the recording medium that is peelably stuck on an adhesive surface (3); and
a cooling section (6, 13) for cooling the adhesive surface on a downstream side of the recording head, in a transportation direction (A) of the recording medium.

2. The recording apparatus according to Claim 1, wherein the cooling section includes a blower (7).

3. The recording apparatus according to Claim 1, wherein, as the cooling section, a blower (7) is provided for applying wind to the recording medium on an upstream side of a portion (5) in which the recording medium is peeled off from the adhesive surface, in the transportation direction.

4. The recording apparatus according to Claim 1, wherein, as the cooling section, a blower (7) is provided that applies wind to the adhesive surface on a downstream side of a portion (5) in which the recording medium is peeled off from the adhesive surface, in the transportation direction.

5. The recording apparatus according to Claim 1, wherein, as the cooling section, a blower (7) is provided that applies wind to a roller (11) on a downstream side among rollers (11, 12) creating a rotation movement of the transportation element, in the transportation direction.

6. The recording apparatus according to Claim 1, wherein a roller (13) on a downstream side among rollers (12, 13) creating the rotation movement of the transportation element, in the transportation direction also serves as a cooling roller.

7. The recording apparatus according to any one of the preceding claims, wherein the cooling section is capable of adjusting

a degree of cooling.

8. The recording apparatus according to any one of the preceding claims, further comprising:

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a heating section (9) for heating a portion (8) in which the recording medium is stuck on the adhesive surface.

9. The recording apparatus according to Claim 8, wherein a sticking roller (10) provided in the portion (8) in which the recording medium is stuck also serves as the heating section.

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FIG. 1

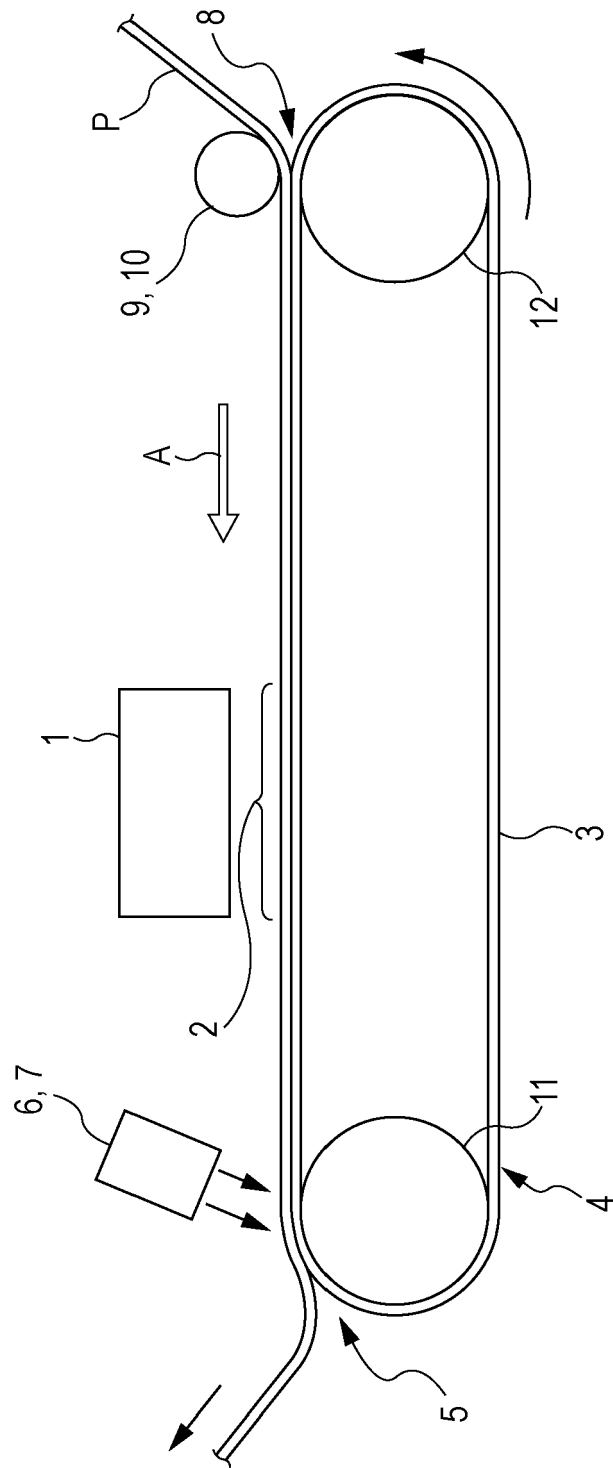


FIG. 2

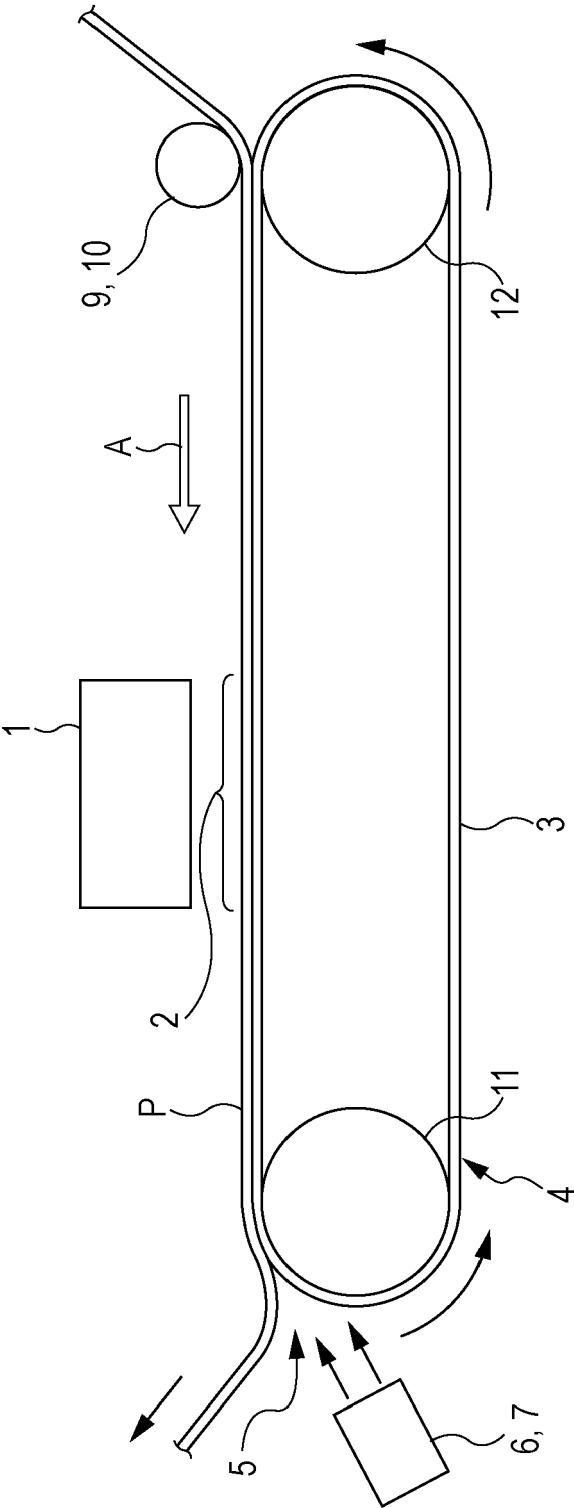


FIG. 3

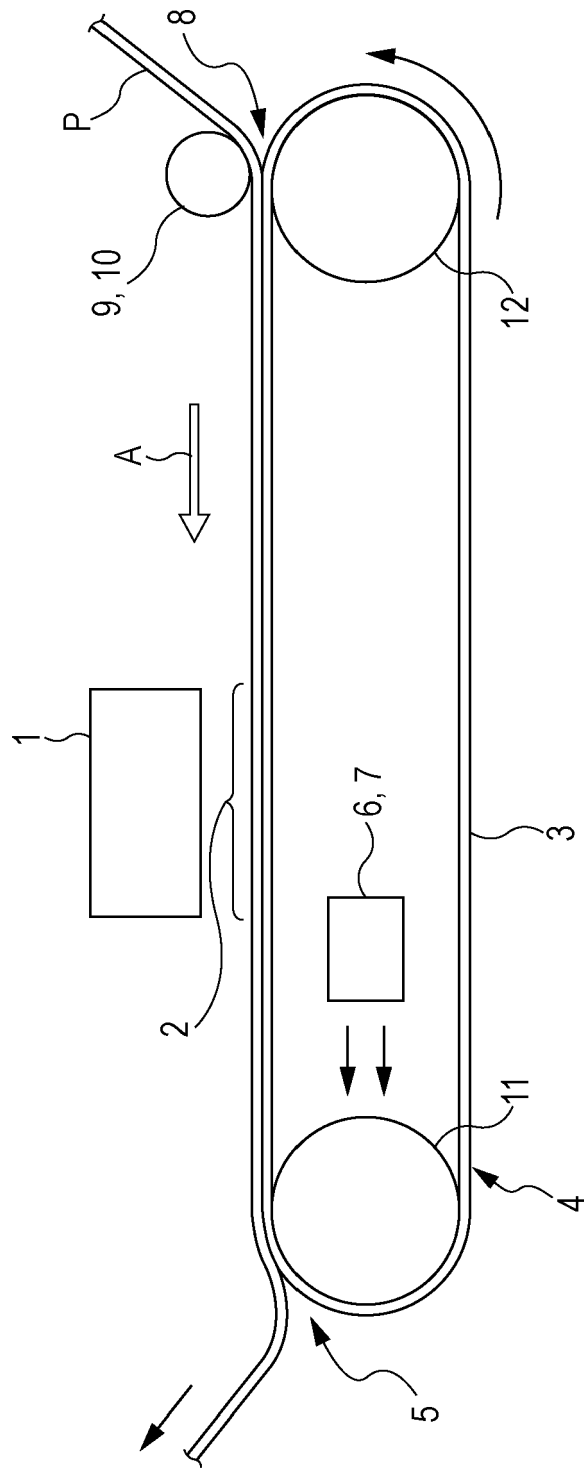
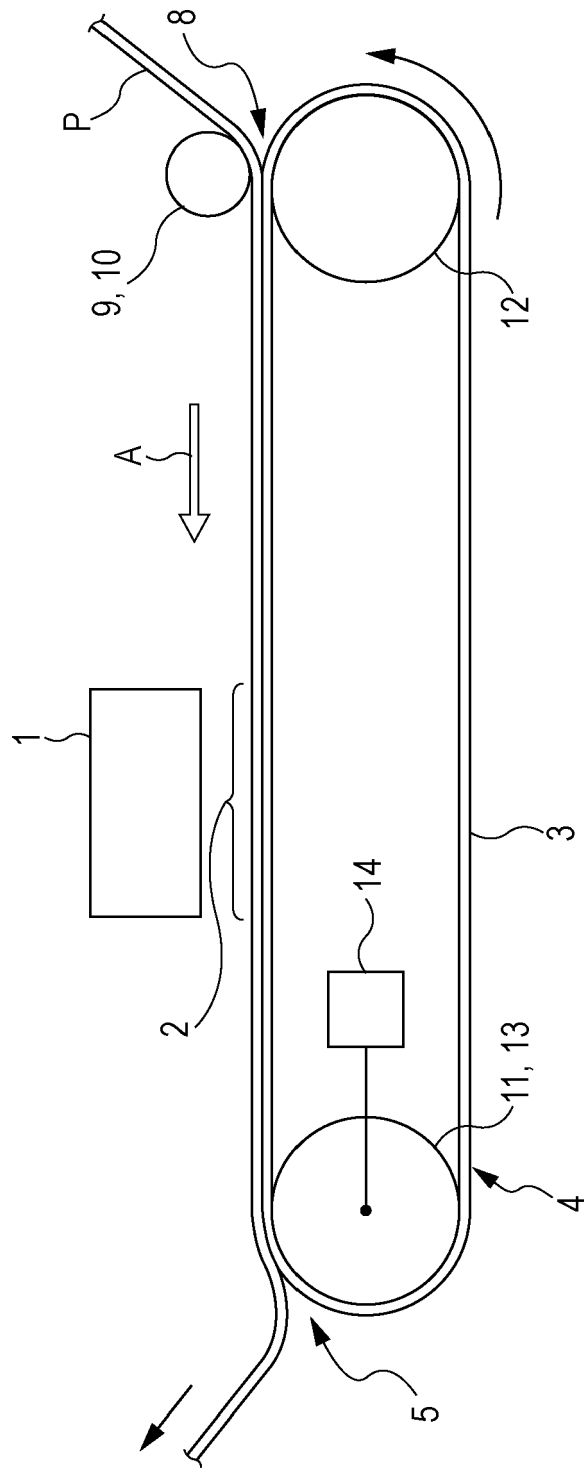


FIG. 4





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EP 14 18 9070

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Place of search The Hague		Date of completion of the search 20 February 2015	Examiner Adam, Emmanuel
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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