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(54) **PRINTING APPARATUS**

(57) A printing apparatus (11) includes a printing unit (16) configured to perform printing by ejecting liquid to a medium (S1) conveyed, a supporting part (21) facing the printing unit (16), and including a supporting surface (22) configured to support the medium (S1), a downstream supporting part (28) located downstream of the supporting part (21) in a medium conveyance direction, and including a downstream supporting surface (29) obliquely extending with respect to the supporting surface (22),

and a heating unit (41) facing the downstream supporting part (28). The heating unit (41) includes: a heating part (42) configured to heat the medium (S1), and a heating case (44) configured to house the heating part (42), the heating case (44) includes a heating top portion (45) located at an uppermost position in the heating case (44), and the heating top portion (45) is located at a position below the supporting surface (22).

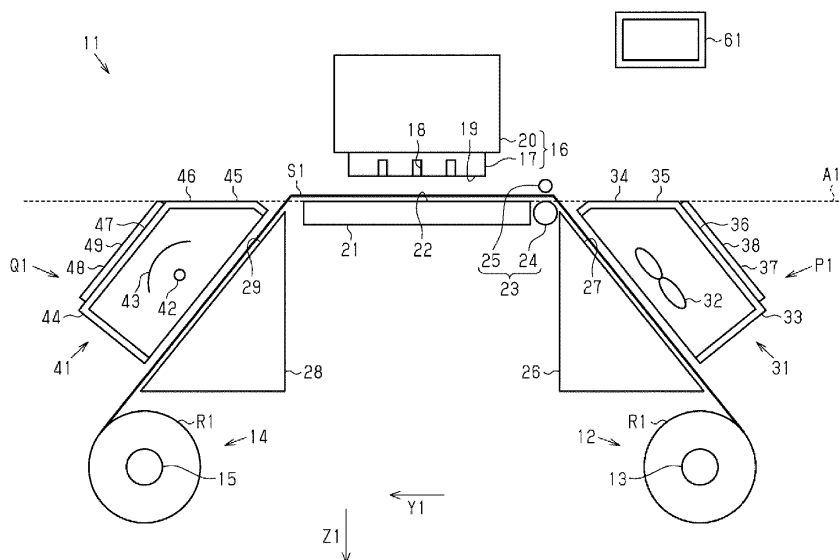


FIG. 1

Description

[0001] The present application is based on, and claims priority from JP Application Serial Number 2022-202192, filed December 19, 2022, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to a printing apparatus.

2. Related Art

[0003] JP-A-2020-104320 discloses a printing apparatus including a printing unit that performs printing by ejecting liquid to a medium, a supporting part facing the printing unit, a heating unit that heats the printed medium, and a downstream supporting part facing the heating unit. The supporting part includes a supporting surface that supports the medium. The medium after the printing is conveyed downward from the supporting part toward the downstream supporting part. The heating unit includes a portion located on the upper side of the supporting surface.

[0004] In the printing apparatus disclosed in JP-A-2020-104320, the medium is conveyed downward in a curved manner from the supporting part toward the downstream supporting part. Therefore, the printing apparatus performs printing mainly for a flexible medium such as fabric and roll paper. On the other hand, printing apparatuses perform printing not only on flexible mediums, but also on rigid mediums such as thick paper and board paper. In this case, the rigid medium is not curved, and is therefore conveyed straight along the supporting surface. The rigid medium may interfere with the heating unit, the air blowing unit and the like during the conveyance along the supporting surface. In view of this, when printing is performed on the rigid medium, it is necessary to detach the heating unit, the air blowing unit and the like, but such a detaching operation is time consuming, and reduces the usability.

SUMMARY

[0005] A printing apparatus for solving the above-described problems includes a printing unit configured to perform printing by ejecting liquid to a medium conveyed, a supporting part facing the printing unit, and including a supporting surface configured to support the medium, a downstream supporting part located downstream of the supporting part in a medium conveyance direction, and including a downstream supporting surface obliquely extending with respect to the supporting surface, and a heating unit facing the downstream supporting part. The heating unit includes: a heating part configured to heat

the medium, and a heating case configured to house the heating part, the heating case includes a heating top portion located at an uppermost position in the heating case, and the heating top portion is located at a position below the supporting surface.

[0006] A printing apparatus for solving the above-described problems includes a printing unit configured to perform printing by ejecting liquid to a medium conveyed, a supporting part facing the printing unit, and including a supporting surface configured to support the medium, an upstream supporting part located upstream of the supporting part in a medium conveyance direction, and including an upstream supporting surface obliquely extending with respect to the supporting surface, an air blowing unit facing the upstream supporting part. The air blowing unit includes an air blowing part configured to blow air toward the upstream supporting surface, and an air blowing case configured to house the air blowing part, the air blowing case includes an air blowing top portion located at an uppermost position in the air blowing case, and the air blowing top portion is located at a position below the supporting surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a side view illustrating an example of a printing apparatus.

FIG. 2 is a side view of a state where printing is performed on a rigid medium.

FIG. 3 is a side view of a state where a heating extension portion is located at a heating extension position and an air blowing extension portion is located at an air blowing extension position.

FIG. 4 is a side view illustrating a modification of the printing apparatus.

DESCRIPTION OF EMBODIMENTS

[0008] An example of a printing apparatus is described below with reference to the drawings. The printing apparatus is an ink-jet printer that records images such as letters, photographs and diagrams by ejecting ink as an example of liquid to a medium such as fabric and a sheet, for example. The printing apparatus performs printing on a soft medium and a rigid medium as the medium.

Printing Apparatus

[0009] As illustrated in FIGS. 1 and 2, a printing apparatus 11 includes a feeding part 12. The feeding part 12 is configured to feed a soft medium S1 with flexibility. The feeding part 12 feeds the unused soft medium S1.

[0010] The soft medium S1 is a medium such as fabric and thin paper. Therefore, the soft medium S1 can be bent and curved during conveyance. The soft medium S1 is fed from a roll R1 obtained by winding the soft me-

dium S1, for example.

[0011] The feeding part 12 includes a feeding shaft 13. The feeding shaft 13 holds the unused roll R1. When the roll R1 held by the feeding shaft 13 rotates, the unused soft medium S1 is fed from the feeding part 12. Images are printed on the soft medium S1 fed from the feeding part 12.

[0012] The printing apparatus 11 includes a winding unit 14. The winding unit 14 is configured to wind up the soft medium S1. Specifically, the winding unit 14 winds up the soft medium S1 fed from the feeding part 12. The winding unit 14 winds up the used soft medium S1. That is, an image is printed on the soft medium S1 in the process from the feeding of the soft medium S1 by the feeding part 12 to the winding of the soft medium S1 by the winding unit 14.

[0013] The winding unit 14 includes a winding shaft 15. The winding shaft 15 holds the used roll R1. When the roll R1 held by the winding shaft 15 rotates, the used soft medium S1 is wound around the winding unit 14.

[0014] The printing apparatus 11 includes a printing unit 16. The printing unit 16 is configured to print an image on a medium by ejecting liquid. The printing unit 16 prints an image on the soft medium S1, for example. The printing unit 16 may perform printing not only on the soft medium S1, but also on a rigid medium H1. The rigid medium H1 is thick paper, board paper and the like. The rigid medium H1 is not bent or curved during conveyance. Therefore, the rigid medium H1 is not fed from the feeding part 12, or wound by the winding unit 14. The rigid medium H1 is separately supplied to the printing unit 16 separately from the soft medium S1.

[0015] The printing unit 16 includes a head 17. The head 17 includes a nozzle surface 19 at which one or more nozzles 18 open. The head 17 ejects liquid from the nozzle 18.

[0016] The printing unit 16 includes a carriage 20. The carriage 20 is equipped with the head 17. The carriage 20 performs scanning with respect to the medium. Through the scanning of the carriage 20, the head 17 can eject the liquid over the entire width of the medium. As described above, the printing apparatus 11 is a so-called serial printer. The printing apparatus 11 may be a line printer of which the head 17 can eject liquid at the same time over the width of the medium.

[0017] The printing apparatus 11 includes a supporting part 21. The supporting part 21 supports a medium. Specifically, the supporting part 21 supports the medium being conveyed. The supporting part 21 supports the medium from below. The supporting part 21 faces the printing unit 16. Thus, liquid is ejected from the printing unit 16 to the medium in the region supported by the supporting part 21.

[0018] The supporting part 21 includes a supporting surface 22 that supports the medium. The supporting surface 22 is a surface that faces the printing unit 16. Specifically, the supporting surface 22 faces the nozzle surface 19. The supporting surface 22 makes contact with

the medium. The supporting surface 22 faces upward, for example. The position of the supporting surface 22 in a vertical direction Z1 is a reference position A1. That is, the reference position A1 represents the height of the supporting surface 22.

[0019] The supporting part 21 is located on the upper side of the feeding part 12. The supporting part 21 is located on the upper side of the winding unit 14. Thus, the soft medium S1 extending from the feeding part 12 to the winding unit 14 is provided across the supporting part 21.

[0020] The printing apparatus 11 includes a conveyance unit 23. The conveyance unit 23 is configured to convey a medium. The conveyance unit 23 conveys the medium in a conveyance direction Y1 on the supporting surface 22. Therefore, the conveyance direction Y1 is a direction along the supporting surface 22. The conveyance unit 23 conveys the soft medium S1 in the conveyance direction Y1 on the supporting surface 22. The conveyance unit 23 conveys the rigid medium H1 in the conveyance direction Y1 on the supporting surface 22. As an example, the conveyance unit 23 is located upstream of the supporting part 21 in the conveyance direction Y1. The conveyance unit 23 may be located downstream of the supporting part 21 in the conveyance direction Y1.

[0021] The conveyance unit 23 includes a first roller 24 and a second roller 25. The first roller 24 and the second roller 25 convey the medium by rotating with the medium sandwiched therebetween. The nip point of the first roller 24 and the second roller 25 is at the same height as the reference position A1. Thus, the first roller 24 and the second roller 25 sandwich the medium at the reference position A1.

[0022] The first roller 24 and the second roller 25 sandwich the medium, and thus the medium is set in the printing apparatus 11. The soft medium S1 is set in the printing apparatus 11 by being provided across the supporting part 21 from the feeding part 12 to the winding unit 14. The rigid medium H1 is set in the printing apparatus 11 by being inserted between the first roller 24 and the second roller 25. At this time, the rigid medium H1 is set so as to protrude to the upstream side in the conveyance direction Y1 from the location on the supporting part 21.

[0023] The printing apparatus 11 includes an upstream supporting part 26. The upstream supporting part 26 is located upstream of the supporting part 21 in the conveyance direction Y1. The upstream supporting part 26 is located at a position below the reference position A1. The upstream supporting part 26 supports the soft medium S1. Specifically, the upstream supporting part 26 supports the soft medium S1 in the period from the feeding from the feeding part 12 to the sandwiching by the first roller 24 and the second roller 25. On the other hand, the upstream supporting part 26 does not support the rigid medium H1.

[0024] The upstream supporting part 26 includes an upstream supporting surface 27 that supports the soft medium S1. The upstream supporting surface 27 is a

surface that obliquely extends with respect to the supporting surface 22. As an example, the upstream supporting surface 27 is a surface that tilts obliquely upward in the direction from the feeding part 12 toward the supporting part 21.

[0025] The printing apparatus 11 includes a downstream supporting part 28. The downstream supporting part 28 is located downstream of the supporting part 21 in the conveyance direction Y1. The downstream supporting part 28 is located at a position below the reference position A1. The downstream supporting part 28 supports the soft medium S1. Specifically, the downstream supporting part 28 supports the soft medium S1 in the period until it is wound by the winding unit 14 after being supported by the supporting part 21. On the other hand, the downstream supporting part 28 does not support the rigid medium H1.

[0026] The downstream supporting part 28 includes a downstream supporting surface 29 that supports the soft medium S1. The downstream supporting surface 29 is a surface that obliquely extends with respect to the supporting surface 22. As an example, the downstream supporting surface 29 is a surface that tilts obliquely downward in the direction from the supporting part 21 toward the winding unit 14.

Air Blowing Unit

[0027] The printing apparatus 11 may include an air blowing unit 31. The air blowing unit 31 faces the upstream supporting part 26. Specifically, the air blowing unit 31 faces the upstream supporting surface 27. The air blowing unit 31 is configured to blow air to the soft medium S1. The air blowing unit 31 removes foreign matters from the soft medium S1 by blowing air to the soft medium S1. Specifically, the air blowing unit 31 removes foreign matters from the soft medium S1 before the printing. In this manner, the printing quality of the soft medium S1 is improved.

[0028] The air blowing unit 31 includes an air blowing part 32. The air blowing part 32 blows air to the soft medium S1 supported by the upstream supporting part 26. Specifically, the air blowing part 32 blows air to the soft medium S1 in the portion located on the upstream supporting surface 27. The air blowing part 32 is a fan, for example.

[0029] The air blowing unit 31 includes an air blowing case 33. The air blowing case 33 houses the air blowing part 32. The air blowing case 33 opens toward the upstream supporting part 26.

[0030] The air blowing case 33 includes an air blowing top portion 34. The air blowing top portion 34 is a portion located at the uppermost position in the air blowing case 33. The air blowing top portion 34 is located at a position below the reference position A1. That is, the air blowing unit 31 is not located above the supporting surface 22. As a result, when setting the rigid medium H1, the air blowing unit 31 does not interfere with the rigid medium

H1. Thus, the rigid medium H1 is set in the state where it extends straight to the upstream side in the conveyance direction Y1 from the location on the supporting part 21. In this manner, the printing apparatus 11 can perform printing on the rigid medium H1 without detaching the air blowing unit 31. In addition, since it is not necessary to detach the air blowing unit 31, it is not necessary to ensure the housing space for the detached air blowing unit 31.

[0031] The air blowing top portion 34 is located at the reference position A1. That is, the air blowing top portion 34 is located at the same height as the supporting surface 22. As a result, when setting the rigid medium H1, the air blowing top portion 34 can support the rigid medium H1 together with the supporting part 21. With the air blowing top portion 34 supporting the rigid medium H1, the posture of the rigid medium H1 is stabilized.

[0032] The air blowing top portion 34 may include an air blowing top surface 35. The air blowing top surface 35 is the outer surface of the air blowing case 33. As an example, the air blowing top surface 35 is a surface facing upward in the air blowing case 33. The air blowing top surface 35 is located at the reference position A1. That is, the air blowing top surface 35 is located at the same height as the supporting surface 22. The air blowing top surface 35 supports the rigid medium H1. In this manner, the posture of the rigid medium H1 is easily stabilized.

[0033] The air blowing case 33 may include an air blowing continuous surface 36 that is continuous with the air blowing top surface 35. As an example, the air blowing continuous surface 36 extends obliquely downward from the air blowing top surface 35. Specifically, the air blowing continuous surface 36 extends parallel to the upstream supporting surface 27.

[0034] As illustrated in FIG. 3, the air blowing case 33 includes an air blowing extension portion 37. The air blowing extension portion 37 is a portion extending the air blowing top portion 34. The air blowing extension portion 37 includes an air blowing extension surface 38. The air blowing extension surface 38 is a surface extending the air blowing top surface 35. The air blowing extension surface 38 extends parallel to the air blowing top surface 35. The air blowing extension surface 38 is continuous with the air blowing top surface 35. The air blowing extension surface 38 is located at the reference position A1 as with the air blowing top surface 35. With the air blowing extension portion 37 extending the air blowing top portion 34, the air blowing top surface 35 and the air blowing extension surface 38 support the rigid medium H1. In this manner, the posture of the rigid medium H1 is easily stabilized.

[0035] As illustrated in FIGS. 2 and 3, the air blowing extension portion 37 is configured to be displaced to an air blowing housing position P1 and an air blowing extension position P2. As an example, the air blowing extension portion 37 is displaced by rotating. For example, the air blowing extension portion 37 is displaced by rotating around one end portion. The air blowing extension

portion 37 rotates with a hinge 39. The air blowing extension portion 37 may be displaced not only by rotating but also by sliding, for example.

[0036] The air blowing housing position P1 is a position where the air blowing extension portion 37 is housed in the air blowing case 33. As an example, the air blowing housing position P1 is a position where the air blowing extension portion 37 is set along the air blowing continuous surface 36. The air blowing extension portion 37 illustrated in FIG. 2 is located at the air blowing housing position P1.

[0037] The air blowing extension position P2 is a position where the air blowing extension portion 37 extends the air blowing top portion 34. As an example, the air blowing extension position P2 is a position where the air blowing extension surface 38 is continuous with the air blowing top surface 35. The air blowing extension portion 37 illustrated in FIG. 3 is located at the air blowing extension position P2.

Heating Unit

[0038] As illustrated in FIGS. 1 and 2, the printing apparatus 11 may include a heating unit 41. The heating unit 41 faces the downstream supporting part 28. Specifically, the heating unit 41 faces the downstream supporting surface 29. Thus, the heating unit 41 is configured to heat the soft medium S1. The heating unit 41 dries the soft medium S1 by heating the soft medium S1. That is, the heating unit 41 dries the soft medium S1 after the printing. In this manner, the printing quality of the soft medium S1 is improved.

[0039] The heating unit 41 includes a heating part 42. The heating part 42 heats the soft medium S1 supported by the downstream supporting part 28. Specifically, the heating part 42 heats the portion located on the downstream supporting surface 29 in the soft medium S1. The heating part 42 is an infrared ray heater, for example.

[0040] The heating unit 41 may include a reflection plate 43. The reflection plate 43 reflects, toward the downstream supporting surface 29, the infrared ray emitted from the heating part 42. In this manner, the heating efficiency of the heating part 42 is improved.

[0041] The heating unit 41 includes a heating case 44. The heating case 44 houses the heating part 42. The heating case 44 houses the reflection plate 43. The heating case 44 opens toward the downstream supporting part 28.

[0042] The heating case 44 includes a heating top portion 45. The heating top portion 45 is a portion located at the uppermost position in the heating case 44. The heating top portion 45 is located at a position below the reference position A1. That is, the heating unit 41 is not located above the supporting surface 22. Thus, when ejecting the rigid medium H1, the heating unit 41 does not interfere with the rigid medium H1. In this manner, the printing apparatus 11 can perform printing on the rigid medium H1 without detaching the heating unit 41. In ad-

dition, since it is not necessary to detach the heating unit 41, it is not necessary to ensure a housing space for the detached heating unit 41.

[0043] The heating top portion 45 is located at the reference position A1. That is, the heating top portion 45 is located at the same height as the supporting surface 22. In this manner, when ejecting the rigid medium H1, the heating top portion 45 can support the rigid medium H1 together with the supporting part 21. Thus, the posture of the rigid medium H1 is stabilized.

[0044] The heating top portion 45 may include a heating top surface 46. The heating top surface 46 is an outer surface of the heating case 44. As an example, the heating top surface 46 is a surface facing upward in the heating case 44. The heating top surface 46 is located at the reference position A1. That is, the heating top surface 46 is located at the same height as the supporting surface 22. The heating top surface 46 supports the rigid medium H1. In this manner, the posture of the rigid medium H1 is easily stabilized.

[0045] The heating case 44 may include a heating continuous surface 47 that is continuous with the heating top surface 46. As an example, the heating continuous surface 47 extends obliquely downward from the heating top surface 46. Specifically, the heating continuous surface 47 extends parallel to the downstream supporting surface 29.

[0046] As illustrated in FIG. 3, the heating case 44 includes a heating extension portion 48. The heating extension portion 48 is a portion extending the heating top portion 45. The heating extension portion 48 includes a heating extension surface 49. The heating extension surface 49 is a surface extending the heating top surface 46. The heating extension surface 49 extends parallel to the heating top surface 46. The heating extension surface 49 is continuous with the heating top surface 46. The heating extension surface 49 is located at the reference position A1 as with the heating top surface 46. With the heating extension portion 48 extending the heating top portion 45, the heating top surface 46 and the heating extension surface 49 support the rigid medium H1. In this manner, the posture of the rigid medium H1 is easily stabilized.

[0047] As illustrated in FIGS. 2 and 3, the heating extension portion 48 is configured to be displaced to a heating housing position Q1 and a heating extension position Q2. As an example, the heating extension portion 48 is displaced by rotating. For example, the heating extension portion 48 is displaced by rotating around one end portion. The heating extension portion 48 rotates with a hinge 50. The heating extension portion 48 may be displaced not only by rotating but also by sliding, for example.

[0048] The heating housing position Q1 is a position where the heating extension portion 48 is housed in the heating case 44. As an example, the heating housing position Q1 is a position where the heating extension portion 48 is set along the heating continuous surface 47. The heating extension portion 48 illustrated in FIG.

2 is located at the heating housing position Q1.

[0049] The heating extension position Q2 is a position where the heating extension portion 48 extends the heating top portion 45. As an example, the heating extension position Q2 is a position where the heating extension surface 49 is continuous with the heating top surface 46. The heating extension portion 48 illustrated in FIG. 3 is located at the heating extension position Q2.

[0050] The printing apparatus 11 may include an operation unit 61. The operation unit 61 is a touch panel, for example. The operation unit 61 may be a button, a lever, a switch, and the like. When the operation unit 61 is operated, printing is started. That is, when the operation unit 61 is operated, the driving of the printing unit 16, the conveyance unit 23 and the like is started.

[0051] The user may select whether printing is performed on the soft medium S1 or the rigid medium H1 from the operation unit 61. In the case where printing on the soft medium S1 is started through the operation of the operation unit 61, the driving of the feeding part 12, the winding unit 14, the air blowing unit 31, the heating unit 41 and the like is also started. In the case where printing on the rigid medium H1 is started through the operation of the operation unit 61, the air blowing extension portion 37 and the heating extension portion 48 may be displaced. Specifically, the air blowing extension portion 37 may be displaced to the air blowing extension position P2 and the heating extension portion 48 may be displaced to the heating extension position Q2. In this case, the supporting surface 22, the air blowing extension surface 38, and the heating extension surface 49 are located at the reference position A1 and arranged on a straight line. In this manner, the rigid medium H1 is conveyed in a stable posture.

[0052] After printing on the rigid medium H1 is completed, the air blowing extension portion 37 may be displaced to the air blowing housing position P1 and the heating extension portion 48 may be displaced to the heating housing position Q1. In this manner, the air blowing extension portion 37 and the heating extension portion 48 are prevented from hindering the operation. In addition, regardless of the start and termination of the printing, the air blowing extension portion 37 and the heating extension portion 48 may be displaced when the operation unit 61 is operated. In addition, the user may manually displace the air blowing extension portion 37 and the heating extension portion 48 without using the operation unit 61.

Operational Effects

[0053] Next, operational effects of the above-mentioned embodiment are described.

(1) The heating top portion 45 is located at a position below the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e.,

when the rigid medium H1 is conveyed, the rigid medium H1 does not interfere with the heating unit 41. Therefore, even when printing is performed on the rigid medium H1, it is not necessary to detach the heating unit 41. Thus, the reduction in usability is suppressed.

(2) The heating top portion 45 is located at the same height as the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed, the heating top portion 45 can support the rigid medium H1. With the heating top portion 45 supporting the rigid medium H1, the posture of the rigid medium H1 is stabilized.

(3) The heating top portion 45 includes the heating top surface 46 located at the same height as the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed, the heating top surface 46 can support the rigid medium H1. Thus, in comparison with the case where the heating top portion 45 supports the rigid medium H1 in a small area, the posture of the rigid medium H1 is stabilized.

(4) The heating extension portion 48 is configured to be displaced to the heating extension position Q2 where it extends the heating top portion 45 and the heating housing position Q1 where it is housed in the heating case 44. With the above-mentioned configuration, when the heating extension portion 48 is located at the heating extension position Q2, the heating top portion 45 and the heating extension portion 48 can support the rigid medium H1 when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed. When the heating extension portion 48 is located at the heating housing position Q1, the heating extension portion 48 is prevented from hindering the operation when the soft medium S1 is conveyed from the supporting part 21 to the downstream supporting part 28.

(5) The air blowing top portion 34 is located at a position below the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed, the rigid medium H1 does not interfere with the air blowing unit 31. Therefore, even when printing is performed on the rigid medium H1, it is not necessary to detach the air blowing unit 31. Thus, the reduction in usability is suppressed.

(6) The air blowing top portion 34 is located at the same height as the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed, the air blowing top portion 34 can support the rigid me-

dium H1. With the air blowing top portion 34 supporting the rigid medium H1, the posture of the rigid medium H1 is stabilized.

(7) The air blowing top portion 34 includes the air blowing top surface 35 located at the same height as the supporting surface 22. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed, the air blowing top surface 35 can support the rigid medium H1. Thus, in comparison with the case where the air blowing top portion 34 supports the rigid medium H1 in a small area, the posture of the rigid medium H1 is stabilized.

(8) The air blowing extension portion 37 is configured to be displaced to the air blowing extension position P2 where it extends the air blowing top portion 34, and the air blowing housing position P1 where it is housed in the air blowing case 33. With the above-mentioned configuration, when the air blowing extension portion 37 is located at the air blowing extension position P2, the air blowing top portion 34 and the air blowing extension portion 37 can support the rigid medium H1 when the medium is conveyed straight along the supporting surface 22, i.e., when the rigid medium H1 is conveyed. When the air blowing extension portion 37 is located at the air blowing housing position P1, the air blowing extension portion 37 is prevented from hindering the operation when the soft medium S1 is conveyed from the supporting part 21 to the downstream supporting part 28.

Modifications

[0054] The above-mentioned example may be modified as follows for implementation. The above-mentioned examples and the following modifications may be combined for implementation insofar as they are not technically inconsistent.

[0055] As illustrated in FIG. 4, the air blowing extension surface 38 may also serve as the air blowing continuous surface 36. Specifically, the air blowing extension portion 37 may make up the exterior of the air blowing case 33. In this modification, the air blowing extension portion 37 exposes the inside of the air blowing case 33 when it is located at the air blowing extension position P2. When printing is performed on the rigid medium H1, the air blowing unit 31 is not used. Therefore, no problem occurs even when the inside of the air blowing case 33 is exposed. When the air blowing extension portion 37 is located at the air blowing housing position P1, the air blowing part 32 is covered by the air blowing case 33.

[0056] As illustrated in FIG. 4, the heating extension surface 49 may also serve as the heating continuous surface 47. Specifically, the heating extension portion 48 may make up the exterior of the heating case 44. In this modification, the heating extension portion 48 exposes the heating case 44 when it is located at the heating ex-

tension position Q2. When printing is performed on the rigid medium H1, the heating unit 41 is not used. Therefore, no problem occurs even when the heating case 44 is exposed. When the heating extension portion 48 is located at the heating housing position Q1, the heating part 42 is covered by the heating case 44.

[0057] The liquid ejected by the head 17 is not limited to ink, but may be a liquid member obtained by dispersing or mixing particles of a functional material in liquid. For example, the head 17 may eject a liquid member obtained by dispersing or dissolving a material such as an electrode material or a pixel material used for the manufacture of liquid crystal displays, electroluminescence displays, surface-emitting displays and the like.

Technical Ideas

[0058] The following describes technical ideas and operational effects thereof derived from the above-described examples and modifications.

(A) A printing apparatus includes a printing unit configured to perform printing by ejecting liquid to a medium conveyed, a supporting part facing the printing unit, and including a supporting surface configured to support the medium, a downstream supporting part located downstream of the supporting part in a medium conveyance direction, and including a downstream supporting surface obliquely extending with respect to the supporting surface, and a heating unit facing the downstream supporting part. The heating unit includes: a heating part configured to heat the medium, and a heating case configured to house the heating part, the heating case includes a heating top portion located at an uppermost position in the heating case, and the heating top portion is located at a position below the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the medium does not interfere with the heating unit. Therefore, even when the printing is performed on a rigid medium, it is not necessary to detach the heating unit. Thus, the reduction in usability is suppressed.

(B) In the printing apparatus, the heating top portion is located at the same height as the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the heating top portion can support the medium. With the heating top portion supporting the medium, the posture of the medium is stabilized.

(C) In the printing apparatus, the heating top portion includes a heating top surface located at the same height as the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the heating top surface supports the medium. In comparison with the case where the heating top part sup-

ports the medium in a small area, the posture of the medium is stabilized.

(D) In the printing apparatus, the heating case includes a heating extension portion extending the heating top portion, and the heating extension portion is configured to be displaced to a heating extension position where the heating extension portion extends the heating top portion, and a heating housing position where the heating extension portion is housed in the heating case. With the above-mentioned configuration, when the heating extension portion is located at the heating extension position, the heating top portion and the heating extension portion can support the medium when the medium is conveyed straight along the supporting surface. When the heating extension portion is located at the heating housing position, the heating extension portion is prevented from hindering the operation when the medium is conveyed from the supporting part to the downstream supporting part.

(E) The printing apparatus further includes an upstream supporting part located upstream of the supporting part in the conveyance direction, and including an upstream supporting surface obliquely extending with respect to the supporting surface, and an air blowing unit facing the upstream supporting part. The air blowing unit includes: an air blowing part configured to blow air to the medium, and an air blowing case configured to house the air blowing part, the air blowing case includes an air blowing top portion located at an uppermost position in the air blowing case, and the air blowing top portion is located at a position below the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the medium does not interfere with the air blowing unit. Therefore, even when the printing is performed on a rigid medium, it is not necessary to detach the air blowing unit. Thus, the reduction in usability is suppressed.

(F) In the printing apparatus, the air blowing top portion is located at the same height as the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the air blowing top portion can support the medium. With the air blowing top portion supporting the medium, the posture of the medium is stabilized.

(G) In the printing apparatus, the air blowing top portion includes an air blowing top surface located at the same height as the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the air blowing top surface supports the medium. In comparison with the case where the air blowing top part supports the medium in a small area, the posture of the medium is stabilized.

(H) In the printing apparatus, the air blowing case

includes an air blowing extension portion extending the air blowing top portion, and the air blowing extension portion is configured to be displaced to an air blowing extension position where the air blowing extension portion extends the air blowing top portion, and an air blowing housing position where the air blowing extension portion is housed in the air blowing case. With the above-mentioned configuration, when the air blowing extension portion is located at the air blowing extension position, the air blowing top portion and the air blowing extension portion can support the medium when the medium is conveyed straight along the supporting surface. When the air blowing extension portion is located at the air blowing housing position, the air blowing extension portion is prevented from hindering the operation when the medium is conveyed from the supporting part to the downstream supporting part.

(I) A printing apparatus includes a printing unit configured to perform printing by ejecting liquid to a medium conveyed, a supporting part facing the printing unit, and including a supporting surface configured to support the medium, an upstream supporting part located upstream of the supporting part in a medium conveyance direction, and including an upstream supporting surface obliquely extending with respect to the supporting surface, an air blowing unit facing the upstream supporting part. The air blowing unit includes: an air blowing part configured to blow air toward the upstream supporting surface, and an air blowing case configured to house the air blowing part, the air blowing case includes an air blowing top portion located at an uppermost position in the air blowing case, and the air blowing top portion is located at a position below the supporting surface. With the above-mentioned configuration, when the medium is conveyed straight along the supporting surface, the medium does not interfere with the air blowing unit. Therefore, even when the printing is performed on a rigid medium, it is not necessary to detach the air blowing unit. Thus, the reduction in usability is suppressed.

Claims

1. A printing apparatus comprising:

- a printing unit configured to perform printing by ejecting liquid to a medium conveyed;
- a supporting part facing the printing unit, and including a supporting surface configured to support the medium;
- a downstream supporting part located downstream of the supporting part in a medium conveyance direction, and including a downstream supporting surface obliquely extending with respect to the supporting surface; and

- a heating unit facing the downstream supporting part, wherein
the heating unit includes:
- a heating part configured to heat the medium, and
 - a heating case configured to house the heating part,
 - the heating case includes a heating top portion located at an uppermost position in the heating case, and
 - the heating top portion is located at a position below the supporting surface.
2. The printing apparatus according to claim 1, wherein the heating top portion is located at the same height as the supporting surface.
3. The printing apparatus according to claim 2, wherein the heating top portion includes a heating top surface located at the same height as the supporting surface.
4. The printing apparatus according to claim 3, wherein
- the heating case includes a heating extension portion extending the heating top portion, and
 - the heating extension portion is configured to be displaced to a heating extension position where the heating extension portion extends the heating top portion, and a heating housing position where the heating extension portion is housed in the heating case.
5. The printing apparatus according to claim 1, further comprising:
- an upstream supporting part located upstream of the supporting part in the conveyance direction, and including an upstream supporting surface obliquely extending with respect to the supporting surface; and
 - an air blowing unit facing the upstream supporting part, wherein
the air blowing unit includes:
 - an air blowing part configured to blow air to the medium, and
 - an air blowing case configured to house the air blowing part,
 - the air blowing case includes an air blowing top portion located at an uppermost position in the air blowing case, and
 - the air blowing top portion is located at a position below the supporting surface.
6. The printing apparatus according to claim 5, wherein the air blowing top portion is located at the same height as the supporting surface.
7. The printing apparatus according to claim 6, wherein the air blowing top portion includes an air blowing top surface located at the same height as the supporting surface.
8. The printing apparatus according to claim 7, wherein
- the air blowing case includes an air blowing extension portion extending the air blowing top portion, and
 - the air blowing extension portion is configured to be displaced to an air blowing extension position where the air blowing extension portion extends the air blowing top portion, and an air blowing housing position where the air blowing extension portion is housed in the air blowing case.
9. A printing apparatus comprising:
- a printing unit configured to perform printing by ejecting liquid to a medium conveyed;
 - a supporting part facing the printing unit, and including a supporting surface configured to support the medium;
 - an upstream supporting part located upstream of the supporting part in a medium conveyance direction, and including an upstream supporting surface obliquely extending with respect to the supporting surface,
 - an air blowing unit facing the upstream supporting part, wherein
the air blowing unit includes:
 - an air blowing part configured to blow air toward the upstream supporting surface, and
 - an air blowing case configured to house the air blowing part,
 - the air blowing case includes an air blowing top portion located at an uppermost position in the air blowing case, and
 - the air blowing top portion is located at a position below the supporting surface.

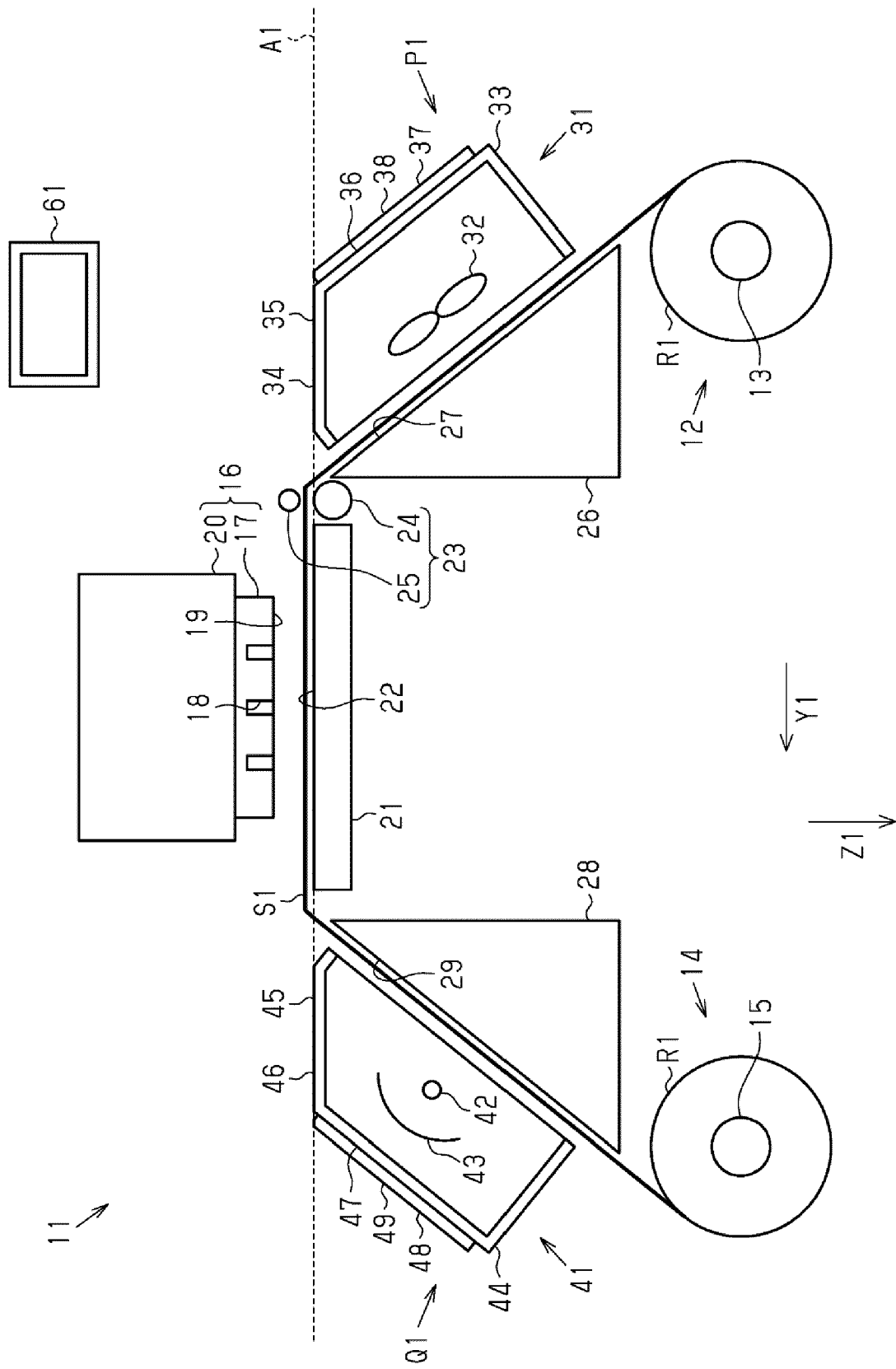


FIG. 1

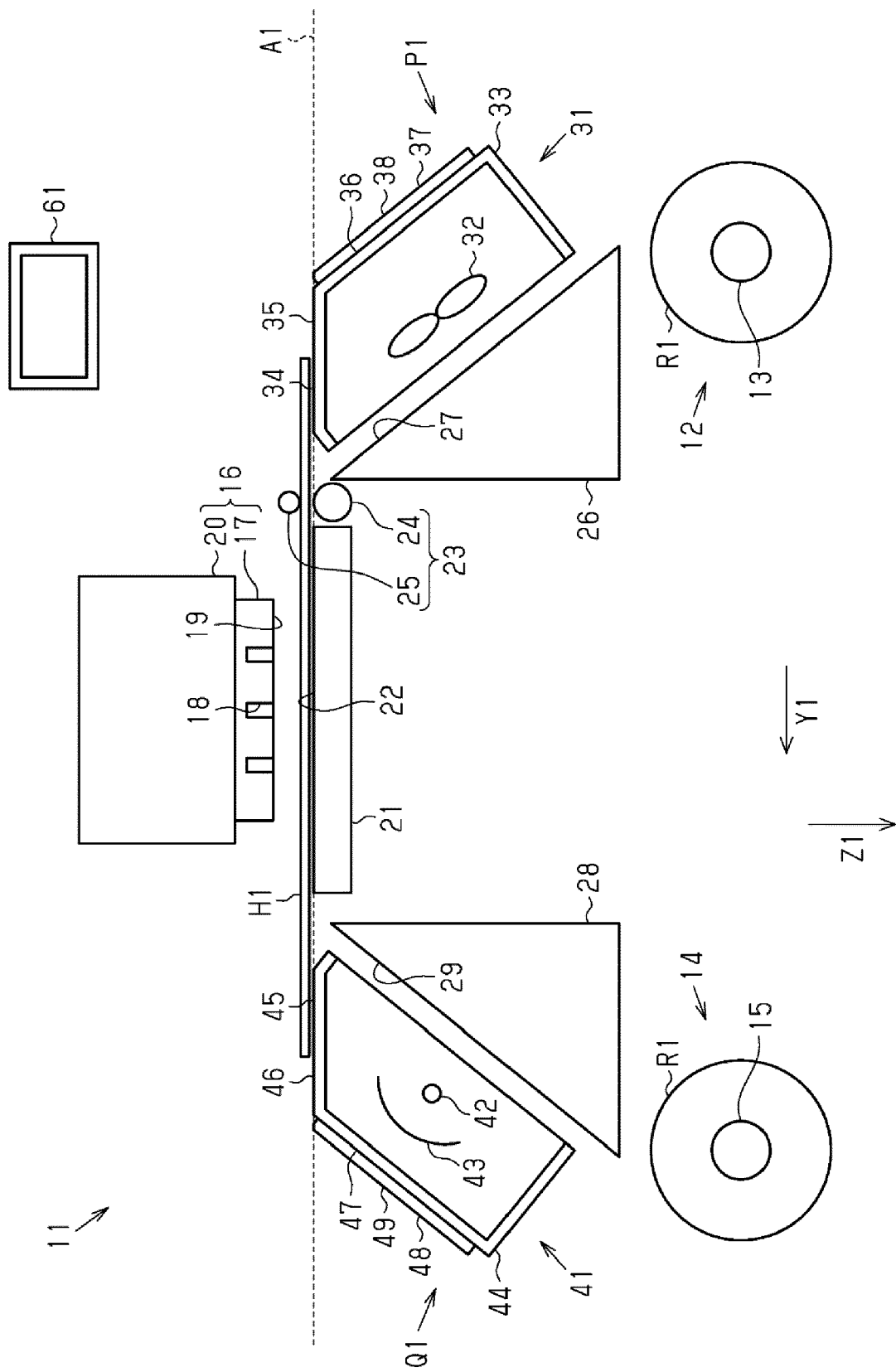


FIG. 2

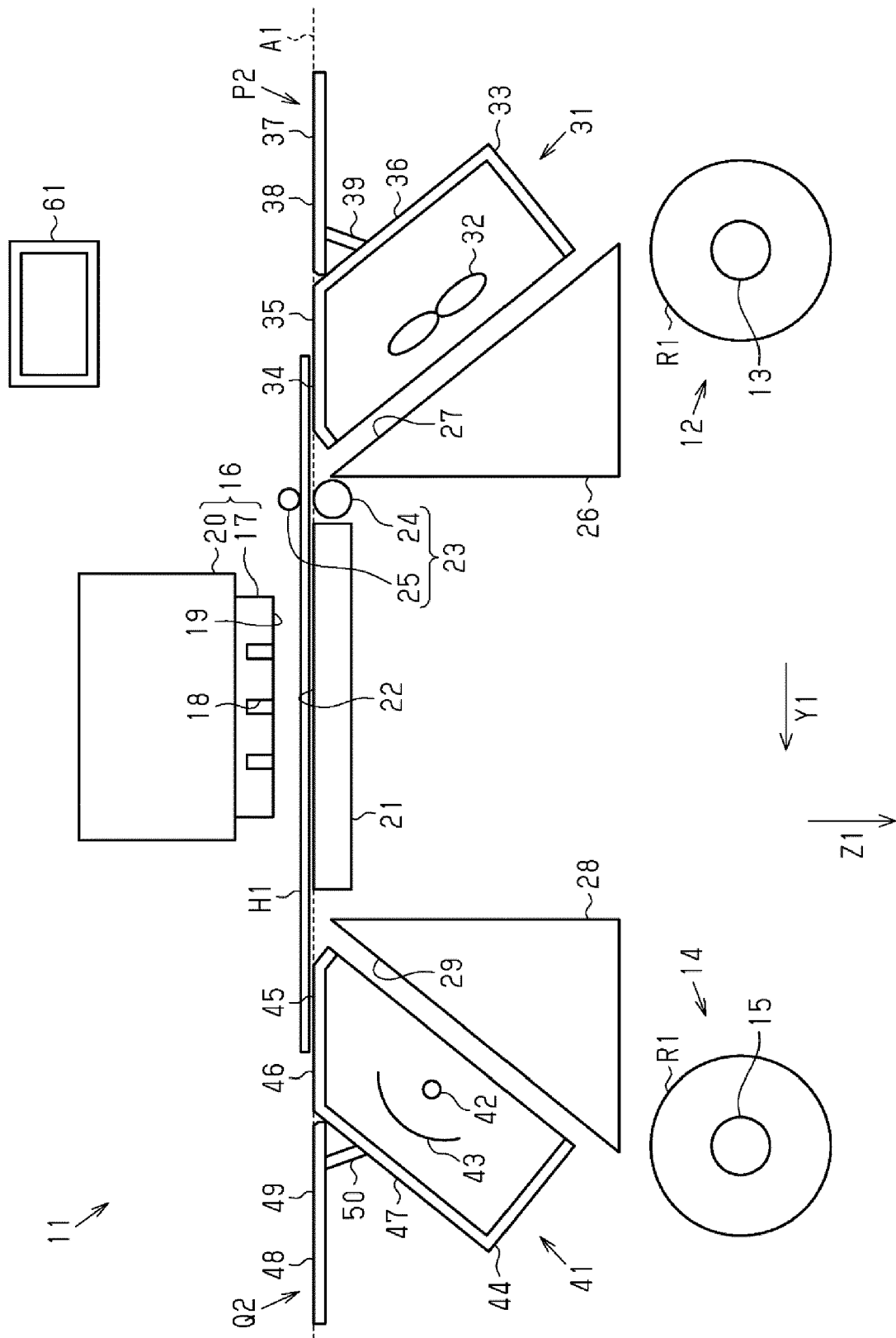


FIG. 3

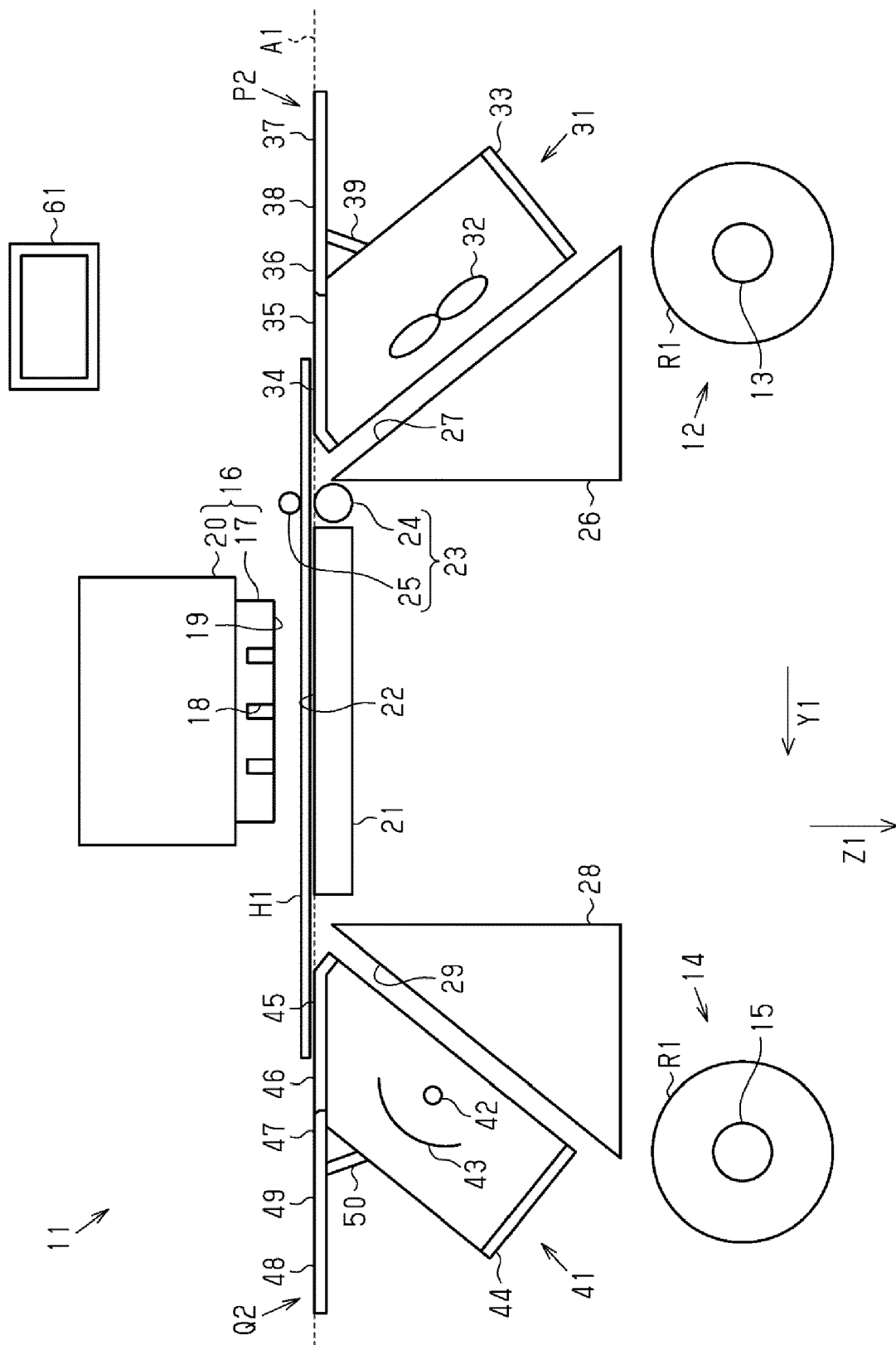


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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