



(11) **EP 3 444 115 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:

23.03.2022 Bulletin 2022/12

(21) Application number: **17781736.8**

(22) Date of filing: **15.02.2017**

(51) International Patent Classification (IPC):

B41F 5/16 ^(2006.01) **B41F 5/02** ^(2006.01)
B41F 5/24 ^(2006.01) **B41F 23/04** ^(2006.01)
B41F 33/00 ^(2006.01) **B41F 33/08** ^(2006.01)
B41F 33/12 ^(2006.01) **B41F 21/10** ^(2006.01)

(52) Cooperative Patent Classification (CPC):

B41F 5/02; B41F 5/24; B41F 21/10; B41F 23/044;
B41F 23/0443; B41F 23/045; B41F 23/0479;
B41F 33/0036; B41F 33/08; B41F 33/12

(86) International application number:

PCT/CN2017/073585

(87) International publication number:

WO 2017/177760 (19.10.2017 Gazette 2017/42)

(54) **SHEET-FED FLEXOGRAPHIC PRINTING PRESS**

FLEXODRUCKMASCHINE MIT BLATTZUFUHR

MACHINE D'IMPRESSION FLEXOGRAPHIQUE ALIMENTÉE EN FEUILLES

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR

(30) Priority: **11.04.2016 CN 201610219265**

(43) Date of publication of application:

20.02.2019 Bulletin 2019/08

(73) Proprietors:

- **Nanjing Mint Co., Ltd.**
Nanjing, Jiangsu 211100 (CN)
- **China Banknote Printing and Minting Corp.**
Beijing 100044 (CN)

(72) Inventors:

- **MA, Lixiang**
Nanjing
Jiangsu 211100 (CN)

• **WU, Jinping**

Nanjing
Jiangsu 211100 (CN)

(74) Representative: **Inal, Aysegul Seda**

Yalciner Patent and Consulting Ltd.
Tunus Cad. 85/3-4
06680 Kavaklidere, Ankara (TR)

(56) References cited:

EP-A1- 0 312 660 EP-A2- 0 819 521
EP-A2- 1 279 497 EP-A2- 1 818 177
WO-A1-2011/145028 CN-A- 1 891 457
CN-A- 101 479 107 CN-A- 102 173 184
CN-A- 105 196 684 US-A- 5 598 777
US-A1- 2004 069 169

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Technical field

[0001] The present invention relates to the technical field of printing equipment, and more particularly to a sheet-fed flexographic printing press.

Background

[0002] For existing flexographic printing press, especially the double-sided flexographic printing press, in order to satisfy the requirements of high production efficiency, ink drying and curing process are conducted on the printing surface immediately after printing such that the printing operations on the next step or the next side can be carried out. The existing fast drying technology for printed product usually uses hot air, infrared or UV light curing and other principles, to achieve the fast drying of printed product. The above drying method will have a thermal effect on the printed surface, causing a slightly warping due to slight increase of temperature on one side surface of the printed product, or even seriously significant deformation of printed product. In special circumstances, this even leads to cooking or burning of the printed product. In addition, since the demand for quality of the printing production is getting stricter, the user proposes more requirements to the online quality inspection system of the printing equipment. The existing flexographic printing presses are still poor in terms of the online inspection system and the printing quality.

[0003] Figure 4 is a flow chart of an existing double-sided flexographic printing press, and the two printing color groups corresponding to both sides of the printed product in the flow chart are sequentially connected. The printing, drying, and curing of the other surface (B side) is carried out immediately after the ink is dried and cured by the drying device upon printing completion of the first side (A side).

[0004] Then, And the quality check of the two printing surfaces is carried out respectively in the checking drum. The printing structure has thermal accumulation problems when continuous drying of the printed product is conducted. The deformation caused by overheating and other issues affects the printing quality.

[0005] Additionally, in the printing machine structure used in the process, the on-line checking of both sides of the printing process is carried out after the two printings are completed, so that the feedback of the printing quality problems on the first side can be received only after the printing of the second side is completed. Therefore, there is a delay in quality control.

[0006] Figure 5 is a schematic representation showing the arrangement of the printing unit drums of an existing double-sided flexographic printing press. The arrangement of the printing unit drums conforms to the printing process shown in Figure 4. The flexographic printing press adopts the printing method of continuously printing

on both sides, which causes the above-mentioned problem of thermal accumulation of printed product and timeliness control of the printed product quality during the production process.

[0007] The patent document WO2011/145028 A1 shows a sheet-fed printing press according to the preamble of claim 1 for numbering and varnishing of security documents, including banknotes, including a numbering group comprising at least one numbering unit for numbering printed material in the form of individual sheets carrying multiple security imprints; and - a varnishing group located downstream of the numbering group for applying varnish onto recto and verso sides of the printed material, the varnishing group comprising at least a first varnishing unit disposed above a path of the printed material to apply varnish on the recto side of the printed material and at least a second varnishing unit disposed below the path of the printed material to apply varnish on the verso side of the printed material.

[0008] Another example of a modular sheet-fed printing press is provided in the document EP 1 818 177 A2

Summary of the invention

[0009] In order to overcome the above-mentioned deficiencies of the prior art, the present invention provides a sheet-fed flexographic printing press which reduces the thermal accumulation of the printed product and timely detects quality problems of the printed product, as defined in claim 1.

[0010] A technical solution for achieving the object of the present invention is that a sheet-fed flexographic printing press includes a first printing unit and a second printing unit each for printing a side of a sheet of a printing stock, respectively. The first printing unit comprises a first impression drum, a first printing paper delivering drum I, at least a first flexographic printing drum for installing a flexographic plate, a first printing ink drying and curing device and a first printing paper delivering drum II, wherein the at least first flexographic printing drum is provided with a corresponding first ink supply system; the second printing unit comprises a second impression drum, a second printing paper delivering drum I, at least a second flexographic printing drum for installing a flexographic plate, a second printing ink drying and curing device and a second printing paper delivering drum II, wherein the at least second flexographic printing drum is provided with a corresponding second ink supply system; the first printing paper delivering drums I and the first printing paper delivering drum II are provided between the first impression drum and the second impression drum; the second printing paper delivering drum I and the second printing paper delivering drum II are provided downstream of the second impression drum in the feeding direction of the sheet; each of the first printing paper delivering drums I, the first printing paper delivering drum II, the second printing paper delivering drum I and the second printing paper delivering drum II is a drum having

a temperature control device; a first checking device is respectively provided outside the first printing paper delivering drum I and the first printing paper delivering drum II, and a second checking device is respectively provided outside the second printing paper delivering drum I and the second printing paper delivering drum II both the first checking device and the second checking device are configured to check material or print quality of the printing stock; a paper feeding device is provided at the front end of the first printing unit; a multi-bin paper collecting device is provided at the rear end of the second printing unit;

[0011] A temperature adjustment control mechanism is provided inside the drum having the temperature control to enable liquid medium to flow. Said first and second impression drums, said first I, first II, second I and second II printing paper delivering drums, and said first and second flexographic printing drums are arranged such that the sheet of the printing stock successively passes through the first flexographic printing drum and the first impression drum, the first impression drum and the first printing paper delivering drum I, the first printing paper delivering drum I and the first printing paper delivering drum II, the first printing paper delivering drum II and the second impression drum, and the second impression drum and the second flexographic printing drum.

[0012] A gripper mechanism for gripping the sheet of the printing stock is installed inside each of the first impression drum, the first printing paper delivering drum I, the first printing paper delivering drum II, the second impression drum, the second printing paper delivering drum I, and the second printing paper delivering drum II.

[0013] A temperature adjustment control mechanism for flowing of the liquid medium is provided inside the first impression drum and the second impression drum.

[0014] The present invention has the following advantages. In the present invention, two units (four printing paper feeding drums in total) are installed between and behind components where the two impression drums are located, respectively. These printing paper feeding drums are drums having a temperature control and a quality checking device. The printing paper feed drums are provided with the temperature control function, which can reduce the thermal accumulation of the printed product, to create conditions for print quality control and neat collection. The printing paper feeding drums are provided with the quality checking device to conduct different quality checking or optical characteristics checking on two sides of the printed product based on the requirements of quality checking, such that the scope of checking is enlarged. At the same time, the checking device is provided between the components, which provides a condition for the timely feedback of the printing quality of the printed product. For example, after the first side of the printing is completed, when it is found during checking that there are quality problems, the present invention can set a timely alarm, shutdown the machine, stop the printing drums or separate collection of printed product and other measures to reduce the unnecessary printing ma-

terials and printing stocks waste.

Brief description of the drawings

[0015] In order to make the contents of the present invention more easily understood, the present invention will be described in further detail with reference to embodiments in conjunction with the accompanying drawings.

Figure 1 and Figure 2 show an embodiment of the present invention;

Figure 3 is a working flow chart of the present invention;

Figure 4 is a flow chart of an existing double-sided flexographic printing press;

Figure 5 is a schematic representation showing the arrangement of the printing unit drums of the existing double-sided flexographic printing press.

[0016] Reference signs in the drawings: 1, the first impression drum; 2, the first printing paper delivering drum I; 3, the first printing paper delivering drum II; 4, the second impression drum; 5, the second printing paper delivering drum I; 6, the second printing paper delivering drum II; 7, the first checking device; 8, the second checking device; 9, a first flexographic printing drum; 10, a first ink supply system; 11, a second flexographic printing drum; 12, a second ink supply system; 13, a first printing ink drying and curing device; 14, a second printing ink drying and curing device; 15, a paper feeding device; 16, a multi-bin paper collecting device; 17, a flexographic printing drum.

Detailed description of the embodiments

[0017] As shown in Figure 1, the present invention discloses a sheet-fed flexographic printing press, which includes a first printing unit and a second printing unit for printing both surfaces of sheet of the printing stock respectively. The first printing unit includes first impression drum 1, first printing paper delivering drum I 2, first printing paper delivering drum II 3, second impression drum 4, second printing paper delivering drum I 5 and second printing paper delivering drum II 6. First printing paper delivering drum 12 and first printing paper delivering drum II 3 are provided between first impression drum 1 and second impression drum 4, second printing paper delivering drum I 5 and second printing paper delivering drum II 6 are provided behind second impression drum 4. First printing paper delivering drum I 2, first printing paper delivering drum II 3, second printing paper delivering drum I 5 and second printing paper delivering drum II 6 are provided as drums having a temperature control and a quality checking device. The interior of the drum having the temperature control is provided with a temperature adjustment control mechanism for the liquid medium to flow, and the drum having the quality checking

device is a drum in which an optoelectronic device or a camera is mounted. The optoelectronic device or camera is connected to a computer or other analytical equipment, so that the printing quality of the paper can be checked in real time.

[0018] In the arrangement of the drums, two (even number) of printing paper feed drums are added between and behind the printing units corresponding to two surfaces of the printed product. On one hand, the paper alternates even times to ensure the two surface printings of the printed product. On the other hand, the problem of thermal accumulation and timely quality control is solved by adding additional temperature control function and print quality checking function on the added printing paper drum.

[0019] First checking device 7 is provided at the exterior of first printing paper delivering drum I 2 and first printing paper delivering drum II 3, and second checking device 8 is provided at the exterior of second printing paper delivering drum I 5 and second printing paper delivering drum II 6. Both, first checking device 7 and second checking device 8, are configured to check the material or print quality of the sheet of the printing stock. Both, first checking device 7 and second checking device 8, are configured to check the print quality of the sheet of the printing stock. First checking device 7 and the second checking device 8 can be a high-speed camera, and the high-speed camera can be connected to a computer to carry out the checking of the printing quality of the printed product.

[0020] A gripper mechanism is installed in the interior of each of first impression drum 1, first printing paper delivering drum I 2, first printing paper delivering drum II 3, second impression drum 4, second printing paper delivering drum I 5 and second printing paper delivering drum II 6 for gripping sheet of the printing stock. The present invention is directed to a sheet-fed double-sided flexographic printing press. Thus, the gripper mechanism used to grip sheet of the printing stock is provided at the gap between impression drums, printing paper feed drums and other drums related to paper gripping and transferring.

[0021] A temperature adjustment control mechanism for flow of the liquid medium is provided inside first impression drum 1 and second impression drum 4. At least one first flexographic printing drum 9 used for installing the flexographic plate is configured on first impression drum 1. Flexographic printing drum 9 is provided with a corresponding first ink supply system 10. At least one second flexographic printing drum 11 used for installing the flexographic plate is configured on second impression drum 4. Second flexographic printing drum 11 is provided with a corresponding second ink supply system 12. First ink supply system 10 and second ink supply system 12 are an anilox roller ink supply system.

[0022] In the present invention, it is possible to carry out flexographic printing on both sides of the printed product. A fast drying and curing type ink is necessary for

printing and a corresponding drying and curing device needs to be configured. First printing ink drying and curing device 13 is configured outside of first impression drum 1, and second printing ink drying and curing device 14 is configured outside of second impression drum 4. The fast drying and curing method will cause a certain amount of heat radiation, leading to increase in the temperature of the drums, other components and the printed product. In order to avoid the influence on the components and quality problem of the printed product caused by increase in the temperature, pipelines for flow of the liquid medium are designed inside the first impression drum 1, first printing paper delivering drum 12, first printing paper delivering drum II 3, second impression drum 4, second printing paper delivering drum I 5 and second printing paper delivering drum II 6, the temperature control of the drum and printed product is achieved by controlling the temperature and flow of liquid medium from outside.

[0023] Figure 3 is a flow chart of the printing process using the present invention. The flow chart shows the sequential process of double-sided printing, drying and curing, cooling and quality checking of the printing press, respectively. By the printing, drying, cooling and quality checking processes, the problem of thermal accumulation and delayed quality control existing in the double-sided flexographic printing will be well solved.

[0024] As shown in Figure 2, the sheet of the printing stock is firstly transferred to first impression drum 1 by the paper entering and feeding drum, and the sheet of the printing stock is successively passed through first flexographic printing drum 9 and flexographic printing drum 17 to complete the two-color overprinting of the first surface of the printed product. Next, the drying and curing of ink is conducted on the first surface by first printing ink drying and curing device 13. Then, the cooling treatment is conducted by first printing paper delivering drum I 2. Then, the printed product is transferred to second impression drum 4 through first printing paper delivering drum II to complete the two-color overprinting of the other surface. Next, the drying and curing of ink is conducted on the other surface by second printing ink drying and curing device 14. After that, the cooling treatment is conducted by second printing paper delivering drum I 5 and second printing paper delivering drum II 6. Finally, the printing is completed and the paper is provided as output. In the process, the two-sided printing are checked and controlled by first checking device 7 and second checking device 8, respectively, to ensure the quality of the printed product. In addition, paper feeding device 15 is provided at the front end of the first printing unit, and multi-bin paper collecting device 16 is provided at the rear end of the second printing unit. It is convenient to print a large amount of paper by setting paper feeding device 15 and multi-bin paper collecting device 16.

Claims

1. A sheet-fed flexographic printing press, comprising:

a first printing unit and a second printing unit 5
each for printing a side of a sheet of a printing
stock, respectively, wherein the second printing
unit comprises a second impression drum (4), a
second printing paper delivering drum I (5), at 10
least a second flexographic printing drum (11)
for installing a flexographic plate, a second print-
ing ink drying and curing device (14), and a sec-
ond printing paper delivering drum II (6), wherein
the at least second flexographic printing drum 15
(11) is provided with a corresponding second
ink supply system (12);
the second printing paper delivering drum I (5)
and the second printing paper delivering drum
II (6) are provided downstream of the second 20
impression drum (4) in the feeding direction of
the sheet;
the first printing unit comprises a first impression
drum (1), at least a first flexographic printing
drum (9) for installing a flexographic plate, a first
printing ink drying and curing device (13), where- 25
in the at least flexographic printing drum (9) is
provided with a corresponding first ink supply
system (10);
a paper feeding device (15) is provided at the
front end of the first printing unit; 30
a multi-bin paper collecting device (16) is pro-
vided at the rear end of the second printing unit;
characterized in that the first printing unit com-
prises a first printing paper delivering drum I (2)
and a first printing paper delivering drum II (3); 35
the first printing paper delivering drum I (2) and
the first printing paper delivering drum II (3) are
provided between the first impression drum (1)
and the second impression drum (4);
each of the first printing paper delivering drums 40
I (2), the first printing paper delivering drum II
(3), the second printing paper delivering drum I
(5) and the second printing paper delivering
drum II (6) is a drum having a temperature con- 45
trol device;
a first checking device (7) is respectively provid-
ed outside the first printing paper delivering
drum I (2) and the first printing paper delivering
drum II (3), and a second checking device (8) is 50
respectively provided outside the second print-
ing paper delivering drum I (5) and the second
printing paper delivering drum II (6) both the first
checking device (7) and the second checking
device (8) are configured to check material or
print quality of the printing stock; 55
a temperature adjustment control mechanism
enabling liquid medium to flow is provided inside
each of the first impression drum (1) and the

second impression drum (4);
a temperature adjustment control mechanism
configured to reduce a thermal accumulation of
the sheet is provided inside each of said first I
(2), first II (3), second I (5) and second II (6)
printing paper delivering drums having the tem-
perature adjustment control device to enable liq-
uid medium to flow,
said first (1) and second (4) impression drums,
said first I (2), first II (3), second I (5) and second
II (6) printing paper delivering drums, and said
at least first (9) and at least second (11) flexo-
graphic printing drums are arranged such that
the sheet of the printing stock successively
passes through the at least first flexographic
printing drum (9) and the first impression drum
(1), the first impression drum (1) and the first
printing paper delivering drum I (2), the first print-
ing paper delivering drum I (2) and the first print-
ing paper delivering drum II (3), the first printing
paper delivering drum II (3) and the second im-
pression drum (4), and the second impression
drum (4) and the at least second flexographic
printing drum (11) whereby a gripper mecha-
nism for gripping the sheet of the printing stock
is installed inside each of the first impression
drum (1), the first printing paper delivering drum
I (2), the first printing paper delivering drum II
(3), the second impression drum (4), the second
printing paper delivering drum I (5), and the sec-
ond printing paper delivering drum II (6).

Patentansprüche

1. Flexodruckpresse mit Blattzufuhr, umfassend :

eine erste Druckeinheit und eine zweite Druck-
einheit jeweils zum Bedrucken einer Seite eines
Bogens eines Bedruckstoffs, wobei die zweite
Druckeinheit eine zweite Drucktrommel (4), eine
zweite Druckpapierabgabestrommel I (5), min-
destens eine zweite Flexodrucktrommel (11)
zum Installieren einer Flexoplatte, eine zweite
Druckfarbentrocknungs- und -härtungsvorrich-
tung (14) und eine zweite Druckpapierabgabe-
strommel II (6) umfasst, wobei die mindestens
zweite Flexodrucktrommel (11) mit einem ent-
sprechenden zweiten Farbzufuhrsystem (12)
vorgesehen ist;
die zweite Druckpapiertransporttrommel I (5)
und die zweite Druckpapiertransporttrommel II
(6) in Vorschubrichtung des Bogens hinter der
zweiten Drucktrommel (4) angeordnet sind;
die erste Druckeinheit eine erste Drucktrommel
(1), mindestens eine erste Flexodrucktrommel
(9) zum Aufbringen einer Flexoplatte, eine erste
Druckfarbentrocknungs- und -härtungsvorrich-

tung (13) umfasst, wobei die mindestens eine Flexodrucktrommel (9) mit einem entsprechenden ersten Farbversorgungssystem (10) vorgesehen ist;

eine Papiervorschubvorrichtung (15) am vorderen Ende der ersten Druckeinheit vorgesehen ist;

eine Mehrschacht-Papiersammelvorrichtung (16) am hinteren Ende der zweiten Druckeinheit vorgesehen ist;

dadurch gekennzeichnet, dass die erste Druckeinheit eine erste Druckpapierabgabebetrommel I (2) und eine erste Druckpapierabgabebetrommel II (3) umfasst;

die erste Druckpapierabgabebetrommel I (2) und die erste Druckpapierabgabebetrommel II (3) zwischen der ersten Drucktrommel (1) und der zweiten Drucktrommel (4);

jede der ersten Druckpapierabgabebetrommel I (2), der ersten Druckpapierabgabebetrommel II (3), der zweiten Druckpapierabgabebetrommel I (5) und der zweiten Druckpapierabgabebetrommel II (6) eine Trommel mit einer Temperatursteuervorrichtung ist;

eine erste Kontrollvorrichtung (7) jeweils außerhalb der ersten Druckpapierabgabebetrommel I (2) und der ersten Druckpapierabgabebetrommel II (3) vorgesehen ist, und eine zweite Kontrolleinrichtung (8) jeweils außerhalb der zweiten Druckpapierabgabebetrommel I (5) und der zweiten Druckpapierabgabebetrommel II (6) vorgesehen ist, wobei sowohl die erste Kontrollvorrichtung (7) als auch die zweite Kontrollvorrichtung (8) konfiguriert sind, das Material oder die Druckqualität des Bedruckstoffs zu kontrollieren;

ein Temperaturregelungsmechanismus, der das Fließen eines flüssigen Mediums ermöglicht, innerhalb jeder der ersten Drucktrommel (1) und der zweiten Drucktrommel (4) vorgesehen ist;

ein Temperaturregelungsmechanismus, der konfiguriert ist, um eine thermische Akkumulation des Bogens zu reduzieren, innerhalb jeder der ersten I (2), ersten II (3), zweiten I (5) und zweiten II (6) Druckpapierabgabebetrommeln mit der Temperaturregelungsvorrichtung vorgesehen ist, um zu ermöglichen, dass flüssiges Medium fließt,

die erste (1) und die zweite (4) Drucktrommel, die erste I (2), die erste II (3), die zweite I (5) und die zweite II (6) Druckpapierabgabebetrommel und die mindestens erste (9) und die mindestens zweite (11) Flexodrucktrommel so angeordnet sind, dass der Bogen des Bedruckstoffs nacheinander die mindestens erste Flexodrucktrommel (9) und die erste Drucktrommel (1), die erste Drucktrommel (1) und die erste Druckpapierab-

gabebetrommel I (2), die erste Druckpapierabgabebetrommel I (2) und die erste Druckpapierabgabebetrommel II (3), die erste Druckpapierabgabebetrommel II (3) und die zweite Drucktrommel (4) sowie die zweite Drucktrommel (4) und die mindestens zweite Flexodrucktrommel (11) durchläuft, wobei in der ersten Drucktrommel (1), der ersten Druckpapierabgabebetrommel I (2), der ersten Druckpapierabgabebetrommel II (3), der zweiten Drucktrommel (4), der zweiten Druckpapierabgabebetrommel I (5) und der zweiten Druckpapierabgabebetrommel II (6) jeweils ein Greifermechanismus zum Greifen des Bogens des Bedruckstoffs installiert ist.

Revendications

1. Presse à imprimer flexographique à feuilles, comprenant :

une première unité d'impression et une deuxième unité d'impression, chacune pour imprimer un côté d'une feuille d'un matériel d'impression, respectivement, dans laquelle la deuxième unité d'impression comprend un deuxième tambour d'impression (4), un deuxième tambour de distribution de papier d'impression I (5), au moins un deuxième tambour d'impression flexographique (11) pour installer une plaque flexographique, un deuxième dispositif de séchage et de durcissement de l'encre d'impression (14), et un deuxième tambour de distribution de papier d'impression II (6), dans laquelle au moins le deuxième tambour d'impression flexographique (11) est pourvu d'un deuxième système d'alimentation en encre correspondant (12) ;

le deuxième tambour de distribution de papier d'impression I (5) et le deuxième tambour de distribution de papier d'impression II (6) sont prévus en aval du deuxième tambour d'impression (4) dans la direction d'alimentation de la feuille ;

la première unité d'impression comprend un premier tambour d'impression (1), au moins un premier tambour d'impression flexographique (9) pour installer une plaque flexographique, un premier dispositif de séchage et de durcissement de l'encre d'impression (13), dans lequel au moins le tambour d'impression flexographique (9) est pourvu d'un premier système d'alimentation en encre correspondant (10) ;

un dispositif d'alimentation en papier (15) est prévu à l'extrémité avant de la première unité d'impression ;

un dispositif de collecte de papier à bacs multiples (16) est prévu à l'extrémité arrière de la deuxième unité d'impression ;

caractérisée en ce que la première unité d'impression comprend un premier tambour de distribution de papier d'impression I (2) et un premier tambour de distribution de papier d'impression II (3) ;

le premier tambour de distribution de papier d'impression I (2) et le premier tambour de distribution de papier d'impression II (3) sont prévus entre le premier tambour d'impression (1) et le deuxième tambour d'impression (4) ;

chacun du premier tambour de distribution du papier d'impression I (2), du premier tambour de distribution du papier d'impression II (3), du deuxième tambour de distribution du papier d'impression I (5) et du deuxième tambour de distribution du papier d'impression II (6) est un tambour ayant un dispositif de contrôle de la température ;

un premier dispositif de vérification (7) est respectivement prévu à l'extérieur du premier tambour de distribution de papier d'impression I (2) et du premier tambour de distribution de papier d'impression II (3), et un deuxième dispositif de vérification (8) est respectivement prévu à l'extérieur du deuxième tambour de distribution de papier d'impression I (5) et du deuxième tambour de distribution de papier d'impression II (6) ; le premier dispositif de vérification (7) et le deuxième dispositif de vérification (8) sont tous deux configurés pour vérifier la qualité du matériau ou de l'impression du matériel d'impression ;

un mécanisme de contrôle de réglage de température permettant à un milieu liquide de s'écouler est prévu à l'intérieur de chacun du premier tambour d'impression (1) et du deuxième tambour d'impression (4) ;

un mécanisme de contrôle d'ajustement de température configuré pour réduire une accumulation thermique de la feuille est prévu à l'intérieur de chacun desdits premier I (2), premier II (3), deuxième I (5) et deuxième II (6) tambours de distribution de papier d'impression ayant le dispositif de contrôle d'ajustement de température pour permettre au milieu liquide de s'écouler, lesdits premier (1) et deuxième (4) tambours d'impression, lesdits premier I (2), premier II (3), deuxième I (5) et deuxième II (6) tambours de distribution de papier d'impression, et lesdits au moins premier (9) et au moins deuxième (11) tambours d'impression flexographique sont disposés de telle sorte que la feuille du matériel d'impression passe successivement à travers le au moins premier tambour d'impression flexographique (9) et le premier tambour d'impression (1), le premier tambour d'impression (1) et le premier tambour de distribution de papier d'impression I (2), le premier tambour de distri-

bution de papier d'impression I (2) et le premier tambour de distribution de papier d'impression II (3), le premier tambour de distribution de papier d'impression II (3) et le deuxième tambour d'impression (4), et le deuxième tambour d'impression (4) et le au moins deuxième tambour d'impression flexographique (11) selon lequel un mécanisme de préhension pour saisir la feuille du matériel d'impression est installé à l'intérieur de chacun du premier tambour d'impression (1), du premier tambour de distribution de papier d'impression I (2), du premier tambour de distribution de papier d'impression II (3), du deuxième tambour d'impression (4), du deuxième tambour de distribution de papier d'impression I (5), et du deuxième tambour de distribution de papier d'impression II (6).

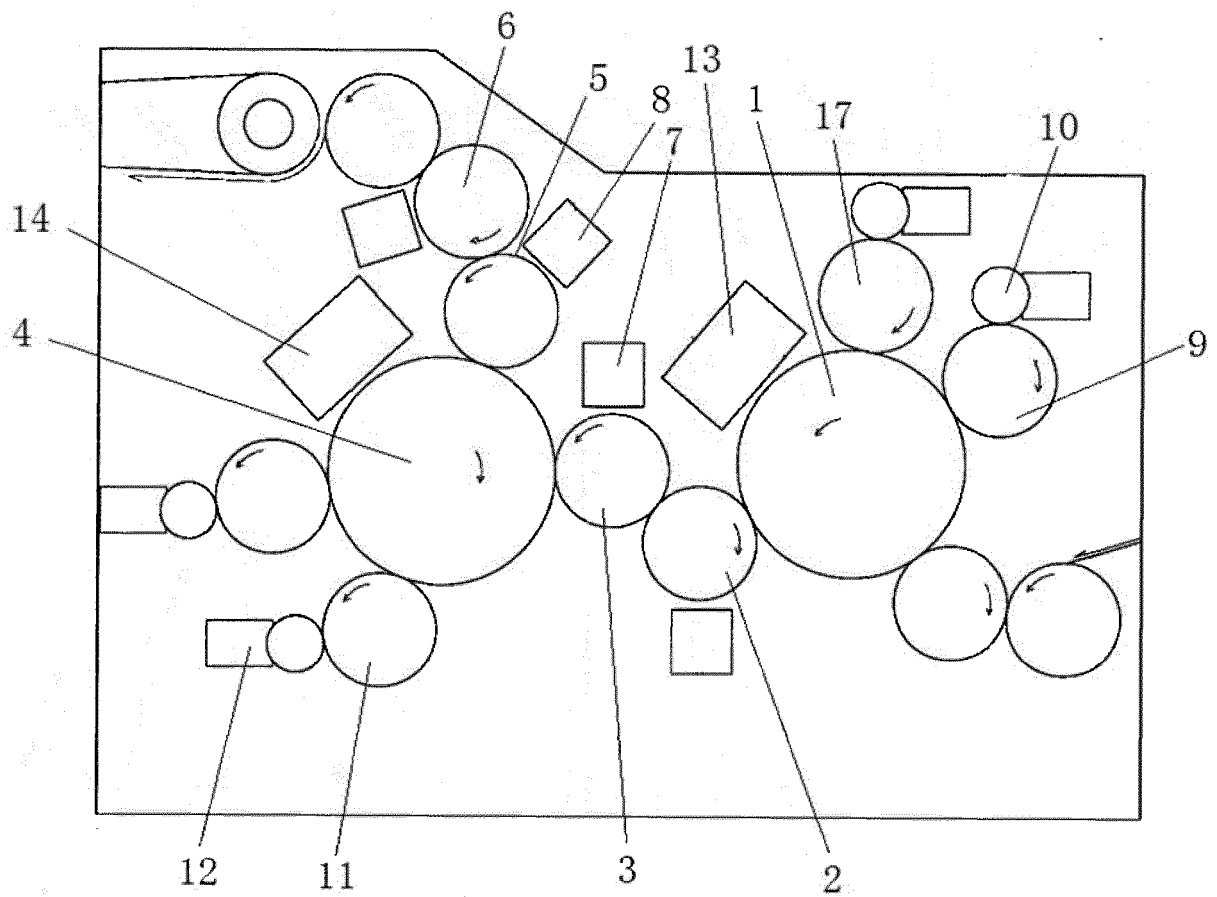


Figure 1

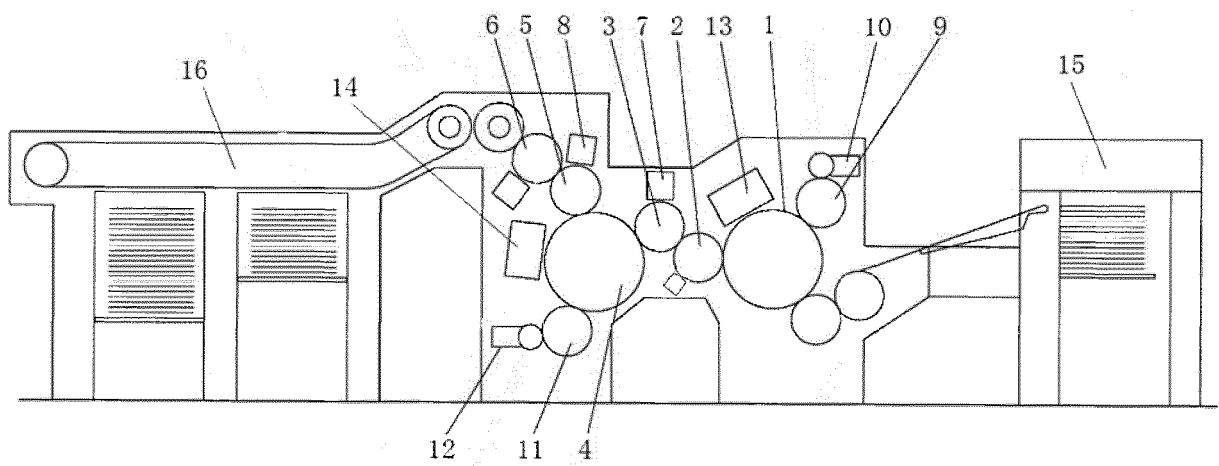


Figure 2

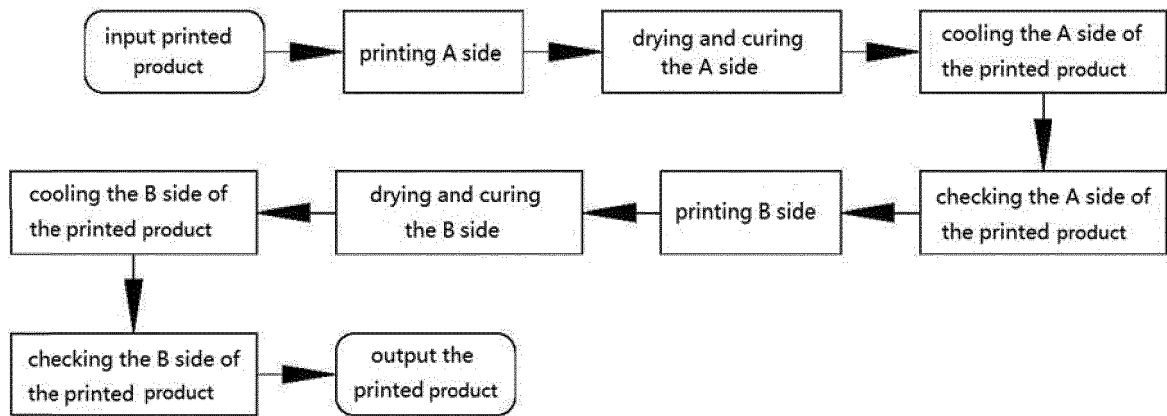


Figure 3

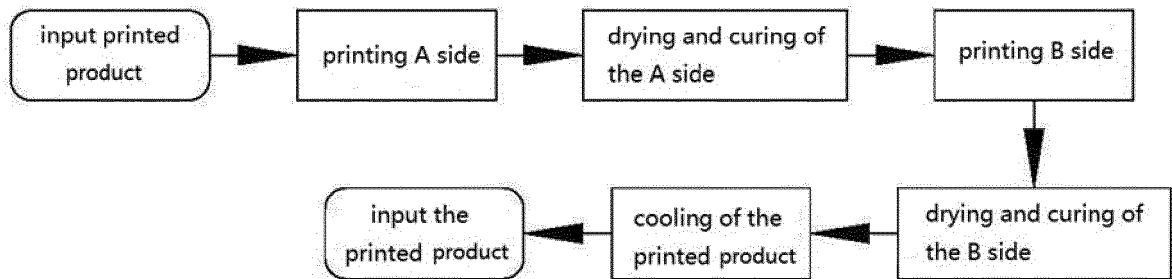


Figure 4

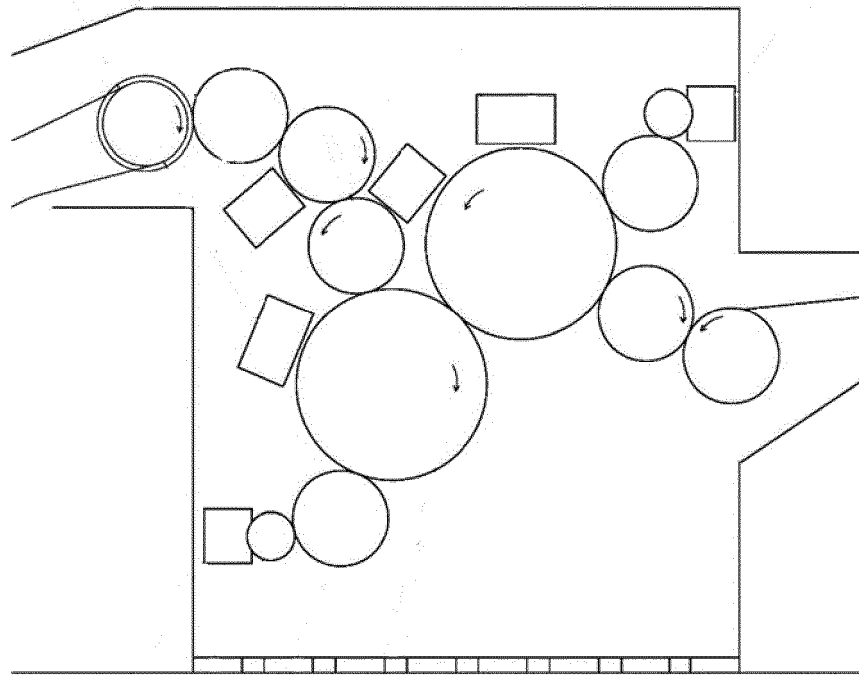


Figure 5

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- WO 2011L45028 A1 [0007]
- EP 1818177 A2 [0008]