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(54) A METHOD FOR STACKING PRINTED SHEETS ALIGNED ON AN EDGE OF A PALLET

(57) In order to directly stack printed sheets at the edge of a pallet for improved compatibility with certain finishers, the present invention provides:

A sheet printer (1) comprising:

- a stacker (20; 120) at an end of a transport path of the printer (1), which stacker (20; 120) is configured to hold a pallet (30; 130) and to form a stack (16; 116) of printed sheets (S, S') thereon;
- a registration unit (6, 12; 112) for adjusting an position and/or orientation of a sheet (S, S'),

characterized in that

- the stacker (20; 120) comprises a stack holder (29) for holding the pallet (30; 130) with one of its edges at a predetermined pallet edge position (P; P') in a first direction (X, Y); and
- that a controller (38) is configured to control registration unit (6, 12; 112) to position the sheet (S, S') with a corresponding edge at the predetermined pallet edge position (P; P') in the first direction (X, Y).

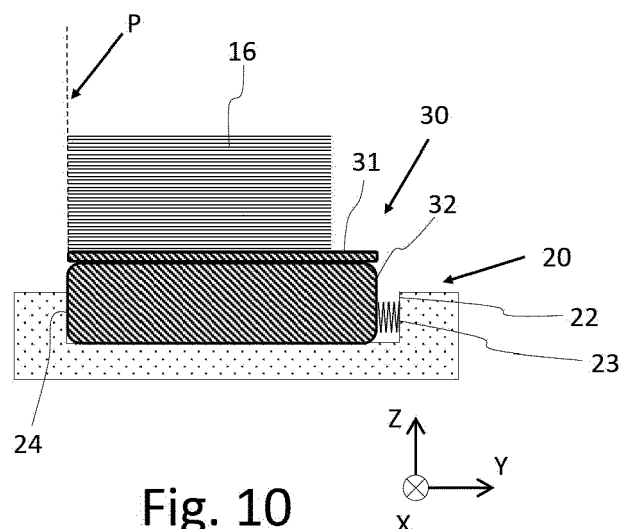


Fig. 10

Description**BACKGROUND OF THE INVENTION**

1. Field of the invention

[0001] The invention relates to a method of stacking printed sheets on a pallet, to a sheet printer, to a computer program, and to a computer-readable medium.

2. Description of Background Art

[0002] A sheet printer may comprise a stacker at an end of a transport path of the printer. The stacker may be configured to hold a pallet and to form a stack of printed sheets thereon. Such a stacker is known from e.g. US5669755A. The stacks of printed sheets are generally transported on their respective pallets to a finisher for processing the sheets into print products, such as books, leaflets, etc. Certain finishers allow the stack to be loaded with its pallet into the finisher. These finishers commonly require that the edge of the stack is positioned at an edge of the pallet, as otherwise a separator in the finisher is unable to engage the sheets and separate these from the stack. Sheet printers generally position the stack on the pallet spaced apart from the pallet's edges due to restrictions in the stacker. It is known to provide additional loading aids that allow a stack to be transferred from one pallet to another pallet outside of the printer, so that the stack is at the edge of the pallet. It is further known that sheet printers may comprise a registration unit for adjusting an position and/or orientation of a sheet on the transport path, as for example disclosed in EP3896019B1.

SUMMARY OF THE INVENTION

[0003] It is an object of the invention to provide an alternative and/or improved method of method of stacking printed sheets on a pallet, preferably a more efficient or simpler method.

[0004] In accordance with the present invention, a method of stacking printed sheets on a pallet according to claim 1, a printer according to claim 9, a computer program according to claim 14, and a computer-readable medium according to claim 15 are provided.

[0005] It is the insight of the inventors that repositioning of the stack on a pallet outside of the printer can be avoided if the stack is formed in the stacker with one if its edges positioned at an edge of the pallet. It is the further inside of the inventors that the sheet can be positioned at the pallet edge position inside the printer, preferably using components already present in the printer, such as a sheet registration unit.

[0006] The method comprises the steps of:

- positioning a sheet with a corresponding edge at a pallet edge position in a first direction while trans-

porting the sheet towards the stacker, which pallet edge position corresponds to a position of an edge of the pallet in the stacker;

- stacking the sheet on the pallet with its corresponding edge at the pallet edge position.

[0007] At least one edge of the pallet is at the predetermined pallet edge position in the stacker. Inside the printer's position of the sheet is compared to the pallet edge position and the sheet is controlled, so that inside the stacker it is in the pallet edge position. In consequence, the sheet is stacked in the stacker directly at an edge of the pallet. Thereby, the stack is formed at said edge of the pallet. The stack on the pallet is thus directly suited for use by a finisher. By forming the stack directly on an edge of the pallet no additional re-positioning steps of the stack on the pallet after stacking are required. Thereby, the object of the present invention has been achieved.

[0008] More specific optional features of the invention are indicated in the dependent claims.

[0009] In a preferred embodiment, the first direction is a lateral direction perpendicular to the transport direction of the sheet. A lateral edge of the sheet is then positioned at the pallet edge position. The edge of the pallet defining the pallet edge position is at the same side of the pallet as said edge of the sheet. The lateral edge of the pallet is preferably further aligned, so that it is parallel to the transport direction of the sheet.

[0010] In an embodiment, the method comprises the steps of:

- determining a position of the sheet in the printer;
- comparing the sheet's position to a pallet edge position parameter or setting corresponding to the position of the respective edge of the pallet in the stacker in the lateral direction;
- adjusting the position of the sheet in the printer, so that the sheet is inside the stacker at the pallet edge position in the lateral direction.

[0011] The position of the pallet's edge is stored on a memory of a printer's controller as a pallet edge position parameter or setting. The sheet's position inside the printer is determined at one or more points. This position is compared to the pallet edge position parameter or setting. Inside the printer the sheet is controlled based on said comparison, so that the sheet will be stacked at the pallet edge position. Preferably, the stacker comprises a pallet holder with an aligner, which defines the pallet edge position. The aligner defines an end position for the pallet in at least the lateral direction. This position is relative to the registration unit, which is applied for positioning the sheet at the pallet edge position. The pallet edge position defines the pallet edge position parameter or setting. The aligner may be adjustable in which case the controller applies a pallet edge position parameter, which is updated based on a changed posi-

tion of the aligner. In case the aligner defines a substantially fixed position for pallets during stacking, then the controller applies a pallet edge position edge setting.

[0012] In an embodiment, the sheet is moved into the pallet edge position before stacking. The sheet may be re-positioned on the transport path of the printer at the lateral position of a selected edge of the pallet, while the sheets are moving towards the stacker, for example using a registration unit provided in the printer.

[0013] In an embodiment, the method further comprises the step of positioning a pallet in a stacker with one of its edges in the pallet edge position in the lateral direction. During stacking both the pallet's edge and the corresponding edge of the sheets are at the pallet edge position. A pallet is thus loaded into the stacker, so that its edge is at the pallet edge position. In another embodiment, the step of positioning the pallet comprises positioning the pallet at an aligner of a pallet holder on a pallet support of a stacker. Additionally, the pallet's edge may be aligned so that it is aligned with a second direction preferably perpendicular to the first direction. The first and second directions are preferably horizontal, wherein the edge of the pallet is positioned at a predefined lateral position and preferably extends substantially parallel to the transport direction of the sheet. To this end, the stacker may comprise a stack holder with an aligner, so that when loaded the stack is securely held aligned with the pallet edge position during the stack forming.

[0014] In an embodiment, the edge of the sheet to be positioned at the pallet edge position is the respectively same edge of that of the pallet positioned at the pallet edge position in the lateral direction. Basically the same respective edge of the pallet is positioned at the pallet edge position as the sheet. Preferably, the edge is a lateral edge with respect to a main transport direction of the sheet. The left edge of the sheet is then positioned at the left edge of the pallet, or its right edge at the right edge of the pallet. In another embodiment, leading or trailing edge of the sheet is positioned respectively at the leading or trailing edge of the pallet.

[0015] In an embodiment, the step of positioning the sheet comprises shifting the sheet perpendicular to its transport direction into the pallet edge position. The sheet is shifted laterally. In case the first direction is the lateral direction, this positions the sheet at the pallet edge position. In the stacker leading or trailing edges of the sheet are aligned with one another to ensure a neat stack, for example by aligning these to the transport direction. In another embodiment, the method further comprises the step of selecting one of the lateral sides of the pallet for positioning the edges of the sheets at. The edge of pallet can be aligned at either lateral edge of the pallet. For each print/stack job, a different, lateral edge of the pallet can be selected, for example to aid the operator to distinguish between print jobs or for logistical reasons. For each sheet stack, the pallet edge position is selected to be at one of the lateral edges of the pallet. The registration unit is then controlled to align the sheets with the selected

lateral edge of the pallet.

[0016] In an embodiment, the step of positioning the sheet is performed after a step of printing on the sheet and before the step of stacking the sheet, and wherein after the step of positioning the sheet, the sheet is transported to the stacker while maintaining its respective edge in the pallet edge position in the lateral direction. In this case the first direction is the lateral direction. The sheet is positioned at the pallet edge position after the printed image has been fixed on the sheet. The position adjustment may e.g. be performed by a registration unit positioned between the stacker and the printhead assembly. The sheet is then transported to the stacker while maintaining its respective edge at the pallet edge position. Alternatively, the sheet may be registered upstream of the printhead assembly, so that it maintains its position in the pallet edge position as passes the printhead assembly for printing and moves to the stacker.

[0017] A further aspect of the invention relates to a sheet printer comprising:

- a stacker at an end of a transport path of the printer, which stacker is configured to hold a pallet and to form a stack of printed sheets thereon;
- a registration unit for adjusting an position and/or orientation of a sheet, wherein:
- the stacker comprises a stack holder for holding the pallet with one of its edges at a predetermined pallet edge position in a lateral direction perpendicular to a transport direction of the transport path; and
- that a controller is configured to control registration unit to position the sheet with a corresponding edge at the predetermined pallet edge position in the lateral direction.

[0018] The printer is configured to perform the method according to any of the embodiments described above. To ensure that each sheet is position at the respective edge of the pallet, the pallet is loaded in the stacker, so that its respective edge is at the predetermined pallet edge position. In the printer, the sheet is then controlled so it lands on the pallet or the stack thereon with its corresponding edge at the pallet edge position. The position of the sheet is adjusted by the registration unit, which registration unit is preferably along a transport path of the printer.

[0019] In an embodiment, the registration unit is positioned upstream of the stacker and configured to adjust a position and/or orientation of the sheet on the transport path of the printer. Such a registration unit is configured to position one lateral edge of the sheet at the pallet edge position in the lateral direction. As the sheet then travels further in the transport direction, said edge of the sheet remains in the pallet edge position until it arrives at the stacker. Preferably, the registration unit also orients the one lateral edge substantially parallel to the transport direction of the sheet.

[0020] In an embodiment, the stack holder comprises

an aligner for aligning the edge of the pallet into the pallet edge position in the lateral direction, preferably wherein the aligner comprises at least one urging element for driving the pallet against at least one an pallet alignment stop. The aligner ensures that the pallet's edge is and remains at the pallet edge position during stacking. The aligner ensures rapid and easy loading of a new pallet by simplifying the aligning of the pallet's edge. The aligner thus defines a during use and/or stacking fixed point in space, which defines the pallet edge position. This allows the pallet edge position to be applied by the controller as a pallet edge position parameter or setting, so that sheets can be accurately aligned thereto and thus to the actual pallet edge position.

[0021] In an embodiment, the controller on its memory stores a pallet edge position setting or parameter corresponding to the pallet edge position in the lateral direction, wherein the controller is configured to control the registration unit based on comparison between the pallet edge position setting or parameter and a determined position of the sheet on the transport path. The pallet edge position corresponds to a physical location in the printer, for example defined by an aligner for the pallet. The pallet edge position setting or parameter is applied during the sheet registration, so that the edge of the sheet will be at the physical pallet edge position, after stacking. The sheet may be brought into said position before stacking.

[0022] In an embodiment, the lateral direction is perpendicular to a transport direction of the transport path and a during use vertical direction. The pallet is positioned so that its respective edge is at a predefined position in the lateral direction. Preferably, said edge is further parallel to a main transport direction of the sheet. The registration unit then shifts the sheet, so that its lateral edge on the same side of the respective edge of the pallet has the same lateral position as the pallet's edge, so that by transporting the sheet further it arrives at the stacker at said same lateral position. It will be appreciated that the lateral position is relatively to a center of the transport path. In another embodiment, the registration unit is downstream of a printhead assembly, so that the sheet is moved into the pallet edge position after printing.

[0023] In an embodiment, the transport path is arranged to transport the sheets in the transport direction from the registration unit to the stacker while maintaining the respective edge of the sheets at the pallet edge position in the lateral direction. The transport path is formed by a transport mechanism comprising e.g. transport pinches, vacuum belts, and/or vacuum drums. After the registration unit has positioned the sheet with its lateral edge at the lateral position of the pallet's edge, the sheet is transported so that said edge remains in that lateral position.

[0024] In an embodiment, the controller is further configured to select one of the lateral edges of the pallet for aligning a sheet stack thereon, and is further configured

to control the registration unit to align the sheets at the selected lateral edge of the pallet for forming said sheet stack. The registration unit is arranged to align the sheet with either lateral edge of the pallet. For each print/stack job a lateral edge of the pallet is selected, either based in the print job information or by a default setting in the controller's memory. Dependent on this selection, the controller selects a pallet edge position setting or parameter corresponding to the left or right edge of the pallet. The controller then controls the registration unit to position the corresponding left or right side of the sheets at the selected edge of the pallet.

[0025] The present invention further relates to computer program comprising instructions to cause the sheet printer as described above to execute the steps of the method as described above. The present invention additionally relates to a computer-readable medium having stored thereon the above mentioned computer program.

[0026] Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the present invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The present invention will become more fully understood from the detailed description given herein below and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

- Fig. 1 is a schematic cross-sectional, side view of a representation of a sheet printer;
- Fig. 2 is a schematic top view of an unloaded pallet support of the stacker in the printer of Fig. 1;
- Fig. 3 is a schematic cross-sectional, side view of the pallet support in Fig. 2 loaded with a pallet;
- Fig. 4 is a schematic cross-sectional, side view of the pallet support in Fig. 2 loaded with a pallet;
- Fig. 5 is a schematic top view of a sheet approaching the registration unit in the printer in Fig. 1;
- Fig. 6 is a schematic top view of the pallet support in Fig. 2 loaded with a pallet;
- Fig. 7 is a schematic top view of a sheet registered by the registration into the pallet edge position;
- Fig. 8 is a schematic top view of the pallet support in Fig. 6 with a sheet stacked on the pallet;
- Fig. 9 is a schematic top view of a further sheet approaching the registration unit in the printer in Fig. 1;

- Fig. 10 is a schematic, cross-sectional, frontal view of a sheet stack aligned with an edge of the pallet on the stack holder in Fig. 8; and
- Fig. 11 is a schematic cross-sectional, side view of the stack support in Fig. 10 illustrating the safety panel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] The present invention will now be described with reference to the accompanying drawings, wherein the same reference numerals have been used to identify the same or similar elements throughout the several views.

Sheet printer

[0029] Fig. 1 illustrates a sheet printer 1. An input module 4 on the right side comprises one or more input stack supports 2 supporting at least one stack 3 of sheets. Individual sheets are separated from the stack 3 by the input module 4, which places the sheets on an input path of the printer 1. The input module 4 may comprise a separator to separate individual sheets from the stack 3. The input path brings the sheets to a print path section, illustrated as a straight, linear path, where the sheet is processed for printing thereon. The print path section comprises a switch 5 positioned at an intersection of the input path and a duplex path, which duplex path is arranged to return printed sheets to the print path. Sheets on the print path can thus be a mix of unprinted or one-side printed sheets.

[0030] The print path comprises a first registration unit 6 downstream of the switch 5. The first registration unit 6 comprises a first sheet detector 5 for detecting a position and orientation of each sheet. The orientation of the sheet is e.g. the angle of its forward facing or leading edge with respect to the transport direction X. Dependent on the measured position and orientation, the first registration unit 6 controls its registration drive 7 to position the sheet to a predefined position and/or align the sheet to a predefined orientation, for example with its leading edge perpendicular to the transport direction X, so that it will be parallel to the printhead assembly 10.

[0031] The registered sheet subsequently passes by a coater 9, which applies a liquid coating on at least a portion of the treated surface. The coater 9 may for example comprise an array of printheads configured to jet droplets of coating liquid or comprise a roller for transferring coating liquid as the roller rolls over the sheet. Any suitable coating liquid may be applied, such as for example Canon ColorGrip. The coating liquid preferably forms a continuous coat on the sheet, which enables or improves the bonding of color inks to the sheet.

[0032] The coated sheets travels to the printhead assembly 10, which jets one or more layers of color inks

onto the coated sheet. The printhead assembly 10 is preferably a page wide array of inkjet printheads to allow productive printing.

[0033] The jetted color inks are then fixed onto the sheet by means of a fixation unit 11. The fixation unit 11 applies or removes energy from the sheet, so that the jetted color inks undergo a phase change. The fixation unit 11 may comprise coolers and/or heaters, such radiation heaters with e.g. UV or IR light, hot air blowers, such as impingement blowers, contact heaters, such a heated transport belt or drum, etc. Alternatively or additionally, the fixation unit 11 may comprise curing station, which emits light with a wavelength which induces a chemical reaction in the color inks and/or coating liquid, causing these to solidify.

[0034] At the downstream side of the print path, a second registration unit 12 is provided to adjust the position and/or orientation of the sheets. This second registration unit 12 may be configured similar to the first registration unit 6. The second registration unit 12 can be applied to position and/or orientation a sheet with respect to a specific output location, for example a stacking location. The second registration unit 12 comprises its own registration drive 27 and may comprise a sheet detector 13, or the sheet's position can be derived by tracking the sheet's movement after detection by the first sheet detector 7.

[0035] At the end of the print path, a further switch 26 is provided to selectively direct sheets into the duplex path or to the output location. The duplex path preferably comprises a turn station, which inverts the sheet, so that it leaves the duplex path with its unprinted side eventually facing the printhead assembly 10. The output location in Fig. 1 comprises a stacker 20, which gathers the printed sheets in a further stack 16 on a pallet 30 on a pallet support 21. The stacker 20 comprises a stacking unit 15, which receives printed sheets and positions these on top of another into the stack 16. The stacking unit 15 may in one example comprise a rotatable flipping wheel with one or more slots at its circumference for holding a leading edge of a sheet. By rotating the flipping wheel as it holds the sheet, the sheet is flipped, and then released from the slots as the leading edge of the sheet contacts a stop at the bottom side of the flipping wheel. Such a stacking unit is known from US 9457980 B2, the content of which is herein incorporated by reference. The pallet support 21 of the stacker 20 is provided on a lift 22, so that its position in the vertical direction Z can be adjusted. This allows the top of the stack 16 to be at the working level of the stacking unit 15 as the stack height increases. The pallet support 21 is configured for supporting a pallet 30, though in absence of a pallet it may be suited for directly stacking sheets thereon as well.

Stacking on pallet

[0036] Fig. 2 illustrates the stack support 21 of the stacker 20 in top down view. The stack support comprises

a main surface provided with a pallet holder 29 for holding the pallet 30 in place on the stack support 21. The pallet holder 29 further comprises one or more aligners 28, so that the pallet is positioned and/or aligned to a position in at least one horizontal direction X, Y. The pallet holder 29 is formed by a pair of receiving recesses 22 or slots in the stack support 21. The receiving recesses 22 are positioned and dimensioned according to the pallet 30, so that the feet 32 of the pallet 30 can be received in the receiving recesses 22. The receiving recesses 22 are spaced apart corresponding to the distance between the feet 32 of the pallet 30. The length and width of each receiving recess 22 exceeds those of the pallet feet 32, so that a foot 32 fits into a receiving recesses 22. At least one receiving recess 22 is provided with an pallet alignment stop 24, in Fig. 2 in the form of an end face or surface of the receiving recess 22. A urging element 23 in the form of a spring is provided to urge the pallet 30 against the pallet alignment stop 24, so that an edge of the pallet 30 is at a pre-defined position in the lateral direction Y. In Fig. 2 the urging element 23 is positioned inside the receiving recess 22 to drive a foot 32 of the pallet 30 against the pallet alignment stop 24. It will be appreciated that an additional alignment mechanism to align the pallet 30 in the main transport direction X may be provided as well. In this example two similar aligners 28 at different positions are applied. Different types of aligners may be applied, for example fittingly dimensioned and positioned receiving slots, locking mechanisms, male-female connectors, etc. Alternative pallet holders may be applied as well, such as stop elements or grippers that protrude from the pallet support's main surface. It will be appreciated that herein a pallet 30 is defined as any suitable stack support that comprises a planar stack support surface 31 supported on at least two spaced apart feet 32, preferably positioned at or near opposing edges of the support surface 31. The pallet may be standard size and/or an irregular or custom-made pallet.

[0037] Fig. 3 illustrates the step of inserting a pallet 30 with its feet 32 into the receiving recesses 22 of the pallet support 21. In its received state, the urging element 23 drives the pallet 30 against the pallet alignment stop 24, so that an edge of the top panel 32 is positioned at the pallet edge position P, as shown in Fig. 4. When engaged by the pallet holder 29 an edge of the pallet 30 is positioned at the pallet edge position P, preferably such that this edge of the pallet 30 is substantially parallel to the main transport direction X. It will be appreciated that while in Fig. 4 the right edge (when viewed in the transport direction X) of the pallet 30 has been selected to define the pallet edge position P, the left side of the pallet 30 may be used as well to define the pallet edge position P. The left or right edge of the pallet 30 may be selected based on the print job information or selected by an operator before stacking starts. To position the sheets S with their edges at the left edge of the pallet 30, the width of the pallet 30 may be applied to determine the left edge's position relative to the alignment stop 24.

[0038] Fig. 5 illustrates a completely printed sheet S moving towards the stacker 20 to be stacked. The sheet S arrives at the second registration unit 12, which determines the position and orientation of the sheet S by means of the detector 27. The controller 38 compares the determined position and orientation of the sheet S to the pallet edge position P to determine a corrective action to position the sheet S corresponding to the pallet edge position P. The controller 38 controls the second registration drive 27 to rotate and or shift the sheet S, so that one of its lateral edges is positioned at the pallet edge position P in the lateral direction Y, as shown in Figs. 6 and 7. In addition, the sheet S is rotated, so that it is registered so that all sheets S are stacked with at least one edge parallel to one another. For example, one lateral edge of the sheet S is moved to the pallet edge position P and rotated so that this edge is substantially parallel to the main transport direction X. Alternatively, the sheet S may be moved with a lateral edge to the pallet edge position P, while it is rotated so that its leading edge is parallel to the lateral direction Y.

[0039] The sheet S then is transported to the stacker 20 while maintaining its position at the pallet edge position P. The stacker 20 then engages the sheet S and stacks it on the pallet 30, as shown in Fig. 8. The sheet S arrives at the pallet 30 with one edge at the pallet edge position P. The pallet 30 is positioned on the pallet support 21, so that its edge is at the pallet edge position P. In consequence, the sheet S is stacked on the pallet 30, so that an edge of the sheet S is positioned at the edge of the pallet 30. It will be appreciated that herein the same edge of the pallet 30 as that of the sheet S are positioned at the pallet edge position P. This process is repeated for any further sheets S' for forming the stack 16, as shown in Fig. 9.

[0040] In consequence, a stack 16 is formed on the pallet 30, wherein an edge of the stack 16 is positioned at a corresponding edge of the top panel 31 of the panel 30, as shown in Fig. 10. This is achieved by positioning the respective edges of the sheets S, S' for the stack 16 at the pallet edge position P in the lateral direction Y by means of the second registration unit 12. Therein, the pallet edge position P is formed by a predefined position where an edge of the top panel of the pallet 30 is positioned when the pallet 30 is positioned on the pallet support 21.

[0041] Fig. 11 illustrates a safety panel 40 provided on the stack support 21. The safety panel 40 closes off the stacker 20 during operation to shield an operator from moving parts. The safety panel 40 extends parallel to the main transport direction X and the vertical direction Z. The safety panel 40 is provided with a plate 41 which comprises open slits 42 that provide relatively narrow access openings into the stacker 20. The slits 42 are dimensioned to allow forks of a forklift to pass through, so that these can be inserted between the top panel or support surface 31 of the pallet 30 and the pallet support 21. Since the slits 42 are open in an upward direction Z, this allows the pallet 30 to be lifted from the stack support 21. It will be appreciated that the stack support 21 may be

movable in the lateral direction Y, so that it moves out of the stacker 20.

[0042] Although specific embodiments of the invention are illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations exist. It should be appreciated that the exemplary embodiment or exemplary embodiments are examples only and are not intended to limit the scope, applicability, or configuration in any way. Rather, the foregoing summary and detailed description will provide those skilled in the art with a convenient road map for implementing at least one exemplary embodiment, it being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope as set forth in the appended claims and their legal equivalents. Generally, this application is intended to cover any adaptations or variations of the specific embodiments discussed herein.

[0043] It will also be appreciated that in this document the terms "comprise", "comprising", "include", "including", "contain", "containing", "have", "having", and any variations thereof, are intended to be understood in an inclusive (i.e. non-exclusive) sense, such that the process, method, device, apparatus or system described herein is not limited to those features or parts or elements or steps recited but may include other elements, features, parts or steps not expressly listed or inherent to such process, method, article, or apparatus. Furthermore, the terms "a" and "an" used herein are intended to be understood as meaning one or more unless explicitly stated otherwise. Moreover, the terms "first", "second", "third", etc. are used merely as labels, and are not intended to impose numerical requirements on or to establish a certain ranking of importance of their objects.

[0044] The present invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

Claims

1. A method of stacking printed sheets (S, S') on a pallet (30);, comprising the steps of:

- positioning a sheet (S, S') with a corresponding edge at a pallet edge position (P) in a first direction (Y) while transporting the sheet (S, S') towards the stacker (20), which pallet edge position (P) corresponds to a position of an edge of the pallet (30) in the stacker (20);
- stacking the sheet (S, S') on the pallet (30) with its corresponding edge at the pallet edge position (P).

2. The method according to claim 1, wherein the first direction (Y) is a lateral direction (Y) perpendicular to the transport direction (X) of the sheet (S, S').

3. The method according to claim 2, further comprising the steps of:

- determining a position of the sheet (S, S') in the printer (1);
- comparing the sheet's position to a pallet edge position parameter or setting corresponding to the position of the respective edge of the pallet (30) in the stacker (20) in the lateral direction (Y);
- adjusting the position of the sheet (S, S') in the printer (1), so that the sheet (S, S') is inside the stacker (20) at the pallet edge position (P) in the lateral direction (Y).

4. The method according to claim 2 and/or 3, further comprising the step of:

- positioning a pallet (30) in a stacker (20) with one of its edges at the pallet edge position (P) in the lateral direction (Y).

5. The method according to claim 4, wherein the edge of the sheet (S, S') to be positioned at the pallet edge position (P) is the respectively same edge of that of the pallet (30) positioned in at the pallet edge position (P) in the lateral direction (Y).

6. The method according to any of the previous claims 2 to 5, wherein the step of positioning the sheet (S, S') is performed after a step of printing on the sheet (S, S') and before the step of stacking the sheet (S, S'), and wherein after the step of positioning the sheet (S, S'), the sheet (S, S') is transported to the stacker (20) while maintaining its respective edge in the pallet edge position (P) in the lateral direction (Y), and preferably wherein the method further comprising the step of selecting one of the lateral sides of the pallet (30) for positioning the edges of the sheets (S, S') at.

7. The method according to any of the previous claims, wherein the step of positioning the pallet (30) comprises positioning the pallet (30) at an aligner (28) of a pallet holder (29) of a pallet support (21) of a stacker (20).

8. The method according to any of the claims 2 to 7, further comprising the steps of:

- determining a position of the sheet (S, S');
- comparing said determined position to a setting or parameter corresponding to the pallet edge position (P; P') in the lateral direction (Y); and

wherein the step of positioning the sheet (S, S') is performed based on said comparison.

9. A sheet printer (1) comprising:

- a stacker (20) at an end of a transport path of the printer (1), which stacker (20) is configured to hold a pallet (30) and to form a stack (16) of printed sheets (S, S') thereon;
- a registration unit (6, 12) for adjusting an position and/or orientation of a sheet (S, S'),

characterized in that

- the stacker (20) comprises a stack holder (29) for holding the pallet (30) with one of its edges at a predetermined pallet edge position (P) in a lateral direction (Y) perpendicular to a transport direction (X) of the transport path; and
- that a controller (38) is configured to control registration unit (6, 12) to position the sheet (S, S') with a corresponding edge at the predetermined pallet edge position (P) in the lateral direction (Y).

- 10.** The sheet printer (1) according to claim 9, wherein the stack holder (29) comprises an aligner (28) for aligning the edge of the pallet (30) into the pallet edge position (P) in the lateral direction (Y), preferably wherein the aligner (28) comprises at least one urging element (23) for driving the pallet (30) against at least one an pallet alignment stop (24).
- 11.** The sheet printer (1) according to claim 10 or 11, wherein the controller (38) on its memory stores a pallet edge position (P) setting or parameter corresponding to the pallet edge position (P) in the lateral direction (Y), wherein the controller (38) is configured to control the registration unit (6, 12) based on comparison between the pallet edge position (P) setting or parameter and a determined position of the sheet (S, S') on the transport path.
- 12.** The sheet printer (1) according to any of the claims 9 to 11, wherein the transport path is arranged to transport the sheets (S, S') in the transport direction (X) from the registration unit (6, 12) to the stacker (20) while maintaining the respective edge of the sheets (S, S') at the pallet edge position (P) in the lateral direction (Y).
- 13.** The sheet printer (1) according to any of the claims 9 to 12, wherein the controller (38) is further configured to select one of the lateral edges of the pallet (30) for aligning a sheet stack (16) thereon, and is further configured to control the registration unit (6, 12) to align the sheets (S, S') at the selected lateral edge of the pallet (30) for forming said sheet stack (16)..

14. A computer program comprising instructions to cause the sheet printer according to any the claims 9 to 13 to execute the steps of the method according to any the claims 1 to 8.

15. A computer-readable medium having stored thereon the computer program of claim 14.

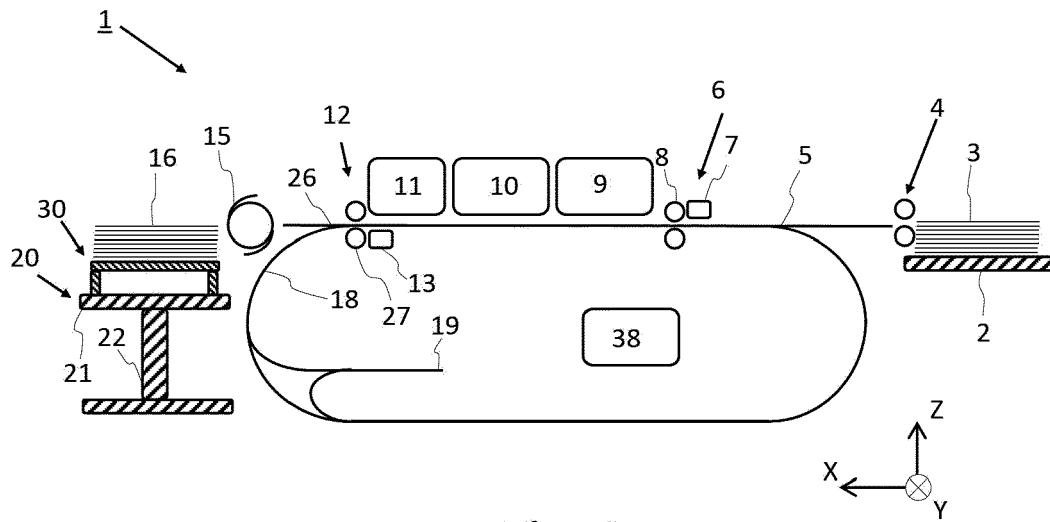


Fig. 1

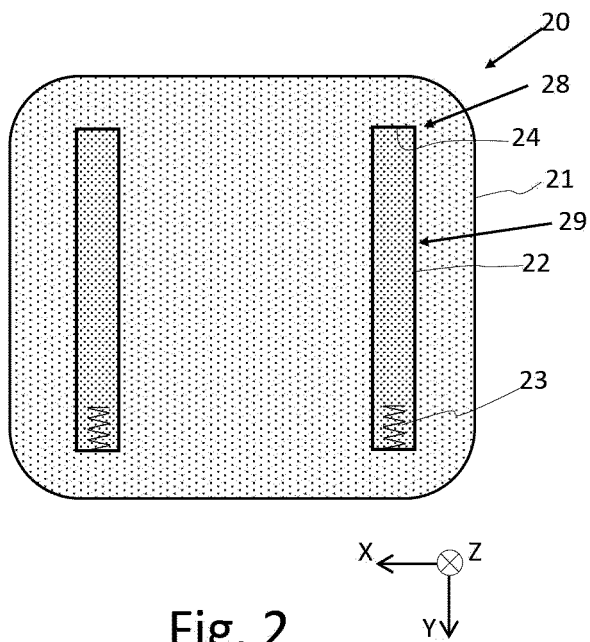


Fig. 2

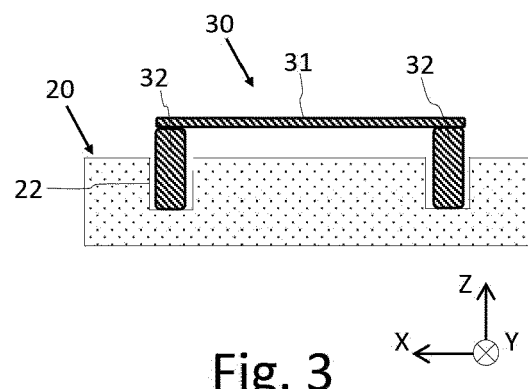


Fig. 3

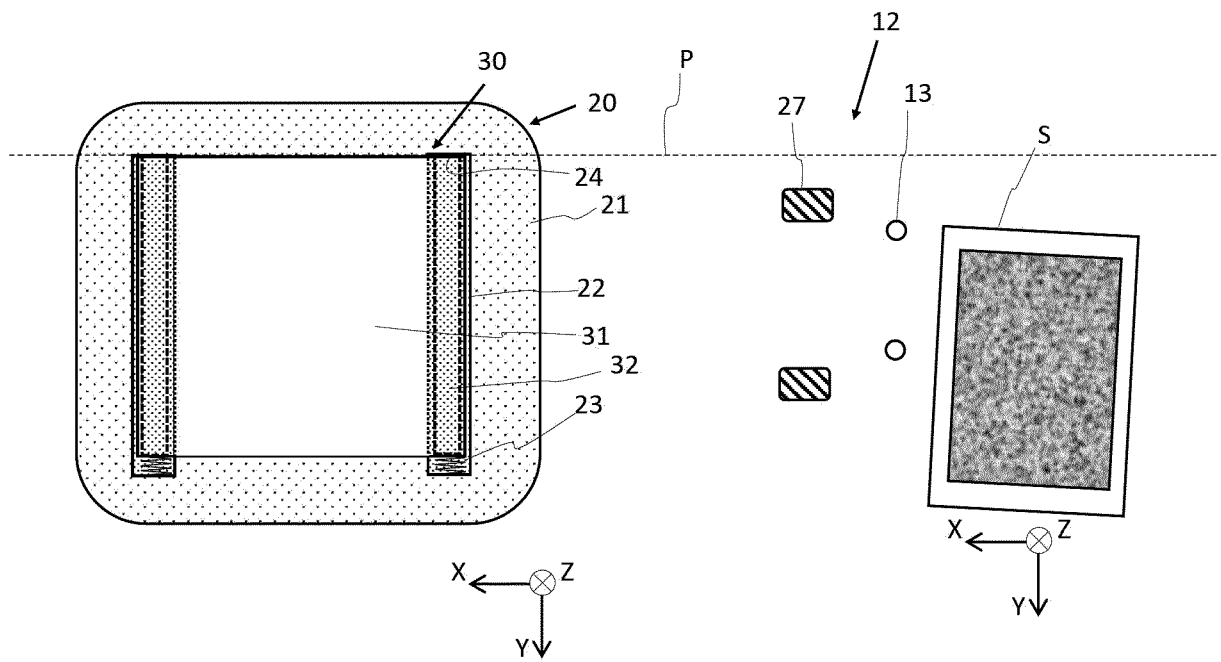


Fig. 4

Fig. 5

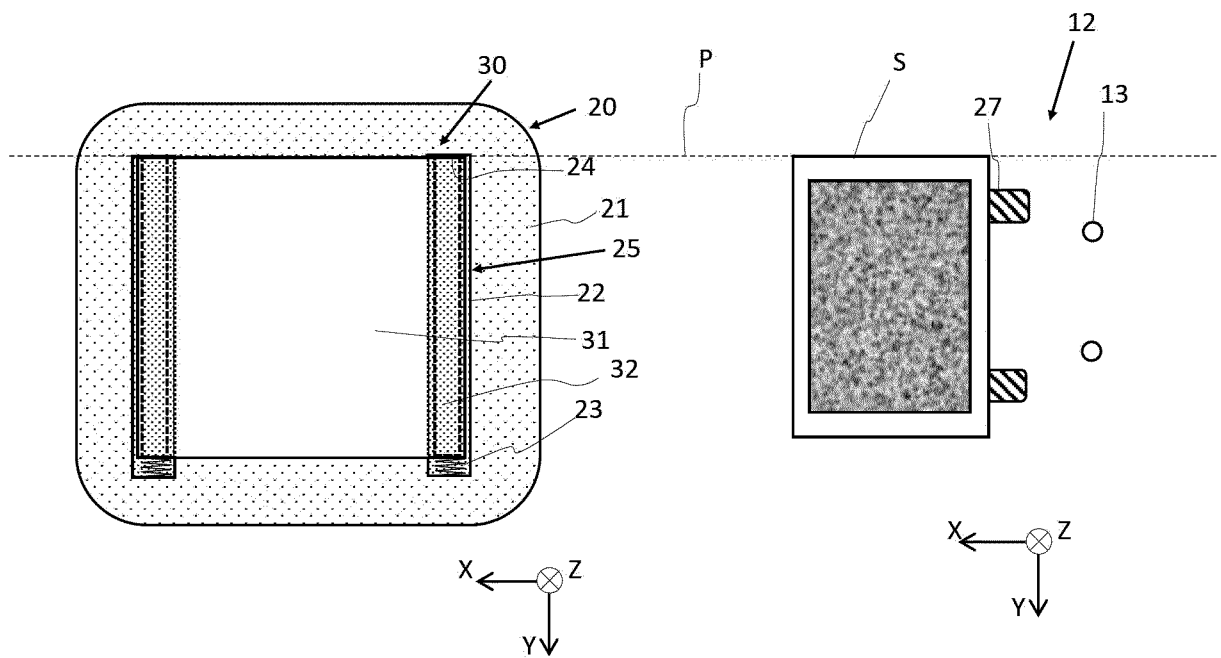


Fig. 6

Fig. 7

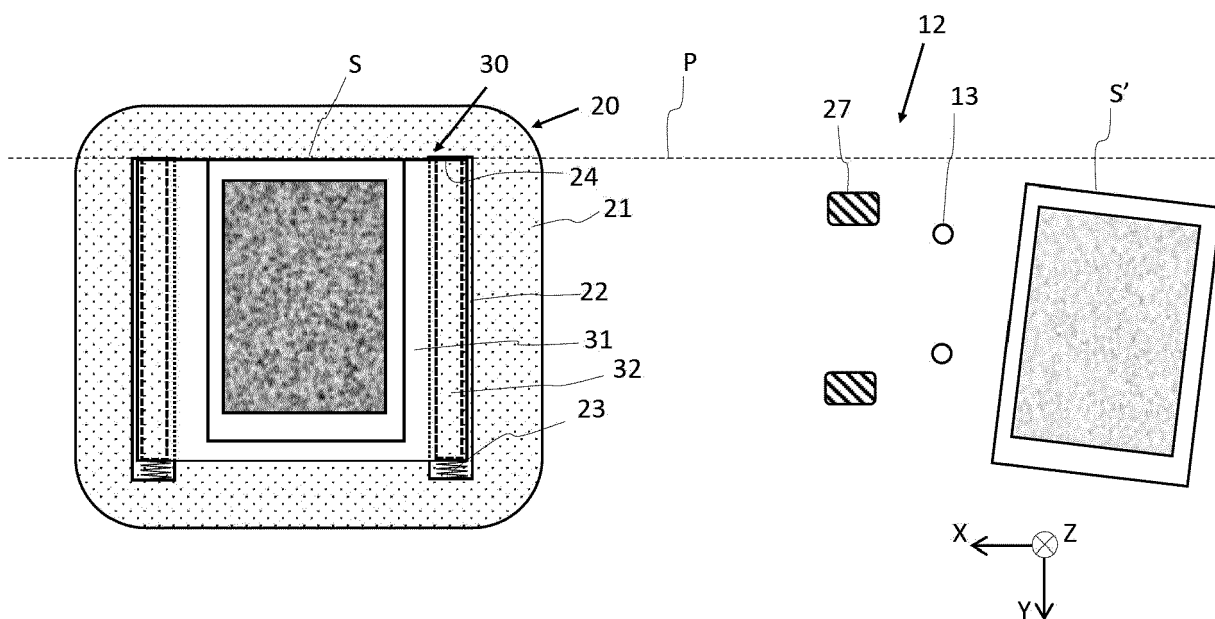


Fig. 8

Fig. 9

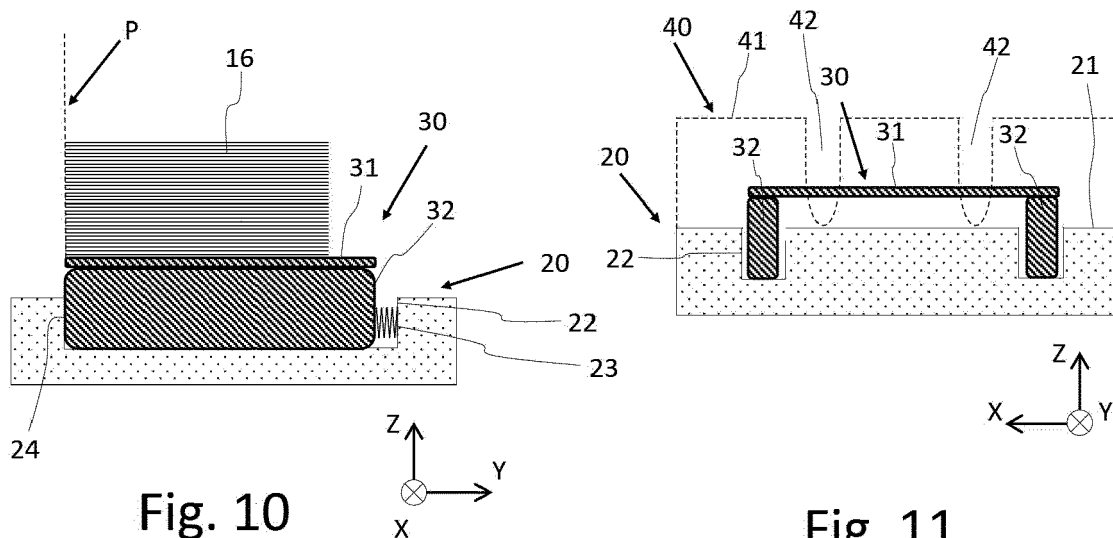


Fig. 10

Fig. 11



EUROPEAN SEARCH REPORT

Application Number

EP 23 20 0468

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			B65H
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		13 March 2024	Athanasiadis, A
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