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(72) Inventor: **Zweerman, Robertus L.**
5611 PR Eindhoven (NL)

(74) Representative: **Vanoppen, Ronny R.J. et al**
Océ-Technologies B.V.
Corporate Patents, Postbus 101
5900 MA Venlo (NL)

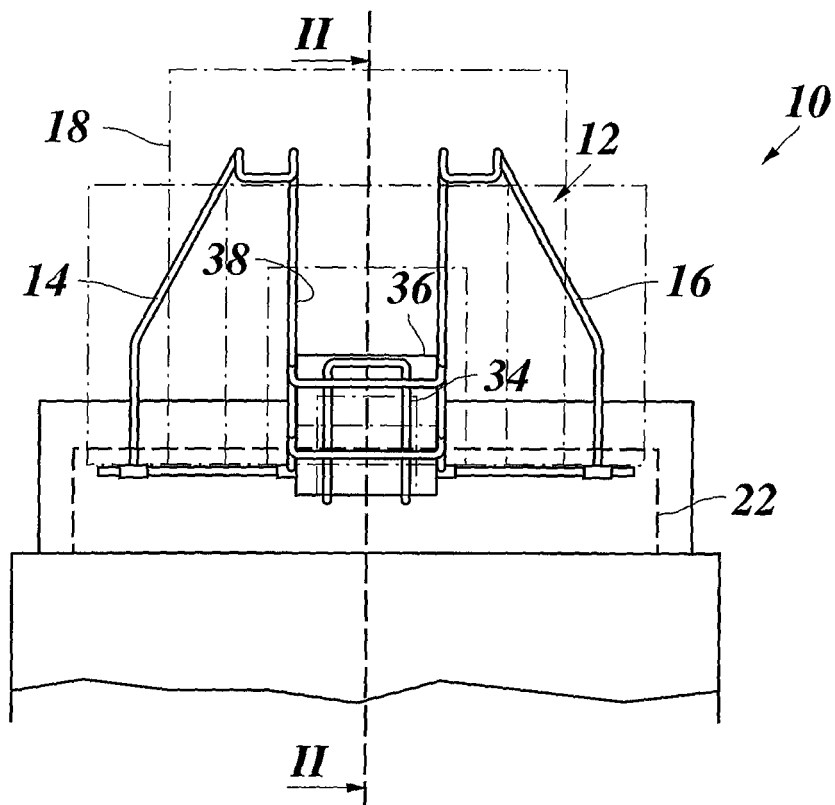
(71) Applicant: **Océ-Technologies B.V.**
5914 CC Venlo (NL)

(54) **Tray system for wide format sheets**

(57) A tray system for a wide format sheets, the system comprising a tray (12) that is adapted to collect printed media sheets (18) of a first sheet size on a surface of the tray (12), the system further comprising feeding means for feeding printed media sheets (18; 36) to the tray (12) from a discharge nip near a first edge of the tray

(12), characterized in that the tray (12) comprises an integrated tray portion (34) adapted to collect printed media sheets (36) of a second sheet size that is smaller than the first sheet size, the tray (12) comprising an opening (38) permitting access to sheets (36) of the second size on the tray portion (34) from a second edge of the tray (12) opposite to said first edge.

Fig. 1



Description

[0001] The invention relates to a tray system for a wide format sheets, the system comprising a tray that is adapted to collect printed media sheets of a first sheet size on a surface of the tray, the system further comprising feeding means for feeding printed media sheets to the tray from a discharge nip near a first edge of the tray. The invention also relates to a printer comprising a tray system of the type indicated above.

[0002] In copiers and printers, printed media sheets are frequently collected on one or more trays. For example, a wide format printer has a tray that is inclined with respect to the horizontal direction such that an upper edge of the tray is accessible at a front side of the printer. The tray is, for example, adapted to support sheets of A0 size. When a sheet of A0 size is fed to the tray from a discharge nip near the lower edge of the tray, the sheet is moved upward along the top surface of the tray until the trailing edge of the sheet has reached the tray. The leading edge of the sheet will then be near the upper edge of the tray or has been pushed beyond the upper edge of the tray. A user standing in front of the printer may take one or more sheets and remove them from the tray.

[0003] Frequently, wide format printers allow to print sheets of different sizes, for example varying from A4 or US letter to A0 or even larger sizes. The printer needs to have a tray that can handle the largest media size that is to be printed, for example, A0 size. When a printed sheet of, for example, A4 size or A3 size is fed to the tray from a discharge nip near the lower edge of the tray, the trailing edge of the sheet gets to lie at the lower edge of the tray. When the upper edge of the tray points to the front of the printer, this results in the A4 or A3 sheets being difficult to reach for the user, because the tray is in the way. This is particularly disturbing when the tray rises towards the front side of the printer, because, then, the user has to reach over the relatively high front edge of the tray. On the other hand, an inclined arrangement of the tray is preferable because it reduces the footprint of the printer.

[0004] It is an object of the invention to provide a tray system that makes it easier for the user to reach for printed media of different sizes, and to provide a printer comprising such tray system.

[0005] According to the invention, this object is achieved by a tray system of the type indicated above, wherein that the tray comprises an integrated tray portion adapted to collect printed media sheets of a second sheet size that is smaller than the first sheet size, the tray comprising an opening permitting access to sheets of the second size on the tray portion from a second edge of the tray opposite to said first edge.

[0006] When sheets of the first sheet size, for example A0 size, are printed, they are fed to the tray from the discharge nip near the first edge of the tray, and they are moved along the surface of the tray until the trailing edge

of a sheet has reached the tray. The sheet then covers at least a major part of the tray, including the integrated tray portion. The sheets are easy to reach from the front side of the printer, because the length of the tray approximately corresponds to the length of the media sheet or is even shorter so that the sheet extends over the upper edge of the tray.

[0007] When sheets of the second sheet size are to be printed, for example A3 size sheets, these sheets are collected at the integrated tray portion. A user can reach for the printed sheets from the second edge of the tray by reaching through the opening next to the tray portion, because the length of the tray portion is reduced as compared to a maximum length of the tray. An edge of the tray portion opposite to the first edge of the tray borders the opening. The integrated tray portion being reachable from the front side of the printer increases the user-friendliness of the tray system, because both large and small sheets can be reached from the same side. The tray system is especially useful in multi-roll printers or copiers that allow to print on a variety of media sizes, for example from A4 or US letter to A0 size and larger.

[0008] Useful details and further developments of the invention are indicated in the dependent claims.

[0009] Preferably, the tray and the tray portion are inclined with respect to the vertical direction. The tray is then, as in a horizontal arrangement, able to support printed sheets and take up their weight. Moreover, an inclined tray is preferable for reasons of space.

[0010] In a particularly preferred embodiment, the tray portion is displaced towards the bottom side of the tray with respect to a main part of the tray. In other words, the tray portion is arranged below the main part of the tray. As a result, collected sheets of the second size may remain on the tray portion while sheets of the first size are printed and discharged. Further, the capacity of the tray portion may be increased so that the number of collectable small size sheets is larger than the number of collectable large size sheets.

[0011] In a particularly preferred embodiment, the feeding means, the tray, and the tray portion are arranged to enable the feeding means to feed sheets of the second sheet size to the tray portion from the same discharge nip as from which sheets of the first size are fed to the tray. For example, the discharge nip may be above the surface of the tray, so that a sheet that is printed first comes to lie on top of the surface of the tray whereas a sheet that is printed next comes to lie on top of the sheet printed first. Small size sheets will be dropped into the tray portion. Thus, no measures have to be taken to adapt the feeding means to selectively feed sheets to the tray or the tray portion. Therefore, the construction of the feeding means can be kept simple. Printed sheets of the larger size have to be removed from the tray when sheets of the smaller size are to be printed.

[0012] Preferably, the tray comprises a left wing and a right wing, and said tray portion is arranged between the left wing and the right wing of the tray. For example,

the left wing and the right wing may be symmetrical. The tray portion being arranged between the left and the right wing ensures that the width of the tray is not restricted due to the existence of the tray portion. Thus, a printed sheet of the first size can be well supported at its left and at its right side. The opening is defined between the left wing and the right wing and is preferably open towards the front side of the printer.

[0013] Preferably, the tray and the tray portion are formed by an open frame, built of bent metal bars or wires. Thus, the weight of the tray is reduced.

[0014] A preferred embodiment of the invention will now be described in conjunction with the drawings, in which:

Fig. 1 is schematic front view of a wide format printer; and

Fig. 2 is a schematic partial cross-sectional view of the printer along the line II-II of Fig. 1.

[0015] As is shown in Figs. 1 and 2, a wide format printer 10 comprises a tray 12 that is adapted to collect printed media sheets 18 of A0 sheet size in portrait or landscape orientation. Tray 12 has a left wing 14 and a right wing 16 when seen from the front side of the printer, as in Fig. 1. The wings 14 and 16 each are formed by an open frame of substantially inverted U-shape. The tray 12 is inclined by an angle of about 45° with respect to the vertical direction such that an upper edge of the tray 12 is accessible at the front side of the printer 10. The width of tray 12 decreases towards its upper edge, as is shown in Fig. 1.

[0016] In Fig. 2, an A0 size paper sheet 18 is shown that is supported on tray 12. A path 20 along which the printing media are transported from a printing device 22 to the tray 12 is illustrated with dashed lines. Feeding means 24 are, for example, formed by rollers defining a discharge nip 25 that is positioned above the lower edge of the tray 12. An upper section 26 of tray 12 is bent towards the front side of the printer to ensure that sheets of great length smoothly bend downwards at the upper edge of tray 12. An end section 28 of upper section 26 is further bent downwards. As shown in Fig. 2, the A0 sheet 18 lies, in portrait orientation, on an upper side of tray 12. The length of the A0 sheet 18 is, for example, approximately equal to the length of tray 12. Thus, sheet 18 is bent, and a leading edge 30 of sheet 18 is hanging from the bent upper section 26. A trailing edge 32 of sheet 18 is supported at the lower edge of tray 12. A large number of A0 sheets 18 may be stacked on the tray 12.

[0017] Between the left wing 14 and the right wing 16 of tray 12, the frame structure forms an integrated tray portion 34. The frame structure forming the tray portion comprises a bow of substantially inverted U-shape and shallow U-shaped cross braces connecting the bow to the wings 14 and 16. The size of the tray portion 34 is approximately equal to the size of an A3 size sheet 36 in portrait orientation. Thus, the length of the tray portion

34 is smaller than the length of wings 14 and 16. Tray portion 34 is displaced towards the lower side of tray 12, that is, downwards, with respect to wings 14 and 16, and its lower edge is near the discharge nip 25. Thus, the feeding means 24 is enabled to feed either A0 size sheets 18 to the tray 12 or smaller sheets, for example A3 size sheets, to the tray portion 34 from the same discharge nip 25. Each sheet is transported by the feeding means 24 until the trailing edge of the sheet has passed the feeding means 24 and is dropped into the tray portion 34 or onto the tray 12.

[0018] Sheets that are collected on the tray portion 34 may remain on the tray portion 34 while larger sheets are collected on the wings 14 and 16 of the tray 12 so that they bridge the tray portion 34.

[0019] An A3 size sheet 36 that is supported by tray portion 34 is shown in Figs. 1 and 2. To remove one or more A3 size sheets 36 from tray portion 34, the user can reach into a gap or opening 38 (Fig. 1) between the wings 14 and 16 and remove the sheets from the tray portion 34. The upper edge of tray portion 34 borders the opening 38. Opening 38 also facilitates the removal of smaller sheets from tray portion 34, for example A4 size sheets or US letter size sheets, the sheets being arranged in landscape or portrait format. Different sheet sizes from A4 landscape to A0 portrait and A0 landscape are indicated by chain-dotted lines in Fig. 1.

[0020] Since tray portion 34 is adapted for collecting media sheets of limited size, for example A3 size, tray portion 34 does not need to have an upper section that is bent towards the front side of the printer as in case of the upper section 26 of tray 12.

[0021] Instead of being formed by a frame, tray 12 including tray portion 34 alternatively may be formed by one or more sheets of metal or plastic, for example.

Claims

1. A tray system for a wide format sheets, the system comprising a tray (12) that is adapted to collect printed media sheets (18) of a first sheet size on a surface of the tray (12), the system further comprising feeding means (24) for feeding printed media sheets (18; 36) to the tray (12) from a discharge nip (25) near a first edge of the tray (12), **characterized in that** the tray (12) comprises an integrated tray portion (34) adapted to collect printed media sheets (36) of a second sheet size that is smaller than the first sheet size, the tray (12) comprising an opening (38) permitting access to sheets (36) of the second size on the tray portion (34) from a second edge of the tray (12) opposite to said first edge.
2. The tray system of claim 1, wherein the tray (12) and the tray portion (34) are inclined with respect to the horizontal direction.

3. The tray system of claim 2, wherein an upper section (26, 28) of the tray (12) is bent downwardly.
4. The tray system of claim 1 or 2, wherein the tray portion (34) is displaced towards a bottom side of the tray (12) with respect to a main part (14, 16) of the tray (12). 5
5. The tray system of any one of the preceding claims, wherein the feeding means (24), the tray (12); and the tray portion (34) are arranged to enable the feeding means (24) to feed sheets (36) of the second sheet size to the tray portion (34) from the same discharge nip (25) as from which sheets (18) of the first size are fed to the tray (12). 10 15
6. The tray system of any one of the preceding claims, wherein the tray (12) comprises a left wing (14) and a right wing (16), and said tray portion (12) is arranged between the left wing (14) and the right wing (16) of the tray (12). 20
7. The tray system of any one of the preceding claims, wherein the tray (12) and the tray portion (14) are formed by an open frame. 25
8. A printer comprising the tray system of any one of claims 1 to 7.

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Fig. 1

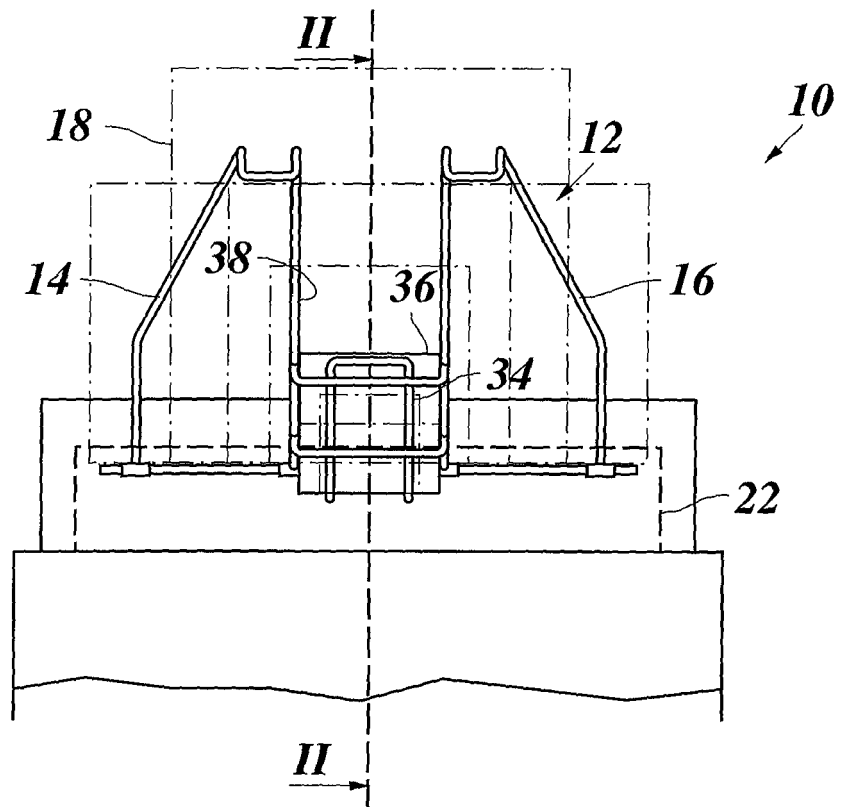
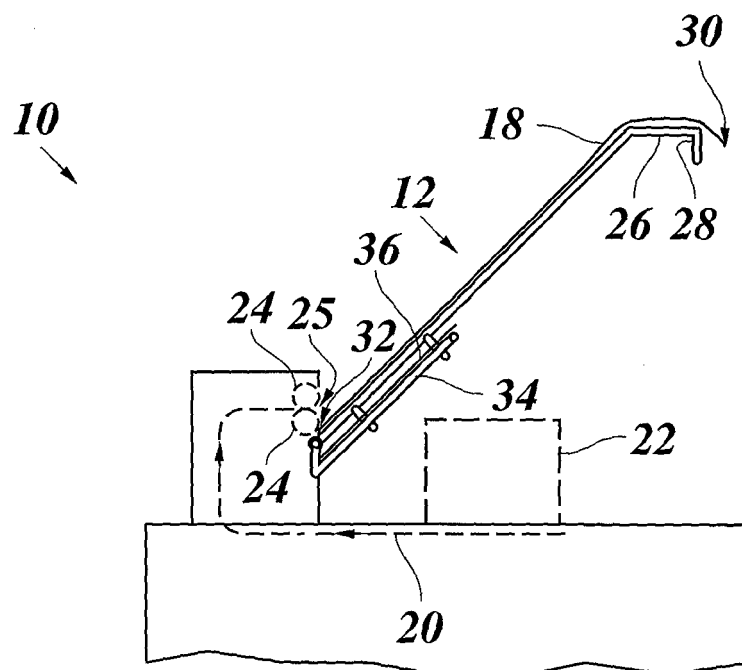


Fig. 2





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EUROPEAN SEARCH REPORT

Application Number
EP 04 10 6078

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Place of search Munich		Date of completion of the search 29 April 2005	Examiner Pollet, D
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EUROPEAN SEARCH REPORT

Application Number
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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