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Recommended Citation
HP INC, "ROLL MEDIA PINCHING APPARATUS ADAPTIVE TO MEDIA DIAMETER CHANGES IN LARGE FORMAT PRINTERS", Technical Disclosure Commons, (July 20, 2018)
https://www.tdcommons.org/dpubs_series/1344
Roll Media Pinching Apparatus Adaptive to Media Diameter Changes in Large Format Printers

Abstract: A roll media pinching apparatus allows a large format printer to automatically switch between roll media and cut sheet media as media sources for printing. The roll media is rewound to a parking position when cut sheet media is to be used, and unwound to a linefeed pinching point when the roll media is to be used.
This disclosure relates to the field of large-format printers.

A technique is disclosed that automatically switches between roll media and sheet media without user intervention.

In many current large format printers, there are two media input devices dedicated for roll media and sheet media respectively. In such a printer, the media input source is not able to be auto switched for different print jobs by the printer. This is because the roll media is not pinched, and hence its leading edge cannot be moved into the designated positions. Without an auto switching function, the printer requires users to manually insert the roll media leading edge into the linefeed roller for processing a roll printing job, after completion of a cut sheet printing job. This undesirably requires frequent user intervention when the two types of media sources are frequently switched for different print jobs.

According to the present disclosure, and as understood with reference to the Figure, a roll media pinching apparatus 10 allows a large format printer 20 to accept both roll media 30 and cut sheet media 40 as media sources during operation. The roll pinch apparatus 10 enables roll media leading edge position control, when media sources are switched by the printer 20 based on different print jobs received from users. As such, the pinch apparatus 10 provides the product with an auto-roll-and-sheet-switching (ARSS) capability, which greatly improves the product experience of the user.

Input media source auto switching is implemented with a roll media input system, in which a servo motor controls the roll media spindle rotating bi-directionally. The pinching apparatus 10 allows the roll media input system to achieve auto switching. When switching from roll media 30 to sheet media 40, the roll media 30 is rewound and its leading edge is parked in a parking position 50. This clears the paper path for cut sheet media 40 to be used for a cut sheet print job, with the sheet media 40 loaded from a cut sheet tray 45. For switching from sheet media 40 to roll media 30, the roll media 30 is unwound so as to move the leading edge of the roll media 30 from the parking position 50 to a linefeed pinching point 60.

In one example, the roll pinching apparatus 10 includes a set of pinch arms attached on a roll cover to apply pinch forces on roll media; a double wheels pinch mechanism on each pinch arm assembly to press on roll media surface; a media guide feature on each wheel holder for controlling media shape; and a retracting mechanism on the wheel holders for clearance of roll media installation.

With the roll cover closed, the pinch arms apply pinch forces on the surface of the roll media 30, and the media leading edge goes into a slot of the paper path. In the auto-switch procedure, the edge of the roll media 30 is moved from the parking position 50 to the linefeed pinching position 60, or vice-versa. Because the roll media pinch point is disposed a distance from the slot path, a media guide feature is used to prevent the media from buckling when the roll media 30 is moved between the two positions 50, 60.
paper guide is integrated into the pinch wheel holder, such that the location and orientation of the paper guide follows the diameter changes of the roll media 30. This provides consistent media guiding which is adaptive to changes in the roll diameter.

The disclosed technique advantageously provides for auto media source switching between roll media 30 and cut sheet media 40 without user intervention. The compact design of the roll media pinch apparatus 10 does not require additional space and thus does not increase the footprint of the printer 20. The simple paper guide on the pinch wheel holder prevents jams caused by media buckling.

*Disclosed by Xiaoxi Huang, HP Inc.*