LATERAL SKEW COMPENSATION DIAGNOSTIC PLOT FOR PRINTER SHEET FEEDER ACCESSORY

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Lateral Skew Compensation Diagnostic Plot for Printer Sheet Feeder Accessory

Abstract

In current printing systems, lateral skew is a critical parameter when printing in single-sheet mode and has a noticeable impact on image quality. In this disclosure, it is described a procedure to compensate this defect by printing a diagnostic plot, measuring it and applying a correction.

1 Introduction

A sheet feeder is a mechanism that holds a stack of paper and feeds each sheet into a printer, one at a time. Neither manufacturing nor installation procedures are perfect and this may lead to a slight misalignment between the sheet feeder and the printer, thus causing that the media enters the print zone with a relative angle respect to the printing axis. Such angle is reflected in an error in image registration in both X and Y axes during printing. This image quality defect is depicted in figure 1.

Figure 1: Media entering the printzone with relative angle and result image due to skew in a page wide array printer.

To overcome this type of issue, the media movement and the printing axes should be perpendicular or, at least, meet a certain mechanical tolerance. In this article, we present a plot design that allows for easily diagnosing and correcting the lateral skew of a printer sheet feeder.
2 Description

The proposed solution consists in a diagnostic plot with a specific design, which is shown in figure 2. For better understanding, figure 3 represents how the plot would be printed in a printing system with a sheet feeder. Notice that the design presents several B-marks, all of which should match – when printed – with the actual B standard sizes (e.g. 27.8 x 39.4 inches for B1).

![Skew Diagnostic Plot](image)

Figure 2: Design of the lateral skew compensation diagnostic plot.

![Diagnostic Plot printed using a sheet feeder](image)

Figure 3: Diagnostic Plot printed using a sheet feeder.

After the plot is printed, a user with a proper tool or an automated sensor (e.g. a line sensor) can measure the distance between the A mark and the lateral edge of the sheet. For convenience, we refer to it as $AE$ distance. Then, the same measurement must be done with one of the B-marks that fit in the resulting printed sheet. This later measurement will be the $BE$ distance. Figure 4 provides a graphic representation of both values.
After the measures are taken, the skew value $S$ can be computed as: $S = AE - BE$. Such skew value provides the units of skew (e.g. inches or millimeters) per a given plot length (B1, B2, B3 or B4). The fact of having a plot design with several B-sizes marks ensures that the procedure can be executed with a broad set of printer-compatible media sizes, as long as the non-fitting content is clipped. Moreover, the use of the biggest B-mark printed is recommended in order to provide the highest possible skew resolution.

This information can be used to adjust the system, via hardware or software, to overcome the skew defect. Notice also that the plot design and procedure described are universal and can be applied to any similar system.

3 Conclusion

A smart diagnostic plot design has been presented in this article to easily determine the skew of the plots induced by a printer sheet feeder. The proposed solution has no real limitations and should work with any current system design. Besides, the plot evaluation could be automated, potentially allowing for a close-loop skew calibration in case the system is able to correct the defect by means of a hardware or software solution.

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