July 08, 2019

PROFILING TOOL FOR TEXTILE MEDIAS

HP INC

Title

Profiling tool for textile medias

Abstract

Dye Sublimation printing is a two-step process, where the ink is firstly applied on a transfer substrate, or directly onto a fabric, and then passed through a heat-based fixation system to adhere to the fibers. During this process the color of the sample is changed by both the sublimation process and the properties of the target substrate.

In-printer profiling for such applications is currently impossible due to the difficult nature of loading a heat processed material back into the printer.

In this paper we propose a tool that allows for the loading of pieces of sublimated fabric in the printer, regardless of elasticity, with the intent of using the on-board spectrophotometer to scan color patches and create an ICC profile.

Body

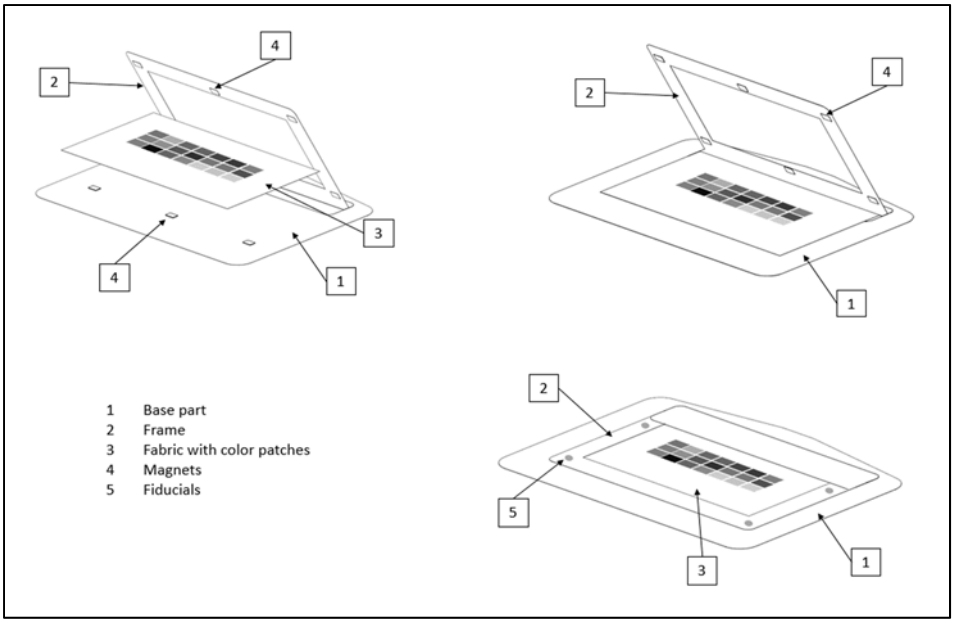
Creating color profiles for the dye-sub markets is generally an expensive process, further complicated by the impact of heat-transfer settings, and large number of fabrics available. By using the proposed tool, we can ensure proper media navigation on any type of textile fabric, facilitating the scan of color patches on pieces of fabric, regardless of the sublimation type used (calendar, heat press).

The proposed invention is composed of a white plastic surface on which the sublimated fabric can be fixed. This plastic-based part is thin and flexible enough to be able to load into the printer (through the loading input as a normal media) without damaging any media path component, or the fabric. In addition to the plastic surface, the tool has a frame attached by the top side.

Unlike previous HP tools used in loading medias, the color of the textile load zone is very important, as it could affect the color measurements in most textiles as they are not fully opaque. For this tool we propose the usage of an opaque, white plastic, with a smooth surface and a reflection factor of 70-80% as to emulate paper. The intent here is to ensure a controlled environment on top of which to run the measurements, for a more reliable performance.

The base part and the frame have magnets on their and once the fabric is placed between the base part and the frame, these magnets will hold the fabric, avoiding any undesired movement during the load process or during measurements. Moreover, this system will allow the user to spread the fabric as required (especially useful for stretchable fabrics) in order to remove any wrinkles that could affect the measurements or media handling.

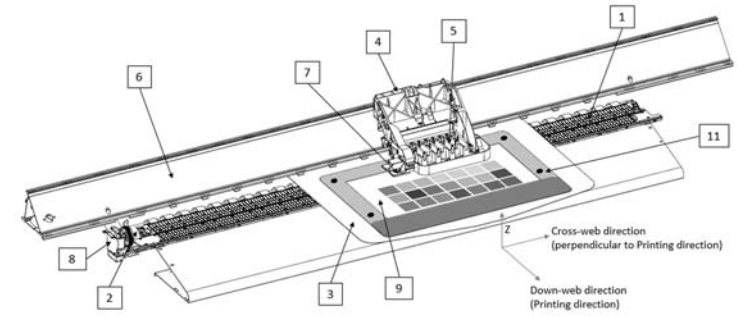
With the proposed tool, one can load post-processed materials with color charts to enable profiling within the printer. Because the on-board spectrophotometer is placed in the printing carriage, it can measure the patches in a cross-web direction (perpendicular to printing direction) thanks to the carriage movement along the width of the media. On the other hand, the media advance mechanism of the printer is responsible for placing the correct row of the grid below the spectrophotometer.



The tool is linked to a printer internal workflow for loading and moving the substrate, based on predefined media properties defined during development, ensuring accurate media registration. Thus, we can adapt existing calibrations, such as the profiling workflow, to generate the ICC profile for the loaded textile.

Due to the physical properties of textile medias which may cause shrinkage during heat processing we cannot accurately rely on having the fiducials printed on the sample, as such we propose to have them on the sides of the tools, to ensure that regardless of the media, accurate substrate advance is achieved.

Regarding the length of the invention, it must be long enough to allow the media advance mechanism of the printer push and pull (depending on the direction) forward and backward the whole tool without causing wrinkles in the target textile. As an example, the HP S300/S500 printers require approximately 5 inches on top of the color chart are. In this case, if an OCTP chart is used, the total required length would be 20 inches, so that it can be loaded as a normal media inside the printer.



1 Print Zone
2 Media advance mechanism (drive roller)
3 Profiling tool (Proposed invention)
4 Carriage
5 Printheads (PHs)
6 Scan Axis guide
7 Spectrophotometer
8 Advance Motor & control
9 Fabric with color patches
10 Magnets
11 Fiducials

Disclosed by *Ignasi Bonjoch, Andrei Dafinoiu and Toni Gracia, HP Inc.*