Three-color Laser Marking Engine for KODAK Digital Lab System

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Abstract
A three-color (RGB) Laser marking engine for Kodak digital laser printers will be described in this paper. These printers are intended for digital silver halide photofinishing products. The optical schematic of the laser marking engine along with the performance requirements and the capability of the marking engine will be presented.

Introduction
Flying spot laser writers, using rotating polygons, have established a track record for producing high-quality hard copy images. A good example of the image quality capability of these writers can be seen in the monochrome film writers,1,2 used in the Health science area. To write on silver halide color paper, the laser writer should be capable of generating RGB exposure on the medium. However, using RGB sources over a wide wavelength range makes the optical design and the beam combination complex. This is especially true when the marking engine has to maintain high-quality RGB spots, color registration, optical power stability etc. over the entire scan to produce high-quality color prints. The laser marking engine built for this application meets these stringent requirements, the proof of which can be seen in the quality of prints produced by this laser writer. Image quality requirements for this printer are covered in another paper titled “Image quality verification in the development of hardware and media for the KODAK Digital Lab System”, in this conference.

Performance Requirements of the Printer

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Max. Scan Length (print width)</td>
<td>12 inches</td>
</tr>
<tr>
<td>Resolution (pixels/in)</td>
<td>512</td>
</tr>
<tr>
<td>Productivity (Pr/Hr - burst)</td>
<td>1000 (4” x 6”)</td>
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<tr>
<td>Paper speed (inches/sec)</td>
<td>3.354</td>
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</tbody>
</table>

Description of the Printer
The Kodak laser printer to be described here is a stand-alone digital photo finishing system for consumer photography. It accepts electronic digital image input and generates color prints on silver halide media, and is capable of printing images up to 12 inch width, maximum.

Laser Marking Engine Specifications
Based on the performance requirements of the printer, the marking engine was designed to the following specifications shown in the table.
Summary

This printer, as designed, is capable of much higher productivity and with the same design, a productivity of 18000-4R prints/hr at a lower resolution has been demonstrated by changing the polygon and the shaper optics. Very high quality color pictorial images with text and graphics are being made with this printer.

References