

The purePhoto™ Book Production System

Bill Orr, Area Manager, North America, Imaging Solutions AG

Abstract

Automated production of silver halide photo based photo books has presented challenges to imaging service providers. Most traditional bookbinding techniques are not suitable for photos produced on conventional silver halide paper. This paper describes a comprehensive, highly automated workflow for the production of case-bound books made with real photo paper. The implementation of a unique gluing machine is the key enabling component to this new system. The gluing machine is supported by a set of equipment that addresses all the production steps required to deliver high quality photo books at high-volume levels.

Photobook

Sales of photo books have been growing at a very high rate in the recent past. It is one of the bright spots in an otherwise disappointing market for physical photo display items. To meet this demand, photo fulfillment entities have largely turned to digital presses to print the images that are subsequently bound in book form by a variety of conventional bookbinding techniques. This approach has provided an expedient means of delivering books with consumer generated image content. But for many, this is not the ideal media for image presentation.

The widely used designation “photo book” implies a quality level established by images printed on silver halide output media. The superior qualities of silver halide images over toner based media are well recognized by consumers and image specialists alike. Wider color gamut resulting in more richly saturated colors, finer gradation in Dmin and Dmax for more detailed reproduction of highlights and shadows, continuous tone dyes for subtler rendition of tonality in skin and sky, and crisper reproduction of fine detail are typical of silver halide images as compared to digital press output.

It would seem that the superior image quality of silver halide images would naturally lead to a dominant market position for photo books printed on photo paper. And this is true for high end custom made keepsake books such as professional wedding albums. But not for consumer photo books. There are two reasons for this seeming paradox: the technical challenge of producing duplex output on photo paper and the inefficiency of existing custom silver halide book production methods. Both of these obstacles have been addressed by the fastBook made by Imaging Solutions AG, a supplier of high productivity equipment to the photo fulfillment industry.

fastBook

fastBook is designed to automatically glue single-sided printed sheets of photo paper together, back-to-back to create a complete book block of double-sided pages. Input to the fastBook is a set of folded sheets of photo paper in page order sequence. After the set is placed into the feed tray, an operator starts the fastBook and a transport drum begins cycling. Vacuum ports along the outside surface of the drum grab each sheet in sequence and transport it to the glue station. As the drum rotates, glue is applied in a uniform thin layer to the back surface of the sheet. As the drum rotates further, the sheet is precisely placed on a shuttle table and pressed onto the previous sheets as the table moves in sync with the drum. This process is repeated until all the sheets have been placed on the shuttle table to form a complete book block. The book block is then ejected from the fastBook machine.

fastBook operates at a rate of 1200 cycles per hour. This speed results in an achievable production rate of 80 book blocks of 25 pages (13 sheets) per hour. Thus the first objective of a highly efficient throughput was achieved.

Finding a suitable glue to bond sheets of photo paper together was key to meeting the other challenge. Achieving a good glue bond on photo paper is difficult. Glue requirements include fast set time, high bond strength to polyethylene, resistance to environmental factors such as heat and humidity and non-toxicity. Most polyurethane cold glues do not bond well with PE backcoat used on color negative papers. Many glues were ruled out due to toxicity concerns. Polyurethane glues also tend to adsorb moisture from the air and this, over time, can cause deformation of the book pages. After many trials a formulation was developed that meets all requirements.

The fastBook uses a proprietary EVA, hot melt, glue sold under the brand name purePhoto Glue. It is applied to the photo paper by extrusion through a narrow slit in a die bar that extends across the width of the sheet. The glue is delivered from an outboard control system that maintains the proper temperature and pressure. Glue application temperature is 160° - 180° C. purePhoto Glue is non-toxic.

Once the glue has been properly applied to bond the photo paper pages together, the structural integrity of a book depends on the photo paper itself. Photo paper is flexible and tough. Wear testing has shown that book blocks made with properly creased and folded sheets will survive thousands of cycles. Photo paper book blocks are inherently strong and suitable for high usage applications.

To produce a finished book, the completed book block must be trimmed on the three open sides, then cased in. A hard cover case is applied by gluing the front and back end sheets of the book block to a board casing. The cover may be a unique custom-made photo cover or a pre-made linen or leather case.

There are several suitable casing-in machines that may be used for this process or it may be done manually.

Conclusion

The fastBook is the essential component that enables an efficient production workflow for books made using AgX media. But there are other important pieces required for a complete production system. Many photolabs will have some or all of the equipment already in place. This is one of the beauties of making books using real photo paper. Adding the fastBook to an existing photo workflow will enable production of one of the few high-growth, high-margin products in the photo fulfillment market. This is the logical starting point for entry to this market.

Author Biography

Starting his imaging career over 35 years ago designing transistorized densitometers to replace vacuum tube technology, Bill Orr has witnessed many developments in the image fulfillment industry. Over the years, he has enjoyed rewarding assignments with Macbeth Corp, Ilford, Fotomat, Mitsubishi Paper Mills and Gretag Imaging. He is now with Imaging Solutions AG of Regensdorf Switzerland and in the midst of launching a new book production system based on silver halide paper developed. Bill is a graduate of SUNY Plattsburg and a USAF veteran.