Flat Die Stamps: A New Technology From Brother

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The traditional manufacturing processes of stamps produced a stamp with a relief on the die. Brother has created the SC-2000 (Stampcreator Pro) and the SC-300 PC that manufacture stamps with a flat die, i.e. no relief. The purpose of this paper is to describe the process and evaluate the features or characteristics that separate stamps made by the Brother stamp units from stamps made by more traditional manufacturing processes.

Introduction

Brother is currently marketing two products that enable any individual or small business to make affordable quality stamps. The Stampcreator Pro, released in December 1998, and the SC-300 PC, to be released March, 1999, utilize a PC or MAC to produce pre-inked stamps of any text, graphics, signatures, logos, or photos in 3 minutes. The predecessor of these two products, the Brother SC-100, has been on the market for 2 years and is a stand-alone, portable unit that uses the same manufacturing process as the SC-300 PC.

The common methods of manufacturing rubber stamps encountered by document examiners are: (1) Hand-carved; (2) Ludlow typograph (vulcanized rubber); (3) Light hardened photo-polymer; (4) Laser cut rubber; and (5) Kit sets (i.e. Trodat). The manufacturing process of the SC-300 PC and the Stampcreator Pro differs from these methods as the die (stamp pad) is not made of vulcanized rubber, the image is not raised (relief), and thermal heating is used to create the image.

Brother's Manufacturing Process

The Stampcreator, also known as the SC-2000, embeds images onto rubber stamp surfaces. The SC-2000's stamp editor on a PC or MAC allows the individual to create any image by utilizing the 200 built-in stamp templates to produce a stamp in eleven sizes and in ink colors black, red, blue or green. Additional graphics can be used by importing data from a scanner or digital camera to the computer. The stamp is pre-inked and capable of making 50,000 impressions at 600 dpi.

The SC-2000 creates a positive image using thermal transfer printing. The micro porous rubber pad is light sensitive and similar to the rubber used for winter stud-less tires (Figure 1).

Once the blank stamp is placed in the stamp creation bay, a light from a Xenon lamp is used to create the heat to close (melt) the excess pores (non-image area) while the covered micro pores (image area) remain open. The ink is packed in a plastic bag in the base of the stamp and is released by attaching the stamp handle. It takes approximately 2 hours for the stamp material to absorb the ink, after which time the stamp is ready for use.

The SC-300 PC is connected to a PC or MAC to create a disposable stamp in four sizes, capable of making 5,000 impressions at 180 dpi. The stamp pad contains the ink and is lapped by plastic film, similar to silk screen technology (Figure 2). A thermal print head, the same element used for thermal printers and thermal fax machines, heats each element to 200 degrees Celsius, perforating the flat pad surface. The ink exits through the holes in the pad to create the stamp impression (Figure 3).

Stamp Ink

The majority of rubber stamps made in the U. S. use one of the following major ink manufacturers: (1) Chicago Ink & Research; (2) American Coding and Marking Ink Co.; (3) Aero Brand Inks. A Japanese ink company developed the stamp ink for Brother's SC-2000 and SC-300 PC. Even though the ink formula differs slightly between the SC-2000 and the SC-300 PC, the ink used for both is oil based, non-toxic, and non-flammable.

As stated earlier, the ink is stored in a plastic bag in the handle of the SC-2000 stamp and stored in the pad itself on the SC-300 PC. The only place ink

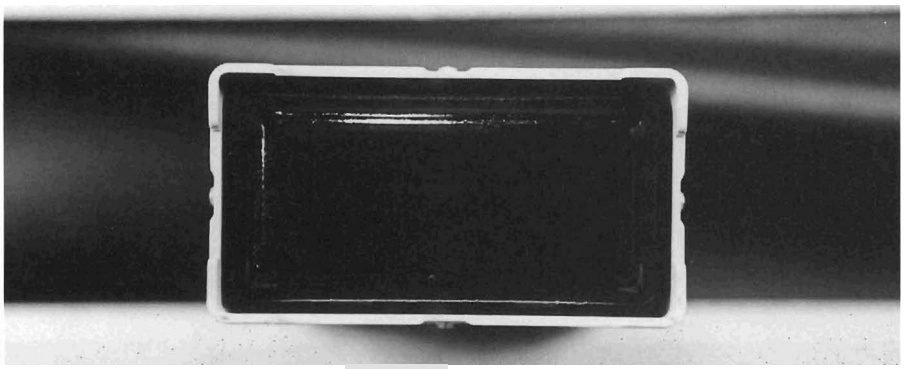

Figure 1. The die of the SC-2000 stamp is a micro porous rubber pad that is light sensitive. The image area has a very slight relief that can be observed with oblique lighting.

can be felt is in the image area of the two stamps, where ink exits the micro pores. The non-image area of the rubber on the SC-2000 and the SC-300 PC pad are free of ink, which prevents the ink from drying out and allows for a longer shelf life due to the limited exposure of the ink to air.

Methods and Materials

Light and heavy impressions were made from the following stamps:

1. Ludlow process, i.e., vulcanized rubber. Self-inking.
2. Ludlow process, i.e., vulcanized rubber. Stamp pad.
3. Gel stamp. Pre-inked.
4. Photo-polymer process. Self-inking.
5. Brother SC-300 PC. Pre-inked.
6. Brother SC-2000. Pre-inked.

Twenty sheets of plain copier paper were prepared for examination, each bearing one impression from the above listed stamps. The author examined the impressions to determine if the impressions made from the SC-300 PC and the SC-2000 bore features different than the impressions made by the stamps manufactured by the Ludlow or photo-polymer processes.

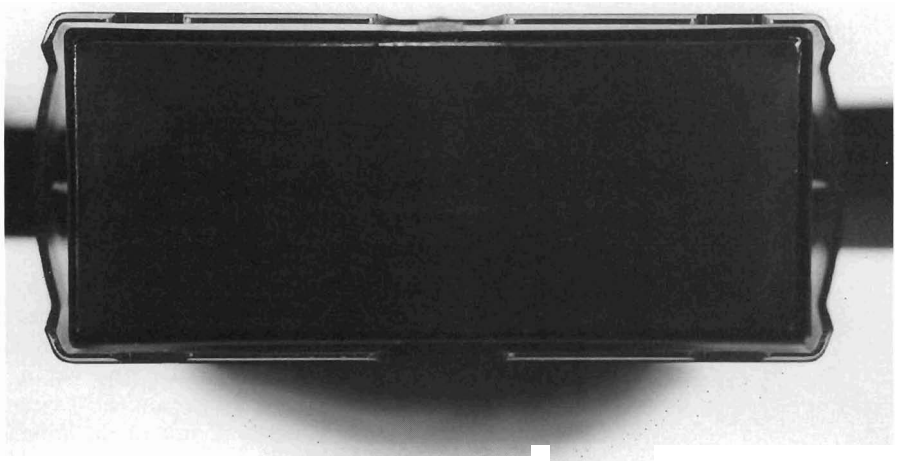

Figure 2. The die of the SC-300 PC. The die contains the ink and is lapped by plastic film, similar to silk screen technology.

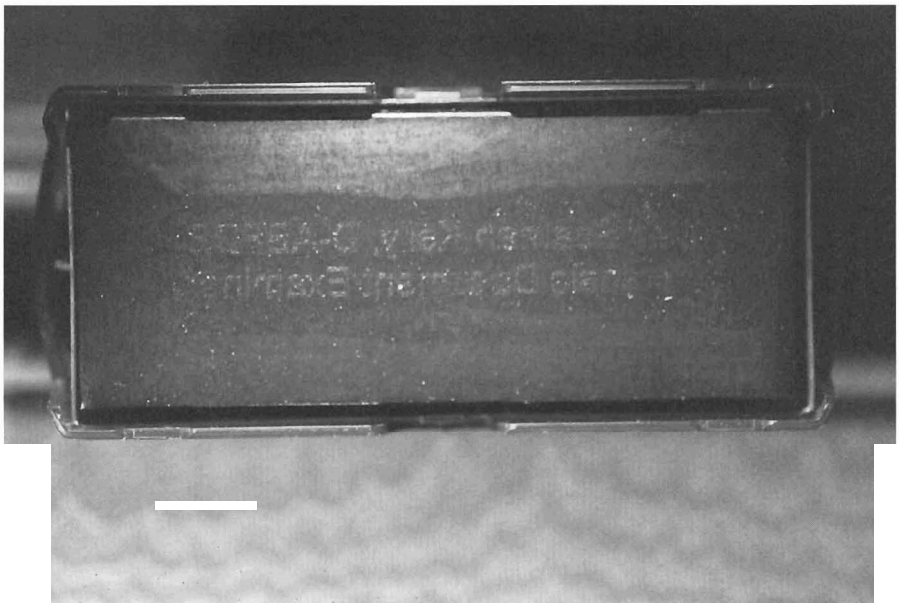

Figure 3. Image area of the SC-300 PC die is flat. Ink exits through the micro pores in the image area. The die is ink free in the non-image area.

Results and Discussion

The examination of the impressions created by the photo-polymer stamp and the vulcanized rubber stamps revealed the same features discussed in the current literature and research of rubber stamps. Ink-filled angles in the letter, rounded line beginnings and endings, and a heavier concentration of ink in the inner edge of the ink line due to the "squeegee" effect of the ink being squeezed out were observed in both sets of impressions. Poor edge detail, at times, may be observed especially if the stamp is inked by hand (Figure 4).

The gel stamp is a pre-inked stamp that produces an impression with good edge detail, ink- filled angles in the letter, rounded line beginnings and endings, and a heavier concentration of ink in the inner edge of the ink line (Figure 5). This impression differs from the impressions made by the vulcanized rubber and the polymer stamps in that when made correctly, it is clean and precise.

The impression made by the SC-2000 stamp is characterized by features closely resembling offset lithography in that it has good edge detail, rounded line beginnings and endings, and heavy ink saturation distributed evenly throughout the letter (Figure 6).

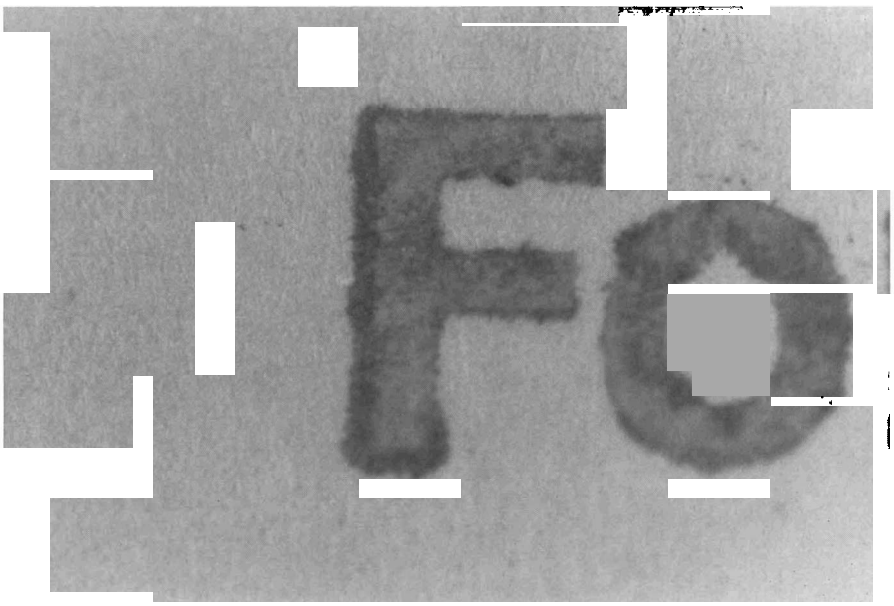

Figure 4. Impression made by vulcanized rubber stamp inked using a stamp pad. Features of poor edge detail, rounded line beginnings and endings, and a heavier concentration of ink in the inner edge of the ink line giving a "squeegee" effect are commonly observed.

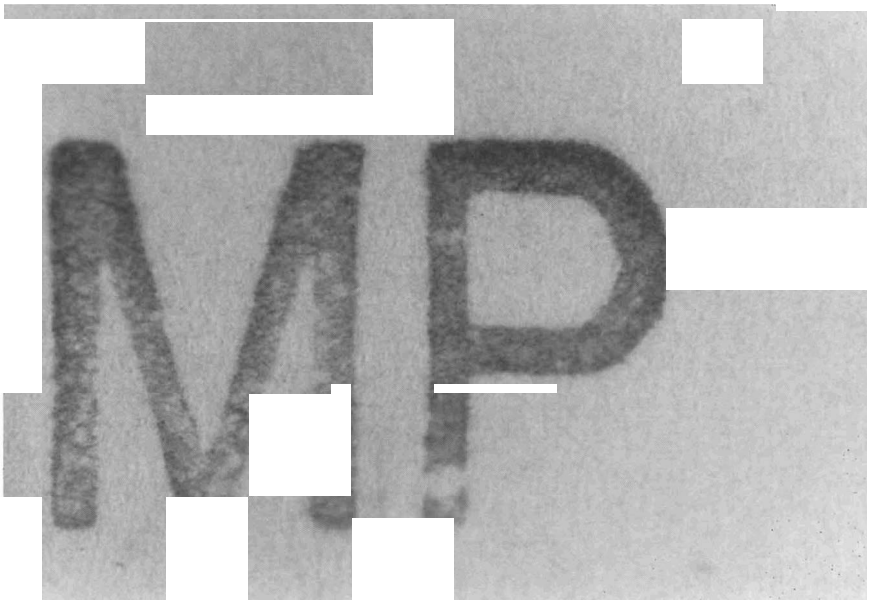

Figure 5. Gel stamp impression. Clean and concise edge detail with minimal concentration of ink in the inner ink line.

The impression made by the SC-300 PC features an even distribution of ink, rounded line beginnings and endings, and some banding (blank vertical line spacing). The edge detail has slight feathering (Figure 7). The ink saturation is not as heavy with the SC-300 PC since it produces an impression at 180 dpi while an impression made from a the SC-2000 stamp is 600 dpi.

Light pressure stamp impressions from the SC-300 PC reveal the individual dots of ink forming the letter. Under magnification, a dot matrix pattern can be observed through the center of the letter (Figure 8). The outside ink line is comprised of heavy concentrations of ink that are intermittent. A stamp impression made with slightly heavier pressure produced a stamp bearing the feature of vertical banding with saw-tooth edging in the center of the letter (Figure 9).

Summary

The release of the Brother SC-2000 (Stampcreator Pro) and the SC-300 PC makes the ability to create quality stamps using a computer available to the general public. The impressions made by the Brother SC-2000 and the SC-300 PC feature differ-

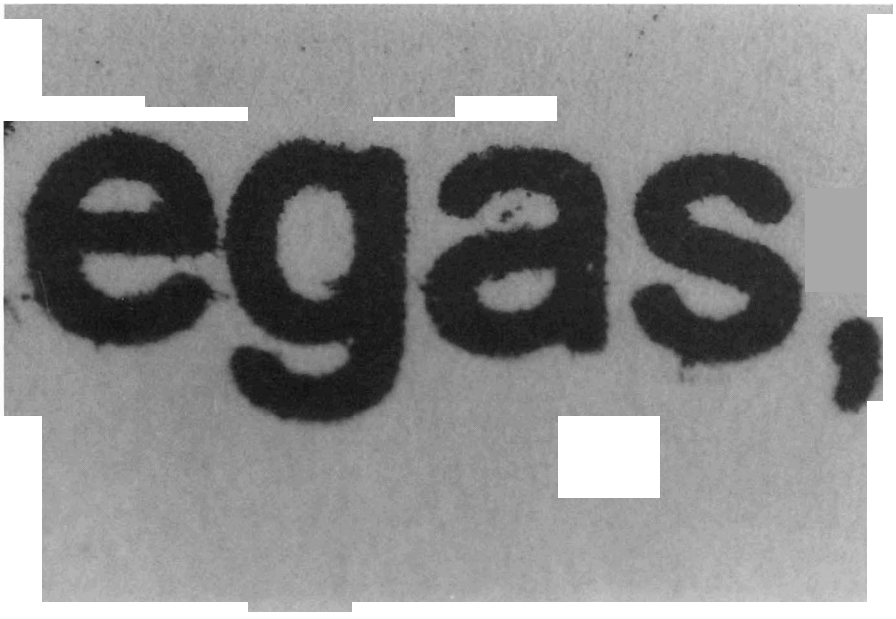

Figure 6. Impression made by the Brother SC-2000 (Stampcreator Pro). Good edge detail and heavy ink saturation evenly distributed throughout the letter are notable features.

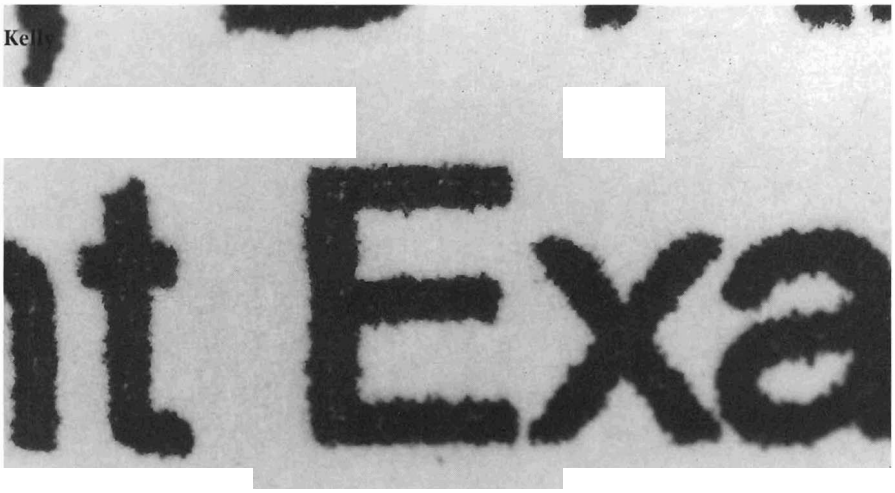

Figure 7. Stamp impression made by the Brother SC-300 PC features an even distribution of ink and light vertical banding in the letter.

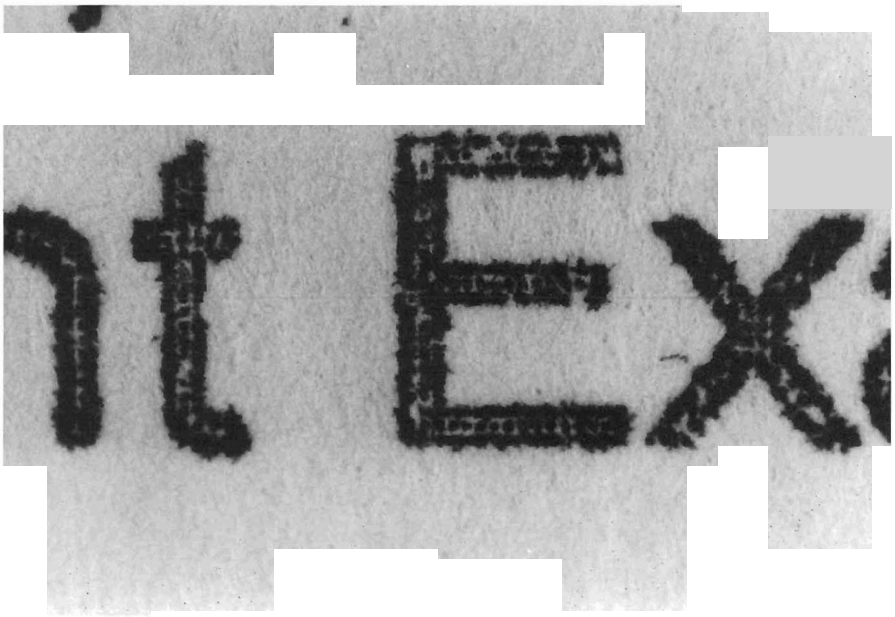

Figure 8. Brother SC-300 PC light stamp impression. Individual dots made from the ink exiting the micro pores of the die resemble a dot matrix pattern.

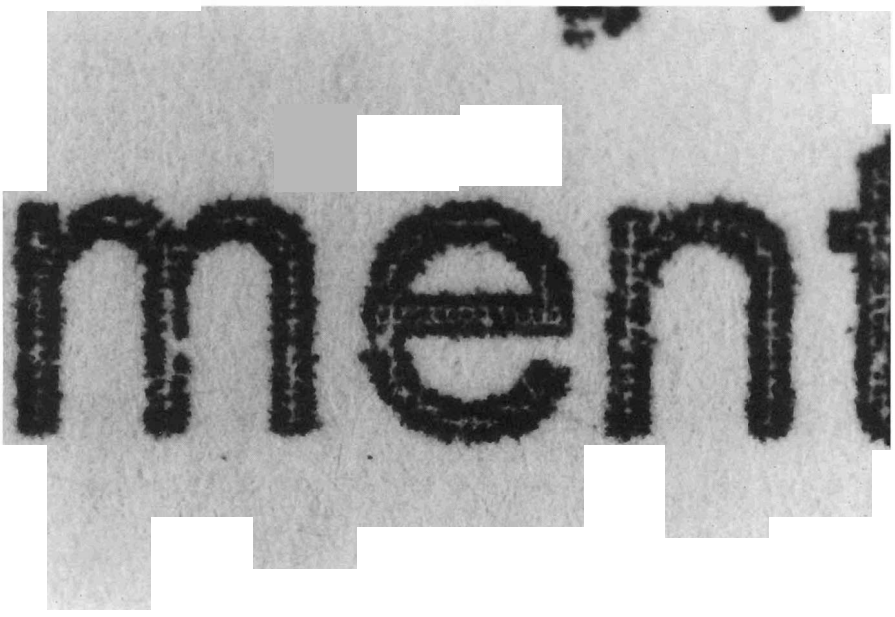

Figure 9. Slightly heavier impression from a Brother SC-300 PC stamp features vertical banding with saw-tooth edges in the center of the letter.

ent characteristics than stamps made by the other manufacturing processes. A SC-2000 impression has good edge detail, heavy ink distribution evenly throughout the letter, and rounded letter formations. A SC-300 PC heavy impression features light banding in the center of the letter as well as an even distribution of ink. A SC-300 PC light impression features individual dots that resemble a dot matrix pattern.

Research into these two units is in its initial stages and will focus on the individual characteristics of the impressions made by the SC-2000 and the SC-300 PC and to identify stamp defects created during the manufacturing process.

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