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Identifying the Copying Machine Used in Preparation of Simulated Forgeries

The proliferation of rapid office copiers has in recent years provided a new problem for Document Examiners. Not only is it possible to determine which of many processes was used to prepare a given copy, in many cases an individual machine can be identified as the one on which the copy was made. One of the more common types of office copiers, the xerograph machine, lends itself to these sorts of identification quite well. To establish that a copy was in fact made on a particular copying machine requires full analysis of the copy and the machine.

Case Background

In the spring of 1972 a series of stolen business checks totaling approximately \$36,000.00 were cashed in the greater Chicago area. The checks were prepared utilizing a typewriter and check protector and were made payable to various individuals with valid bank accounts in the area. For the most part, the payer signatures on the checks were illegible. All of the checks were endorsed, with a genuine account number below the endorsement, and cashed at the bank that serviced that account.

The checks continued to be passed, and subsequently, two men were challenged attempting to cash a check at a drive-up window of a bank. The police were notified, and the men were arrested as they left the parking lot. During a search of the car some blank business checks and four machine copies of personal checks were located. One of the payer signatures on one of the copies corresponded with the payee name and endorsement on the check the bank teller had challenged. Handwriting standards of the men arrested were obtained and submitted to the examiner together with the machine copies and checks.

Copying Machine Process

The process Xerox uses is known as a transfer electrostatic process. The machine uses a drum with approximately 3/1000-in. selenium coating that is given an electrostatic charge. Occasionally, due to the frequent maintenance handling, the coating becomes chipped or scratched. Such marks will be registered on a copy made by the machine. Additionally, on the 914 Xerox model, marks or scratches on the glass plate on which the original document is placed will appear. Further, the rubber mat used to cover the original document is white and quite easily marked or scratched. Therefore, if the original document does not cover the entire sheet, these markings, for the most part, will be reproduced

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on the uncopied portion of the paper. Although the drum is frequently cleaned, removing most of the minor scratches, the glass plate and rubber mat are rarely changed.

Examination

Comparison of the endorsements with the genuine signatures revealed that they were simulated forgeries. It was apparent a handwriting comparison could not assist the investigation.

An examination of the four machine copies revealed that the personal checks were made payable to the same business firm. Further, there were marks from a copying machine on the copies (Figs. 1 and 2). As one of the suspected was employed by this firm, it was suggested that known standards be obtained from the copying machine (Xerox Corporation, Chicago, Ill.) within this company. Standards were made by activating the copying machine without inserting material to be copied. In effect, this was a blank piece of paper.

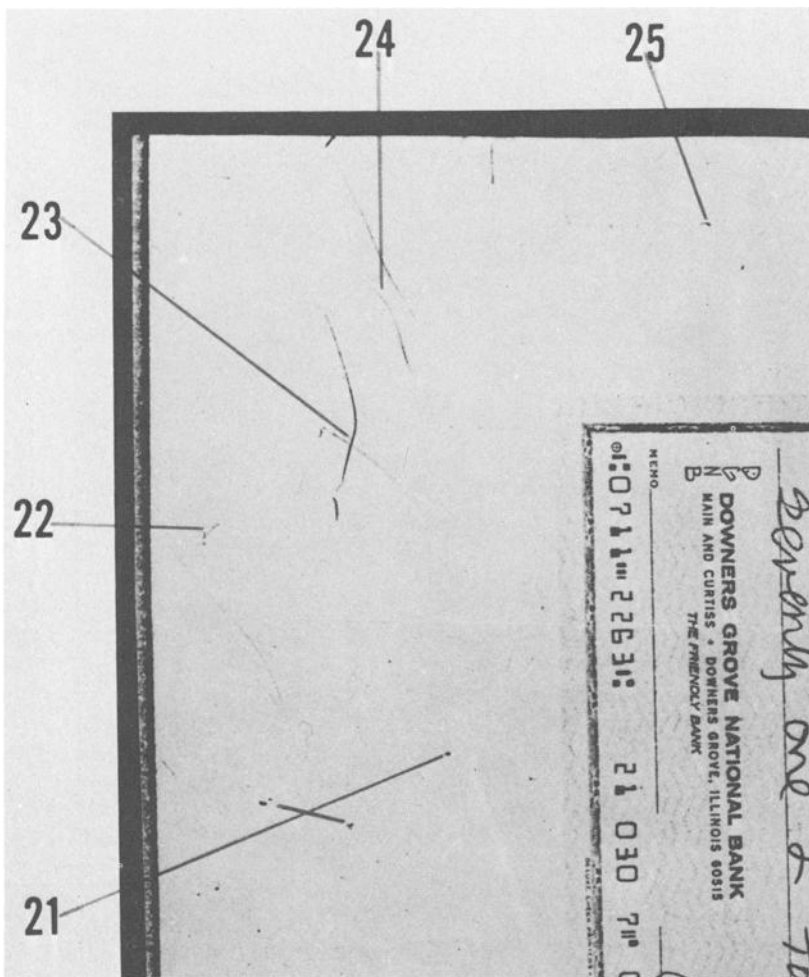


FIG. 1—Numbers 23 and 24 are defects on the glass plate of the copying machine reproduced on the questioned document. $\times 1.5$.

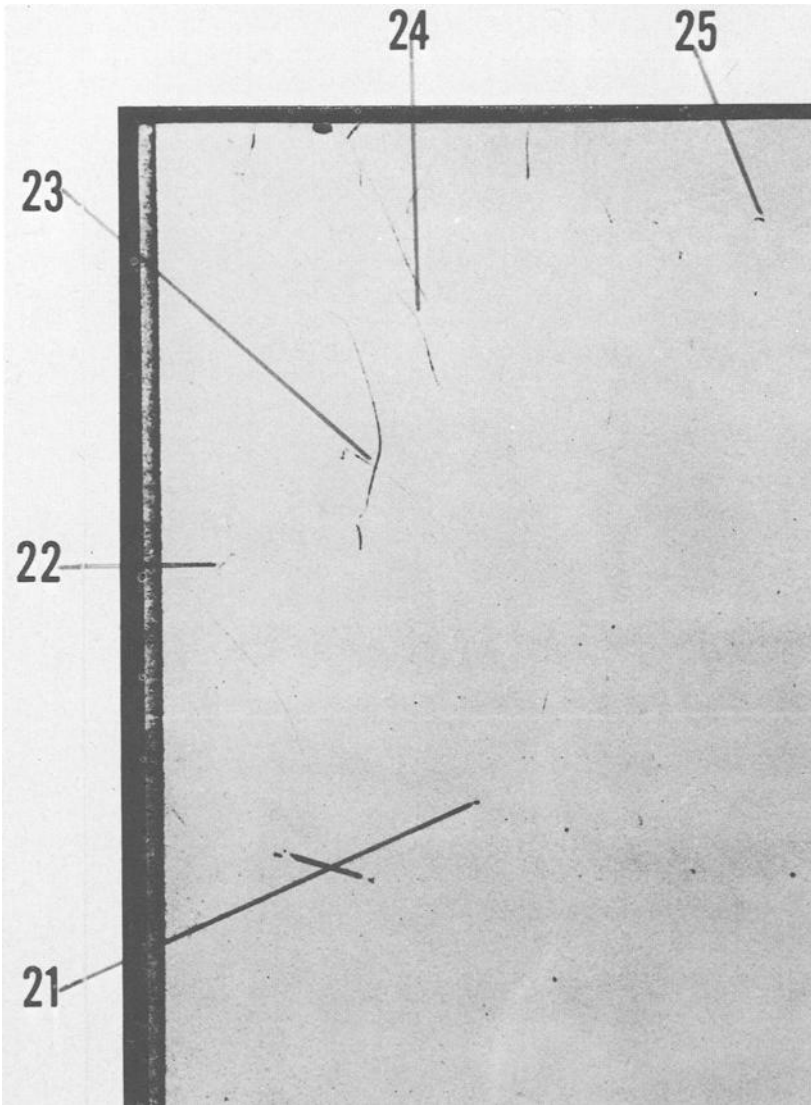


FIG. 2—Numbers 23 and 24 are defects on the glass plate of the copying machine reproduced on known samples. $\times 1.5$.

Inspection of the known standards from the Xerox machine disclosed many marks that were also reproduced on the uncopied portion of the questioned copy. Photographic enlargements were made marking some of the areas similar to the technique used for fingerprint comparison.

In this particular case, the image of the check covered a small area of the copy produced. The rubber mat had numerous marks that were reproduced on the copy. Also, the glass plate had gross scratches (Figs. 1 and 2) that were reflected on the copy. Additionally, the drum had some minor pit marks that were reproduced.

Conclusions

The process used in examining the questioned document and relating the defects noted to a specific copying machine enabled the examiner to show conclusively that the copy had been prepared on a particular Xerox machine. As a result, it was possible to photographically demonstrate the conclusions.

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