Twin Signatures- Replication of Signatures

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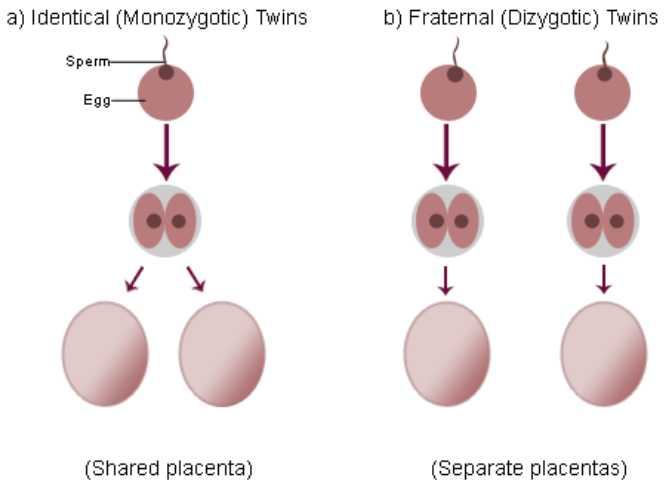
ABSTRACT

Signatures produced by seals or stamps are usually recognized immediately as facsimiles. Many apparatus had been invented to write letters or other characters for the duplication of writing. These signatures 'the machine-made signature' also called as 'Twin Signatures' may present unique problems and challenges for the document examiner. Today's machines can produce signatures of excellent quality and are in wider use than one might expect. Hence, it is important for the document examiner to know something about them. This review must be useful for the expert to tackle with problems of present scenario.

Keywords: Twin Signatures, Autopen, Writing Machine, Robotic Signature.

INTRODUCTION

Twins are two offspring produced by the same pregnancy. The vast majority of twins are (a) identical (monozygotic) i.e. they develop from one zygote and (b) fraternal (dizygotic) i.e. they develop from two different eggs.



Monozygotic (MZ) or identical twins occur when a single egg is fertilized to form one zygote (hence, 'monozygotic') which then divides into two separate embryos. Dizygotic (DZ) or fraternal twins (also referred to as 'non-identical twins'/ 'dissimilar twins'/ 'biovular twins' usually occur when two fertilized eggs are implanted in the uterus wall at the same time. Fraternal twins are, essentially, two ordinary siblings who happen to be born at the same time, since they arise from two separate eggs fertilized by two separate sperm, just like ordinary siblings.

In the similar way, is there any way by that twin signatures can be formed? The answer is, no. There is no such technique that can form **'identical twin signatures'** but '**fraternal (non-identical) twin signatures**' can be produced. Identical signatures are those signatures which are similar in all aspects means having clone effect of all the characteristics of handwriting, which is still a dream. No repeated act can be accomplished identically. The same results cannot be produced regardless of whether it is created by a machine or human effort. But, what future yield no one can predict e.g. although mono-zygotic twins are having similar DNA but still their fingerprints are different. Not only their fingerprints, but some biometric features like iris scan, hand vein pattern, etc. are also different.

HANDWRITING OF TWINS

McCarthy (1981) claimed that the basic axiom of handwriting identification was that "no two writings by the same or different persons are identical." Thorndike (1915) and Kramer & Lauterbach (1928) wrote on the subject of similarity in the writing of twins, but not from the point of view of writing identification. None of the authors were document examiners or professed to be handwriting examiners. Thorndike, however, does point out the dissimilarity in the writing of twins, and goes so far as to say, "Twins are probably distinguishable by their handwriting often than by their physical appearance."

Beacom (1960), a former handwriting teacher, was the first in the document examination profession to tackle the subject. It was her recollection that the writing of twins differed sufficiently for discrimination purposes, but she was without empirical data to support her position. In her study of the writings of 50 pairs of twins, 19 pairs were identical and 31 fraternal (including, 20 pairs of males, 22 pairs of females and 8 pairs include both male and female). The identical twins are always, of course, of the same sex. The results show that four pairs of identical twins were mixed as to handedness, one dextral and one sinistral, a circumstance that prompts some to classify them as mirror twins. Three pairs of fraternal twins were similarly mixed as to handedness. Forty three pairs were both dextral, and sinistral. Writings were assessed with the assistance of the Ayers scale for writing quality on the basis of legibility, relative sizes, spacing, slant, and line qualities. Although, some pairs received similar scores, even then this did not reflect similarity in their writings as different ratings were received by each member of the pair for different aspects of their writings, but sometimes resulted in a similar cumulative total.

Twins displayed comparable abilities to their siblings in cursive writing, lettering, and script writing. Notwithstanding their similarity in schools attended, teachers, and family environments, the writings of twins could be discriminated from one another without great difficulty given adequate specimens. Basic differences could always be found.

Beacom also found some progression in the differences between siblings, probably resulting from differences in occupations as adults. There were no particular deviations in writing quality related to sex that were unlike other populations.

In an endeavour to determine whether twins displayed greater resemblance to one another in their writings than other siblings, Kramer and Lauterbach (1928) studied the products of 205 pairs of twins and 101 pairs of siblings. It was their finding that twins showed a greater degree of resemblance than other siblings, whereas, Beacom showed that resemblance does not increase with age. Where greater resemblance occurs, however, there may be factors other than genetics at work.

Gamble (1980) studied that out of 58 pairs of identical twins 24 pairs were of males and 34 pairs of females and claimed that this work established that no matter how closely two persons are alike and related to one another, their handwriting allowed them to be differentiated. He found 42 of his sets of twins were dextral writers, 15 sets were mixed and 1 set was sinistral. These stats are slightly different to those of other studies, but the number of subjects is not large in any case and this may account for it.

Gamble's study was directed at seven elements of writing (1) pictorial effect, (2) size, (3) slope, (4) speed, (5) writing quality, (6) proportions, and (7) letter forms. His finding was that identical twins can exhibit greater similarity in their writing than might otherwise be expected. Nevertheless, similarities in letter forms and general appearance are accompanied by a sufficient number of differences to allow an examiner to discriminate between individuals.

Beacom claims to have studied the writings of triplets, quadruplets and quintuplets with similar results, that is, that the issue of multiple births develop writing habits that are distinctive from one another and evidently independent of their genetic backgrounds.

TWIN SIGNATURES

Fraternal (Non-identical) twin signatures can be formed. Although, these are non-identical, it does not mean that these are completely different. Twin effect is still there, as produced/formed by the similar process sometimes in similar time period. These signatures may have various resemblances in their handwriting characteristics so called as suspicious signatures.

The human being is not a machine producing an identical product over and over again. One of the most important principles involves the handwriting variation of a single writer. It is a generally accepted handwriting principle that no two handwritings or signatures are written exactly alike by the same person. If a handwriting expert finds an identical signature to the one that is being questioned, it is an indicator that one may be a copy of the other which may be based on a tracing, a copy or a scan of one signature that is placed on another document. No two specimens are absolutely identical. How much they vary from one another depends on the individual writer and the conditions under which each was written.

Since variation is an integral part of natural handwriting, no two samples of writing prepared by one person are identical in every detail. The extent of variation differs among writers and, consequently, natural variation forms an important element in the identification of handwriting. No two specimens of even a minimally complicated signature should be identical.

Then he may turn to the authentic and forged signatures in almost any case and show to the layman that the first question of forgery arose from the fact that these two signatures at a first glance are identically alike to almost the minutest detail.

HISTORICAL DEVELOPMENT OF WRITING MACHINE

Two basic types of signature signing machines are used extensively all over the world. The first one requires actually writing a signature. This writing motion is transferred through a system of mechanical linkage to one or more pens which simultaneously

reproduce similar or identical signatures. The second makes a matrix or recording which can be played back through the machine to reproduce great numbers of signatures or other writings. Both of these types of machines have been in use for many years.

An autopen or signing machine is a device used for the automatic signing of a signature or autograph. The first signature duplicating machines were developed by an Englishman named John Isaac Hawkins. Hawkins received a United States patent for his device in 1803. In 1804, Thomas Jefferson began using the device extensively. This early device was known at the time as a Polygraph (an abstracted version of the Pantograph) and bears little resemblance to today's autopens in design or operation.

Signagraph

The earliest successful machine was patented in 1906 by William R. Woodward, who called his invention 'Signagraph' also known as the 'Scriptographe'. In 1908, he established the 'Signature Company', which still markets and operates its own machines.

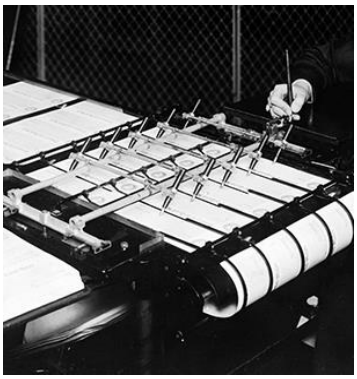


Fig. 1: Signagraph

Autopen

The first commercially successful autopen was developed by Robert M. De Shazo, Jr., in 1942. De Shazo developed the technology that became the modern autopen in reference to a Request For Quote (RFQ) from the Navy, and in 1942, received an order for the machine from the Secretary of the Navy. This was the beginning of a significant market in government for the autopen, as the machines soon ended up in the offices of members of Congress, the Senate and the Executive branches. At one point, De Shazo estimated there were more than 500 autopens in use in Washington, D.C.

Fig. 2: Autopen

Signa Signer

In 1968, Harvey Houston, owner of Auto Letter, Inc. was using automatic typewriters in his direct-mail advertising work and wanted the added impact that personal signatures and hand-written postscripts would bring. Unlike other machines, Signa Signer uses a standard recording tape similar to that used in common cassette-type recorders, Scotch 226. Most customers record from three to five different signatures on each tape. This variety of styles would make Signa Signer use more difficult to detect than that of Autopen, where a single style is normal.

Signature Systems - E.S.P.

After Signa Signer's demise, Houston established a new company, Signature Systems, Inc. He called his new design E.S.P. (Electronic Signature Processing): a machine featuring many improvements which not only cut production time (12 instead of 87 hours to wire a machine), but improved performance. About half the original size and two or three times faster, it signs up to 750 signatures an hour and has all new electronic components, solid-state plug-in circuitry, motor drive compensator and paper feed

mechanism, the only moving parts being the basic deck, the mechanical linkage to the writing arm, and the paper feed on the continuous feed machine.

Signamatic

This machine is, or was, manufactured by Galloy, 9 et 11 Avenue de Saint Mande, Paris. The brochure claims 800 - 1000 signatures an hour. The machine has automatic and hand-fed operation and counters to monitor use. Two short signatures can fit on a single matrix. All matrixes are produced at their plant. Any type of writing instrument - pencil, ball-point, felt-tip, roller-ball, or fountain pen - can be used.

Fig. 3: Signamatic

Autograph

This machine is, or was, manufactured by Marme S.A., 26 - 28 rue Sedaine, Paris. It is apparently a copy of the belt-type Autopen, and its work product and general characteristics are probably similar to those of that machine. It is available in hand-fed or automatic models, and the manufacturer claims it will sign up to 800 signatures an hour. Originally equipped with a ball-point pen, it appears to be adaptable to any type of writing instrument. This machine may now be out of production.

In the eighteenth century, a Friedrich yon Knaus allegedly invented a ‘successful writing machine’ which with the aid of a pen simulated genuine signatures. Others to experiment with such a machine were Robert Houdin, the French magician, and P. T. Barnum, the circus impressario. In 1916 P. M. Durand patented a machine known as the "Signo" and in 1946 M. F. Wiesendanger devised an instrument which could write whole sentences and affix signatures.

In 1958 R. M. De Shazo invented a machine capable of affixing 3000 signatures in an eight hour day. This machine, called the "Autopen," is the subject of this investigation. The Autopen originally presented problems to autograph collectors; however, this group has long been aware of the existence of these "genuine forgeries" and has catalogued the most important.

Robotic Pen

The autopen called the Robot Pen was developed in the 1930s, and became commercially available in 1937 (used as a storage unit device, similar in principle to how vinyl records store information) to record a signer's signature. A small segment of the record could be removed and stored elsewhere to prevent misuse. The machine would then be able to mass-produce a template signature when needed.

It allows you to use your computer to produce writing that appears to be handmade, complete with the unmistakable appearance of using a real pen (as opposed to an inkjet or laser printer) to address an envelope or sign your name. And it does so with precision approaching that of a skilled artist and just as importantly using an arm that never gets tired.

The pen holder fits a wide variety of pens, including Sharpie fine and ultra-fine point markers, most rollerball and fountain pens, small-bodied whiteboard markers, and so forth. It can even hold a fountain pen at a proper angle of 45° to the paper. You can also use implements other than pens, such as pencils, chalk, charcoal, brushes, and many others.

Axidraw is a “personal writing and drawing machine” created by Evil Mad Scientist. It can hold anything from a fountain pen to a Sharpie, and using a computer input, draw or write whatever you want on any A4-sized area.

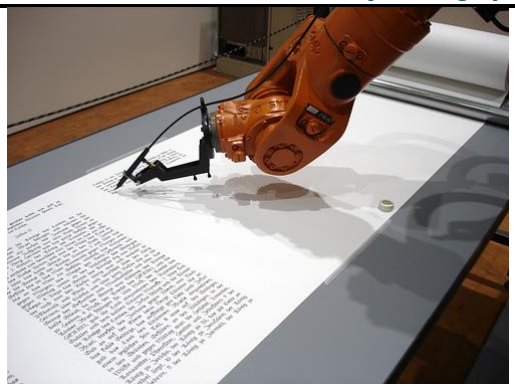


Fig. 4: Robotic Pen

CONCLUSION

There is no clause anywhere that "any document must have a handwritten signature or the pen must be held in the hand of the person whose name is being signed". The signature produced by a writing machine is vastly superior which also gives the perception in the mind of the recipient that this is obviously a printed or stamped signature. Therefore, it is quite possible that in the near future various organizations, agencies etc., may use such types of signatures as it gives resemblance to a totally handwritten appearance. It is noteworthy that the manufacturer represents the sameness of the signature as a safety feature since "no man ever signs his name precisely the same way twice." The popularity of the writing machines will create new problems for document examiners. For example, "Was this matrix used to effect this signature?", "Is this machine generated signature consistent with the date on the document?" are questions which will be presented by examiners in the immediate future.

ACKNOWLEDGMENT

Authors convey special regard to Sh. Deepak Handa, Principle Scientific Officer (Documents), Central Forensic Science Laboratory (CBI), New Delhi, for his support and encouragement to pursue the research work.

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