

1957

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### Recommended Citation

Ordway Hilton, Identification of Typewriting--Problems Encountered with Shaded and Proportional Spacing Type Faces, 48 J. Crim. L. Criminology & Police Sci. 219 (1957-1958)

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## IDENTIFICATION OF TYPEWRITING

### Problems Encountered with Shaded and Proportional Spacing Type Faces

ORDWAY HILTON

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Shaded type faces are not new to the typewriter trade, but they do represent an increasingly common problem today compared to ten or fifteen years ago. On the other hand, proportional spacing typewriting is less than fifteen years old. It, too, has grown greatly in popularity particularly during the last six or seven years and in part no doubt has influenced the trend toward more shaded type fonts. The most frequently encountered proportional spacing fonts are shaded so that in this identification problem both complexities may be met at once. Yet neither question has been adequately attacked in any published work.<sup>1</sup> It is time that this deficiency was overcome.

#### DEFINITIONS

Before undertaking an analysis of the special problems encountered in the identification of shaded and proportional spacing typewriting, it is well to define accurately what each is and to point out the ways in which it differs from ordinary, fine line typewriting fonts.

A *shaded type face* is a font in which some of the letters have printing surfaces of varying widths, some portions wider than others. This class of design is very common among printing type but has been less popular among typewriter fonts although as early as 1900 shaded type fonts were in use. Note particularly the Oliver Print Type.

<sup>1</sup> The writer presented an extensive study of I.B.M. proportional spacing typewriting at the 1957 meeting of the American Academy of Forensic Sciences. This paper considered problems encountered in the identification of these machines together with a study of the type face history of the various proportional spacing fonts. It is to be published in the JOURNAL OF FORENSIC SCIENCES, the Academy's official publication.

An earlier paper, "A Test Plate for Proportional Spacing Typewriter Examination" appeared in this Journal, vol. 47, no. 2, pages 257-259, July-August, 1956. This paper is to be reprinted with supplementary material in the POLICE JOURNAL (London) in the near future.

No other papers are known to have been published on these problems to date.

*Proportional spacing type* derives its name from the variable horizontal space required to print different letters—some being wider than others. The machine is constructed so that the carriage moves a certain number of basic units for each letter—the number governed by the particular letter of the alphabet. The width ratios between letters are comparable to those which have been traditional to the printing trade. Proportional spacing type may be either a fine line font, that is one without shading, or shaded. As we observed earlier, shaded fonts are more popular. Today I.B.M. is the main producer of proportional spacing machines. Varityper, which is basically a composing machine for offset printing, has proportional spacing fonts, and Underwood has marketed to a limited extent a differential spacing machine which prints letters of two widths,  $\frac{1}{10}$  and  $\frac{1}{20}$  inch. Principal attention will be given to the I.B.M. machine in this paper.

#### IDENTIFICATION OF SHADED TYPE

Identification of shaded typewriting is based upon exactly the same factors that have been used for years with fine line type. They include malalignment, both horizontal and vertical; twisted letters; battered and broken type faces; rebound, that is a weak second impression of the letter adjacent to the heavy outline; letters printing too heavy or too light; and uneven impressions, that is a letter off-its-feet. Minor defects such as mal-operation of the ribbon, skipping of a space, irregular or improper line spacing, defective margin stops, incorrect movement by the shift key making capitals constantly out of alignment with small letters, and improper escapement spacing should be considered. If the same classical defects are to be sought out, then what is there distinctive about the identification of an individual machine equipped with shaded type?

Undoubtedly, the most common defect in a newly manufactured machine, or one in good repair, is a series of uneven type face impressions, letters off-their-feet. Final alignment at the factory often fails to eliminate these defects completely. To determine from examination of a shaded type face impression whether it is off-its-feet is an extremely difficult task when the defect is only slight. The fact that the type is cut with some portions of the outline wider than others tends to hide the fact that one side is printing a little heavier compared to the other. Comparable difficulty may also be encountered with a slightly battered type face where the type metal is only flattened a trifle. With fine line type faces the heavier impression on one side or the slight battering can be recognized by the somewhat wider impression in the area of the defect. With shaded type, careful comparison with non-defective, reference impression helps, but location of a fault free reference standard may in itself be a difficult task. The serifs of shaded letters are designed with uniform widths so that unevenness may be more readily recognized from their study. A slightly darker inking in the area of a heavier impression is a further clue. Examination of the work of the machine using the binocular microscope and light coming more from one side than the other is a tremendous aid in discerning where the letters are sitting a trifle deeper into the paper due to an off-foot impression. These steps may enable the examiner to determine that certain letters have this defect, but undoubtedly there will be instances when the fact cannot be accurately ascertained.



Figure 1

## Identification of Source of Disputed Letter

Among the typewriting defects which helped to establish that the disputed letter had been written on a machine in the plaintiff's office are: "t" printing to the right of its normal position ("th" crowded); "S" badly off-its-feet, printing too heavily at the lower right turn (arrow); "a" lower than "r"; "s" higher than "i"; "o" low; and "u" to right of normal position. The font of type on this machine has only slight shading.

Actually, identification of shaded type, particularly with a machine that has seen only slight use, requires a greater emphasis upon alignment defects than upon uneven type impressions. The former certainly can be more readily demonstrated than the latter. If no broken types are present, then the impression should be carefully examined under ruled test plates to ascertain what letters print above or below the base line or to right or left of proper position. Thus, with some re-evaluation and change of emphasis it is entirely possible to effect an identification of a machine equipped with shaded type faces (figure 1).

## IDENTIFICATION OF PROPORTIONAL SPACING TYPE

The identification of an individual machine equipped with proportional spacing type faces presents another challenging problem. The electric mechanism, the varying widths of letters, the narrow space between characters, and the preponderance of shaded type faces complicate the task.

I.B.M. employs three basic units from which they build their proportional spacing fonts. The most common is  $\frac{1}{32}$  of an inch, but  $\frac{1}{36}$  and  $\frac{1}{45}$  are used for some fonts. Undoubtedly the most popular font is Modern, a shaded type. Secretarial is the only fine line proportional spacing font. Both are built upon a  $\frac{1}{32}$  unit denominator. In all eight different fonts are available based upon these units, five based upon  $\frac{1}{36}$ , and two upon  $\frac{1}{45}$ .<sup>2</sup>

<sup>2</sup> Fonts using  $\frac{1}{32}$  inch escapement are Secretarial, Bold Face No. 1, Modern, Documentary, Bold Face Italics, Testimonial, Directory, and Arcadia.  $\frac{1}{36}$  inch escapement includes Copperplate Gothic, Mid-Century, Bold Face No. 2, Heritage, and Registry;  $\frac{1}{45}$  inch escapement, Text and Charter.

As defined earlier, proportional spacing type faces vary in width depending upon the letter. Lower case letters are generally narrower than capitals. Most lower case letters require three units, e.g.,  $\frac{3}{32}$  for Modern, but "f", "i", "j", "l", and "t" use two; "w", 4; and "m", 5. This pattern applies to the Modern font and several others, but there are slight modifications with the letters of each group in different fonts.<sup>3</sup> Most capital letters need four units except the "I", 2; the "J" and "S", 3; and "M" and "W", 5. Numerals and most other characters are based upon three units.

The proportional spacing of letters creates a need for a new alignment test plate which provides for the variable letter widths, especially in demonstrating whether characters print to the left or right of their proper position.<sup>4</sup> Test plates ruled vertically in units of either  $\frac{1}{32}$ ,  $\frac{1}{36}$ , or  $\frac{1}{45}$  of an inch fulfill the need for I.B.M. machines and ruled in units of  $\frac{1}{20}$  of an inch for Underwood. Furthermore, since spacing between lines on I.B.M. machines are usually .189 inch (i.e. 5.28 lines per inch) rather than  $\frac{1}{6}$  of an inch, it may be necessary to have additional test plates for the purpose of checking line spacing and malalignment above and below the base line.

By employing these test plates and a typewriter protractor, it will be found that there are a combination of letters printing to the right or left of proper position, above or below the base line, or leaning slightly. The defects become more apparent, some would be missed entirely otherwise, and demonstration of the condition is readily made.

If the shaded font is involved, then a similar problem arises to that found with shaded type faces on uniform escapement machines. Again it is difficult to tell whether a letter is printing slightly off-its-feet, but the suggestions which were made earlier will be of assistance in revealing the facts.

Regardless of font of type with electric typewriters, and all I.B.M. machines are electric driven, a letter which consistently writes lighter or heavier than other letters does so because of a machine defect rather than "typist touch." This condition holds true for proportional spacing machines with both fine line and shaded type.

A study of the work from a number of proportional spacing machines reveals that I.B.M. has not been completely successful in preventing their type faces from becoming battered and broken, particularly along the edges. Almost every proportional spacing machine after a moderate degree of use contains at least one broken type face. The detection of these broken faces is greatly facilitated by the fact that most I.B.M. machines employ a carbon paper ribbon rather than the traditional cloth ribbon. The carbon paper ribbon gives a much sharper, clearer outline of the letter, and even a slight break in the type face will show up. The combination of these conditions is fortunate when making a demonstration before a jury for broken type faces are very easily illustrated. However, their greater frequency on this class of machine must be considered in evaluating an opinion since on newer, modern, standard typewriters broken type faces have become more and more infrequent.

The various factors which identify ordinary typewriters certainly play a part

<sup>3</sup> The unit width of letters in each font of I.B.M. type is set forth in a company publication entitled "How to Make a Perfect Impression".

<sup>4</sup> For further discussion of this problem see the writer's article in this Journal cited in footnote 1.

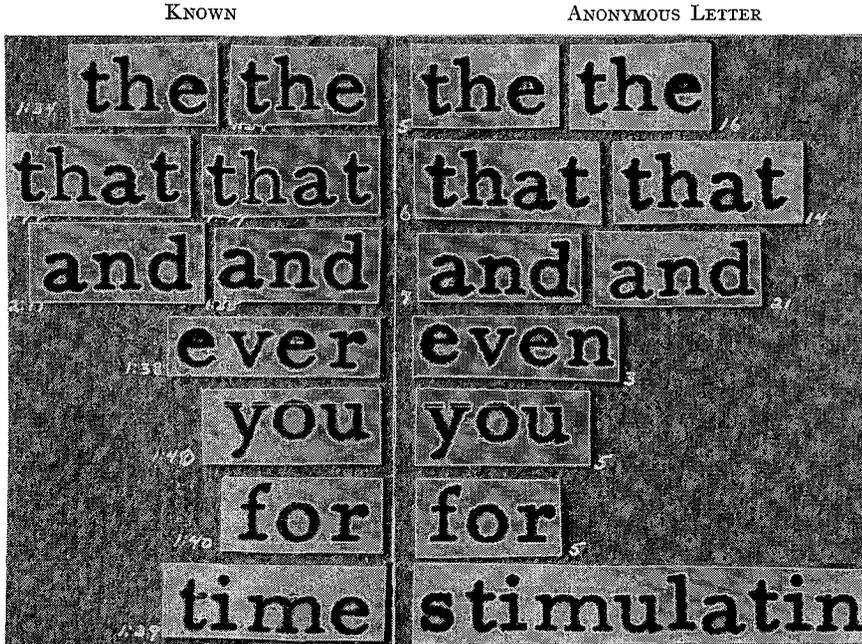


Figure 2

#### Source of Anonymous Letter Revealed

The I.B.M. proportional spacing typewriter which was used to write a vicious anonymous letter is identified. Among the machine defects common to both the known typewriting and the anonymous letter are: the difference in base line alignment of the "h" and "e", the "h", "t", and "a", the "a", "d", and "n", and the "o", "r", and "f"; the horizontal alignment of the "v" crowded closer to the following "e" than to the preceding one; and the lack of parallelism between the t-staff and the i-staff. There is a small chip in the left end of the t-crossing; the kind of small defect which is clearly revealed in typewriting through a carbon paper ribbon.

in the identification of proportional spacing machines. Besides those already discussed there are also such defects as improper line spacing, irregular escapement, incorrect shift key movement, and less common faults. Modification of techniques used with standard typewriters are principally those brought about by the more frequent use of shaded type fonts and the variable letter spacing. These are not serious modifications, but they must be taken into account by the progressive examiner (figure 2).

#### CONCLUSIONS

A lack of familiarity with shaded typewriting and proportional spacing typewriting may mean that the problem of identifying the individual machine seems more difficult. The various factors discussed in this paper indicate where modification of emphasis and procedure needs to be made, but beyond this identification rests upon exactly the factors which have always been considered. These special type face machines can be identified and a demonstration of the findings made.