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COMPLETE SPECIFICATION

Means for Demonstrating the Pronunciation of Language

I, SIR ISAAC JAMES PITMAN (KNIGHT) of 9, Southampton Place, London, W.C.1., a British Subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to means for demonstrating the correct (or approximately correct) stressing and vowel value of words and phrases in any alphabetically written language.

It should be appreciated from the outset that the invention is not directly concerned with the teaching of the language itself. By contrast, the basic object of the invention is to provide means for imparting to a reader, or to an automatic reading device, information which otherwise would only normally be learnt through hearing the words or phrases spoken.

This invention will enable reading machines, such as those comprising combinations of electronic scanning devices and sound transmitters, to be programmed to read out loud from a text, using sounds which recognisably resemble human speech sounds, and giving a desired degree of stress and vowel value.

In its broadest form the invention can be used with any existing alphabetic characters such for example as the Roman Alphabet, the Greek Alphabet, the German Alphabet or the Cyrillic Alphabet.

According to the present invention, there is provided a receptive surface bearing an arrangement of words in alphabetic writing for the purpose of demonstrating the stressing and vowel value in the spoken word, in which the characters which are used for stressed words or syllables are different from the characters which are used for unstressed words or syllables, and departure from normal vowel value is indicated by variation in the position of individual characters or groups of characters constituting an unstressed word or syllable, relative to the mean axis of the line of writing,

according to the nature of the departure from normal vowel value required to be given to the spoken word.

In this Specification, the following definitions will be used:—

"Characters" shall mean letters and symbols (whether conventional or wholly or partly novel) adapted to indicate consonant and vowel sounds, and shall include complexes thereof such as diphthongs.

"Receptive Surface" shall mean any surface adapted for the permanent, temporary or evanescent positioning thereon of characters and, in addition to ordinary media for the reception of written and printed characters, shall include such surfaces as photographic, cinematographic and television screens, and tapes.

"Writing" shall mean the presentation of words by the application of characters to a receptive surface in such a manner that the characters can be detected and distinguished and shall include, for example, writing, printing, duplicating, embossing or indenting, photographic and electro-magnetic reproduction and presentation.

"Alphabetic Writing" shall mean the presentation of words by the adjacent positioning of written characters in linear series.

"Normal vowel value" shall mean the vowel sound ascribed by a reader to a character or group of characters in a word or syllable in which that vowel sound is being pronounced with stress, and "Departure from normal vowel value" shall mean the different vowel sound ascribed by a reader to that same character or group of characters in that same word or syllable in which that vowel sound is being pronounced without stress.

"Shwa" as used to define one form of departure from normal vowel value, shall have the meaning ascribed to that term in "The English Pronouncing Dictionary" (by Daniel Jones M.A. — published by J. M. Dent & Sons, Ltd.) viz: "The colorless, indistinct, neutral

vowel sound represented by the symbol (ə); the unstressed mid-central vowel sound of the two A's in America."

5 "Shwi" as used to define the other form of departure from normal vowel value, shall mean the vowel sound represented in the English Pronouncing Dictionary by the symbol (i); the unstressed vowel sound lying forward of the central position; e.g. the sound of the ultimate
10 unstressed syllable of the English word "very".

"Mean axis of a line of writing" shall denote a notional axial line which passes through the characters in series in the order in which they are written when spelling words, and which
15 divides those characters in general into two halves straddling that line approximately equally on each side.

In a preferred form of the invention, a character or group of characters constituting a stressed word or syllable to be spoken with normal vowel value is positioned to occupy a median position approximately equally straddling the mean axis of the line of writing; while a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwi" is displaced to occupy a position towards one side of the said mean axis, and a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwa" is displaced to occupy a position towards the other side of the said mean axis.

When this invention is applied to conventional written language, in which the mean axis of the line of writing runs from side to side of the receptive surface and the lines are to be scanned successively from top end to the bottom end of the receptive surface, a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwi" is preferably displaced from the median position in a direction towards the top end of the receptive surface, while, by contrast, a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwa" is displaced from the median position in a direction towards the bottom end of the receptive surface.

In order to indicate the relative difference of stressed and unstressed words and syllables, the dimensions of the characters may be varied. This may be effected, in the case of visual characters, by varying their overall height or their thickness or by varying both.

For simplicity, it is also preferred to use a consistent form of alphabet having no distinction in shape between upper and lower case symbols for any character.

Where a font in a single case is employed, capital letters may be indicated by increasing the height and/or thickness of the required character or characters beyond that used for stress indication.

Alternatively, upper and lower case characters of conventional form may be employed.

In most cases it is very advantageous for a systematic alphabetic relationship between characters and sounds to be employed for spelling, and moreover for the appearance of words and syllables so printed, to conserve a close similarity to those print-forms which are conventional in that alphabetic language.

The invention is particularly suitable for use in conjunction with the series of characters or symbols known, in the United Kingdom, as the "Initial Teaching Alphabet", examples of which are given in Table 1 of the accompanying drawings.

The Initial Teaching Alphabet employs, in addition to characters which are identical with or closely similar to lower case symbols of the conventional Roman Alphabet, a number of additional characters which are closely similar to existing print forms such as are used in the case of diphthongs or complex phonic letter combinations. It will thus be appreciated that if the present method is used in conjunction with the Initial Teaching Alphabet, the appearance of words and syllables so printed will conserve a notably closed similarity to conventional print forms.

It has already been indicated that, for the purpose of simplifying the task of the reader, it may be desirable to utilise a font of type in which there is no distinction in shape between the upper and lower case symbol for any particular letter. This is one of the principles incorporated in the Initial Teaching Alphabet. Moreover, there already exists, in the principles of the Initial Teaching Alphabet, a systematic alphabetic relationship between characters and sounds which is employed for spelling.

It will be readily appreciated that the invention includes a teaching or demonstration device, for example a printed sheet or book, comprising an arrangement of printed matter in any alphabetic language, having the words or syllables presented in accordance with the method of this invention, in any one of its forms.

To explain the invention more clearly, it is convenient to set out a passage in English, first in ordinary conventional print form, and then in various ways which adopt the principles of the invention.

The selected passage reads as follows: There are four aspects of learning a foreign language. First of all, everyone wants to be able to listen to it with understanding and then be able to speak it and be understood. Then, of course, they want to be able to read it and also to write it.

Referring now to the tables in the accompanying drawing:—

Table 2 is an example of the passage set out in accordance with the invention and utilising conventional Roman characters wherein the

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characters of stressed words or syllables are conventional upper case letters, and the characters of unstressed words or syllables are conventional lower case letters.

- 5 Table 3 is an example of the passage set out in accordance with the invention and utilising conventional Roman characters but in upper case only, wherein the characters denoting stress are letters of larger size, and the characters denoting lack of stress are letters of smaller size.

- 10 Table 4 is an example of the passage set out in accordance with the invention and utilising conventional Roman characters, but in lower case only, wherein the characters denoting stress are letters of larger size, and the characters denoting lack of stress are letters of smaller size.

- 15 In the examples of Tables 2, 3 and 4, the characters or groups of characters making up a word or syllable having the unstressed vowel sound termed 'Shwa' occupy a position on the lower side of the mean axis of the line of writing, while the characters or groups of characters making up a word or syllable having the unstressed vowel sound termed 'Shwi' occupy a position on the upper side of the mean axis of the line of writing.

- 20 Table 5 is an example of the passage set out using the Initial Teaching Alphabet, but without incorporating the principles of this invention, and

- 25 Table 6 is an example of the passage set out using the Initial Teaching Alphabet and in accordance with the invention, wherein the letters or symbols are all in a single case, the characters denoting stress being of larger size and the characters denoting lack of stress being of smaller size.

- 30 Table 7 shows the preferred way of carrying out this invention and is set in two basic type sizes. The exact point sizes are not particularly significant. What is important is that the smaller characters are approximately 2/3 the size of the larger characters. (There are 72 points in an inch. However, point size is an indication of the vertical height required to print every character, not necessarily of the vertical height of any one printed character; that is, an amateur cannot measure a character as printed and be sure that it is a definite point size.)

- 35 The use of a standard basic relationship between the two type sizes enables variations in stress to be indicated more precisely. In line one "aspects" and "for" are both of the same larger size. However, "aspects" appears in what is called "standard type," and "for" in what is called "semi-bold". The words printed in semi-bold type, like the word "for", receive the strongest stress of all. The words printed in the large standard type, like the word "aspects" receive secondary stress.

- 40 The unstressed syllables or characters all appear in the smaller size type in standard

weight. If they appear flush with the top of the "x" line, as in the last syllable of the last word in the first line, they take the "Shwi" sound of "i" in the word "it". If they appear flush with the bottom of the "x" line, as in the word "ar", they take the "Shwa" sound of "uh". The "x" line simply refers to the vertical space occupied by the printed portion of the lower case letter "x" — if it existed in the Initial Teaching Alphabet — in the larger size type. Also, when we state that the smaller characters appear flush with the bottom or top of the x line, we are referring to characters of the same vertical height as "x".

The means of this invention may also be used in a reading machine, for producing sounds having a recognisable similarity to a spoken language from a written text. Broadly it will be necessary to provide a transducing device adapted automatically to scan and encode the characters of the written text, and to transmit encoded signals corresponding to said characters; and a receiving device adapted automatically to receive and decode the said signals, and to transmute the information conveyed thereby into sounds which recognisably resemble human speech sounds and to emit said sounds, and wherein the position of the characters in the written text controls the nature of the emitted sounds so as to provide a degree of variation in the stress and vowel value of the syllable in the speech sounds so emitted.

WHAT I CLAIM IS:—

1. A receptive surface bearing an arrangement of words in alphabetic writing for the purpose of demonstrating the stressing and vowel value in the spoken word, in which the characters which are used for stressed words or syllables differ from the characters which are used for unstressed words or syllables, and departure from normal vowel value is indicated by variation in the position of individual characters or groups of characters constituting an unstressed word or syllable, relative to the mean axis of the line of writing, according to the nature of the departure from normal vowel value required to be given to the spoken word.

2. A receptive surface according to Claim 1, in which a character or group of characters constituting a stressed word or syllable to be spoken with normal vowel value is positioned to occupy a median position approximately equally straddling the mean axis of the line of writing; while a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwi" is displaced to occupy a position towards one side of the said mean axis, and a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwa" is displaced to occupy a position towards the other side of the said mean axis.

3. A receptive surface according to Claim 130

characters of stressed words or syllables are conventional upper case letters, and the characters of unstressed words or syllables are conventional lower case letters.

5 Table 3 is an example of the passage set out in accordance with the invention and utilising conventional Roman characters but in upper case only, wherein the characters denoting stress are letters of larger size, and the characters denoting lack of stress are letters of smaller size.

10 Table 4 is an example of the passage set out in accordance with the invention and utilising conventional Roman characters, but in lower case only, wherein the characters denoting stress are letters of larger size, and the characters denoting lack of stress are letters of smaller size.

15 In the examples of Tables 2, 3 and 4, the characters or groups of characters making up a word or syllable having the unstressed vowel sound termed 'Shwa' occupy a position on the lower side of the mean axis of the line of writing, while the characters or groups of characters making up a word or syllable having the unstressed vowel sound termed 'Shwi' occupy a position on the upper side of the mean axis of the line of writing.

20 Table 5 is an example of the passage set out using the Initial Teaching Alphabet, but without incorporating the principles of this invention, and

25 Table 6 is an example of the passage set out using the Initial Teaching Alphabet and in accordance with the invention, wherein the letters or symbols are all in a single case, the characters denoting stress being of larger size and the characters denoting lack of stress being of smaller size.

30 Table 7 shows the preferred way of carrying out this invention and is set in two basic type sizes. The exact point sizes are not particularly significant. What is important is that the smaller characters are approximately $\frac{2}{3}$ the size of the larger characters. (There are 72 points in an inch. However, point size is an indication of the vertical height required to print every character, not necessarily of the vertical height of any one printed character; that is, an amateur cannot measure a character as printed and be sure that it is a definite point size.)

35 The use of a standard basic relationship between the two type sizes enables variations in stress to be indicated more precisely. In line one "aspects" and "for" are both of the same larger size. However, "aspects" appears in what is called "standard type," and "for" in what is called "semi-bold". The words printed in semi-bold type, like the word "for", receive the strongest stress of all. The words printed in the large standard type, like the word "aspects" receive secondary stress.

40 The unstressed syllables or characters all appear in the smaller size type in standard

weight. If they appear flush with the top of the "x" line, as in the last syllable of the last word in the first line, they take the "Shwi" sound of "i" in the word "it". If they appear flush with the bottom of the "x" line, as in the word "ar", they take the "Shwa" sound of "uh". The "x" line simply refers to the vertical space occupied by the printed portion of the lower case letter "x" — if it existed in the Initial Teaching Alphabet — in the larger size type. Also, when we state that the smaller characters appear flush with the bottom or top of the x line, we are referring to characters of the same vertical height as "x".

70 The means of this invention may also be used in a reading machine, for producing sounds having a recognisable similarity to a spoken language from a written text. Broadly it will be necessary to provide a transducing device adapted automatically to scan and encode the characters of the written text, and to transmit encoded signals corresponding to said characters; and a receiving device adapted automatically to receive and decode the said signals, and to transmute the information conveyed thereby into sounds which recognisably resemble human speech sounds and to emit said sounds, and wherein the position of the characters in the written text controls the nature of the emitted sounds so as to provide a degree of variation in the stress and vowel value of the syllable in the speech sounds so emitted.

WHAT I CLAIM IS: —

1. A receptive surface bearing an arrangement of words in alphabetic writing for the purpose of demonstrating the stressing and vowel value in the spoken word, in which the characters which are used for stressed words or syllables differ from the characters which are used for unstressed words or syllables, and departure from normal vowel value is indicated by variation in the position of individual characters or groups of characters constituting an unstressed word or syllable, relative to the mean axis of the line of writing, according to the nature of the departure from normal vowel value required to be given to the spoken word.

2. A receptive surface according to Claim 1, in which a character or group of characters constituting a stressed word or syllable to be spoken with normal vowel value is positioned to occupy a median position approximately equally straddling the mean axis of the line of writing; while a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwi" is displaced to occupy a position towards one side of the said mean axis, and a character or group of characters constituting an unstressed word or syllable to be spoken with the vowel sound termed "Shwa" is displaced to occupy a position towards the other side of the said mean axis.

3. A receptive surface according to Claim 130



- 2, in which the mean axis of the line of writing runs from side to side of the receptive surface and the lines are to be scanned successively from top end to the bottom end of the receptive surface, and in which a character or group of characters constituting a word or syllable to be spoken with the vowel sound termed "Shwi" is displaced from the median position in a direction towards the top end of the receptive surface, while a character or group of characters constituting a word or syllable to be spoken with the vowel sound termed "Shwa" is displaced from the median position in a direction towards the bottom end of the receptive surface.
4. A receptive surface according to any of the preceding claims, in which the difference between characters denoting stress or lack of stress is indicated by varying the dimensions of the characters.
5. A receptive surface according to Claim 4, wherein a consistent form of alphabet is employed, having no distinction in shape between upper and lower case symbols for any character.
6. A receptive surface according to Claim 4, in which upper and lower case characters of conventional form are employed.
7. A receptive surface according to any of the preceding claims in which a systematic alphabetic relationship between characters and sounds is employed for spelling.
8. A receptive surface according to Claim 7, in which the appearance of words and syllables on the surface, conserves a close similarity to those print-forms which are conventional in the alphabetic language being used.
9. A receptive surface according to Claim 6, in which any conventional alphabet is employed and the presentation of words is otherwise substantially in accordance with the examples set out in Table 2.
10. A receptive surface according to Claim 4, in which any conventional alphabet is employed and the characters are written in the appropriate upper case form only, the presentation of words being otherwise substantially in accordance with the example set out in Table 3.
11. A receptive surface according to Claim 4, in which any conventional alphabet is employed and the characters are written in the appropriate lower case form only, and the presentation of words is otherwise substantially in accordance with the example set out in Table 4.
12. A receptive surface according to Claim 7, when appendant to Claims 3 and 4, wherein the characters of the Initial Teaching Alphabet are employed and the presentation of words is substantially in accordance with the example set out in Table 6 or Table 7.

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