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(54) Title: A TRANSLITERATION AND PRONUNCIATION SYSTEM

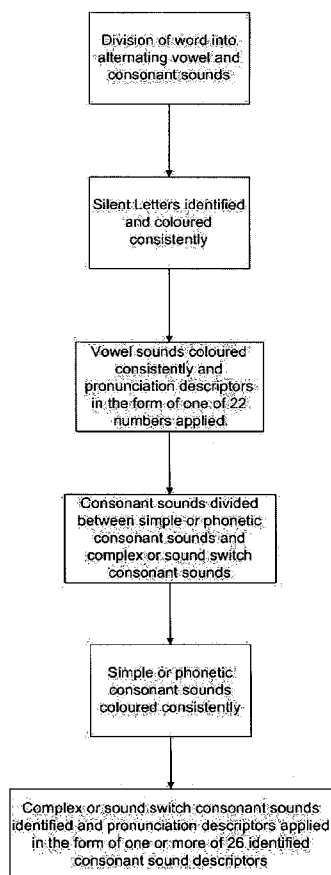


Figure 8

(57) Abstract: A transliteration system for converting primary text in a primary alphabet into transliterated text in coloured text letters or letter groups, at least some of the coloured text having letter identifiers to enable pronunciation of the text in the language of the primary alphabet.

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A transliteration and pronunciation system

Field of the Invention.

The present invention relates to speech and comprehension and particularly to a system for converting printed primary text in a first alphabet in two
5 transliteration text in a second, coded alphabet in order to make the text easy to read.

Background Art.

Today, of all of the languages which use characters to represent the written form, the English language is the most irregular with respect to the manner in which sound or speech is associated with a word and to the letter components with the
10 word, causing difficulty when converting text for reading or speech.

Consider the rules applied to read words such as:

Bat or Cat or Sat

In the above examples, the letter "A" is a particular "a" sound which is completely different to the "a" sound in the word "water" for example, in which, the
15 letter "A" has more of an "or" sound. Indeed, the letter "A" can have up to ten different sounds and may actually have more than one sound when used.

English has the added complexity of sounding very different when spoken in different accents.

The complexity and irregularities associated with English in particular
20 mean that it is a very difficult language to learn. This difficulty is exacerbated when the language is used or learnt by foreigners with English as a second language.

With the advent of the Internet as a communications means, many websites are in English leading to particular difficulties for non-English speakers to fully utilize or access the site.

25 It would therefore be an advance in the art to provide a system whereby printed primary text can be transliterated into coded text to enable pronunciation of the printed primary text in the language of the primary text.

It will be clearly understood that if a prior art publication is referred to herein, this reference does not constitute an admission that the publication forms part
30 of the common general knowledge in the art in Australia or in any other country.

Summary of the Invention.

The present invention is directed to a transliteration and pronunciation system which may at least partially overcome at least one of the abovementioned

disadvantages or provide the consumer with a useful or commercial choice.

With the foregoing in view, the present invention in one form, resides broadly in A transliteration system for converting primary text in a primary alphabet into transliterated text in coloured text letters or letter groups, at least some of the coloured text having letter identifiers to enable pronunciation of the text in the language of the primary alphabet..

The present invention in a more particular form, resides broadly in a transliteration system for converting primary text in a primary alphabet into transliterated text wherein the transliterated text is displayed in the primary alphabet using coloured letters or letter groups with letter identifiers to enable pronunciation of the letters or letter groups within word in the primary text in the language of the primary alphabet whilst preserving the letters in the primary text.

In a more particular form, the invention resides in a transliteration engine for use in conjunction with computer displayed text for converting printed primary text in a primary alphabet into transliterated text in a secondary, coded alphabet wherein the secondary coded alphabet displays the text in coloured text with letter identifiers to enable pronunciation of the text in the language of the primary alphabet whilst preserving the letters in the primary text.

The system of the present invention is based around a sound-to-letter association key which can be used to convert simple monochromatic printed text and international phonetic symbols into a coloured and coded format allowing a user to pronounce the words represented in the monochromatic printed text or international phonetic symbols more simply. According to a preferred embodiment, each letter (or letter group) in a word will normally be provided in a colour or shade dependent upon the pronunciation of the letter or letter group, with the colour of the letters or letter groups being indicative of either a vowel sound, a consonant sound, a sound switch consonant, or a silent letter.

The colour or shade of the letters or letter groups in the transliterated text will preferably allow the user to identify whether the sound of that letter or letter group is a vowel sound, a simple consonant sound, a complex consonant sound or no sound as the letter or letter group is silent. The system of the present invention, by providing transliterated text with pronunciation cues rather than ambiguous phonetic information, is capable of providing user with the ability to speak accented language.

For example, where the system is configured to use Australian English, a transliterated word may include a vowel and consonant groups having a first set of pronunciation descriptors and the same word went transliterated using a system configured to use American English may provide that word with a second, different set of pronunciation descriptors according to the pronunciation of the component parts in the target language.

The colours may typically be embodied in the following manner:

1. a magenta vowel with appropriate superscript represents one of 22 separate vowel sounds;
2. a black consonant is sounded phonetically or a “simple” consonant sound;
3. a blue consonant letter or letter group is provided with an appropriate superscript illustrating the phonetic sound made by the blue consonant letter or letter group or a “complex” consonant sound; and
4. yellow letters and word endings are not sounded.

Irrespective of which four colours are used, the present invention primarily differentiates between a vowel sound, a simple consonant sound, a complex consonant sound or no sound, graphically in the first instance. The system may allow pronunciation of the words primary text in an accented manner in the language of the primary text. The system may be based upon a user reading the transliterated text and pronouncing the words based on phonetics rather than language-specific pronunciation rules, but representing the transliterated text in the primary alphabet, not the phonetic symbol alphabet.

The first or primary alphabet may be an alphabet from any language but will typically be either English or the international phonetic alphabet. Typically, the second alphabet reproduces the letters or symbols of the printed primary text and adjusts each letter or letter group into a particular colour as outlined above. The letter or letter group will also typically be provided with a pronunciation code to be used as a guide for pronunciation, particularly the vowels or its consonant letters or letter groupings which have particular phonetic sounds.

Therefore, the system of the present invention is not a translation system as the transliterated text will preferably appear in the same alphabet as the primary text, thereby preserving the language of the primary text. The transliterated text will simply have letter or letter groups represented in colour for identification

purposes and where appropriate, have pronunciation descriptors added, normally as a superscript or centrally above the letter or letter group. Normally, pronunciation descriptors will be used for vowel sounds and complex consonant sounds but not for silent letters or letter groups nor simple consonant sounds.

5 According to a particularly preferred embodiment, the system will typically include an activation button located on a toolbar in either a computer program or more preferably, an Internet browser interface which will typically activate or perform the transliteration of the primary text into the secondary coded text. The activation button will typically be a shortcut to a program which will perform the
10 transliteration and thereby alter the displayed text.

 Toggling the activation button will normally toggle between the primary and transliterated text.

 The system therefore will typically be embodied in a method for transforming text in a primary alphabet into a secondary alphabet and a computer
15 program or the like which will typically run on one or more computers which will perform the method.

 The system of the present invention will typically involve a computer program or media operating in one of two main ways, namely either searching for each word in the primary text in a database or dictionary of primary text words to find
20 the coded secondary text corresponding to the word in primary text and displaying the coded text corresponding to the primary text word in the position where the primary text word appears, commonly called a "find and replace" program, or alternatively, the computer may undertake an algorithmic conversion of the primary text according to one or more rules governing the conversion into the secondary text.

25 Normally, the algorithmic conversion of the primary text will be performed on individual words which are "new" or "unrecognised" in the primary text. It is preferred that where a word is new or unrecognised in the primary text, the transliteration will normally return an unchanged word. Preferably, the word which is not recognised or is new to the system will be flagged and forwarded to a system
30 administrator who will then be responsible for subjecting the unrecognised word to the algorithmic conversion and adding that word to the database of recognised words.

 The "find and replace" embodiment of the present system will typically be an iterative process, namely the system will search and replace the first word in the

primary text and once complete, move to the next word in the primary text. The system will typically continue to do this until all words in the primary text have been transliterated.

In the "find and replace" embodiment, the system in general and the
5 dictionary or database of recognised words in particular will typically be remote from the point at which a user activates the system, with an activation button located somewhere on a computer page connected to a remote computer or computer network in order to perform the transliteration.

Preferably, the system will operate according to the "find and replace"
10 embodiment when the activation button is engaged. There will normally be a small program implemented on the user's machine which will control the find and replace activity. As mentioned above, the database of recognised words will normally be remote from the user, but it is also anticipated that a database of recognised words may be provided to the user for loading on to a local machine. Where provided in the
15 form for loading onto a local machine, the dictionary or database of recognised words will normally be updatable, typically at prescribed intervals or according to a "push" update system according to which the system administrator will push updates to a local machine as a main or control database of recognised words is updated through the addition of new words which have been converted.

20 According to the algorithmic conversion embodiment, the transliteration will typically be achieved through the application of transliteration rules to the primary text.

The transliteration rules will typically include the following:

Typically, the first step involved in reading printed text is the ability to
25 form pronunciation groups within a word. The pronunciation groups may be one or more letters. For example, a simple consonant will typically be a single letter pronunciation group whereas a single letter vowel may include more than one pronunciation group, a group of vowels may be a single pronunciation group or a group of consonants may include one or more pronunciation group. The pronunciation
30 groups will normally be formed according to the individual sounds made in pronouncing the word.

An important part of the present invention is to convert simple monochromatic printed text into a colour-coded visual representation of the original

monochromatic printed text to simplify the sounding of the syllables and thereby words and paragraphs. Irrespective of the colours used, the system of the present invention differentiates graphically in the first instance.

Irrespective of which four colours are used, the present invention
5 primarily differentiates graphically in the first instance:

1. the magenta vowel sounds are illustrated as follows, with a numerical superscript between 1 and 22 above the magenta vowel;



A reader can then identify that a letter is a vowel by the colour of the letter or letter
10 group, and the particular sound of the vowel by the numerical superscript according to the particular vowel sound out of the 22 base vowel sounds.

2. the black phonetic consonant letter groups alternate with the magenta vowel sounds in the following manner;



15 As can be seen from the above, the black phonetic consonant letters all letters groups do not have a pronunciation descriptor and are simply pronounced phonetically.

In the second instance, the system of the present invention differentiates the sub-dominant consonant letter groups from the dominant or phonetic
20 consonant letter or letter groups as well as differentiating the different sub-dominant consonant letter groups from each other as follows:

3. the blue sound switch consonant letter group whose sounds are represented by letter or letter group superscripts above the blue letters, highlight the phonetic irregularities of some constants or consonant groups as follows;



25

Typically, the letter or letter group superscripts used for sound switch consonant letter groups will be sounded phonetically according to the consonant superscript or where there are more than one consonant present in the superscript, as

each consonant in order of reading

4. the yellow silent letter group represents word components which are not spoken or sounded at all and may represent either a consonant or a vowel in the word.

5 Therefore, the system of the present invention facilitates the syllable by syllable and thereby entire word and paragraph formation by providing instant visual differentiation of the vowel, phonetic, sound switch and silent letter groups as follows:



10 The algorithmic conversion is therefore preferably based upon the separation of all words into a distinct pattern of alternating vowel sounds and consonants. According to the preferred embodiment, the vowel sounds are given a consistent colour to be easily recognized.

15 The system administrator will typically monitor the conversion of new or unrecognised words and their addition to the database of recognised words in case the algorithmic conversion makes errors when converting new or unrecognised words.

20 The system preferably includes a user computer with a graphical user interface and at least one selection tool for selecting and operating programs associated with the graphical user interface, a system computer or computer network containing the dictionary database, and at least one communications pathway between the user computer and the system computer or computer network.

25 Typically, the output from this embodiment of the system will be the transliterated text in colour and with coded pronunciation descriptors added to the text.

In the following discussion, the vowels and consonants are represented by the symbols "V" (in red) and "C" (in black) respectively, although any colour can be used. Indeed, in a preferred embodiment, the vowels are illustrated in red and the consonants in black.

30 The system also preferably differentiates between the sub-dominant

consonant letter groups which may be present in words by using blue text to illustrate a “sound switch” consonant group with pronunciation sounds in superscript above the letter group and silent letters or letter groups for letters which are not sounded (either consonants or vowels).

5 The algorithmic conversion embodiment will then typically transliterate the text in an iterative word by word manner based on the letters or groups of letters in the word and then replacing the letters in the primary text with corresponding secondary alphabet.

10 According to a particularly preferred embodiment, the transliterated secondary text may be associated with further functionality such as an audio recording or one or more still images of the respective word parts in order to assist with the pronunciation of the word. Normally, the secondary text as illustrated on the interface may be selectable via a user using a selection tool, and such selection may normally display or play the audio recording or image(s).

15 Users will typically be able to select text within a larger portion or block of text (whether primary text or secondary text). Where a portion of primary text is selected, activation of the system may transliterate only a portion of the text, or alternatively, where no text is selected, activation of the system may transliterate all of the text appearing on a particular display, page or in a particular document.

20 The system of the present invention may also preferably include representations of a person highlighting the shape and movement of a person's mouth when moving through the initial, middle and final positions of each of the 26 consonant sounds including the sound switch consonant groups, as illustrated in Figure 4. Normally, these representations will be provided as images and more
25 preferred will be provision of the representations in audiovisual means.

Each of the 26 preferred consonant sounds may comprise one or more critical still images as some consonant sounds are sounded as a single sound whereas others are a combination of two or more sounds.

30 Twenty-three of the 26 illustrated system vowel sounds are single sounds, which can therefore be illustrated as a single still. Three of the 26 illustrated system vowel sounds are double sounds and therefore two stills are illustrated, namely an initial and a final consonant sound. All of the stills in each of the consonant sounds are sounded in a single measure of time, regardless of the number of sounds which

produce the consonant sound.

The critical still images and/or audiovisual means will preferably provide representations not only of mouth shape in the formation of each sound but preferably also include tongue position. This may assist with pronunciation generally
5 and accents in particular. It may even convey the slight differences used in accents in the same language.

Each of the critical still images illustrated are in 1/24th of 1 second duration. The critical still images will normally be displayed when a user hovers their selection tool, typically a mouse or similar, over the transliterated text or text portions.

10 An important aspect of the present invention is that the system can be adjusted to account for different accents by using different vowel, consonant and sound switch superscript descriptors. A simple form of the adjustment is illustrated in Figure 5 which illustrates the different superscript descriptors used to indicate the pronunciation of three sample words in “educated English” as compared to “non-
15 educated English”.

In addition, hovering a selection tool, for example a mouse pointer over portions of the transliterated text will preferably produce a visual display of the critical still image of that portion. For example where an individual word is divided into its component parts according to the system, offering a mouse pointer over a
20 component of the word will produce a visual display of the critical still image of that component. By scrolling the mouse pointer across the word, the user can then view the critical still images of each of the component parts of the word one after the other, thereby learning how the word is pronounced. An aural or soundbite of the pronunciation of the component may also be produced.

25 The critical still image may be presented in a toolbar at an upper portion of the display, or adjacent the word itself.

The system of the present invention will typically be accessed via a subscription to the system. There may therefore typically be differences in the rights of users of the system. Also, there may be user access for members of the system and
30 administrator access so that the system administrator can adjust the system or provide improvements or patches or the like.

The subscription to the system will typically involve a monetary charge, typically a predetermined amount in order for access to the system for a

predetermined period. Continued membership by a user to the system will typically be made subject to payment of charge.

There may be some "vetting " of prospective user members and by the system administrator prior to accepting the subscription and allowing the user member
5 access to the system.

The subscription may be used in order to track the use of the system and/or operations performed by the user. For example where the system is used to transliterate Internet Web pages, the system may have an embedded sub-routine allowing the system administrator to gather information about the types of pages that
10 particular users access and once there, the actions performed on such a page. Normally, the system administrator will monitor the usage via a communications network such as the Internet or similar.

The results of any such data gathering may be made available to third party members in order to sell advertising on particular pages for example. The third
15 party members may be required to be members of the system, but may be in a different class of membership to the user members.

As suggested above, the system will typically include an action button located in a program, preferably on a toolbar in a program. Typically, the system of the present invention may be purchased by software manufacturers for a licence fee in
20 order to include the system program of the present invention as a bundle embedded in other manufacturer's software.

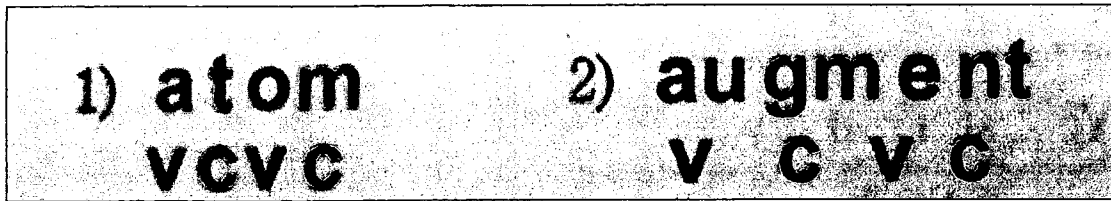
Subscribers may be able to licence the system on a per programme basis or at a single fee for all programs on a particular machine for example.

The system of the present invention as particularly embodied in the
25 computer program embodiment will normally be secured so that it cannot be loaded into other programs or circumvented for use outside the system constraints and monitoring.

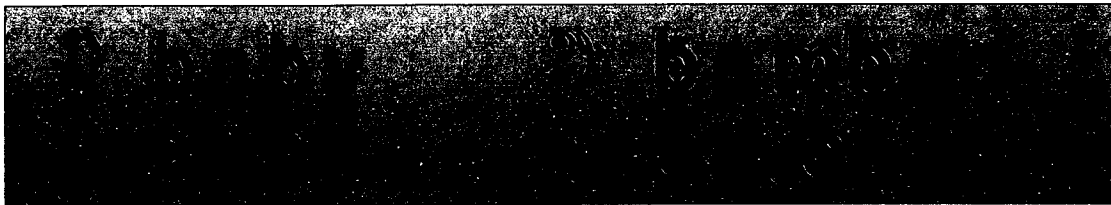
The system of the present invention may also include a pronunciation guide. A pronunciation guide will normally be provided in order to assist the
30 pronunciation of the transliterated text. The pronunciation guide will normally be instructed or applied according to particular rules which will typically include the following:

All words beginning with a vowel sound "a, e, i, o, u" will thereby

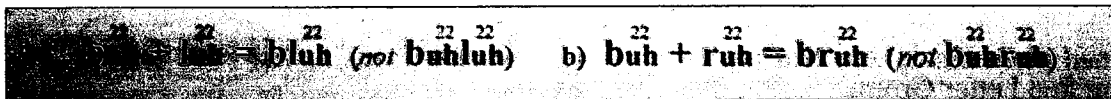
alternate with the consonant component in the words to form words having a pattern such as:



Words beginning with the consonant sounds or letters in the alphabet will alternate with the vowel sounds or letter components to form words having a pattern such as:



The various consonant letters or letter groups are preferably coded according to this preferred embodiment in either black text or blue text as previously discussed. In the words where consonants are used adjacent to each other, the formation of the spoken phonetic consonant clusters typically occurs as follows:



In words where consonants are used adjacent to each other, the formation of the spoken phonetic consonant clusters which include sound switch consonants, typically occurs as follows:



It is to be noted that the pronunciation of the sound switch group of consonants is preferably determined by the vowel letter or group of either side of the sound switch group.

Formation of consonant clusters including silent consonants (which according to the code of the system yellow) will normally occur subject to the above rules relating to spoken phonetic consonant clusters and clusters including sound switch consonants in the following way:



The system of the algorithmic conversion embodiment also deals with the formation of syllables within words. Given that the consonant sounds and the vowel sounds in a word normally alternate with one another, the system preferably has a number of rules for dealing with the formation of syllables as follows:

- 5 (a) When the word begins with a consonant, the following cascading steps are taken –
- 10 i. the default situation is to join a black consonant to an adjacent red vowel to form the first syllable and then proceed through the word joining each black consonant with the following red vowel;
 - ii. follow step (a)(i), and where two black consonants are used in the middle of a word, join the first black consonant with the preceding syllable and the second black consonant is then joined with the following red vowel;
 - 15 iii. follow step (a)(i), and where three black consonants are used in the middle of a word, join the first two black consonants with the preceding syllable and the third black consonant is then joined with the following red vowel;
 - iv. follow step (a)(i), and where two red vowels are used in the middle of a word, join the second red vowel with the following black consonant;
 - 20 v. follow step (a)(i), and where a sound switch consonant is used, treat the sound switch consonant as a black consonant sound;
 - vi. follow step (a)(i), and where a sound switch consonant group is used, divide the sound switch consonant into its component sounds and follow the above rules for division of the component sounds with the preceding and subsequent red vowel sounds.
 - 25
- 30 (b) When the word begins with a vowel, the following cascading steps are taken –
- i. Where there is only one red vowel sound and one black consonant sound, the two are sounded together;
 - ii. where there is only one black consonant after the first red vowel and the black consonant is followed by another red vowel, the

first red vowel is sounded by itself, and then the black consonant is joined to the following red vowel to form the second syllable;

- 5 iii. where two black consonants follow the first red vowel, the
consonants are divided, one joined with the preceding red
vowel and the second black consonant joined to the subsequent
red vowel or sounded by itself;
- 10 iv. follow step (b)(ii) and where two red vowels appear in the
middle of a word, the second red vowel is either sounded by
itself or joined with a subsequent black consonant (if any);
- v. where two red vowels appear at the start of the word, the first
red vowel is sounded by itself, and the second red vowel is
linked with the following black consonant, or blue sound
switch consonant (if any);
- 15 vi. where a blue sound switch consonant group with two consonant
sounds follows a red vowel, divide the sound switch consonant
into its component sounds and follow the above rules for
division of the component sounds with the preceding and
subsequent red vowel sound;
- 20 vii. where a blue sound switch consonant group with more than two
consonant sounds follows a red vowel join the first two sound
switch consonant sounds with the preceding red vowel and the
last with the subsequent red vowel sound.

As can be seen above, the blue sound switch consonant groups will typically be provided with a pronunciation descriptor which includes one or more of 22 vowel sounds and/or one or more of 26 basic consonant sounds.

In a further form, the present invention resides in a transliteration system for converting printed primary text in a primary alphabet into transliterated text in a secondary, coded alphabet wherein the secondary coded alphabet displays the transliterated text in international phonetic symbols to enable pronunciation of the text in the language of the primary alphabet.

The International Phonetic Alphabet (IPA) is a system of phonetic notation based on the Latin alphabet, devised by the International Phonetic Association as a standardized representation of the sounds of spoken language.

5 The IPA is designed to represent only those qualities of speech that are distinctive in spoken language: phonemes, intonation, and the separation of words and syllables. To represent additional qualities of speech such as tooth-gnashing, lisping, and sounds made with a cleft palate, an extended set of symbols called the Extended IPA is used.

10 The IPA is not the only phonetic transcription system in use. The other common Latin-based system is the Americanist phonetic notation, devised for representing American languages, but used by some US linguists as an alternative to the IPA. There are also sets of symbols specific to Slavic, Indic, Finno-Ugric, and Caucasian linguistics, as well as other regional specialties. The differences between these alphabets and IPA are relatively small, although often the special characters of
15 the IPA are abandoned in favour of diacritics or digraphs.

Other alphabets, such as Hangul, may have their own phonetic extensions. There also exist featural phonetic transcription systems, such as Alexander Melville Bell's Visible Speech and its derivatives.

20 The International Phonetic Association recommends that a phonetic transcription should be enclosed in square brackets "[]". A transcription that specifically denotes only phonological contrasts may be enclosed in slashes "/" instead. If one is in doubt, it is best to use brackets, for by setting off a transcription with slashes one makes a theoretical claim that every symbol within is phonemically contrastive for the language being transcribed.

25 Phonetic transcriptions try to objectively capture the actual pronunciation of a word, whereas phonemic transcriptions are model-dependent.

For phonetic transcriptions, there is flexibility in how closely sounds may be transcribed. A transcription that gives only a basic idea of the sounds of a language in the broadest terms is called a *broad transcription*; in some cases this may
30 be equivalent to a phonemic transcription (only without any theoretical claims). A close transcription, indicating precise details of the sounds, is called a *narrow transcription*. These are not binary choices, but the ends of a continuum, with many possibilities in between. All are enclosed in brackets.

Neither transcription makes any claims about the phonemic status of the sounds. Instead, they represent certain ways in which it is possible to produce the sounds that make up the word.

There are also several possibilities in how to transcribe this word phonemically, but here the differences are generally not of precision, but of analysis.

However, phonemic transcriptions may also be broad or narrow, or perhaps it would be better to say abstract vs. concrete. They may show a fair amount of phonetic detail, usually of a phoneme's most common allophone, but because they are abstract symbols they do not need to resemble any sound at all directly. Phonemic symbols will frequently be chosen to avoid diacritics as much as possible, under a 'one sound one symbol' policy, or may even be restricted to the ASCII symbols of a typical keyboard.

Occasionally a transcription will be enclosed in pipes ("| |"). This goes beyond phonology into morphological analysis.

To avoid confusion with IPA symbols, it may be desirable to specify when native orthography is being used, so that, for example, the English word *jet* is not read as "yet". This is done with angle brackets or *chevrons*: *jet*. It is also common to italicize such words, but the chevrons indicate specifically that they are in the original language's orthography, and not in English transliteration.

20 **Iconic**

In *iconic* phonetic notation, the shapes of the phonetic characters are designed so that they visually represent the position of articulators in the vocal tract. This is unlike alphabetic notation, where the correspondence between character shape and articulator position is arbitrary. This notation is potentially more flexible than alphabetic notation in showing more shades of pronunciation. An example of iconic phonetic notation is the Visible Speech system, created by Scottish phonetician, Alexander Melville Bell.

Analphabetic

Another type of phonetic notation that is more precise than alphabetic notation is *analphabetic* phonetic notation. Instead of both the alphabetic and iconic notational types' general principle of using one symbol per sound, analphabetic notation uses long sequences of symbols to precisely describe the component features of an articulatory gesture. This type of notation is reminiscent of the notation used in

chemical formulas to denote the composition of chemical compounds. Although more descriptive than alphabetic notation, analphabetic notation is less practical for many purposes (e.g. for descriptive linguists doing fieldwork or for speech pathologists impressionistically transcribing speech disorders). As a result, this type of notation is
5 uncommon.

Any of the above secondary alphabets may be used in order to render the primary text into a more phonetic equivalent. The secondary text may be coloured as outlined above to indicate the vowels and/or consonants but this may be more difficult with symbol based alphabets.

10 **Brief Description of the Drawings.**

Various embodiments of the invention will be described with reference to the following drawings, in which:

Figure 1 is a representative portion of monochromatic printed text.

Figure 2 is the text of Figure 1 transliterated according to a particularly
15 preferred embodiment of the present invention.

Figure 3 is a graphical illustration of the critical still images of the 22 vowel sounds of the system of a preferred embodiment of the present invention.

Figure 4 is a graphical illustration of the critical still images of the 26 consonant and consonant grouping sounds of the system of a preferred embodiment of
20 the present invention.

Figure 5 is a graphical illustration of an example of the system of a preferred embodiment of the present invention, used to pronounce text in an accent from the transliterated secondary text and the differences required.

Figure 6 is a schematic illustration of a preferred embodiment of the
25 system of the present invention in which the transliteration occurs a central server which contains a database and a plug-in program is provided at a user interface.

Figure 7 is a flow chart illustrating the application of the transliteration algorithm to a portion of primary text.

Figure 8 is a flow chart illustrating the application of the conversion
30 algorithm for converting a new or unrecognised word into a transliterated word in coloured text for addition to the database of transliterated words.

Figure 9 is a flow chart illustrating the preferred method for division of a word beginning with a consonant into syllables according to an aspect of the present

invention.

Figure 9 is a flow chart illustrating the preferred method for division of a word beginning with a vowel into syllables according to an aspect of the present invention.

5 **Detailed Description of the Preferred Embodiment.**

According to a particularly preferred embodiment, a transliteration system is provided.

10 The transliteration system of the preferred embodiment is a transliteration engine for use in conjunction with computer displayed text for converting printed primary text in a primary alphabet into transliterated text in a secondary, coded alphabet wherein the secondary coded alphabet displays the text in coloured text with letter identifiers to enable pronunciation of the text in the language of the primary alphabet whilst preserving the actual letters of the words in the primary text.

15 The system of the present invention is based around an empirical sound-to-letter association key which can be used to convert simple monochromatic printed text and international phonetic symbols into a multicoloured and coded format allowing a user to more simply pronounce the words represented in the monochromatic printed text or international phonetic symbols.

20 According to a particularly preferred embodiment, the system includes an activation button located on a toolbar in a program, typically an Internet browser interface, which activates or performs the transliteration of the primary text into the secondary coded text.

25 The system of the preferred embodiment involves one or more computers searching for each word in the primary text in a database or dictionary of primary text words to find the coded secondary text corresponding to the word in primary text and displaying the coded text to which the primary text word corresponds in the position where the primary text word appears, commonly called a "find and replace" program.

30 The "find and replace" embodiment of the preferred embodiment is an iterative process, namely the system will search and replace the first word in the primary text, and once complete, move to the next word in the primary text. The system continues to do this until all words in the primary text have been transliterated.

primary text, and once complete, move to the next word in the primary text. The system continues to do this until all words in the primary text have been transliterated.

In the “find and replace” embodiment, the dictionary or database is located on a server remote from the point at which a user activates the system, with an
5 activation button located somewhere on a computer page connected to a remote server containing the dictionary database in order to perform the transliteration.

In this embodiment, the system includes a user computer with a graphical user interface and a selection tool for selecting and operating programs associated with the graphical user interface, a system computer or computer network
10 containing the dictionary database, and a communications pathway between the user computer and the system computer or computer network.

Typically, the output from this embodiment of the system is the transliterated text in colour and with coded pronunciation descriptors added to the text.

15 The code is typically embodied in the following manner:

1. a magenta vowel with appropriate superscript represents one of 22 separate vowel sounds;
2. a black consonant is sounded phonetically;
3. a blue consonant is provided with a blue coded superscript illustrating the
20 phonetic sound made by the blue consonant; and
4. yellow letters and E word endings are not sounded.

Irrespective of which four colours are used, the present invention primarily differentiates graphically in the first instance:

5. the magenta vowel sounds are illustrated as follows with a numerical
25 superscript between one and 22 above the magenta vowel;



6. the black phonetic consonant letter groups alternate with the magenta vowel sounds in the following manner;



In the second instance, the system of the present invention differentiates the sub-dominant consonant letter groups from the dominant consonant letter groups as well as differentiating the different sub-dominant consonant letter groups from each other as follows:

- 5 7. the blue sound switch consonant letter group whose sounds are represented by letter or letter group superscripts above the blue letters, highlight the phonetic irregularities of some constants or consonant groups as follows;



- 10 8. the yellow silent letter group represents word components which are not spoken or sounded at all and may represent either a consonant or a power in the word.

The vowel sounds are therefore sounded according to a list of coded vowel sounds and identified by the superscript number above the vowels in the word, the consonants are sounded according to a list of coded consonant sounds, the blue
15 sound switch consonant letter groupings are sounded according to a phonetic superscript provided and the yellow letters are not pronounced.

Therefore, the system of the present invention facilitates the syllable by syllable and thereby entire word and paragraph formation by providing instant visual differentiation of the vowel, phonetic, sound switch and silent letter groups as
20 follows:



Typically, the first step involved in reading printed text is the ability to form syllables within a word.

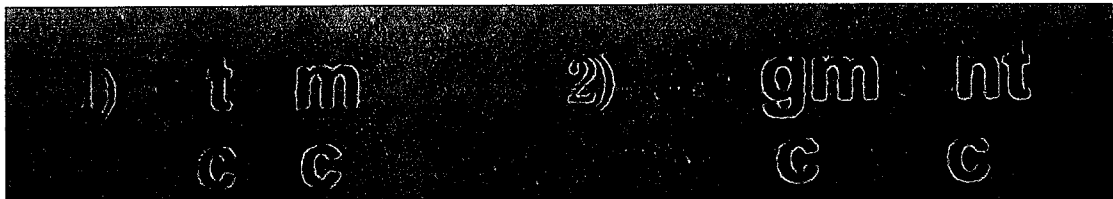
An important part of the present invention is to convert simple
25 monochromatic printed text into a colour-coded visual representation of the original monochromatic printed text to simplify the sounding of the syllables and thereby words and paragraphs. Irrespective of the colours used, the system of the present invention differentiates graphically in the first instance.

As stated above, the present invention is somewhat based upon the

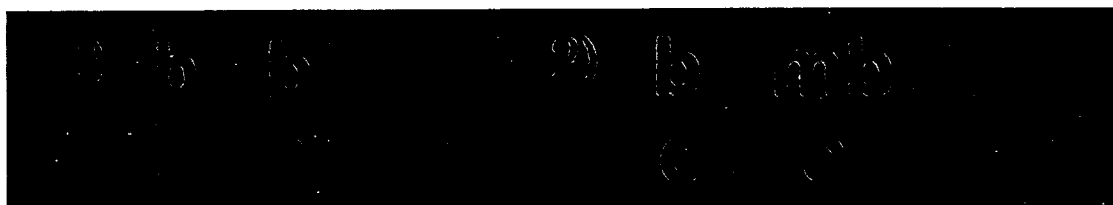
separation of all words into a distinct pattern of alternating vowel sounds and consonants. According to the preferred embodiment, the vowel sounds are given a consistent colour to be easily recognized.

In the following discussion, the vowels and consonants are represented by the symbols "V" (in red) and "C" (in black) respectively. Indeed, in the preferred embodiment, the vowels are illustrated in red and the consonants in black. The system also differentiates between the sub-dominant consonant letter groups which may be present in words by using blue text to illustrate a "sound switch" consonant group with pronunciation sounds in superscript above the letter group and silent letters or letter groups for letters which are not sounded (either consonants or vowels).

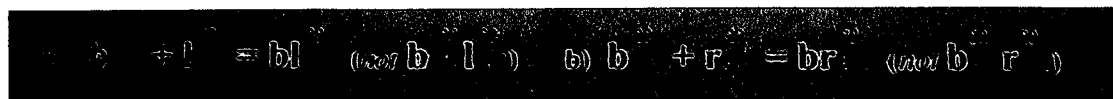
All words beginning with a vowel sound "a, e, i, o, u" will thereby alternate with the consonant component in the words to form words having a pattern such as:



Words beginning with the consonant sounds or letters in the alphabet will alternate with the vowel sounds all letter components to form words having a pattern such as:



The various consonant letters or letter groups are coded according to the present invention in either black text or blue text as previously discussed. In the words where consonants are used adjacent to each other, the formation of the spoken phonetic consonant clusters typically occurs as follows:



In words where consonants are used adjacent to each other, the formation of the spoken phonetic consonant clusters which include sound switch consonants, typically occurs as follows:

It is to be noted that the pronunciation of the sound switch group of consonants is determined by the vowel letter or group of either side of the sound switch group.

- 5 Formation of consonant clusters including silent consonants (which according to the code of the system yellow) will occur subject to the above rules relating to spoken phonetic consonant clusters and clusters including sound switch consonants in the following way:

10 The system of the present invention also deals with the formation of syllables within words. Given that the consonant sounds and the vowel sounds in a word normally alternate with one another according to the present invention, the system preferably has a number of rules for dealing with the formation of syllables as follows:

- 15 (c) When the word begins with a consonant, the following cascading steps are taken –
- 20 i. the default situation is to join a black consonant to an adjacent red vowel to form the first syllable and then proceed through the word joining each black consonant with the following red vowel;
 - 25 ii. follow step (a)(i), and where two black consonants are used in the middle of a word, join the first black consonant with the preceding syllable and the second black consonant is then joined with the following red vowel;
 - 30 iii. follow step (a)(i), and where three black consonants are used in the middle of a word, join the first two black consonants with the preceding syllable and the third black consonant is then joined with the following red vowel;
 - iv. follow step (a)(i), and where two red vowels are used in the middle of a word, join the second red vowel with the following black consonant;

treat the sound switch consonant as a black consonant sound;

- vi. follow step (a)(i), and where a sound switch consonant group is used, divide the sound switch consonant into its component sounds and follow the above rules for division of the component sounds with the preceding and subsequent red vowel sounds.

(d) When the word begins with a vowel, the following cascading steps are taken –

- i. Where there is only one red vowel sound and that one black consonant sound, the two are sounded together;

- ii. where there is only one black consonant after the first red vowel and the black consonant is followed by another red vowel, the first red vowel is sounded by itself, and then the black consonant is joined to the following red vowel to form the second syllable;

- iii. where two black consonants follow the first red vowel, the consonants are divided, one joined with the preceding red vowel and the second black consonant joined to the subsequent red vowel or sounded by itself;

- iv. follow step (b)(ii) and where two red vowels appear in the middle of a word, the second red vowel is either sounded by itself or joined with a subsequent black consonant (if any);

- v. where two red vowels appear at the start of the word, the first red vowel is said by itself, and the second red vowel is linked with the following black consonant, or blue sound switch consonant (if any);

- vi. where a blue sound switch consonant group with two consonant sounds follows a red vowel divide the sound switch consonant into its component sounds and follow the above rules for division of the component sounds with the preceding and subsequent red vowel sound;

- vii. where a blue sound switch consonant group with more than two consonant sounds follows a red vowel join the first two sound switch consonant sounds with the preceding red vowel and the

last with the subsequent red vowel sound.

When the above-mentioned system is applied to printed primary text in a first alphabet, it transliterates the text into a second, coded alphabet wherein the second coded alphabet displays the text in coloured text with letter identifiers to enable pronunciation of the text in the language of the first alphabet. An example is illustrated in Figures 1 and 2 which illustrates the printed primary text and the transliterated text respectively.

Once the text has been transliterated according to the preferred embodiment, the next step is the pronunciation of the words following the pronunciation guides of the colour-coded transliterated text.

The system of the present invention also preferably includes representations of a person highlighting the shape and movement of a person's mouth when moving through the initial, middle and final positions of each of the 22 preferred vowel sounds, as illustrated in Figure 3. Normally, these representations will be provided as images and more preferred will be provision of the representations in audiovisual means.

Each of the 22 preferred vowel sounds may comprise one or more critical still images as some vowel sounds are sounded as a single sound whereas others are a combination of two or more sounds.

Each of the vowel sounds are illustrated in Figure 3. As can be seen from Figure 3, each of the vowel sounds has a superscript descriptor, a corresponding International Phonetic Symbol, the system vowel sound (whether single, double or triple sound) and a critical still which corresponds to the system vowel sound.

Twelve of the 22 illustrated system vowel sounds are single sounds, which can therefore be illustrated as a single still. Eight of the 22 illustrated system vowel sounds are double sounds and therefore two stills are illustrated, namely an initial and a final vowel sound. Two of the 22 illustrated system vowel sounds are triple sounds and therefore three stills are illustrated, namely an initial, a middle, and a final vowel sound. All of the stills in each of the vowel sounds are sounded in a single measure of time, regardless of the number of sounds which produce the vowel sound.

The system of the present invention may also preferably include representations of a person highlighting the shape and movement of a person's mouth

when moving through the initial, middle and final positions of each of the 26 consonant sounds including the sound switch consonant groups, as illustrated in Figure 4. Normally, these representations will be provided as images and more preferred will be provision of the representations in audiovisual means.

5 Each of the 26 preferred consonant sounds may comprise one or more critical still images as some consonant sounds are sounded as a single sound whereas others are a combination of two or more sounds.

 Twenty-three of the 26 illustrated system vowel sounds are single sounds, which can therefore be illustrated as a single still. Three of the 26 illustrated
10 system vowel sounds are double sounds and therefore two stills are illustrated, namely an initial and a final consonant sound. All of the stills in each of the consonant sounds are sounded in a single measure of time, regardless of the number of sounds which produce the consonant sound.

 The critical still images and/or audiovisual means will preferably
15 provide representations not only of mouth shape in the formation of each sound but preferably also include tongue position. This may assist with pronunciation generally and accents in particular. It may even convey the slight differences used in accents in the same language.

 Each of the critical still images illustrated are in 1/24th of 1 second
20 duration. The critical still images will normally be displayed when a user hovers their selection tool, typically a mouse or similar, over the transliterated text or text portions.

 An important aspect of the present invention is that the system can be adjusted to account for different accents by using different vowel, consonant and sound switch superscript descriptors. A simple form of the adjustment is illustrated in
25 Figure 5 which illustrates the different superscript descriptors used to indicate the pronunciation of three sample words in "educated English" as compared to "non-educated English".

 In the present specification and claims (if any), the word "comprising" and its derivatives including "comprises" and "comprise" include each of the stated
30 integers but does not exclude the inclusion of one or more further integers.

 Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present

invention. Thus, the appearance of the phrases “in one embodiment” or “in an embodiment” in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more combinations.

5 In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications
10 within the proper scope of the appended claims (if any) appropriately interpreted by those skilled in the art.

Claims

1. A transliteration system for converting primary text in a primary alphabet into transliterated text in coloured text letters or letter groups, at least some of the coloured text having letter identifiers to enable pronunciation of the text in the language of the primary alphabet.
2. A transliteration system as claimed in claim 1 wherein the transliterated text is displayed in coloured text preserving the letters in the primary text.
3. A transliteration system as claimed in either claim 1 or claim 2 wherein each letter or letter group in a word is provided in a colour or shade dependent upon the pronunciation of the letter or letter group, with the colour of the letters or letter groups being indicative of either a vowel sound, a consonant sound, a sound switch consonant, or a silent letter.
4. A transliteration system as claimed in any one of the preceding claims wherein the colours are used in the following manner:
 - a. a magenta vowel with appropriate superscript representing one of 22 separate vowel sounds for vowels or vowel groups;
 - b. a black consonant for phonetically sounded or "simple" consonant sounds;
 - c. a blue consonant letter or letter group with an appropriate letter or letter group superscript illustrating the phonetic pronunciation sound made by a sound switch consonant group with a phonetically "complex" consonant sound; and
 - d. yellow letters for letters, and letter groups which are not sounded.
5. A transliteration system as claimed in claim 4 wherein the pronunciation sound of the sound switch group of consonants is determined by a vowel letter or group on either side of the sound switch group.
6. A transliteration system as claimed in any one of the preceding claims embodied in a computer program executed on a computer, which when executed loads an activation button onto a toolbar in at least one computer program executed on the computer.
7. A transliteration system as claimed in claim 6 wherein the activation button is a shortcut to a program which will perform the transliteration and thereby alter the displayed text.
8. A transliteration system as claimed in either claim 6 or claim 7 wherein a

database or dictionary of primary text words is provided with each primary text word having a corresponding transliterated word associated therewith.

9. A transliteration system as claimed in claim 8 wherein when the activation button is engaged, the program searches for each word in the primary text in the database to find the transliterated text corresponding to the word in primary text and displays the transliterated text corresponding to the primary text word in the position where the primary text word appears.
10. A transliteration system as claimed in claim 9 wherein an algorithmic conversion of the primary text is performed on individual words which are unrecognised in the search of the primary text in the database, the transliteration system returning an unchanged word in the primary text, forwards the unrecognized word algorithmic conversion and adding that word to the database of recognised words once converted.
11. A transliteration system as claimed in either claim 9 or claim 10 wherein the searching is an iterative process until all words in the primary text have been transliterated or deemed unrecognized whereupon the system will return the transliterated text.
12. A transliteration system as claimed in any one of the preceding claims wherein each letter or letter group in the transliterated text is associated with one or more still images of a person highlighting the shape and movement of a person's mouth when moving through the positions of the mouth in pronunciation of the respective letter or letter group in order to assist with the pronunciation of the word.
13. A transliteration system as claimed in claim 12 wherein a sound recording of the respective letter or letter group is also provided for playback.
14. A transliteration system as claimed in either claim 12 or claim 13 wherein all critical still images are sounded in a single measure of time, regardless of the number of sounds which produce the sound.
15. A transliteration system as claimed in any one of claims 12 to 14 wherein the critical still images provide representations not only of mouth shape in the formation of each sound but also include tongue position.
16. A transliteration system as claimed in any one of the preceding claims wherein access to a system is via a subscription.

17. A transliteration system as claimed in any one of the preceding claims wherein an algorithmic conversion of a word into a transliterated word utilises the formation of pronunciation syllables within words.

5 18. A transliteration system as claimed in claim 17 wherein during algorithmic conversion of a word, the following cascading steps are taken when the word begins with a consonant:

- a. the default situation is to join a black consonant to an adjacent red vowel to form the first syllable and then proceed through the word joining each black consonant with the following red vowel;
- 10 b. follow step (a), and where two black consonants are used in the middle of a word, join the first black consonant with the preceding syllable and the second black consonant is then joined with the following red vowel;
- 15 c. follow step (a), and where three black consonants are used in the middle of a word, join the first two black consonants with the preceding syllable and the third black consonant is then joined with the following red vowel;
- d. follow step (a), and where two red vowels are used in the middle of a word, join the second red vowel with the following black consonant;
- 20 e. follow step (a), and where a sound switch consonant is used, treat the sound switch consonant as a black consonant sound;
- f. follow step (a), and where a sound switch consonant group is used, divide the sound switch consonant into its component sounds and follow the above rules for division of the component sounds with the preceding and subsequent red vowel sounds.
- 25

19. A transliteration system as claimed in either claim 17 or 18 wherein during algorithmic conversion of a word, the following cascading steps are taken when the word begins with a vowel:

- a. Where there is only one red vowel sound and one black consonant sound, the two are sounded together;
- 30 b. where there is only one black consonant after the first red vowel and the black consonant is followed by another red vowel, the first red vowel is sounded by itself, and then the black consonant is joined to the

- following red vowel to form the second syllable;
- 5 c. where two black consonants follow the first red vowel, the consonants are divided, one joined with the preceding red vowel and the second black consonant joined to the subsequent red vowel or sounded by itself;
- d. follow step (b)(ii) and where two red vowels appear in the middle of a word, the second red vowel is either sounded by itself or joined with a subsequent black consonant (if any);
- 10 e. where two red vowels appear at the start of the word, the first red vowel is sounded by itself, and the second red vowel is linked with the following black consonant, or blue sound switch consonant (if any);
- f. where a blue sound switch consonant group with two consonant sounds follows a red vowel, divide the sound switch consonant into its component sounds and follow the above rules for division of the component sounds with the preceding and subsequent red vowel sound;
- 15 g. where a blue sound switch consonant group with more than two consonant sounds follows a red vowel join the first two sound switch consonant sounds with the preceding red vowel and the last with the subsequent red vowel sound.
- 20 20. A transliteration engine for use in conjunction with computer displayed text for converting printed primary text in a primary alphabet into transliterated text in a secondary, coded alphabet wherein the secondary coded alphabet displays the text in coloured text, at least some of the coloured text having letter identifiers to enable pronunciation of the text in the language of the primary alphabet.
- 25 21. A transliteration system for converting printed primary text in a primary alphabet into transliterated text in a secondary, coded alphabet wherein the secondary coded alphabet displays the transliterated text in international phonetic symbols to enable pronunciation of the text in the language of the primary alphabet.

Today, of all languages which use alpha characters to represent the written form, the English language is the most irregular with respect to the way in which sound or speech is associated to whole words and to the letter components within them, representing 99% of all difficulty when decoding text in reading and speech itself where English is secondary.

Phonetisation Of English

For at least 200 years, governments, universities and scholars have looked for a 1 to 1 sound to letter correlation to make the language of English 100% Phonetic. The idea was to lift Phonetisation of the English language from its current 38%-43% to 100% Phonetisation for advanced reading and enunciation for the purpose of eliminating illiteracy and to raise IQ from 100 score average to 120+.

The DD-Code and related applications could eliminate illiteracy of English worldwide and facilitate children of 5 years read & speak any and all printed text, some 2,000,000 words, by learning the code or rule for just One Word, or what is more specifically defined as "reading on the adult level" from first or immediate exposure to The DD-Code even at this age.

The Master Key

The Master Key covering some Two Million Words of English, with a myriad of sound to letter code irregularities and complexities, compounded & compiled over the past 4000 years, is now determined by a single 4-Way Sound to Letter Key: The DD-Code.

Children will be able to read and decode any and all printed text of any accent of English, without these kids really knowing the difficulty of the generations that preceded them with respect to learning the Language of English.

Figure 1

Today, of all languages which use alphabetic characters to represent the written form, the English language is the most irregular with respect to the way in which sound or speech is associated to words and to the letter components within them, representing 99% of all difficulty when decoding text in reading and speech itself where English is secondarily.

Phonetisation Of English

For at least 200 years, governments, universities and scholars have looked for a 1 to 1 sound to letter correlation to make the language of English 100% Phonetic. The idea was to lift Phonetisation of the English language from its current 38%-43% to 100% Phonetisation for advanced reading and enunciation for the purpose of eliminating illiteracy and to raise IQ from 100 score average to 120+.

The DD-Code and related applications could eliminate illiteracy of English worldwide and facilitate children of 5 years read & speak any and all printed text, some 2,000,000 words by learning the code or rule for just One Word, or what is more specifically defined as "reading on the adult level" from first or immediate exposure to The DD-Code even at this age.

The Master Key

The Master Key covering some Two Million Words of English, with a myriad of sound to letter code irregularities and complexities, compounded & compiled over the past 4000 years is now determined by a single 4-Way Sound to Letter Key. The DD-Code.

Children will be able to read and decode any and all printed text in any accent of English, without the usual difficulties of the current system. The DD-Code is the most efficient and longest lasting method of English.

Figure 2

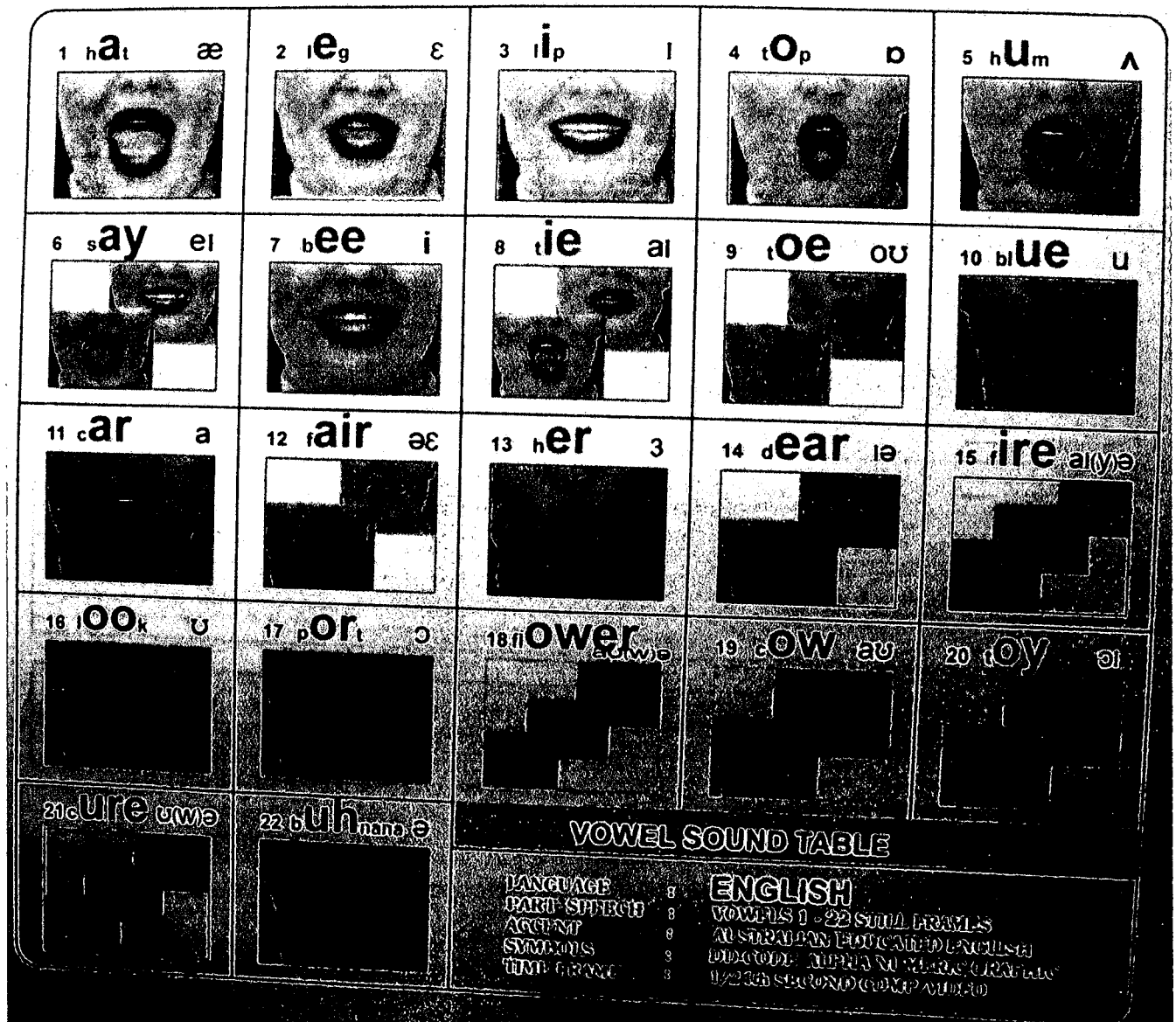


Figure 3

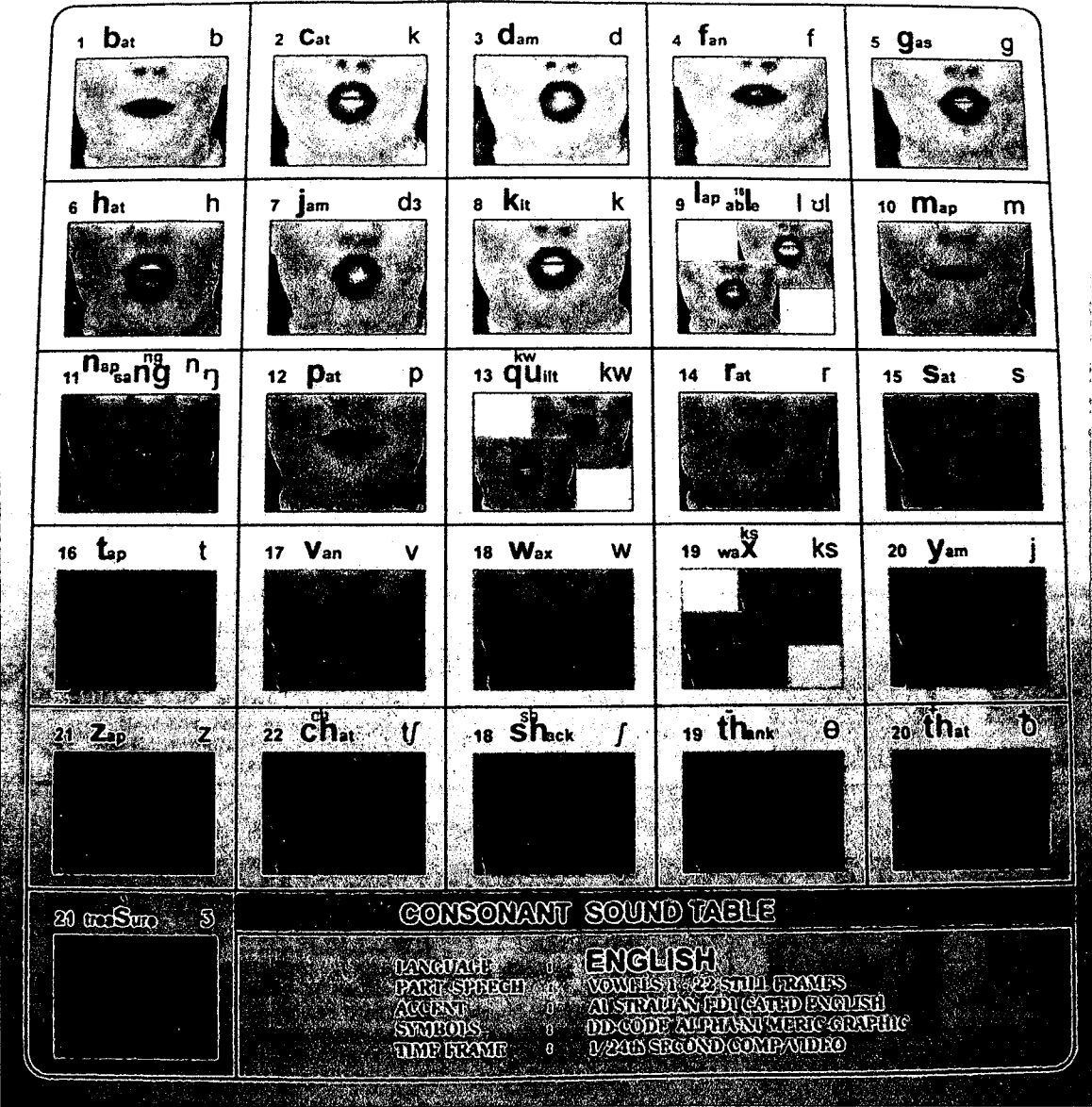


Figure 4

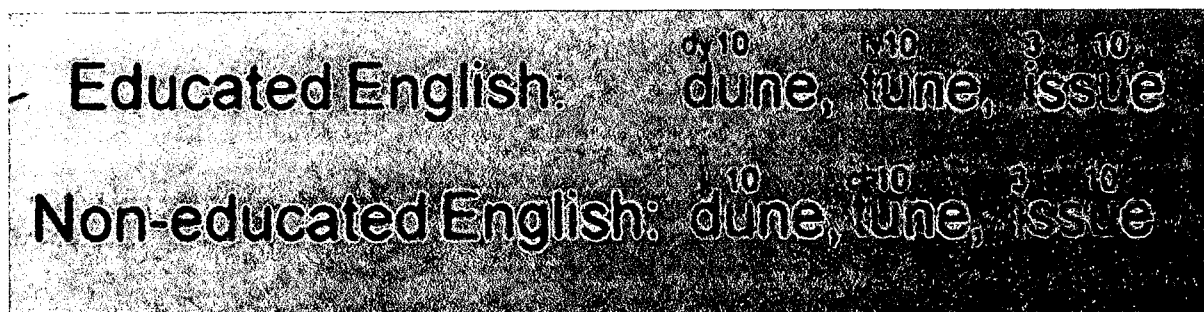


Figure 5

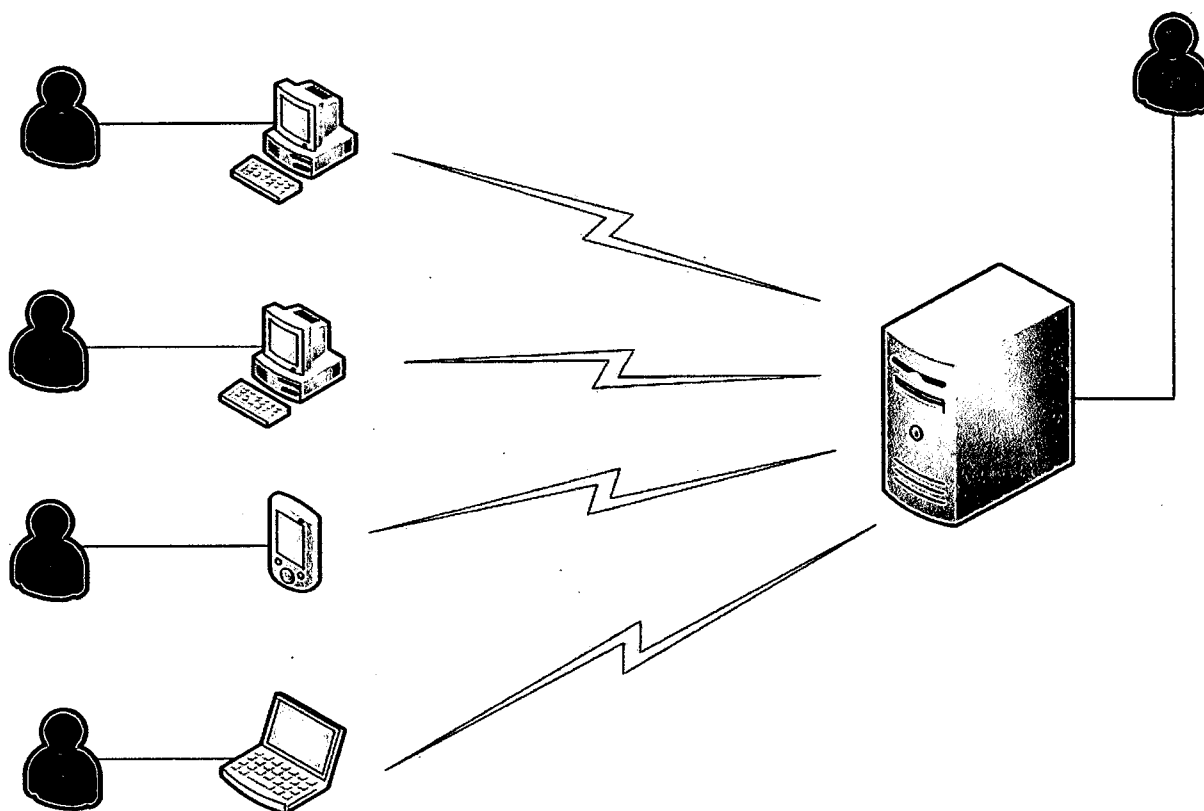


Figure 6

6/9

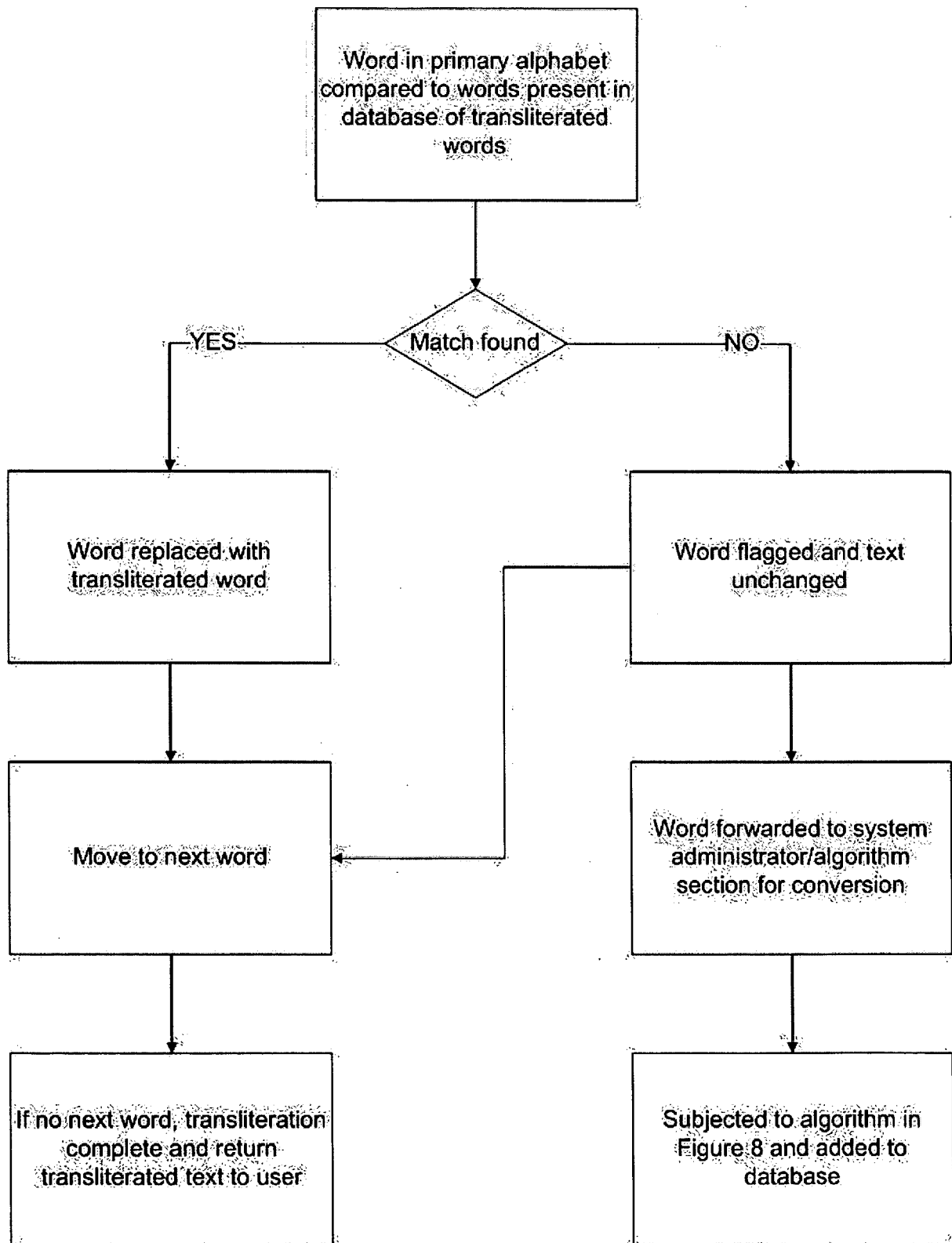


Figure 7

7/9

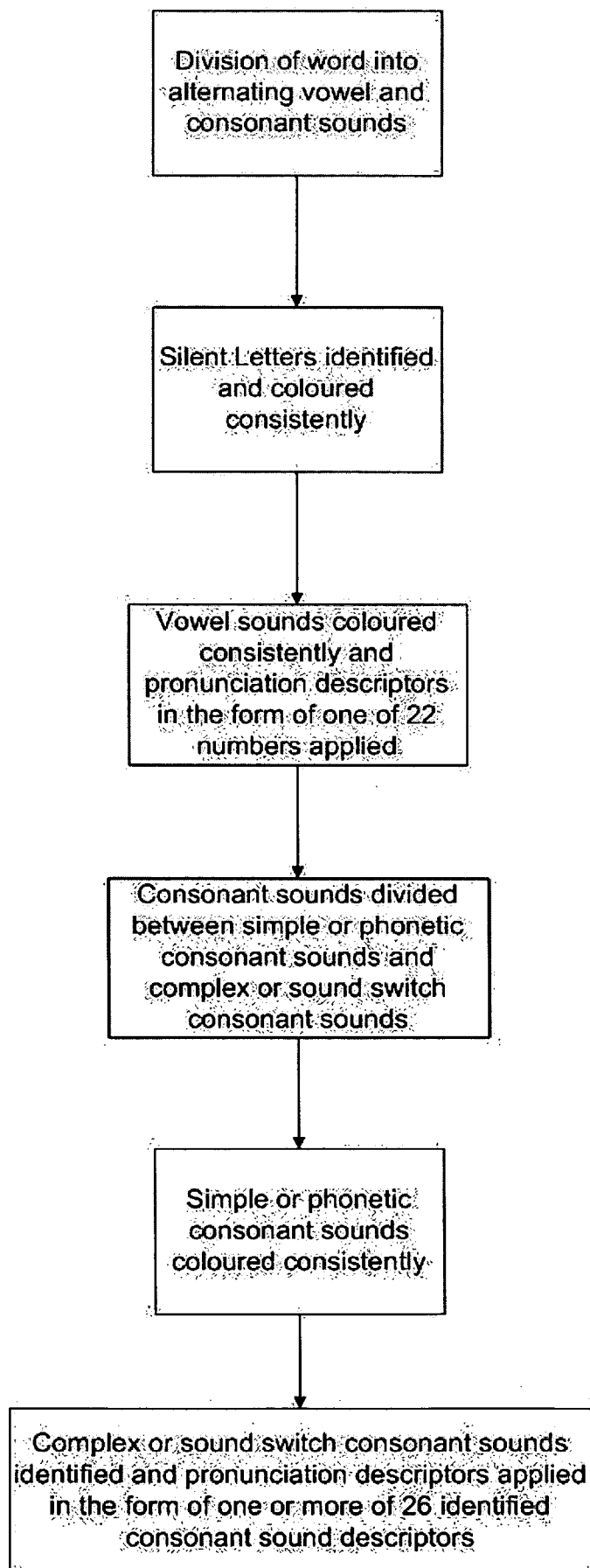


Figure 8

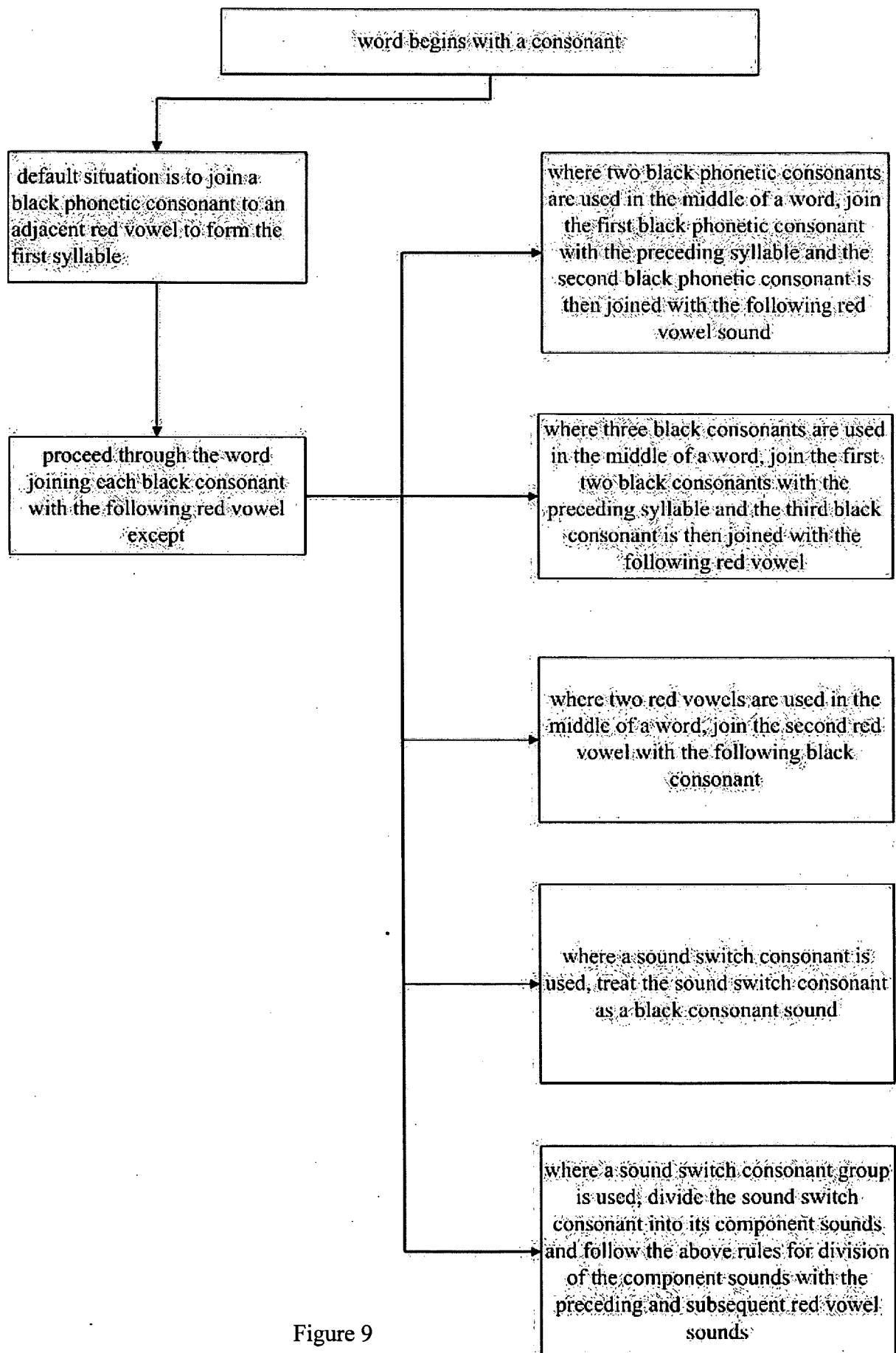


Figure 9

9/9

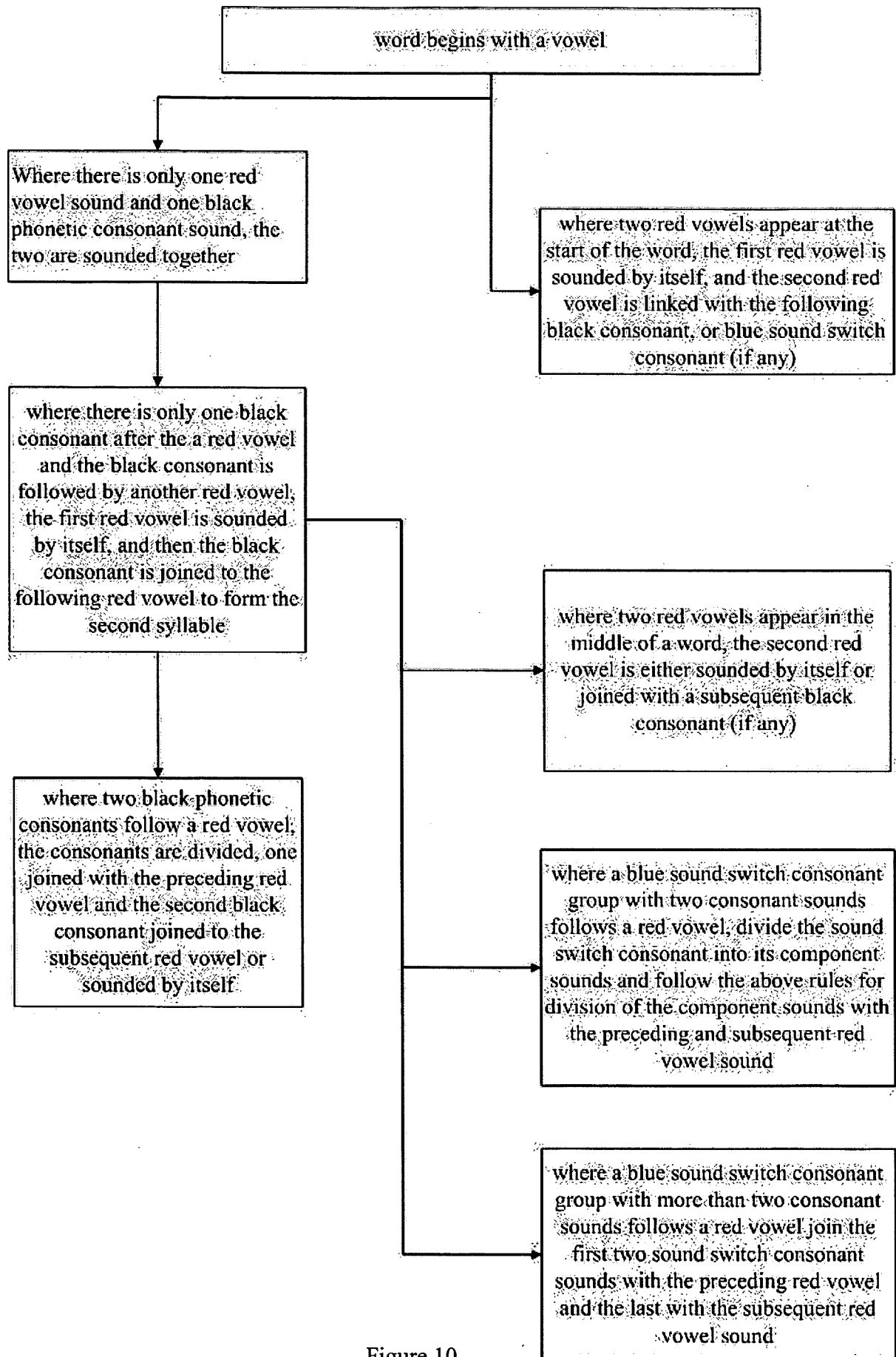


Figure 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2009/000077

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

G06F 17/28 (2006.01)

G09B 1/00 (2006.01)

G09B 19/04 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Epodoc, WPI, Google Patents Search: keywords : transliteration, pronunciation, colour coded and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3715812 (NOVAK) 13 February 1973 column 2, lines 5-20; column 3, lines 25-67; column 4, lines 28-30; column 10, lines 14-23 ; Figs. 1-7	1-4, 6-7, 16-19
Y	column 2, lines 5-20; column 3, lines 25-66; Figs. 1-7;	5, 8-15, 20
	US 6126447 A (ENGELBRITE) 3 October 2000	
X	abstract; column 3, lines 5-10, 24-57; column 2, lines 30-31; Figs. 1-6	1-4, 6-7, 16-19
Y	abstract; column 3, lines 5-10, 24-57; Figs. 1-6	5, 8-9, 12-15, 20

☒ Further documents are listed in the continuation of Box C

☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
06 May 2009

Date of mailing of the international search report
25 MAY 2009

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2009/000077

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	US 4115932 (CHARLESWORTH) 26 September 1978	
X	column 1, lines 12-33;	1
Y	column 2, line 60-column 4, line 22	5
	US 4443199 (SAKAI) 17 April 1984	
X	abstract; column 1, lines 24-35; column 2, lines 55-61; column 3, lines 16-20	1, 21
	US 2005/0182616 A1 (KOTIPALLI) 18 August 2005	
Y	abstract, para. [0015]	20
	US 6996520 B2 (LEVIN) 7 February 2006	
Y	column 6, lines 38-47; column 7, lines 53-59; column 8, lines 15-23; claims 8-9	8-11
	US 5286205 A (INOUE et al.) 15 February 1994	
Y	abstract; column 2, lines 59-68; column 3, lines 54-57; column 3 line 65 – column 4 line 3; Figs. 1-10; claim 1	12-15

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2009/000077

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- Claims 1-20 are directed to converting primary text into transliterated text using colours to identify different sounds so as to enable ease of pronunciation. It is considered that having coloured text while preserving letters in primary text comprises a first distinguishing feature.
 - Claim 21 is directed towards converting primary text into transliterated text in a secondary coded alphabet. It is considered that generating secondary coded alphabet and displaying the transliterated text in international phonetic symbols comprises a second distinguishing feature.
1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
 2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
 3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
 4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2009/000077

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member		
US	3715812	NONE			
US	6126447	NONE			
US	4115932	NONE			
US	4443199	NONE			
US	2005182616	NONE			
US	6996520	AU 2003287664	AU 2003290955	AU 2003291049	
		EP 1567945	EP 1576586	EP 1588283	
		US 2004102201	US 2004102956	US 2004102957	
		WO 2004049110	WO 2004049195	WO 2004049196	
US	5286205	NONE			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
END OF ANNEX					