

**(12) PATENT APPLICATION**  
**(19) AUSTRALIAN PATENT OFFICE**

**(11) Application No. AU 200069697 A1**

(54) Title  
**Apparatus for displaying characters of at least two distinct types received in the form of a stream coming from central unit**

(51)<sup>7</sup> International Patent Classification(s)  
**G09G 005/00 G09F 009/00**

(21) Application No: **200069697**

(22) Application Date: **2000.11.02**

(30) Priority Data

(31) Number	(32) Date	(33) Country
<b>9913795</b>	<b>1999.11.04</b>	<b>FR</b>

(43) Publication Date : **2001.05.10**

(43) Publication Journal Date : **2001.05.10**

(71) Applicant(s)  
**ALCATEL**

(72) Inventor(s)  
**Alexis Duvillier**

(74) Agent/Attorney  
**FREEHILLS CARTER SMITH BEADLE,MLC Centre,Martin Place,SYDNEY NSW 2000**

## A B S T R A C T

The invention proposes display apparatus for displaying characters of at least two types, referred to as characters of a first type and as characters of a second type, the apparatus comprising a screen reproducing in legible character form encoded characters received in a data stream. Characters of the first and second types are reproduced on the screen with respective mutually distinct formats when only one type of character is received in a given data stream. The invention includes a detector for detecting an element that indicates the existence of at least two types of character in the same received data stream in order to activate selection of a common display format on said screen of the characters of said first and second types.

**CLAIMS**

1 Display apparatus for displaying characters of at least two types, referred to as a first type and as a second type, the apparatus comprising a screen reproducing in graphic and legible character form the encoded characters received in a data stream, the characters of said first and second types being reproduced on said screen with respective mutually distinct formats when only one type of character is received in a given data stream, the apparatus including a detector for detecting an element that indicates the existence of at least two types of character in the same received data stream in order to activate selection of a common display format on said screen for characters of said first and second types.

2 Display apparatus according to claim 1, wherein said screen is an LCD screen associated with a video memory, and wherein the apparatus includes an interpreter for interpreting the received encoded characters as bits which are written in memory cells of a video memory associated with respective pixels of said screen.

3 Display apparatus according to claim 2, wherein said interpreter operates with at least two display formats, said two display formats being used for characters of said first and second types respectively when only one type of character is received in a given stream, and a single display format, comprising either one of said two display formats or a third display format, is used for both types of character when they are received in the same data stream.

4 A terminal, including display apparatus according to any one of claims 1 to 3, said terminal being either a fixed terminal or a mobile terminal.

5 A central unit transmitting successive data streams to at least one terminal according to claim 4, a data stream comprising encoded characters to be reproduced in the form of legible characters on a screen of said terminal, said data stream comprising either only characters of a first type, or only characters of a second type, or indeed characters of at least said first and second types, said central unit inserting an element in an initial portion of the data stream to indicate the existence of at least two types of character in said data stream when said data stream comprises at least characters of said first and second types.

FIG.1

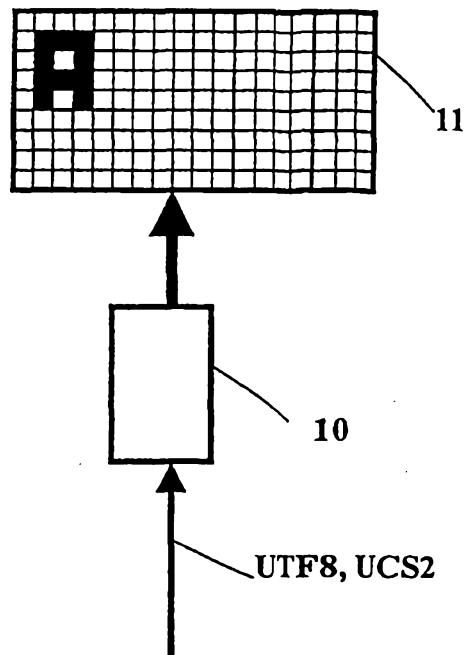
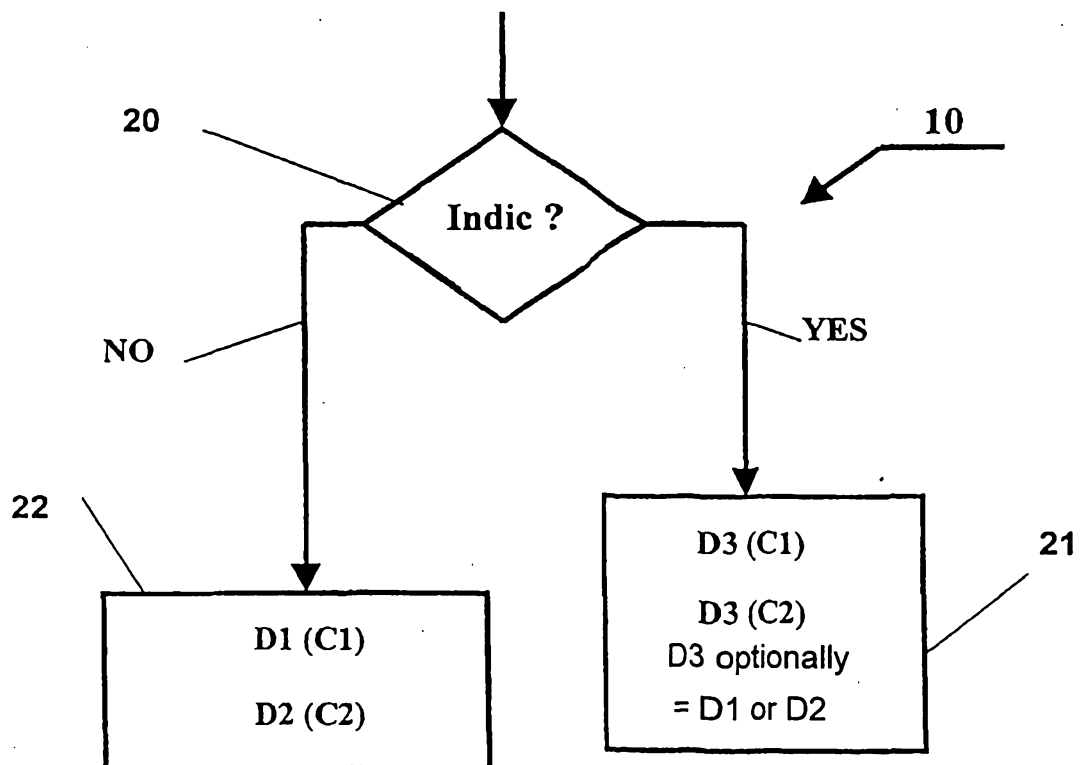


FIG.2



AUSTRALIA

*Patents Act 1990*

**ORIGINAL  
COMPLETE SPECIFICATION  
STANDARD PATENT**

Invention Title:      Apparatus for displaying characters of at least two distinct types received in the form of a data stream coming from a central unit

The following statement is a full description of this invention, including the best method of performing it known to us:

**APPARATUS FOR DISPLAYING CHARACTERS OF AT LEAST TWO DISTINCT TYPES RECEIVED IN THE FORM OF A DATA STREAM COMING FROM A CENTRAL UNIT**

**FIELD OF THE INVENTION**

5        The present invention relates in general to apparatus for displaying at least two distinct types of characters. These various types of character, e.g. European characters and Chinese characters, are received by a display apparatus in the form of a stream of successive data items coming from a central unit. By way of example, in an Internet environment, each data stream forms a portion of the information that is transmitted in a hypertext markup language (HTML) or in a wireless markup language (WML) in order to display a page.

**BACKGROUND OF THE INVENTION**

15        It is known to encode characters of different types in the form of encoded characters, e.g. by using the UTF8 or UCS2 alphabet as standardized by the standards authorities, typically for interpretation after reception by an Internet browser.

20        An Internet type network now makes it possible to access information distributed over the entire world. The information is stored in data bases or "servers" that are accessible by means of a terminal which may be fixed (e.g. a TV, a PC) or mobile (e.g. a mobile telephone) and that includes display apparatus. Some servers could contain characters of different types, for example European characters and Chinese characters, that are already encoded and that can be transmitted to a terminal in a single stream of encoded characters. The display apparatus typically comprises an interpreter which receives the stream of encoded characters and which responds by displaying the associated characters on a screen, e.g. an LCD or a bitmap, by illuminating pixels on the screen. As shown in Figure 1, the interpreter 10 receives the stream of encoded characters, e.g. using the UTF8 alphabet or the UCS2 alphabet or indeed the ISO-LATIN-ONE alphabet, etc. ..., and it controls the display of the corresponding characters on a screen 11 over a control bus. In a manner known for an LCD type screen, the screen 11 is associated with a video memory (not shown). The interpreter 10 writes "0" or "1" bits in

memory cells of the video memory that are associated with respective corresponding pixels of the screen 11. The video memory is scanned periodically in read mode for the purpose of illuminating each of the pixels that corresponds to a memory cell in the "1" state.

Typically, the interpreter is initialized as a function of the type of each received character. Since all languages do not use identical characters or ideograms, it can be necessary to display characters of some given language with a display size or dimension on the screen that is greater than the size required for some other language so as to ensure that the characters are equally distinguishable.

The more numerous and more complex the characters in any one language, the greater the display size or resolution level that needs to be given to each character in order to make it easy to read and to enable the user to distinguish between such characters.

When a display apparatus receives characters of different types, e.g. European characters and Chinese characters, the above described technique then leads to certain characters in one given type being displayed on the screen with one format while other characters of another type are displayed with another format, giving rise to a display of successive characters of different types that is poor in appearance, or even illegible. The term "format" is used herein to designate the size or dimension used by each character. The term "character" designates either a letter of an alphabet such as Arabic, European, or Russian, or an ideogram for a language such as Chinese or Japanese.

The applicant does not concede that the prior art discussed in the specification forms part of the common general knowledge in the art at the priority date of this application.

## SUMMARY OF THE INVENTION

An object is thus to provide a central unit suitable for informing the display apparatus that characters of different types exist in the transmitted character stream. Another object of the invention is to provide display apparatus suitable for

providing an optimal display of the received encoded characters as a function of the information supplied by said central unit.

To this end, the invention provides display apparatus for displaying characters of at least two types, referred to as a first type and as a second type, the apparatus comprising a screen reproducing in graphic and legible character form the encoded characters received in a data stream, the characters of said first and second types being reproduced on said screen with respective mutually distinct formats when only one type of character is received in a given data stream, the apparatus including a detector for detecting an element that indicates the existence of at least two types of character in the same received data stream in order to activate selection of a common display format on said screen for characters of said first and second types.

In a variant of the invention, the screen is an LCD screen associated with a video memory, and it includes an interpreter for interpreting the received encoded characters as bits which are written in memory cells of a video memory associated with respective pixels of said screen. This interpreter operates with at least two distinct display formats, the two display formats being used respectively for characters of the first type and for characters of the second type when only one type of character is received in a given data stream. However, a single display format, which can be one of said two display formats, is used for both types of character when both types are received in the same data stream.

The invention also provides for a terminal including the display apparatus, wherein the terminal may be either a fixed terminal or a mobile terminal.

The invention also provides a central unit transmitting data streams. This central unit transmits



successive data streams to at least one terminal, a data stream comprising encoded characters to be reproduced in the form of legible characters on a screen of said terminal, the data stream comprising either only  
 5 characters of a first type, or only characters of a second type, or indeed characters of at least said first and second types, said central unit inserting an element in an initial proton of the data stream to indicate the existence of at least two types of character in said data  
 10 stream when said data stream comprises at least characters of said first and second types.

#### BRIEF DESCRIPTION OF THE DRAWING

Other characteristics and advantages of the present invention will appear more clearly on reading the following description given with reference to the accompanying drawing, in which:

- Figure 1 is a block diagram of display apparatus; and

- Figure 2 is a flow chart of an algorithm included in an interpreter of received encoded data, forming a portion of the Figure 1 apparatus.

#### MORE DETAILED DESCRIPTION

In the invention, a central unit transmits successive data streams to at least one remote terminal, which may be fixed or mobile. Each data stream transmitted by the central unit includes characters in an encoded form that are to be reproduced in the form of characters that can be read on the screen of the terminal. The data stream comprises either only  
 25 characters of a first type, or only characters of a second type, or indeed at least characters of both the first type and the second type. For example, each data stream can be an HTML page, or an extensible markup language (XML) page corresponding to an HTML page after  
 30 translation by a gateway in application of the recommendations of the wireless access protocol (WAP) forum. According to the invention, the central unit  
 35

inserts in an initial portion of the data stream to be transmitted an element that indicates the existence of at least two types of character in the data stream when the data stream includes at least one character of the first type and at least one character of the second type. For this purpose, prior to transmitting the data stream, the central unit analyzes the content of the data stream whose characters are to be displayed on the screen of the terminal, which characters are in encoded form, e.g. using the UTF8 alphabet or the UCS2 alphabet. As soon as the presence of two types of character is detected, the central unit inserts said element indicating the existence of at least two types of character in the data stream.

As shown in Figure 2, the interpreter 10 of the invention includes a detector 20 for detecting an "Indic" element that indicates the existence of at least two types of character in a single received data stream, in order to activate selection of a common display format on said screen for displaying said characters of the first and second types, when both of these types of character are present in the received data stream. As described above, and by way of example for an LCD type of screen, the screen 11 is associated with a video memory. The interpreter 10 writes binary "0" or "1" digits into the memory cells of said video memory that are associated with respective pixels of the screen 11. The video memory is scanned periodically in read mode to switch on each of the screen pixels that corresponds to a memory cell in the "1" state. The interpreter 10 then activates internal display management means which can be implemented partially or completely in software form to manage the video memory as a function of the received successive encoded characters. As shown by steps 21 and 22 in Figure 2, if no "Indic" element indicating the existence of at least two types of character in a given received data stream is detected, then the interpreter 10

activates either that one of the display management means D1 that is appropriate for displaying characters C1 of the first type, or that one of the display management means D2 that is appropriate for displaying characters C2 of the second type. Which one of these two display means D1 or D2 is selected depends on the type of the first character to be received.

However, if an "Indic" element indicating the existence of at least two types of character in the same received data stream is detected (20), then the interpreter 10 activates common display management means D3 for using the same format to display both characters C1 of the first type and characters C2 of the second type. In the context of the invention, the term "display management means" is used to distinguish between circuits implemented partially or completely in software form for processing received encoded characters and using distinct display formats on the screen 11. In the invention, the common display management means D3 used for displaying both characters C1 of the first type and characters C2 of the second type can use the display format of one or other of the two display means D1 and D2, or else some other display format that is distinct from the respective display formats of the display means D1 and D2.

In the above description, the term "screen" is used to designate all or part of a display medium. It could well be the case that the display medium, e.g. for ergonomic reasons, is split into two portions, one portion for displaying a menu and another portion for displaying received data. Under such circumstances, the portion allocated to displaying the menu could well use characters of a size greater than that used for the received data, and this can be independent of the way the invention is implemented.

**CLAIMS**

1 Display apparatus for displaying characters of at least two types, referred to as a first type and as a second type, the apparatus comprising a screen reproducing in graphic and legible character form the encoded characters received in a data stream, the characters of said first and second types being reproduced on said screen with respective mutually distinct formats when only one type of character is received in a given data stream, the apparatus including a detector for detecting an element that indicates the existence of at least two types of character in the same received data stream in order to activate selection of a common display format on said screen for characters of said first and second types.

2 Display apparatus according to claim 1, wherein said screen is an LCD screen associated with a video memory, and wherein the apparatus includes an interpreter for interpreting the received encoded characters as bits which are written in memory cells of a video memory associated with respective pixels of said screen.

3 Display apparatus according to claim 2, wherein said interpreter operates with at least two display formats, said two display formats being used for characters of said first and second types respectively when only one type of character is received in a given stream, and a single display format, comprising either one of said two display formats or a third display format, is used for both types of character when they are received in the same data stream.

4 A terminal, including display apparatus according to any one of claims 1 to 3, said terminal being either a fixed terminal or a mobile terminal.

5 A central unit transmitting successive data streams to at least one terminal according to claim 4, a data stream comprising encoded characters to be reproduced in the form of legible characters on a screen of said terminal, said data stream comprising either only characters of a first type, or only characters of a second type, or indeed characters of at least said first and second types, said central unit inserting an element in an initial portion of the data stream to indicate the existence of at least two types of character in said data stream when said data stream comprises at least characters of said first and second types.

6 A central unit according to claim 5, wherein said data stream is an HTML page or a WML page.

7 Display apparatus substantially as herein described with reference to the accompanying drawings.

8. A terminal substantially as herein described with reference to the accompanying drawings.

9. A central unit substantially as herein described with reference to the accompanying drawings.



FIG.1

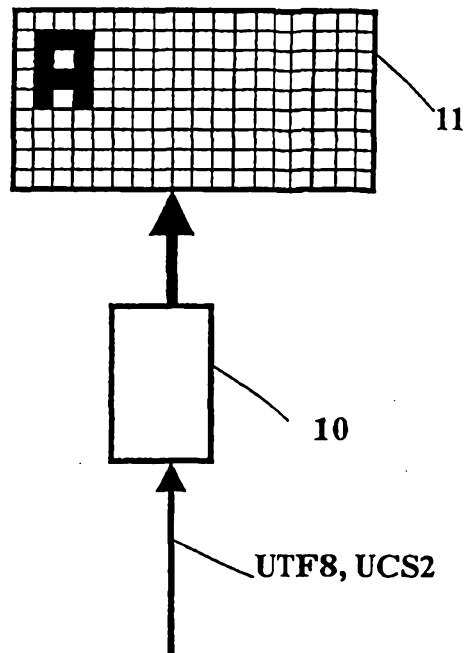


FIG.2

