SPECIFICATION

1. Title of the Invention

AUTOMATIC TRANSLATING METHOD AND MACHINE

[0001]

2. Field of the Invention

The present invention relates to an automatic translating method and machine for translating text in a foreign language, such as English, into text in a native tongue, such as Japanese (or Korean, Chinese, etc.), and in particular to an automatic translating method and a machine equipped with a plurality of translating environments. More specifically, the present invention pertains to an automatic translating method and a machine for translating foreign language text in a WWW page, which is provided by a WWW server on the Internet, into native tongue text, and in particular to an automatic translating method and a machine for translating foreign text by automatically selecting a translating environment that is appropriate for the foreign text. In this case, "translating environment" means a dictionary database and grammatical algorithms (e.g., setting of clauses, setting of definitions of auxiliary verbs, selections of styles) that are used for translation.

[0002]

3. Description of the Background

Internet:

Research and development have been made of a "telecomputing system" for connecting remotely located computers by using communication lines, such as public telephone lines. In Japan, for example, popular interest in communication using personal computers began after the telecommunications industry law became effective in 1985.

[0003] -

The latest primary telecomputing movement concerns the employment of the Internet. The Internet, a network formed by the cooperative interconnection of a number computer networks, is based on the network "NSFnet" that was established upon the investment of the National Science Foundation (NSF) in the United States in 1970's. The Internet, an international network, originally linked universities and research institutes in 54 nations for the exchange of academic study information. However, servers (mainly UNIX work stations) installed at the universities and research institutes have voluntarily continued to interconnect, so that the Internet has grown into a huge worldwide network. The present Internet is constituted by in excess of several hundreds of thousands of servers worldwide. Remotely located servers are interconnected using communication protocols called "TCP/IP (Transmission Control Protocol/Internet Protocol)," and can communicate with each other by transferring data or via BBSs (Bulletin Board Systems).

[0004]

The conventional (e.g., initial) Internet was regarded, more or less, as a UNIX based connection of computers. However, following its opening to the public in 1994 and the appearance of connection service providers, the Internet has gradually begun to be used by ordinary offices and individuals. As an example, primary personal computer communication services in Japan, such as "PC-VAN" and "NiftyServe," provide Internet connection services.

[0005]

The Internet is the conglomeration of networks that are run by different organizations and that have different policies. Even though there are organizations that manage respective networks, no organization provides overall management for the Internet. That is, servers worldwide, such as database servers and file servers, are managed locally by the respective users of a network. A user of the Internet can also be an information provider linked to the Internet via a server, and can seamlessly access any kind of information on the Internet. This is greatly different from a personal computer service by which a user can access only a specific host, i.e., an information server. In English, "the Internet" is normally represented as a proper noun to distinguish it from the wide area work internetworking that are established for the interconnection of the computers of specific companies.

[0006]

World Wide Web (WWW):

It is without doubt true that the introduction of the "World Wide Web (WWW)" accelerated the popularization of the Internet. The WWW is a wide area information system (Internet application) that builds hyper text/*/ on a network, especially on the Internet, in order to seamlessly access information, and was originally developed by the European Particle Physics Laboratory (CERN) in 1989. With the WWW, a user, i.e., a WWW client, can retrieve target information by jumping from server to server, or from database just by using a mouse to click on words, phrases or images highlighted on a screen.

[0007]

In accordance with the meaning of the name "World Wide Web," at present, a great number of WWW servers exist on the Internet. Multiple WWW pages constituted by files described in a language called HTML (Hypertext Markup Language) are accumulated on a local disk at each WWW server.

[0008]

Included in an HTML file are text files and various other types of files, such as image, speech and image files. HTML is in general based on SGML (Standard Generalized Markup Language), and its current version, "HTML 3.x," was released by the WWW standardization organization, "W3 Consortium," in 1996. Files that conform to the HTML are basically constituted by text files, and the formatting of text, the locations of image files and speech files, and linking destinations are described by using "tags" delimited by "<"and ">" that assist in the file sorting.

[0009]

A WWW user (WWW client) can read a file stored in a WWW page of a WWW server by means of a communication protocol called HTTP (Hypertext Transfer Protocol) (HTTP corresponds to the upper level protocol of the TCP/IP). A so-called "WWW browser," a computer program that functions as an Internet tour guide, interprets the contents of an HTML file and displays the contents on the screen of a user's machine. Typical examples of the WWW browsers are "Web Explorer", produced by IBM Corp. ("Web Explorer" is a trademark of IBM Corp.), "Netscape Navigator", produced by Netscape Communications Corp., and "Internet Explorer", produced by Microsoft Corp.

[0010]

An image file designated in an HTML file may be located in a different WWW server. The WWW browser not only interprets HTML files but also reads image files, and displays composite text, in which are included images, on the display screen of a WWW client machine. Further, an HTML file includes commands such as "read what file of which server when this text (or the image) is clicked on by a mouse." A user can read another HTML file merely by using a mouse to click on text presented on a display screen, or to click on a location on a screen. An HTML file selected by clicking a mouse may be located either in the same WWW server as is its preceding HTML file, or in another WWW server.

[0011]

To include in an HTML file a command instructing the reading of a subsequent HTML file is also called "to form a link" in this technical area. A linking destination is designated by using an identifier called a URL (Uniform Resource Locator). A URL is a standard addressing technique for identifying information resources on the Internet, i.e., files accumulated by servers on the Internet. The specifications for URLs are regulated by RFC1738, which is one of the official RFC (Request for Comments) document sets that were prepared by the IETF (Internet Engineering Task Force)/**/.

[0012]

The URL consists of a character string including three elements: a protocol name (scheme name) for accessing an information resource; a server name for storing the information resource; and a file name in the server. Protocols that can be selected are HTTP (http),

NNTP (news), FTP (ftp: file transfer protocol), Telnet (telenet), and access of a local disk (file).

The typical server name is "www.ibm.com", "www.yahoo.com", etc. The URL for the file "Arts", provided via the WWW service of a server "www.yahoo.com", is represented as "http://www.yahoo.com /Arts/". The components of the URL are separated for each other by a "/". In other words, the URL is an address of a WWW page. It should be noted that a "WWW page" is the general name for a screen provided by a WWW server, and is also called a "home page".

[0013]

Among the character strings that constitute the URL, in this specification each character string segment separated by a "/" is hereinafter called a "partial URL character string".

[0014]

Translation program for WWW page:

As was previously described, with the WWW, the Internet user can access worldwide WWW server while he or she is at a desk, and can view an acquired WWW page on a browser screen.

[0015]

Since much of the text in WWW pages is written in English, the Internet users outside the English speaking zone (for example, in Japan, China or Korea), or other Internet users who are not familiar with English, have trouble reading such WWW page, and thus can not adequately utilize this wide area information system. Therefore, automatic translation software or automatic translating support software has recently been developed and

produced. Some automatic translation software programs are especially designed for translation of text on the Internet, i.e., WWW pages.

Data acquired via the Internet is relayed by automatic translation software using the proxy function/***/ of a WWW browser, and a translated document is retransmitted to the WWW browser and is displayed on a browser screen. One example of the automatic translation software produced by giving prominence to compatibility with the Internet is "King of Internet Translation Ver 1.x," sold by IBM Japan, Ltd.

[0016]

Automatic translation is a technique whereby the processing capability of a computer system is utilized to translate text prepared in a foreign language, such as English, into text expressed in a native tongue, such as Japanese, or vice versa. A database is built as a model of the enormous pool of knowledge that human beings possess (or apparently possess) concerning languages, and a translation engine refers to this database when performing automatic translation.

[0017]

Usually it is difficult to accurately perform the automatic translation of original text so that the intent of the original text is faithfully reflected in the translation. This is a direct result of the ambiguity inherent in natural languages. One source of this ambiguity stems from the use of words that have many meanings, i.e., that have two or more meanings, and that frequently appear in original text. Each time a word having many meanings appears in the text, the translation engine must select a meaning, so that the selection of meanings is accompanied by some errors, i.e., mistranslations. Another source of ambiguity is grammar variation. English sentences, for example, are sorted into several basic sentence

patterns, such as SVO, SVOO and SVOC, from the relationship between subjects, verbs, etc. When relatives ("that", "which", "why", etc) are omitted, understanding sentence patterns and grammar tends to be difficult.

[0018]

A method for providing a plurality of translating environments has been widely employed in order to ensure more accurate automatic translation. The term "translating environment" describes a dictionary database and grammatical algorithms (setups for clauses and setups for auxiliary verb meanings, and sentence stylistic designations) used for a translation process, and it is generally understood that a genre, a field, an application to which original text belongs must correlate with a translating environment. Like words that are frequently used when referring to respective fields, such as the arts, sports, education and science, have differing meanings and usages, and special translating environments, such as an Internet dictionary, an art dictionary, and a sport dictionary, for respective types of genre are already available for use. When an appropriate translating environment for original text contents is used, unnecessary analyzation during automatic translation is eliminated, and translation accuracy is enhanced.

[0019]

The easiest and the primary method employed for selecting an appropriate translating environment is that one where a user manually selects the appropriate translating environment in accordance with the contents of the original text. In this case, a user must understand the contents of the original text before automatic translation is run. However, it is not easy for a user to understand at a glance the contents of an original text written in a language other than his or her native language, and the user may spend a lot of time

obtaining an understanding of the text. As a result, the provision of a translation system has less meaning.

Especially since many Internet users need the help furnished by automatic translation to scan an enormous amount of WWW pages when selecting useful information, if viewing the original text requires much time, automatic translation is a meaningless activity.

[0020]

There is another background art that places the responsibility for the selection of a translating environment on an automatic translation system. In Japanese Unexamined Patent Publications No. Hei 7-191999, Hei 6-332946, Hei 6-318229, Hei 6-60117 and Sho 61-173060, for example, disclosed is a translation system that automatically selects a translating environment. A translation system of this type eliminates the troublesome procedures required when a user selects a translating environment, and it enhances work efficiency. However, most of the conventional techniques analyze the contents of original text before selecting a translating environment that matches the intent of the original text. And a process for analyzing original text requires a considerably long time to complete, and complicates the translation system. In other words, the conventional techniques are complicated systems when viewed both from their construction and their utilization.

[0021]

<<Notes>>

*: Hypertext is software for treating characters, pictures, and tables as objects and for providing various correlations between objects in order to access the objects.

**: IETF is an organization that studies technical problems on the Internet, discusses services and proposes solutions.

***: The proxy function is a function whereby a host, while serving as a proxy, receives communication data from the Internet and relays the data to another host that can not effect a direct outside access.

[0022]

4. Objectives

It is one object of the present invention to provide a superior automatic translating method and a machine, for employing a translation system equipped with a plurality of translating environments, to translate foreign language text (e.g., English text) into native language text (e.g., Japanese, Korean or Chinese text).

[0023]

It is another object of the present invention to provide a superior automatic translating method and a machine that, before translating foreign language text into native language text, automatically select an appropriate translating environment for the foreign language text that is to be translated.

[0024]

It is an additional object of the present invention to provide a superior automatic translating method and a machine that employ a translation system equipped with a plurality of translating environments to appropriately translate foreign language text in a WWW page, provided by a WWW server across the Internet, into native language text.

[0025]

5. Summary of the Present Invention

To achieve the above objects, according to a first aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file stored in an information resource designated by a user, comprises the steps of: (a) interpreting a combined character string in which means for accessing an information resource and a name of the information resource are specified; (b) selecting one of the plurality of translating environments in accordance with a result obtained by the interpretation; and (c) employing the selected translating environment for the translation of text among the file stored in the information resource designated by the combined character string.

[0026]

According to a second aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file that is stored in an information resource designated by a user, comprises the steps of: (a) user inputting a combined character string in which specified are access means for an information resource and a name of the information resource; (b) downloading, in accordance with the access means specified by the combined character string, a file stored in the information resource designated by the combined character string; (c) interpreting the combined character string; (d) selecting one of the plurality of translating environments in accordance with an interpretation result; and (e) translating, by employing the selected translating environment, the text among the downloaded file.

[0027]

According to a third aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file that is stored in an information resource designated by a user, comprises the steps of: (a) user inputting a combined character string in which specified are access means for an information resource and a name of the information resource; (b) downloading, in accordance with the access means specified by the combined character string, a file stored in the information resource designated by the combined character string; (c) displaying on a display screen the downloaded file along with an original file in the file; (d) interpreting the combined character string; (e) selecting one of the plurality of translating environments in accordance with an interpretation result; (f) translating the original text by employing the selected translating environment; and (g) displaying on the display screen the translated text along with the original text.

[0028]

According to a fourth aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource designated by user input of a combined character string in which are specified access means for the information resource and a name of the information resource, and to translate text in the file, comprises the steps of: (a) recording, as a database, a combination of the combined character string and a translating environment that are related to the specified information resource; (b) searching the database for a combined character string that most nearly resembles a newly input combined character string; and (c) translating the text among the downloaded file by

employing the translating environment corresponding to the combined character string found in the step (b).

[0029]

According to a fifth aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource specified by user input of a combined character string in which are described access means for the information resource and a name of the information resource, and to translate text in the file, comprises the steps of: (a) recording, as a database, a combination of the combined character string and a translating environment that are related to the specified information resource; (b) searching the database for a combined character string that most nearly resembles a newly input combined character string; (c) translating, by employing the translating environment corresponding to the combined character string found in the step (b), the text among the file downloaded from the specified information resource; and (d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text.

[0030]

According to a sixth aspect of the present invention, an automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource specified by user input of a combined character string in which are described access means for the information resource and a name of the information resource, and to translate text in the file, comprises the steps of:

(a) recording, as a database, a combination of the combined character string and a translating environment that are related to the specified information resource;
(b) searching the database for a combined character string that most nearly resembles a newly input combined character string; (c) translating, by employing the translating environment corresponding to the combined character string found in the step (b), the text among the file downloaded from the specified information resource; (d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text; and (e) in case an appropriate translation result is obtained, additionally recording, in the database, a relationship between the new combined character string and the employed translating environment.

[0031]

According to a seventh aspect of the present invention, an automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing the information resource (and a file name in the server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprises the steps of: (a) interpreting the URL character string; (b) selecting one of the plurality of translating environments in accordance with an interpretation result; and (c) employing the selected translating environment to translate text in the downloaded file.

[0032]

According to an eighth aspect of the present invention, an automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing the information resource (and a file name in the server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprises the steps of: (a) displaying on a display screen the downloaded file along with original text; (b) interpreting the URL character string; (c) selecting one of the plurality of translating environments in accordance with an interpretation result; (d) employing a selected translating environment to translate the original text; and (e) displaying on the display screen a text translation along with the original text.

[0033]

According to a ninth aspect of the present invention, an automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing the information resource (and a file name in the server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprises the steps of: (a) recording, as a database, a combination of URL character string and a translating environment; (b) searching the database for a URL character string that most nearly resembles a newly input URL character string; and (c) translating, by employing a translating environment corresponding to the URL character string obtained by the step (b), the text in the downloaded file.

[0034]

According to a tenth aspect of the present invention, an automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing the information resource (and a file name in the server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprises the steps of: (a) recording, as a database, a combination of the URL character string and a translating environment; (b) searching the database for a URL character string that most nearly resembles a newly input URL character string; (c) translating, by employing a translating environment corresponding to the URL character string obtained by the step (b), the text among the downloaded file; and (d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text.

[0035]

According to an eleventh aspect of the present invention, an automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing the information resource (and a file name in the server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprises the steps of: (a) recording, as a database, a combination of the URL character string and a translating environment; (b) searching the database for a URL character string that most nearly

resembles a newly input URL character string; (c) translating, by employing a translating environment corresponding to the URL character string obtained by the step (b), the text among the downloaded file; (d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text; and (e) in case an appropriate translation result is obtained, additionally recording, in the database, a relationship between the new URL character string and the translating environment.

[0036]

According to a twelfth aspect of the present invention, an automatic translation machine, that employs one of a plurality of translating environments to translate text in a file downloaded from a WWW server via the Internet, comprises: (a) first means for storing a database that manages a combination of a URL character string and a translating environment; (b) second means for inputting a URL character string; (c) third means for downloading from a WWW server a file designated by the input URL; (d) fourth means for searching the first means for a URL character string that most nearly resembles a newly input URL character string; (e) fifth means for selecting a translating environment that relates to the searched URL character string as an appropriate one; (f) sixth means for translating, by employing the selected translating environment, the text among the file downloaded from the WWW server; and (g) seventh means for displaying on a display screen a translation result.

[0037]

The "translating environment" is a dictionary database and grammatical algorithms (e.g., setups for clauses, setups for auxiliary verb meanings, sentence stylistic designation), which are used for translation processing.

[0038]

The present invention is intended mainly for the automatic translation of WWW pages, and is based on the fact that the URL, which is an address of a WWW page, consists of a combination of descriptive character string segments (i.e., "partial URL character strings): a protocol name, a server name and a file name.

[0039]

The automatic translating method and the machine according to the present invention can be implemented by means of a computer process, which is performed by interlocking with a series of browsing operations for receiving a WWW page from a WWW server and for displaying it on a browser screen.

[0040]

The computer process includes a translation engine, used for translating foreign language text into native language text (or vice versa), and a plurality of translating environments, such as translating environment A (Internet dictionary), translating environment B (art dictionary), and translating environment C (sports dictionary). According to the automatic translating method of the present invention, a database for URL character strings is accumulated. The database may have a table format, as shown in Table 1, that shows a correspondence between URL character strings, which are related to WWW pages accessed relatively frequently, and translating environments. The translating environments that correspond to respective URL character strings are regarded as appropriate environments, based on the results obtained by the past performances of the translation process.

[0041]

[Table 1]

[0042]

In Table 1, translating environment A (an Internet dictionary) is recorded as an appropriate environment for URL names "www.ibm.com/" and "www.yahoo.com/"; translating environment B (an art dictionary) is recorded as an appropriate environment for "www.yahoo.com/Arts"; and translating environment C (a sports dictionary) is recorded as an appropriate environment for "www.yahoo.com/Arts/Recreation/ Sports/". The database may be prepared in advance by a system designer based on general user usage tendencies. The database may be expanded further studying the access habits of users.

[0043]

When a user inputs a URL character string to a WWW browser screen, via the Internet the WWW browser (or the proxy of the WWW browser) downloads a file from a WWW page designated in the URL character string. The computer process according to the present invention interprets the input URL character string. Here, interpretation of the URL character string refers to a process employed to search for a URL character sting that most nearly resembles (i.e., is most analogous to) the input URL character string. More specifically, one URL character string is regarded as a combination of partial URL character strings, and a URL character string having the combination of partial URL character strings that most nearly resembles the input URL character string is searched for in the database. When, for example, the input URL is "www.ibm.com/", which is present in the database, the corresponding translating environment A (an Internet dictionary) is automatically selected.

If the input URL string is "www.yahoo.com/Arts/Architecture/", which is not registered in the database, translating environment B (an art dictionary), which corresponds to "www.yahoo.com/Arts/", whose partial URL character strings most resemble the input URL string, is automatically selected. In the computer process according to the present invention, the URL character string may be interpreted either after a WWW page has been downloaded, or in parallel with the downloading. The computer process according to the present invention may include a proxy function for a WWW browser to download a WWW page.

[0044]

The translation engine employs the selected translating environment to translate foreign language text in a downloaded file into native language text. The native language text obtained by translation is, for example, transmitted to the WWW browser and is displayed on a browser screen. At this time, an original text window for the original foreign text and a translation window for the native language text may be simultaneously displayed on the same screen (both the original and its corresponding translation may be displayed).

[0045]

When a user determines that the result of translation displayed on the browser screen is not correct, he or she may select another translating environment and perform the automatic translation again. When the appropriate translating environment for an unregistered URL character string is found, that environment may be added to the database.

[0046]

That is, according to the present invention provided are an automatic translating method and machine for automatically selecting a translating environment based on a URL character string, which is a WWW page address provided across the Internet by a WWW server, before automatic translation of the WWW page is performed. Since an appropriate translating environment is selected, the accuracy of the translation is enhanced. Since the selection of a translating environment and the addition of the environment to the database are performed only for a URL character string, which is a relatively small amount of data, the processing is simple and constructing of the system is easy.

[0047]

A technique, performed before automatic translation, for selecting, from among a plurality of translating environments, a translating environment appropriate for the intent of original text was already proposed before the filing of the present application (see the previously mentioned Japanese Unexamined Patent Publications). Most of the conventional techniques select a translating environment, not URL character string, by referring to the result obtained by analyzing the original text. In other words, the conventional techniques, which include a process for analyzing the original text, are complicated systems both in their construction and their utilization, and are essentially different from the present invention. These conventional techniques were not created for the translation of WWW pages. Viewed from a different aspect, the present invention and the conventional techniques that differ from the present invention can coexist.

[0048]

The other objects, features, and advantages of the present invention will become apparent in due course during the detailed description of the embodiment of the present invention, which will be given while referring to the accompanying drawings.

[0049]

6. Description of the Preferred Embodiment

The preferred embodiment of the present invention will now be described while referring to the accompanying drawings.

[0050]

A. Hardware environment

Fig. 1 is a schematic diagram illustrating the hardware arrangement of a computer system 10 appropriate for embodying the present invention. The respective sections will now be described.

[0051]

A CPU 11, a main controller, executes various programs under the control of an operating system (OS). The CPU 11 may be, for example, a "Pentium/1xx MHz", from Intel Corp. The OS may be, for example, "OS/2", from IBM Corp. ("OS/2" is a trademark of IBM Corp.), or "Windows 95", from Microsoft Corp.

[0052]

The CPU 11 is mutually connected with hardware blocks via three buses: a processor bus 12 directly connected to an external pin of the CPU 11, a PCI (Peripheral Component Interconnect) bus 16 that serves as a local bus, and an ISA (Industry Standard Architecture) bus 18 that serves as an input/output bus.

[0053]

The processor bus 12 communicates with the PCI bus 16 via a bridge circuit (host-PCI bridge) 13. The bridge circuit 13 in this embodiment includes a memory controller for controlling access to a main memory 14, and a data buffer for absorbing a difference between the speeds of the buses 12 and 16.

[0054]

The main memory 14 is used as an area where programs are loaded and as a work area for a currently executing program, and is generally constituted by a plurality of DRAM (dynamic RAM) chips. An L2-cache 15, a high-speed memory, is used to temporarily store code/data that are frequently accessed and to absorb the time required for the CPU 11 to access the main memory 14, and is generally constituted by an SRAM (static RAM) chip. A ROM 17 is nonvolatile memory in which are permanently stored a test program (POST), that is executed when the system is powered on, and code groups, that are used to operate respective hardware components of the system 10.

[0055]

The PCI bus 16 is a bus (which has a width of 32 bits, an operating frequency of 33 MHz, and a maximum data transfer speed of 132 KBps) that enables the high-speed data transfer.

The peripheral devices, such as the video controller 20 and a card bus controller (not shown), driven at a relatively high speed are connected to the PCI bus 16.

[0056]

The video controller 20 is a dedicated controller for the actual processing of image commands issued by the CPU 11. The video controller 20 temporarily stores processed image data in a screen buffer (VRAM) 21, and reads the data from the VRAM 21 and outputs it to a display 22.

[0057]

The PCI bus 16 and the ISA bus 18 are mutually connected by a bridge circuit (PCI-ISA bridge) 19. The bridge circuit 19 in this embodiment includes a DMA controller, a programmable interrupt controller (PIC), and a programmable interval timer (PIT). The bridge circuit 19 in this embodiment also has an IDE (Integrated Drive Electronics) connector for connecting an external IDE storage device. An IDE hard disk drive (HDD) 23 and an IDE CD-ROM drive 24 are connected to the IDE connector.

[0058]

The above described bridge circuits 13 and 19 conform to the specifications provided by the PCI, and are generally provided in the form of a single chip set. An example chip set is "Triton," sold by Intel Corp.

[0059]

The ISA bus 18 (which has a width of 16 bits and a maximum data transfer speed of 4 MBps) has a slower data transfer speed than the PCI bus 16 and is used for the connection

of peripheral devices, such as a keyboard/mouse controller (KMC) 25, an I/O controller 28 and an audio controller 34, that are driven at relatively low speeds.

[0060]

The keyboard/mouse controller 25 is a dedicated controller that fetches, as computer data, code input at a keyboard 26 and coordinate values input via a mouse 27.

[0061]

The I/O controller 28 is a dedicated controller for driving a floppy disk drive (FDD) 29 and for controlling the exchange of parallel or serial data via a parallel port 30 or via a serial port 32. Generally, a printer 31 is connected to the parallel port 30, and a modem 33 is connected to the serial port 32.

[0062]

The modem 33 is used to exchange data via an analog public telephone line 50. The modem 33 converts a digital signals in the computer system 10 into analog signals and transmits the analog signals across a line 50, and converts analog signals received across the line 50 into digital signals and supplies them to the computer system 10. The computer system 10 in this embodiment can communicate with a server machine 60 (more specifically, a modem (not shown) of the server machine 60) via the line 50 by using a dialup connection. The "server machine" is one of the server machines (e.g., a server machine nearest to a user who operates the system 10) owned by a "service provider" who provides the Internet connection service. The server machine 60 is commonly provided on the Internet 70, and performs an IP connection, to the Internet 70, of the computer system 10 that has dialed up the server machine 60.

Service providers are, for example, "IBM Internet connection service", by IBM Japan, Ltd., and "BEKKOAME/INTERNET", by Bekkoame Internet.

[0063]

The audio controller 34 is a dedicated controller for inputting/outputting audio signals. The audio controller 34 fetches as computer data audio signals from a microphone 35, or performs DA conversion of audio data and outputs the results through a loudspeaker 36.

[0064]

So-called personal computers that are currently available can adequately function as the computer systems 10 shown in Fig. 1. Many electric circuits, etc., other than those shown in Fig. 1, are required to constitute the computer system 10. Since these components are well known to one having ordinary skill in the art, they are not essential to the subject of the present invention. No explanation for them is given in the specification.

[0065]

B. Automatic translation system

Fig. 2 is a schematic diagram illustrating the system configuration of an automatic translation system 100 that embodies the present invention. The automatic translation system 100 is actually implemented as one of the application programs to be run by the computer system 10 shown in Fig. 1.

[0066]

The automatic translation system 100 comprises a translation proxy 110, a translation engine 120 and a translating environment selector 130.

These sections and a WWW browser 150 interact with each other to preferably perform an automatic translation process.

[0067]

The WWW browser 150 is a computer program that acts as an Internet tour guide. The WWW browser 150 provides for a user of the computer system 10 a user interface for inputting a URL (Uniform Resource Locator), i.e., an address of a desired WWW page. Also, the WWW browser 150 interprets the contents of an HTML file included in the WWW page and displays the result of the interpretation on the display 22. The WWW browser 150 in this embodiment has a proxy function. More specifically, the WWW browser 150 requests the translation proxy 110 to download a file from a WWW page. The WWW browser 150 also receives the translation of a text file from the translation proxy 110 and displays it and an image file (e.g., a GIF file) on the display 22. The WWW browser 150 supports some display modes, such as "original text only", "translation only" and "both original and translation", and these modes can be switched on a browser screen. The browser screen may be one window of multiple windows, which will be described later.

[0068]

Upon a request from the WWW browser 150, the translation proxy 110 downloads, via the Internet 70, a file from a WWW page designated by the URL, and transmits text in the downloaded file to the translation engine 120. The translation proxy 110 also receives the translation of text from the translation engine 120 and transmits it to the WWW browser 150.

The "proxy" is an agent for a host that can not perform a direct outside access, and is the generic term for a relay function, such as the reception of communication data from the Internet.

[0069]

The translation engine 120 is a main body for performing a translation process, i.e., for providing a translation (e.g., text in a native language, such as Japanese) of an original (e.g., text in a foreign language, such as English). By employing a translating environment, the translation engine 120 translates the original text that has been received from the translation proxy 110, and transmits the translation of the text to the translation proxy 110. The translation engine 120 in this embodiment has a plurality of translating environments, such as translating environment A, translating environment B and translating environment C. The "translating environment" is a dictionary database and grammatical algorithms (e.g., setups for clauses, setups for auxiliary verb meanings, sentence stylistic designations) that is used for the translation process. As is generally known, there exists correlation between a genre, a field and an application of original text and a translating environment. In this embodiment, provided for each genre is a special dictionary database, such as an Internet dictionary, a business dictionary, a politics dictionary, an entertainment dictionary, an art dictionary, or a sports dictionary.

[0070]

The translating environment selector 130 changes as needed a translating environment to be used by the translation engine 120. The design of the translating environment selector 130 in this embodiment is based on the fact that a URL, an address of a WWW page, consists of a combination of character string segments (i.e., "partial URL character

strings") that respectively describe a protocol name, a server name and a file name. The translating environment selector 130 automatically selects an appropriate translating environment in accordance with a URL character string input by the WWW browser 150.

[0071]

Fig. 3 is a schematic diagram illustrating the arrangement of the translating environment selector 130. As is shown in Fig. 3, the translating environment selector 130 is subdivided into a URL input section 131, a translating environment output section 132, a URL database 133, a URL comparison section 134, and a basic operating section 135.

[0072]

The URL database 133 is a table in which are described URL character strings for WWW pages accessed relatively frequently, and the correspondence between each URL character string and its appropriate translating environment.

[0073]

In Figs. 4 and 5 is shown the URL database 133 displayed on a WWW browser screen (Fig. 5 shows a continuation of the screen in Fig. 4). As is shown in Figs. 4 and 5, the URL character strings for WWW servers/WWW pages accessed frequently are registered in the database 133, in correlation with their appropriate translating environments. For example, "www.ibm.com/" and "www.yahoo.com/" are registered in conjunction with their appropriate translating environment "Internet, general", while "cnn.com/" is registered in conjunction with its appropriate environment "politics".

In the URL database 133 in this embodiment, the respective character strings are described irregularly (i.e., described only in the order in which they were registered, not in any other order such as alphabetical, partial URL character string arrangement, or string count).

[0074]

One characteristic point concerning the correspondence between a URL character string and its appropriate translating environment is that when the URL character strings describe the same WWW server name but the designated files differ, in many cases the appropriate translating environment also differs. As is shown in Figs. 4 and 5, for example, "Internet, general" is registered as an appropriate environment for "www.yahoo.com/". However, "politics", "sports" and "art" are registered as appropriate environments for files in the same WWW server, "www.yahoo.com/ : Government/", "www.yahoo.com/Recreation/Sports/," and "www.yahoo.com/Arts/" respectively. Further, according to an empirical rule originally devised by the present inventors, it was found that even among files in the same WWW server, files that have combinations of "partial URL character strings" (character segments divided by a "/" in a character string constituting one URL) that most nearly resemble each other or are most analogous tend to use the same appropriate translating environment. For example, a file designated by URL character string "www.yahoo.com/Arts/Architecture" has the appropriate translating environment "arts", which is the same as that for "www.yahoo.com/Arts/", whose partial URL character strings more nearly resemble than those of "www.yahoo.com/".

[0075]

A designer of the automatic translation system 100 may register in advance URL character strings in the URL database 133.

In addition, a user of the system 100 may also register the URL character strings via the basic operating section 135, which will be described later.

[0076]

The URL input section 131 receives, via the translation proxy 110, a URL character string that is input on the WWW browser screen, and transmits it to the URL comparison section 134. The URL comparison section 134 performs a comparison process for the input URL character string on the URL database 133, and finds an appropriate translating environment. The URL comparison section 134 reports the comparison result to the translation engine 120 through the translating environment output section 132.

[0077]

C. Selection of translating environment

The URL comparison section 134 searches the URL database 133 for a URL character string that most nearly resembles (is most analogous to) an input URL character string, and outputs to the translation engine 120 a translating environment that corresponds to the obtained URL character string. Fig. 6 is a flowchart for a routine performed by the URL comparison section 134 when selecting a translating environment. In this routine, S denotes a URL character string input by the WWW browser, i denotes an index on the URL database 133, and m denotes an index for the URL character string obtained during the search process that S most nearly resembles. S(i), for example, represents a URL character string that is registered in the i-th record in the URL database 133. When the final result obtained by the database search is m = M, it means that the appropriate translating environment is the one that corresponds to the M-th URL character string S(M)

in the URL database 133. E(m) represents a translating environment for a URL character string that is registered in the m-th record in the URL database 133.

[0078]

In this routine, first, an initial value is entered in each index (step S10). The initial value for index i is 1, which represents a first record in the URL database 133. The initial value for index m is 0 which indicates that a similar URL character string has not yet been found.

[0079]

At step S20, a check is performed to determine whether or not the value held by current index i has exceeded the count for the last record in the URL database 133.

[0080]

When the result obtained at decision step S20 is negative, i.e., when an uncompared record remains in the URL database 133, at step S30 a check is performed to determine whether or not the currently input URL character string S includes, as a partial URL character string, URL character string S(i) for the i-th record.

[0081]

When the result obtained at decision block S30 is negative, i.e., when the URL character string S(i) does not resemble the currently input URL character string S, program control jumps to step S70. At step S70, i is incremented by one in order to compare the next record in the URL database 133 with the current URL character string S. Program control thereafter returns to step S20.

[0082]

When the result obtained at decision block S30 is affirmative, i.e., when the URL character string S(i) resembles the currently input URL character string S, program control jumps to step S40. At step S40, a check is performed to determine whether m = 0, i.e., whether a similar URL character string has not yet been found. When m = 0, i is substituted into m in order to temporarily store the URL character string used for comparison.

[0083]

If, at decision block S40, m _ 0, i.e., if a similar URL character string has already been temporarily stored, program control moves to step S50. At step S50, the URL character S(i) that is currently being used for comparison is compared with the URL character string S(m) already stored to determine whether the URL character string more nearly resembles the currently input URL character string S. This determination is performed by comparing the URL character strings S(i) and S(m) to decide which has a greater number of sequential partial URL character strings. For "www.yahoo.com/" and "www.yahoo.com/Arts/", since the former consists of one partial URL character string and the latter consists of two, the latter is superior. The remark "a greater number of sequential partial URL character strings" means that even when more partial URL character strings correspond to each other, unless the arrangement of the partial URL character stings do not match, the similarity is low as the result of the URL comparison. Assume that a currently input URL character string is "www.yahoo.com/ Recreation/Sports/" and two URL character strings, "www.yahoo.com/Sports/" and "www.yahoo.com/Recreation/" are registered in the URL database 133. Although the latter have two sequential partial URL character strings that match those of the input URL character string, the former has only one partial URL character string that matches that of the input URL character string (although "Sports" is

included in the input URL character string, it does not count because the arrangements do not correspond to each other). Therefore, the latter URL character string is superior.

[0084]

When, at decision block S50, it is ascertained that the newly compared URL character string S(i) is better, at step S60, i is substituted into m in order to change the most analogous URL character string. Then, program control goes to step S70. If, at decision step S50, the URL character string S(m) previously stored is better, program control skips step S60, to maintain the current value for m, and goes to step S70.

[0085]

At step S70, i is incremented by one to compare the next record in the URL database 133, and program control thereafter returns to step S20. If, at step S20, an uncompared record remains in the URL database 133, the process at steps S30 through S70 is repeated. When, at step S20, it is ascertained that the value held by current index i has exceeded the count for the last record in the URL database 133, program control branches to "Yes" and goes to step S80.

[0086]

At step S80, a check is performed to determine whether m = 0. When m = 0, it means that, at the loop S20 through S70, a URL character string that resembles the currently input URL character string S has not been found in the URL database 133. In this case, a default translating environment is output to the translation engine 120 (step S90), and the routine for selecting a translating environment is terminated.

[0087]

If m _ 0, the translating environment E(m) for the URL character string regarded as most analogous at the loop S20 through S70 is output to the translation engine 120 (step S100). The routine for selecting a translating environment is thereafter terminated. The translation engine 120 employs the selected translating environment E(m) to translate a downloaded file.

[0088]

D. Updating URL database

As was previously described, the contents of the URL database 133 are additionally registered via the basic operating section 135. In this subdivision, the procedures for adding a new registration to the URL database 133 will be briefly described.

[0089]

Fig. 8 is a flowchart for a routine for adding a new registration to the URL database 133. First, a translation of text is displayed on the WWW browser screen to ask a user whether the translation is satisfactory, i.e., whether an appropriate translating environment has been selected (step S200).

[0090]

When the result obtained at decision block S200 is negative, adding a registration is not required, and all of the following steps are skipped. The routine is thereafter terminated.

[0091]

If the result obtained at decision block S200 is affirmative, a user is asked whether the relationship between a newly input URL character string S and its appropriate translating environment E(m) should be added to the URL database 133 (step S210). The user refers to the frequency in the future of the newly input URL character string S to determine whether to perform the registration.

[0092]

If the result obtained at decision block S210 is affirmative, that relationship is registered in the URL database 133 (step S220). The routine is thereafter terminated. If the result obtained at decision block S210 is negative, program control skips step S220 and terminates the routine.

[0093]

E. Browser screen

Fig. 7 is a screen of the WWW browser 150 to which the automatic translation system 100 of the present invention is attached. The screen in Fig. 7 is in an "original and translation display" mode in which translated text is shown immediately under the original text. This mode can be switched to another mode, "original only" or "translation only", on the WWW browser screen. The WWW browser screen may be one window of multiple windows on the display 22.

[0094]

Reading from the top, a "title bar," a "menu bar" and a "tool bar" are provided on the WWW browser screen. As is well known, the title bar is an area in which is displayed the name of an application to be activated for a screen, and the menu bar is an area in which is displayed a list of commands that can be selected. Also well known is that the tool bar is one type of menu bar in which are arranged buttons for quickly activating functions frequently used. These buttons are also called "smart icons".

[0095]

A URL input portion is provided immediately under the tool bar. A user can enter a URL character string in the URL input section to designate a desired WWW page to be accessed. In Fig. 7, URL name "www.yahoo.com/" is input.

[0096]

The input URL character string is transmitted to the translation proxy 110. The translation proxy 110, which takes the place of the WWW browser 150, downloads a file from the designated WWW page, and temporarily transmits the original text among the file to the translation engine 120. The input URL character string is transmitted to the translating environment selector 130 via the translation proxy 110. The translating environment selector 130 interprets the received URL character string and selects for it an appropriate translating environment, which is reported to the translation engine 120. The translation engine 120 employs the selected translating environment to translate original text and transmits the original text and the translated text to the WWW browser 150 via the translation proxy 110. This processing sequence is performed in the background of a desktop.

[0097]

A rectangular area, below the URL input section, that occupies most of the browser screen is the main body of the WWW browser screen, whereat the contents of a downloaded WWW page are displayed. In Fig. 7, the "www.yahoo.com/" page designated by the URL name is displayed on the screen.

[0098]

At the uppermost level of the main body of the WWW browser screen is provided an indicator for displaying a current display mode and a selected translating environment. In Fig. 7, "original and translation" mode is highlighted as a display mode, and therefore, translated text is displayed immediately under the original text on the screen. Since, as is shown in Fig. 4, "Internet, general" is registered as the appropriate environment for "www.yahoo.com/" in the URL database 133, a message to that effect is displayed in the indicator. A user can dynamically change a display mode and an employed translating environment by clicking on the indicator with the mouse 27.

[0099]

F. Appendix

The present invention has been described in detail while referring to a specific embodiment. However, it should be obvious to one having ordinary skill in the art that various modifications or revisions of the embodiment are possible within the scope of the present invention. For example, the automatic translation system is not limited to a system that uses the proxy function of a WWW browser, but may be a system that receives original text on a WWW browser screen via a clip board and translates it.

That is, although the present invention has been disclosed by using an example, it should not be limited to that example. To fully understand the subject of the present invention, the claims should be referred to.

[0100]

As is described above in detail, according to the present invention, provided are a superior automatic translating method and a machine, for employing a translation system equipped with a plurality of translating environments, to translate foreign language text (e.g., English text) into native language text (e.g., Japanese, Korean or Chinese text).

[0101]

Further, according to the present invention, provided are a superior automatic translating method and a machine that, before translating foreign language text into native language text, automatically select an appropriate translating environment for the foreign language text to be translated.

[0102]

In addition, according to the present invention, provided are a superior automatic translating method and a machine that employ a translation system equipped with a plurality of translating environments to appropriately translate foreign language text in a WWW page, provided by a WWW server across the Internet, into native language text.

7. Brief Description of the Drawings

Fig. 1 is a schematic diagram illustrating the hardware arrangement of a computer system 10 according to the present invention.

Fig. 2 is a schematic diagram illustrating the system configuration of an automatic translation system according to the present invention.

Fig. 3 is a schematic diagram illustrating the arrangement of a translating environment selector 130.

Fig. 4 is a diagram illustrating the URL database 133 displayed on a WWW browser screen.

Fig. 5 is a diagram illustrating the URL database 133 displayed on a WWW browser screen (continued from Fig. 4).

Fig. 6 is a flowchart showing a routine performed by a URL comparison section 134 when selecting a translating environment.

Fig. 7 is a diagram illustrating an example screen for a WWW browser 150, to which the automatic translation system 100 of the present invention is attached.

Fig. 8 is a flowchart showing a routine for adding a registration to the URL database 133.



8. Claims

Claim 1

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file stored in an information resource designated by a user, comprising the steps of:

(a) interpreting a combined character string in which means for accessing an information resource and a name of said information resource are specified;

(b) selecting one of said plurality of translating environments in accordance with a result obtained by the interpretation; and

(c) employing the selected translating environment for the translation of text among the file stored in said information resource designated by said combined character string.

Claim 2

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file that is stored in an information resource designated by a user, comprising the steps of:

(a) user inputting a combined character string in which specified are access means for an information resource and a name of said information resource;

(b) downloading, in accordance with the access means specified by said combined character string, a file stored in said information resource designated by said combined character string;

(c) interpreting said combined character string;

(d) selecting one of said plurality of translating environments in accordance with an interpretation result; and

(e) translating, by employing the selected translating environment, the text among the downloaded file.

Claim 3

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to translate text among a file that is stored in an information resource designated by a user, comprising the steps of:

(a) user inputting a combined character string in which specified are access means for an information resource and a name of said information resource;

(b) downloading, in accordance with the access means specified by said combined character string, a file stored in said information resource designated by said combined character string;

(c) displaying on a display screen the downloaded file along with an original file in said file;

(d) interpreting said combined character string;

(e) selecting one of said plurality of translating environments in accordance with an interpretation result;

(f) translating said original text by employing the selected translating environment; and

(g) displaying on said display screen the translated text along with the original text.

Claim 4

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource designated by user input of a combined character string in which are specified access means for said information resource and a name of said information resource, and to translate text in said file, comprising the steps of:

(a) recording, as a database, a combination of said combined character string and a translating environment that are related to the specified information resource;

(b) searching said database for a combined character string that most nearly resembles a newly input combined character string; and

(c) translating the text among the downloaded file by employing the translating environment corresponding to the combined character string found in said step (b).

Claim 5

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource specified by user input of a combined character string in which are described access means for said information resource and a name of said information resource, and to translate text in said file, comprising the steps of:

(a) recording, as a database, a combination of said combined character string and a translating environment that are related to the specified information resource;

(b) searching said database for a combined character string that most nearly resembles a newly input combined character string;

(c) translating, by employing the translating environment corresponding to the combined character string found in said step (b), the text among the file downloaded from the specified information resource; and

(d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text.



Claim 6

An automatic translating method, that is run by a translation system equipped with a plurality of translating environments, to download a file stored in an information resource specified by user input of a combined character string in which are described access means for said information resource and a name of said information resource, and to translate text in said file, comprising the steps of:

(a) recording, as a database, a combination of said combined character string and a translating environment that are related to the specified information resource;

(b) searching said database for a combined character string that most nearly resembles a newly input combined character string;

(c) translating, by employing the translating environment corresponding to the combined character string found in said step (b), the text among the file downloaded from the specified information resource;

(d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate said text; and

(e) in case an appropriate translation result is obtained, additionally recording, in said database, a relationship between the new combined character string and the employed translating environment.

Claim 7

An automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing said information resource (and a file name in said server), downloading a file in a specified server via the Internet, and

translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprising the steps of:

(a) interpreting the URL character string;

(b) selecting one of said plurality of translating environments in accordance with an interpretation result; and

(c) employing the selected translating environment to translate text in the downloaded file.

Claim 8

An automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing said information resource (and a file name in said server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprising the steps of:

(a) displaying on a display screen the downloaded file along with original text;

(b) interpreting the URL character string;

(c) selecting one of said plurality of translating environments in accordance with an interpretation result;

(d) employing a selected translating environment to translate said original text; and

(e) displaying on said display screen a text translation along with the original text.

Claim 9

An automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing said information resource (and a file

* C L M S *

name in said server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprising the steps of:

(a) recording, as a database, a combination of URL character string and a translating environment;

(b) searching said database for a URL character string that most nearly resembles a newly input URL character string; and

(c) translating, by employing a translating environment corresponding to the URL character string obtained by said step (b), the text in the downloaded file.

Claim 10

An automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing said information resource (and a file name in said server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprising the steps of:

(a) recording, as a database, a combination of said URL character string and a translating environment;

(b) searching said database for a URL character string that most nearly resembles a newly input URL character string;

(c) translating, by employing a translating environment corresponding to the URL character string obtained by said step (b), the text among the downloaded file; and

(d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate the text.

Claim 11

An automatic translating method for, in accordance with a URL (Uniform Resource Locator) character string that is a combination of a protocol name for accessing an information resource and a server name for storing said information resource (and a file name in said server), downloading a file in a specified server via the Internet, and translating, by employing one of a plurality of translating environment, the text among the downloaded file, comprising the steps of:

(a) recording, as a database, a combination of said URL character string and a translating environment;

(b) searching said database for a URL character string that most nearly resembles a newly input URL character string;

(c) translating, by employing a translating environment corresponding to the URL character string obtained by said step (b), the text among the downloaded file;

(d) employing, in case an appropriate translation result is not obtained, another translating environment to retranslate said text; and

(e) in case an appropriate translation result is obtained, additionally recording, in said database, a relationship between the new URL character string and the translating environment.

Claim 12

An automatic translation machine, that employs one of a plurality of translating environments to translate text in a file downloaded from a WWW server via the Internet, comprising:

(a) first means for storing a database that manages a combination of a URL character string and a translating environment;

(b) second means for inputting a URL character string;

(c) third means for downloading from a WWW server a file designated by said input URL;

(d) fourth means for searching said first means for a URL character string that most nearly resembles a newly input URL character string;

(e) fifth means for selecting a translating environment that relates to the searched URL character string as an appropriate one;

(f) sixth means for translating, by employing the selected translating environment, the text among the file downloaded from the WWW server; and

(g) seventh means for displaying on a display screen a translation result.

Claim 13

A computer programmable storage medium, that stores a computer program for translating text contained in a file downloaded from a WWW server on the Internet, said computer program comprising:

(a) a plurality of translating environments;

(b) a database for recording a table in which are managed combinations of URL character strings and said translating environments;

(c) first computer program code means for downloading a file from the WWW server specified by a user in the form of a URL character string;

(d) second computer program code means for searching said database for a URL character string that most nearly resembles a newly input URL character string;

(e) third computer program code means for selecting a translating environment that relates to the searched URL character string as an appropriate one;

(f) fourth computer program code means for translating, by employing the selected translating environment, the text contained among the file downloaded from the WWW server; and

(g) fifth computer program code means for displaying a translation of the text on a display screen.

AUTOMATIC TRANSLATING METHOD AND MACHINE

Abstract

A superior automatic translation system (100), which has a plurality of translating environments, appropriately translates original text in a WWW page, downloaded from a WWW server across the Internet (70), to provide a translation of the text.

A computer process according to the present invention comprises a translation engine (120), for translating foreign language text into native language text; a plurality of translating environments; and a database relative to URL character strings and translating environments. When a user enters a URL character string at a WWW browser screen, a designated WWW page is downloaded via the Internet (70). The database is examined to find a URL character string that most nearly resembles (is most analogous to) the input URL character string. Then, the translation engine (120) employs the selected translating environment to translate the foreign language text in the downloaded WWW page into native language text. The native language text obtained by the translation process is transmitted to the WWW browser (150) and is displayed on the browser screen.

Fig. 2

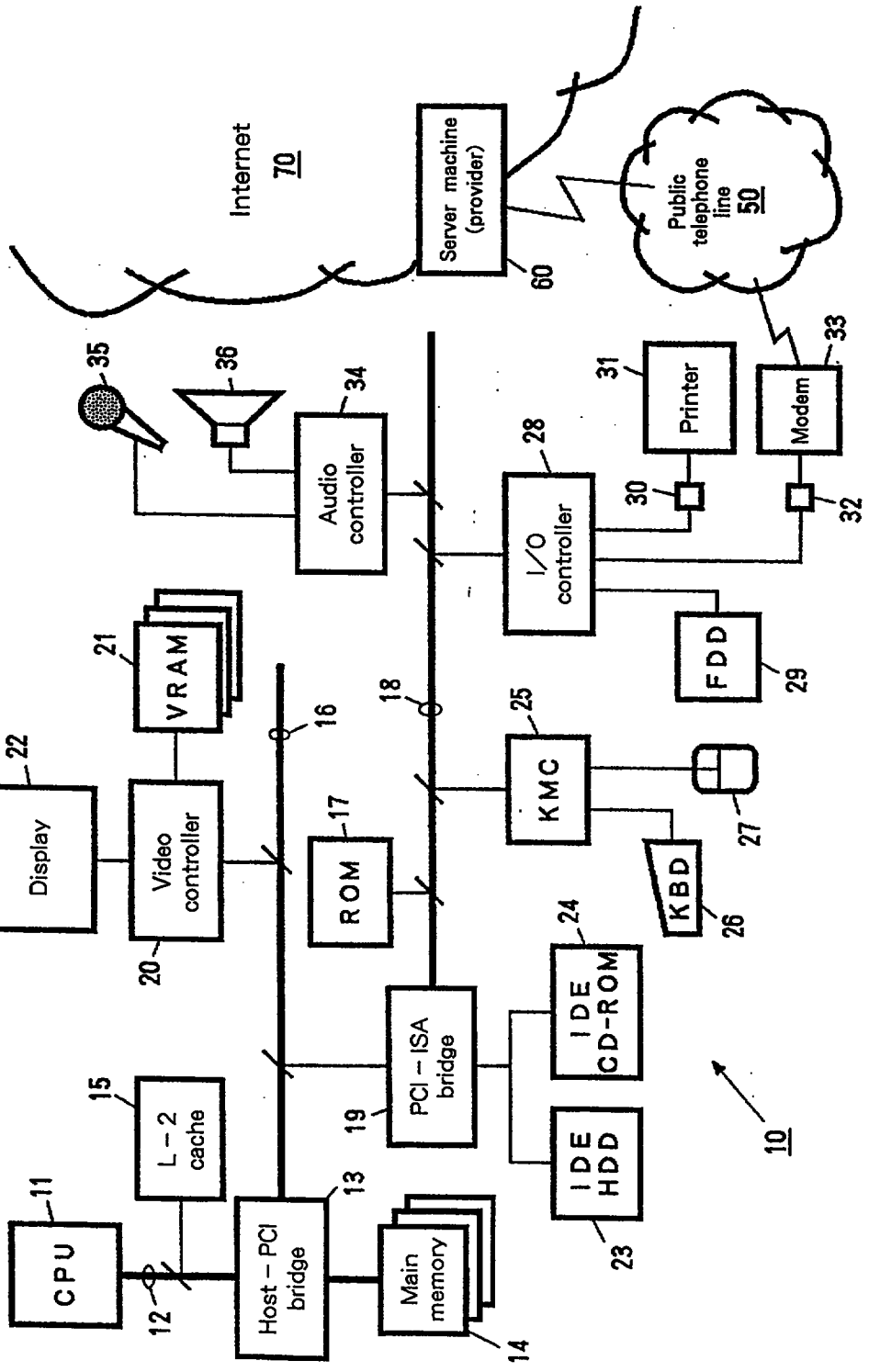

Internet
70
Server machine (provider)
60
Public telephone line
50
Modem
33
Printer
31
35
36
34
Audio controller
28
I/O controller
30
32
FDD
29
21
VRAM
22
Display
Video controller
20
16
18
25
KMC
27
KBD
26
17
ROM
24
IDE CD-ROM
IDE HDD
23
PCI – ISA bridge
19
15
L – 2 cache
11
CPU
12
Host – PCI bridge
13
Main memory
14
10

Fig. 1

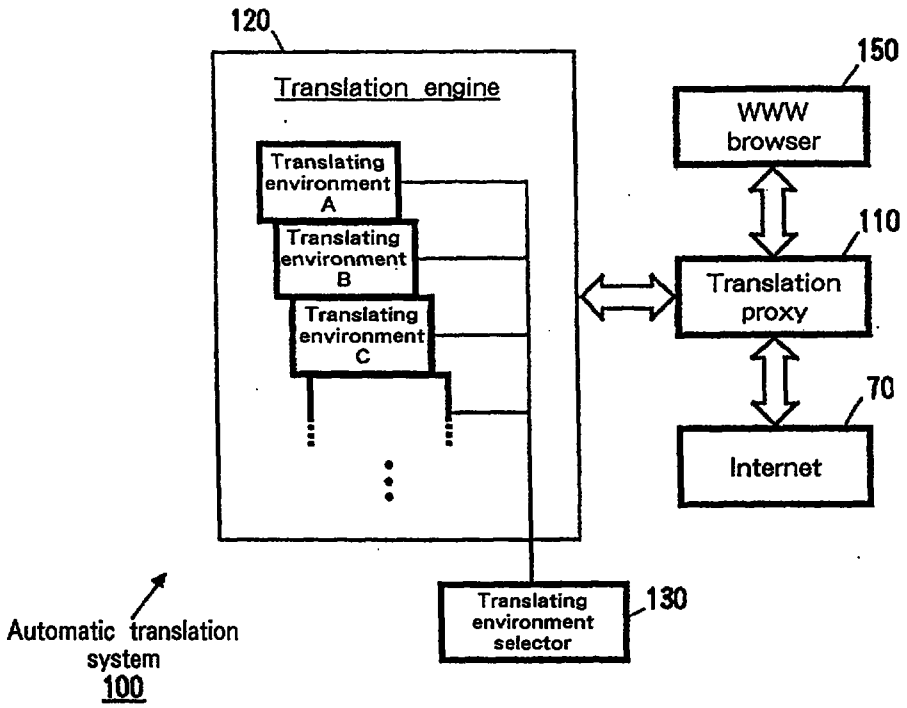

120
Translation engine
Translating environment A
Translating environment B
Translating environment C
150
WWW browser
110
Translation proxy
70
Internet
Translating environment selector
130
Automatic translation system
100

Fig. 2

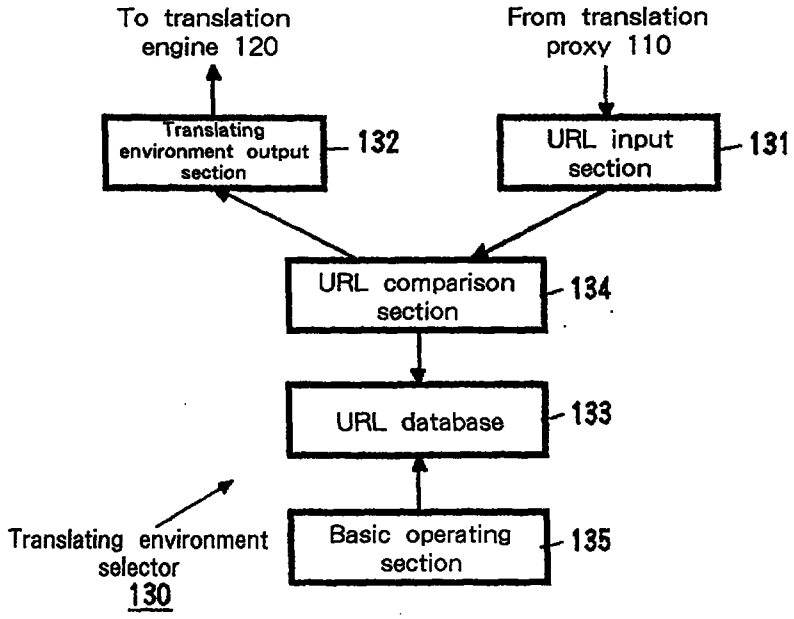

To translation engine 120
From translation proxy 110
Translating environment output section
132
URL input section
131
URL comparison section
134
URL database
133
Basic operating section
135
Translating environment selector
130

Fig. 3

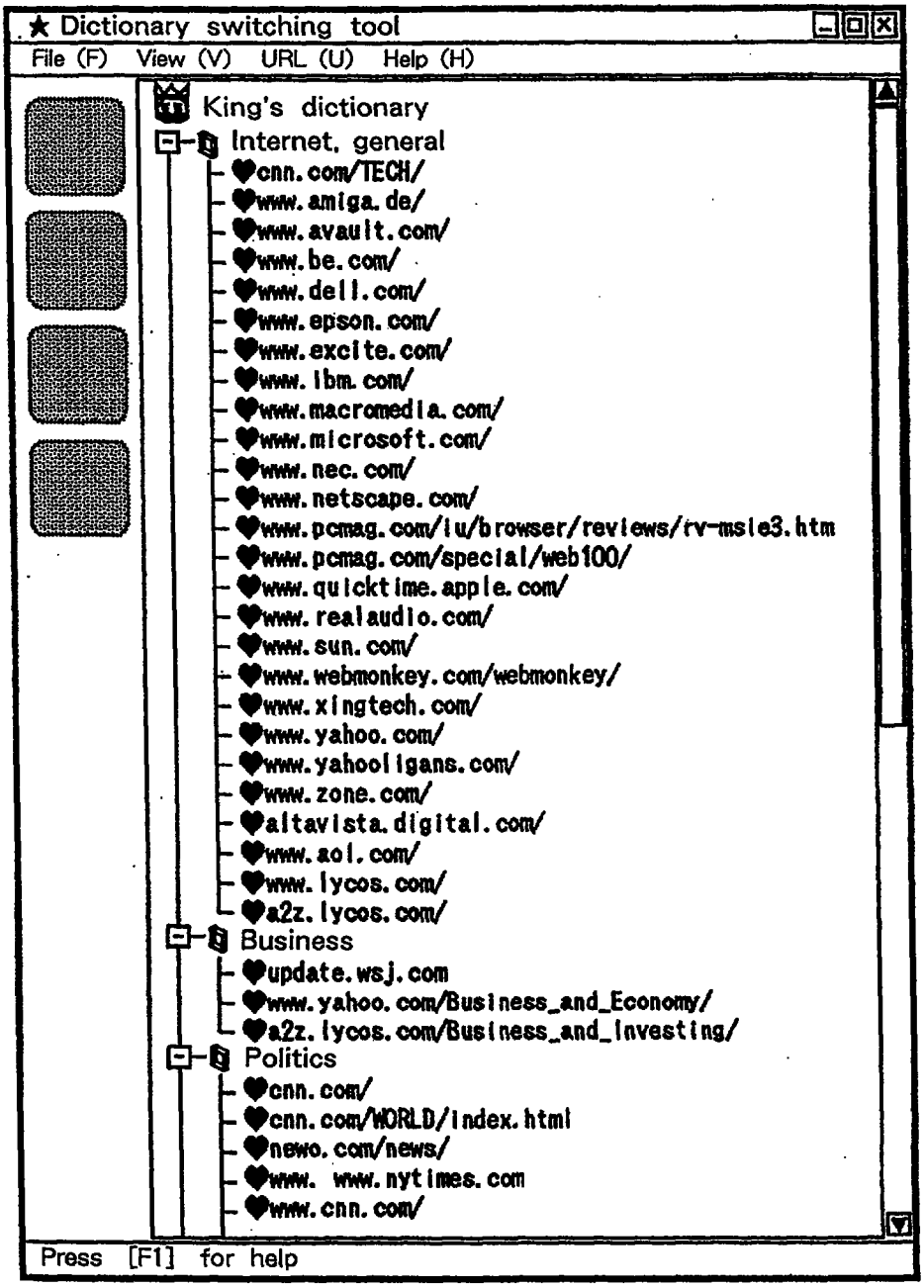

★ Dictionary switching tool
File (F) View (V) URL (U) Help (H)
King's dictionary
Internet, general
cnn.com/TECH/
www.amiga.de/
www.avault.com/
www.be.com/
www.dell.com/
www.epson.com/
www.excite.com/
www.ibm.com/
www.macromedia.com/
www.microsoft.com/
www.nec.com/
www.netscape.com/
www.pcmag.com/iu/browser/reviews/rv-msie3.htm
www.pcmag.com/special/web100/
www.quicktime.apple.com/
www.realaudio.com/
www.sun.com/
www.webmonkey.com/webmonkey/
www.xingtech.com/
www.yahoo.com/
www.yahooligans.com/
www.zone.com/
altavista.digital.com/
www.aol.com/
www.lycos.com/
a2z.lycos.com/
Business
update.wsj.com
www.yahoo.com/Business_and_Economy/
a2z.lycos.com/Business_and_Investing/
Politics
cnn.com/
cnn.com/WORLD/index.html
newo.com/news/
www. www.nytimes.com
www.cnn.com/
Press [F1] for help

Fig. 4

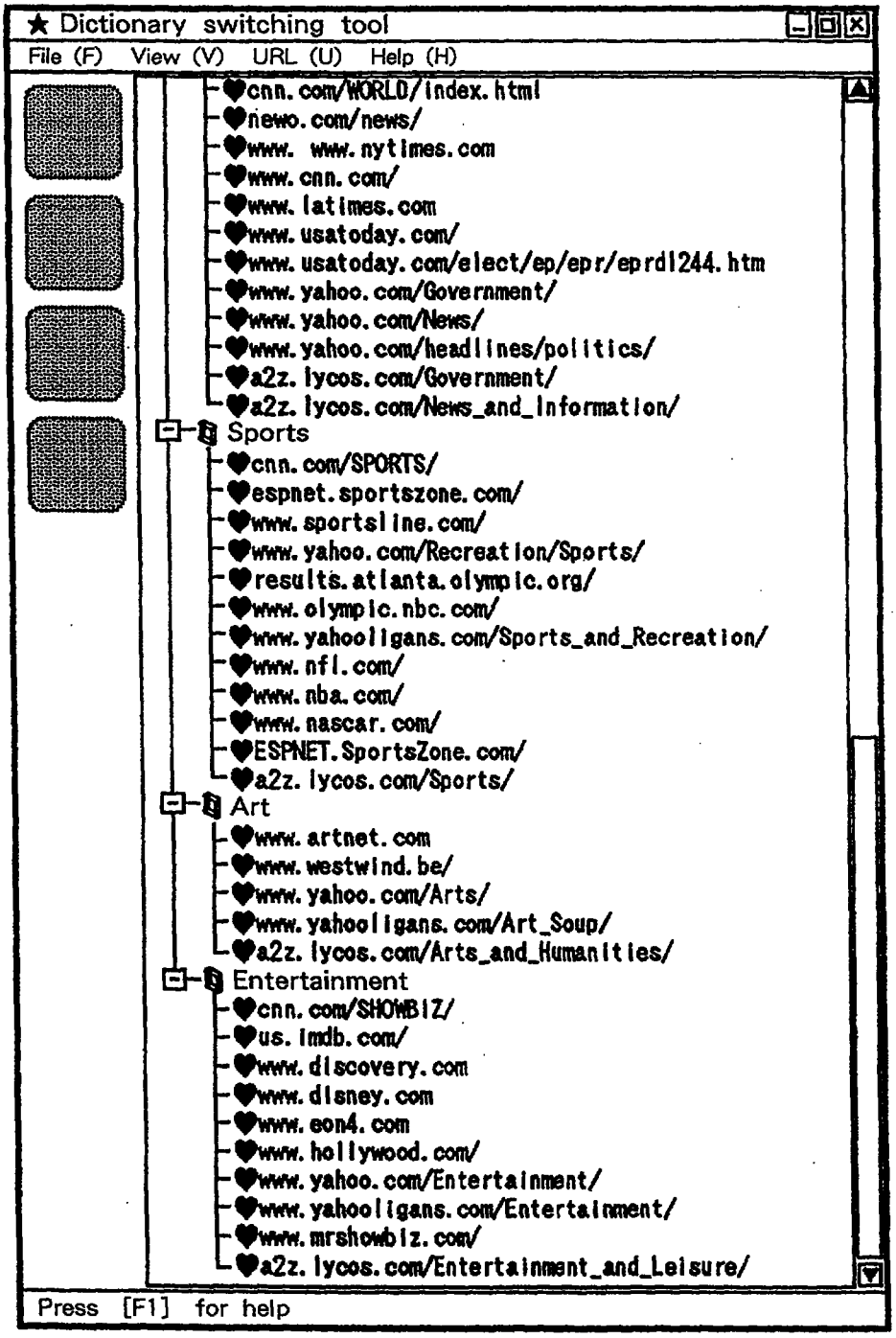

★ Dictionary switching tool
File (F) View (V) URL (U) Help (H)
cnn.com/WORLD/index.html
newo.com/news/
www. www.nytimes.com
www.cnn.com/
www.latimes.com
www.usatoday.com/
www.usatoday.com/elect/ep/epr/eprd1244.htm
www.yahoo.com/Government/
www.yahoo.com/News/
www.yahoo.com/headlines/politics/
a2z.lycos.com/Government/
a2z.lycos.com/News_and_Information/
Sports
cnn.com/SPORTS/
espnet.sportszone.com/
www.sportsline.com/
www.yahoo.com/Recreation/Sports/
results.atlanta.olympic.org/
www.olympic.nbc.com/
www.yahooligans.com/Sports_and_Recreation/
www.nfl.com/
www.nba.com/
www.nascar.com/
ESPNET.SportsZone.com/
a2z.lycos.com/Sports/
Art
www.artnet.com
www.westwind.be/
www.yahoo.com/Arts/
www.yahooligans.com/Art_Soup/
a2z.lycos.com/Arts_and_Humanities/
Entertainment
cnn.com/SHOWBIZ/
us.imdb.com/
www.discovery.com
www.disney.com
www.eon4.com
www.hollywood.com/
www.yahoo.com/Entertainment/
www.yahooligans.com/Entertainment/
www.mrshowbiz.com/
a2z.lycos.com/Entertainment_and_Leisure/
Press [F1] for help

Fig. 5

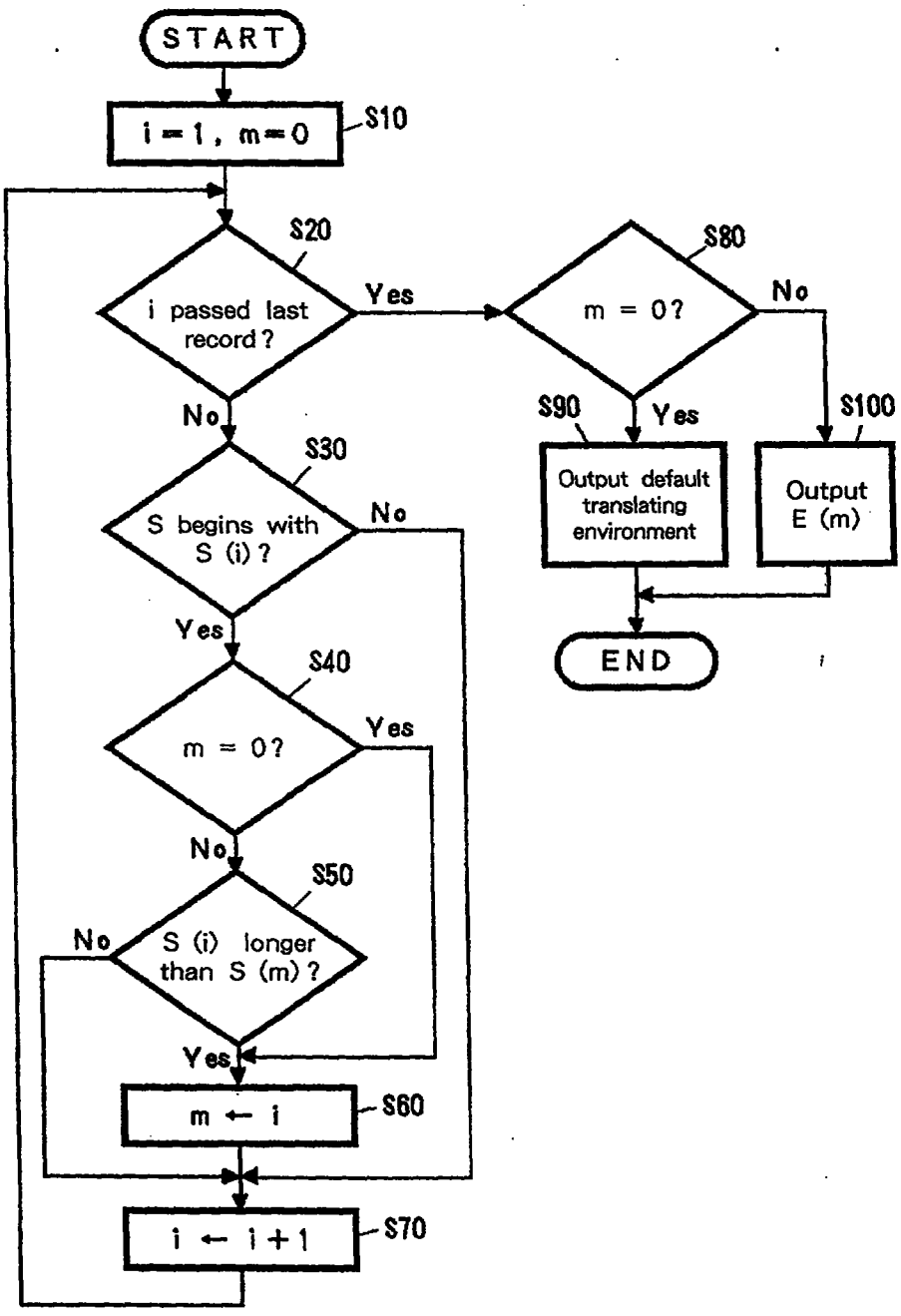

START
i = 1, m = 0
S10
S20
i passed last record?
Yes
No
S80
m = 0?
No
Yes
S90
S100
Output default translating environment
Output E (m)
END
S30
S begins with S (i)?
No
Yes
S40
m = 0?
Yes
No
S50
S (i) longer than S (m)?
No
Yes
m ← i
S60
i ← i + 1
S70

Fig. 6

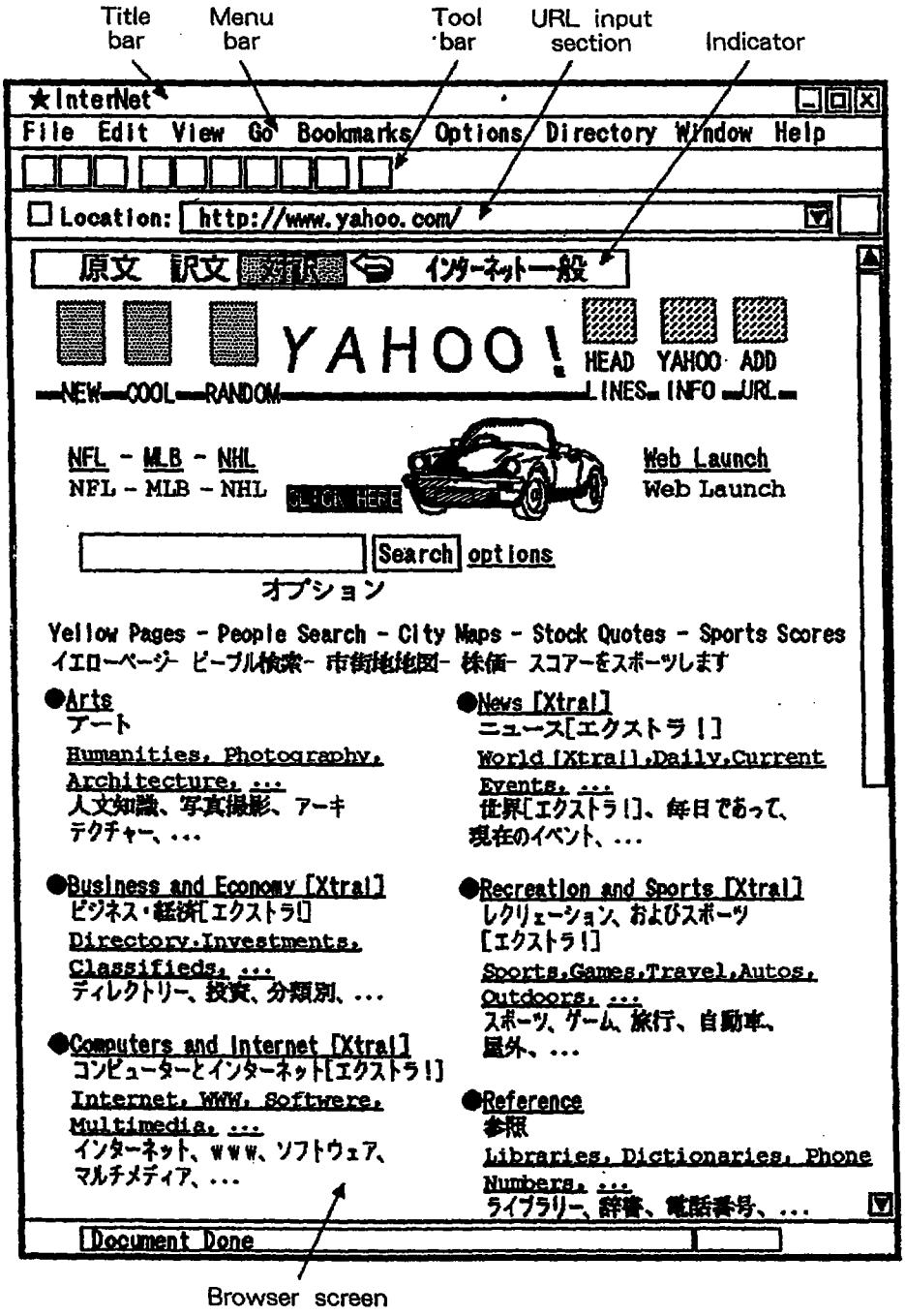

Title bar
Menu bar
Tool bar
URL input section
Indicator
★InterNet
File Edit View Go Bookmarks Options Directory Window Help
Location: http://www.yahoo.com/
原文 訳文 対訳 インターネット一般
YAHOO!
HEAD LINES
YAHOO INFO
ADD URL
NEW COOL RANDOM
NFL - MLB - NHL
NFL - MLB - NHL
CLICK HERE
Web Launch
Web Launch
Search
options
オプション
Yellow Pages - People Search - City Maps - Stock Quotes - Sports Scores
イエローページ- ピープル検索- 市街地地図- 株価- スコアーをスポーツします
●Arts
アート
Humanities, Photography, Architecture, ...
人文知識、写真撮影、アーキテクチャー、...
●News [Xtra!]
ニュース[エクストラ!]
World [Xtra!], Daily, Current Events, ...
世界[エクストラ!]、毎日であって、現在のイベント、...
●Business and Economy [Xtra!]
ビジネス・経済[エクストラ!]
Directory, Investments, Classifieds, ...
ディレクトリー、投資、分類別、...
●Recreation and Sports [Xtra!]
レクリェーション、およびスポーツ[エクストラ!]
Sports, Games, Travel, Autos, Outdoors, ...
スポーツ、ゲーム、旅行、自動車、屋外、...
●Computers and Internet [Xtra!]
コンピューターとインターネット[エクストラ!]
Internet, WWW, Software, Multimedia, ...
インターネット、WWW、ソフトウェア、マルチメディア、...
●Reference
参照
Libraries, Dictionaries, Phone Numbers, ...
ライブラリー、辞書、電話番号、...
Document Done
Browser screen

Fig. 7

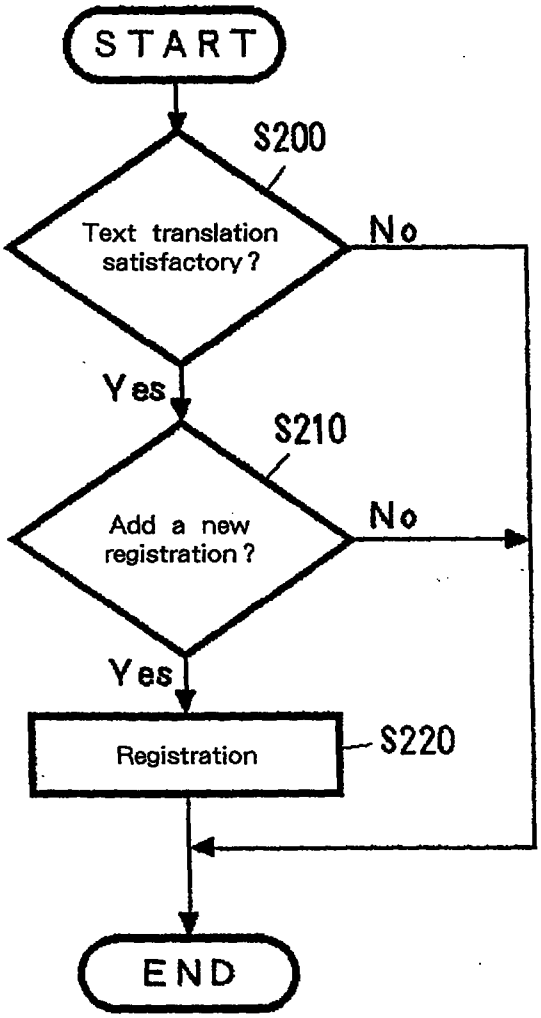

START
S200
Text translation satisfactory?
No
Yes
S210
Add a new registration?
No
Yes
Registration
S220
END

Fig. 8

URL character strings	Translating environments
www.ibm.com/	Translating environment A (Internet dictionary)
www.yahoo.com/	Translating environment A (Internet dictionary)
www.yahoo.com/Arts/	Translating environment B (art dictionary)
www.yahoo.com/Arts/Recreation/Sports/	Translating environment C (sports dictionary)

Table 1