

**METHOD AND DEVICES OF
TRANSMITTING TACTILE INFORMATION
DESCRIPTION**

TECHNICAL FIELD

[0001] The invention relates to a method of transmitting tactile information between a tactile emitter and receiver. It also relates to devices integrating a tactile display and implementing the method of transmitting tactile information, for example such as a telephone, a computer device, or a vehicle steering wheel.

STATE OF PRIOR ART

[0002] There are various types of tactile displays. French patent application No. 02 15527 deposited on Sep. 12, 02 corresponding to patent application WO, PCT FR 03 50152 deposited on Mar. 12, 03 discloses a tactile display including

[0003] a touch plate with a touch area,

[0004] a network of magnetic coils activating mobile parts that modify the tactile feel as a function of currents passing through said coils to produce a tactile sensation on the touch area that depends on the different currents circulating in each of said coils,

[0005] an addressing circuit to selectively address currents in the different coils,

[0006] in which

[0007] the touch plate includes a monolithic network of elements to modify the tactile feel, each element in the network including all mobile parts, each mobile part possibly moving under the action of a magnetic field, each set of mobile parts of a network element being subject to the field produced by one or several coils in the network,

[0008] the network of magnetic coils is in the form of a monolithic layer,

[0009] an insulating intermediate layer is arranged between the monolithic layer of coils and the touch plate, this insulating intermediate layer comprising a recess facing each of the elements that modify the tactile feel, providing a mobility space for said set of mobile parts of this element.

[0010] The elements that modify the tactile feel will be called pads in the remainder of the presentation.

[0011] A tactile display may have two functions; it may be designed either to make use of tactile sensitivity to transmit information (this is the case for a portable telephone vibrator) or to transmit contact information such as the local shape, roughness, texture, thermal and chemical exchanges, etc. In virtual reality or remote presence applications, an attempt is made to restore "raw" tactile perceptions, while for handicapped persons or normal telecommunication, an attempt is usually made to transmit tactile information. These displays apply low deformation or low pressure vibrations and pressures on the skin. They excite mechanical receptors present on the epidermis of the skin, capable of converting the static or dynamic indentations measured on the surface of the skin to a nerve influx.

[0012] These devices were initially developed for applications dedicated to the blind and to reading Braille, but they are now used increasingly frequently for man-machine interfaces

to improve the realism of virtual representations and improve interaction between man and the machine.

PRESENTATION OF THE INVENTION

[0013] In tactile transmission methods according to prior art, each configuration of tactile pads corresponds to an item of information. Thus, for example it is possible to transmit a sequence of information, for example letters of the Braille alphabet, so that a blind person can read text. In this type of information transmission, each configuration has a specific meaning, even if reading implies successive transmission of the different letters.

[0014] The invention proposes a new method of transmitting tactile information in which the meaning of the message is not carried by a given configuration of the tactile pads on the touch plate, but rather by a sequence of configurations, each particular configuration in the sequence having no particular meaning. The message acquires its meaning not only by the nature of the different tactile displays that follow each other, but also by the rate at which they follow each other. Thus for example, the same sequence of tactile display patterns may have a different meaning depending on whether the transmission rate of this sequence is fast or slow.

[0015] The first step to achieve this objective is to define a structured tactile communication language according to the invention. Since the meaning of transmitted information does not become clear except with time, the inventors preferred to transmit information that will create an emotional state in the user of the tactile display who receives the message. The advantage of this type of information is that it requires no or very little learning by users. This characteristic is due to the fact that the inventors have experimented on a sample of persons and have shown that the proposed rates actually created the required impression. Personalisation is easy if necessary to adapt it to the particular experience of a person.

[0016] This language can also be used in communication; according to the invention, a definition of an exchange protocol is associated with this language so that it can be used through a network, for example the Internet or a network on which a real time protocol is defined. The invention achieves this by defining beacons. The defined beacon structure can associate and synchronise this tactile language with other communication media (text, sounds, etc.).

[0017] The language proposed herein can be upgraded. A beginning of a vocabulary, in other words a set of tactile patterns, is suggested. The user can extend or modify this vocabulary as described above.

[0018] The language proposed herein is independent of whether or not the tactile display used is remote. A control server for the tactile display is associated with this language. This server may be a remote server. In this case, the tactile information is transmitted through a network. The server can also be located on a terminal containing the tactile display. The server used may be remote or included in the terminal being used, and will translate identified words of the vocabulary into a sequence of tactile images to be displayed on the tactile display.

[0019] To achieve all these purposes, the invention relates to a method of transmitting tactile information to a touch plate of a tactile display containing pads, said touch plate being controlled by a server, and in this method,

[0020] (a) tactile information transmitted in the form of a digital word is defined as being a sequence of a predefined