

SMART PEN TO DETECT HUMAN MENTAL FOCUS AND CONCENTRATION WITH PRESSURE SENSORS ON THE GRIP USING MACHINE LEARNING

FIELD OF INVENTION

The present invention relates to the field of sensor based mental concentration prediction.

The present invention relates to the field of sensor and machine learning based smart pen to detect concentration of the user.

More particularly, the present invention is related to smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning .

BACKGROUND OF THE INVENTION

The subject matter discussed in the background section should not be assumed to be prior art merely as a result of its mention in the background section. Similarly, a problem mentioned in the background section or associated with the subject matter of the background section should not be assumed to have been previously recognized in the prior art. The subject matter in the background section

merely represents different approaches, which in-and-of-themselves may also be inventions.

Some of the prior work listed herewith:

CN113311952PRESSURE SENSOR ASSEMBLY FOR TOUCH PEN AND TOUCH PEN The invention discloses a pressure sensor assembly for a touch pen and the touch pen. The pressure sensor assembly comprises an elastic element, a strain gauge, a fixing piece and a force transmission piece. The elastic element is provided with a strain concentration area, and the strain gauge is adhered to the strain concentration area of the elastic element; the fixing piece is used for fixing the elastic element; the force transmission piece is used for transmitting force generated when the touch pen is used to the elastic element. During writing, the force transmission piece transmits writing force of the pen point to the elastic element, so that the elastic element generates strain, strain changes are collected through the strain gauge arranged on the elastic element, and finally electric signals related to the writing force are output.

US20060277989MULTI-FUNCTION DETECTING PEN A multi-function detecting pen is described. The multi-function detecting pen includes a head module, a detecting chips module, a power module, a lighting module, and a control module. The head module is disposed at a front portion of the pen and the detecting chips module is followed. The detecting chips module may include at least one pressure detecting chip for measuring a pressure, e.g. tire pressure, and/or a gas detecting chip for measuring a gas concentration, e.g. alcohol concentration. The

detecting chips module may further include a temperature detecting chip for measuring a temperature, e.g. ambient temperature or tympanum temperature. The head module may further include a switchable or a replaceable adapter for coupling to the corresponding object and keeping the head module clean.

KR102053639ICT CONVERGENCE SMART PEN MANAGEMENT CONTROL METHOD The present invention relates to a method for controlling an mist spray system including: an automatic administration device including a dilution unit for diluting a drug supplied from an administration pump using water supplied from the outside, and supplying the diluted drug; a water tank for storing the water supplied from the outside; a pressurization pump for applying a pressure to the water stored in the water tank to supply the same; a filtering device for passing the water supplied from the pressurization pump to filter the same; a mixing unit for mixing first water supplied from the filtering device and the drug supplied from the automatic administration device; a high-pressure pump for applying a constant pressure to a mixed solution of the water and the drug discharged from the mixing unit, and supplying the same into a pen; a flowmeter for measuring the amount of the first water supplied from the water tank; a sensing unit for measuring humidity and temperature inside and outside the pen and the quality of air inside the pen; a pen environment adjustment unit for controlling the temperature, humidity, and ventilation in the pen; and a control unit for controlling a dilution concentration of the automatic administration device. More particularly, the present invention relates to a method for controlling an ICT convergence smart pen management system, which comprises: a data collection step of receiving the temperature and humidity inside

and outside the pen and air quality data inside the pen from the sensing unit; a concentration calculating step of calculating the concentration of the mixed solution corresponding to a target humidity from the transmitted data; a diluent concentration calculating step of receiving the amount of water supplied from the flowmeter in accordance with the calculated concentration of the mixed solution, and calculating the concentration of a diluent in the dilution unit; and a first diluent preparation step of performing dilution by the dilution unit in accordance with the calculated diluent concentration calculating step. COPYRIGHT KIPO 2020

JP1995237387BALLPOINT PEN PURPOSE: To prevent ink from flowing backwards during writing in upward posture and shock and flowing forwards when a pen is postured downwards and prevent a pen from becoming scratchy during writing in upward posture and writing in downward posture after shock. CONSTITUTION: Before writing, a ball valve 15 abuts against the rear end of projecting beads 16, resulting in opening a guide hole 20. The ink 21 flowing from an ink shoring tube 4 through the guide hole 20 into a valve chamber 13 is guided to the rear end of a tip ball 5a by passing through ink guiding grooves formed between the projecting beads. Since a tip ball 5a is brought into close contact with the inner edge of the tip holding part by being pressed with a bar shaft part 18, ink is prevented from flowing forwards. Further, by the minute retracting of the tip ball 5a due to the pressure of a pen, clearance develops, resulting in allowing ink to flow out. Since the viscosity of ink lowers through the rotation of the tip ball 5a, a large quantity of ink flow out, resulting in realizing high concentration writing. When a tip is postured upwards, the ball valve 15 comes into close contact with a ball bearing

seat 14 so as to tightly seal the guide hole 20, resulting in preventing ink from flowing backwards.

US5336009 INK GUIDE FOR A BALLPOINT PEN A non-absorbent ink guide is provided which allows a ballpoint pen to replaceable use different ink cartridges of different concentration. The ink guide has channels of different pitches for guiding the ink to the tip thereof and for returning flow of the ink after the tip has been saturated with the ink, a buffer portion to reduce the hydrodynamic pressure and flowing speed of the ink, and a collar to define the distance of the tip to the steel ball of the ball bearing of the ballpoint pen.

EP0006331 INKING SYSTEM FOR PEN RECORDERS. An ink priming system for a multi-pen recorder of the gravity-fed capillary tube type comprises a gas manifold (50) common to all of the ink bottles (16) individually provided for each channel of the recorder. Individual control valves (56) may be selectively actuated by the operator to prime each pen. When the control valve is closed, the gas pressure is bled off so that the inking system thereafter acts as a normal gravity-fed capillary tube system. A non-clogging inking system is provided by utilizing a short length of flexible thin walled tubing (26) to supply ink to the movable recording pen (12). The length of this tubing is sufficiently short that evaporation of the ink solvent through the walls of the tube is accompanied by diffusion of the dye back to the ink bottle so that the concentration of dye in the ink at the end of the tube adjacent the recording pen does not exceed saturation value during prolonged periods of non-use of the recorder.

KR1020060104315USB BRUSH-PEN DRIVE FOR EASILY INPUTTING INFORMATION TO COMPUTER OR PORTABLE TERMINAL, AND DEVICE FOR GENERATING LINE THICKNESS OF DIGITAL PEN PURPOSE: A USB(Universal Serial Bus) brush-pen drive and a device for generating line thickness of a digital pen are provided to offer a stylus or digitizer pen function which is easy to control the line thickness and color concentration by including a line thickness generating device, and implement the function in diverse types such as a pen, a pencil, a fountain pen, and a brush. CONSTITUTION: A housing protects parts and an inner space including electronic parts. A motion detecting unit measures motion of the pen with an acceleration sensor(341) and performs measurement for compensation through an angular velocity sensor(342). A microprocessor(331) calculates a position of a pen tip by receiving a signal from the sensor. The line thickness generating device(400) adjusts the line thickness and the color concentration by detecting/calculating pressure. A flash memory RAM(230) facilitates data I/O(Input/Output).

US4291317INKING SYSTEM FOR MULTI-PEN RECORDERS An ink priming system for a multi-pen recorder of the gravity-fed capillary tube type comprises a gas manifold common to all of the ink bottles individually provided for each channel of the recorder. Individual control valves may be selectively actuated by the operator to prime each pen. When the control valve is closed, the gas pressure is bled off so that the inking system thereafter acts as a normal gravity-fed capillary tube system. A non-clogging inking system is provided by utilizing a short length of flexible thin walled tubing to supply ink to the movable recording pen. The

length of this tubing is sufficiently short that evaporation of the ink solvent through the walls of the tube is accompanied by diffusion of the dye back to the ink bottle so that the concentration of dye in the ink at the end of the tube adjacent the recording pen does not exceed saturation value during prolonged periods of non-use of the recorder.

KR1020070073381FRONT AND REAR PEN CAPS HAVING AN AROMA PERFUME FILTER AND A PEN FOR EMITTING AROMA PERFUME IN PRESSING AN AROMA PERFUME FILTER PROTECTION UNIT PURPOSE: Front and rear pen caps having an aroma perfume filter and the pen are provided to improve mental concentration of examinees and psychological stability by aroma perfume emitted from the aroma perfume filter and to let a user simply regulate the concentration of aroma perfume. CONSTITUTION: The front cap(100) of a pen(50) is composed of a body unit(10) into which the pen is inserted; a finger-pressure unit(40) formed on the upper surface of the body and composed of a support piece on which an aroma perfume filter(20) is placed, and a finger-pressure piece for applying pressure on the user's fingers; the aroma perfume filter settled on the support piece; an aroma perfume filter protection film; and a slit formed at the side of the body unit to combine and install the body unit and the aroma perfume filter protection film.

EP1591499AQUEOUS INK FOR BALL-POINT PEN USING OIL-IN-WATER TYPE RESIN EMULSION AND BALL-POINT PEN USING THE AQUEOUS INK The problem is to provide ink for a ballpoint pen which enables to write well on a flat and smooth, and impermeable surface such as metal, glass, plastic material and the like

and a ballpoint pen using this ink. Ink for an aqueous ballpoint pen, of viscosity in the range of 5 through 30mPa•s at 20°C and using an oil-in-water type resin emulsion, including a solvent of water and alcohol-based solvent of 0.5kPa to 10kPa vapor pressure at 20°C, pigment and water-soluble resin, with an aggregate concentration of solid contents of said water-soluble resin and oil-in-water type resin emulsion being 5.0 to 30.0mass% against total composition of the ink, and a ballpoint pen using the ink.

CN1690141AQUEOUS INK FOR BALL-POINT PEN USING OIL-IN-WATER TYPE RESIN EMULSION AND BALL-POINT PEN USING THE AQUEOUS INK The problem is to provide ink for a ballpoint pen which enables to write well on a flat and smooth, and impermeable surface such as metal, glass, plastic material and the like and a ballpoint pen using this ink. Ink for an aqueous ballpoint pen, of viscosity in the range of 5 through 30 maps at 20 DEG C. and using an oil-in-water type resin emulsion, including a solvent of water and alcohol-based solvent of 0.5 kPa to 10 kPa vapor pressure at 20 DEG C., pigment and water-soluble resin, with an aggregate concentration of solid contents of said water-soluble resin and oil-in-water type resin emulsion being 5.0 to 30.0 mass % against total composition of the ink, and a ballpoint pen using the ink.

US20050239919INK FOR AN AQUEOUS BALLPOINT PEN USING OIL-IN-WATER TYPE RESIN EMULSION AND AN AQUEOUS BALLPOINT PEN USING THE INK The problem is to provide ink for a ballpoint pen which enables to write well on a flat and smooth, and impermeable surface such as metal, glass, plastic material and the like and a ballpoint pen using this ink. Ink for an aqueous ballpoint

pen, of viscosity in the range of 5 through 30 maps at 20° C. and using an oil-in-water type resin emulsion, including a solvent of water and alcohol-based solvent of 0.5 kPa to 10 kPa vapor pressure at 20° C., pigment and water-soluble resin, with an aggregate concentration of solid contents of said water-soluble resin and oil-in-water type resin emulsion being 5.0 to 30.0 mass % against total composition of the ink, and a ballpoint pen using the ink.

US4215352INKING SYSTEM WITH SATURATION CONTROL MEANS FOR MULTI-PEN RECORDERS An ink priming system for a multi-pen recorder of the gravity-fed capillary tube type comprises a gas manifold common to all of the ink bottles individually provided for each channel of the recorder. Individual control valves may be selectively actuated by the operator to prime each pen. When the control valve is closed, the gas pressure is bled off so that the inking system thereafter acts as a normal gravity-fed capillary tube system. A non-clogging inking system is provided by utilizing a short length of flexible thin walled tubing to supply ink to the movable recording pen. The length of this tubing is sufficiently short that evaporation of the ink solvent through the walls of the tube is accompanied by diffusion of the dye back to the ink bottle so that the concentration of dye in the ink at the end of the tube adjacent the recording pen does not exceed saturation value during prolonged periods of non-use of the recorder..

.Groupings of alternative elements or embodiments of the invention disclosed herein are not to be construed as limitations. Each group member can be referred to and claimed individually or in any combination with other members of the group or other elements found herein. One or more members of a group can be included

in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is herein deemed to contain the group as modified, thus fulfilling the written description of all Markus groups used in the appended claims.

As used in the description herein and throughout the claims that follow, the meaning of “a,” “an,” and “the” includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein, the meaning of “in” includes “in” and “on” unless the context clearly dictates otherwise.

The recitation of ranges of values herein is merely intended to serve as a shorthand method of referring individually to each separate value falling within the range. Unless otherwise indicated herein, each individual value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context.

The use of any and all examples, or exemplary language (e.g. “Such as”) provided with respect to certain embodiments herein is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention otherwise claimed. No language in the specification should be construed as indicating any non-claimed element essential to the practice of the invention.

The above information disclosed in this Background section is only for the enhancement of understanding of the background of the invention and therefore it

may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY

Before the present systems and methods, are described, it is to be understood that this application is not limited to the particular systems, and methodologies described, as there can be multiple possible embodiments which are not expressly illustrated in the present disclosure. It is also to be understood that the terminology used in the description is for the purpose of describing the particular versions or embodiments only and is not intended to limit the scope of the present application.

The present invention mainly cures and solves the technical problems existing in the prior art. In response to these problems, the present invention discloses Smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning .

As one aspect of the present invention is to presents “ a smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning, wherein the smart pen comprises: A touch sensor, used to detect the pressure, wherein the touch sensor is embedded in the area of gripping of the pen, wherein the touch sensor is used to detect the pressure of finger of the user of the pen; and A processing unit , wherein the processing unit comprises at least

one a memory storage and a communication unit, wherein the processing unit is used to embedded within a pen casing to record data as a user reads sections of text using the pen as a pointer, wherein processing unit is used to process the information received from the touch sensor and determine the pressure of the fingers of the user while gripping the pen and determine the mental focus and concentration of the user using a machine learning model, wherein the machine learning model is trained using a large data of the user through the value of grip pressure and concentration of the users, wherein the processing unit (2) send the concentration and mental focus status to an external device using the communication unit...”

BRIEF DESCRIPTION OF DRAWINGS

To clarify various aspects of some example embodiments of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. It is appreciated that these drawings depict only illustrated embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the use of the accompanying drawings.

In order that the advantages of the present invention will be easily understood, a detailed description of the invention is discussed below in conjunction

with the appended drawings, which, however, should not be considered to limit the scope of the invention to the accompanying drawings, in which:

Figure 1 shows block diagram representation of Smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning .

DETAIL DESCRIPTION

The present invention is related to Smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning .

Figure 1 shows detail block diagram representation of Smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning .

Although the present disclosure has been described with the purpose of Smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning , it should be appreciated that the same has been done merely to illustrate the invention in an exemplary manner and to highlight any other purpose or function for which explained structures or configurations could be used and is covered within the scope of the present disclosure.

The Smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning is presented in this disclosure.

The smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning, comprises a touch sensor (1), and a processing unit (2).

The touch sensor (1) is used to detect the pressure, wherein the touch sensor is embedded in the area of gripping of the pen (10).

The touch sensor (1) is used to detect the pressure of finger of the user of the pen (10).

The processing unit (2) comprises at least one a memory storage (3) and a communication unit (4).

The processing unit (2) is used to embedded within the pen casing to record data as a user reads sections of text using the pen (10) as a pointer.

The processing unit (2) is used to process the information received from the touch sensor (2) and determine the pressure of the fingers of the user while gripping the pen and determine the mental focus and concentration of the user using a machine learning model.

The machine learning model is trained using a large data of the user through the value of grip pressure and concentration of the users.

The processing unit (2) send the concentration and mental focus status to an external device (5) using the communication unit (4).

The touch sensor (2) is piezoelectric based touch sensor (2).

The external device (5) is mobile computing unit (5). The mobile computing unit (5) is smart phone..

The figures and the foregoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements

may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, order of processes described herein may be changed and are not limited to the manner described herein. Moreover, the actions of any block diagram need not be implemented in the order shown; nor do all of the acts need to be necessarily performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples.

Although implementations of the invention have been described in a language specific to structural features and/or methods, it is to be understood that the appended claims are not necessarily limited to the specific features or methods described. Rather, the specific features and methods are disclosed as examples of implementations of the invention.

CLAIMS

We claim:

1. . A smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning, wherein the smart pen comprises:

A touch sensor (1), used to detect the pressure, wherein the touch sensor (1) is embedded in the area of gripping of the pen (10), wherein the touch sensor (1) is used to detect the pressure of finger of the user of the pen (10) ; and

A processing unit (2), wherein the processing unit (2) comprises at least one a memory storage (3) and a communication unit (4), wherein the processing unit (2) is used to embedded within the pen casing to record data as a user reads sections of text using the pen (10) as a pointer, wherein processing unit (2) is used to process the information received from the touch sensor (2) and determine the pressure of the fingers of the user while gripping the pen and determine the mental focus and concentration of the user using a machine learning model, wherein the machine learning model is trained using a large data of the user through the value of grip pressure and concentration of the users, wherein the processing unit (2) send the concentration and mental focus status to an external device (5) using the communication unit (4).

2. The smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning as claimed in claim 1, The touch sensor (2) is piezoelectric based touch sensor (2).

3. The smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning as claimed in claim 1, the external device (5) is mobile computing unit (5).

4. The smart pen (10) to detect human mental focus and concentration with pressure sensors on the grip using machine learning as claimed in claim 1, the mobile computing unit (5) is smart phone.

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SMART PEN TO DETECT HUMAN MENTAL FOCUS AND CONCENTRATION WITH PRESSURE SENSORS ON THE GRIP USING MACHINE LEARNING

ABSTRACT

The present invention relates to Smart pen to detect human mental focus and concentration with pressure sensors on the grip using machine learning . The objective of the present invention is to solve the problems in the prior art technologies related to pressure sensor based mental focus prediction.