

UNITED STATES PATENT AND TRADEMARK OFFICE

I, Stephen Robert MURRAY BSc (Hons), Dip. Trans. IoL,
declare:

1. That I am a citizen of the United Kingdom of Great Britain and Northern Ireland and a translator to RWS Group Ltd, of Europa House, Chiltern Park, Chiltern Hill, Chalfont St Peter, Buckinghamshire, United Kingdom.
2. That I am well acquainted with the Chinese and English languages.
3. That the attached is, to the best of my knowledge and belief, a true translation into the English language of the accompanying document "Cheng - CN203386188U".
4. That I believe that all statements made herein of my own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application in the United States of America or any patent issuing thereon.



For and on behalf of RWS Group Ltd
The 14th day of August 2023

(54) Title of utility model

Infrared touch screen frame structure

(57) Abstract

The present utility model discloses an infrared touch
5 screen frame structure, set up at an edge of a touch
panel to form an infrared touch screen, and comprising a
frame, a circuit board and an infrared element, the
infrared element comprising a lamp tube and a pin, the
pin being soldered to the circuit board; within the
10 frame, there is a semi-closed cavity in which the circuit
board and the infrared element are placed, and the lamp
tube extends out of the semi-closed cavity and lies
against a surface of the touch panel. By having the lamp
tube lie against the surface of the touch panel directly,
15 the present utility model reduces the distance from the
center of the lamp tube to the touch panel, so when a
user is writing, strokes will not easily become joined
up, so the writing effect is good; moreover, the frame
body thickness is reduced, and materials are saved, thus
20 reducing costs.

1. An infrared touch screen frame structure, set up at an edge of a touch panel to form an infrared touch screen, and comprising a frame, a circuit board and an infrared element, the infrared element comprising a lamp tube and a pin, the pin being soldered to the circuit board, characterized in that within the frame, there is a semi-closed cavity in which the circuit board and the infrared element are placed, and the lamp tube extends out of the semi-closed cavity and lies against a surface of the touch panel.

2. The infrared touch screen frame structure as claimed in claim 1, characterized in that an end part of the frame is provided with a light filter plate, the light filter plate being located in front of the infrared element.

3. The infrared touch screen frame structure as claimed in claim 1, characterized in that a protrusion is provided on the frame; the protrusion is placed on an upper surface of the touch panel, and the infrared element is located in front of the protrusion.

4. The infrared touch screen frame structure as claimed in claim 3, characterized in that a support is provided below the protrusion; the support and the protrusion together clamp the touch panel.

5. The infrared touch screen frame structure as claimed in claim 1, characterized in that two engagement grooves are provided on the frame; the engagement grooves clamp and fix the circuit board.

Infrared touch screen frame structure

Technical field

[0001] The present utility model relates to the field
5 of touch screens, in particular to an infrared touch
screen frame structure with a smaller thickness.

Background art

[0002] A touch screen is a type of multimedia device for
10 demonstration, indispensable in modernized multimedia
office work and teaching. In interactive electronic white
boards, a variety of principles may be relied on to
perform positioning, with infrared positioning being
commonly used. In infrared positioning, infrared
15 receivers and transmitters distributed densely around a
display region form a scanning network in horizontal and
vertical directions, and it is thus possible to determine
X and Y coordinates by means of the position of infrared
rays in the horizontal and vertical directions that are
20 blocked.

[0003] Existing infrared touch screens generally all
have printed circuit boards installed in a frame, with
infrared elements mounted on the printed circuit board;
thus, a closed space in which to place the infrared
25 elements and circuit boards needs to be left inside the
frame. As a result, the distance from the center of the
infrared element to the touch panel is increased by the
thickness of the frame casing, reaching 4 - 5 mm, and a
touch object will trigger a touch operation when it has
30 not yet touched the touch panel, so when a user is
writing, strokes will easily become joined up, resulting
in a poor user experience.

Summary of the utility model

35 [0004] Based on the above, in response to the problem
in the prior art, there is a need to provide an infrared
touch screen frame structure with a smaller thickness.

[0005] To solve the problem in the prior art, the present utility model discloses an infrared touch screen frame structure, set up at an edge of a touch panel to form an infrared touch screen, and comprising a frame, a circuit board and an infrared element, the infrared element comprising a lamp tube and a pin, the pin being soldered to the circuit board; within the frame, there is a semi-closed cavity in which the circuit board and the infrared element are placed, and the lamp tube extends out of the semi-closed cavity and lies against a surface of the touch panel.

[0006] Furthermore, an end part of the frame is provided with a light filter plate, the light filter plate being located in front of the infrared element.

[0007] Furthermore, a protrusion is provided on the frame; the protrusion is placed on an upper surface of the touch panel, and the infrared element is located in front of the protrusion.

[0008] Furthermore, a support is provided below the protrusion; the support and the protrusion together clamp the touch panel.

[0009] Furthermore, two engagement grooves are provided on the frame; the engagement grooves clamp and fix the circuit board.

[0010] The present utility model has the following beneficial effects: the frame has a semi-closed cavity in which the circuit board and the infrared element are placed, and the lamp tube can extend out of the semi-closed cavity and lie against a surface of the touch panel; this reduces the distance from the center of the lamp tube to the touch panel, so when a user is writing, strokes will not easily become joined up, so the writing effect is good; moreover, the frame body thickness is reduced, and materials are saved, thus reducing costs.

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Brief description of the drawings

[0011] Fig. 1 is a sectional schematic structural drawing of the infrared touch screen frame structure of the present utility model.

5 Detailed description of the utility model

[0012] To enable further understanding of the features and technical approaches of the present utility model as well as the specific objective and functions achieved, the present utility model is described in further detail
10 below with reference to the drawings and specific embodiments.

[0013] Referring to Fig. 1, the present utility model discloses an infrared touch screen frame structure, set up at an edge of a touch panel 10 to form an infrared
15 touch screen. The infrared touch screen frame structure comprises a frame 20, a circuit board 30 and an infrared element 40. The infrared element 40 comprises a lamp tube 41 and a pin 42, the pin 42 being soldered to the circuit board 30; within the frame 20, there is a semi-closed
20 cavity 21 in which the circuit board 30 and the infrared element are placed; and the lamp tube 41 extends out of the semi-closed cavity 21 and lies against a surface of the touch panel 10.

[0014] An end part of the frame 20 is provided with a
25 light filter plate 22; the light filter plate 22 is located in front of the infrared element 40, and infrared rays transmitted or received by the lamp tube 41 pass through the light filter plate 22.

[0015] A protrusion 24 is provided on the frame 20; the
30 protrusion 24 is placed on an upper surface of the touch panel 10, and the infrared element 40 is located in front of the protrusion 24.

[0016] A support 50 is provided below the protrusion 24; the support 50 and the protrusion 24 together clamp the
35 touch panel 10.

[0017] Two engagement grooves 23 are provided on the frame 20; the engagement grooves 23 clamp and fix the circuit board 30.

[0018] In the infrared touch screen frame structure of the present utility model, the frame 20 thereof has a semi-closed cavity 21 in which the circuit board 30 and the infrared element 40 are placed, and the lamp tube 41 can extend out of the semi-closed cavity 21 and lie against a surface of the touch panel 10; this reduces the distance from the center of the lamp tube 41 to the touch panel 10, and avoids the phenomenon whereby a touch object triggers a touch operation when it has not yet touched the touch panel, so when a user is writing, strokes will not easily become joined up, so the writing effect is good; moreover, the frame body thickness is reduced, and materials are saved, thus reducing costs.

[0019] The above embodiments express only a few implementations of the present utility model, and are described in quite specific and detailed terms, but cannot therefore be construed as limiting the patent scope of the present utility model. It should be pointed out that a person skilled in the art could still make changes and improvements without departing from the concept of the present utility model, and all of these are included in the scope of protection of the present utility model. Thus, the scope of protection of the present utility model patent shall be defined by the attached claims.

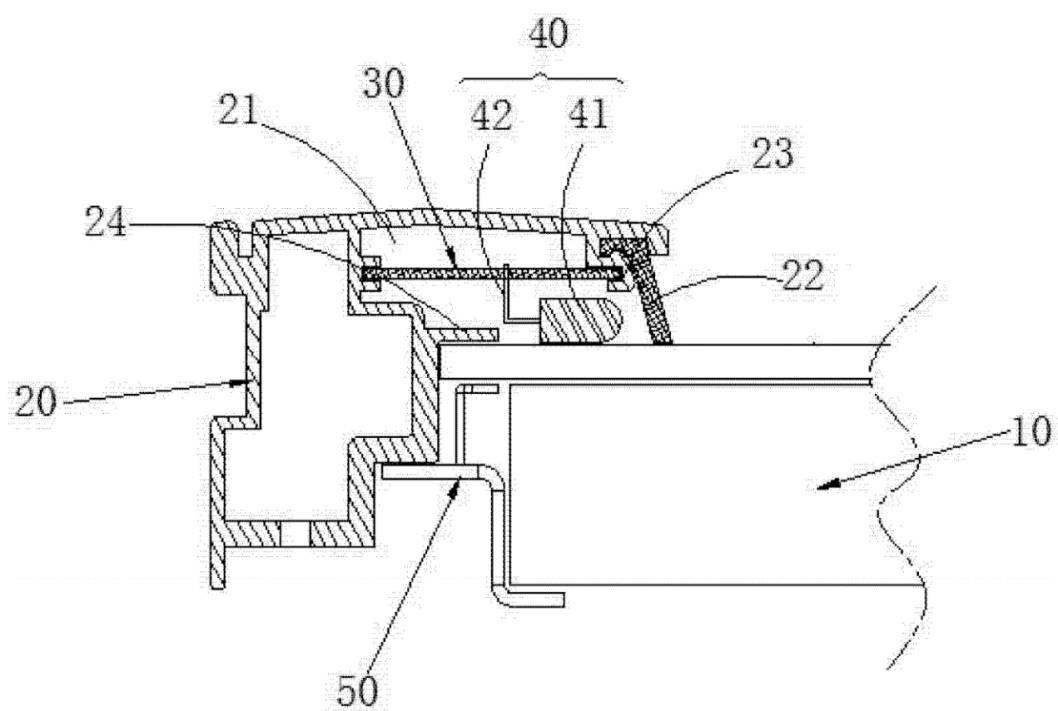


Fig. 1