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(54) Title: PROJECTION-TYPE TOUCH CONTROL ELECTRONIC WHITEBOARD AND FRAME STRUCTURE THEREOF

(54) 发明名称: 投影式触控电子白板及其边框结构

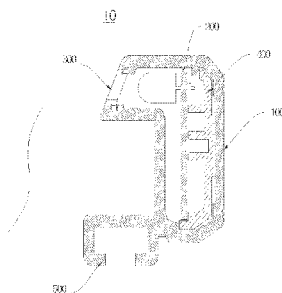


图 5/ Fig.5

(57) Abstract: Disclosed is a frame structure of a projection-type touch control electronic whiteboard to be arranged on the edge of an electronic whiteboard screen, comprising a frame, a light source assembly arranged inside the frame, and an optical filter arranged on the side opening of the frame; the side opening of the frame extends along the edge of the electronic whiteboard; a sensor of the light source assembly is vertically arranged on the circuit board of the light source assembly; the circuit board extends along the edge of the electronic whiteboard; and the vertically arranged sensor provides touch control positioning through the filter. Also disclosed is an electronic whiteboard with the frame structure. The electronic whiteboard and the frame structure thereof enable the electronic whiteboard to have a narrow frame, and are easy to install and maintain, thus facilitating the designing of a light and thin electronic whiteboard having a more attractive appearance.

(57) 摘要:

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本国际公布:

— 包括国际检索报告(条约第 21 条(3))。

本发明公开一种投影式触控电子白板的边框结构，用于设置在电子白板的屏幕的边缘处，包括边框、设置在所述边框内的光源组件和设于所述边框侧边开口处的滤光片，所述边框的侧边开口沿电子白板的边缘延伸，所述光源组件的传感器竖排在所述光源组件的电路板上，且所述电路板沿电子白板的边缘延伸，所述竖排的传感器透过所述滤光片提供触控定位。还公开一种具有上述边框结构的电子白板。上述电子白板及其边框结构使得电子白板具有窄边框，易安装，易维护，方便设计更加美观的轻薄电子白板。

说明书

发明名称：投影式触控电子白板及其边框结构

[1] 【技术领域】

[2] 本发明涉及电子白板技术领域，特别是涉及一种投影式触控电子白板和一种投影式触控电子白板的边框结构。

[3] 【背景技术】

[4] 在电子白板技术领域，特别是采用投影显示的大型电子白板中（参考图1），多采用红外传感技术为电子白板提供触控定位。红外传感器一般都设置在电子白板的边框中。如图2所示，是一种传统的电子白板的横向剖视图。该电子白板包括基板1、设置在基板1四个边缘的边框2、设置在边框2中的传感器组件3和设置在边框2侧边开口处的滤光片4。其中传感器组件3发射出信号并经过滤光片4滤光后为触控区域另一侧的传感器接收。参考图3a和图3b，传感器组件3包括电路板31、插设在电路板31上的传感器32和驱动传感器32的电路芯片33。在传统的电子白板中，传感器组件3中的传感器32的管脚是与传感器主体部分垂直的，也即传感器32主体部分是卧排在电路板31上的，这样就需要将整个电路板31以平行于基板1的方式放置在基板1的边缘，这样整个电子白板的边框就会太宽，无法形成窄边框设计。

[5] 【发明内容】

[6] 基于此，有必要提供一种用于窄边框的投影式电子白板的边框结构。

[7] 此外，还提供一种投影式电子白板。

[8] 一种投影式电子白板的边框结构，用于设置在电子白板的显示区域的边缘处，包括边框、设置在所述边框内的传感器组件和设于所述边框侧边开口处的滤光片，所述边框的侧边开口沿电子白板的边缘延伸，所述传感器组件的传感器竖排在所述传感器组件的电路板上，且所述电路板沿显示区域的边缘延伸，所述竖排的传感器透过所述滤光片提供触控定位。

[9] 在其中一个实施例中，所述边框整体为条柱状，并具有截面为L型的容置腔，用于容置所述传感器组件，所述传感器组件的电路板和传感器相互垂直地设置

并置于所述截面为L型的容置腔中。

[10] 在其中一个实施例中，还包括托板，所述电路板固定在所述托板上，并与托板一起活动地容置于所述边框内。

[11] 在其中一个实施例中，还包括设于所述边框上且与设有滤光片的开口相对的边框连接结构，多个边框可通过所述边框连接结构相互连接。

[12] 在其中一个实施例中，所述边框连接结构为与角铁配合的框架。

[13] 一种投影式电子白板，包括触控板和设于所述触控板四个边缘的边框结构，所述边框结构包括边框、设置在所述边框内的传感器组件和设于所述边框侧边开口处的滤光片，所述边框的侧边开口沿触控板的边缘延伸，所述传感器组件的传感器竖排在所述光源组件的电路板上，且所述电路板沿触控板的边缘延伸，所述竖排的传感器透过所述滤光片提供触控定位。

[14] 在其中一个实施例中，所述边框整体为条柱状，并具有截面为L型的容置腔，用于容置所述光源组件，所述光源组件的电路板和传感器相互垂直地设置并置于所述截面为L型的容置腔中。

[15] 在其中一个实施例中，还包括托板，所述电路板固定在所述托板上，并与托板一起活动地容置于所述边框内。

[16] 在其中一个实施例中，还包括设于所述边框上且与设有滤光片的开口相对的边框连接结构，相邻的边框通过所述边框连接结构相互连接。

[17] 在其中一个实施例中，所述边框连接结构包括为与角铁配合的框架，相邻边框通过角铁连接，且相邻的边框连接处设有与所述角铁固定连接且覆盖边框端部的角件。

[18] 上述投影式电子白板及其边框结构，通过将红外LED光源的发光灯体与电路板垂直设置，使得电路板可以采用沿屏幕边缘延伸的方向设置，相比于传统的设置方式，可以将显示屏的边框部分变窄，便于设计更美观的显示屏。

[19] 【附图说明】

[20] 图1为触摸电子白板用于投影的示意图；

[21] 图2为一种传统的显示屏的横向剖视图；

[22] 图3a和图3b为图2中的触控组件结构示意图；

- [23] 图4为一实施例的显示屏的边框结构示意图；
- [24] 图5为图4所述边框结构的横向剖视图；
- [25] 图6为图5中的触控组件结构示意图；
- [26] 图7为一实施例的显示屏的横向剖视图；
- [27] 图8为相邻的边框结构相接处带角件的示意图；
- [28] 图9为相邻的边框结构相接处不带角件的示意图。

[29] **【具体实施方式】**

- [30] 如图4所示，为一实施例的投影式电子白板的边框结构示意图，图5为图4所示的边框结构的横向剖视图。结合图4和图5，该边框结构10包括边框100、设置在边框100内的传感器组件200和设于边框100侧边开口处的滤光片300（参考图5）。

- [31] 边框100整体为条柱状，并具有截面为L型的容置腔。边框100侧边开设沿电子白板的屏幕的边缘延伸的开口，滤光片300设于该开口处。

- [32] 如图6所示，传感器组件200包括传感器210和电路板220。在电子白板相对的边缘上设置的边框结构10中，对应设置发送传感器和接收传感器。这样，从电子白板一侧边缘发送的传感器信号能够被另一侧的传感器接收。传感器210竖排在电路板220上，也即传感器210的管脚与传感器轴向相同，使得传感器210与电路板220相互垂直。电路板220沿电子白板的边缘延伸，多个传感器210即沿该延伸方向顺序排列，并且传感器信号的发射或接收方向朝向滤光片300，透过滤光片300提供触控定位。相互垂直的传感器210和电路板220容置于上述的具有L型截面的容置腔中。

- [33] 进一步地，如图4~图6所示，本实施例的边框结构10还包括托板400。电路220固定在托板400上，并与托板400一起活动地容置于边框100内。

- [34] 在传统的电子白板边框结构中，一旦传感器出现故障，就要更换传感器组件中的部分电路板，此时需要将电子白板四个边框全部拆除以取出电路板。本实施例的边框结构10中，传感器组件200则可以随托板400一起整体地在边框100的容置腔中移动，在电路出现故障时，从边框100的一端拉动托板400，即可将传感器组件200整体取出。因此可以方便地维护。

- [35] 进一步地，如图5所示，本实施例的边框结构10还包括设于边框100上的边框连接结构500。在边框100的位置上，边框连接结构500与设有滤光片300的开口相对，在边框100与电子白板边缘连接时，边框连接结构500和滤光片300分别位于电子白板的正面和背面。相邻的边框100可通过边框连接结构500相互连接，以形成紧凑的边框整体。
- [36] 本实施例中，边框连接结构500为与角铁配合的框架。
- [37] 上述实施例中，通过将传感器210的传感器主体与电路板220垂直设置，使得电路板210可以采用沿电子白板边缘延伸的方向设置，相比于传统的设置方式，可以将电子白板的边框部分变窄，便于设计更美观的电子白板。同时，传感器组件200作为一个整体可以随托板400活动地进出边框100的容置腔，便于在传感器故障时进行维护。
- [38] 可以理解，在不同的实施例中，托板400和边框连接结构500根据成本或便利性等需求增减，且具体结构也不限于上述实施例的结构。
- [39] 如图7所示，为一实施例的电子白板的横向剖视图。该电子白板包括触控板20和设于触控板20四个边缘的如上述实施例的边框结构10（图7中仅显示两个边缘的边框结构）。
- [40] 参考图8，边框结构10在相邻处通过角件30连接。参考图9，边框结构10的相邻处设置角铁40，相邻边框10的边框连接结构500通过角铁40连接，角件30与角铁40固定连接并覆盖在边框10的相邻的端部。当光源组件200出现故障时，只需要将角件30拆卸，然后通过托板400将光源组件200整体拉出，即可方便地维修。
- [41] 以上所述实施例仅表达了本发明的几种实施方式，其描述较为具体和详细，但并不能因此而理解为对本发明专利范围的限制。应当指出的是，对于本领域的普通技术人员来说，在不脱离本发明构思的前提下，还可以做出若干变形和改进，这些都属于本发明的保护范围。因此，本发明的保护范围应以所附权利要求为准。

权利要求书

- [权利要求 1] 一种投影式电子白板的边框结构，用于设置在电子白板的显示区域的边缘处，包括边框、设置在所述边框内的传感器组件和设于所述边框侧边开口处的滤光片，所述边框的侧边开口沿电子白板的边缘延伸，其特征在于，所述传感器组件的传感器竖排在所述传感器组件的电路板上，且所述电路板沿显示区域的边缘延伸，所述竖排的传感器透过所述滤光片提供触控定位。
- [权利要求 2] 根据权利要求1所述的投影式电子白板的边框结构，其特征在于，所述边框整体为条柱状，并具有截面为L型的容置腔，用于容置所述传感器组件，所述传感器组件的电路板和传感器相互垂直地设置并置于所述截面为L型的容置腔中。
- [权利要求 3] 根据权利要求1所述的投影式电子白板的边框结构，其特征在于，还包括托板，所述电路板固定在所述托板上，并与托板一起活动地容置于所述边框内。
- [权利要求 4] 根据权利要求1所述的投影式电子白板的边框结构，其特征在于，还包括设于所述边框上且与设有滤光片的开口相对的边框连接结构，多个边框可通过所述边框连接结构相互连接。
- [权利要求 5] 根据权利要求4所述的投影式电子白板的边框结构，其特征在于，所述边框连接结构为与角铁配合的框架。
- [权利要求 6] 一种投影式电子白板，包括触控板和设于所述触控板四个边缘的边框结构，所述边框结构包括边框、设置在所述边框内的传感器组件和设于所述边框侧边开口处的滤光片，所述边框的侧边开口沿触控板的边缘延伸，其特征在于，所述传感器组件的传感器竖排在所述光源组件的电路板上，且所述电路板沿触控板的边缘延伸，所述竖排的传感器透过所述滤光片提供触控定位。
- [权利要求 7] 根据权利要求6所述的投影式电子白板，其特征在于，所述边框整体为条柱状，并具有截面为L型的容置腔，用于容置所述光源组件，所述光源组件的电路板和传感器相互垂直地设置并置于所述截

面为L型的容置腔中。

[权利要求 8] 根据权利要求6所述的投影式电子白板，其特征在于，还包括托板，所述电路板固定在所述托板上，并与托板一起活动地容置于所述边框内。

[权利要求 9] 根据权利要求6所述的投影式电子白板，其特征在于，还包括设于所述边框上且与设有滤光片的开口相对的边框连接结构，相邻的边框通过所述边框连接结构相互连接。

[权利要求 10] 根据权利要求9所述的投影式电子白板，其特征在于，所述边框连接结构包括为与角铁配合的框架，相邻边框通过角铁连接，且相邻的边框连接处设有与所述角铁固定连接且覆盖边框端部的角件。

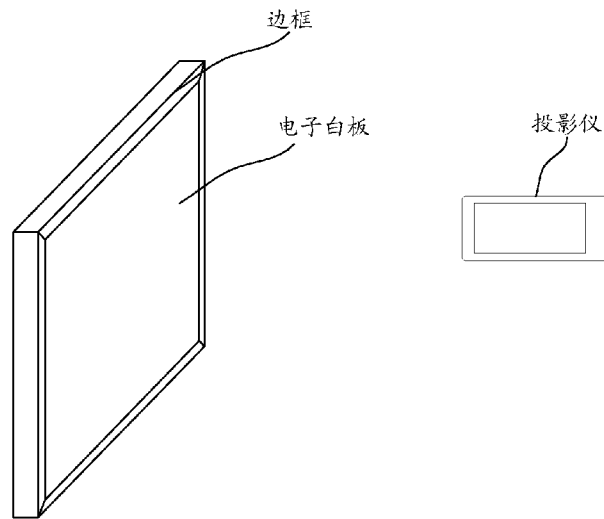


图 1

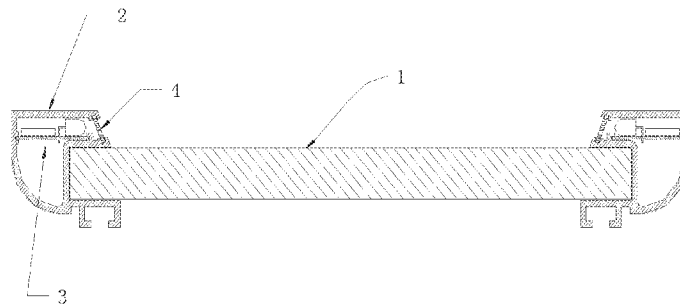


图 2

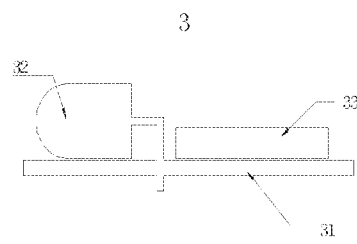


图 3a

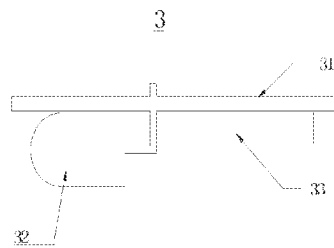


图 3b

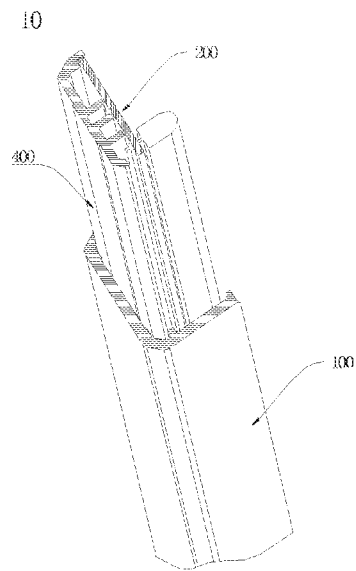


图 4

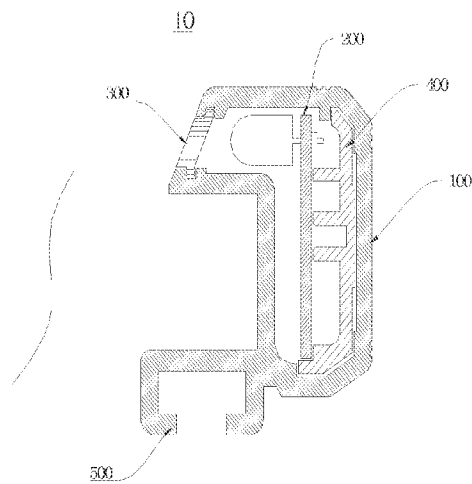


图 5

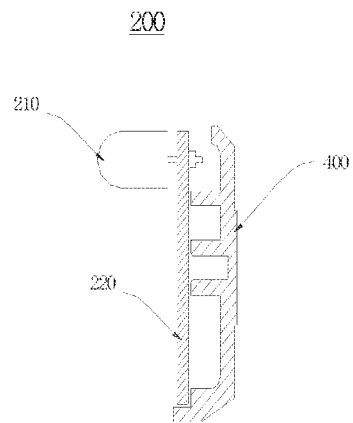


图 6

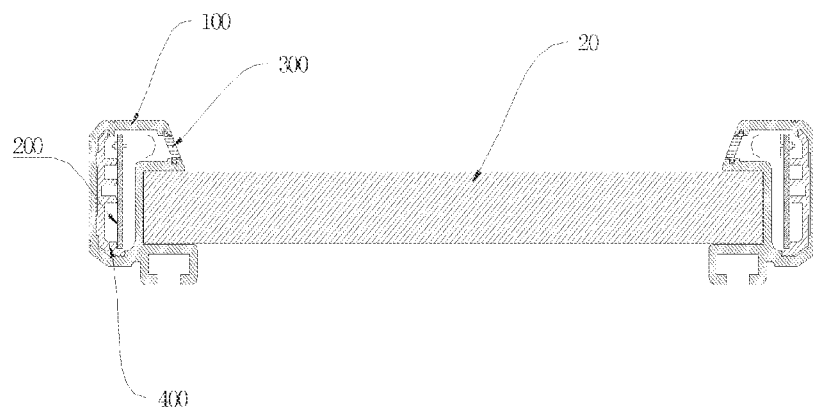


图 7

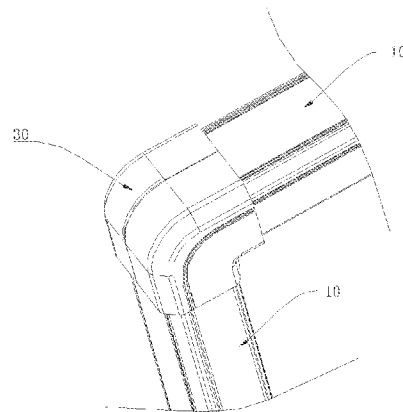


图 8

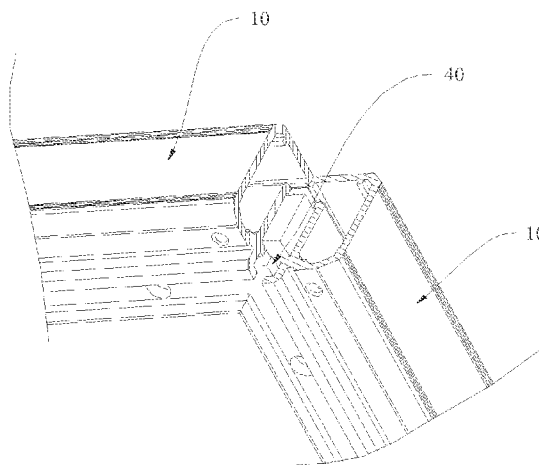


图 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2013/073781

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/042 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06F 3/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CNPAT, CNKI, DWPI, EPODOC: touch, frame, size, width, narrow, sensor, sensing, infrared, circuit board, vertical, perpendicular, white board, print circuit board, optics

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201917889 U (ZHEJIANG RUNZHI ELECTRONIC TECHNOLOGY CO., LTD.) 03 August 2011 (03.08.2011) description, paragraphs [0029]-[0031], [0071] and [0075], and figures 1 and 7	1-10
X	CN 102662534 A (SHENZHEN TIMELINK SCI&TECHNOLOGY CO.) 12 September 2012 (12.09.2012) description, paragraphs [0021]-[0024], and figure 1	1-10
X	CN 202661975 U (SHENZHEN TIMELINK SCI&TECHNOLOGY CO.) 09 January 2013 (09.01.2013) description paragraphs [0021]-[0024], and figure 1,	1-10
E	CN 203178984 U (SHENZHEN TIMELINK SCI & TECHNOLOGY CO.) 04 September 2013 (04.09.2013) claims 1-10	1-10
A	CN 202171790 U (IRICO GROUP CO., LTD.) 21 March 2012 (21.03.2012) the whole document	1-10

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 28 November 2013 (28.11.2013)	Date of mailing of the international search report 05 December 2013 (05.12.2013)
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer ZENG, Wei Telephone No. (86-10) 62411695

IPR2024-00013

Flatfrog Laboratories AB, Ex. 2005

Page 14 of 23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2013/073781

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 201917889 U	03.08.2011	None	
CN 102662534 A	12.09.2012	WO 2013159472 A1	31.10.2013
CN 202661975 U	09.01.2013	None	
CN 203178984 U	04.09.2013	None	
CN 202171790 U	21.03.2012	None	

国际检索报告

国际申请号
PCT/CN2013/073781**A. 主题的分类**

G06F 3/042 (2006.01) i

按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

IPC: G06F3/-

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))

CNPAT, CNKI, DWPI, EPODOC: 触摸, 触敏, 触控, 边框, 宽度, 窄, 感应, 感测, 传感, 光学, 红外, 白板, 电路, 电路板, 印刷电路板, 印制电路板, 垂直, 竖直, 竖排, 外框, 框架, touch, frame, size, sensor, sensing, infrared, circuit board, vertical, perpendicular

C. 相关文件

类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	CN 201917889 U (浙江润智电子科技有限公司) 03. 8 月 2011 (03.08.2011) 附图 1, 7, 说明书 0029-0031, 0071, 0075 段	1-10
X	CN 102662534 A (深圳市天时通科技有限公司) 12. 9 月 2012 (12.09.2012) 附图 1, 说明书 0021-0024 段	1-10
X	CN 202661975 U (深圳市天时通科技有限公司) 09. 1 月 2013 (09.01.2013) 附图 1, 说明书 0021-0024 段	1-10
E	CN 203178984 U (深圳市天时通科技有限公司) 04. 9 月 2013 (04.09.2013) 权利要求 1-10	1-10
A	CN 202171790 U (彩虹集团公司) 21. 3 月 2012 (21.03.2012) 全文	1-10

☐ 其余文件在 C 栏的续页中列出。☒ 见同族专利附件。

* 引用文件的具体类型:

“A” 认为不特别相关的表示了现有技术一般状态的文件

“E” 在国际申请日的当天或之后公布的在先申请或专利

“L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇
引用文件的公布日而引用的或者因其他特殊理由而引
用的文件(如具体说明的)

“O” 涉及口头公开、使用、展览或其他方式公开的文件

“P” 公布日先于国际申请日但迟于所要求的优先权日的文件

“T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了
理解发明之理论或原理的在后文件“X” 特别相关的文件, 单独考虑该文件, 认定要求保护的
发明不是新颖的或不具有创造性“Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件
结合并且这种结合对于本领域技术人员为显而易见时,
要求保护的发明不具有创造性

“&” 同族专利的文件

国际检索实际完成的日期

28. 11 月 2013 (28.11.2013)

国际检索报告邮寄日期

05.12 月 2013 (05.12.2013)

ISA/CN 的名称和邮寄地址:

中华人民共和国国家知识产权局

中国北京市海淀区蓟门桥西土城路 6 号 100088

传真号: (86-10)62019451

受权官员

曾威电话号码: (86-10) **62411695**

关于同族专利的信息

PCT/CN2013/073781

无

Projection-type touch control electronic whiteboard and frame structure thereof

Abstract

Disclosed is a frame structure of a projection-type touch control electronic whiteboard to be arranged on the edge of an electronic whiteboard screen, comprising a frame, a light source assembly arranged inside the frame, and an optical filter arranged on the side opening of the frame; the side opening of the frame extends along the edge of the electronic whiteboard; a sensor of the light source assembly is vertically arranged on the circuit board of the light source assembly; the circuit board extends along the edge of the electronic whiteboard; and the vertically arranged sensor provides touch control positioning through the filter. Also disclosed is an electronic whiteboard with the frame structure. The electronic whiteboard and the frame structure thereof enable the electronic whiteboard to have a narrow frame, and are easy to install and maintain, thus facilitating the designing of a light and thin electronic whiteboard having a more attractive appearance.

Images (5)



Classifications

■ **G06F3/0428** Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means by opto-electronic means by sensing at the edges of the touch surface the interruption of optical paths, e.g. an illumination plane, parallel to the touch surface which may be virtual

Landscapes

- Engineering & Computer Science
- General Engineering & Computer Science

Show more

Claims (10)

Hide Dependent ^

1. A frame structure of a projection type electronic whiteboard, configured to be disposed at an edge of a display area of the electronic whiteboard, comprising a frame, a sensor component disposed in the frame, and a filter disposed at an opening of the side of the frame, a side opening of the bezel extending along an edge of the electronic whiteboard, wherein a sensor of the sensor assembly is vertically arranged on a circuit board of the sensor assembly, and the circuit board extends along an edge of the display area, A vertical array of sensors provides touch positioning through the filter.
2. The frame structure of the projection type electronic whiteboard according to claim 1, wherein the frame is entirely in the shape of a bar and has an L-shaped accommodating cavity for accommodating the sensor assembly, the sensor The circuit board and the sensor of the assembly are disposed perpendicular to each other and placed in the L-shaped receiving cavity.
3. The frame structure of the projection type electronic whiteboard according to claim 1, further comprising a tray, the circuit board being fixed on the pallet and movably housed in the frame together with the pallet .
4. The frame structure of the projection type electronic whiteboard according to claim 1, further comprising a frame connecting structure disposed on the frame and opposite to the opening provided with the filter, wherein the plurality of frames pass through the frame The connection structures are connected to each other.
5. The frame structure of the projection type electronic whiteboard according to claim 4, wherein the frame connection structure is a frame that cooperates with the angle iron.
6. A projection type electronic whiteboard includes a touch panel and a frame structure disposed on four edges of the touch panel, the frame structure includes a frame, a sensor component disposed in the frame, and a side of the frame a filter at the opening, the side opening of the frame extending along an edge of the touch panel, wherein the sensor of the sensor assembly is vertically arranged on a circuit board of the light source assembly, and the circuit board is along The edge of the touchpad extends, and the vertical row of sensors provides touch positioning through the filter.

WO2014131221A1

WIPO (PCT)

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Other languages: [French](#), [Chinese](#)

Inventor: [陈伟山](#), [闫广林](#), [谷鸿林](#), [栗勇](#), [邓华芹](#), [冯广伦](#)

Worldwide applications

2013 [CN](#) [WO](#)

Application PCT/CN2013/073781 events ⓘ

2013-04-07 Application filed by [深圳市天时通科技有限公司](#)

2014-09-04 Publication of WO2014131221A1

Info: [Patent citations \(10\)](#), [Cited by \(12\)](#), [Legal events](#), [Similar documents](#), [Priority and Related Applications](#)

External links: [Espacenet](#), [Global Dossier](#), [PatentScope](#), [Discuss](#)

7. The projection type electronic whiteboard according to claim 6, wherein the frame is entirely in the shape of a bar and has an L-shaped accommodating cavity for accommodating the light source assembly, the circuit of the light source assembly. The plate and the sensor are disposed perpendicular to each other and placed in the L-shaped receiving cavity.
8. The projection type electronic whiteboard according to claim 6, further comprising a pallet fixed to the pallet and movably housed in the bezel together with the pallet.
9. The projection type electronic whiteboard according to claim 6, further comprising a frame connecting structure disposed on the frame and opposite to the opening provided with the filter, wherein the adjacent frames are connected to each other through the frame connecting structure connection.
10. The projection type electronic whiteboard according to claim 9, wherein the frame connecting structure comprises a frame that is matched with the angle iron, the adjacent frames are connected by an angle iron, and the adjacent frame connection is provided with the The angle iron is fixedly attached and covers the corner piece at the end of the bezel.

Description

Projection touch electronic whiteboard and its frame structure

[Technical Field]

The present invention relates to the field of electronic whiteboard technology, and in particular to a frame structure of a projection type touch electronic whiteboard and a projection type touch electronic whiteboard.

【Background technique】

In the field of electronic whiteboard technology, especially in a large electronic whiteboard using projection display (refer to FIG. 1), infrared sensing technology is often used to provide touch positioning for the electronic whiteboard. Infrared sensors are generally placed in the border of the electronic whiteboard. As shown in FIG. 2, it is a transverse cross-sectional view of a conventional electronic whiteboard. The electronic whiteboard includes a substrate 1, a frame 2 disposed at four edges of the substrate 1, a sensor assembly 3 disposed in the frame 2, and a filter 4 disposed at an opening at a side of the frame 2. The sensor component 3 emits a signal and is filtered by the filter 4 to receive the sensor on the other side of the touch area. Referring to Figures 3a and 3b, the sensor assembly 3 includes a circuit board 31, a sensor 32 interposed on the circuit board 31, and a circuit chip 33 that drives the sensor 32. In a conventional electronic whiteboard, the pins of the sensor 32 in the sensor assembly 3 are perpendicular to the main body of the sensor, that is, the main portion of the sensor 32 is placed on the circuit board 31, so that the entire circuit board 31 needs to be Placed on the edge of the substrate 1 in parallel with the substrate 1, so that the frame of the entire electronic whiteboard is too wide to form a narrow bezel design.

[Summary of the Invention]

Based on this, it is necessary to provide a frame structure of a projection type electronic whiteboard for a narrow bezel.

In addition, a projection type electronic whiteboard is also provided.

A frame structure of a projection type electronic whiteboard, configured to be disposed at an edge of a display area of the electronic whiteboard, comprising a frame, a sensor component disposed in the frame, and a filter disposed at an opening of the side of the frame, a side opening of the bezel extends along an edge of the electronic whiteboard, a sensor of the sensor assembly is vertically arranged on a circuit board of the sensor assembly, and the circuit board extends along an edge of the display area, the vertical row of sensors Touch positioning is provided through the filter.

In one embodiment, the frame is generally cylindrical and has an L-shaped accommodating cavity for accommodating the sensor assembly, and the circuit board and the sensor of the sensor component are juxtaposed perpendicularly to each other. In the accommodating cavity of the L-shaped cross section.

In one embodiment, a pallet is further included, the circuit board being secured to the pallet and movably received within the bezel with the pallet.

In one embodiment, a frame connection structure disposed on the frame and opposite to the opening provided with the filter is further included, and the plurality of frames can be connected to each other through the frame connection structure.

In one embodiment, the bezel connection structure is a frame that mates with the angle iron.

A projection type electronic whiteboard includes a touch panel and a frame structure disposed on four edges of the touch panel, the frame structure includes a frame, a sensor component disposed in the frame, and a side of the frame a filter at the opening, the side opening of the frame extends along an edge of the touch panel, the sensor of the sensor assembly is vertically arranged on the circuit board of the light source assembly, and the circuit board is along the touch panel The edge extends, and the vertical row of sensors provides touch positioning through the filter.

In one embodiment, the frame is generally cylindrical and has an L-shaped receiving cavity for accommodating the light source assembly, and the circuit board and the sensor of the light source assembly are juxtaposed perpendicularly to each other. In the accommodating cavity of the L-shaped cross section.

In one embodiment, a pallet is further included, the circuit board being secured to the pallet and movably received within the bezel with the pallet.

In one embodiment, a frame connection structure disposed on the frame and opposite to the opening provided with the filter is further included, and adjacent frames are connected to each other through the frame connection structure.

In one embodiment, the frame connecting structure comprises a frame that is matched with the angle iron, the adjacent frames are connected by an angle iron, and the adjacent frame connection is fixedly connected with the angle iron and covers the end of the frame. Corner pieces.

The above-mentioned projection type electronic whiteboard and the frame structure thereof are arranged by vertically arranging the light emitting body of the infrared LED light source and the circuit board, so that the circuit board can be arranged in a direction extending along the edge of the screen, and the display screen can be displayed compared to the conventional setting mode. The frame portion is narrowed to facilitate a more aesthetically pleasing display.

[Description of the Drawings]

1 is a schematic diagram of a touch electronic whiteboard for projection;

IPR2024-00013

Figure 2 is a transverse cross-sectional view of a conventional display screen;

3a and 3b are schematic structural views of the touch component of FIG. 2;

4 is a schematic structural view of a frame of a display screen according to an embodiment;

Figure 5 is a transverse cross-sectional view of the bezel structure of Figure 4;

6 is a schematic structural view of the touch component of FIG. 5;

Figure 7 is a transverse cross-sectional view of the display screen of an embodiment;

Figure 8 is a schematic view of the corner piece adjacent to the adjacent frame structure;

Figure 9 is a schematic view of the adjacent frame structure at the junction without corner pieces.

【detailed description】

FIG. 4 is a schematic structural view of a frame of a projection type electronic whiteboard according to an embodiment, and FIG. 5 is a transverse cross-sectional view of the frame structure shown in FIG. 4. 4 and 5, the bezel structure 10 includes a bezel 100, a sensor assembly 200 disposed within the bezel 100, and a filter 300 disposed at a side opening of the bezel 100 (refer to FIG. 5).

The frame 100 has a columnar shape as a whole and has an L-shaped receiving cavity. An opening extending along an edge of the screen of the electronic whiteboard is opened at a side of the frame 100, and the filter 300 is disposed at the opening.

As shown in FIG. 6, sensor assembly 200 includes a sensor 210 and a circuit board 220. In the bezel structure 10 disposed on the opposite edge of the electronic whiteboard, a transmitting sensor and a receiving sensor are correspondingly disposed. In this way, the sensor signal transmitted from one edge of the electronic whiteboard can be received by the sensor on the other side. The sensor 210 is vertically arranged on the circuit board 220, that is, the pins of the sensor 210 are the same as the sensor axis, such that the sensor 210 and the circuit board 220 are perpendicular to each other. The circuit board 220 extends along the edge of the electronic whiteboard, and the plurality of sensors 210 are sequentially arranged along the extending direction, and the transmitting or receiving direction of the sensor signal is directed toward the filter 300, and the light transmitting sheet 300 is provided with the touch positioning. The mutually perpendicular sensor 210 and the circuit board 220 are housed in the above-described accommodating cavity having an L-shaped cross section.

Further, as shown in FIG. 4 to FIG. 6, the frame structure 10 of the embodiment further includes a tray 400. The circuit 220 is secured to the pallet 400 and is movably received within the bezel 100 with the pallet 400.

In the traditional electronic whiteboard frame structure, once the sensor fails, some of the circuit boards in the sensor assembly are replaced. In this case, all four frames of the electronic whiteboard need to be removed to remove the circuit board. In the frame structure 10 of the embodiment, the sensor assembly 200 can move integrally with the tray 400 in the accommodating cavity of the frame 100. When the circuit fails, the tray 400 is pulled from one end of the frame 100, and the sensor can be used. The assembly 200 is taken out as a whole. Therefore, it can be easily maintained.

Further, as shown in FIG. 5, the frame structure 10 of the embodiment further includes a frame connection structure 500 disposed on the frame 100. In the position of the bezel 100, the bezel connection structure 500 is opposite to the opening provided with the filter 300. When the bezel 100 is connected to the edge of the electronic whiteboard, the bezel connection structure 500 and the filter 300 are respectively located on the front and back sides of the electronic whiteboard. Adjacent bezels 100 may be interconnected by a bezel connection structure 500 to form a compact frame as a whole.

In this embodiment, the bezel connection structure 500 is a frame that cooperates with the angle iron.

In the above embodiment, by vertically arranging the sensor body of the sensor 210 and the circuit board 220, the circuit board 210 can be disposed in a direction extending along the edge of the electronic whiteboard. Compared with the conventional setting manner, the frame portion of the electronic whiteboard can be changed. Narrow, easy to design a more beautiful electronic whiteboard. At the same time, the sensor assembly 200 as a whole can move in and out of the accommodating cavity of the frame 100 with the pallet 400, so that maintenance can be performed in the event of a sensor failure.

It can be understood that, in different embodiments, the pallet 400 and the frame connecting structure 500 are increased or decreased according to requirements such as cost or convenience, and the specific structure is not limited to the structure of the above embodiment.

As shown in Fig. 7, it is a transverse cross-sectional view of an electronic whiteboard according to an embodiment. The electronic whiteboard includes a touch panel 20 and a bezel structure 10 (the frame structure in which only two edges are shown in FIG. 7) provided in the four edges of the touch panel 20.

Referring to Figure 8, the bezel structure 10 is joined adjacent by corner members 30. Referring to FIG. 9, the corner structure 10 is disposed adjacent to the frame structure 10, and the frame connection structure 500 of the adjacent frame 10 is connected by the angle iron 40, and the corner piece 30 is fixedly connected with the angle iron 40 and covers the adjacent end of the frame 10. unit. When the light source assembly 200 fails, it is only necessary to disassemble the corner piece 30, and then the entire light source assembly 200 is pulled out through the pallet 400 to be easily repaired.

The above-mentioned embodiments are merely illustrative of several embodiments of the present invention, and the description thereof is more specific and detailed, but is not to be construed as limiting the scope of the invention. It should be noted that a number of variations and modifications may be made by those skilled in the art without departing from the spirit and scope of the invention. Therefore, the scope of the invention should be determined by the appended claims.

Patent Citations (10)

Publication number	Priority date	Publication date	Assignee	Title
CN201917889U *	2010-12-26	2011-08-03	浙江润智电子科技有限公司	Side frame structure member of infrared touch display device
CN202171790U *	2011-07-19	2012-03-21	彩虹集团公司	Leading-out structure of electrodes of touch screen
CN102662534A *	2012-04-27	2012-09-12	深圳市天时通科技有限公司	Touch display device
CN202661975U *	2012-04-27	2013-01-09	深圳市天时通科技有限公司	Touch control displaying device

CN203178984U *	2013-03-01	2013-09-04	深圳市天时通科技有限公司	Projection type touch electronic whiteboard and frame structure thereof
Family To Family Citations				
CN2389361Y *	1999-09-15	2000-07-26	驹扬股份有限公司	Novel structure for electronic thermometer
CN101201675B *	2006-12-15	2011-03-23	英业达股份有限公司	Fixed structure of connecting circuit board
JP5232188B2 *	2010-03-11	2013-07-10	株式会社日立製作所	Elevator car operation panel and elevator equipped with the same
CN102340961A *	2010-07-20	2012-02-01	鸿富锦精密工业（深圳）有限公司	Circuit board combination
CN202394209U *	2011-11-28	2012-08-22	程抒一	Slot-type touch screen

* Cited by examiner, † Cited by third party

Cited By (12)

Publication number	Priority date	Publication date	Assignee	Title
US11256371B2	2017-09-01	2022-02-22	Flatfrog Laboratories Ab	Optical component
US11281338B2	2017-03-28	2022-03-22	Flatfrog Laboratories Ab	Touch sensing apparatus and method for assembly
US11281335B2	2016-12-07	2022-03-22	Flatfrog Laboratories Ab	Touch device
US11567610B2	2018-03-05	2023-01-31	Flatfrog Laboratories Ab	Detection line broadening
US11740741B2	2017-02-06	2023-08-29	Flatfrog Laboratories Ab	Optical coupling in touch-sensing systems
Family To Family Citations				
EP3705933A1 *	2013-11-27	2020-09-09	Guangzhou Shirui Electronics Co., Ltd.	All-in-one smart tablet pc
CN107209608A	2015-01-28	2017-09-26	平蛙实验室股份公司	Dynamic touch isolates frame
EP4075246A1	2015-12-09	2022-10-19	FlatFrog Laboratories AB	Stylus for optical touch system
CN107506096A *	2017-09-06	2017-12-22	合肥宗平计算机科技有限公司	Infrared touch panel framework and its touch-screen
CN107390957B *	2017-09-11	2021-03-02	Tcl华星光电技术有限公司	Infrared touch module and infrared touch display device
CN111061391A *	2018-10-17	2020-04-24	华为技术有限公司	Infrared touch frame, infrared touch screen and display device
CN111651098B *	2020-06-02	2023-03-10	深圳市鸿合创新信息技术有限责任公司	Infrared touch device and section bar

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
WO2014131221A1	2014-09-04	Projection-type touch control electronic whiteboard and frame structure thereof
CN207198817U	2018-04-06	Touch input device
EP3076228B1	2020-06-17	Smart tablet integrated device and assembly method thereof
WO2011032465A1	2011-03-24	High-transparent led display module
WO2017015978A1	2017-02-02	Display apparatus and electronic device
WO2010014783A3	2010-05-06	Glass substrate for capacitive touch panel and manufacturing method thereof
WO2013143175A1	2013-10-03	Liquid crystal display module and framework component thereof
WO2014019247A1	2014-02-06	Liquid crystal display device, frame unit thereof, and liquid crystal panel alignment method
WO2013189105A1	2013-12-27	Backlight module and liquid crystal display device
CN102902121B	2015-05-20	Double-sided display device and backlight module
WO2014015482A1	2014-01-30	Liquid crystal display device, and backlight module and back panel frame thereof
JPWO2014087557A1	2017-01-05	Furniture unit

WO2021103634A1	2021-06-03	Touch frame and touch screen comprising same
CN103676314A	2014-03-26	Transparent display device
WO2016127445A1	2016-08-18	Liquid crystal display device and narrow-frame liquid crystal module thereof
WO2014008655A1	2014-01-16	Spliced display back panel and liquid crystal display
WO2013151202A1	2013-10-10	Multilayer glass structure having liquid crystal cell for displaying lcd image on transparent window of refrigerator
TW201349992A	2013-12-01	Electronic device
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WO2013007064A1	2013-01-17	Backlight module and backlight device
WO2016090695A1	2016-06-16	Display panel having touch control function and manufacturing method thereof
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CN102446027A	2012-05-09	Touch panel frame structure

Priority And Related Applications

Applications Claiming Priority (2)

Application	Filing date	Title
CN2013100666639A	2013-03-01	Projection type touch-control electronic whiteboard and frame structure thereof
CN201310066663.9	2013-03-01	

Legal Events

Date	Code	Title	Description
2014-10-22	121	Ep: the epo has been informed by wipo that ep was designated in this application	Ref document number: 13876473 Country of ref document: EP Kind code of ref document: A1
2015-09-01	NENP	Non-entry into the national phase	Ref country code: DE
2016-03-23	122	Ep: pct application non-entry in european phase	Ref document number: 13876473 Country of ref document: EP Kind code of ref document: A1
2016-08-03	122	Ep: pct application non-entry in european phase	Ref document number: 13876473 Country of ref document: EP Kind code of ref document: A1
2016-08-24	32PN	Ep: public notification in the ep bulletin as address of the addressee cannot be established	Free format text: NOTING OF LOSS OF RIGHTS PURSUANT TO RULE 112(1) EPC (EPO FORM 1205A DATED 15.03.2016)
2017-01-11	122	Ep: pct application non-entry in european phase	Ref document number: 13876473 Country of ref document: EP Kind code of ref document: A1

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