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Nakanishi et al.

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(54) **TOUCH PANEL AND ELECTRONIC APPARATUS USING THE SAME**

(75) Inventors: **Akira Nakanishi**, Osaka (JP); **Tetsuya Tadokoro**, Osaka (JP)

(73) Assignee: **Matsushita Electric Industrial Co., Ltd.**, Osaka (JP)

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(51) **Int. Cl.**
G09G 5/00 (2006.01)

(52) **U.S. Cl.** **345/173; 345/176**

(58) **Field of Classification Search** **345/173-175, 345/176, 177, 156; 178/18.01, 18.02, 18.03; 428/212, 213; 257/437; 427/164, 165; 200/310; 349/104, 105; 359/580, 581, 586, 589; 430/156, 430/157; 40/152, 600**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,605,789 B1 *	8/2003	Chen et al.	200/310
6,771,327 B1 *	8/2004	Sekiguchi	349/12
6,958,748 B1 *	10/2005	Fukui et al.	345/173
2001/0013861 A1 *	8/2001	Shimizu	345/173
2003/0127308 A1 *	7/2003	Chen et al.	200/310

FOREIGN PATENT DOCUMENTS

JP	5-114329	5/1993
JP	9-24571	1/1997
JP	11-202322	7/1999
JP	11-297160	10/1999
JP	2000-207983	7/2000

OTHER PUBLICATIONS

PCT International Search Report for PCT Application No. PCT/JP02/04295 dated Jun. 4, 2002.

English Translation Form PCT/ISA/210 for PCT Application No. PCT/JP02/04295 dated Jun. 4, 2002.

* cited by examiner

Primary Examiner—Nitin Patel

(74) *Attorney, Agent, or Firm*—RatnerPrestia

(57) **ABSTRACT**

A touch panel comprising: a resin substrate; a first film with one surface provided with a first conductive layer and another surface adhering the resin substrate; a second film provided with a second conductive layer on one surface facing the first conductive layer of the first film; and a third film adhering a surface of the resin substrate opposite to the surface the first film is adhered. The first and third films sandwich the resin substrate via adhesive layers. Warp caused by changes in temperature and humidity during and after the production of the touch panels can be decreased, thereby achieving application of the touch panels to a large-sized display apparatuses.

14 Claims, 6 Drawing Sheets

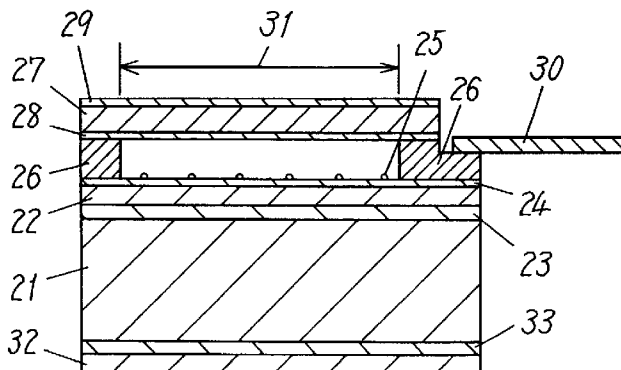


FIG. 1

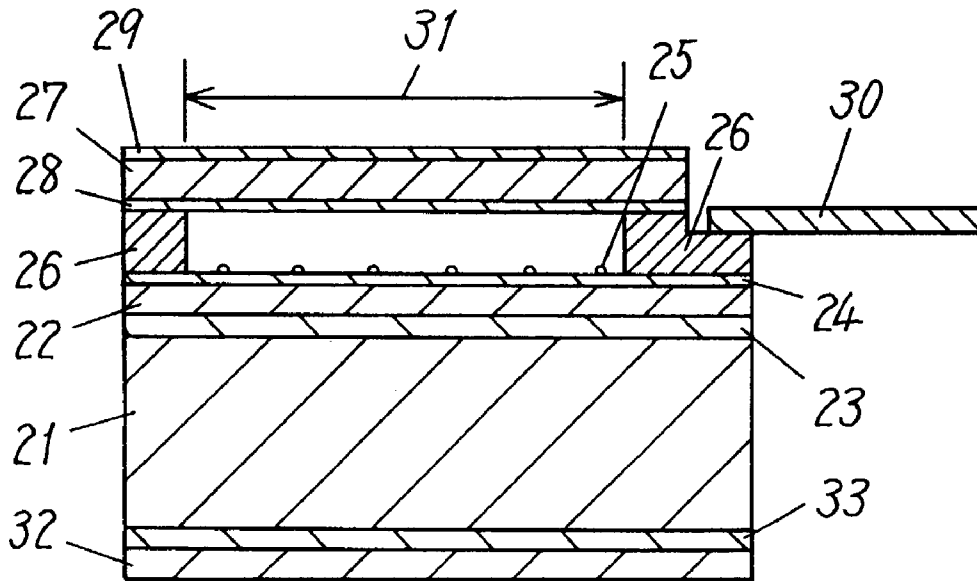


FIG. 2

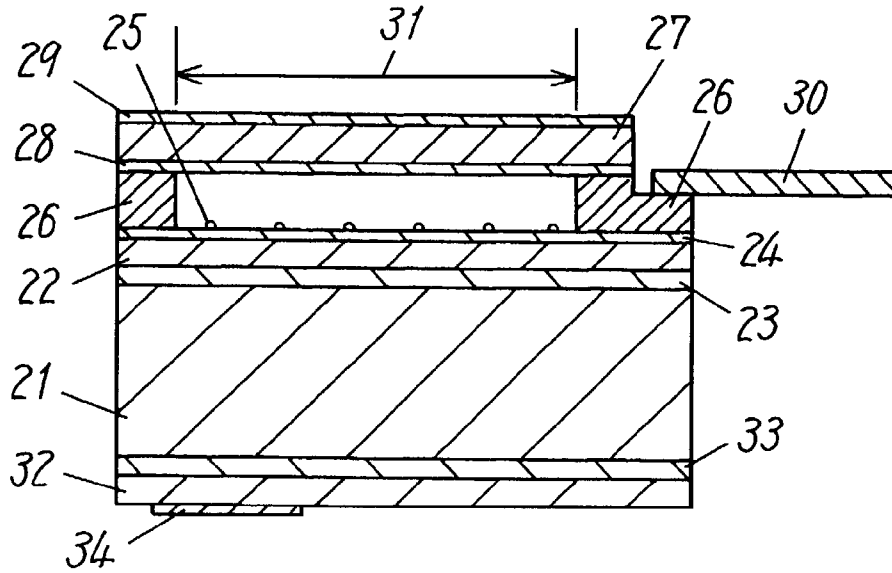


FIG. 3

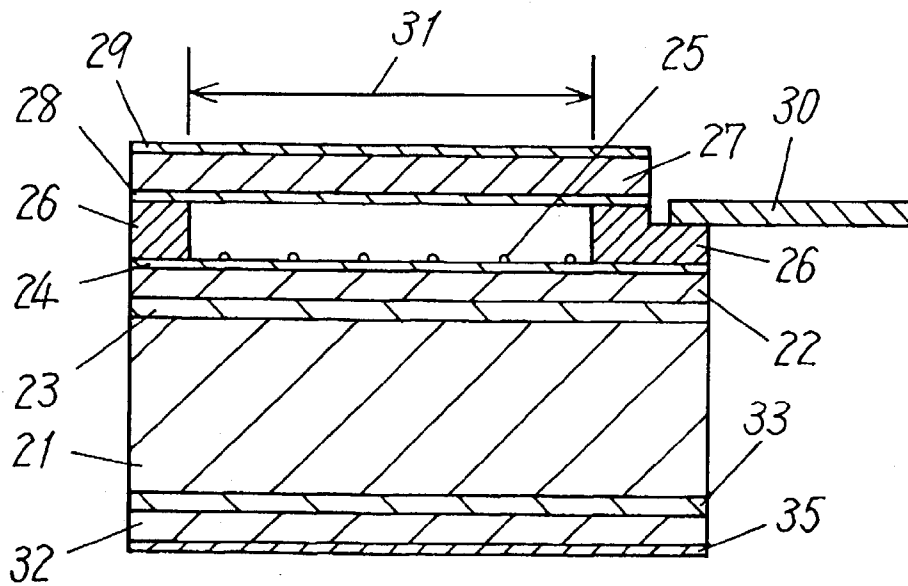


FIG. 4

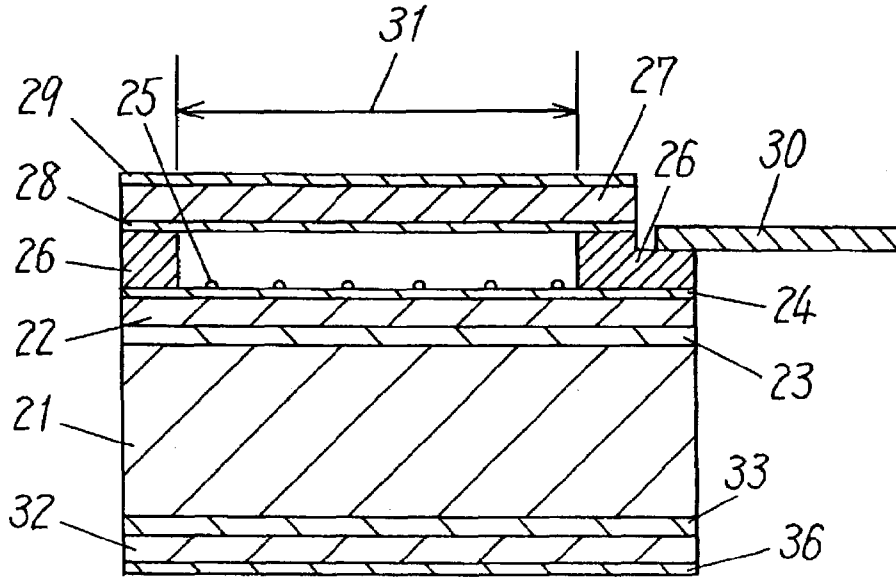
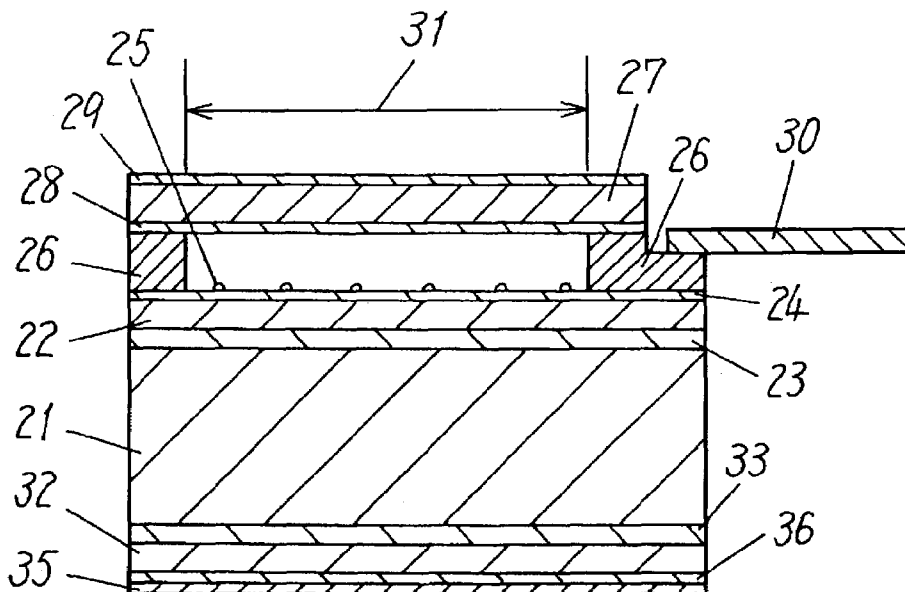


FIG. 5



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