Tohoku Univ. Technology

Flexible & Robust Liquid Crystal Displays

Liquid crystal device resistant to external pressure

Overview

- In a conventional liquid crystal display(LCD), when a large pressure is applied from the outside or a steep bending deformation is forced, **the display image is disorderd cause of thickness variation of the liquid crystal layers**, and **the substrate spacer is damaged**.
- Therefore, **liquid crystals are difficult to apply to flexible displays** because of such problems.
- The invention packs **a liquid crystal material into robust microtubes** and **arranges them in a plurality** to form a liquid crystal layer.
- Using such a structure, **pressure force can be dispersed** even when pressure is applied from the outside.
- It is expected to be applied to **a robust and flexibile liquid crystal display.**

Product Application

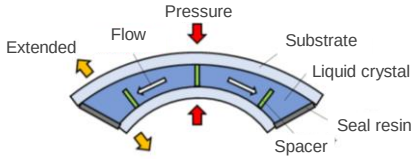
☐ Displays requiring flexibility and robustness
- Rollable, flexible smartphones, tablets
- Large rollable LCD display for advertising
- Table-surface display on which various things can be placed, and floor-top display that doesn't disturb when a people rides on it

IP Data

IP number : Not published
Inventors : FUJIKAKE Hideo, SUGAYA Yuto, NAKATANI Masakazu
Admin No. : T23-063

Features･Outstandings

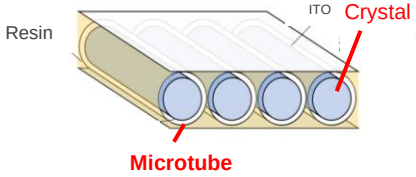
<Conventional problems>

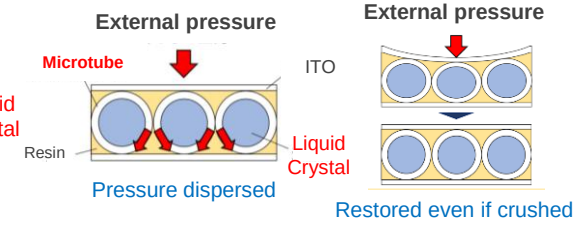


Problems when bending the LCD
- The image is disordered.
- Spacers are broaken.

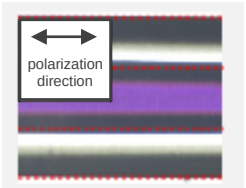
<Invention>

Liquid crystal filled in a robust microtube

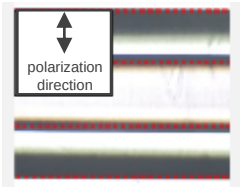




⇒ Pressure-resistant structure



Absorption for polarized light



Transparency for polarized light

Spontaneous molecular alignment of liquid crystal (with anisotropy dye) inside the microtube

(No change after the load is applied)s

< Application > *1

Rollable large LCD

Flexible display

Using on the floor Flexible display

*1 Fujikake Laboratory https://www.ecei.tohoku.ac.jp/fujikake/menu.htm

Contact

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