

# Touch-sensitive cladding panels using surface acoustic waves

Reference No: B69128, B70301

## CHALLENGE

In modern electronics a wide variety of **touch sensitive controls** are implemented, ranging from push-buttons to capacitive touch sensors. Push-buttons are typically implemented by creating holes in a surface panel, in which the push-buttons are placed. This **can make the device sensitive to humidity and dirt in the environment**. On the other hand, **capacitive touch sensors** can avoid this problem. However, **only non-conductive surfaces can be functionalized** using this method and **detectability is reduced when gloves are worn**.

## INNOVATION

The inventors suggest a method and device based on **Lamb-waves**, the underlying effect being radiation loss. This arises when the surface, which is conducting the wave, is brought into contact with a soft or liquid medium whose velocity of sound is smaller than that of the conducting material. The invented method has the advantage that **the front-side of the cladding panel can remain unchanged** since the sensors are attached to the back-side<sup>1</sup>. **Furthermore, the functional concept can be applied to almost all sheeting materials** (metal, ceramic, wood, plastic). Finally, the **touch position can be detected** by including partially reflecting elements, such as grooves and edges<sup>2</sup>. The back reflected signals from reflectors in front of the touch position are unaltered, whereas the back reflections from reflectors behind the touch position are attenuated.

## COMMERCIAL OPPORTUNITIES

Typical use cases are manual controls in automotive industry or other machinery, where the invented method can be used to functionalize panels in the interior. Further applications include home appliances or even smart home systems, where functionalized bathroom tiles can detect falls and serve as an early warning system for flooding.

## DEVELOPMENT STATUS

Prototype has been successfully tested.

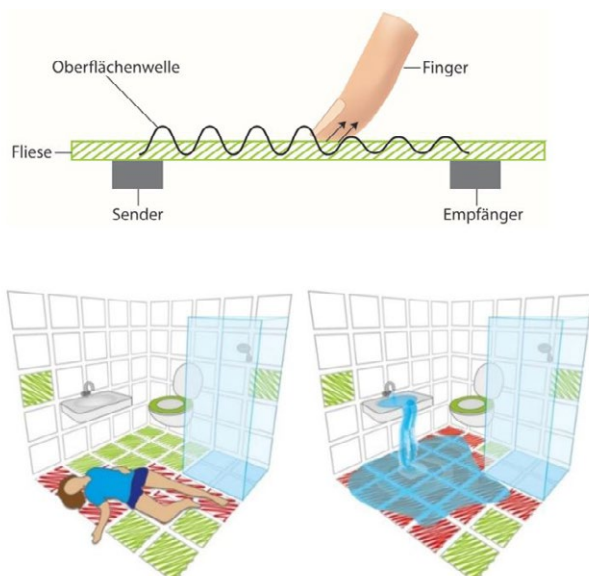


Figure: (Top) Showing the simplest implementation of the suggested device and method. A finger in contact with the panel attenuates the propagating wave. (Bottom) Illustration of two use cases discussed above<sup>3</sup>.

## REFERENCES:

- 1 C. Yu et al., Proc. Sensor 2013, p. 766–771 (2013), doi: 10.5162/IMCS2012/P4.4
- 2 EP2350795B1
- 3 L. Meisenbach et al., Proc. AAL 2011, 87, (2011)

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