Company Develops Handheld with Flexible Screen

A Dutch display technology firm has developed what apparently is the first handheld device with a large, flexible, roll-out display that could be used like a PDA or even an electronic book.

Having a big screen that can roll up into a small device enables the viewing of content—such as complex Web pages—currently not practical for handhelds, said Thomas van der Zijden, vice president of marketing for Polymer Vision, which manufactures the device.

The flexible black-and-white display also consumes less energy than standard handheld-device screens and thus would enable batteries to last longer, he noted.

By the end of this year, Telecom Italia Mobile plans to sell the device, which is code-named Readius but which will be marketed in Italy as Librofonino. It will play podcasts; have Internet access via Wi-Fi; and display RSS (really simple syndication) feeds, e-books, e-mail, and PDF and text files.

The 100mm × 57mm × 22mm device's electrophoretic reflective display is 127 mm wide, said van der Zijden.

In an electrophoretic display, he explained, tiny black and white particles are contained in small capsules with clear liquid. This material is considered electrophoretic ink. Depending on the applied electric field, he said, either the black or white particles move to the front or back, thereby changing the display's appearance.

The display is very readable because its contrast is more like that of a sheet of paper than that of a typical black-and-white screen, noted van der Zijden.

Polymer Vision builds the display using a 25-micron-thick flexible, organic plastic substrate. The substrate uses thin-film-transistor technology, in which a transistor deposited on the substrate controls each visual element.

The display's electronics are also organic and flexible and can be deposited at the low temperatures necessary to keep the plastic substrate from melting. This creates a screen that can roll into or out of a host device.

"Once the picture is established with electrophoretic ink, no battery power is required to keep the image on the display, unlike LCD displays that require continuous refresh of even a still image," van der Zijden explained. This saves energy.

The display is thin and reflects incoming light back up through the screen and thus doesn't need backlighting. This also reduces power consumption.

Polymer Vision is working on future versions that could show color and video, noted van der Zijden.

"This is the first commercial roll-out display of any kind. Any material on the Internet will be viewable. It is a significant technological event," said Barry Young, senior vice president of market research firm DisplaySearch. "However, the resolution is limited and the display response time is slow, so it won't be a very good device for reading a book."

And, he added, without an additional light source, it won't be easily readable in dark environments. ■

A Dutch company has developed a small device with a large, flexible, roll-out display that lets users look at content not easily viewable on most handhelds.