MobilePhoneCase –Thermochromic

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Mobile phones are now an integral part of modern life. They are far more than solely a communication device through text messaging and phone calls. Mobile phones have internet capability, allowing them to control a large number of devices from smart heating sensors to recording programmes on the smart television in the home (Koskela and Väänänen – Vainio – Matilla 2004). They also allow for Skype capabilities and can store multiple apps allowing rapid access to websites. With all these capabilities, comes increased pressure on the life of the mobile phone itself and of its battery (Perucci et. al. 2009). A lot of current mobile phones have a battery life of one day before it needs to be recharged. Overtime, and with increased use, this can decrease even further. Mobile phone companies have responded to this by creating wireless chargers, which means the consumer does not need a power socket to charge the phone (Whelton 2015).

Increased usage of a mobile phone will lead to an increase in temperature of the phone (Gibbs 2015). This can be easily identified at the front and back of the phone, where the phone or phone cover will be physically warm to the touch (Bond 2015). This increase in temperature can cause irreparable damage to the phone over time, resulting in the consumer purchasing a new phone.

The thermochromic phone case is a relatively simple idea which could result in significant savings for consumers with little expense or time. The black thermochromic ink, with a crtitical temperature of 31°C is painted onto an existing plastic mobile phone cover (usually the back cover as phone aesthetics or capabilities are not reduced). When the phone's temperature increases above the critical temperature of the thermochromic ink, the phone cover changes colour from black to clear. Different thermochromic inks are available with higher and lower critical temperatures than 31°C as was used in this research. An increase in mobile phone use results in an increase in temperature and a rapid change in colour of the thermochromic ink. The consumer can then take action to reduce the phones temperature (by decreasing the number of apps running for example) and increasing both battery and phone longevity.

References:

Bond, J.(2015). "Cell phone getting hot? Here's the fix". Online available at: http://www.smartmobilephonesolutions.com/content/cell-phone-gets-hot

Gibbs, S. (2015). "Why does my phone get really hot and slow down in summer?". Online available at: https://www.theguardian.com/technology/2015/jul/06/why-does-my-phone-get-hot-slow-down-summer

Koselka, T. and Väänänen – Vainio – Matilla, K. (2004). "Evolution towards smart home environments: empirical evaluation of three user interfaces". In: Personal and Ubiquitous Computing. Vol. 8 Iss. 3 234-240pp.

Perucci,G.P., Fitzek, F.H.P., Sasso, G., Kelterer, W. and Widmer, J. (2009). "On the impact of 2G and 3G network useage for mobile phone battery life". In: Wireless Conference, 2009. 255 – 259pp.

Whelton, A. (2015). The future of wireless charging. Online available at

https://www.carphonewarehouse.ie/Magazine/June-2015/The-future-of-wireless-charging

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