

Detection of loose cap and safety ring for pharmaceutical glass bottles

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Abstract:

A quality inspection of bottles by image processing is a very effective and high-quality way to guarantee a quality of packaging. This paper focuses on a study and development of a bottle cap inspection system for loose screw caps and a safety ring cap. The bottle cap is divided into two parts to be processed. The first part is thread cap area and the second part is the area between the thread cap and safety ring cap. Both parts are converted from RGB color image to HSV color space. Then a threshold adjustment is used to extract features of a groove for the thread cap image area and for a detection of defects such as crack fracture and a broken link ring. The defects are between the safety ring cap and the thread cap area. The experimental results show that the designed detection system has a sensitivity of 84.615% and a specificity of 100% for the detection of safety ring caps and a sensitivity of 87.879% and a specificity of 83.871% for the detection of loose caps.

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