

05A-051

FOOD CONTAMINANTS DETECTOR USING HIGH T_c SQUIDS MAGNETOMETER

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A PC controlled high sensitive food contaminant detector was designed and constructed. There is a possibility that individuals ingest contaminants that have been accidentally mixed with food because processed foods have become very common. Therefore a detection method of small contaminants in food and pharmaceuticals is required. The system we have developed is the High-T_c SQUID based system, which is covered with waterproof stainless steel plates and acceptable to HACCP (Hazard Analysis Critical Control Point) program. The outer dimension of the system is 1510mmL x 215mmW x 870mmH and an acceptable object size is 200mmW x 80mmH. An automatic liquid nitrogen filling system was installed in the standard model. This system employed double layered permeable metals with thickness of 1mm as a magnetically shielded box. The distribution of the magnetic field in the box was simulated by FEM (Maxwell, Ansoft Corporation); the gap between each shield layer was optimized before fabrication. Then the shielding factor of 1/730, which is good enough to operate the system in a factory was achieved in z-component. As a result, we robustly detected a steel ball as small as 0.3 mm in diameter with distance of 80mm above the object. The system on sale is around the corner.

Keyword(s): SQUID, Food contaminant, Detector, FEM, Magnetic shield

05A-475

A REAL-TIME AUTOMATIC INSPECTION SYSTEM FOR PATTAVIA PINEAPPLES

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An automatic inspection of Pattavia pineapples is presented in this paper. The system classifies the pineapples that ripe naturally according to their weight, size and maturity. Unlike previous methods, the proposed system can be categorized as a Non Destructive Testing (NDT) and can inspect the fruits in real-time on a conveyer belt. Dynamic weighing module is used to measure their weights while sizes and maturity levels are determined using Machine Vision. Automatic detection of pineapple body is employed by the technique and pineapple-skin-color models are constructed to perform grading maturity of the pineapples into seven different classes. The system performed efficiently and achieved high accuracy in our experiment.

Keyword(s): Pineapple inspection, Pineapple maturity, Dynamic weighing, Machine vision