

**Method and apparatus for 3-dimensional vision and
inspection of ball and like protrusions of electronic
components**

5 ABSTRACT

A method for 3-dimensional vision inspection of objects, such as microelectronic components, which have protrusions as features to be inspected, such as input/output contact balls, is disclosed. The method
10 comprising the steps of determining interior and exterior parameters of a pair of cameras, forming a rectified coordinate system from the parameters of both cameras determined above with a relative pose of second image capturing means with respect to the first image capturing means. A pair of images of the object having a plurality of co-planar protrusions on one surface are
15 captured by the cameras system wherein image coordinates of the images are transformed into coordinates of the rectified coordinate system. Conjugate points of each protrusion are then determined for the measurement of its co-planarity and height. Various configurations of the apparatus for capturing the images and processing the image data are also disclosed.

20

FIGURE 2 accompanies the abstract.