Claims

What is claimed is:

1. A feeder system comprising:

a feeder configured to receive a component;

a pick location configured to present the component from a carrier tape for a subsequent picking process; and

a camera system configured to view the component at or prior to the pick location prior to the subsequent picking process, wherein the camera system is configured to capture a first image of the component and a second image of the component;

wherein the camera system is configured to measure an offset between one or more topside features of the component and an outline of the component.

2. The feeder system of claim 1, wherein the feeder is configured to receive the carrier tape, wherein the carrier tape includes a cover over the component and wherein the feeder is configured to remove the cover prior to providing the component for viewing by the camera system.

3. The feeder system of claim 1, further comprising a feeder bank having a bridge, wherein the feeder is attached to the feeder bank, wherein the bridge extends across the feeder bank above the feeder, and wherein the camera system is located in the bridge.

4. The feeder system of claim 1, wherein the camera system includes a remote camera with a fiber optic lens.

5. The feeder system of claim 1, wherein the feeder further includes an upward facing back light under the carrier tape, and wherein the upward facing back light is a low-profile discreet LED strip.

6. A method of inspecting components comprising:

receiving, by a feeder, a component;

acquiring, by a camera system, position information related to the position of the component, including capturing, by the camera system, a first image of the component and a second image of the component;

calculating an offset, by a control system, between an outline of the component and a topside feature of the component;

presenting, after the acquiring, the component for picking; and

picking the component with a pick and place head.

7. The method of claim 6, wherein the receiving includes receiving a carrier tape having a cover over the component, the method further comprising removing the cover prior to the acquiring.

8. The method of claim 6, further comprising using the position information during the placement of the component by the pick and place head.

9. The method of claim 6, wherein the acquiring further includes finding the outline of the component and further includes finding the topside feature of the component.

10. The method of claim 10, further comprising:

signaling, by a control system, for the feeder to turn on an upward facing backlight located under the carrier tape prior to the finding the outline of the component; and

signaling, by a control system, for the camera system to turn on camera system lights prior to the finding the topside feature of the component.

11. A pick and place machine comprising:

a feeder system including:

a feeder configured to receive a component; and

a pick location configured to present the component from the feeder for a subsequent picking process;

a pick and place head configured to pick up the component from the feeder; and

a camera system configured to view the component at or prior to the pick location prior to the subsequent picking process;

wherein the camera system is configured to capture a first image of the component and a second image of the component;

wherein the camera system is configured to measure offset between a topside feature of the component and an outline of the component.

12. The feeder system of claim 11, wherein the feeder is configured to receive a carrier tape having a cover over the component and wherein the feeder is configured to remove the cover prior to providing the component for viewing by the camera system.

13. The pick and place machine of claim 11, further comprising a control system, and wherein the offset measurement from the camera system is provided to the control system.

14. The pick and place machine of claim 11, wherein the feeder system further includes a feeder bank having a bridge, wherein the feeder is attached to the feeder bank, wherein the bridge extends across the feeder bank above the feeder, and wherein the camera system is located on the bridge.

15. The pick and place machine of claim 11, wherein the camera system is attached to the feeder.

16. The pick and place machine of claim 11, wherein the camera system includes a remote camera with a fiber optic lens.

17. The pick and place machine of claim 11, wherein the feeder further includes an upward facing back light located under the carrier tape, and wherein the upward facing back light is a low-profile discreet LED strip.

18. The pick and place machine of claim 11, wherein the feeder system further includes a feeder bank, wherein the feeder is attachable to the feeder bank without disturbing the camera system.

19. The pick and place machine of claim 17, further comprising a control system, the control system configured to control the feeder, the pick and place head, the camera system, and the upward facing back light.