

This Feed Mechanism will single out one component from a disorganized batch of bulk components and present it to an exact location.

Background

Electrical circuits such as printed wiring boards or hybrid microcircuits designed to utilize surface mount electrical components are commonly assembled by computer controlled automated equipment. These machines typically use a vacuum nozzle to pick up and handle the components during assembly. Three methods are commonly used to feed surface mount components to automatic assembly equipment. These methods consist of tape reel feeders, linear or bowl type vibratory feeders or waffle style packages. Very small mechanical components for micro-mechanical assemblies are often generated by wet manufacturing processes such as LIGA or Micro-wire-EDM. These manufacturing processes result in the components being in a loose bulk state needing to be manipulated and organized for pickup by automated equipment.

As both micro electrical and mechanical components get smaller, it becomes more difficult to manipulate and orientate components that are not prepackaged in a reel, linear or waffle package, and these smaller components do not move well with vibratory feeders. This feed mechanism singles out one component from a cluster of unorganized identical components, using a series of sliding elements. It delivers an oriented single component in an exact location, for pickup by the automated equipment.

Description

A Feed Mechanism for Feeding Minute Components is designed to automatically present small components that are supplied in bulk into a repeatable position to allow these small components to be picked up by automated equipment. Using a series of sliding shelves and wiping arms this mechanism can operate on components as small as the width of a human hair (0.002 – 0.010 inch) to single out one component from a bulk supply of components. It will then orient the component and present that one component into an exact location for pick up.

Advantages

All other small component feeders used in automated assembly equipment, require the components being placed to be prepackaged in an equidistant organized pattern. This Feed Mechanism will single out one component from a disorganized batch of bulk components and present it to an exact location.

- Conventional vibratory feeders are not effective on minute components. This mechanism
- Operates on components as small as 0.002 – 0.010 inches
- Is customizable to fit specific component parameters
- Is adaptable to function while submerged in liquid

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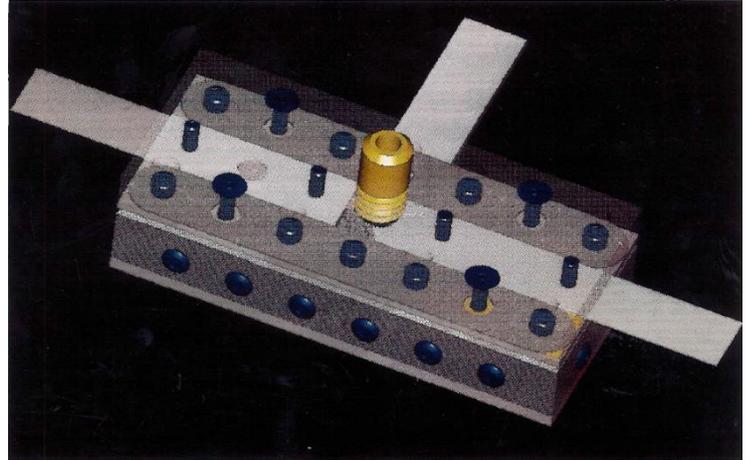
Applications

As a bulk feeder for miniature electronic or mechanical components and solder preforms, this product would benefit:

- Manufacturers of micro-electronic or mechanical assembly equipment
- Circuit board assembly manufacturers, automated and hand operations
- Reclaimed component suppliers

As a wash station for bulk cleaning of miniature components, this product would benefit the following industries:

- Medical industry
- Precision manufacturing industry



Intellectual Property Status

This technology is patented under US Patent #s 7,604,451, issued 10/20/2009, and 8,303,237, issued 11/06/2012.

Keyword List

Component feeder, vibratory, assembly, automated assembly, pick-n-place, surface mount, circuit board, micro-mechanical assembly

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