



US005684252A

United States Patent [19]

[11] Patent Number: 5,684,252

Kessler et al.

[45] Date of Patent: Nov. 4, 1997

[54] **METHOD AND APPARATUS FOR ULTRASONIC INSPECTION OF ELECTRONIC COMPONENTS**

4,332,016 5/1982 Berntsen 73/628
5,431,054 7/1995 Reeves 73/641

[75] Inventors: **Lawrence W. Kessler**, Buffalo Grove; **Daniel W. Micek**, Norridge; **John Billone**, Des Plaines, all of Ill.

Primary Examiner—Christine K. Oda
Attorney, Agent, or Firm—Dorn, McEachran, Jambor & Keating

[73] Assignee: **Sonoscan, Inc.**, Bensenville, Ill.

[57] ABSTRACT

[21] Appl. No.: 678,607

A method and apparatus for non-destructive ultrasonic inspection in which a plurality of integrated circuits or other electronic components laid out in a fixed pattern on a liquid-permeable tray are moved along an inspection path through a scanning station. In the scanning station the electronic components are repetitively scanned by an ultrasonic beam from a transmitter/receiver moving rapidly back and forth across the inspection path; an ultrasonic coupling liquid (usually water) continuously flows along the beam path; the coupling liquid also flows along the surfaces of the electronic components opposite the beam path. The tray of electronic components is air dried as it emerges from the scanning station. Both reflected and "through" ultrasonic signals can be collected to disclose any anomalies present in the electronic components. A screen may be used to assure retention of the electronic components in the desired pattern on a tray.

[22] Filed: Jul. 15, 1996

[51] Int. Cl.⁶ G01N 29/04

[52] U.S. Cl. 73/618; 73/620

[58] Field of Search 73/620, 629, 621, 73/627, 633, 644, 582, 592, 596, 598, 600, 618, 41.2, 41.3, 41.4, 45.5; 324/514

[56] References Cited

U.S. PATENT DOCUMENTS

3,850,027	11/1974	Nakanishi	73/600
3,886,793	6/1975	Cramer	73/601
3,898,839	8/1975	White	73/644
4,008,602	2/1977	Love	73/620
4,208,915	6/1980	Edwards	73/620

14 Claims, 3 Drawing Sheets

