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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DEEPAK PAI and MELVIN ERIC GRAF

Appeal 2010-012002
Application 11/350,276
Technology Center 2800

Before CARLA M. KRIVAK, CAROLYN D. THOMAS, and
CARL W. WHITEHEAD JR., *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-6 and 26-31 (App. Br. 2). We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

STATEMENT OF THE CASE

Appellants' claimed invention is directed to electromechanical leads connecting integrated circuit packages to printed wire boards (PWB) having a low profile (Spec. ¶ [0001]).

Independent claim 1, reproduced below, is illustrative.

1. A connector system for resiliently attaching and electrically connecting a first set of contacts substantially located on a first surface of a circuit chip to a second set of contacts substantially located on a second surface of a circuit board, the connector system comprising:

a plurality of leads in predetermined spaced relation, each of the plurality of leads being sized and arranged to form a C-shaped body having a first leg and a second leg, the first leg and second leg being substantially parallel with a curved portion between the first leg and the second leg;

each of the plurality of leads including a strip of copper foil folded to form the C-shaped body with the first leg having a first surface configured to connect to at least one of the first set of contacts and the second leg having a second surface configured to connect to at least one of the second set of contacts, the plurality of leads being sized and arranged such that the first surface of the circuit chip is substantially parallel to the second surface of a circuit board; and

wherein the plurality of leads defines a separation of about 0.010 inches or less between the first surface of the circuit chip and the second surface of the circuit board.

REFERENCES and REJECTIONS

The Examiner rejected claims 1-5 under 35 U.S.C. § 103(a) based upon the teachings of Phy (US Patent 4,751,199, Jun. 14, 1988) in view of

Appeal 2010-012002
Application 11/350,276

Chen (US Patent 6,867,984 B2, Mar. 15, 2005) and Chan (US Patent No. 6,224,396 B1, May 1, 2001).

The Examiner rejected claim 6 under 35 U.S.C. § 103(a) based upon the teachings of Phy and Jimarez (US Patent 5,729,440, Mar. 17, 1998).

The Examiner rejected claims 26-31 under 35 U.S.C. § 103(a) based upon the teachings of Phy and Zhu (US Patent 6,784,378 B2, Aug. 31, 2004).

ANALYSIS

The Examiner finds Phy discloses all the limitations of Appellants' claim 1, except for a plurality of leads defining a separation of about 0.010 inches or less between a first surface of a chip and a second surface of a circuit board (Ans. 4). The Examiner finds Chen discloses it would be known in the art to miniaturize electronic products by making the height of contacts as small as possible (*id.*). The Examiner then finds Chan discloses an interposer having a height of about 0.030-0.035 inches and a deflection of 0.020 inches, thus providing a separation of about 0.010 inches (Ans. 5).

Appellants contend Chen teaches away from Appellants' invention. That is, although Chen does teach "a trend toward miniaturization," it notes the reduction in the size of the gap should not be too much or problems will ensure for a C-lead gap. Further, Chen discloses the compressible space of the gap should be *at least 0.8 mm* so the element can be restored to its proper initial state. (Chen, col. 1, l. 43-col. 2, l. 2; App. Br. 6-8). Thus, in Chen, a C-lead gap is required to be 0.030 inches (App. Br. 7) and cannot be reduced further than 0.030 inches (App. Br. 8). Chen solves this problem by proposing a new lead design that is not C-shaped, but is whistle shaped.

Appellants' further note, Chan discloses a Z-shaped lead having a separation gap of about 0.030-0.035 inches; whereas a C-shaped lead is claimed (App. Br. 10).

The Examiner responds that Chen was cited for miniaturization and not for teaching gap size and that Chan was cited for various shapes "including a shape close to 'S' shape (reverse) with a thickness of 0.0030" (which is close to the thickness of the lead in the instant invention, recited in the dependent claim 2, about 0.0028"). This shape is close to two C-shapes," (Ans. 10)

It should be noted that a C-shape is claimed. Chan does not disclose a C-shape; it does disclose an S-shape and a Z-shape. We agree with Appellants' arguments, particularly that an S-lead, for example, has two different points of curvature that absorb stress. A C-lead has only one point of curvature. Thus, the different shapes are subject to different mechanical considerations. (Reply Br. 6). We further agree that Chen teaches away and also abandoned the C-shape lead for a whistle shaped lead (App. Br. 6). Therefore, we will not sustain the Examiner's obviousness rejection of claim 1, and claims 2-6 and 26-31 dependent therefrom, as none of the other cited references cures the deficiencies of Phy, Chen, or Chan.

DECISION

The Examiner's decision rejecting claims 1-6 and 26-31 is reversed.

REVERSED

Vsh/peb