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Therefore, this

United States Patent

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David J. Kappos

Director of the United States Patent and Trademark Office



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(12) **United States Patent**
Fran et al.

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(54) **STACKED SOLID ELECTROLYTIC CAPACITOR WITH MULTI-PIN STRUCTURE**

(75) **Inventors:** Yui-Shin Fran, Hsinchu (TW); Ching-Feng Lin, Zhudong Township, Hsinchu County (TW); Chi-Hao Chiu, Hsinchu (TW); Chun-Chia Huang, Xinying (TW); Wen-Yen Huang, Yangmei Township, Taoyuan County (TW)

(73) **Assignee:** Apaq Technology Co., Ltd., Jhunan Township (TW)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 296 days.

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(58) **Field of Classification Search** 361/523, 361/541, 303.1, 306.1, 306.3, 540
See application file for complete search history.

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Primary Examiner — Eric Thomas
Assistant Examiner — Arun Ramaswamy
(74) Attorney, Agent, or Firm — C. G. Mersereau; Nikolai & Mersereau, P.A.

(57) **ABSTRACT**

A stacked solid electrolytic capacitor with positive multi-pin structure includes a plurality of capacitor units, a substrate unit and a package unit. The positive electrode of each capacitor unit has a positive pin extended outwards therefrom. The positive pins are divided into a plurality of positive pin units that are separated from each other and electrically stacked onto each other. The negative electrode of each capacitor unit has a negative pin extended outwards therefrom. The negative pins are divided into a plurality of negative pin units. The negative pin units are separated from each other and the negative pins of each negative pin unit are electrically stacked onto each other. The substrate unit has a positive guiding substrate electrically connected to the positive pins and a negative guiding substrate electrically connected to the negative pins. The package unit covers the capacitor units and one part of the substrate unit.

10 Claims, 8 Drawing Sheets

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If the application for this patent was filed on or after December 12, 1980, maintenance fees are due three years and six months, seven years and six months, and eleven years and six months after the date of this grant, or within a grace period of six months thereafter upon payment of a surcharge as provided by law. The amount, number and timing of the maintenance fees required may be changed by law or regulation. Unless payment of the applicable maintenance fee is received in the United States Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period.

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If the application for this patent was filed on or after June 8, 1995, the term of this patent begins on the date on which this patent issues and ends twenty years from the filing date of the application or, if the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121, or 365(c), twenty years from the filing date of the earliest such application ("the twenty-year term"), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b), and any extension as provided by 35 U.S.C. 154(b) or 156 or any disclaimer under 35 U.S.C. 253.

If this application was filed prior to June 8, 1995, the term of this patent begins on the date on which this patent issues and ends on the later of seventeen years from the date of the grant of this patent or the twenty-year term set forth above for patents resulting from applications filed on or after June 8, 1995, subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b) and any extension as provided by 35 U.S.C. 156 or any disclaimer under 35 U.S.C. 253.

