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[Continued on next page]

(54) Title: ANODIC FILMS WITH ENHANCED FEATURES

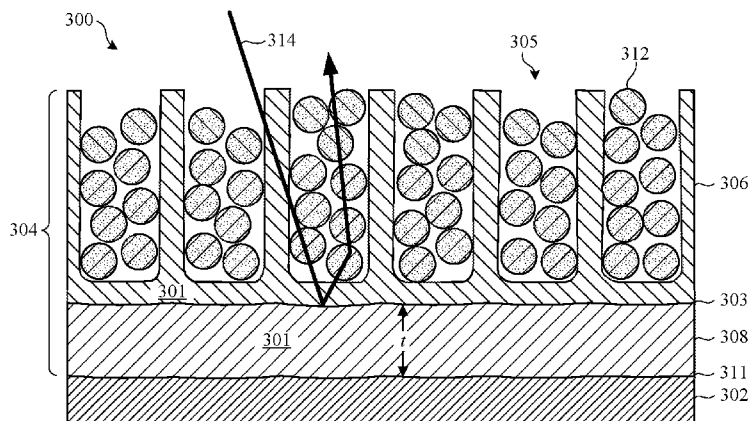


FIG. 3D

(57) Abstract: Anodizing techniques for providing enhanced anodic films are described. According to some embodiment, a barrier layer smoothing operation is used to flatten an interface between the anodic film and underlying metal substrate. According to some embodiments, the methods involve depositing a pigment having a particle diameter of about 20 nanometers or greater into an anodic film. According to some embodiments, the anodic films have multiple metal oxide layers. A first layer can provide scratch and chemical resistance and a second layer can provide a light diffusing pore structure that diffusely reflects incoming light and provides a white appearance to the anodic film. According to some embodiments, the anodic films have a dense porous layer and a thickened barrier layer. The porous layer can act as a cosmetic portion of the anodic film and have pores that have a colorant infused therein. The thickened barrier layer can distribute defects within the anodic film associated with alloying elements of the high performance aluminum alloy in a larger non-porous film compared to conventional anodic films, thereby lessening the chance of corrosion inducing agents of reaching the high performance aluminum alloy. The methods can be used form cosmetically appealing coatings for consumer products, such as housings for electronic products.



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A. CLASSIFICATION OF SUBJECT MATTER

C25D 11/14(2006.01)i, C25D 11/12(2006.01)i, C25D 11/08(2006.01)i, C25D 11/10(2006.01)i, C25D 9/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C25D 11/14; C25D 1/20; A01N 1/02; C25D 1/00; C25D 11/18; C25D 11/02; C25D 11/12; C25D 11/08; C25D 11/10; C25D 9/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: anodic film, barrier layer, smoothing, pigment, porous layer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5124172 A (BURRELL et al.) 23 June 1992 See column 1, line 6 - column 7, line 13; and figures 1-4.	1-60
Y	US 2015-0176146 A1 (APPLE INC.) 25 June 2015 See paragraphs [0002]-[0070]; and figures 3, 15B-15C.	1-60
A	US 2013-0168253 A1 (MARDILOVICH et al.) 04 July 2013 See paragraphs [0020]-[0038]; and figure 1B.	1-60
A	US 2012-0073973 A1 (YAMASHITA et al.) 29 March 2012 See paragraphs [0241]-[0266]; and figures 3A-3D.	1-60
A	WO 2015-047635 A1 (APPLE INC.) 02 April 2015 See paragraphs [0016]-[0030]; and figures 2B-2C.	1-60

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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