

Title (en)
Method for electroplating hard chrome layers

Title (de)
Verfahren zur galvanischen Abscheidung von Hartchromschichten

Title (fr)
Procédé de dépôt galvanique de couches en chrome dur

Publication
EP 2180088 A1 20100428 (DE)

Application
EP 08018462 A 20081022

Priority
EP 08018462 A 20081022

Abstract (en)
The method comprises contacting a substrate surface to be coated with chromium-containing electrolytes in a cell at 30-85[deg] C for galvanic deposition, and applying a voltage between the substrate surface to be coated and a counter electrode for galvanically depositing a first hard chromium layer on the substrate surface, where the deposition takes place in a container that is gas-tight against environment and a low pressure is adjusted during applying the voltage in the container. The substrate surface and chromium-containing electrolytes are moved with relative speed of greater than 1-5 m/s. The method comprises contacting a substrate surface to be coated with chromium-containing electrolytes in a cell at 30-85[deg] C for galvanic deposition, and applying a voltage between the substrate surface to be coated and a counter electrode for galvanic deposition of a first hard chromium layer on the substrate surface, where the deposition takes place in a container that is gas-tight against the environment and a low pressure is adjusted during applying the voltage in the container. The substrate surface and chromium-containing electrolytes are moved with a relative speed of greater than 1-5 m/s. A second hard chromium layer is deposited on the first hard chromium layer, where a pulse current is applied between the substrate surface and the counter electrode for the deposition of the first hard chromium layer and a direct current is applied for the deposition of the first hard chromium layer on the second hard chromium layer. A pressure difference is adjusted to an ambient pressure of 20-200 mbar. The pulse current for the deposition of the first hard chromium layer is applied with a frequency of 50-1000 Hz. For the deposition of the hard chromium layer, a current density is adjusted to 50-500 A/dm², where pH value in the electrolytes is adjusted to = 1. The chromium-containing electrolytes flow into the cell from below and over an overflow.

Abstract (de)
Die vorliegende Erfindung betrifft ein Verfahren zur galvanischen Abscheidung einer Hartchromschicht auf einer Substratoberfläche bei hohen Abscheidegeschwindigkeiten. Erfindungsgemäß ist es vorgesehen, die zu beschichtende Substratoberfläche unter gegenüber dem Umgebungsdruck reduzierten Druck einen zur galvanischen Abscheidung geeigneten chromhaltigen Elektrolyten zu kontaktieren und während der Abscheidung der Chromschicht auf der Substratoberfläche eine Relativbewegung zwischen Substratoberfläche und Elektrolyten zu erzeugen.

IPC 8 full level
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CPC (source: EP KR US)
C25D 5/003 (2013.01 - EP KR US); **C25D 5/04** (2013.01 - EP KR US); **C25D 5/08** (2013.01 - EP KR US); **C25D 5/12** (2013.01 - EP KR US); **C25D 5/18** (2013.01 - EP KR US); **C25D 5/623** (2020.08 - EP KR US); **C25D 5/625** (2020.08 - EP KR US); **C25D 5/627** (2020.08 - EP KR US); **C25D 7/10** (2013.01 - KR); **C25D 21/00** (2013.01 - EP US); **C25D 21/04** (2013.01 - EP KR US); **C25D 7/10** (2013.01 - EP US)

Citation (applicant)
• GB 1551340 A 19790830 - KURSI F J, et al
• US 2706175 A 19550412 - ELMAR LICHARZ CARL
• EP 1191129 A2 20020327 - SOQI INC [JP]
• US 2001054557 A1 20011227 - TAYLOR E JENNINGS [US], et al
• EP 0024946 A2 19810311 - FORD MOTOR CO [GB], et al
• US 5277785 A 19940111 - VAN ANGLE ERIK S [US]

Citation (search report)
• [Y] GB 1551340 A 19790830 - KURSI F J, et al
• [Y] US 2706175 A 19550412 - ELMAR LICHARZ CARL
• [Y] EP 1191129 A2 20020327 - SOQI INC [JP]
• [Y] US 2001054557 A1 20011227 - TAYLOR E JENNINGS [US], et al
• [Y] EP 0024964 A1 19810311 - CENTRE TECHN IND MECANIQUE [FR]
• [A] US 5277785 A 19940111 - VAN ANGLE ERIK S [US]

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