

Title (en)  
ZINC-NICKEL ELECTROPLATING

Title (de)  
ZINK-NICKEL-ELEKTROPLATTIERUNG

Title (fr)  
ELECTRODEPOSITION ZINC-NICKEL

Publication  
**EP 1292724 B2 20151223 (EN)**

Application  
**EP 00951046 A 20000615**

Priority  
US 0040208 W 20000615

Abstract (en)  
[origin: WO0196631A1] The present invention relates to an apparatus (12) for applying a zinc-nickel electroplate to a workpiece. The apparatus comprises a zinc-nickel electroplating bath (16) comprising an amine additive, such as poly(alkyleneimine), which is capable of being oxidized in the bath to cyanides. The bath has a pH more than about 14. A cathode workpiece (18) is positioned in the bath. An anode assembly (20) is also positioned in the bath. The anode assembly comprises an enclosure (22) defining an anolyte compartment (24), at least a portion of the enclosure being an ion exchange membrane (26). An anolyte (28) is positioned in the compartment. An insoluble metal anode (30) is immersed in the anolyte. The anolyte is a conductive salt or base solution and the anode is a metal or metal coating selected from the group consisting of nickel, cobalt, iron, chromium and alloys thereof.

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CPC (source: EP)  
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Citation (opposition)  
Opponent :

- WO 0006807 A2 20000210 - HILLEBRAND WALTER GMBH & CO KG [DE], et al
- US 4889602 A 19891226 - OSHIMA KATSUhide [JP], et al
- DE 4035316 C2 19931104 - DAIMLER BENZ AG [DE], et al
- WO 9840539 A1 19980917 - QUANTUM CORP [US]
- US 3718549 A 19730227 - DU ROSE A, et al
- F. GOETZE, DR.: "Chemie für Gymnasien", vol. 1, 1972, C.C. BUCHNERS VERLAG, BAMBERG, pages: 84

Cited by  
EP3358045A1; WO2018146041A1; EP2384800A1; EP3415665A1; CN110325669A; JP2019530800A; US11339492B2

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