

Title (en)
COBALT-FREE TUNGSTEN CARBIDE-BASED HARD-METAL MATERIAL

Title (de)
KOBALTFREIER WOLFRAMKARBID-BASIERTER HARTMETALLWERKSTOFF

Title (fr)
MATÉRIAU DE MÉTAL DUR À BASE DE CARBURE DE TUNGSTÈNE EXEMPT DE COBALT

Publication
EP 4127258 A1 20230208 (DE)

Application
EP 21711586 A 20210317

Priority
• EP 20165742 A 20200326
• EP 2021056762 W 20210317

Abstract (en)
[origin: WO2021191009A1] Disclosed is a cobalt-free tungsten carbide-based hard-metal material comprising 70-97 wt% of hard-material particles which are at least predominantly formed by tungsten carbide and 3-30 wt% of a metallic binder which is an iron-nickel-based alloy comprising at least iron, nickel and chromium with a ratio of Fe to (Ni + Fe) of $0.70 \leq \text{Fe}/(\text{Fe} + \text{Ni}) \leq 0.95$; a Cr content of $0.5 \text{ wt}\% \leq \text{Cr}/(\text{Fe} + \text{Ni} + \text{Cr})$ and (i) for the range $0.7 \leq \text{Fe}/(\text{Fe} + \text{Ni}) \leq 0.83$: $\text{Cr}/(\text{Fe} + \text{Ni} + \text{Cr}) \leq (-0.625 * (\text{Fe}/(\text{Fe} + \text{Ni})) + 3.2688) \text{ wt}\%$; (ii) for the range $0.83 \leq \text{Fe}/(\text{Fe} + \text{Ni}) \leq 0.85$: $\text{Cr}/(\text{Fe} + \text{Ni} + \text{Cr}) \leq (-27.5 * (\text{Fe}/(\text{Fe} + \text{Ni})) + 25.575) \text{ wt}\%$ and (iii) for the range $0.85 \leq \text{Fe}/(\text{Fe} + \text{Ni}) \leq 0.95$: $\text{Cr}/(\text{Fe} + \text{Ni} + \text{Cr}) \leq 2.2 \text{ wt}\%$; optionally with an Mo content relative to (Fe + Ni + Cr) of $0 \text{ wt}\% \leq \text{Mo}/(\text{Fe} + \text{Ni} + \text{Cr}) \leq 10 \text{ wt}\%$; optionally with a V content relative to (Fe + Ni + Cr) of $0 \text{ wt}\% \leq \text{V}/(\text{Fe} + \text{Ni} + \text{Cr}) \leq 2 \text{ wt}\%$; and unavoidable impurities up to a total of not more than 1 wt% of the hard-metal material.

IPC 8 full level
C22C 29/06 (2006.01); **C22C 1/05** (2006.01); **C22C 29/08** (2006.01); **C22C 38/00** (2006.01)

CPC (source: EP US)
C22C 29/005 (2013.01 - US); **C22C 29/067** (2013.01 - EP); **C22C 29/08** (2013.01 - EP US); **C22C 38/00** (2013.01 - EP); **C22C 38/44** (2013.01 - US); **C22C 38/46** (2013.01 - US); **C22C 1/051** (2013.01 - EP)

Citation (search report)
See references of WO 2021191009A1

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

Designated validation state (EPC)
KH MA MD TN

DOCDB simple family (publication)
EP 3885459 A1 20210929; CN 115349023 A 20221115; CN 115349023 B 20240604; EP 4127258 A1 20230208; JP 2023518477 A 20230501; JP 7490075 B2 20240524; US 2023151461 A1 20230518; WO 2021191009 A1 20210930

DOCDB simple family (application)
EP 20165742 A 20200326; CN 202180023942 A 20210317; EP 2021056762 W 20210317; EP 21711586 A 20210317; JP 2022556637 A 20210317; US 202117913626 A 20210317