

Title (en)

Manufacture and consolidation of alloy metal powder billets.

Title (de)

Herstellung und Formen von Halbzeug aus legiertem Metallpulver.

Title (fr)

Préparation et consolidation d'ébauches de poudre d'alliages métalliques.

Publication

EP 0252193 A1 19880113 (EN)

Application

EP 86305315 A 19860710

Priority

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Abstract (en)

Metal powder of the desired composition having a particle size of -80 mesh is charged into an extrusion container (11), preferably a piece of carbon steel pipe (8), in successive layers about two inches thick. Each layer is compacted after deposition by a high energy rate forming ram (16) so as to raise the tap density of the powder to about 80% of theoretical. An inner cover plate (17) is then placed loosely on the compacted powder in the extrusion container, and is not attached to the container shell. On top of this inner plate is placed an outer cover plate (18) which is welded to the container shell. Both plates are also of carbon steel, but are much thicker than the container wall. The container so prepared is heated in a heating furnace to a temperature below the melting temperature of the container and the powder alloy thus raising the density of the powder to about 90-93% of theoretical. The heated container is rapidly transferred to an extrusion press and hot extruded at a reduction ratio of about 3 to 1 and at a pressure of about 3000 tons. The inner cover plate, not being affixed to the extrusion container, does not move at the same rate as the container, and in effect is partially extruded against the powder, so as to raise its density to substantially 100% of theoretical. A billet having a diameter equal to that of the extrusion container and a density of substantially 100% of theoretical may be produced by loading the container and processing it in the way above set out but extruding it a distance only sufficient to accommodate the inner and outer covers in their extruded condition. The container is then removed without the remainder going through the die.

IPC 1-7

B22F 3/20

IPC 8 full level

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Citation (search report)

- GB 2097022 A 19821027 - VOLVO PERSONVAGNAR AB, et al
- AT 375574 B 19840827 - UK NII SP STALEJ [SU]
- GB 1163967 A 19690910 - IIT RES INST [US]
- EP 0165409 A1 19851227 - KLOSTER SPEEDSTEEL AB [SE]
- US 3450528 A 19690617 - THOMPSON VERNON R
- DE 2259228 A1 19740516 - BBC BROWN BOVERI & CIE
- FR 2024261 A1 19700828 - FEDERAL MOGUL CORP
- DE 3009916 A1 19810924 - NYBY UDDEHOLM AB [SE]
- EP 0097306 A2 19840104 - SCM CORP [US]

Cited by

EP0327064A3; CN104209358A; EP0439251A1; US5170556A

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