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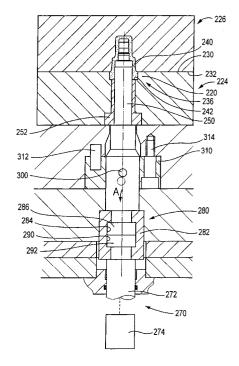
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(54)Die-casting method and die-casting apparatus

(57)A method of die-casting a die-cast article (220, 426) having at least one of an inner circumferential surface and an outer circumferential surface, whose cross sectional shape is a circle, the die-casting article being formed with a die-casting apparatus having a mold cavity (236, 430) therein and a molding portion (250; 410) for forming one of the inner and outer circumferential surfaces of the die-cast article, the method being characterized by comprising the steps of: introducing a molten metal into the mold cavity; and separating the diecast article and the molding portion from each other while the die-cast article and the molding portion are rotated relative to each other, after the molten metal has solidified into the die-cast article. A die-casting apparatus for practicing the method is also disclosed.

FIG. 3





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Application Number EP 02 00 8010

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| Category | of relevant passa | ndication, where appropriate, ages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.CI.7) |
| X | PATENT ABSTRACTS OF vol. 1999, no. 08, 30 June 1999 (1999- -& JP 11 062907 A (5 March 1999 (1999- * abstract * * paragraph [0001] * figures 10,9,1,2, | -06-30) (NANBU:KK), -03-05) - paragraph [0007] * | 1-12 | B22D17/22 B22D17/24 B22D17/20 |
| х | US 4 958 676 A (KUN 25 September 1990 (* abstract * * column 1, line 55 | | 1,3,7,8, | |
| | | | | |
| | | | | TECHNICAL FIELDS SEARCHED (Int.Cl.7) |
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| X : parti Y : parti docu A : tech O : non- | ATEGORY OF CITED DOCUMENTS cularly relevant if taken alone cularly relevant if combined with another ment of the same category nological background written disolosure mediate document | T : theory or princ E : earlier patent o after the filing o her D : document cite L : document cite | iple underlying the in document, but publis | vention hed on, or |

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 02 00 8010

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on

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09-12-2002

| | Patent documer cited in search rep | nt port | Publication date | | Patent fam member(s | ily) | Publication date |
|----|--|--------------------------|--|-----------------------|---|----------|---|
| JP | 11062907 | А | 05-03-1999 | JP | 3034827 | B2 | 17-04-2000 |
| US | 4958676 | А | 25-09-1990 | NONE | | | |
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