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(54) **SYSTEM FOR POURING MOLTEN METAL INTO INJECTION CHAMBERS**

(57) The system is envisaged for obtaining high-quality aluminium parts by means of injection, envisaging for such purpose a conduit (1) having an angle of more than 90° with respect to the vertical, which is connected by its upper end to an outlet (2) of the tank containing the molten aluminium, while the opposite end includes an outlet nozzle (3) wherethrough the molten aluminium is poured into the melting chamber, thereby achieving the total absence of turbulence and the production of oxygen bubbles, such that, to this end, the conduit (1) is tiltably mobile upwards and downwards by means of a cylinder (5) envisaged in a support frame having height regulation means using a manually operated handle (6).

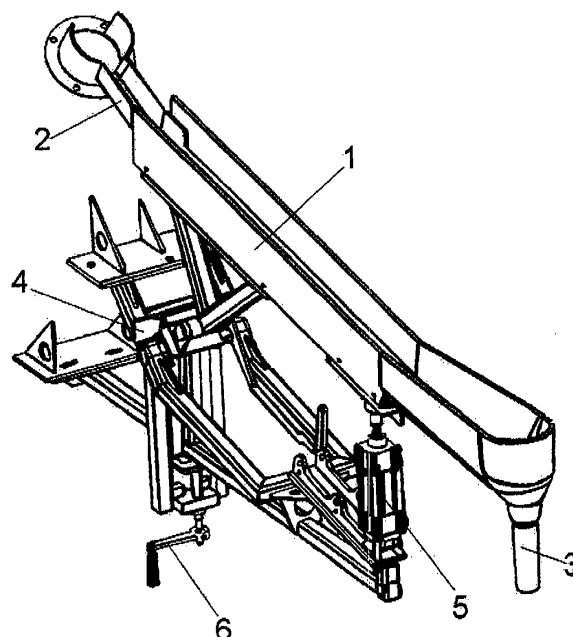


FIG. 1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a system for pouring molten metal into injection chambers, more specifically to a system whereby high-quality parts may be obtained from aluminium in the liquid phase used by injected aluminium foundries.

[0002] The object of the invention is intended for offering foundries the possibility of manufacturing aluminium parts for subsequent thermal treatment thereof, as in the case of structural parts. In this manner, it allows injected aluminium foundries to access markets that it could not previously access due to quality problems and which are currently developed by means of other technologies.

BACKGROUND OF THE INVENTION

[0003] Injected aluminium foundries, either due to product safety requirements and/or due to the greater structural complexity of the parts, are obliged to become increasingly stringent with metal quality at the express request of car manufacturers.

[0004] The main problems for obtaining optimum quality of metal and, therefore, of the final parts produced, are, on the one hand, the oxidation of the aluminium, which gives rise to hard spots and problems in the final machining and, on the other, the formation of bubbles that seriously limit the resistance of the metal, avoiding subsequent mechanical and heat treatment.

[0005] At present, the system used is to pour the liquid metal from a great height producing, on the one hand, more oxidation, as it has a greater surface for producing said oxidation and, on the other, on letting it fall from a great height, bubbles and turbulence are formed that trap the oxygen, giving rise to the same problems as those mentioned in the preceding paragraph.

[0006] All of this entails the rejection of parts produced by the end client, at great cost to the foundries.

DESCRIPTION OF THE INVENTION

[0007] The system for pouring molten metal into injection chambers proposed by the invention resolves the previously expounded problem in a completely satisfactory manner based on a simple but highly effective solution.

[0008] More specifically, the system of the invention reduces the oxidation and porosity of the components to a large extent, thereby achieving a considerably lower rejection of parts, in addition to a higher quality of said parts and even enabling subsequent heat treatments.

[0009] To this end, the system advocated is based on using a system for pouring aluminium from the base of the injection chamber, such that on filling the container from the bottom upwards the air is expelled without forming bubbles. This is achieved by means of a mobile sys-

tem for filling the tank of the injection machine, aimed at obtaining very high-quality parts.

[0010] The system is focused mainly on obtaining structural aluminium parts, although any type of component produced using the injection method is valid.

[0011] The system consists of a conduit that can optionally be heated, which is disposed at an angle of more than 90° with respect to the vertical, depositing, through one pouring outlet, the aluminium at the bottom of the injection chamber, producing the so-called filling of said chamber from the bottom upwards, which avoids oxidation and turbulence and oxygen capture by the aluminium. Once the container or chamber has been filled through the conduit it is raised, exiting the tank and allowing the passage of the injection piston.

[0012] The conduit is mounted on a structure that includes a pneumatic hydraulic cylinder to raise or lower the conduit and either lift it out of the injection chamber or position the pouring outlet over said chamber.

[0013] This system enables substantial progress in the enhancement of metal quality, particularly in all those "structural" parts that require aluminium with low porosity and low oxide content, and particularly in sensitive parts in automotive safety or basic features, in addition to those cases where the parts require subsequent heat treatment, machining and/or grinding.

DESCRIPTION OF THE DRAWINGS

[0014] In order to complement the description being made and with the object of helping to better understand the characteristics of the invention, in accordance with a preferred embodiment thereof, said description is accompanied, as an integral part thereof, by a set of drawings where, in an illustrative and non-limiting manner, the following has been represented:

Figure 1. Shows a representation corresponding to a perspective view of a system for pouring molten metal into injection chambers embodied in accordance with the object of the present invention.

PREFERRED EMBODIMENT OF THE INVENTION

[0015] As can be observed in the aforementioned figure, the system for pouring molten metal into injection chambers is based on using a mobile conduit (1), having upward and downward tilt, to carry out the pouring of the molten metal (aluminium) into the corresponding injection chamber, said conduit (1) having an upper end that receives, through an outlet (2), the molten metal from a general tank, not represented in the figure, while at the opposite end, the conduit (1) has an outlet (3) which is disposed at the bottom of the injection chamber, not represented either due to being conventional, for pouring the molten metal or aluminium from the lowest possible height, thereby avoiding the formation of turbulence, bubbles, etc. and obtaining high-quality parts.

[0016] The conduit (1) is disposed on a structure (4) in the manner of a conveniently connected frame, having a cylinder (5) whose actuation entails the upward or downward tilt of the conduit (1) itself, wherein the structure or frame (4) can be regulated by means of a manual handle (6). 5

[0017] In this manner, when the conduit (1), which may or may not be heated, is disposed at an angle of more than 90° with respect to the vertical, as represented in the figure, to deposit the molten aluminium at the bottom of the injection chamber, through the outlet nozzle (3), filling said chamber from the bottom upwards so as to prevent the generation of oxidation, turbulence and oxygen capture by the aluminium. 10

[0018] Once the tank or melting chamber has been filled, the conduit (1) is removed, i.e. it is made to tilt in order to exit the melting chamber to allow, in turn, the passage of the injection piston. 15

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Claims

1. A system for pouring molten metal into injection chambers, envisaged for the preferred application thereof in injected aluminium foundries, **characterised in that** it consists of a mobile conduit (1) tiltably mounted in an upward and downward manner on a structure or frame (4), wherein a cylinder (5) has been envisaged for lifting or lowering and tilting the conduit (1) itself, wherein the uppermost end of said conduit is in correspondence with the outlet (2) of a tank containing molten aluminium, while the opposite end has an outlet nozzle (3) for pouring the molten aluminium into the injection chamber. 25 30
2. The system for pouring molten metal into injection chambers, according to claim 1, **characterised in that** the conduit (1) includes heating means. 35
3. The system for pouring molten metal into injection chambers, according to claim 1, **characterised in that** the structure or frame (4) that supports the conduit (1) includes a handle (6) for regulating the height of said frame, whereover the mobile conduit (1) is susceptible of tilting. 40 45

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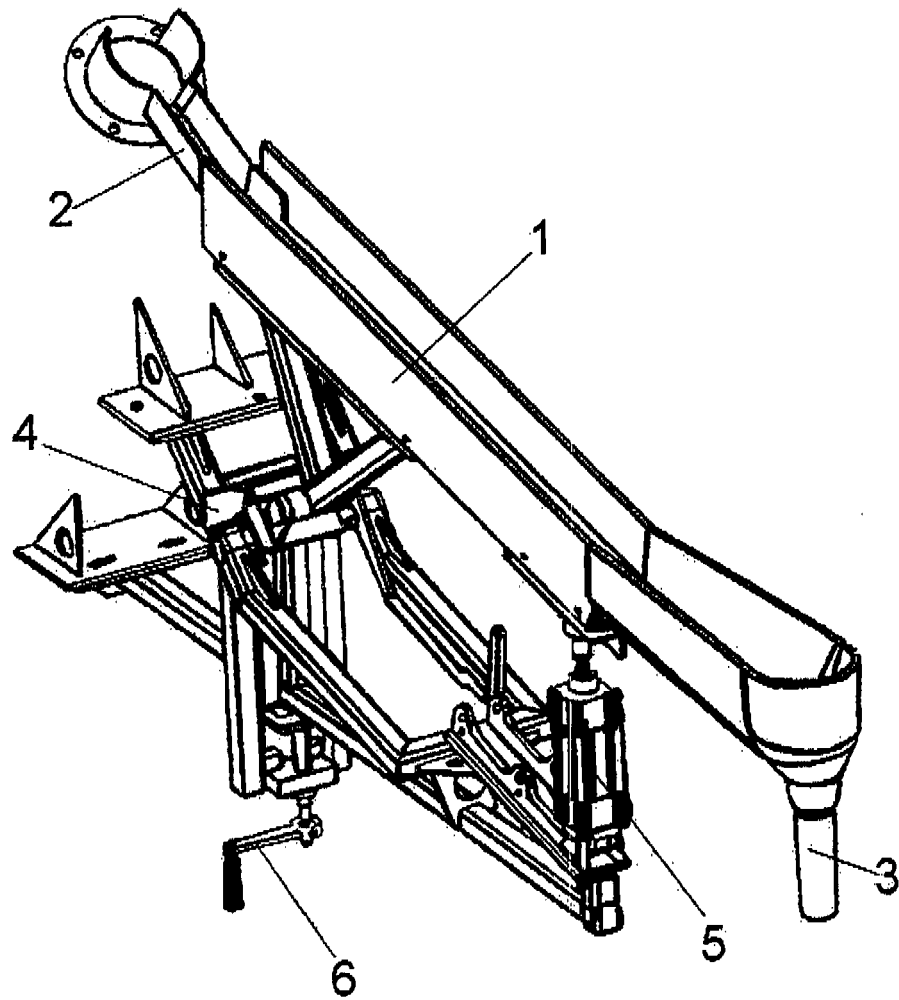


FIG. 1



EUROPEAN SEARCH REPORT

Application Number
EP 16 00 0553

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	JP H07 100615 A (UBE INDUSTRIES) 18 April 1995 (1995-04-18) * abstract * * paragraphs [0008], [0010]; figures 1-4 *	1,2 3	INV. B22D17/30 B22D35/00 B22D35/04 B22D35/06
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			TECHNICAL FIELDS SEARCHED (IPC)
			B22D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 August 2016	Examiner Baumgartner, Robin
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03/02 (P04C01)

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

EP 16 00 0553

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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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19-08-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82