

METHOD OF MOULDING BY MANUAL CASTING

The present invention relates to a method of moulding by manual casting. In more detail, it concerns the method wherein, using a combination of melts with metal moulds comprising lead alloys and brass moulds or aluminium moulds, the casting is carried out by manual operation.

For the cast moulding, an original mould of products is prepared with template and plaster based on the drawing and a plaster mould is made from said original mould of products. Thereafter, a sand mould is formed using this and further a brass type copper alloy is casted to give a metal mould material. Also, in the case of aluminium moulds, aluminium alloy is casted into the sand mould via a similar process to give the metal mould material. With these metal mould materials, engraving can be made easily onto the metal mould itself and finishing is also simple as is machining. Moreover, a die casting method is becoming widespread as a method making continuous production possible, but this method is one aiming at mass production originally and is thus unsuitable for the production of a variety of articles on a small scale.

Recently, as the standard of living is improved and various kinds of amusements and tastes become vigorous, higher grade articles have been requested for the various casting products. For example, for the interior, ornaments, high grade tablewares, championship cups, etc., not only is

appearance important but also it is one of the essential conditions that the design is unique and the article is small in number. In order to provide beautiful products corresponding to the request for such diversification of the kind of articles, there is no choice but to cast manually, and it is best to use metal moulds without the use of conventional sand moulds.

The invention was made with this background and has made it possible to carry out the moulding by manual casting covering every eventuality, to cope with the production of a variety of articles on small scale by combining particular alloy with particular metal moulds and to prevent the roughening in the texture of products simultaneously.

Accordingly, the invention provides a method of moulding by manual casting with a heated mould, wherein the following steps are performed in order:

Brass or aluminium part moulds with engraved inner faces are assembled to form a mould for the article to be cast, the mould having a pouring port,

The mould is held with a fixing jig;

The mould is heated in a furnace at a temperature in the range of 400°C to 700°C and then removed from the furnace;

The heat mould is dipped into a waterbath, with the pouring port directed upwards;

The mould is cooled in the waterbath while lead alloy melt at a temperature in the range of 350°C to 400°C is supplied to the mould through the pouring port;

Pouring of melt is stopped when lead alloy melt

overflows from the pouring port;

The mould is removed from the waterbath and disassembled and the cast article is removed.

The lead alloys applicable to the invention are those wherein, in addition to the ternary alloy of lead-antimony-tin, there are other metals within a range of 0.5 to 2.0%.

The manufacture of casting products is performed via publicly known process. Thus, the original mould of the product is made with plaster from a design drawing or trial sample to give the metal mould. After thorough examination and adjustment of split pieces, the engravings such as patterns, letters, etc. are made onto the inner face of metal mould based on the design and then the casting starts. The casting is carried out by a heated mould technique (Yakifuki). In the heated mould method, the whole mould is heated by baking in an oven before the molten metal is poured. The melt is poured into the metal mould manually. Cooling and solidification are carried out in water. At that time, the turn blowing permits the adjustment of solidified layer by return timing as the name thereof. After the trimming, soldering and assembling, the polishing, plating and lining with coated velvet or the like are provided to the casting article thus obtained, if necessary, to give the final product.

In accordance with the method of moulding by manual casting of the invention, it is possible to cope with the production of a variety of articles on small scale wherein every eventuality is to be covered for every article.

Therefore, the invention is extremely significant for the manufacture of high grade products of rarity value.

In following, the invention will be illustrated based on the examples and the drawings, wherein:-

Figs. 1 (A) and (B) are metal mould for the championship cup, (A) is a broken-up diagram showing the divided state and (B) is an oblique view showing the assembled state, respectively.

In the drawings, 1a, 1b, 1c, 1d, indicate brass part moulds. 2 indicates a brass mould for the championship cup. 3 shows the melt-pouring port. 4 shows the melt-exiting port.

Example (1)

As a relatively large casting article, the casting of championship cup made from lead alloy was carried out by the heated mould method using four brass part moulds (1a), (1b), (1c) and (1d) engraved with the patterns etc. on the inner faces as shown in Fig. 1 (A).

The part moulds were assembled as in Fig. 1 (B) to give a brass mould (2) for the championship cup. This was pressed down with a fixing jig from top and bottom and the whole was charged into the heating furnace to heat to 400 to 700°C. Then, this was taken out and dipped into the water bath directing the melt-pouring port (3) of said brass mould (2) upward. The mould (2) was cooled while the melt of lead alloy (temperature of melt: 350-400°C) was supplied quickly

from the melt-pouring port (3). After the melt was flooded out from the melt-existing port (4), pouring was stopped and the brass mould (2) was pulled up from the water bath, which was broken up to take out the product. The product taken out had no roughening in texture and was of excellent quality.

As described, according to the invention, casting articles excellent in the state of their surfaces can be obtained and sufficient correspondence is possible to the diversification and the advancement to high grade demands. Therefore, the invention exerts remarkable effects industrially.



CLAIMS

1. A method of moulding by manual casting with a heated mould, wherein the following steps are performed in order:

Brass or aluminium part moulds with engraved inner faces are assembled to form a mould for the article to be cast, the mould having a pouring port;

The mould is held with a fixing jig;

The mould is heated in a furnace at a temperature in the range of 400° C to 700° C and then removed from the furnace;

The heated mould is dipped into a waterbath, with the pouring port directed upwards;

The mould is cooled in the waterbath while lead alloy melt at a temperature in the range of 350° C to 400° C is supplied to the mould through the pouring port;

Pouring of melt is stopped when lead alloy melt overflows from the pouring port;

The mould is removed from the waterbath and disassembled and the cast article is removed.

2. A method of moulding by manual casting, substantially as herein described with reference to any of the examples.
