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FOUNDRY RIDDLE

Filed April 20, 1959

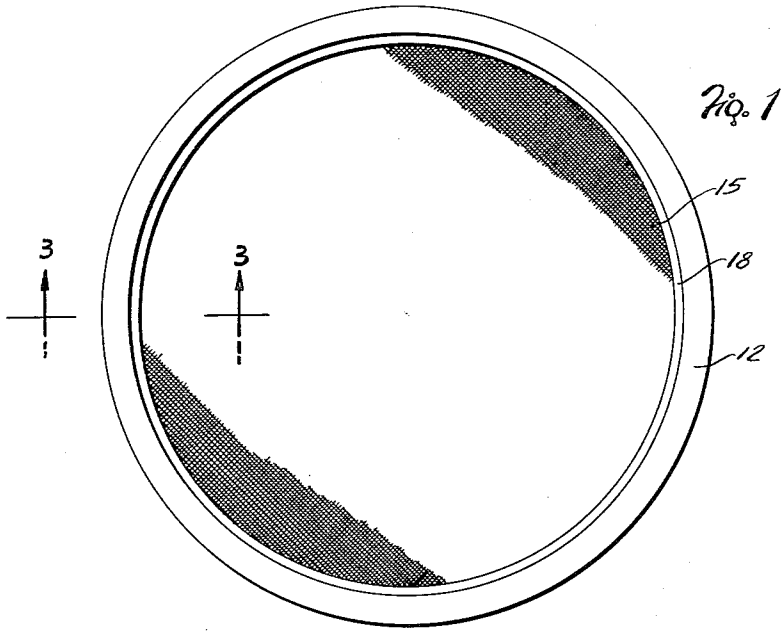


Fig. 1

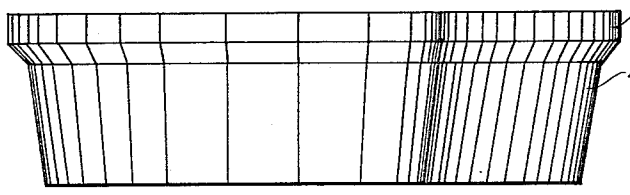


Fig. 2

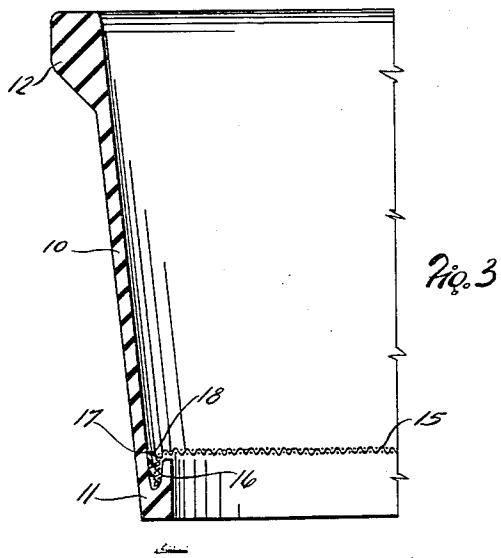


Fig. 3

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FOUNDRY RIDDLE

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This invention relates generally to a foundry riddle and more particularly to an improved foundry riddle which is comfortable to handle and of particularly durable construction.

Hand operated riddles are employed in foundries for sifting the molding and core sand in preparing the molds into which the molten metal is poured for forming the castings. Such riddles include a rim of normally cylindrical configuration with wire screening stretched across one of the open ends of the cylinder. The sand to be sifted is placed within the rim upon the screening and the riddle is then oscillated laterally to sift the sand through the screening. It has been the accepted practice to form the rim of the riddle of relatively thin wood. Because of the rough usage to which foundry riddles are subjected the surfaces of the wooden rim become rough to cause slivers of wood to enter the skin of the operators' hands and to otherwise cause considerable discomfort. In addition, the wooden rims wear rapidly to necessitate frequent replacement.

It is therefore a general object of the present invention to provide an improved foundry riddle having a rim formed of plastic in lieu of wood.

Another object of the present invention is to provide a foundry riddle of improved durability.

Another object of the present invention is to provide a foundry riddle which is substantially more comfortable and convenient for the operator to handle.

Another object is to provide a foundry riddle having a plastic rim to which the screen may be readily assembled in a manner to rigidly secure the screen to the rim.

A further object is to provide an improved foundry riddle of simple and inexpensive but sturdy construction which is efficient in operation.

According to this invention the improved foundry riddle comprises a circular rim which deviates slightly from a true cylindrical configuration by reason of the fact that the walls of the rim taper outwardly a slight amount from the minimum diameter at the bottom of the rim so that the rim is actually in the form of an inverted truncated cone. The rim is formed of plastic which far outlasts the wooden rims that have been employed for this purpose in the past and will not form slivers which penetrate the skin as wood will do when handled by the operator. The upper edge of the rim is enlarged to form an outwardly extending annular flange which reinforces the edge of the rim and also facilitates the grasping of the riddle when it is manipulated by the operator. The lower edge of the rim is likewise enlarged to form an inwardly extending flange which protects the lower edge of the rim and also provides for an annular opening on the inside of the rim to receive the downwardly bent periphery of the wire sifting screen. The periphery of the screen is cemented within the annular opening of the lower flange to secure it across the lower opening of the rim at approximately the minimum diameter of the rim for sifting the molding sand.

The foregoing and other objects of the invention, which will become apparent from the following detailed specification setting forth an illustrative embodiment, may be achieved by the particular apparatus depicted in and described in connection with the accompanying drawings, in which:

FIGURE 1 is a plan view of a foundry riddle incorporating the features of the present invention;

FIGURE 2 is a front elevational view of the foundry riddle illustrated in FIGURE 1; and

FIGURE 3 is a view in vertical section taken along the plane represented by the line 3—3 in FIGURE 1.

Reference is now made more particularly to the drawings which illustrate a foundry riddle constructed in accordance with the teachings of the present invention. As there shown, the improved foundry riddle of the present invention comprises a rim **10** of annular configuration with the annular wall of the rim **10** tapering inwardly through its height from its top edge to its lower edge so that the rim **10** is actually in the form of an inverted truncated cone. Therefore, its bottom edge is of minimum diameter which expands progressively to a maximum diameter at its upper edge.

The foundry riddle, of course, is employed for sifting the sand which is used in foundry molds into which molten metal is poured for forming a metal casting. The sand molds are contained in flasks or metal molding boxes and in sifting the sand into these molding boxes, it is the common practice to rest the riddle on top of the metal framework of the molding box and oscillate the riddle to sift the sand contained within it. The bottom edge of the riddle is therefore moved back and forth on the sharp and rough edges of the metal molding box. This practice subjects the bottom edge of the riddle to an abrasive and wearing action. As a result, the rims **10** wear rapidly along the bottom edge when fabricated of wood. Such rapid wear is reduced appreciably in the present invention by substituting a molded rigid plastic for the rim **10** in lieu of the conventional wood fabrication that has been previously employed for forming the rim of the riddle. Various plastic compositions have been found to be suitable for molding the rim **10**, for example, the plastic composition known as acrylonitrile-butadiene-styrene copolymer has been found to be very satisfactory for this purpose, this particular plastic being manufactured by the Marbon Chemical Division of the Borg Warner Corporation under the tradename "Cycolac."

In addition to the fact that the plastic material by itself improves the wearing qualities of the foundry riddle, it may be constructed to reinforce those areas which are particularly subjected to wear during the use of the riddle. Thus, as previously mentioned, the bottom edge of the rim **10** is moved back and forth across the metal molding box containing the sand mold and this edge is therefore reinforced by an annular expansion along the bottom edge of the rim **10** to form an inwardly extending flange **11**. The flange **11** is substantially thicker in cross section than the wall of the rim **10** so that the bottom edge of the riddle may better take the abuse to which it is subjected in sifting the sand.

In a similar manner, the upper edge of the rim **10** is likewise subjected to undue wear in the ordinary manipulation of the riddle by reason of the fact that after the sand has been sifted into the mold, the particles which do not pass through the screen of the riddle are contained within the rim **10**. The operator therefore, inverts the riddle and usually strikes its upper edge against the edges of the metal molding box to clean the riddle. In addition, after the riddle has been thus cleaned of sand it may be thrown on a hard concrete floor to further subject its edges to abuse. In the past, this treatment of the riddles caused the wooden rims **10** to become worn and roughened so that the riddle not only deteriorated rapidly but the rough wood surface was uncomfortable for the operator to handle by reason of the fact that it yielded slivers which penetrated the skin of the operator who was handling it. The substitution of a rigid plastic material for the wood in the fabrication of the rim **10** in the present invention, eliminates the presence of slivers entirely so that the operator may handle the riddle without

fear of such injury. Furthermore, not only does the plastic material by itself better withstand the abuse to which such riddles are subjected, but the durability of the rim may be further improved by expanding the upper edge to provide an outwardly extending flange **12** which has a substantially greater thickness through its cross section so that it may better absorb the shock to which it is subjected.

Although the flange **12** does serve as a reinforcement for minimizing the wear of the upper edge of the rim **10** when the riddle is inverted and struck on a hard object to remove the coarse material therefrom, the flange **12** serves the additional purpose of facilitating the handling of the riddle by the operator. It was impractical to provide any type of flange along the upper edge of the rim of the previous wooden rim riddles, so that the operator had only the straight cylindrical surface of the rim to grasp. The flange **12** in the riddle of the present invention extends outwardly to enable the operator to wrap his fingers around it to provide a convenient means for firmly grasping the riddle. Therefore, the fabrication of the rim **10** of a plastic material in lieu of wood, not only increases the durability of the riddle, but it also enables the rim **10** to be constructed in such a manner as to reinforce the upper and lower edges which are subjected to maximum abuse, and this reinforcing material forms flanges which facilitate the handling of the riddle by the operator.

The bottom flange **11** extends inwardly of the rim **10** to provide a convenient means for mounting a screen **15** which is drawn taut across the bottom opening of the rim **10** to provide a means for sifting the sand. The screen **15** is of circular configuration to conform to the circular configuration of the rim **10**. The entire peripheral edge **16** of the screen **15** is bent downwardly approximately 90° to the plane of the screen **15** for placement in an annular recess **17** formed in the bottom flange **11** interiorly of the rim **10** as clearly shown in FIGURE 3.

The annular recess **17** opens upwardly to the inside of the rim **10** so that the downwardly extending peripheral edge **16** of the screen **15** may be placed within it. As previously mentioned, the rim **10** is tapered inwardly from its upper edge which results in its upper edge being of maximum diameter and being reduced progressively to its lowermost edge. This configuration of the rim **10** facilitates the assembly of the screen **15** to the rim **10** because after the peripheral edge **16** of the screen **15** has been bent downwardly, the screen **15** may be conveniently assembled to the riddle by moving it downwardly from the upper opening of the rim **10** until the peripheral edge **16** of the screen **15** is placed within the annular recess **17**. After this has been accomplished, the screen **15** may be secured in position by filling the annular recess **17** with a suitable adhesive or cement **18** which will cement the peripheral edge **16** within the recess **17**. It has been found that an epoxy resin is an ideal cement for this purpose, the epoxy being a resin which is produced from epichlorohydrin a by-product of the production of glycerin from petroleum, reacted with bisphenol A. Other adhesives or cements may be likewise found to function very satisfactorily for this purpose.

The adhesive **18** merely serves as a binder to prevent the displacement of the screen **15** in an upward direction since the screen **15** itself, resting upon the flange **11**, absorbs the load when the riddle contains the sand which is being sifted, it not being necessary for the adhesive **18** to absorb any portion of this load. The downwardly extending peripheral edge **16** of the screen **15** prevents displacement of the screen caused by the load on top of the screen or by lateral forces applied to the screen when the riddle is oscillated for sifting the sand. The adhesive **18** is therefore only necessary to prevent upward displacement of the screen **15** and any upward forces which are applied to the screen **15** will be relatively light and will occur infrequently because they are not produced in the normal operation of the riddle.

From the foregoing detailed description of the structure and operation of the illustrative eembodiment of the present invention, it will be apparent that a new and improved foundry riddle has been provided which is of substantially more durable construction while being appreciably more convenient and comfortable for the operator to handle.

Although the illustrative embodiment of the invention has been described in considerable detail for the purpose of making a full disclosure of a practical operative arrangement by means of which the invention may be practised, it is to be understood that various novel features of the invention may be incorporated in other arrangements without departing from the spirit and scope of the invention as defined in the subjoined claim.

The principles of the invention having now been fully explained in connection with the foregoing description of embodying structure, I hereby claim as my invention:

In a foundry riddle for sifting molding sand; a rim having an upstanding annular wall that tapers outwardly from its lowermost edge so that its bottom edge is of minimum diameter with its diameter increasing progressively upwardly to its uppermost edge which is of maximum diameter to form an inverted truncated cone, said rim being formed of molded plastic; an upper solid plastic flange molded integrally with said rim and formed by increasing the thickness of the wall of said rim along its upper annular edge with the flange extending radially outwardly of said rim to reinforce the upper edge of said rim as well as to constitute a convenient grasping means; a lower plastic flange molded integrally with said rim about its lower edge, said flange being formed by increasing the thickness of the wall of said rim and extending radially inwardly of said rim, said lower flange having an annular recess located interiorly of said rim and opening upwardly; and a flat circular sifting screen having a downwardly extending peripheral edge cemented within the annular recess in said lower flange to operably attach said screen to said rim.

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