July 10, 1956 A. B. CASTAGNOLA ET AL 2,753,607

ALIGNING MEANS FOR FOUNDRY FLASK

Filed Nov. 3, 1952

Fig. 1.

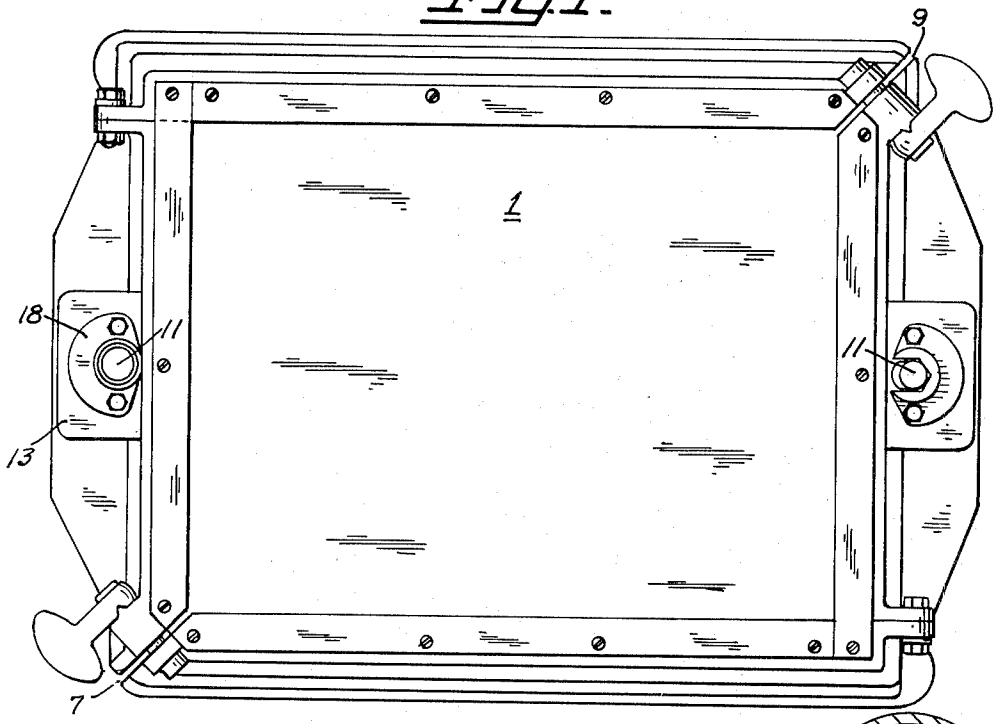
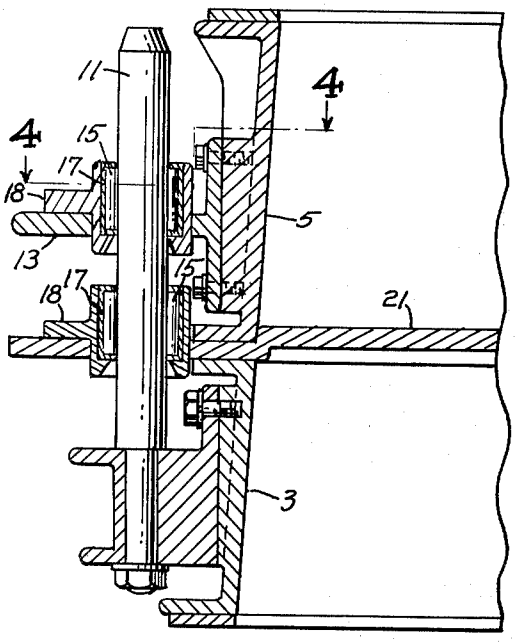


Fig. 2.



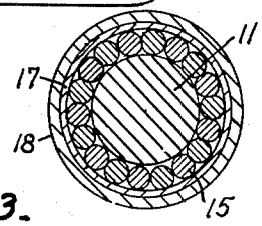


Fig. 3.

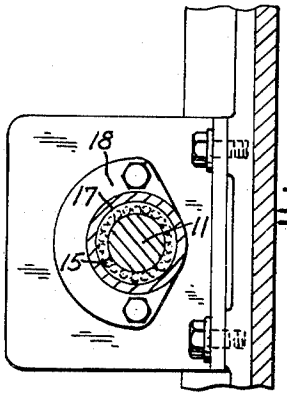


Fig. 4.

INVENTORS
ANGELO B. CASTAGNOLA
EDWARD J. RITELLI
BY
Bruce & Broeler
THEIR ATTORNEYS

United States Patent Office

2,753,607

Patented July 10, 1956

2,753,607

ALIGNING MEANS FOR FOUNDRY FLASK

Angelo B. Castagnola and Edward J. Ritelli,
Oakland, Calif.

Application November 3, 1952, Serial No. 318,435

4 Claims. (Cl. 22—110)

Our invention relates to foundry flasks and more particularly to the aligning means for the cope and drag components which go to make up such flask.

In the field of sand casting, absolute alignment is necessary in assembling the cope and the drag components of a flask to prevent misalignment of the cooperating halves of the resulting mold, and this becomes of paramount importance where the castings are to be finished off on automatic machines.

It has been the prevailing practice in the art to provide the drag at each end with an upstanding guide pin, and the cope with end brackets, each having an opening in alignment with one of said pins for the guidance thereof in assembling the two components of the flask. At least one of the openings provides a very close sliding fit with its associated pin. With such construction, difficulty is often experienced in applying and removing the cope because unless parallelism is maintained between the cope and drag, binding occurs between the pin and bracket. Such situation becomes considerably aggravated should fine sand particles settle in the guide opening or on the guide pin.

Among the objects of the present invention are

(1) To provide novel and improved alignment means for foundry flasks;

(2) To provide novel and improved aligning means for foundry flasks, which will facilitate the assembling and removal of the cope;

(3) To provide novel and improved aligning means for foundry flasks which is unaffected by the entrance of fine sand particles therein;

(4) To provide novel and improved aligning means for foundry flasks which is self-cleaning and economical as to cost.

Additional objects of our invention will be brought out in the following description of a preferred embodiment of the same taken in conjunction with the accompanying drawings wherein—

Figure 1 is a plan view of a foundry flask to which the invention pertains;

Figure 2 is a fragmentary view in section through an end of the flask of Figure 1, illustrating the invention as incorporated therein;

Figure 3 is an enlarged view in section through the aligning means of Figure 2;

Figure 4 is a view in section taken in the planes 4—4 of Figure 2.

Referring to the above mentioned drawings for details of our invention in its preferred form, we have illustrated the same embodied in a flask 1 of the character forming the subject matter of Patent No. 2,453,893 of Nov. 16, 1948, to Angelo B. Castagnola, involving a drag 3 and a cope 5, the drag and cope having diagonal corners 7 and 9 expansible to facilitate the removal of the same from the sand mold when formed therein.

To assure proper and accurate alignment between the cope and the drag, the drag at each end carries a vertically mounted guide pin 11, while the cope carries a bracket 13 at each end having a hole therethrough to receive the corresponding guide pin. One of the holes is accurately dimensioned to the diameter of the pin, while the other has a longer dimension in the direction of the longitudinal axis of the cope to permit of shift of the end wall of the cope and joining side wall along the said axis, when the aforementioned corners are expanded.

We have found that by converting the close fitting cylindrical surface of the hole to one having spaced areas of reduced size, such as presented by a plurality of fine ribs or their equivalent, in contact with the guide pin, not only is the frictional surface contact very materially reduced, but the troughs or their equivalent between the contacting areas, offer refuge and escape for any sand particles which may settle on the pin or otherwise find their way into the guide hole.

A particularly effective way of establishing such structural relationship between the guide pin and guide hole, is to utilize what is known in the art as a needle bearing having an inside diameter comparable to the diameter of the guide pin. Such needle bearing involves a plurality of small diameter cylindrical case hardened rollers 15 disposed side by side in a suitable race 17, and may be incorporated into a cope bracket by affixing thereto a small casting 18 having a countersunk opening therethrough into which the needle bearing may be fitted as an insert. Such use of conventional needle bearings provides a very inexpensive and even more effective way of accomplishing the foregoing structural relationship, because not only is the frictional surface contact with the guide pin thereby reduced to essentially a series of line area contacts, but the total uncontacted or exposed surface area of the pin lying between such line contacts, is thereby so much greater that any particles of sand finding their way in will have essentially no opportunity to cause binding. Any theoretical remote possibility of binding is further minimized by the ability of said rollers to rotate, each on its own axis. Thus, the aligning means may be deemed to be self-cleaning in its action.

It is understood, of course, that the so-called needle bearing does not, as put to use in the present invention, function as a bearing in the common accepted sense, but serves merely as a guide hole in aligning the components of a foundry flask, and in so doing, fulfills all the objects of the invention previously attributed thereto.

The pattern plate which is normally assembled between the cope and the drag in the preparation of a mold, and carries the patterns which determine the mold formations in the sand, may likewise be provided with a similar needle bearing insert at one or both ends thereof, to facilitate its application to the guide pins and its removal therefrom. Such pattern plate has been designated by reference numeral 21 in the drawings.

In lieu of the needle bearing insert described above as constituting the preferred embodiment of the present invention, it is within the contemplation of the present invention to include the utilization of ball-bearings, for such bearings would reduce the frictional surface contact with the guide pins to a minimum, and at the same time provide complete freedom from sand binding. One or more ball-bearing races may be employed for this purpose.

Accordingly, while we have illustrated and described our invention in its preferred form and in considerable detail, we do not desire to be limited in our protection to such details as we have illustrated and described, except as may be required by the appended claims.

We claim:

1. Aligning means for the cope and drag components of a foundry flask, comprising a vertically disposed guide

pin mounted adjacent an end of said drag as a component part thereof, and a bracket on an end of said cope having a guide hole for reception of said guide pin, said guide hole having a guide pin contacting surface composed of a plurality of horizontally spaced surface areas bounded by intermediate spaces.

2. Aligning means for the cope component of a foundry flask, comprising a bracket at an end of said cope, said bracket having a guide hole therethrough whose surface is formed by a plurality of small rotatably mounted elements disposed side by side about the interior thereof.

3. Aligning means for the cope component of a foundry flask, comprising a bracket at an end of said cope, said bracket having a guide hole therethrough whose surface is formed by a plurality of vertical small diameter rollers disposed side by side about the interior thereof.

4. Aligning means for the cope component of a foundry flask, comprising a bracket at an end of said cope, said bracket having a needle bearing insert therethrough to provide a guide hole having a plurality of spaced vertical guide pin contactable surface areas and intermediate spaces.

References Cited in the file of this patent

UNITED STATES PATENTS

2,447,060	Dudak	July 26, 1949

FOREIGN PATENTS

378,309	Germany	July 10, 1923
466,392	Germany	Oct. 5, 1928
499,858	Germany	June 21, 1930
528,173	Germany	June 26, 1931