Nov. 27, 1951 W. HORTH 2,576,180

MIXER

Filed Jan. 29, 1949 2 SHEETS—SHEET 1

Fig. 2

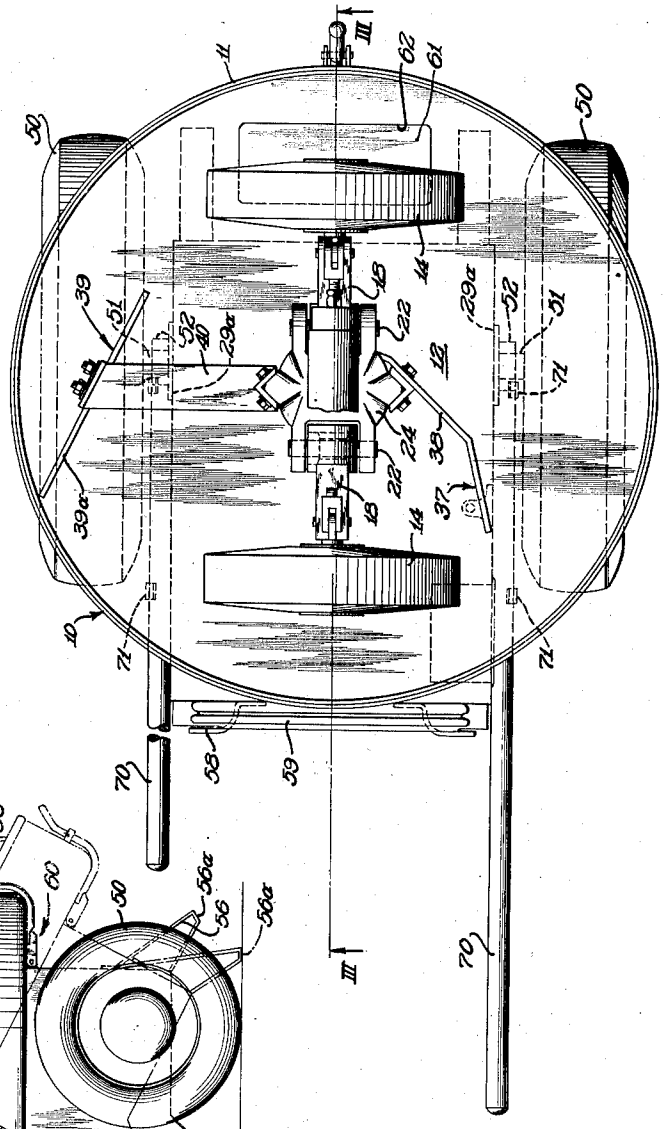
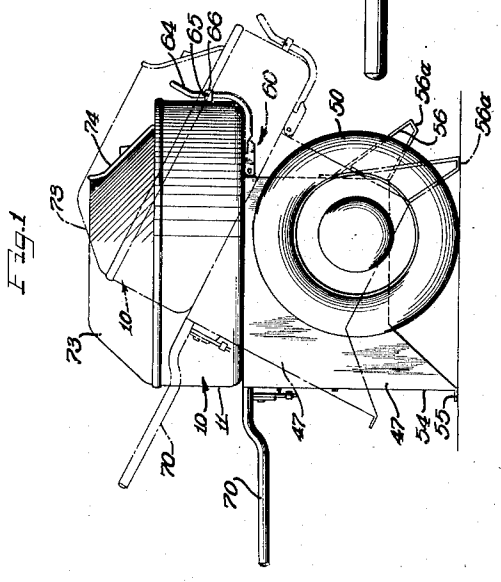


Fig. 1



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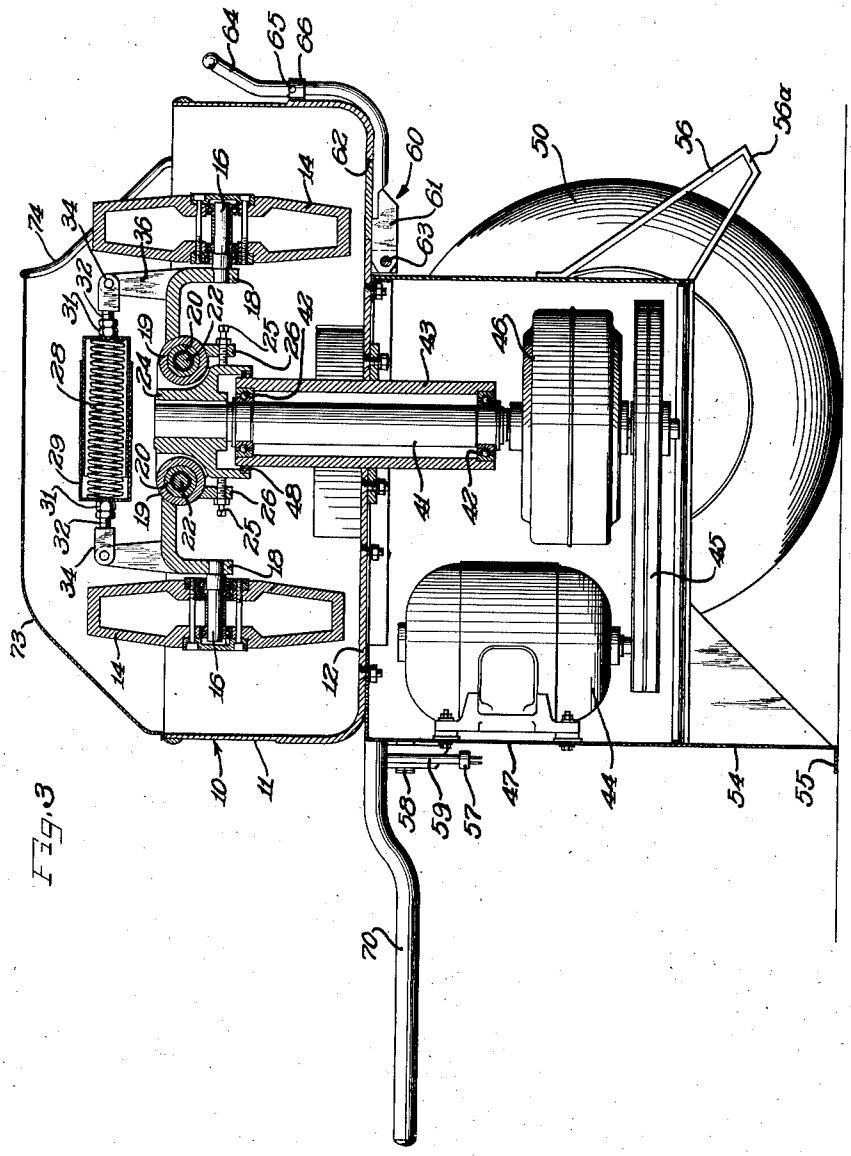


Fig. 3

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UNITED STATES PATENT OFFICE

2,576,180

MIXER

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Application January 29, 1949, Serial No. 73,560

8 Claims. (Cl. 259—102)

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This invention relates to improvements in a mixer. More particularly, this invention has to do with a mixer or muller unit for mixing solid materials and liquids. This unit is of the portable type, being capable of movement from place to place, and has a self-contained power unit permitting operation of the mixer at various stations in a foundry.

In some foundries, especially those of the smaller type, sand is used in small quantities and therefore it is necessary to periodically process the sand in small batches. This processing must be done to various kinds of sand, as for example, core sand and moulding sand. This processing of various types of sand can best be carried out by means of processing units which are relatively small in capacity and which have adjustably operating features which permit changing over from one type of sand to another.

Many foundries do not have extensive conveying systems, and it is therefore necessary to move the sand to be processed to the processing station by manual means. It would therefore be very advantageous for small foundries wherein small batches of various sands are processed, if a unit having a self-contained power means were provided which can be moved from place to place wherever it is needed for processing small batches of sand.

According to the principal features of the present invention there is provided a portable muller unit including an upper crib portion wherein the muller wheels are mounted and a lower housing in which is disposed the self-contained power and driving mechanism. The entire unit is mounted on rubber tired wheels and is provided with adjustable handle members by which the entire unit may be conveniently wheeled around from place to place in a foundry.

The mixer unit of this invention, which handles 250 to 300 pound batches of sand, is so designed and arranged that one man may readily move it bodily from one station to another. The unit may be tilted so that the loading door of the crib is only 30 inches above the floor level, which affords convenient means for loading the unit. There is also provided a discharge door at the bottom wall of the crib through which the contents of the crib may be discharged into a wheelbarrow positioned therebelow.

A special feature of the present invention is the provision of means for adjusting the position of the muller wheels relative to the wear plate of the crib and spring means for pre-loading the muller wheels in any pre-set position thereof.

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It is, therefore, an important object of the present invention to provide a portable mulling unit having a self-contained power unit.

A further object of this invention is to provide novel means for varying the pressure exerted on the sand in the crib.

Another and further object of this invention is to provide a portable mixer that has means for loading which is relatively close to the ground and also has a bottom discharge door that will permit complete discharging of the sand without tilting of the unit.

Other and further features, objects and advantages of the present invention will be apparent to one skilled in the art from the following detailed description of the annexed sheets of drawings.

On the drawings:

Figure 1 is a side elevational view of the portable muller unit of the present invention, showing in dot-dash line the tilted loading and discharging position of the unit;

Figure 2 is a plan view of the portable muller unit of the present invention with the top cover of the crib removed to better disclose the features of the machine; and

Figure 3 is a vertical sectional view taken substantially on line III—III of Figure 2.

As shown on the drawing:

In Figures 2 and 3 the reference numeral 10 indicates the crib of a mixer or muller unit. The crib has a generally circular shape defined by a side wall 11 and has a bottom wall 12 which forms the wear-plate of the machine. A pair of muller wheels 14 are mounted at diametrically opposite points in the crib 10 for free rotation on stub shafts 16 that are secured in and extend laterally from rocker arms 18. The rocker arms 18 have eye portions 19 journaled on antifriction bearing 20 which is disposed about a shaft 22. A cross head 24 journals the opposite ends of both shafts 22 and thus the muller wheels 14 are mounted for pivoting with the rocker arms 18 relative to the cross head 24.

The position of the muller wheels relative to the wear plate 12 of the crib 10 is varied by means of adjusting screws 25 which are threaded through arm members 26 of the rocker arms 18 having end portions bearing against the central portion of the cross head. By adjusting the screws 25 in and out of the arms 26, the muller wheels may be positioned either in touching engagement with the wear plate 12, or approximately two inches thereabove, or at a level therebetween.

The pressure of the muller wheels 14 on the sand in the crib may be varied for each preset position of the muller wheels. This is effected by means of a coil spring 28 disposed in a housing 29 having telescopic walls. A pair of lock nuts 31 are threaded onto screws 32 secured to and extending away from opposite ends of the housing. At their free end the screws 32 are threaded onto connectors 34 which are pivotally connected to an arm 36 projecting upwardly from each rocker arm 18.

It is well known in the foundry art that relatively weak sand mixtures require less muller weight and they produce a shallow sand track under the mullers during the mulling operation. On the other hand, strong sand mixes produce a thick sand cake under the mullers, requiring heavier weight for thorough mulling. By means of this spring adjustment the muller wheels can be preloaded within a pressure range which covers from the dead weight of the muller wheels themselves to any predetermined desired maximum pressure on the mulled wheels. It has been found that a desirable range is from 100 to 300 lbs. for this type of portable unit.

As seen in Figure 2, an inner plow member 37 has an arm portion 38 secured to the crosshead 24 and has a blade portion which is arranged to scrape sand from the wear plate of the muller unit and urge it outwardly into the path of the muller wheels. An outer plow member 39 is mounted at the outer end of an arm 40 which is secured to the crosshead 24. This outer plow member 39 has a blade portion 39*a* which is arranged to scrape the wear plate of the crib and the side walls of the crib and urges the sand inwardly toward the path of the mullers.

The crosshead 24 is rotated by means of a shaft 41, which is keyed to the crosshead and rotatably mounted on bearings 42 in a turret 43 secured in an upright position in the wear plate 12 of the crib. A motor 44 drives the shaft 41 through a V-belt 45 and a speed reducer 46, which units are mounted in a box-like housing 47 disposed below the crib 10. Oil seals 48 are provided between the crosshead 24 and the turret 43.

The muller unit of this invention is made portable by means of wheels 50 which are rotatably mounted on either side of the housing 47 on stub shafts 51 which project outwardly from the side wall of the housing. The shafts 51 may be mounted on the housing in any conventional manner by means of flange plates 52 which are suitably secured thereto. The pivot axis defined by the shafts 51 is in close proximity to the axis of the shaft 41.

A support bracket 54 is formed as an integral part of the rear wall of the housing 47 and has a foot portion 55 arranged to provide supporting contact with the floor. The support bracket 54 provides means for supporting the unit during the mulling operation.

A second support bracket 56, having a flat portion 56*a*, projects from the forward portion of the housing 47 and is disposed in a downwardly inclined direction therefrom. As shown in Figure 1, when the unit is tilted to a loading and discharge position as shown therein in dot-dash line, the flat portion 55*a* provides the support means for the unit.

An extension cord 59 connected at one end to the motor 44 and provided with a conventional plug 57 is arranged to be wound on a rack 58 which is mounted on the rear wall of the housing 47. By means of this extension cord the motor 44 may be energized from any convenient electrical outlet disposed in the foundry.

A discharge door assembly 60 comprising a rectangular shaped closure member 61 movable into an opening 62 in the bottom wall of the crib and pivotally mounted on hinges 63 for downward pivoting movement. A handle 64 conveniently disposed at the forward end of the crib has a bracket 66 provided with lock pin 65 which holds the handle 64 in locked position. If the door 60 is swung open when the unit is disposed in the upright position illustrated in Figure 3, the action of the muller wheels 14 and plows 37 and 39 will discharge the sand through the door.

A pair of elongated handle members 70 are secured to the side wall of the housing by means of clips 71 which may be removably fastened to the housing by any conventional means so that the handles may be adjusted relative to the unit to a length convenient to the operator.

A cover 73 is disposed over the crib 10 and is suitably secured thereto. This cover has an opening 74 at the forward end thereof which permits charging of the unit.

From the foregoing description it will be seen that there is provided in this invention a novel portable muller unit which has a self-contained power unit and drive mechanism and is compactly built for ready movement from place to place by a single operator. The unit is designed for movement to a tilted position which provides a relatively low, convenient charging position. The novel provision of a spring mechanism for preloading the muller wheels at any desired setting of the wheels makes this unit capable of interchangeable operation for processing varying grades of sand.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A mulling machine comprising a material-carrying crib, muller wheels operably mounted in said crib for mulling the material, abutment arms connected to each wheel, a telescoping casing disposed between said abutment arms, and spring means in said casing arranged to separate the members of the telescoping casing and urge both wheels simultaneously against the material in the crib.

2. A mulling machine comprising a material-carrying crib, rocker arms pivotally mounted in said crib, muller wheels disposed at the end of said rocker arms, upstanding abutment arms on each of said rocker arms, a telescoping casing disposed between the upper end of said abutment arms, and spring means in said casing urging both wheels against the material in the crib.

3. A mulling machine comprising a material-carrying crib, rocker arms pivotally mounted in said crib, muller wheels rotatably disposed at the end of said rocker arms, and an adjustment screw operable on said rocker arms to vary the position of said muller wheels in said crib, upstanding abutment arms on each of said rocker arms, a telescoping casing disposed between said upstanding abutment arms, and a spring in said casing arranged to urge said muller wheels against the material in the crib.

4. A mulling machine comprising a wheeled support structure, a housing pivotally mounted

on said support structure having a lower and an upper chamber, said upper chamber defining a material-carrying crib, a shaft disposed in said crib, a turret keyed to said shaft and mounted for rotation in said crib, rocker arms pivotally mounted on said turret, muller wheels rotatably mounted at the end of said rocker arms, an adjustment screw associated with each rocker arm for varying the position of the muller wheels in the crib, a telescopic casing disposed between said rocker arms, a spring in said casing arranged to exert pressure on said muller wheels for urging them against the material in the crib, a discharge door in the base of said upper chamber, said door being positioned substantially at the lowest end of said chamber when said housing is moved to a tilted position, a loading port in said housing movable downwardly to a convenient loading position when the housing is tilted, and a power unit positioned in said lower housing operable on said turret for rotating said muller wheels in said crib.

5. A mulling machine comprising a material-carrying crib having a lower wear plate, muller wheels pivotally and rotatably mounted in said crib for mulling the material, means for driving said muller wheels, a pre-loaded spring in said crib, and a telescopic housing encasing said spring and operatively connected to each of said muller wheels for simultaneously exerting pressure on both of said wheels to load the same toward said wear plate.

6. A mulling machine comprising a material-carrying crib, muller wheels operably mounted in said crib for mulling the material, rocker arms connected to each of said wheels, a spring disposed between said muller wheels, and adjustable telescopic elements operatively connecting said arms to said spring for urging both wheels

against the material in the crib under a variable load.

7. A portable mulling machine comprising a housing, shafts projecting from opposite sides of said housing defining a pivot axis about which said housing may be pivoted, a vehicular wheel journalled at the end of each shaft, driving means disposed between said wheels, a crib defined by portions of said housing above said driving means, a cross-head in said crib, muller wheels journalled by said cross-head, and means drivingly connecting said cross-head to said driving means.

8. A portable mulling machine comprising a carriage structure, spaced vehicular wheels on said carriage structure, a wear plate overlying said wheels, a crib housing superimposed on said wear plate, a cross-head rotatably journalled in said crib, mulling wheels carried by said cross-head for rotation, drive means carried by said carriage structure, and means projecting through said wear plate for drivingly connecting said drive means with said cross-head.

WALTER HORTH.

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