June 9, 1953 A. C. CHRISTENSEN 2,641,387

MIXING MACHINE DISCHARGE DOOR

Original Filed Feb. 27, 1947 2 Sheets-Sheet 1

Fig. 1

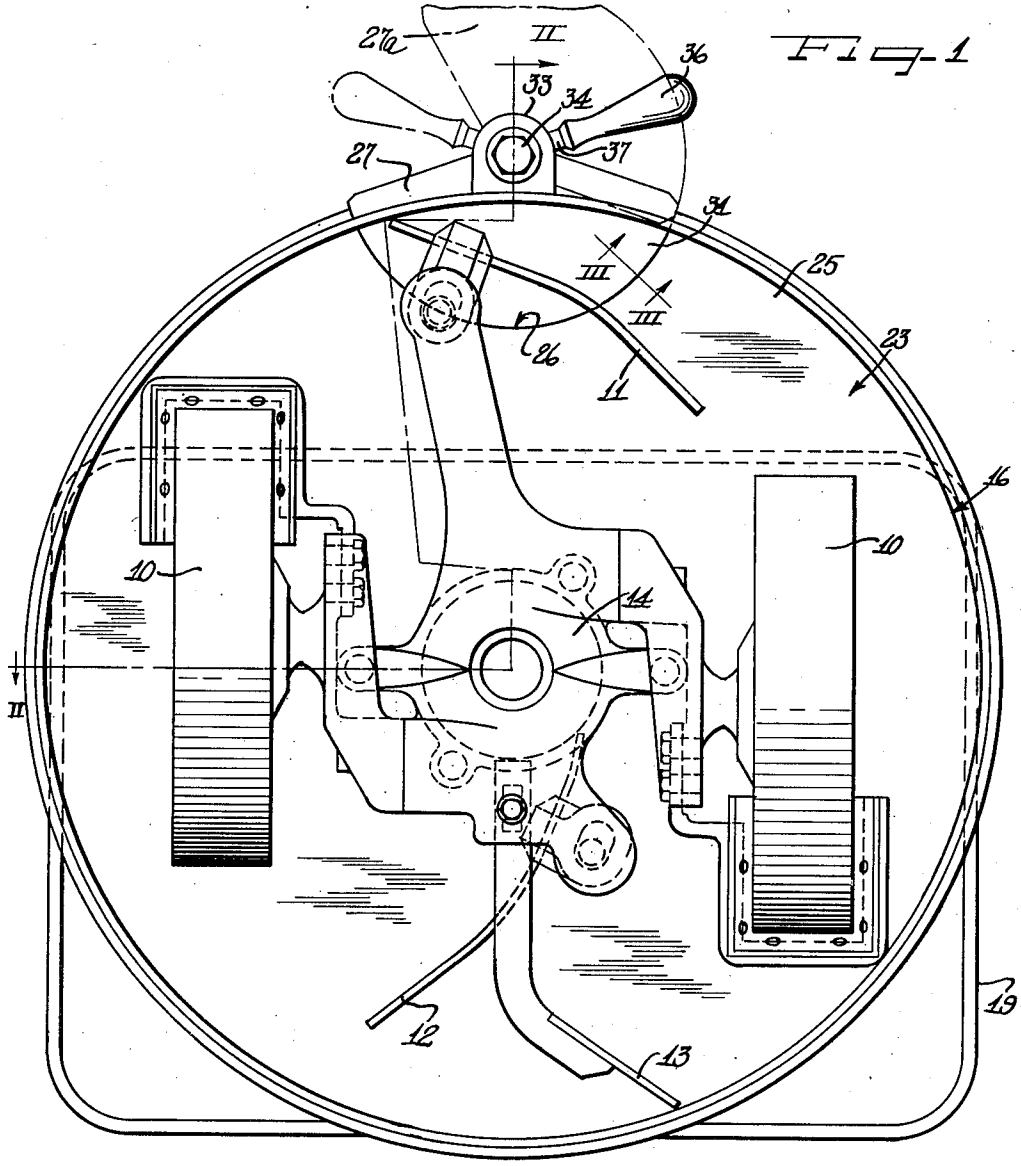
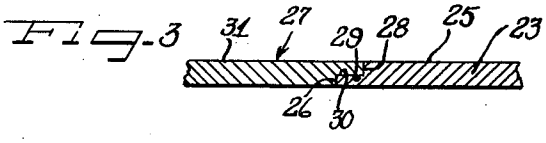


Fig. 3



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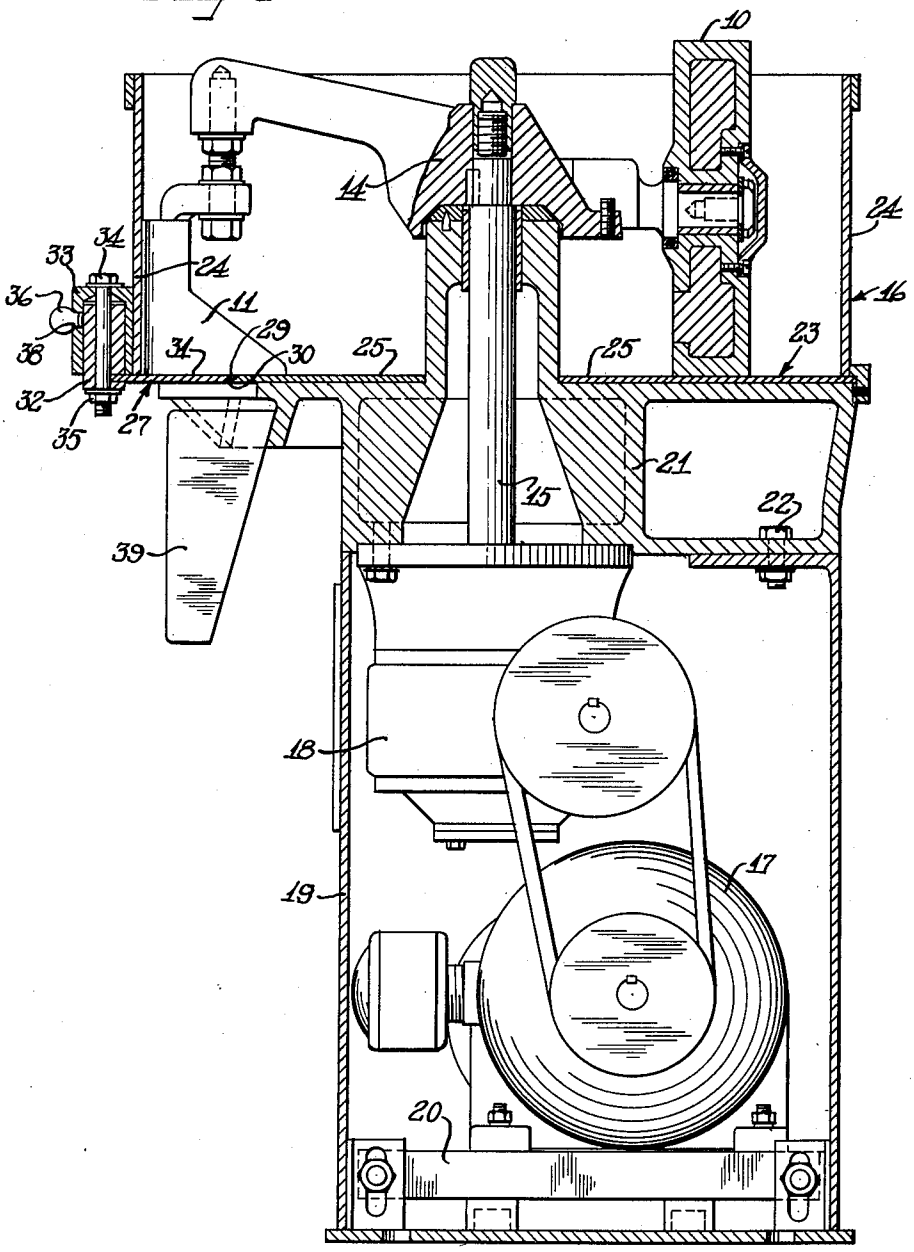
by Hill, Sherman, Meroni, Gross & Simpson Attys

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Fig-2



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2,641,387

MIXING MACHINE DISCHARGE DOOR

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Original application February 27, 1947, Serial No. 731,213. Divided and this application October 6, 1951, Serial No. 250,168

3 Claims. (Cl. 222—556)

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This invention relates to a mixing machine discharge door, and more particularly to such a door which swings in the plane of the door between open and closed position.

The discharge door of the present invention is particularly suited for use with the material mixer disclosed in my copending application entitled "Intensive Mixing Apparatus," Serial No. 731,213, filed February 27, 1947, of which the present application is a division.

An important object of the present invention is to provide a novel discharge door for a mixer.

It is another object of the present invention to provide a discharge door that is leak-proof and self-cleaning.

It is a further object of the present invention to provide a discharge which does not require a latch or locking device.

A feature of the present invention is the provision of a discharge door that is leak-proof and self-cleaning due to a sliding action between the door and the bedplate of the mixing machine.

Other objects, features and advantages of the present invention will be apparent to those skilled in the art from the following detailed description of the annexed drawings, which, by way of preferred example only, illustrate one embodiment of the invention.

In the drawings:

Figure 1 is a plan view of a mixing machine having a discharge door according to this invention;

Figure 2 is a vertical sectional view taken substantially along the line II—II of Figure 1; and

Figure 3 is a partial enlarged vertical sectional view taken substantially along the lines III—III of Figure 1.

As shown in the drawings:

In Figures 1 and 2, a pair of muller wheels 10, an outside plow 11, an inside plow 12, and a scraper 13 are secured to a cross-head 14 for rotation by a drive shaft 15 in a crib 16. The drive shaft 15 is driven from an electric motor 17 through a gear reducer 18, which driving units are disposed in a base frame 19. The motor 17 is also adjustably mounted by means of a cross member 20 on the base frame 19.

The base frame 19 is substantially a box-like structure preferably made of steel having walls thick enough to support the entire weight of the mounting and mechanism thereabove, including a bedplate 21 which is secured to the top surface of the frame 19 by means of a plurality of bolts 22. The bedplate 21 has a substantially rectangular shape at the bottom to conform to the

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shape of the base frame 19 but at the upper sides the bedplate has a substantially circular shape for supporting a wear plate 23 and the crib 16 of the mixing machine. The crib 16 and wear plate or bottom 23 thus define a mulling chamber. The crib 16 has a vertical wall 24 and the bottom 23 has a top surface 25 on which material is progressively mulled. The bottom 23 is provided with a discharge opening adjacent the chamber wall 24 and defined on its innermost side by a circular edge 26 facing the wall.

Provision is made for removing the material in the crib in the form of a closure door 27 which is substantially a semi-circular plate corresponding to the shape of the discharge opening. As shown in Figure 3, the outer circular edge 28 of the plate 27 has a step construction 29 which is adapted to fit in sliding contact over a complemental step construction 30 of the wear plate 23 for sealing engagement with the edge 26 of the opening therein. The closure door is movable in a horizontal plane into the opening with its top surface 31 in alignment with the top surface 25 of the bottom 23 to define the wear surface of the mulling chamber. This construction renders the door leak-proof when closed.

The discharge door 27 is secured to its inner end to a substantially cylindrical member 32 in close proximity to the chamber bottom 23. The member 32 is arranged for pivoting in a support housing 33 projecting from the side of the crib 16 and rigidly fastened thereto as by welding. The door 27 is supported by a bolt 34 disposed in a central aperture in the upper part of the support housing 33 and projecting downwardly through an opening in the cylindrical member 32 to be secured at the bottom by a nut 35. A handle member 36 has a reduced portion 37 which is adapted to pivot in a slot 38 of the support housing 33. The inner end of the handle 36 is arranged to screw into the cylindrical member 32.

Thus, the discharge door 27 may be pivoted upon the bolt 34 by means of the handle 36 which is free to swing in the slot 38. It is to be particularly noted in Figure 2 that this type of door provides a maximum amount of space below the crib which may be advantageously used to position a receptacle under the discharge door 27.

As the discharge door 27 is swung open to the position indicated in dot-dash outline in Figure 1 at 27*a*, any material clinging to the upper surface thereof will be scraped off by the lower inner edge of the crib 16 since the door is swung in close contact thereunder. Thus, this discharge door 27 is substantially self-cleaning.

A discharge chute **39** of any suitable configuration may be secured to the bedplate **21** under the discharge door **27**.

The mixing machine of this invention is put in operation by placing the material to be mixed in the crib **16** and then starting the motor **17**. The drive shaft **15** will then begin to rotate the plows, the scraper and the mullers in the crib. The outer plow **11** is adapted to take the material at the outer rim of the crib and move it inwardly into the path of the mullers and the inner plow **12** is advantageously disposed to take any material which is near the center of the crib and move it outwardly into the path of the mullers. The scraper **13**, will remove all the material from the side wall of the crib. Due to the fact that the mullers are pivotally mounted on their arms, the muller is free to knead and work the mixture by exerting a force thereon in direct proportion to the weight of the muller. The tumbling action of the plow and the kneading action of the mullers is such that tough plastic mixture will result without any damage being done to the grain structure of the materials being mixed.

When it is desired to remove the mixture from the crib, the door **27** is swung about the bolt **34** to allow the mixture to be discharged through the opening provided in the wear plate and in the bedplate.

For further details in the construction and operation of the mixing machine herein disclosed, reference is made to my copending application entitled "Intensive Mixing Apparatus," Serial No. 731,213, filed February 27, 1947, of which the present application is a division.

It is to 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 discharge door for a mixing machine having a base, a crib supported on the base, a wear plate supported by said base and forming the bottom of the crib, the wear plate having a sectoral-shaped opening defining a stepped discharge opening; comprising a door member for mounting on said crib and swingable in a plane parallel to the plane of said wear plate, said door member being of sectoral-shape for movement into said opening in said wear plate to close said discharge opening, said door member having a stepped outer edge for extending in

overlapping relation to the edge of said wear plate opening to form a leak-proof joint when said discharge opening is closed.

2. In combination for a mixing machine of the type having a crib; a wear plate defining the bottom of said crib and having a stepped edge defining a discharge port, and a discharge door of thickness corresponding to that of the wear plate mounted on said crib and swingable in a plane parallel to the plane of said wear plate, said discharge door being of a similar shape to said port and being movable into said port in said wear plate to close said discharge port, said discharge door having a stepped outer edge disposed in over-lapping relation to the edge of said wear plate to form a leak-proof joint when said discharge port is closed with the surfaces of said discharge door flush with the surfaces of said wear plate.

3. A discharge door for a mulling machine including a crib, comprising a tubular support housing mounted at the side of said crib, a sleeve member journaled in said housing member and depending therefrom, a bolt extending centrally through said sleeve member and through an upper wall of said housing for supporting said sleeve member in said housing, a handle member connected with said sleeve member and extending through said support housing, said support housing having a generally horizontal slot accommodating horizontal movement of said handle member to pivot said sleeve member in said housing, a discharge door member of generally sectoral-shape secured at its inner end to said sleeve member below said support housing, said door member having a stepped outer arcuate edge for overlapping engagement with the bottom of said crib to close an opening therein.

ALFRED C. CHRISTENSEN.

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