March 20, 1951 K. MEISENBURG 2,545,485

SEAL AND WATER INLET FOR CHARGING AND DISCHARGING CHUTES OF TRUCK MIXERS

Filed April 22, 1947

Fig. 1.

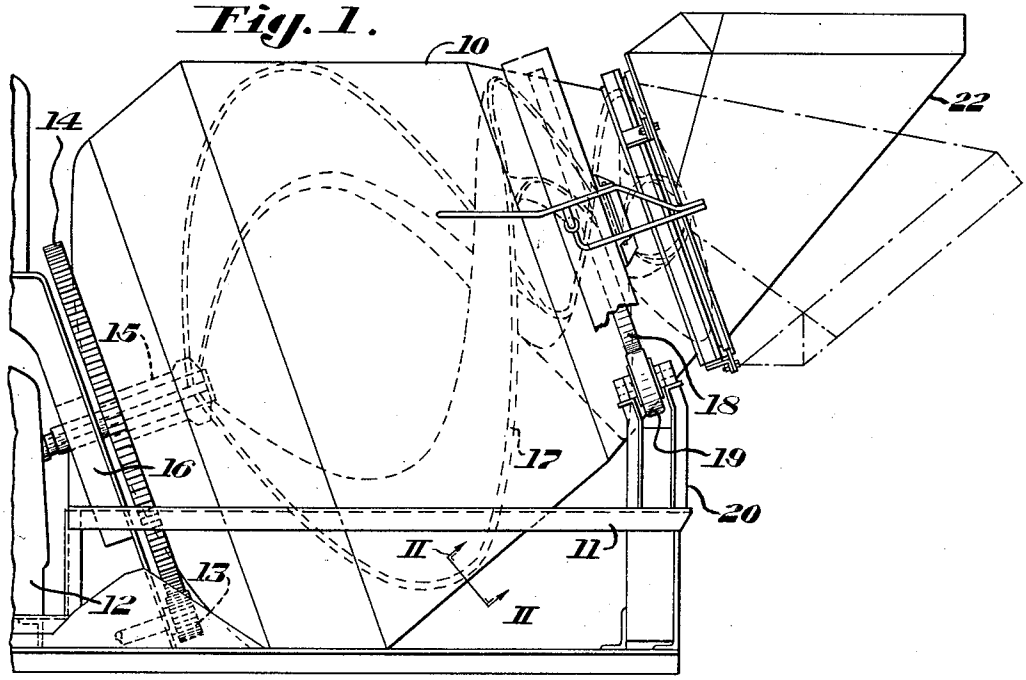


Fig. 3.

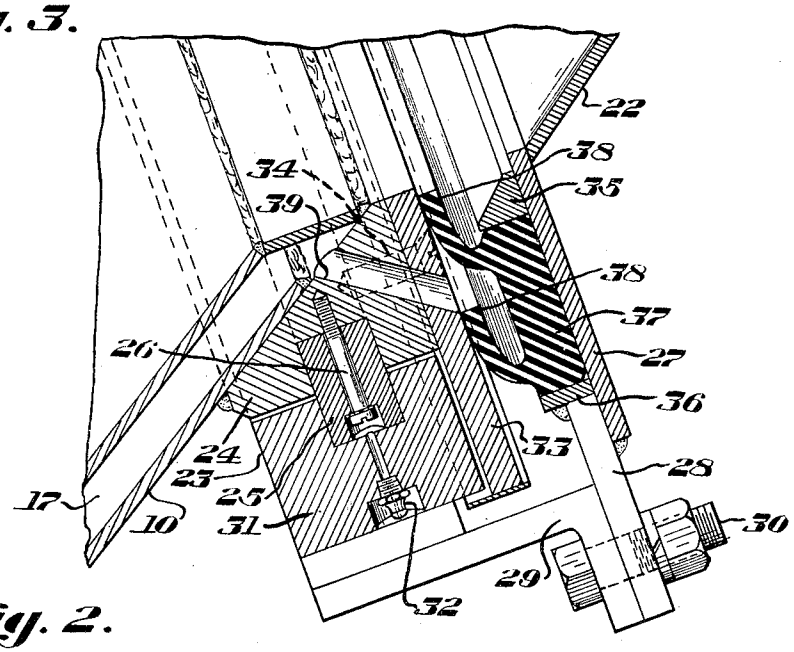
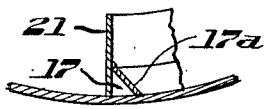


Fig. 2.



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SEAL AND WATER INLET FOR CHARGING AND DISCHARGING CHUTES OF TRUCK MIXERS

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2 Claims. (Cl. 259—161)

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This invention relates to truck mixers of the type having a charging and discharging chute fitted on the open end thereof and, in particular, to means for supplying water to the mixer drum and to a combination water supply and sealing structure operative in the running clearance between the mixer drum and the chute. No claim is made to the sealing or bearing structure per se shown herein, which sealing and bearing structure is broadly shown and claimed in United States patent application Serial No. 49,948 filed September 18, 1948 in the name of Louis J. Sarosdy.

Truck mixers as now constructed usually have a charging and discharging chute rotatably mounted on the open end of the rotary mixer drum. It is necessary to seal the clearance space between the drum and chute to prevent leakage of the dry materials charged into the mixer or the fluid concrete mixed therein. Any seal for this application is obviously subjected to severe service conditions. The material to be handled is highly abrasive and it is practically impossible to prevent entirely the penetration thereof between rubbing surfaces of the seal. Consequently such seals as have been used for this purpose heretofore have required considerable maintenance.

I have invented a novel water supplying and sealing combination particularly adapted for truck-mixer chutes but useful as well in other applications where similar conditions are encountered. In a preferred embodiment, I provide the open end of the mixer with a plane annular sealing member such as a metal ring. I mount a sealing ring of rubber-like material on the chute in position for wiping engagement with the metal ring on the drum. The sealing ring of rubber-like material has spaced concentric lips sliding on said metal ring. A liquid-supply conduit on the drum communicates with the space between said lips. The lips are deflected inwardly so that the inner one may be displaced by the pressure of the liquid. This permits mixing water or wash-out water to be supplied to the interior of the drum through the seal and provides for flushing the seal at will to remove any material accumulating therein.

A complete understanding of the invention may be obtained from the following detailed description and explanation which refer to the accompanying drawings illustrating the present preferred embodiment. In the drawings,

Figure 1 is a side elevation of a high-discharge, truck-mounted, rotary mixer with a charging and discharging chute having the invention applied thereto;

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Figure 2 is a partial section along the plane of line II—II of Figure 1; and

Figures 3 is a partial section on a radial plane through the seal between the mixer drum and chute.

Referring in detail to the drawings, a mixer drum 10 composed of several frusto-conical sections is mounted in a frame 11 for rotation with its axis inclined upwardly toward the rear end of the drum which is open. The frame 11 is adapted to be mounted on a truck body (not shown) and includes driving mechanism 12 for the drum operably connected to a pinion 13. A ring gear 14 secured to the forward end of the drum is in mesh with the pinion 13 whereby the drum may be rotated by the mechanism 12. The forward end of the drum has a hollow stub shaft 15 projecting therefrom rotatably supported in the frame 11 on a suitable bearing 16. The bore through the shaft 15 communicates with ducts 17 mounted in the drum 10 and is connected through a suitable swivel joint to a source of water. A bearing ring 18 adjacent the rear end of the drum rests on supporting rollers 19 journaled in bearings carried on posts 20 extending upwardly from the frame 11.

Helical flights 21 extending around the interior of the drum are effective on rotation of the latter to agitate the material therein and insure thorough mixing thereof. The flights 21 form one side of the ducts 17 which are of triangular section, the other two sides being formed by the wall of the drum and a strip 17a of plate welded thereto and to the flights. The drum may be rotated in either direction. It is customary to drive it while mixing in the direction in which the flights 21 tend to feed the material toward the forward end and in the reverse direction when the material has been thoroughly mixed and is ready to be discharged. On reversal of the direction of rotation, flights 21 tend to move the material in the drum upwardly toward the open, rear end thereof.

A chute 22 is rotatably mounted on the open end of the drum 10. When in the erect position shown in solid lines, the chute discharges material dumped in the open top thereof into the interior of the drum. When the chute is turned to its reverse position shown in chain lines, it serves as a spout to deliver the contents of the drum into a suitable receptacle or directly into a form. The chute 22 is rotatable on the drum by means of a bearing indicated generally at 23.

This bearing includes an inner, grooved ring or race 24 secured to the drum adjacent the open, rear end thereof. Segmental bearing blocks 25 are seated in a groove in the outer cylindrical face of the ring 24 and may be secured to the latter by screws 26.

The chute 22 is mounted on a supporting ring 27. Radial arms 28 are secured to the ring 27 and brackets 29 are mounted on the arms by bolts 30. A bearing ring or outer race 31 secured to the brackets 29 has a groove on its inner face adapted to accommodate the outer edges of the blocks 25. The ring 31 is split diametrically to permit it to be assembled around the blocks 25 before being secured to the brackets 29. Lubricating fittings 32 spaced around the ring 31 are threaded into tapped holes communicating with the groove in the ring. The ring 31 has recesses to accommodate the fittings 32.

A ring 33 of metal plate is secured to the ring 24 by screws 34. The rear face of the ring provides a plane surface normal to the axis of the drum 10. The ring 27 is provided with an inner flange or shoulder 35 formed by a ring welded thereto. A ring 36 welded to the ring 27 concentric with the shoulder 35 defines therewith a continuous channel. A sealing ring 37 of rubber-like material is seated in this channel. The ring 37 has spaced, concentric lips 38 having wiping engagement with the rear face of the ring 33. The lips 38 are flexible and are deflected inwardly toward the edge of the opening at the rear end of the drum 10. Passages 39 drilled through the ring 24 at an angle provide communication between the ducts 17 and the space between the lips 38.

Water is delivered to the ducts 17 through pipe connections controlled by any suitable valve (not shown) from any convenient source mounted on the truck, e. g., a storage tank, mounted high enough to afford the desired pressure by virtue of its gravity head or a reservoir mounted wherever convenient having a pump and delivering water under the desired pressure. Water flowing through the ducts 17 and passages 39 enters the space between the lips 38. When sufficient pressure is applied, the water displaces the inner lip 38 by increasing its deflection slightly, thereby permitting water to escape inwardly into the open, rear end of the drum 10. This flow of water serves a double purpose in that it supplies to the interior of the drum the water necessary for mixing the contents thereof or for wash-out purposes after the contents of the drum have been discharged. At the same time, the inward flow of water flushes out any particles of cement, sand or other grit which may have worked themselves between the inner lip 38 and the ring 33. This makes it possible to maintain a tight seal at all times between the chute and drum, thereby preventing leakage and facilitating the clearing of the sealing surfaces of any grit which may gain entry therebetween, without requiring dismantling of the apparatus or any interruption in the operation thereof. It will be evident that the inner lip of the ring 37 will prevent practically any leakage but any slight leakage which may occur will accumulate in the space between the lips and be flushed out periodically by the flow of water through the ducts 17 and passages 39 through said space. There is little or no tendency for any material which may leak past the inner lip to leak between the outer lip and the ring 33 since no pressure exists in this region until the water is turned on. At that time, the water pressure forces the outer lip into tighter engagement with the ring 33.

It will be apparent from the foregoing that my improved water supplying and sealing combination for a mixer drum have several advantages over the structures previously employed. The seal serves as a water inlet and is thus cleared of any accumulation of gritty material at frequent intervals. Since the ducts 17 are spaced circumferentially of the drum, and the seal permits flow of water at all points around the open, rear end of the drum, a large amount of water may be delivered in a short time. The water accumulating in the space between the lips 38 lubricates the rubbing surfaces of the lips and the ring 33. The sealing ring is self-adjusting to a large extent in respect to its engagement with the ring 33. The inner lip, furthermore, is self-actuating to close the clearance between the chute and drum when the water is turned off, thus acting in the manner of a check valve to prevent return flow. The maintenance necessary to continued operation of the seal is thus reduced to a minimum.

The bearing mounting the chute for rotation is almost wholly enclosed so that the entry of dirt or other foreign matter is practically precluded. Lubrication of the bearing is facilitated by provision of the fittings 32. The chute, therefore, when held stationary for charging or discharging purposes does not impose a substantial friction load on the drum.

Although I have illustrated and described but a preferred embodiment of the invention, it will be recognized that changes in the details of the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In an inclined rotary mixing drum or the like having an open upper end and a relatively rotatable discharge chute mounted thereon, in combination, a rubber-like sealing ring positioned between said drum and said chute and surrounding said open end, said sealing ring having radially spaced flexible concentric lips extending toward said drum and deflected inwardly toward said open end, helical flights within said drum, said helical flights having duct-like passages therealong extending to the perimeter of said open end, said duct-like passages opening into the annular space between said concentric lips, whereby mixing and washout water may be supplied to said drum through the open end thereof cleaning the inner portion of said sealing ring and sealing the outer portion thereof.

2. In an inclined rotary mixing drum or the like having an open upper end and a relatively rotatable discharge chute mounted thereon around said open end, said open end and chute having respectively radial opposed annular bearing surfaces, in combination, a rubber-like sealing ring positioned between said bearing surfaces and surrounding said open end, said sealing ring having radially spaced flexible concentric lips extending toward and bearing on the said bearing surface on said drum, said lips further being deflected inwardly toward said open end, and a plurality of generally axially extending water ducts connected to the inner wall of said drum, said ducts having openings through said bearing surface on said drum around the circumference of said open end and within the annular space between said concentric lips, whereby whenever mixing or washout water is supplied

through said ducts the inner of said concentric lips is deflected to permit such water to flow through said open end into said drum and the outer of said concentric lips is sealed by the pressure of said water.

KARL MEISENBURG.

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