Dec. 4, 1945. E. A. F. PRESSER 2,390,460

DOUBLE ACTING KNEADER IMPROVEMENTS

Filed Jan. 21, 1944

FIG 1

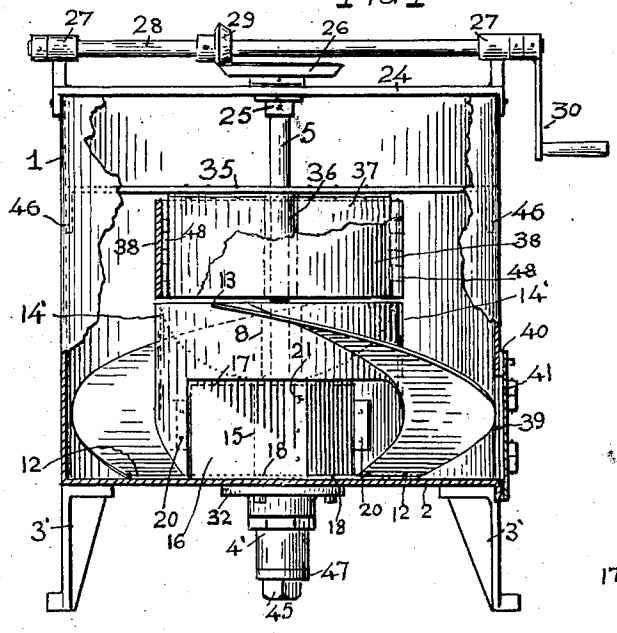
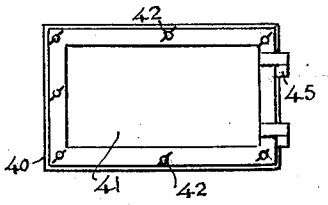


FIG 6.



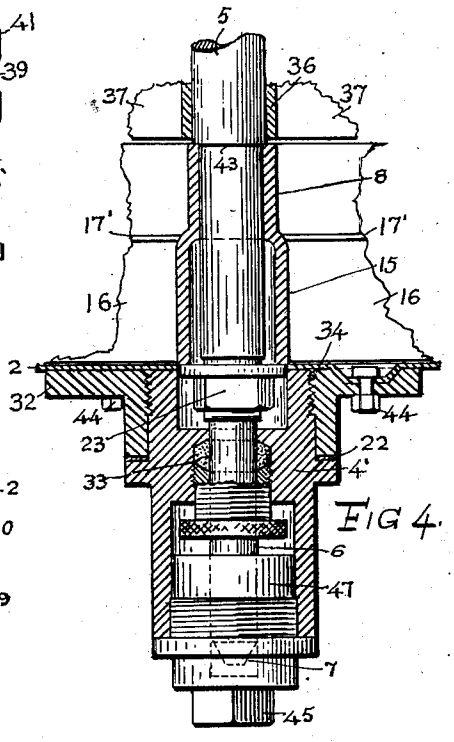


FIG 4.

FIG 2

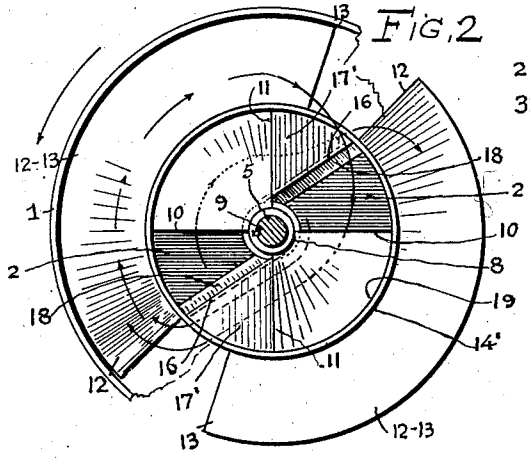


FIG 3.

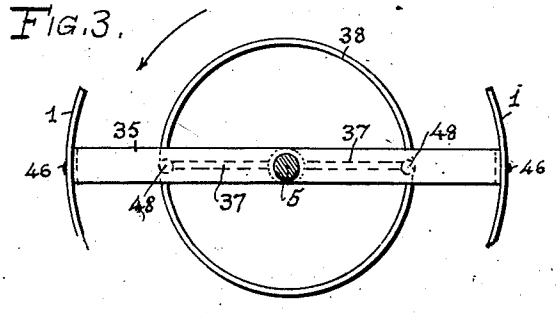
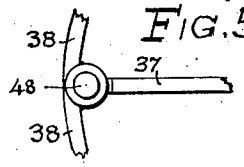


FIG 5.



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DOUBLE-ACTING KNEADER IMPROVEMENT

Eric A. F. Presser, East Chicago, Ind.

Application January 21, 1944, Serial No. 519,101

4 Claims. (Cl. 259—97)

My invention relates to double acting kneader improvements and it more especially includes the features pointed out in the annexed claims.

The purpose of my invention is to provide improvements on the double acting kneader described in my Patent No. 2,350,299 issued May 30, 1944. These improvements comprise cooperating means for the handling of extra heavy sticky and gummy materials and materials that contain abrasive substances; that makes special provision for protecting the bearing of the main shaft at its lower end so as to guard against the intrusion of abrasive materials, by means of a stuffing box at that point; that provides deflecting rotatable baffles which terminate adjacent the exit end of the descending segment to divert material into the path of elevating segments; that provides a plurality of stationary baffles located above the main kneading element and that provides a ring to enclose such baffles which ring is of substantially the same diameter as the joining or dividing wall between the descending and ascending segments, which wall in its upper portion is not broken but is continuous throughout its circumference; and that provides a hermetically sealed opening in the side wall of the container in which the kneader operates so as to facilitate the easy removal of the kneaded material and while the kneader is in operation prevents the inclusion of air beneath the ascending segments.

With these and other ends in view I illustrate in the accompanying drawing such instances of adaptation as will disclose the broad underlying features of the invention without limiting myself to the specific details shown thereon or described herein.

Fig. 1 is an elevation partly in section of an assembled kneader.

Fig. 2 is a top plan view of the kneading element.

Fig. 3 is a top plan of the stationary baffles and enclosing ring.

Fig. 4 is an elevation in section of the lower portion of the kneader.

Fig. 5 is a plan of the hinged relation of Fig. 3.

Fig. 6 is an elevation of a sealing door.

In practicing my invention I may use whatever modifications of structure that the exigencies of varying conditions may demand without departing from the broad spirit of my invention.

A suitable container or vessel 1 of sheet material is used. It has a closed bottom 2 beneath which are supporting legs 3'. Across the open upper end a bar 24 is placed. At its ends it has depending projections which engage the wall 1 of the container where it is held by bolts or otherwise. The bar has an underneath boss to provide a width of bearing for the main driving shaft 5. A collar 25 is placed on the main driving shaft so as to abut against the boss. A bevel gear 26 rests against a slight upper-side boss. It is attached to the extreme upper end of the shaft 5.

The cross bar 24 at its ends has up-standing projections 27 which serve as bearings for a horizontal shaft 28. Collars are provided on the outside of each bearing and a small diameter bevel gear 29 is secured to the shaft 28 so as to mesh with the large bevel gear 26 on the upper end of the shaft 5. The horizontal shaft 28 may have a hand crank 30 for small units. For larger units any desired form of conventional variable speed electric motor drive is used so that the speed of rotation of the kneader may be varied according to the variable consistency of the material that is being treated.

The kneading element comprises an annular ring 14' which forms a vertical dividing wall between the descending and the ascending segments. The element is secured to the shaft 5 by a key-way 9 for rotation. It is held in place against displacement lengthwise of the shaft by a suitable washer, and nut 23. The shaft has a shoulder 43 which abuts the hub 8 of the kneader.

In the present instance only two groups of segments are shown positioned diametrically opposite each other. The hub 8 has a downwardly projecting tubular extension 15 which forms a support for the inner ends of a pair of radially deflecting baffles 16.

To guard against the intrusion of abrasive material into the lower bearing a removable member 4' is assembled beneath the bottom 2. It is threaded into an annular flange 32 that is secured to the bottom of the container. In the member 4' a stuffing box 33 is formed with the usual gland. Beneath the stuffing box a bearing 47 is placed. It supports the lower end of the shaft 5. It is threaded into the stuffing box member 4'. The lower end of the shaft is conical at 7 so as to be easily threaded through the stuffing box in assembling the parts.

The flange 32 associated with the stuffing box member 4' is secured to the bottom wall 2 of the container 1 by means of bolts 44 seated in recesses 31 which facilitate the easy removal of the contents of the container away from the baffles 16 and beneath the segments 12—13 after the kneading operation has been completed.

Above the kneading element a stationary bar 35 is secured to the side wall of the container at 46. It may have a central tube 36 surrounding the drive shaft 5, to which a pair of stationary baffles 37 are secured. These baffles are also secured to the cross bar 35. To their outer edges there is secured, by hinge 48, the two halves of a ring 38 which extends downward to within a small clearance above the continuous circular

dividing ring 14' of the kneading element. (Fig. 1.)

An opening 39 is formed in the side of the container. A gasket 40 surrounds the opening and a door 41 engages the gasket. This door is hinged at 45 in any conventional manner and it is held closed by fastenings 42 or otherwise. (Figs. 1 and 6) I have shown an opening 39 in the side wall of the container closed by a hermetically sealed door 41. If required I may form a duplicate opening and door in the wall of the container diametrically opposite, and in addition may provide a similar sealed opening in the bottom of the container to facilitate the easy removal of the kneaded material and for easy cleaning purposes without removing the kneading unit from the container.

The operation is substantially similar to that of the kneader described in my Patent No. 2,350,299 excepting that in addition it is especially designed to accommodate and continuously knead the heaviest kind of material. To assist in this the sectional tube or ring 38 attached to and surrounding the stationary baffle is provided. This compels the material that is being raised by the outer segments 12—13 to rise to the top of the stationary ring 38 where it moves laterally to the inside of the ring and downward to the descending or inner segments 10—11 to be diverted radially by the baffles 16 into the path of the ascending segments 12—13 thus continuing the cycle of operation as long as required.

The oppositely positioned descending inner segments 10—11 are a part of the hub 8 and the continuous circular wall 14' They terminate adjacent the widened top flange 17' of the baffles 16. These baffles have a lower stiffening flange 18. They are secured to the wall 14' by bent ears 20 and to the central tubular projection 15 by fastening 21.

The inside 19 of the wall 14' and the inside of the ring 38 confine the material as it is drawn downward over the baffles 16 and beneath the segments 10—11 to be delivered beneath the widened flange 17'. From here it is deflected tangentially (Fig. 2) by the baffles 16 into the path of the segments 12—13 to again be raised to the upper edge of the ring 38 and laterally toward the center onto the stationary baffles 37 to repeat the cycle. The baffles 37 counteract any rotative movement of the mass that may be imparted by the rotating segments 12—13.

The threaded portion 34 of the stuffing box member 4' is slightly smaller in diameter than the unthreaded part so as to secure axial alignment independently of the threads. Any kind of a gasket 22 may be used, between the part 4' and the depending projection of the flange 32. The bearing 47 has also an aligning diameter which is larger than the threaded portion (Fig. 4).

The kneader shown in Fig. 1 is semi-portable. For very large installations the bottom and the side walls are enlarged and all the parts are proportioned to meet the extra stresses.

The open space underneath the wide flange 17' of the baffles 16 and one of the ascending segments 12—13 ends at the outer ends of the baffles 16, in vertical alignment with the dividing wall 14' between the inner and outer segments. This open space beneath the ascending segment and in front of baffle 16 facilitates the easy removal of the kneaded material through the side opening 39 of the container. (Figs. 1 and 2.)

The action of the kneading element is to force the material against the bottom of the container under pressure to drive out any included air and thus produce a homogeneous mass of material regardless of its composition, whether it may be bread dough, ingredients for linoleum production, asbestos compositions, or any form of plastics, painting material, printing inks, etc.

What I claim is:

1. A kneading unit comprising a container, an operating shaft rotatable therein, a kneading member which has a plurality of radially opposed pairs of segments the segments of each pair being oppositely inclined and in radial relation to the shaft, a continuous dividing wall between the segments, stationary baffles disposed radially to said shaft, stationary ring sections in vertical alignment with the continuous dividing wall of the kneading unit said dividing wall being concentric with the shaft, means for pivotally supporting the ring sections on such stationary baffles, and means for actuating the shaft to drive or rotate the kneading member.

2. A kneading unit comprising a container, an operating shaft therein, a kneading member on said shaft which has a plurality of pairs of segments the segments of each pair being oppositely inclined and radially disposed in relation to the shaft, a continuous dividing wall between the segments and concentric with the shaft, stationary baffles radially disposed in relation to the shaft, stationary ring sections supported by the baffles in alignment with the continuous dividing wall of the kneading unit, means for supporting the stationary ring sections and baffle plates by the container wall, and means for actuating the shaft to rotate the kneading member beneath the stationary baffle plates and the attached ring sections.

3. A kneading unit comprising a container, a rotatable shaft therein, a kneading member provided with diametrically opposed pairs of segments the segments of each pair being oppositely inclined and in radial relation to the shaft, a continuous dividing wall concentric with the container and the shaft for joining the oppositely inclined segments, stationary baffle plates above the concentric dividing wall, ring sections secured to the baffle plates at their extreme outer edges said ring sections being concentric with the shaft, a central hub for the plates, and means for actuating the shaft to rotate the kneader.

4. A unitary kneading unit comprising a container, an actuating shaft therein, a kneading member secured to said shaft and having a plurality of pairs of segments the segments of each pair being oppositely inclined and in radial relation to the shaft, a continuous dividing wall beneath the segments a hub through which the shaft passes, baffle plates secured to the hub, a ring secured to said plates said ring being concentric with the shaft and the continuous dividing wall between the segments and positioned above the latter, means for holding the baffle plates stationary while the kneading member rotates therebeneath, and means for actuating the shaft to rotate the kneader.

ERIC A. F. PRESSER.