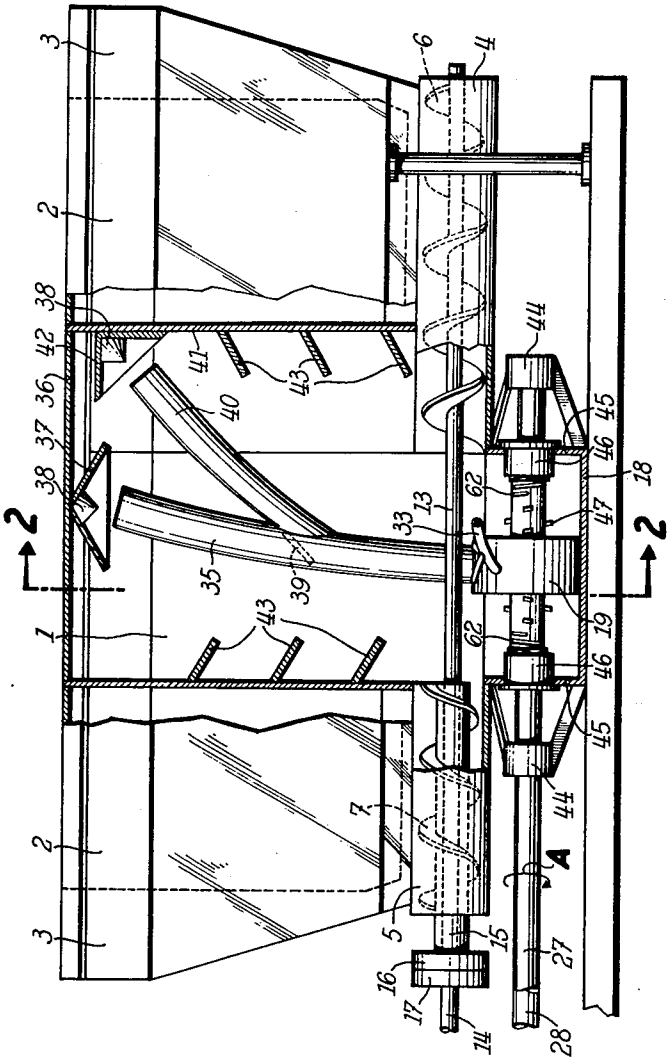
Aug. 7, 1962 E. BRAITSCH 3,048,377

CONCRETE OR MORTAR MIXER

Filed May 6, 1959 4 Sheets-Sheet 1

Fig. 1



INVENTOR.
EUGEN BRAITSCH
BY
Mestern & Kollin
ATTORNEYS

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CONCRETE OR MORTAR MIXER

Filed May 6, 1959 4 Sheets-Sheet 2

Fig. 3

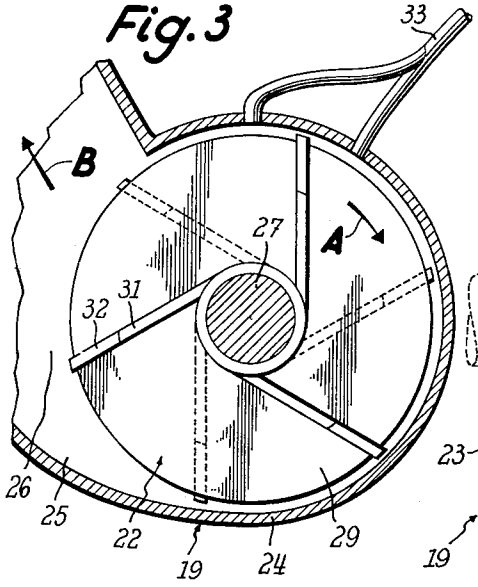


Fig. 4

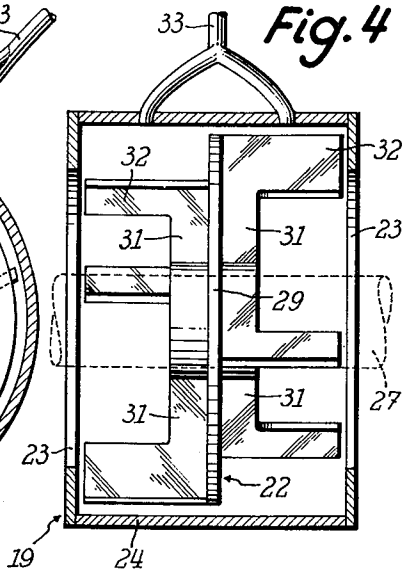
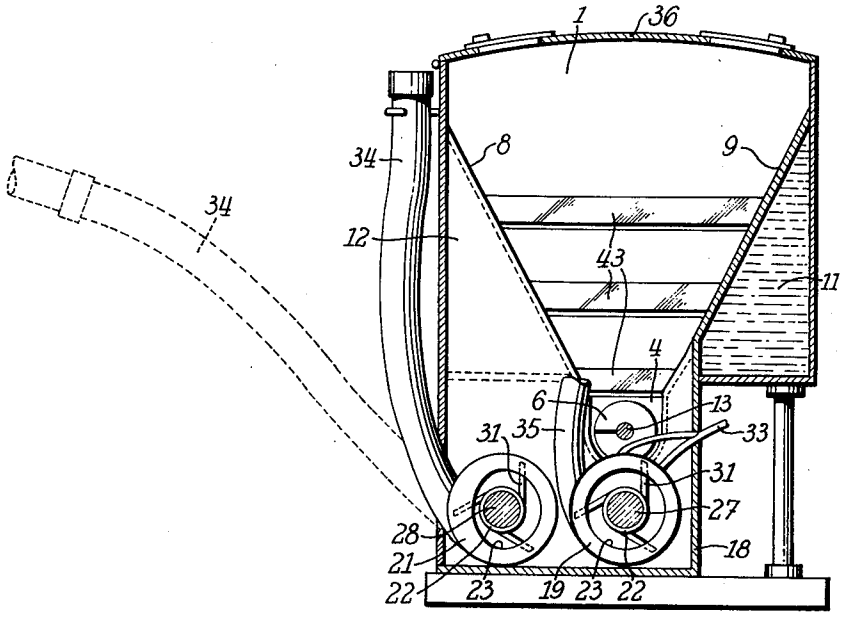


Fig. 2



INVENTOR.

EUGEN BRAITSCH

BY

Mostern & Hollin

ATTORNEYS

Aug. 7, 1962 E. BRAITSCH 3,048,377

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Filed May 6, 1959 4 Sheets-Sheet 3

Fig. 5

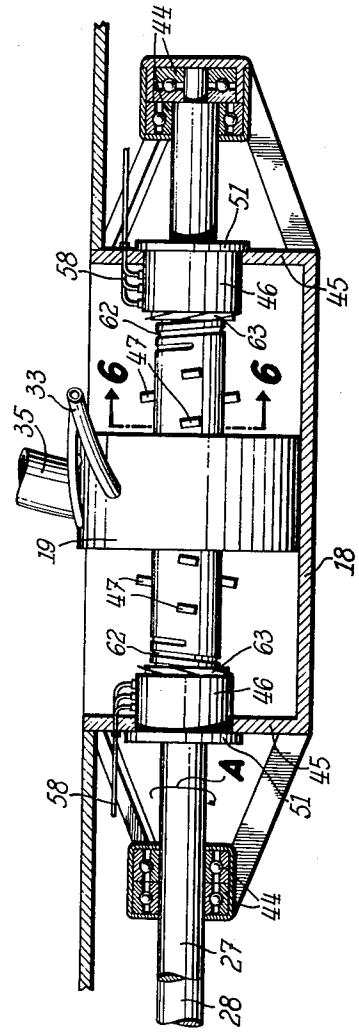


Fig. 6

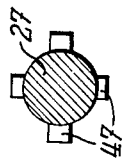
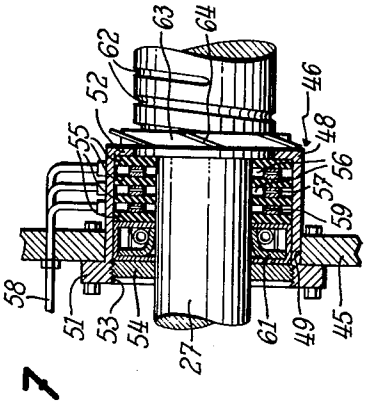


Fig. 7



INVENTOR.
EUGEN BRAITSCH
BY
Western & Rollin
ATTORNEYS

Aug. 7, 1962 E. BRAITSCH 3,048,377

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Filed May 6, 1959 4 Sheets-Sheet 4

Fig.8

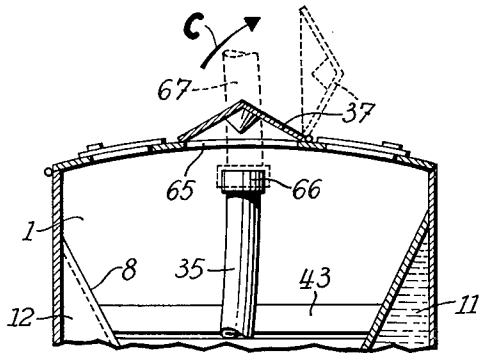
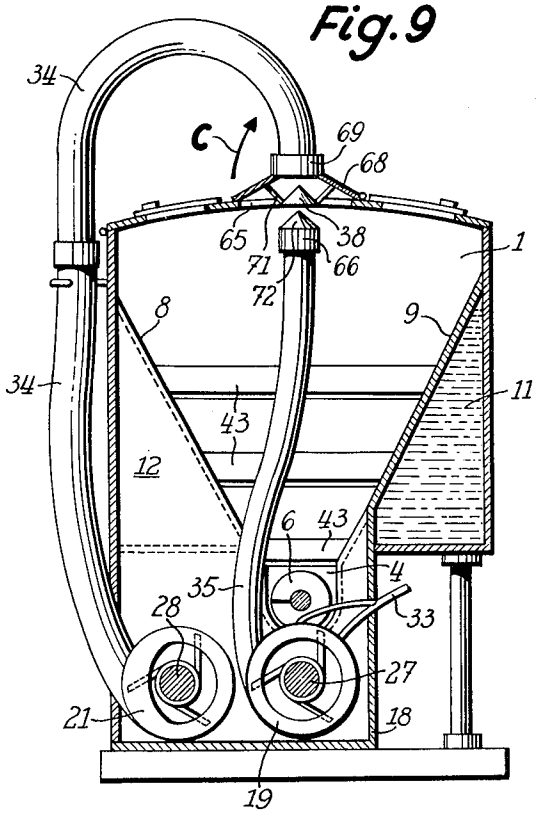


Fig.9



INVENTOR.
EUGEN BRAITSCH
BY
Western & Kollin
ATTORNEYS

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CONCRETE OR MORTAR MIXER

Eugen Braitsch, Rotebuhlstrasse 66, Stuttgart, Germany

Filed May 6, 1959, Ser. No. 811,390
Claims priority, application Germany May 13, 1958
18 Claims. (Cl. 259—161)

The present invention relates to improvements in concrete and mortar mixers and the like.

In producing building materials such as, for example, concrete, mortar, or similar mixtures, the dry mixing components, that is, the binder and the aggregates, are generally mixed with each other by stirring or pouring and are subsequently mixed with the required amount of water to form a batch ready for use. This type of mixing is carried out by means of so-called free-fall or hopper type or pug-mill mixers in which the binder and the aggregates, after passing through a batcher, are alternately added at a certain ratio to the mixing drum which is usually conical and pivotable.

There has also been a prior disclosure of a hopper mixer which is equipped with a revolving mixing drum and two separate containers behind each other for holding the binder and the sand or gravel. These containers are connected to each other and to the mixing drum by two conveyer worms which are disposed in the axial direction behind each other and one of which feeds the binder into the container which is adapted to receive the aggregates, while the other worm adjacent to the mixing drum feeds a mixture of sand or gravel and binder to the revolving mixing drum. When using two independently operating conveyer worms the danger, however, occurs that the sand or gravel will intermingle with the binder and result in a lumpy agglomerate which not only seriously interferes with the desired continuous feeding operation of the worm adjacent to the mixing chamber, but also with the mixing process which is carried out in the mixing drum, so that a thorough intermixture will seldom occur.

In order to attain a much better intermixture of the materials and especially also to overcome the disadvantage that the individual parts of the aggregates will only be incompletely coated by the binder, the above mentioned mixing process has been reversed and the binder and the aggregates such as a gravel, sand, or the like have been added to a preferably predetermined amount of water which was constantly agitated.

For carrying out this more recent method it has, for example, been proposed to utilize an apparatus in which the required amount of water is at first thoroughly mixed with the binder in a mixing container which is equipped with a circulating pump in a lower position, and the thin liquid cement mixture thus produced is passed to another mixing container, which is likewise equipped with a circulating pump, and is again stirred up therein while the aggregates are added thereto and intermixed therewith. Aside from this rather complicated apparatus, there has been a prior disclosure of a much more simple mixer with only one mixing container in which the binder and the aggregates which are added to the water are thoroughly intermixed with the water by means of a circulating pump which is likewise mounted in a lower position. However, since these known mixers are not provided with any special means for measuring or "batching" the binder and the aggregates which are to be added to the water, they cannot be used for carrying out the entire process automatically.

In order to overcome these disadvantages, another mixer has been proposed which has a cylindrical mixing chamber for receiving the material to be mixed which is equipped with a circulating pump in a lower position

and is preceded by a water container and a container for the binder. While the water container is connected to the mixing chamber by a suitable filling device, the container for the binder is connected to the mixing chamber by means of a conveyer worm. This arrangement of only one container for the binder and possibly also for the aggregates has, however, again the disadvantage that either the aggregates have to be added separately or, if the container is filled simultaneously with the binder and the aggregates, the binder will again intermingle with the aggregates and result in a lumpy agglomerate with all of the undesirable features thereof.

Finally, one more prior mixer construction may be mentioned in which two separate containers for the aggregates are arranged directly adjacent to each other and at one side of the mixing chamber, while a further container for the binder is arranged at the other side of the mixing chamber. This pair of containers and the single container are connected to each other and to the mixing chamber by two separate worms on a common shaft. Since in this case the binder and the aggregates are fed to the mixing chamber by oppositely directed worm blades on the same shaft, the mixing ratio between the binder and the aggregates is always constant and cannot be varied.

It is an object of the present invention to provide a concrete or mortar mixer which overcomes the above-mentioned disadvantages of the various known types of mixers by arranging a pair of separate containers for the aggregates and the binder directly adjacent to each other and at both sides of the mixing chamber and by connecting the containers of each group with each other and with the mixing chamber by means of a common conveyer worm. The conveyer worm which is associated with one container group is secured to a hollow shaft which, in turn, is rotatably mounted on and adapted to be connected to one side of a drive shaft which extends through the mixing chamber and has the conveyer worm which is associated with the other container group rigidly secured to its other side. Another advantageous feature of the mixer according to the invention consists in providing the containers for the aggregates directly adjacent to the mixing chamber and the containers for the binder at the other side of each of the aggregate containers.

The mixer according to the invention may be designed so as either to form a stationary apparatus or to be mounted on a vehicle. By the particular design and arrangement of its individual parts it will prevent the undesirable agglomerations between the binder and the aggregates and permit one or the other or both container groups to be emptied of the aggregates and the binder by means of a single conveyer shaft with separate worms thereon. The fact that the container for the binder is mounted at the outside of each container group insures that at first only the binder and thereafter the aggregates held in the container adjacent to the mixing chamber will be passed continuously into the latter. The provision of several container groups and the selective clutching of the respective conveyer worms associated therewith also permits additional binder to be fed into the mixing chamber from the container of the second container group while the aggregates are being added from the container of the first group.

In order to insure that the mixed material which continuously circulates in the mixing chamber will flow constantly to the circulating pump, this pump is mounted in a manner known as such at a point underneath the shafts of the conveyer worms. If this pump is a centrifugal pump, its rotor may consist of a disk which is secured to the pump shaft and is provided at both sides with riblike blades which extend in a tangential direction

to the pump shaft and to a point adjacent to the inner wall of the pump housing which is provided with axial inlet openings. The free ends of these blades carry lateral extensions projecting in the axial direction. Aside from the conduits supplying the water from the water containers to the mixing chamber, the mixer is preferably provided with a further water conduit which may likewise be shut off and is connected to the pump at a point behind the outlet socket thereof, as seen in the direction of its rotation. This permits additional water to be supplied to the pump even while the mixing operation is in progress.

If the circulating pump is provided in the usual manner within the closed mixing chamber and a short pipe or the like is connected thereto for returning the material into the upper part of the mixing chamber, and if such a pipe terminates at a point within the mixing chamber directly in front of a mixing cap which is adapted to distribute the material, this pipe is preferably provided with a branch pipe which terminates in front of another mixing cap which is mounted at a point underneath the cover of the mixing chamber on the inner wall thereof and is adapted to be shut off from the first pipe by a control valve. By thus dividing the flow of the mixture which is continuously circulated in the mixing chamber a very intensive whirling effect will be produced in the mixing chamber and no dead spaces in which the material may collect will be possible therein.

For discharging the mixed material from the mixing chamber and emptying the latter, a feed pump may be provided in the mixing chamber adjacent to the circulating pump. This feed pump which may be of a type similar to the circulating pump is preferably driven at a higher speed which may also be regulated, and its outlet toward the outside has a special conveying hose attached thereto. By thus providing a special feed pump, it is possible to pump not only a thin liquid mixture but even a thick mixture as well as a foamy mixture to an elevation which is as much as 35 meters higher than the mixer.

By providing a special feed pump, the mixer according to the invention has the further advantage that it is safe from the effects of a failure in the operation of the circulating pump inasmuch as the feed pump may then be used in place of the circulating pump. For this purpose, the invention further provides that the mixing cap which is pivotably mounted on the cover of the mixing chamber and is adapted to close the usual opening therein may be exchanged for another mixing cap which may be connected to the hose of the feed pump and is for this purpose preferably provided at its upper part with a quick-acting hose coupling, while the lower part thereof facing toward the opening in the cover carries a distributing cone.

In order to insure that the material will be supplied continuously to the circulating pump and also to the feed pump, the shafts of both pumps are preferably provided with a plurality of blades or the like which are adapted to convey the mixture coming from the mixing chamber toward the axially extending inlet openings of the pumps.

The difficult problem caused by the grinding action of such mixtures of properly sealing the ends of the shafts of the two pumps which project through the end walls of the mixing chamber toward the outside may be solved by the use of packings of a type known as such in combination with a stationary cylindrical socket enclosing each of these packings. According to the invention, the edge of the socket which projects into the mixing chamber is provided with an annular flange extending radially toward the respective shaft, while a ring surrounding the shaft is screwed into the outer end of the socket and is adjustable therein in the axial direction. In cooperation with the inner annular flange, this adjustable outer tightening ring is adapted to compress a plurality of packing rings of a soft elastic material which engage with the shaft and are spaced from each other by suitable spacing rings which have at least a smaller outer diameter than the packing rings so as to form a plurality of annular chambers. These chambers between the packing rings are filled with grease and may be connected by individual conduits to a grease gun or to a central lubricating system. The spacing rings between the individual packing rings are provided with radially extending apertures through which the pressure within these chambers will be equalized. A conventional shaft-sealing ring which is additionally inserted between the outer packing ring and the adjustable tightening ring prevents any grease from escaping from the mentioned annular chambers toward the outside. This type of packing is not only absolutely safe and reliable, but it also produces the advantage that it permits the individual packing rings to be easily and quickly exchanged for new rings by the removal and subsequent reinsertion of the threaded tightening ring.

These packings may according to the invention be protected so as to effect a proper sealing action for a long time by providing each pump shaft adjacent to the respective packing and within the mixing chamber with a helical groove of a depth decreasing gradually in the direction toward the pump. When the pump shaft rotates, this helical groove prevents an accumulation and agglomeration of the material within the mixing chamber in the vicinity of the packing. For the same purpose, the invention provides each pump shaft, and especially the shaft of the feed pump, at a point directly adjacent to the packing and within the mixing chamber with a ring which carries a plurality of deflecting plates or flashings which project into the mixing chamber.

These and other objects, features, and advantages of the present invention will become further apparent from the following detailed description thereof, particularly when read with reference to the accompanying drawings, in which—

FIGURE 1 shows a side view, partly in section, of the apparatus according to the invention;

FIGURE 2 shows a cross section taken along line **2—2** of FIGURE 1;

FIGURE 3 shows a similar cross section of the circulating pump alone on a larger scale;

FIGURE 4 shows a longitudinal section of the circulating pump according to FIGURE 3;

FIGURE 5 shows a longitudinal section of the mixing trough according to FIGURE 1 but on a larger scale;

FIGURE 6 shows a cross section of the pump shaft taken along line **6—6** in FIGURE 5;

FIGURE 7 shows a longitudinal section of a pump shaft packing;

FIGURE 8 shows a cross section similar to a part of FIGURE 2, but illustrating a modification of the invention in which the circulating pump may also be used as a feed pump; while

FIGURE 9 shows a cross section similar to FIGURE 2, but illustrating a further modification of the invention in which the feed pump may also be used as a circulating pump.

Referring to the drawings, FIGURE 1 shows the apparatus according to the invention as consisting of a mixing chamber **1** which has a capacity of, for example, 2.5 $m.^3$. This mixing chamber is connected at each end to a container **2** for aggregates with a capacity of, for example, 2 $m.^3$. Each of these containers **2** is, in turn, connected to a smaller container **3** for holding the binder. Underneath these containers **2** and **3**, there are the respective connecting channels **4** and **5** leading to the mixing chamber **1** and each containing a conveyer worm **6** and **7**, respectively. In order to facilitate the sliding movement of the material from the containers **2** and **3** into the connecting channels **4** and **5** and thus to conveyer worms **6** and **7**, the side walls **8** and **9** of containers **2** and **3** con-

verge downwardly toward channels 4 and 5. These walls 8 and 9 also serve as partitions to form a pair of water containers 11 and 12 which extend parallel to connecting channels 4 and 5, respectively, and have a total capacity of approximately 800 liters similar to that of the mixing chamber 1. The water container 11 extends along the entire length of the apparatus, while the other water container 12 is interrupted by the part adjacent to mixing chamber 1 so that the material in mixing chamber 1 can pass directly to the feed pump 21 as subsequently described.

As further illustrated in FIGURE 1, the shaft 13 of conveyer worm 6 which is mounted in connecting channel 4 extends through mixing chamber 1 and also through the other connecting channel 5, and its end 14 projects from channel 5 and is connected to a driving unit through an intermediate gear, not shown, which rotates shaft 13 at a speed of, for example, 60 r.p.m. The other conveyer worm 7 in connecting channel 5, however, has a hollow shaft 15 and is mounted directly on the part of shaft 13 of the other worm 6 which extends through connecting channel 5. This hollow shaft 15 also projects from channel 5 and carries on its outer end a clutch member 16 which is adapted to be connected to a second clutch member 17 on the end of shaft 14. By this construction it is possible to drive only the conveyer worm 6, while the other worm 7 is stopped when clutch 16, 17 is disengaged.

Underneath the mixing chamber 1, there is another container or trough 18 in which, as illustrated particularly in FIGURE 2, a pair of centrifugal pumps, namely, a circulating pump 19 and a feed or draining pump 21, are mounted side-by-side which are operated at a speed of 1500 r.p.m. and 3500 r.p.m., respectively. Each of these pumps 19 and 21 consists of a rotor 22 which is surrounded by a cylindrical housing 24 which is provided with a pair of opposite inlet openings 23 and terminates by a chutelike portion 25 into an outlet 26. Each rotor 22 itself consists of a disk 29 which is secured to the respective pump shaft 27 or 28 which are driven by separate gears. Both sides of disk 29 carry riblike blades 31 which are disposed at an angle of 120° relative to each other and extend in a tangential direction to pump shaft 27 or 28, respectively, and toward the inner wall of housing 24. The free ends of blades 31 carry lateral blade parts 32 which extend in the axial direction. In order to insure a uniform operation of rotor 22, the blades 31 at one side of disk 29 are offset at an angle of 60° relative to blades 31 at the other side of the disk. Furthermore, the circulating pump 19 is additionally connected to one of the two water containers 11 or 12 through a pipe line 33 which may be shut off and terminates into pump housing 24 at a point behind the outlet socket 26, as seen in the direction of rotation A of rotor 22, and permits additional water to be supplied while the mixing operation is actually in progress.

While the outlet end 26 of feed pump 21 is connected to a single hose 34 or the like which, as described, may be extended and provided with a quick-acting hose coupling, the outlet end 26 of circulating pump 19 is connected to a pipe 35 which extends to the upper part of mixing chamber 1 and terminates at a point in front of a mixing cap 37 with a conical distributor 38 therein, which is mounted on the cover 36 of mixing chamber 1. Pipe 35 also carries a branch pipe 40 which is adjustable by a flap valve 39 and terminates at a point in front of another mixing cap 42 which is mounted on one inner wall 41 of mixing chamber 1. Cap 42 will effect a very good distribution of the material which is supplied by circulating pump 19 in the direction of arrow B, particularly if the mixing chamber 1 is filled to a rather high level and if the material is discharged only through branch pipe 40. Aside from the two mixing caps 37 and 42, the inner walls 41 of mixing chamber 1 are further provided with a plurality of deflecting plates or flashings 43 which likewise assist in attaining an intimate mixture of the material.

The manner of construction of the two pump shafts 27 and 28 and of mounting the same is illustrated in FIGURES 5 and 7. As shown particularly in FIGURE 5, the two shafts 27 and 28 are mounted in ball bearings 44 outside of the trough 18 of mixing chamber 1 and are sealed relative to the two end walls 45 of trough 18 by disk-type packings 48 of a special construction similar to labyrinth packings. At various points along the entire length of shafts 27 and 28, the same also carry a plurality of inclined bladelike projections 47 which, when the shafts rotate in the direction shown by arrow A, convey the material entering from a mixing chamber 1 in the axial direction toward the inlet openings 23 of the pumps. These blades 47 may be staggered at an angle of 90° to each other and consist of several groups of different blade lengths.

FIGURE 7 shows an enlarged longitudinal cross section of one of the disk-type packings 46 which essentially consists of a cylindrical socket 48 which projects to the inside of trough 18 through an aperture 49 in the end wall 45 thereof and is secured to the outer side of end wall 45 by means of an outer flange 51. While the inwardly extending edge of the cylindrical socket 48 has an annular flange 52 projecting toward shaft 27, the opposite side of socket 48 facing toward the outside of the trough has inner screw threads 53 into which a ring 54 is adjustably screwed. Between flanges 52 and ring 54 a plurality of felt rings 55 are inserted which engage with the outer surface of shaft 27 and are spaced from each other by spacing rings 57 which have at least a smaller outer diameter than packing rings 55 so as to form a plurality of annular chambers 56. These chambers 56 are filled with grease so as to attain a proper sealing effect, and each of them is connected by a separate conduit 58 either to a grease gun or to the central lubricating system of the apparatus. In order to insure that an absolutely equal pressure will be maintained in chambers 56, the spacing rings 57 are provided with radially extending apertures 59. For preventing the grease contained in chambers 56 from emerging therefrom toward the outside, a shaft sealing ring 61 is inserted between the outer felt ring 55 and the adjustable ring 54.

In order to prevent the material to be mixed from agglomerating in the vicinity of packings 46, pump shafts 27 and 28 are further provided at the inside of trough 18 adjacent to packings 46 with helical grooves 62 of a gradually decreasing depth in the direction toward pumps 19. These helical grooves are adapted to convey the material continuously toward pumps 19. Furthermore directly adjacent to flange 52 of each packing 46, each shaft 19 and 21 may also be provided with a ring 63 with reflecting blades 64 thereon.

If the apparatus according to the invention as shown in FIGURE 8 is only equipped with one circulating pump 19 and this pump should also be used as a feed pump, the mixing cap 37 is not mounted on the inside of cover 36, as shown in FIGURE 1, but it is pivotably connected thereto and then covers an opening 65 in cover 36 through which, when cap 37 is pivoted upwardly, a hose 67 may be passed into the mixing chamber 1 and be connected by a hose coupling to a head 66 at the end of pipe 35.

A further modification of the invention is illustrated in FIGURE 9, in which the mixing cap 37, which is likewise pivotably connected to cover 36 so as to open or close the opening 65, is exchangeable for another mixing cap 68 which may be connected to hose 34 leading to feed pump 21. This mixing cap 68 is preferably provided at its upper end with a quick-acting hose coupling 69 and underneath the latter with a distributing cone 38 which faces toward or is disposed within the opening 65 and is secured to cap 68 by means of straps 71 or the like. The head 66 of pipe 35 may then be additionally

covered by a cap 72 which also serves as a distributing cone.

If this apparatus is mounted, for example, directly on the chassis of a truck, the different units of the apparatus may then be operated directly by the engine of the truck through a suitable gear system and be controlled from the driver's seat.

If the apparatus according to the invention which is thus mounted on a truck is to be used for producing, for example, a concrete mixture of 3 m.^{3}, the containers 2, 3 and 11, 12 are first filled with binder, sand, gravel, and water, respectively. Since these materials are completely separated from each other during the subsequent trip to the construction site, no agglomerations between these individual materials can occur due to the vibrations in driving, nor can the binder become mixed with the aggregates as it is always the case when the binder is simply added to the aggregates in a common container.

When the truck arrives at the construction site, at first the circulating pump 19 is started and the required amount of water of, for example, 300 liters is pumped into the mixing chamber 1 through a direct line, not shown, which is provided with a gauge and a shutoff valve. Thereafter, at first only the conveyor worm 6 is started to convey the binder contained in the associated container 3 and then the aggregates contained in the adjacent container 2 into mixing chamber 1. While this operation of supplying the binder and aggregates proceeds the circulating pump 19 will already effect a continuous, rather quick circulation of the water contained in the mixing chamber 1. Because of the mixing caps 37 and 42 on the cover 36 of mixing chamber 1 and the deflecting plates or flashings 43 within the chamber, the binder and aggregates will then be very finely distributed and intimately mixed with each other and with the quickly circulating water. As soon as the containers 2 and 3 which communicate with conveyor worm 6 are empty, the clutch 16, 17 is engaged so as also to drive the second conveyor worm 7 and thus to supply additional amounts of binder and aggregates to mixing chamber 1 from the other containers 2 and 3 until the original amount of 300 liters of water has been thoroughly mixed with 700 kg. of binder and 6000 kg. of aggregates to form the desired concrete mass.

If it is found that a further addition of water is required, the same is not supplied through the direct conduit but continuously through conduit 33 which is connected to circulating pump 19, so that this additional water is also quickly distributed and mixed with the entire concrete mixture which is already contained in mixing chamber 1.

If the mixing operation is completed, which usually does not require more than one minute, the feed pump 21 is also started which then discharges the mixture to the outside through hose 34 which is connected to the outlet end 26. Since feed pump 21 is driven at a relatively high speed of about 3500 r.p.m., it is easily possible to connect hose 34 to several hose extensions and to pump the concrete mixture to a place of consumption which may be located at a higher level and as much as 35 m. and more above the apparatus.

If the circulating pump 19 according to the embodiment as shown in FIGURE 8 is to be used as a feed pump, the mixing cap 35 is pivoted upwardly in the direction shown by arrow C, and a separate hose 67 is inserted into mixing chamber 1 and attached to the head 66 of pipe 35.

The circulating pump 19 may, however, also be used as a feed pump in the manner as described if the mixing apparatus is provided with a feed pump 21 but such feed pump is not in a proper operative condition. On the other hand, if the circulating pump 19 should for any reason fail to operate properly, the pivotable mixing cap 37 is simply exchanged for the mixing cap 68 which may be connected to hose 34, whereupon the material is circulated by the feed pump 21.

Obviously, if a truck of a larger size is available or the apparatus is mounted in a stationary position, the capacity of the individual containers and of the mixing chamber may also be increased to any larger size desired.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. In a concrete or mortar mixer having a mixing chamber, a plurality of separate containers having open lower ends forming two groups disposed at opposite sides of said mixing chamber for receiving and dispensing separately from each other the individual components of the final material to be produced, the containers of each group being directly adjacent to each other, each of said groups comprising an aggregate container directly adjacent to respective opposite sides of said mixing chamber for receiving and dispensing the aggregates of said material, each of said groups further comprising a binder container adjacent to said agggregate containers respectively and for receiving and dispensing the binder of said material, a respective receiving chamber connecting the open lower ends of said containers of each group with each other and with said mixing chamber, a drive shaft extending through both of said receiving chambers and through said mixing chamber, means for driving said shaft, a separate conveyer worm in each of said receiving chambers, means for releasably connecting at least one of said conveyer worms to said drive shaft to selectively permit the components from the containers of only one group as well as the components from the containers of both groups to be conveyed into said mixing chamber, means for supplying water into said mixing chamber, and at least one pump underneath said drive shaft within said mixing chamber near the bottom thereof for circulating said material within said mixing chamber, and means for driving said pump.

2. A concrete or mortar mixer as defined in claim 1, further comprising at least one water container, and at least one conduit, a shutoff valve in said conduit, connecting said water container with said pump at a point behind said outlet thereof, as seen in the direction of rotation of said rotor.

3. A concrete or mortar mixer as defined in claim 1, wherein said means for releasably connecting one of said conveyer worms to said drive shaft comprises a tubular shaft rotatably mounted on said drive shaft, one of said conveyer worms being secured to and winding around said tubular shaft, and clutch means having one part secured to said tubular shaft and the other part secured to said drive shaft for coupling said shafts to each other and disconnecting them from each other.

4. A concrete or mortar mixer as defined in claim 3, wherein the other conveyer worm is rigidly secured to said drive shaft.

5. A concrete or mortar mixer as defined in claim 1, further comprising a second pump within said mixing chamber having an inlet communicating with said mixing chamber and an outlet for discharging the contents of said mixing chamber, means for driving said second pump, and means for connecting a hose to said outlet for feeding said contents to a point remote from said mixer.

6. A concrete or mortar mixer as defined in claim 5, wherein said means for driving said second pump is operable at a higher rate than said means for driving said circulating pump thereby driving said second pump at a speed higher than the speed of said circulating pump.

7. A concrete or mortar mixer as defined in claim 1, wherein said circulating pump comprises a substantially

cylindrical housing having a cylindrical wall and end walls and inlet openings in said end wells and an outlet in the substantially cylindrical wall, a pump drive shaft, and a rotor mounted on said pump-drive shaft and rotatable within said housing, said rotor comprising a disk mounted on said pump-drive shaft, a plurality of riblike blades mounted on both sides of said disk and each extending tangentially to said pump-drive shaft and from said pump-drive shaft to a point near the inner surface of said cylindrical wall of said housing and having a lateral bladelike extension on its outer end extending axially toward one of said end walls.

8. A concrete or mortar mixer as defined in claim 7, wherein said riblike blades mounted at one side of said disk are staggered relative to the riblike blades at the other side of said disk.

9. A concrete or mortar mixer as defined in claim 7, further comprising a plurality of blades mounted on said shaft and projecting outwardly therefrom for conveying the material passing downwardly from said mixing chamber in the direction toward the inlet of said pump.

10. A concrete or mortar mixer as defined in claim 7, further comprising a packing on each end wall of said pump drive housing for sealing the part of said pump shaft within said housing toward the outside thereof, said packing comprising a cylindrical socket rigidly secured to each of said end walls and projecting into said housing, said socket having an annular flange on its inner end projecting radially toward said pump-drive shaft, a plurality of soft elastic packing rings within said socket and around said pump-drive shaft, a spacing ring of a smaller diameter than said packing rings interposed between adjacent packing rings thus forming annular chambers between said adjacent packing rings, conduits connected to said socket and communicating with each of said annular chambers for inserting a lubricant therein, and a ring around said pump-drive shaft having outer screw threads screwed from the outer side into said socket to compress said packing rings therein.

11. A concrete or mortar mixer as defined in claim 10, wherein each of said spacing rings has a plurality of radially extending apertures therein for balancing the pressure within each annular chamber.

12. A concrete or mortar mixer as defined in claim 10, further comprising at least one shaft-sealing ring interposed between the outermost packing ring and said threaded ring.

13. A concrete or mortar mixer as defined in claim 10, wherein said pump-drive shaft has a helical groove in its outer peripheral surface within said mixing chamber adjacent to each of said packings, said helical grooves gradually reducing in depth from their outer to their inner ends.

14. A concrete or mortar mixer as defined in claim 1, wherein underneath the central part of said drive shaft between said conveying worms said mixing chamber is formed with a trough-shaped lower part having side walls and a bottom, said circulating pump being mounted within said lower part and having a pump-drive shaft extending through one of the walls thereof, said pump having an inlet communicating with said mixing chamber and an outlet, a conduit connected to the outlet of said pump and extending into the upper part of said mixing chamber and having an outlet opening near the top of said mixing chamber, a caplike member mounted near the top of said mixing chamber and in front of the outlet opening of said conduit and spaced therefrom for deflecting and distributing within said mixing chamber the material conveyed by said pump through said conduit.

15. A concrete or mortar mixer as defined in claim 14, further comprising a cover for closing said mixing chamber, said cover having an aperture therein, said caplike member being pivotably connected to said cover, the end of said conduit having a hose-coupling member thereon for connecting a hose to said conduit passing from the outside through said cover aperture into said mixing chamber when said caplike member is pivoted away from said aperture.

16. A concrete or mortar mixer as defined in claim 14, further comprising a cover for closing said mixing chamber, said cover having an aperture, a cap-like member removably secured to said cover adjacent said aperture, said caplike member having a conical distributing member secured thereto at the lower side facing toward the inside of said mixing chamber, a second pump within said mixing chamber having an inlet communicating with said mixing chamber and an outlet for discharging the contents of said mixing chamber, means for driving said second pump, means for connecting one end of a hose to said outlet, and a quick-acting hose coupling for connecting the open upper end of said caplike member to the other end of said hose to permit said second pump to be used for circulating the material to be mixed through said mixing chamber.

17. A concrete or mortar mixer as defined in claim 14, further comprising a second conduit branching off said first conduit within said mixing chamber and having an outlet opening near the top of said mixing chamber, a second caplike distributing member mounted within said mixing chamber in front of the outlet opening of said second conduit, and a control valve for regulating the flow of material through said second conduit and for shutting it off entirely from said first conduit.

18. A concrete or mortar mixer as defined in claim 17, further comprising a conical member within each of said caplike members converging substantially in the direction of the center of the associated outlet opening of one of said conduits.

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