United States Patent

Johnson

[15] **3,635,449**

[45] **Jan. 18, 1972**

[54] **MIXER**

[72] Inventor: **Milton W. Johnson,** 6620 N. Willameter Blvd., Portland, Oreg. 97203

[22] Filed: **Oct. 5, 1970**

[21] Appl. No.: **77,863**

[52] **U.S. Cl.** **259/179,** 259/170

[51] **Int. Cl.** **B01f 7/04**

[58] **Field of Search** ..... 259/174, 179, 175, 178 A, 178, 259/170, 169, 161

[56] **References Cited**

UNITED STATES PATENTS

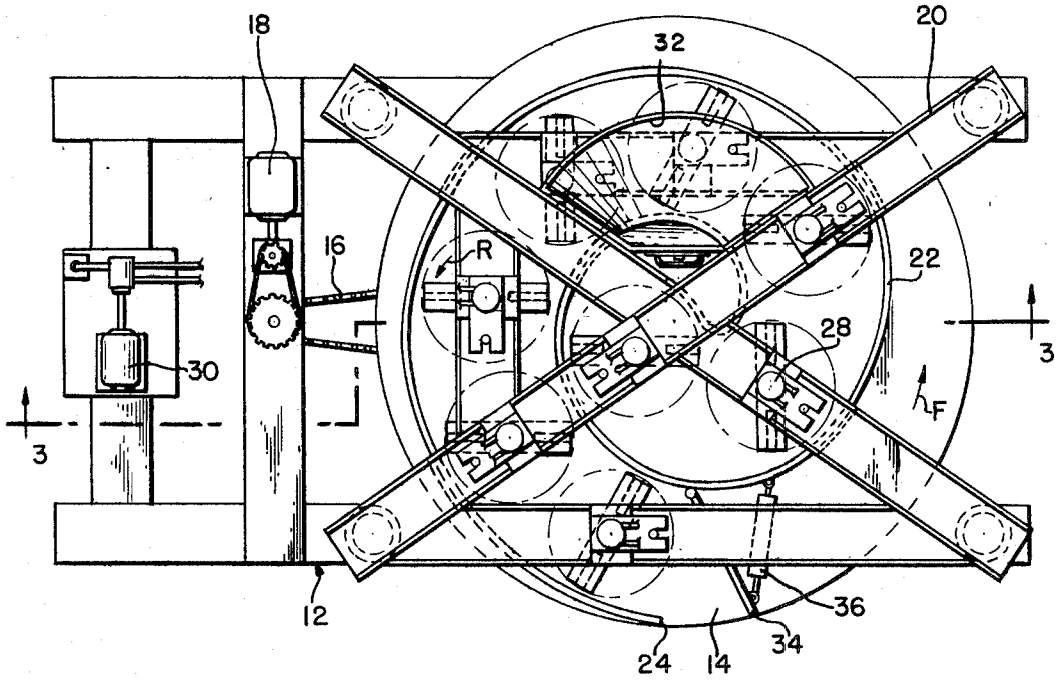
612,584	10/1898	Ferris	259/179
1,398,238	11/1921	Miscampbell	259/174
3,090,607	5/1963	Johnson	259/175
3,536,304	10/1970	Fejmert	259/178 A

Primary Examiner—Robert W. Jenkins
Attorney—Seed, Berry & Dowrey

[57] **ABSTRACT**

A mixer is comprised of a flat rotating disc over which is placed a confining wall that begins near the center of the disc and curves outwardly, generally spirallike, terminating at the outer edge of the disc. Material is supplied at the center of the rotating disc and is guided by the confining wall outwardly to the outer edge of the disc. Mixing paddles are disposed in the path of the material. An adjustable gate is provided at the exit opening defined by the terminal edge of the confining wall and is adjustably mounted for closing off or restricting the flow of material through the exit opening.

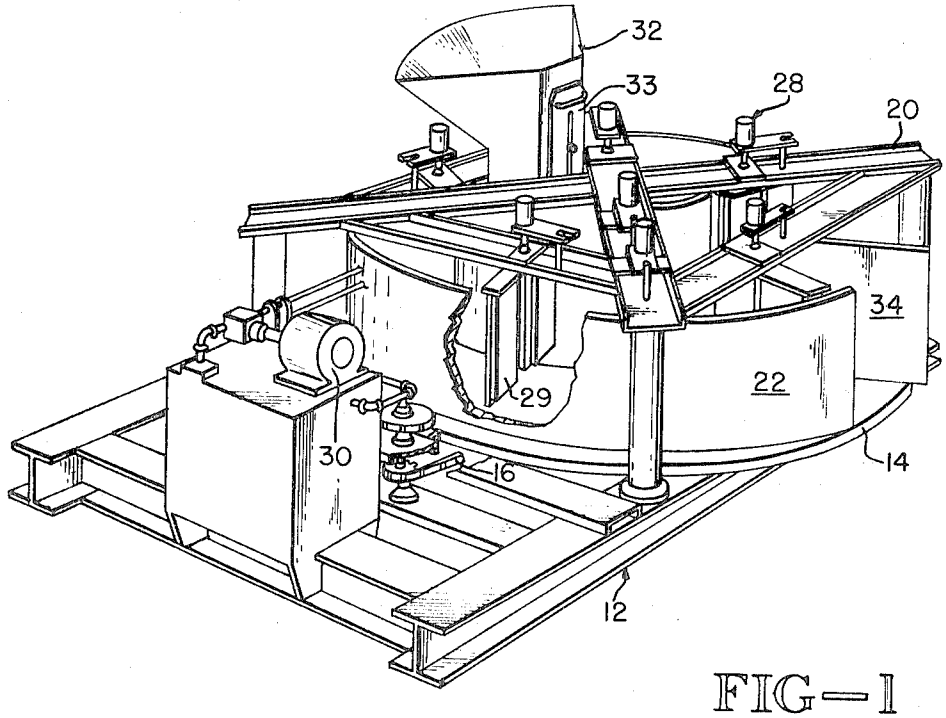
3 Claims, 3 Drawing Figures



PATENTED JAN 18 1972

3,635,449

SHEET 1 OF 2

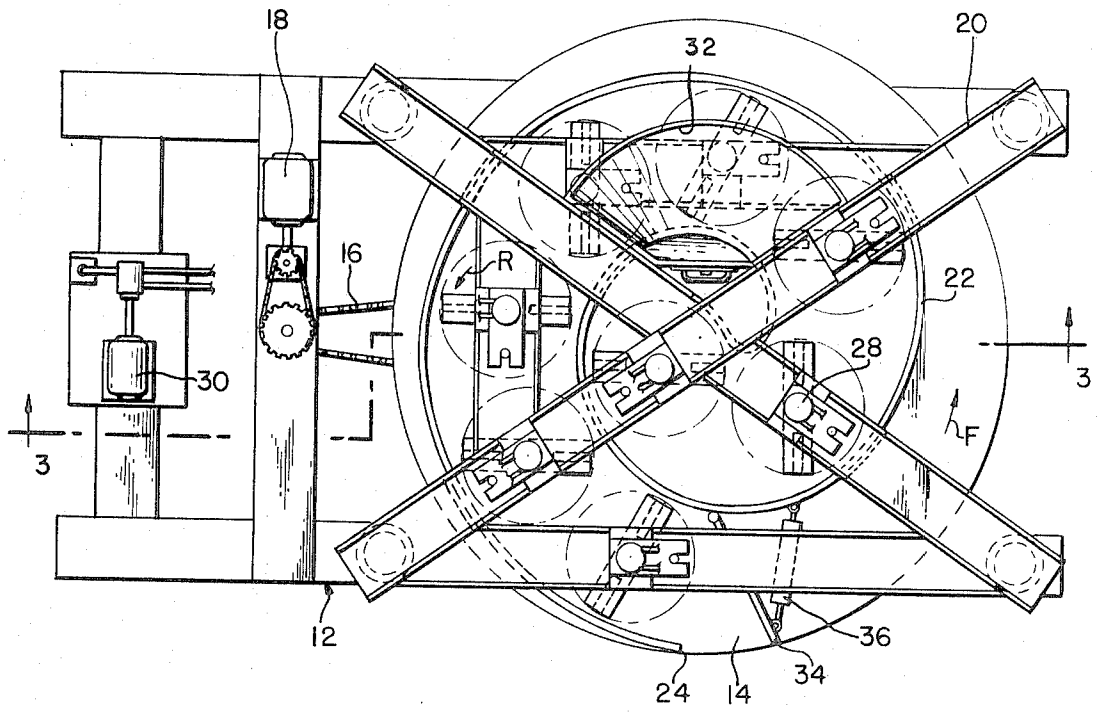


FIG—1

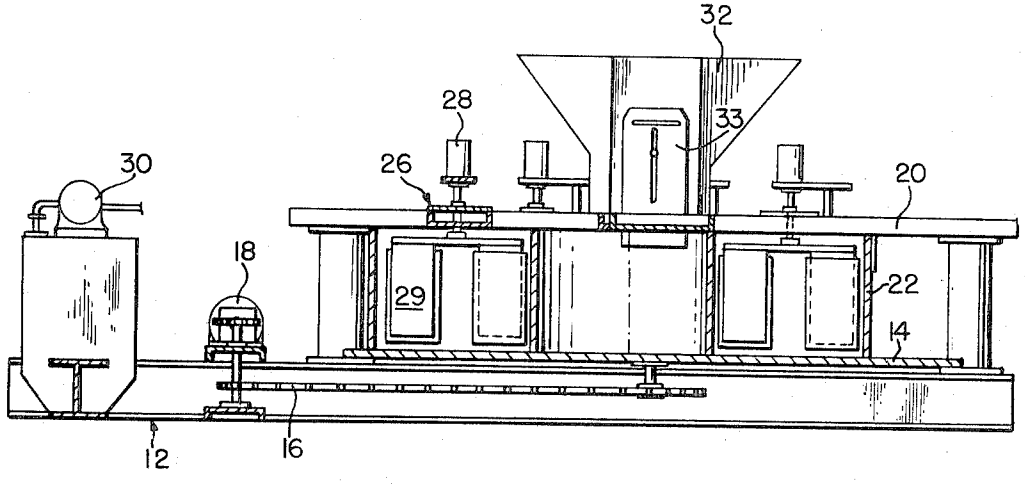
MILTON W. JOHNSON
INVENTOR.

BY Seal, Berry & Downey

ATTORNEYS



FIG—2



FIG—3

MILTON W. JOHNSON
INVENTOR.

BY Seed, Berry & Downey
ATTORNEYS

MIXER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to mixers, and more particularly to a constant flow cement mixer or the like.

2. Description of the Prior Art

This invention is an improvement of my earlier U.S. Pat. No. 3,090,607. In this earlier patent a spirallike confining wall was mounted over a rotating pan and a plurality of mixing paddles were disposed in the passageway defined by the wall and the pan. Material to be mixed was deposited into the passageway near the outer end of the pan and guided inwardly by the wall to the center of the pan where it was discharged through a hole in the bottom. This arrangement has presented several problems in its operation. One of the problems encountered was that the material as it was moved toward the center of the pan moved into a more confined area which increased the frictional forces acting on the material and tended to back up the material in the passageway. A second problem was that the discharge of material through the bottom opening was relatively slow again causing the material to back up in the passageway. A third problem was that the flow rate of the material through the discharge opening was dependent almost exclusively upon gravity forces and often caused the material to back up in the passageway.

SUMMARY OF THE INVENTION

Basically the present invention overcomes the above problems by employing a rotating flat disc and outwardly spiraling confining means mounted above the disc for guiding the material through a passageway defined by the disc and the confining means. The passageway terminates at an exit opening adjacent the outer end of the disc. Material to be mixed is deposited near the inner, more confined end of the spiral confining means adjacent the center of the disc and is guided by the confining means outwardly in an unrestricted path. Discharge of the mixed material, after it has passed through a plurality of mixing paddles, is guided off the edge of the disc by an adjustably mounted gate. The gate may also be used to control the flow through the discharge opening so as to obtain greater mixing if desired. The discharge being near the outer edge of the disc imparts a linear velocity to the material so back up of the material at the exit point is eliminated.

It is another object, therefore, of this invention to provide an improved mixing device which obtains greater flow of material and better mixing of the material.

It is another object of this invention to provide a mixing device which has an outwardly expanding, spirallike confining wall mounted above a rotating disc with the discharge point being at the end of the confining wall over the outer edge of the disc and which is provided with means for controlling the rate of discharge through the discharge point.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric with parts broken away illustrating the improved mixing device of this invention.

FIG. 2 is a plan view, with parts removed, of the mixing device shown in FIG. 1.

FIG. 3 is a vertical section of the mixing device taken along the line 3—3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The mixing device overall is basically similar to the device shown in my earlier U.S. Pat. No. 3,090,607 and includes a frame 12 which supports a flat disc 14 which is rotatably mounted on the frame. The disc is rotated by a chain and sprocket mechanism 16 driven by a motor 18. The frame members 20 are supported on the frame 12 and mount a stationary confining wall 22 that is generally spirallike beginning near the center of the disc and terminating at a terminal edge 24 over the outer edge of the disc. The confining wall and the material-supporting surface of the disc 14 are closely spaced and define a passageway having an exit opening or discharge point defined by the terminal edge 24 of the confining wall and its next inner spiral.

Also mounted on the frame members 20 are a plurality of mixing units 26 each powered by a hydraulic motor or the like and having a pair of paddles 29 disposed in the material passageway. The hydraulic motors 28 are powered by a pump unit 30 which causes the paddles to rotate in the counterclockwise direction as shown by the arrow R. Movement of the disc is in the direction of arrow F such that the direction of rotation of both the paddles and the disc complement one another to mix the material and move it outwardly of the disc along the side surface of the confining wall 22.

As best shown in FIG. 3 material is introduced into the passageway near the center of the disc by a hopper 32 having a closed bottom and a side opening the size of which is controlled by closure member 33. The closure member is adjustably mounted so that it may control the flow of material into the passageway. The flow rate of mixed material discharged through the exit opening is controlled by a gate 34 pivotally mounted for adjusting the size of the discharge opening. A conventional hydraulic ram 36 is mounted at one end to the gate and at the opposite end to the stationary confining wall 22 for closing the gate. As is readily apparent pivotal movement of the gate in the clockwise direction as viewed in FIG. 2, will restrict the flow of material through the exit opening thus either stopping the discharge or backing the material up in the passageway so that additional mixing may occur. When the gate is swung in the counterclockwise direction so that the exit opening is not restricted the gate acts as a deflector to guide the material off the outer edge of the disc. With the gate open the flow of material at the discharge point is virtually unrestricted so that there is little back up pressure to decrease the flow of material in the passageway. In addition since the discharge occurs at the point on the disc where the linear velocity of the material is at a maximum, the material is discharged at maximum momentum thus further reducing back up.

In the operation of the device the disc is set to rotate at approximately 2 r.p.m. with the cement and aggregate being placed in the hopper 32 at a controlled rate. The material drops into the passageway and begins its outward travel past the mixing paddles 29. If the material has received the proper amount of mixing the gate 34 is opened and the mixed material is discharged. If the material has not received adequate mixing the gate is moved to restrict the flow rate so that the material remaining in the mixer is backed up to receive additional mixing.

It is believed that the invention will have been clearly understood from the foregoing detailed description of the preferred illustrated embodiment. It should be understood that changes in the details of construction may be resorted to without departing from the spirit of the invention and it is accordingly intended that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A constant flow mixer comprising a rotatable horizontal disc having a surface to carry the material to be mixed; a curved stationary confining wall having a bottom edge located adjacent said surface so as to form in conjunction with said disc a spirallike material-carrying passageway of more than one revolution beginning near the center of the disc and extending outwardly to an outlet adjoining the edge of the disc, a deflector mounted at said outlet for guiding the discharging mixed material to said edge, a plurality of mixing units having paddles disposed in said material-carrying passageway; means for depositing material to be mixed into said material-carrying passageway near its beginning; and means for rotating said disc to move the material through said passageway.

2. The mixer of claim 1 wherein said deflector is adjustably mounted for closing a predetermined amount so as to restrict the flow of material through said outlet to obtain additional mixing.

3. The mixer of claim 2 wherein said outlet is defined by the terminal edge of said confining wall and the outside surface of the next inner spiral of said confining wall.

* * * * *