July 9, 1940. R. C. HOPKINS 2,207,011

SAND MIXER, AERATOR, AND SIFTER

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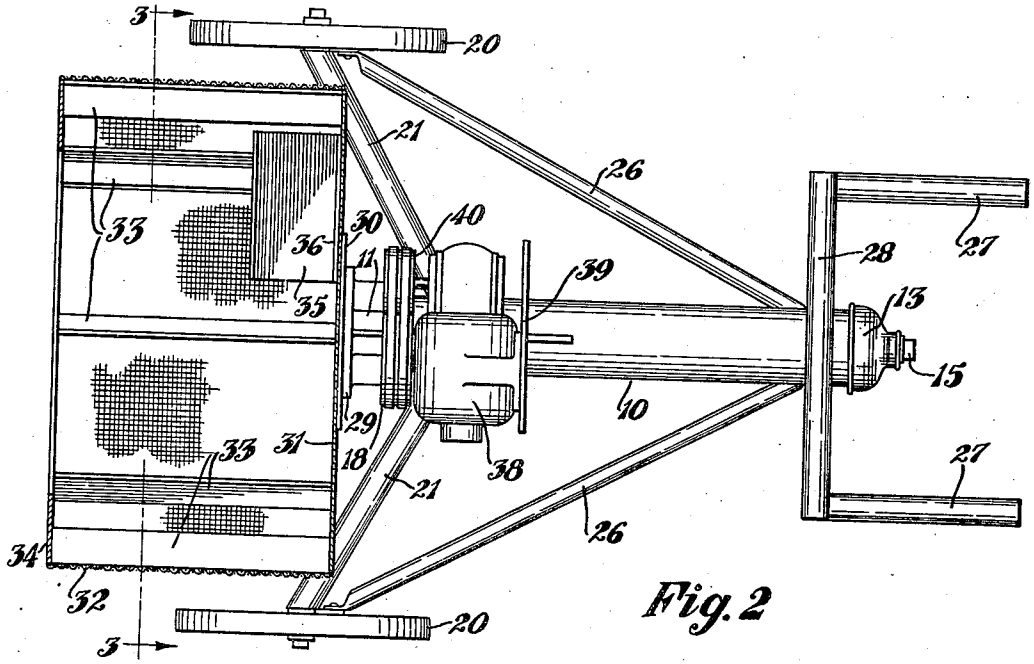


Fig. 2

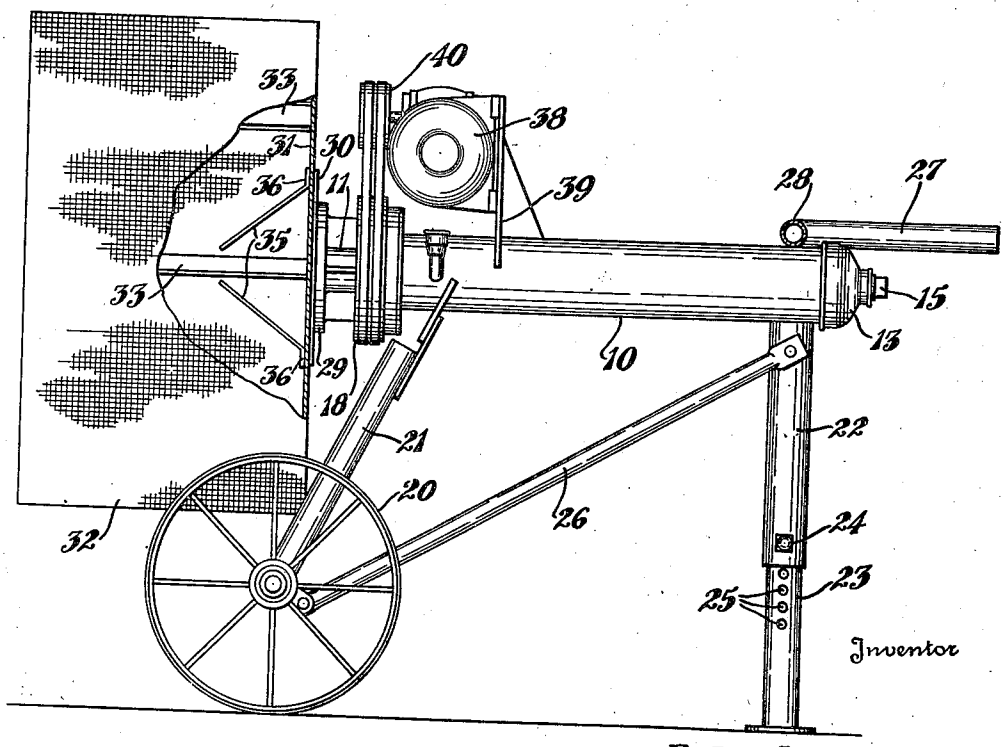


Fig. 1

Inventor

Robert C. Hopkins

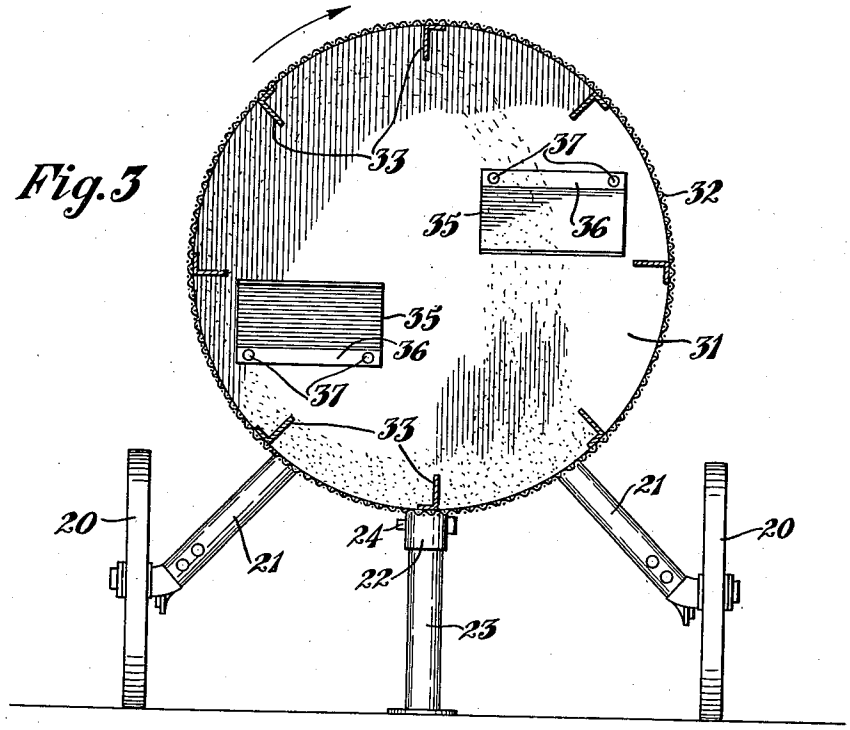
By Pfleger and Bishop Attorneys

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Fig. 3



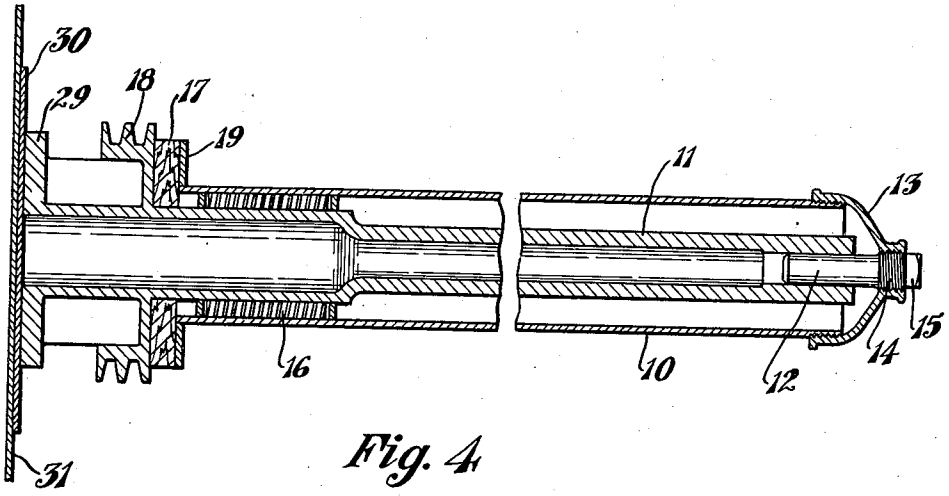


Fig. 4

Inventor

Robert C. Hopkins

By Pease and Bishop

Attorneys

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UNITED STATES PATENT OFFICE

2,207,011

SAND MIXER, AERATOR, AND SIFTER

Robert C. Hopkins, Alliance, Ohio

Application October 23, 1937, Serial No. 170,585

2 Claims. (Cl. 209—297)

The invention relates to apparatus for screening sand, and more particularly to a machine for mixing, aerating and sifting the sand, all in a single operation.

An object of the invention is to provide a machine for this purpose having a rotary screening drum with longitudinally disposed flights or vanes located at spaced intervals around the interior of its cylindric wall and oppositely disposed angularly inclined baffle plates located in one end whereby the sand is carried to the top of the drum by the flights or vanes and then dropped upon the inclined baffle plates which retard the fall of the sand and spread it out so as to permit the air to pass therethrough.

A further object is to provide a machine of this character in which a section of wrought iron pipe forms the principal part of the frame, said pipe housing the main shaft and the bearings therefor and being arranged to be filled with grease or other lubricant for lubricating the same.

Another object is the provision of simple and efficient means for adjusting the drum of the machine at different angles and for driving the drum through a reduction head motor and either tex rope, sprocket chain or V-belt.

Another object is to provide means for adjusting the speed of rotation of the drum so as to pass the falling sand through the longest possible path.

The above objects together with others which may be apparent from the drawings and following description may be attained by constructing the improved apparatus in the manner illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of a sand mixer, aerator and sifter constructed in accordance with the invention;

Fig. 2, a top plan view of the machine shown in Fig. 1, the screening drum being shown in section;

Fig. 3, a section taken as on the line 3—3, Fig. 2; and

Fig. 4, an enlarged longitudinal sectional view through the main shaft and its housing.

Similar numerals refer to similar parts throughout the drawings.

The principal piece in the framework of the machine may comprise a section of wrought iron pipe indicated generally at 10 and forming a housing for the main shaft 11 and its bearings. The shaft may be hollow as shown, and at its outer end is provided with a pintle bearing 12 carried as by a cap 13 screw threaded or otherwise connected to the end of the section of wrought iron pipe and extending into the adjacent end of the shaft. This pintle may be connected to the cap as by the enlarged threaded portion 14 and provided with a squared outer end 15 by means of which the pintle may be removed and replaced.

A roller bearing 16 may be located within the other end portion of the pipe housing 10 and an impregnated wood thrust plate 17 surrounds the shaft at the adjacent end of the pipe 10, being located between the pulley or sprocket 18 which may be formed integrally with or fixed upon the shaft 11, and the flange ring 19 surrounding the end of the pipe 10.

The shaft housing 10 may be supported upon a pair of wheels 20 mounted at the lower ends of the depending angular legs 21 which are connected to the inner end portion of the shaft housing. An adjustable pedestal may support the outer end portion of the housing, comprising a depending sleeve 22 telescoped over the post 23 and adapted to be held in adjusted position as by a bolt or pin 24 adapted to be selectively received in any one of the apertures or sockets 25 in the post.

Angular brace rods 26 may be connected to the upper end of the sleeve 22 and to the lower ends of the angular legs 21.

For the purpose of transporting the apparatus upon the wheels 20, a pair of handles 27 may be provided, being connected to opposite ends of the crossrod 28 which may be welded or otherwise connected intermediate its ends to the outer end portion of the pipe housing 10.

The end of the shaft 11 beyond the pulley 18 is provided with a flange 29 to which may be attached a flange plate 30 which in turn is concentrically fixed to the head 31 of the screening drum.

Although the screening drum is illustrated as being cylindrical in shape, it should be understood that it may be elliptical, square or other shape without departing from the invention. The peripheral wall 32 of the drum may be formed of wire screening of any desirable mesh, depending upon the particular kind of sand to be screened.

A plurality of longitudinally disposed flights or vanes 33 may be located at suitably spaced distances around the interior of the screen and a flange ring 34 may be connected to the end thereof. Oppositely disposed, inclined baffle plates 35 may be connected to the inner side of the head 31 as by the angularly bent flanges 36 and rivets 37.

For the purpose of driving the apparatus, a reduction head motor indicated generally at 38 may be mounted upon the top of the shaft housing 1 as by a bracket 39, and provided with a pulley or sprocket wheel 40 operatively connected as by a tex rope, V-belt or sprocket chain with the pulley or sprocket 18 upon the shaft 11.

In the operation of the apparatus to mix, aerate and sift the sand, a suitable quantity of sand is placed within the screening drum which is rotated in the direction of the arrow shown in Fig. 3, at a sufficient speed to carry the sand substantially to the top of the drum and then drop it across one of the baffle plates 35, as indicated by the broken line arrows in Fig. 3, thoroughly mixing and aerating the sand as it falls from a point near the top of the screening drum over the baffle plate and down to the lower side of the drum.

The machine may be very easily adjusted to change the angle of the drum by merely removing the pin or bolt 24 and raising or lowering the sleeve 22 upon the post 23 to the desired position, in which it may be held by replacing the pin or bolt.

In actual operation it has been found that the maximum capacity of the machine is attained when the shaft is nearly horizontal, while the fineness and thoroughness of sifting increases when the screen is tilted up at a sharper angle where the quantity of sand which goes through the machine becomes proportionately smaller.

I claim:

1. Apparatus of the character described comprising a tubular housing, a shaft journaled and enclosed within said housing, a screening drum upon one end of the shaft, angular legs depending from the housing adjacent to said drum for supporting the weight of the drum and the adjacent end of the housing upon the ground, a sleeve depending from the other end of the housing, a post for supporting the weight of the other end of the housing, said post being telescopically adjustable within the lower end of the sleeve, and means for holding said post in adjusted position in said sleeve.

2. Apparatus of the character described comprising a tubular housing, a shaft journaled and enclosed within said housing, a screening drum upon one end of the shaft, angular legs depending from the housing adjacent to said drum, for supporting the weight of the drum and the adjacent end of the housing, wheels carried by the legs for contact with the ground, an upright vertically adjustable support depending from the other end of the housing, for supporting the weight of said other end of the housing, a motor upon the housing, and gearing operatively connecting the motor to the shaft.

ROBERT C. HOPKINS.