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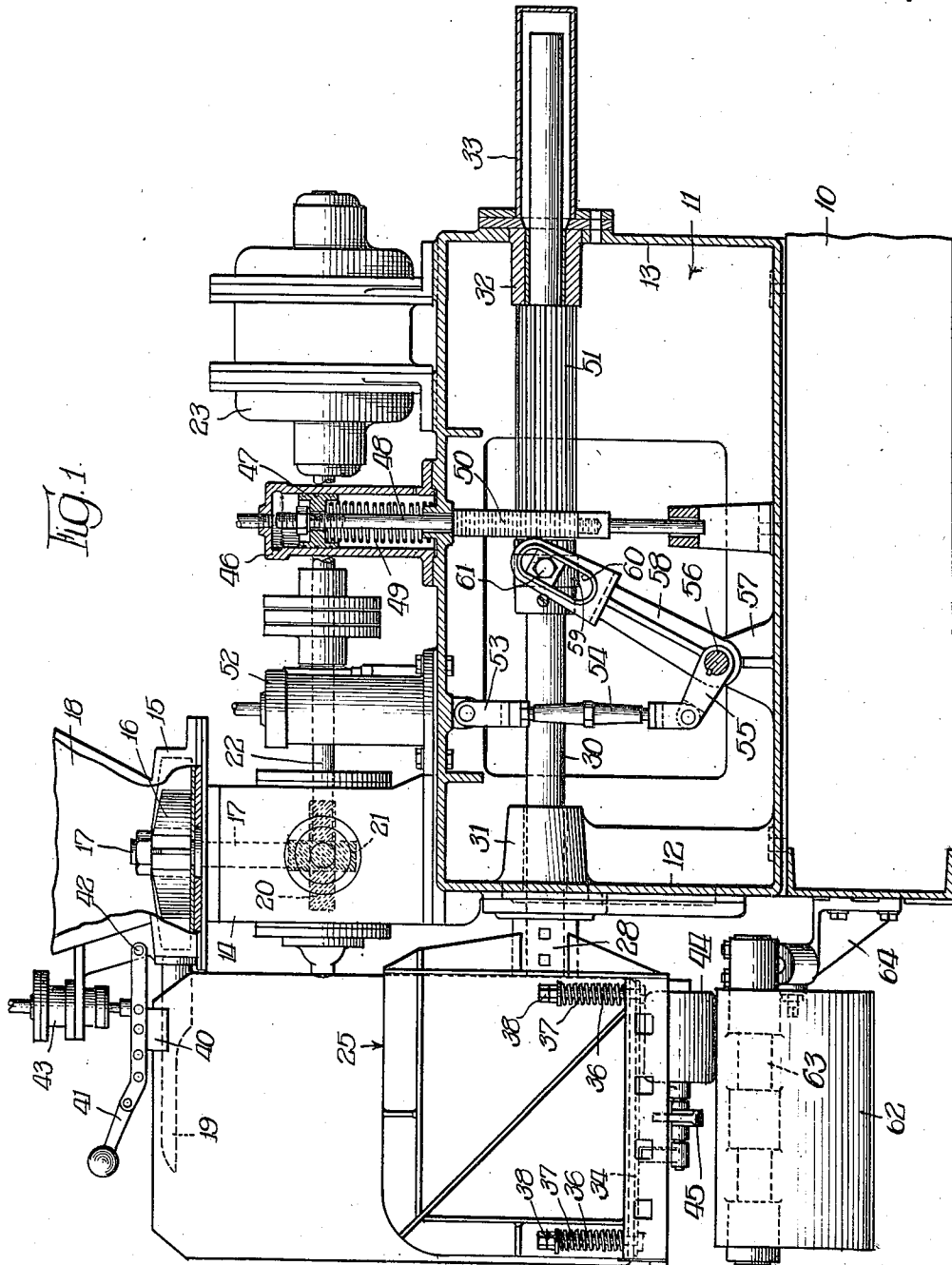
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BAG FILLING AND HANDLING MECHANISM

Filed Nov. 26, 1934

2 Sheets-Sheet 1



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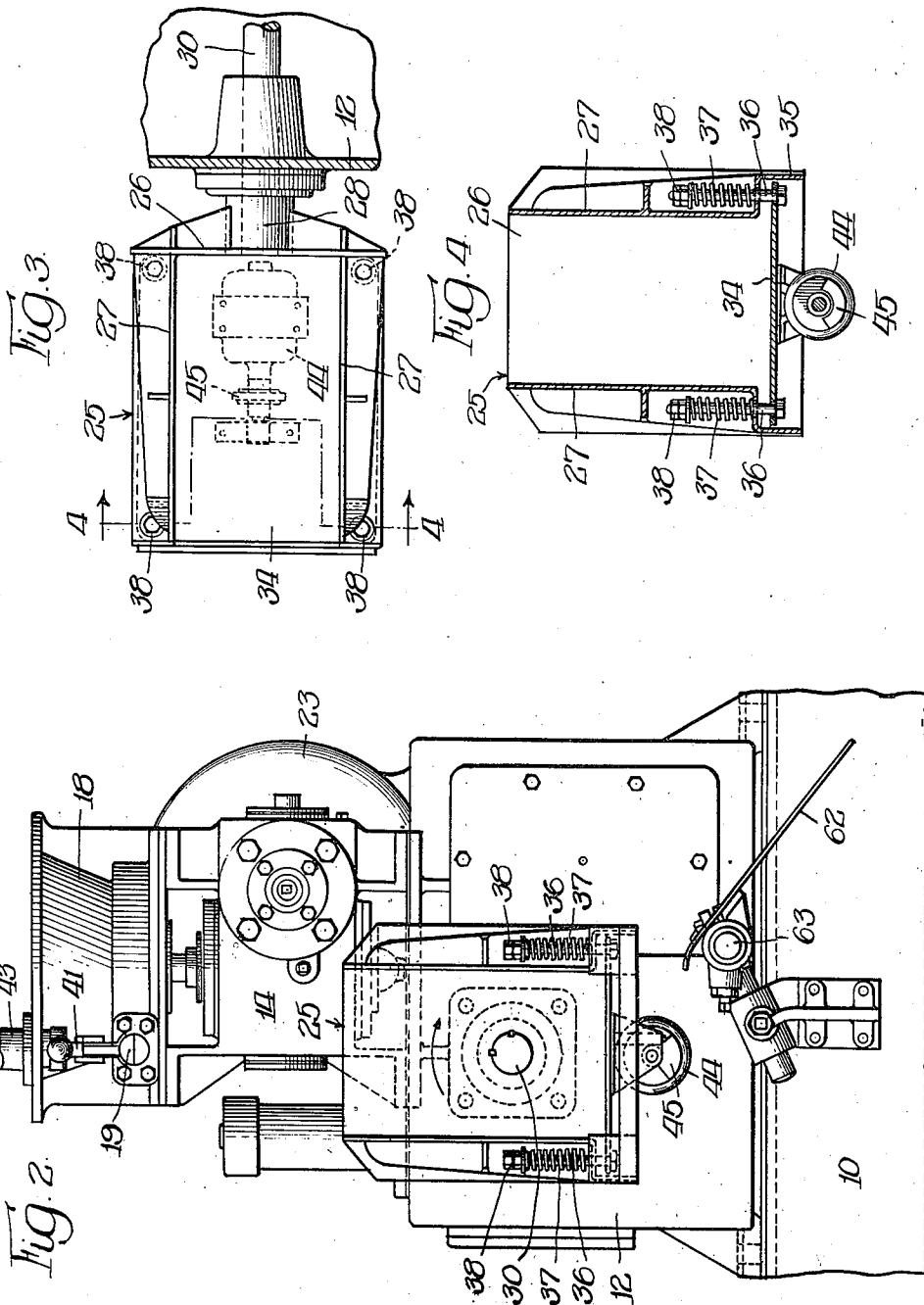
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UNITED STATES PATENT OFFICE

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BAG FILLING AND HANDLING MECHANISM

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8 Claims. (Cl. 226—48)

The invention relates to bag filling mechanism and has reference more particularly to a machine for filling bags with cement or other materials and which will automatically discharge the bag without attention from the operator.

An object of the invention is to provide apparatus for efficiently filling a bag with finely divided materials such as cement without any loss of the material and which will automatically remove the bag at the end of the filling operation and deliver the same to conveying means.

A further object is to provide bag handling mechanism which will include novel vibrating means for agitating the bag during the filling operation to settle and compact the materials within the bag.

With these and various other objects in view the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the invention and wherein like reference characters are used to designate like parts—

Figure 1 is a side elevational view, parts being shown in section of the bag filling and handling mechanism of the invention;

Figure 2 is a front elevational view of the apparatus shown in Figure 1;

Figure 3 is a detail plan view of the bag holder; and

Figure 4 is a sectional view taken along line 4—4 of Figure 3 showing the resiliently suspended base of the bag holder.

The embodiment of the invention shown in the drawings consists of a supporting base or platform 10 on which is supported the housing 11 having a front and rear walls 12 and 13, respectively, providing an enclosure for the mechanism for actuating the bag holder. The enclosure 11 provides a support for the casing 14 to the upper end of which is secured the circular housing 15 for the impeller 16 secured to shaft 17 journaled by casing 14. Flaring upwardly and outwardly from housing 15 is a hopper 18 which delivers the material such as cement to the impeller. Rotation of the impeller feeds the material to a discharge spout 19 connecting tangentially with housing 15. The impeller shaft 17 has suitably keyed thereto a gear 20 having meshing engagement with gear 21 on a horizontal shaft 22 extending through casing 14 and operatively connecting with the electric motor 23 which rotates the shaft and through the mesh-

ing gears the impeller 16 to feed the materials from the hopper 18. The above feeding mechanism for finely divided materials has been particularly designed for association with the weighing apparatus disclosed in applicant's copending application Serial No. 753,495, filed November 17, 1934, to which reference is made for a more complete disclosure of the driving means for the feeding impeller.

The invention concerns bag handling mechanism including a bag holder designated in its entirety by 25 and consisting of a rear plate member 26 having formed integral therewith the vertical side plate members 27 which form a U-shaped holder when viewed in plan as in Figure 3, the rear plate 26, and therefore the holder, being suitably secured as at 28 to the projecting end of shaft 30. The shaft is journaled by the inwardly directed bearings 31 and 32 on the front and rear walls of the housing 11, the shaft therefore extending through the housing and projecting from the rear wall thereof as shown in Figure 1. In order to exclude dust and dirt from bearing 32 and to protect the rearwardly projecting end of shaft 30 the same is suitably enclosed by the tubing 33. The base member or bottom 34 of the bag holder is accommodated by means of the outwardly directed portions 35 formed on the side plate members 27 for receiving the same. Elongated bolts 36 support the base from the side members which is yieldingly suspended therefrom as each bolt receives a coil spring 37 confined between the horizontal section of portion 35 and the nuts 38 threaded to the upper end of each bolt.

The empty cement bag or other container is located on base 34 of the bag holder and is confined between the side plate members 27 which are spaced apart a distance to just receive the bag. Along with this operation the discharge spout 19 is inserted within an opening in the upper end of the bag so that the material discharged therefrom will be delivered to the bag. To relieve the operator from the necessity of holding the bag in position on the holder the invention contemplates a locking member 40 secured to lever 41 which is pivoted to the hopper 18 at 42. The arm can be actuated manually or automatically through the air cylinder 43 to release or apply member 40 to the discharge spout 19 which therefore functions to hold the bag to the spout.

During the filling operation it is necessary to settle the material delivered to the bag, which is accomplished in the present instance by the

yieldingly mounted base 34 of the bag holder. The base member and the bag supported thereby are continually vibrated by the electric motor 44 secured to the underside of the base and which rotates the disc 45 non-rotatably secured to the rotor shaft of the motor. Disc 45 is either eccentrically mounted on the rotor shaft or is non-uniform with respect to weight distribution so that its rotation at high speed will cause the yieldingly supported base member to vibrate. In this manner the material delivered to the bag is agitated and caused to settle so that at the completion of the filling operation the material in the bag is in a compacted condition. It is understood that other means for vibrating the bag can be used.

Suitably secured on the upper surface of enclosure 11 is an air cylinder 46 having a piston 47 connecting with the piston rod 48 extending within the enclosure 11 and providing a rack bar 50. The bar meshes with teeth 51 formed on shaft 30 and extending for a considerable portion of the length of said shaft in order to accommodate axial movement of said shaft.

A second air cylinder 52 is located on enclosure 11 adjacent cylinder 46 for reciprocating the connection 53 including the turnbuckle 54 and which pivotally joins at its lower end with arm 55. The shaft 56 journaled in supports 57 has the arm 55 fixedly secured thereto and also lever 58 provided with an elongated slot 60 at the outer end thereof for receiving the stud 61 projecting from the collar 59 rotatably mounted on shaft 30 but which is held to prevent longitudinal movement of the same on the shaft. This operatively connects the shaft with the lever 58 and axial movement can be imparted to the shaft by pivotal movement of the lever, although rotation of the shaft is not interfered with.

At the end of the bag filling operation air is admitted to the cylinder 52 to cause downward movement of connection 53 and rotation of shaft 56 and lever 58 in a counter-clockwise direction. As the lever operatively connects with shaft 30 the same is reciprocated to the left, thereby locating the bag holder 25 outwardly of the position it assumes during the bag filling operation. This movement of the bag holder is necessary to release the bag from the discharge spout 19, the locking member 40 having been first released to free the bag with respect to the discharge spout. With the bag holder located in its outermost position piston 47 of air cylinder 46 is then actuated to move rack 50 downwardly. As the rack meshes with teeth 51 on shaft 30 the shaft is rotated. The rotation of the shaft and therefore the bag holder is clockwise as shown in Figure 2, and simultaneously with this rotation cylinder 52 is exhausted of its air to cause return of lever 58 to its initial position and therefore return of the bag holder to its innermost position. It will be understood that the holder is simultaneously rotated in a clockwise direction and is drawn inwardly so that at the end of these operations the bag holder will have been aligned with the delivery slide 62 and will have been rotated to cause the bag to slide from the bag holder and onto the delivery slide, whereupon the same is eventually discharged upon an endless conveyor belt. The slide is secured in adjusted position on shaft 63 which is in turn supported from bracket 64.

Discharge of the filled bag from the bag holder when completed will by means of suitable electric contacts deenergize a solenoid valve to ex-

haust the air from cylinder 46, permitting the spring 49 to return the piston to its uppermost position, the upward movement of the rack bar 50 rotating shaft 30 and righting the bag holder. At the completion of this operation the bag holder assumes its initial position and is ready to receive an empty bag, whereupon the operations of filling the same and discharging are repeated.

The impeller 16 is rotated continuously by the driving motor, it being understood that a predetermined quantity of material is delivered to the same at one time sufficient to neatly fill a bag or container. Prior to the filling operation the operator either manually, or automatically through air cylinder 43 actuates lever 41 and locks the bag to the discharge spout 19. At the beginning of the filling operation the motor 44 is started to rotate, the vibrator 45 agitating the base member 34 of the bag holder and also the bag supported thereon. Since the base member is resiliently supported from the bag holder it is readily agitated and as the filling operation proceeds the material within the bag is caused to settle so that the bag when completely filled will contain the proper weight of material.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. The combination with feeding means for finely divided material, of a holder for yieldingly supporting a bag or container to be filled with said material, a shaft supporting said holder, means mounting the shaft for horizontal reciprocating movement and for rotation, and means for reciprocating said shaft and for rotating the same.

2. The combination with feeding means for finely divided material, of a holder for yieldingly supporting a bag or container to be filled with said material, a shaft supporting said holder, means mounting the shaft for horizontal reciprocating movement and for rotation, an oscillating lever operatively connecting with the shaft for reciprocating the same, and means including a rack bar for rotating the shaft.

3. The combination with feeding means for finely divided material, of a holder for yieldingly supporting a bag or container to be filled with said material, a shaft supporting said holder, means mounting the shaft for horizontal reciprocating movement and for rotation, an oscillating lever operatively connecting with the shaft for reciprocating the same, means including a rack bar for rotating the shaft, and other means for oscillating the lever and actuating the rack bar respectively.

4. The combination with feeding means for finely divided material, of a holder for yieldingly supporting a bag or container to be filled with said material, a shaft supporting said holder, means mounting the shaft for horizontal reciprocating movement and for rotation, an oscillating lever operatively connecting with the shaft for reciprocating the same, means including a rack bar for rotating the shaft, and independent means for oscillating the lever and for actuating said rack bar.

5. Bag filling and handling mechanism comprising feeding means having a discharge spout, locking means for holding a bag on the spout

with the spout located within the bag, a holder below the spout for supporting the bag to be filled with said material, a shaft for supporting the holder, means mounting the shaft for horizontal reciprocating movement and for rotation, whereby the bag is removed from said spout by reciprocation of the holder and is discharged therefrom by rotation of the holder.

6. Bag filling and handling mechanism comprising feeding means having a discharge spout, locking means for holding a bag on the spout with the spout located within the bag, a holder below the spout for supporting the bag to be filled with said material, a shaft for supporting the holder, means mounting the shaft for horizontal reciprocating movement and for rotation, an oscillating lever operatively connecting with the shaft for reciprocating the holder to release the bag from said discharge spout, and means including a rack bar for rotating the shaft to cause the holder to discharge the released bag.

7. Bag filling and handling mechanism comprising feeding means having a discharge spout, a holder located below said spout for supporting

a bag to be filled with said material, said holder including a base member yieldingly supported therefrom, vibrating means carried by said base member for agitating the same and the bag supported thereon, a shaft supporting the holder, and means for horizontally reciprocating said shaft and for rotating the shaft, said operations taking place in sequence.

8. Bag filling and handling mechanism comprising feeding means having a discharge spout, a holder located below said spout for supporting a bag to be filled with said material, said holder being substantially U-shaped in plan view for holding the bag upright and including a base member yieldingly supported therefrom, a motor carried by the underside of said base member and having a disc fixed to the rotor shaft thereof, said disc having its mass eccentrically distributed with respect to the shaft, whereby said base member is vibrated when the shaft is rotated at high speed, means supporting the holder, and independent means for horizontally reciprocating and for rotating said supporting means.

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