

Sept. 15, 1931.

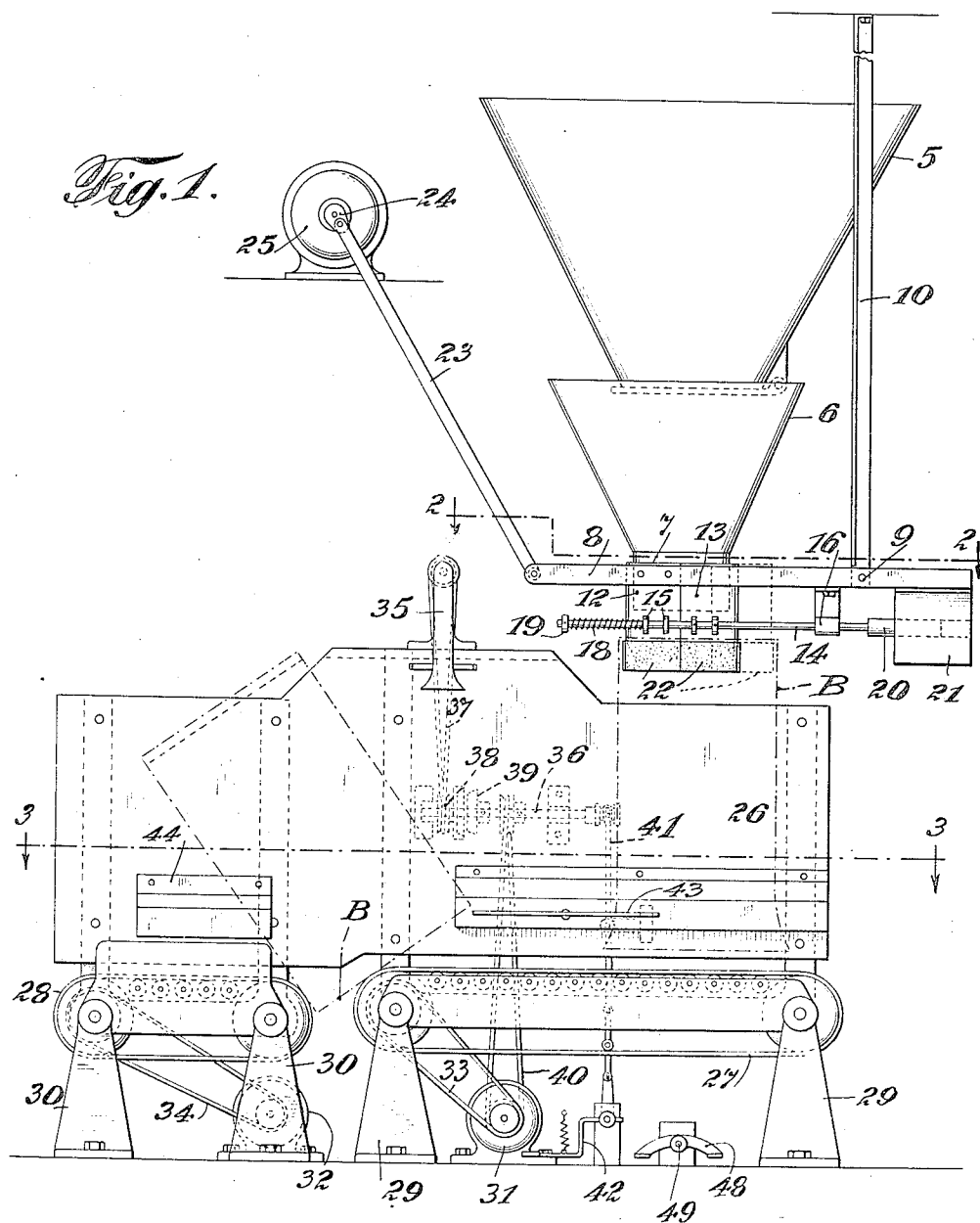
J. J. NEUMAN

1,823,283

BAG FILLING APPARATUS

Filed Dec. 7, 1929

5 Sheets-Sheet 1



INVENTOR
Jacob J. Neuman
BY *C. P. Gehl*
his ATTORNEY

Sept. 15, 1931.

J. J. NEUMAN

1,823,283

BAG FILLING APPARATUS

Filed Dec. 7, 1929

5 Sheets-Sheet 2

Fig. 2.

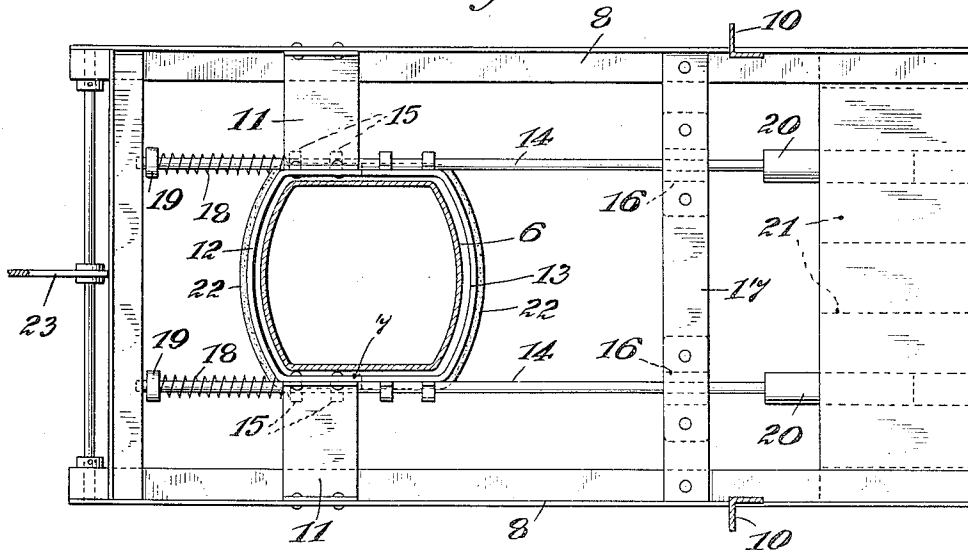
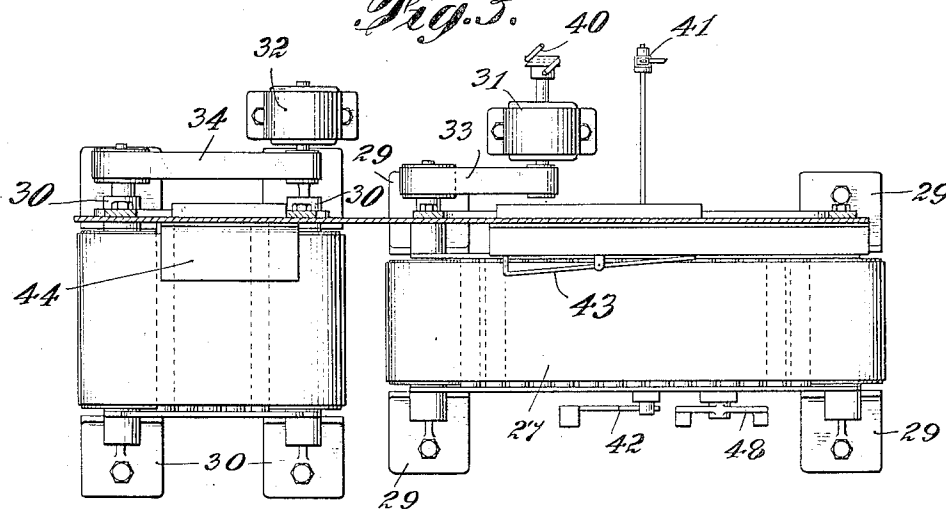


Fig. 3.



INVENTOR

Jacob J. Neuman

BY

C. P. Gephel
his ATTORNEY

Sept. 15, 1931.

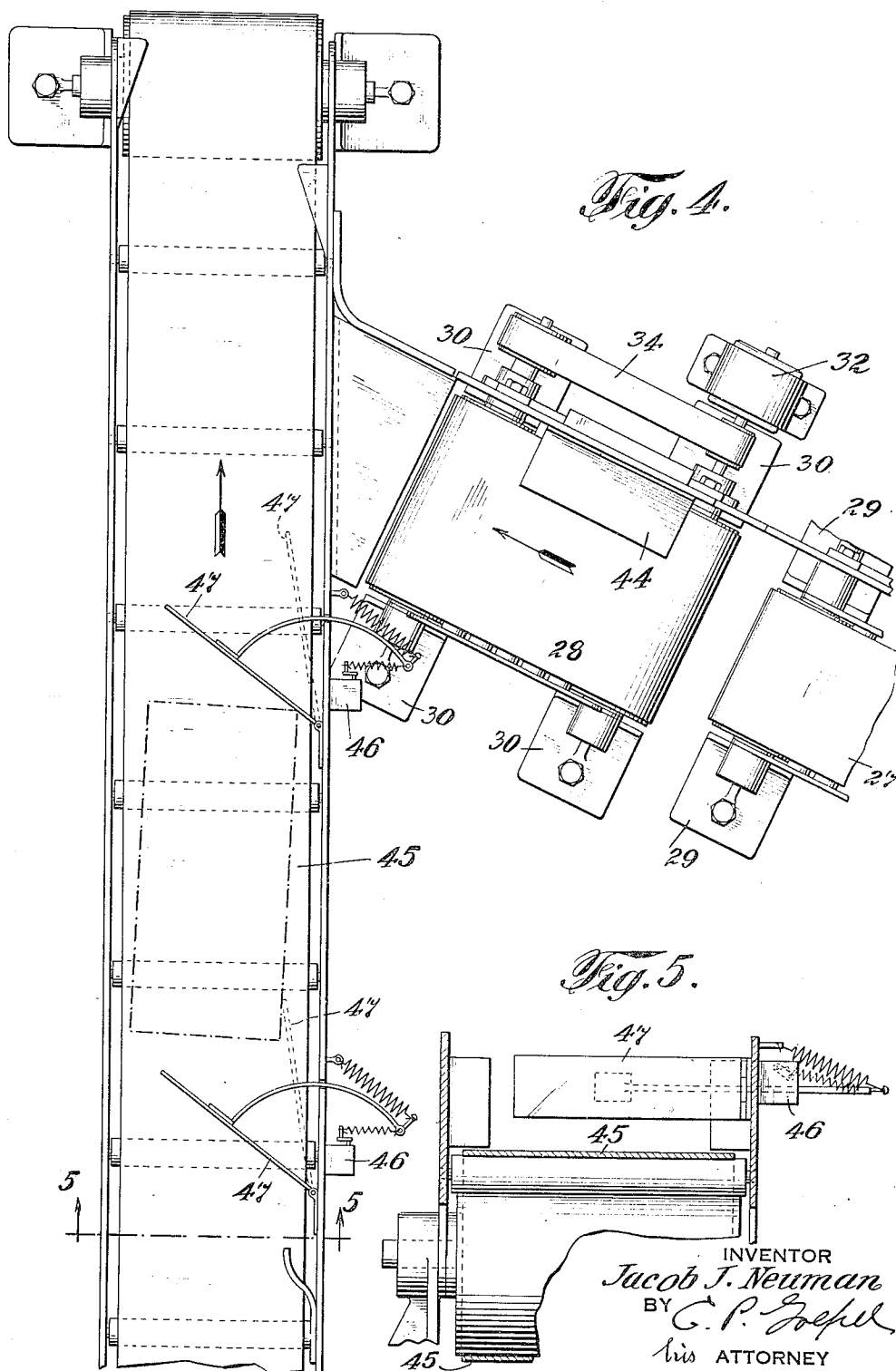
J. J. NEUMAN

1,823,283

BAG FILLING APPARATUS

Filed Dec. 7, 1929

5 Sheets-Sheet 3



Sept. 15, 1931.

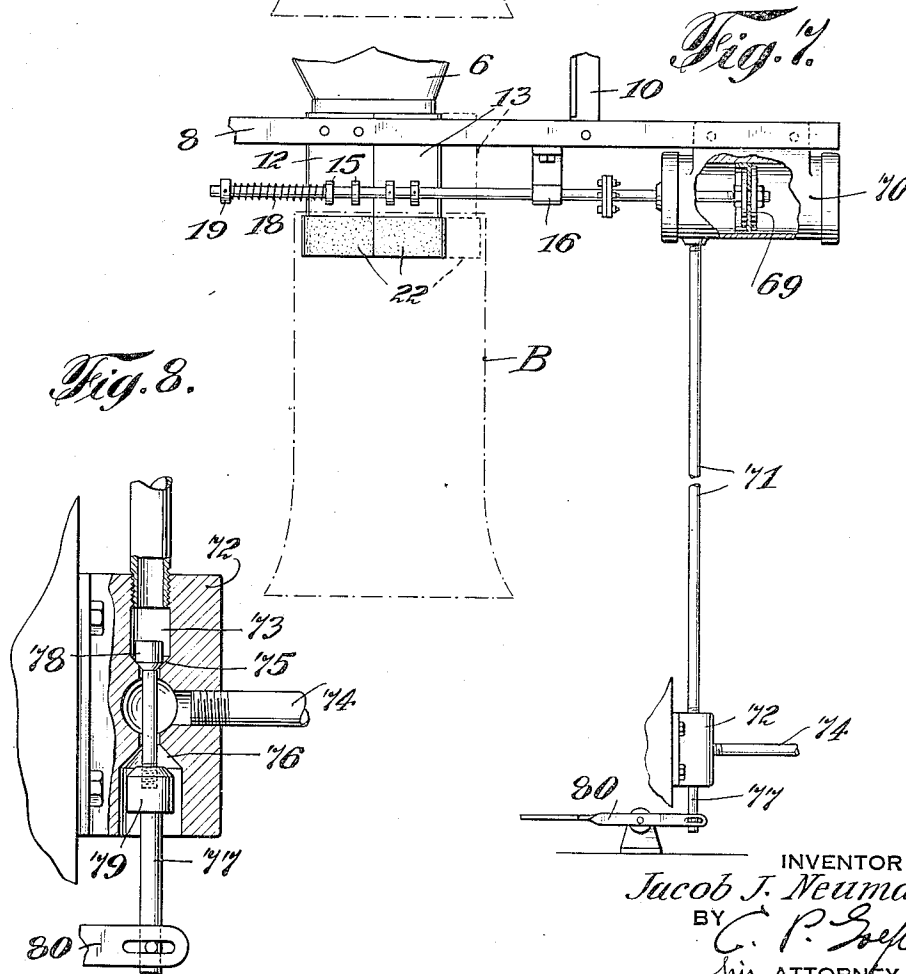
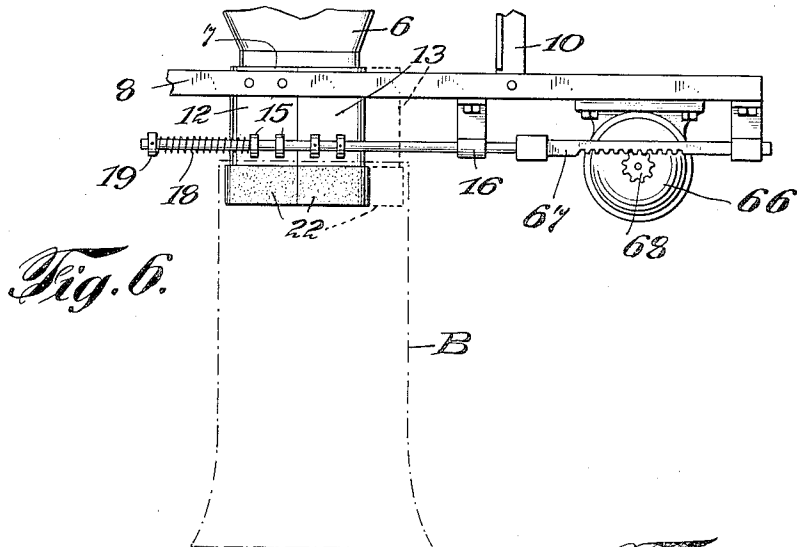
J. J. NEUMAN

1,823,283

BAG FILLING APPARATUS

Filed Dec. 7, 1929

5 Sheets-Sheet 4



INVENTOR
Jacob J. Neuman
BY *C. P. Seipel*
his ATTORNEY

Sept. 15, 1931.

J. J. NEUMAN

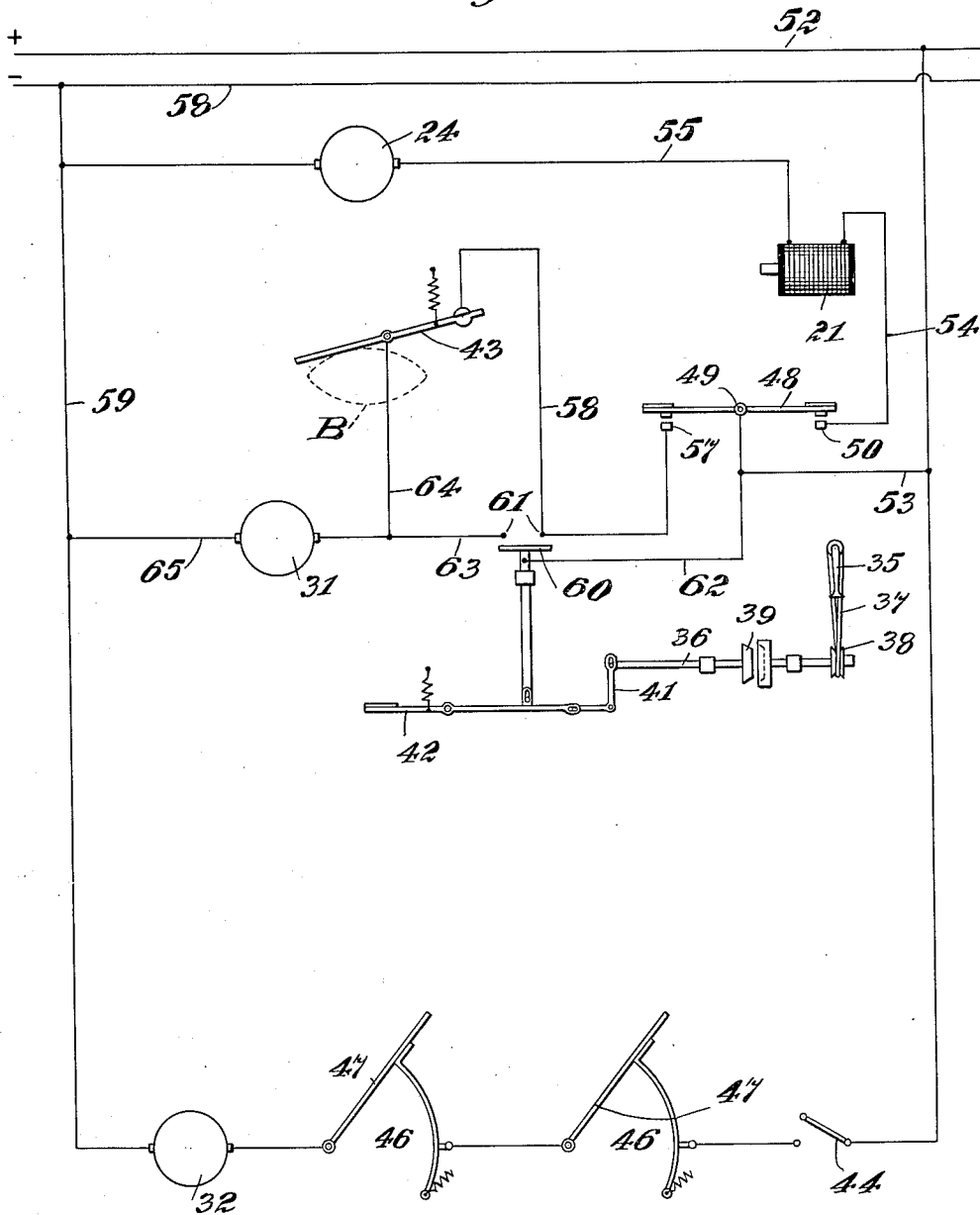
1,823,283

BAG FILLING APPARATUS

Filed Dec. 7, 1929

5 Sheets-Sheet 5

Fig. 9.



INVENTOR
Jacob J. Neuman
BY *C. P. Lyle*
his ATTORNEY

UNITED STATES PATENT OFFICE

JACOB J. NEUMAN, OF NEW YORK, N. Y.

BAG FILLING APPARATUS

Application filed December 7, 1929. Serial No. 412,414.

This invention relates to automatic packaging and conveying apparatus, and has for its general object and purpose to provide means for filling containers with a commodity and transporting each container after being filled to position to be operated upon by means for sealing or closing the open end of the container and means for subsequently transporting the sealed containers and delivering the same upon a main conveyor.

It is one of the important objects of the invention to provide simple and reliable means for releasably holding a flexible container wall at the open end thereof in an expanded condition for the feeding of the material into the container, and to also provide means for vibrating said holding means and the container so as to cause the material to compactly mass therein and thus insure the reception of the material in uniform predetermined quantities in containers of minimum size.

A further object of the invention is to provide electrically operated manually controlled sewing mechanism for sewing the mouth of a bag or fabric container to securely seal the same, and to provide suitable switch means automatically controlled by the bag or container to close the motor circuit for operating a bag conveyor after the stitching operation is completed.

It is a further object of my invention to provide a main conveyor for the filled bags or containers, a second conveyor having an independent operating motor for transporting the filled bags to the main conveyor, and normally closed switch means in the motor circuit adapted to be actuated by bags or containers on the main conveyor to render said transporting conveyor inoperative and thus prevent collision between bags on the main conveyor and a bag being delivered from the transporting conveyor.

It is a further general object of my present invention to provide apparatus of the above character, which is comparatively simple in its construction, reliable and efficient in its operation, and by means of which the filling, sealing and transporting or convey-

ance of bags or containers for various commodities may be materially expediated.

With the above and other objects in view, the invention consists in the improved automatic packaging and conveying apparatus, as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have illustrated one simple and practical embodiment of the invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a side elevation showing one practical embodiment of the essential features of my present invention;

Fig. 2 is a horizontal sectional view on an enlarged scale taken on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan view, illustrating the main conveyor for the filled bags, the transporting conveyor and the switch means controlling the motor circuit of the latter conveyor;

Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a detail side elevation showing another embodiment of the device for expanding the open end of the bag or container;

Fig. 7 is a similar view partly in section showing another alternative embodiment of the bag holding means;

Fig. 8 is a detail sectional view of the control valve for the pneumatically operated device shown in Fig. 7, and

Fig. 9 is a diagrammatic view illustrating the electrical control circuit and switch means therein for the various parts of the apparatus.

Referring in detail to the drawings, and more particularly to Figs. 1, 2 and 3 thereof, 5 designates a main hopper which contains, in the present instance, sugar or other granulated or comminuted commodity to be filled into cloth bags or sacks, one of which is indicated in dotted lines at B in Fig. 1.

Beneath this main hopper, a smaller secondary discharge hopper 6 is arranged and at its lower end is provided with a downwardly projecting outlet extension 7 which may be of any desirable cross sectional form. A horizontally positioned frame 8 is fulcrumed at its opposite sides and adjacent one end as indicated at 9 upon the lower ends of the vertically disposed bars 10 which are suitably fixed at their upper ends to sealing beams or other stationary parts. In spaced relation to the other end of the frame 8, the transverse frame plates 11 extend inwardly from opposite sides of said frame and are fixed at their inner ends to one section 12 of a bag supporting and expanding device. The other section 13 of this device which is opposed to the section 12 is suitably secured at its opposite sides to spaced rods 14 movable through guides 15 on the opposite sides of the section 12 and through the additional guides 16 depending upon the transverse bar 17 of the frame 8. The end portions of rods 14 which project beyond the section 12 have coil springs 18 arranged thereon bearing at one of their ends against one of the guides 15 and at their other ends against collars 19 fixed upon the ends of said rods. The other ends of these rods are connected with the movable cores 20 of solenoids 21 suitably mounted on the end of the frame 8 at one side of the fulcrum 9, said solenoids serving as counterbalancing means for the part of the frame extending on the opposite side of said fulcrum and the bag holding sections 12 and 13. These bag holding sections surround the outlet extension 7 of the hopper 6 and at their lower ends which are spaced from the frame 8 are provided with friction bands of felt, rubber or other suitable material shown at 22.

The frame 8 is vertically oscillated by means of the pitman rod connection 23 with the crank arm 24 fixed to one end of the shaft of an electric motor 25.

Beneath the frame 8, a vertically positioned wall 26 is suitably supported and beneath said wall and at one side thereof the conveyers 27 and 28 respectively, spaced apart longitudinally of said wall are mounted between the bearing supports indicated at 29 and 30. These conveyers are driven by separate motors 31 and 32 respectively, operatively connected with one roller of each conveyer by drive belts or chains indicated at 33 and 34.

Upon the top of the vertical supporting wall 26 and above one end of conveyer 27 a sewing machine conventionally indicated at 35 is suitably mounted. This machine is operated from the countershaft 36 by means of drive belt 37 traversing a pulley 38 loose on said shaft and provided with one element of a friction clutch, said shaft 36 being axially shiftable and carrying the other

clutch element 39 fixed thereon. A drive belt 40 connects shaft 36 with the shaft of the motor 31. The shaft 36 is shifted to operatively connect the motor with the drive belt 37 of the sewing machine by suitable lever connections indicated at 41 between one end of said shaft and a foot pedal 42 which is also operable to close the circuit of motor 31, as will be hereinafter more fully explained. The circuit of this motor is adapted to be broken by the engagement of the filled bag on conveyer 27 with a normally closed switch 43 which may be suitably mounted on the support 26.

A normally open switch 44 is also arranged in the circuit of motor 32 above the conveyer 28 and is adapted to be engaged and moved to closed position by a filled bag delivered to conveyer 28 from the conveyer 27.

The bags are transported to and delivered upon the main conveyer shown at 45 in Fig. 4 of the drawings, which may be common to a series of packaging machines above described. There is also arranged in the circuit of motor 32 a plurality of normally closed switches 46 spaced apart longitudinally of the conveyer 45, each of said switches including a movable spring held plate 47 extending obliquely transversely across the upper stretch of the conveyer and adapted for engagement by the filled bags carried thereon. As indicated by the arrows in Fig. 4, the conveyer 28 is arranged to deliver a bag thereon in an oblique path at one side of the conveyer 45 and in the direction of travel of the upper stretch of said conveyer. The spaced switches 46 are located adjacent the point of juncture of these two conveyers so that it will be evident that a bag on conveyer 45 within a predetermined distance of the conveyer 28 will actuate one of the switches 46 moving the same to open position, thus preventing operation of conveyer 28 by its motor 32. The spacing of these switches is such with respect to the length of the bag that before the first switch encountered and opened by the bag is released for movement to the closed position, the second of these switches nearest to the conveyer 28 will be engaged by the bag and moved to its open position, thus maintaining the circuit of motor 32 open. After this second switch is released and returns to its closed position, and providing the first switch 46 has not been engaged and opened by another bag on conveyer 45, the circuit of motor 32 will then be closed, providing a filled bag has operated the switch 44 so that conveyer 28 will be operated to deliver the filled bag thereon to the main conveyer 45. Thus the possibility of bags being carried on conveyer 45 obstructing the delivery of the filled bags from the conveyer 28 is obviated. The circuit for motors 24 and 31 is also

adapted to be closed by means of a foot lever 48 fulcrumed intermediate of its ends as at 49. When one end of said lever is depressed to engage contact 50, a circuit is closed as shown in Fig. 9 from a positive feed wire 52, conductor 53, wire 54 to the windings of solenoid 21 and through wire 55, and the field of the motor 24 to the negative feed wire 56. Assuming therefore, that the mouth of the bag B has been momentarily supported and held so that the lower ends of the bag expanding sections 12 and 13 are positioned within the same, it will be evident that when the above circuit is closed, the solenoids 21 are energized to move rods 14 and thus move the section 13 away from section 12 against the action of springs 18, thereby tightly engaging the friction bands 22 with the cloth wall of the bag and opposite sides of its mouth. Thus, the bag end is expanded and tightly gripped so that the bag is supported in an elevated position above conveyer 27. At the same time, through operation of motor 25, frame 8 is oscillated, thus vibrating the bag so that as the material is fed into the bag from hoppers 5 and 6, it is caused to settle or compactly mass therein, thereby insuring the reception of a desired predetermined quantity of the material in a bag of minimum size.

Upon release of foot lever 48, the above circuit is broken so that the bag holding section 13 returns to its normal position thereby releasing the bag which drops under the weight of its contents upon conveyer 27. The other end of foot lever 48 is then depressed to engage contact 57, and thus close the circuit of motor 31 through wire 58, the normally closed switch 43, the field of motor 31, conductor 59 to the negative feed wire 56 and through conductor 53 to the positive feed wire 52. Upon energization of this motor, conveyer 27 is operated to move the bag and position the walls of said bag at its mouth or open end for engagement by the needle of the sewing machine 35. Lever 48 is then released, and the sewing machine is operated by actuating foot lever 42, which simultaneously establishes the driving connection between the shaft of motor 31 and driving belt 37 as above explained, and closes the circuit of said motor by operation of the switch 60 shown in Fig. 9. This switch engages spaced contacts 61 connecting wire 58 with a wire 62 connected with conductor 53 and with the field armature of motor 31 through wire 63 to which the switch 43 is connected by wire 64, the opposite side of the motor field being connected with the negative current supply wire 56 by conductor 65. Therefore, it will be evident that as the conveyer 27 progressively moves the filled bag thereon, the sewing machine 35 is operated to stitch together

the opposite side walls of the bag mouth, thus securely sealing the same. During this stitching operation, the bag B is engaged with switch 43 and holds said switch open, the circuit of motor 31 however being closed through the switch 60. When the stitching operation is completed and the operator releases pressure on the foot pedal 42, the driving connection between motor 31 and the sewing machine 35 is broken. Simultaneously, the bag passes beyond and out of contact with switch 43 which returns to its normally closed position, thus re-establishing the circuit of motor 31 which was broken at the switch 60 when pressure on pedal 42 was released. Therefore, operation of conveyer 27 is continued so that the bag is discharged from one end thereof as indicated by dotted lines at the left in Fig. 1, upon the conveyer 28.

When the sealed bag falls upon conveyer 28, it engages and closes the switch 44 in the circuit of motor 32 and if both of the switches 46 are also in their normally closed positions, said motor will be energized to operate conveyer 28 and thus deliver the bag to the main conveyer 45. However, as above explained, should a bag on the latter conveyer be engaged with either of switches 46 to thereby move the same to open position, the circuit of the conveyer operating motor 32 is broken so that the bag will merely be supported in a stationary position on conveyer 28, thus avoiding collision between the bags on conveyer 45 and the bag delivered from conveyer 28 and interruption of the proper operation of the apparatus, as above explained.

In Fig. 6 of the drawings, I have shown a modified form of the means for operating the movable section 13 of the bag holding device. Thus, in lieu of the solenoids 21, a small motor 66 may be mounted upon the end of the frame 8 and the ends of rods 14 connected to a rack 67, the teeth of which are engaged by a pinion 68 on the motor shaft. The circuit control means for the motor may be the same as that provided for the solenoids 21 as above described.

In Figs. 7 and 8, I have shown another alternative form of this means for moving the bag holding member or section 13, in which a pneumatically controlled means is provided for actuating the rods 14. Thus a piston 69 reciprocating in the cylinder 70 fixed upon the frame 8 is suitably connected with the rods 14. A pipe 71 admits air or other pressure fluid to one end of the cylinder, said pipe being connected with the passage 73 of a valve casing 72. The pressure fluid supply pipe 74 is connected centrally with the passage 73, said passage being provided at opposite sides of its central portion with valve seats 75 and 76 respectively. A rod 77 is loosely movable in the passage 72

and provided with spaced valve heads 78 and 79 for engagement upon the seats 75 and 76 respectively. One end of the rod 77 is connected with a suitable lever 80. In the position of the valves 78 and 79 as shown in Fig. 8 of the drawings, communication between supply pipe 74 and the cylinder 70 is closed by engagement of the valve 78 on the seat 75. When lever 80 is actuated to move the valve rod 77 upwardly, valve 79 is engaged with seat 76 while the valve 78 is disengaged from seat 75 thus permitting the air or other pressure fluid to pass from supply pipe 74 through the passage 73 upwardly through pipe 71 and into the cylinder 70, where it acts against the piston 69 to move said piston in the cylinder, and thus shift the bag holding section 13 against action of springs 18 as above explained to engage said section of the bag wall and properly support the bag while it is being filled.

From the foregoing description considered in connection with the accompanying drawings, the construction of the apparatus, the manner of its operation, and the several advantages thereof will be clearly understood. It will be seen that by means thereof, bags or sacks may be rapidly filled with uniform quantities of sugar or other granulated or comminuted materials, and such filled bags delivered from a plurality of the machines upon a common conveyor to be delivered thereby to a storage room. It will of course, be understood that the showing of the mounting and arrangement of the several conveyers is merely suggestive, and that various other arrangements of these conveyers may be resorted to while still accomplishing the purpose of the present invention. Also various other types or forms of the circuit closing and opening switches as above referred to might be employed. Likewise, although I have referred to several alternative devices for operating the bag holding and supporting means, it will nevertheless be understood that other structural embodiments of this part of the present disclosure might be adopted. Therefore, no unnecessary limitations are to be implied from the foregoing detail description, and the privilege is reserved of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In packaging apparatus, means for filling a container, sealing mechanism spaced from the filling means, a conveyer for supporting and moving the filled container from the filling means to said sealing means, a common operating motor for the conveyer and sealing means, manually operable means for energizing said motor and operatively connecting the same with the sealing means, and means automatically controlled by the

sealed container and operable after the container has been sealed to energize said motor independently of the manually operable means and continue the operation of the conveyer to discharge the sealed container therefrom.

2. In packaging apparatus, means for filling a container, sealing means spaced from said container, a conveyer for receiving and moving the filled container from the filling means to the sealing means, a common operating motor for the conveyer and the sealing means, a circuit therefor, a normally open switch in said circuit, manually controllable means for simultaneously establishing an operating connection between said motor and the sealing means and for closing said switch to move the container relative to the sealing means, and an additional normally closed switch in the motor circuit automatically engaged and held in open position by the container during the sealing operation and operating after the sealing means is operatively disconnected from the motor to close the motor circuit independently of said first named switch and continue the operation of the conveyer to discharge the sealed container therefrom.

3. In packaging apparatus, a conveyer, means mounted above and in relatively fixed relation to the conveyer engageable within the open end of a container and with opposite walls thereof to sustain the container in a suspended position above the conveyer while the container is being filled, and means for vertically vibrating said suspending means with the container and its contents during the filling operation.

4. In packaging apparatus, a conveyer, relatively movable members adapted to be positioned in the open end of a container, means for separating said members and expanding the same against opposite side walls of the container to sustain the container in a suspended position above and out of contact with the conveyer during filling of the container, means for vertically vibrating said members with the container and its contents during the filling operation, and means for returning said container supporting members to normal position to release the filled container and permit the same to drop by gravity upon said conveyer.

5. In packaging apparatus, a vertically vibratory frame, complementary opposed members mounted on said frame adapted to be positioned within the open end of a container, one of said members being fixed in the frame and the other movable relative thereto, means carried by the frame and connected with said movable member for moving the same relative to the fixed member and frictionally engage said members with opposite walls of the container to sustain the container in suspended relation to said

frame during the filling operation, and means for vibrating said frame and the container during the filling operation.

6. In packaging apparatus, a vertically vibratory frame, a material feed hopper, complementary members disposed in opposed relation and normally surrounding the discharge end of the feed hopper, one of said members being fixed to said frame and the other movable relative thereto, said members having end portions adapted to be positioned within the open end of a container, manually controllable means connected with the movable member to separate said members and frictionally engage the ends thereof with opposite side walls of the container to sustain said container in suspended relation to the frame, means for vertically vibrating said frame and the container during the filling operation, and means for returning said movable member to its normal position to release the filled container.

7. In packaging apparatus, a horizontally positioned frame fulcrumed adjacent one end for pivotal movement, a material feed hopper, opposed members normally surrounding the outlet end of the hopper, one of said members being fixed to the frame and the other movable relative thereto, said members extending below the frame and provided at their lower ends with means for frictionally engaging opposite side walls of a container at the open end thereof, rods slidably supported on the frame and connected to opposite sides of the movable member, spring means yieldingly holding said rods and the movable member in a normal position, means mounted on the frame for moving said rods against the action of said springs to separate said members and expand the lower ends thereof against the container walls to sustain the container in suspended relation to the frame during the filling operation, and means for vertically vibrating said frame and the container during filling of the latter.

8. In packaging apparatus, a vertically vibratory frame, container supporting members adapted for engagement within the open end of a container, and manually controllable means mounted on the vibratory frame for moving one of said members rectilinearly in the frame relative to the other member to frictionally engage said members with opposite sides of the container wall and sustain the container in suspended relation to the frame, and means for vibrating said frame and the suspended container.

9. In packaging apparatus, a vertically vibratory frame, members adapted for engagement with the wall of the container to support the same in suspended relation to the frame, one of said members being rigidly fixed in the frame, means for mounting the other of said members for rectilinear sliding movement towards and from the

fixed member, means for actuating said slidable member, and means for vibrating said frame.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

JACOB J. NEUMAN.

70

75

80

85

90

95

100

105

110

115

120

125

130