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M. GOTTEN

SACKING, PACKING, AND MIXING MACHINE

Filed March 25, 1926 2 Sheets-Sheet 1

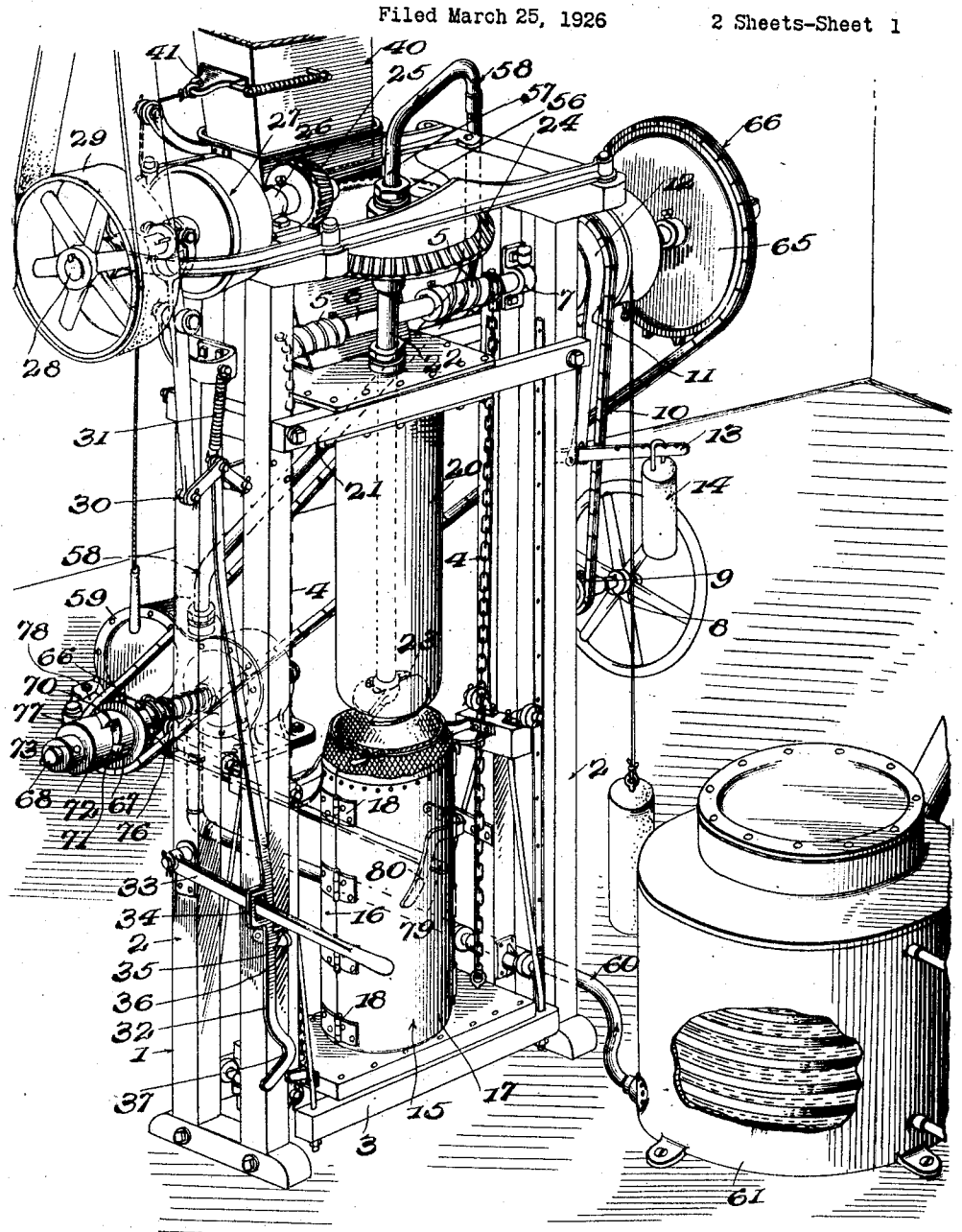


Fig. 1.

WITNESSES

W. A. Williams.

W. F. Buckley.

INVENTOR

Monroe Gotten.

BY Munn & Co.

ATTORNEYS

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M. GOTTEN

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Fig. 2.

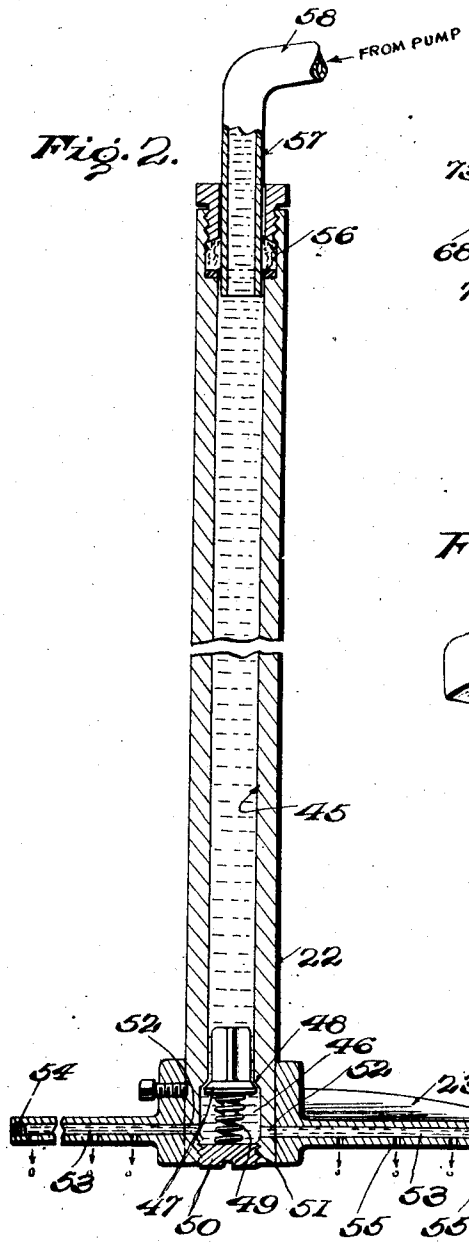


Fig. 5.

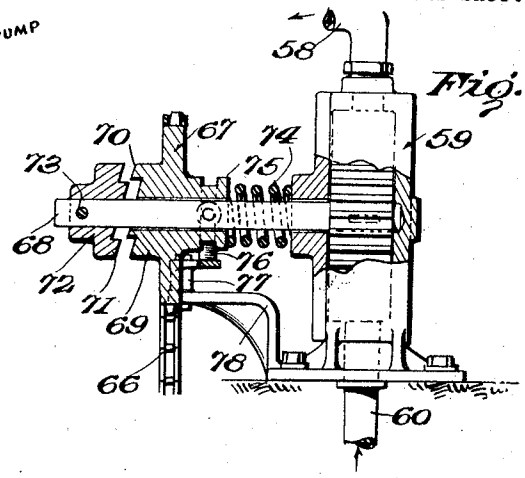


Fig. 4.

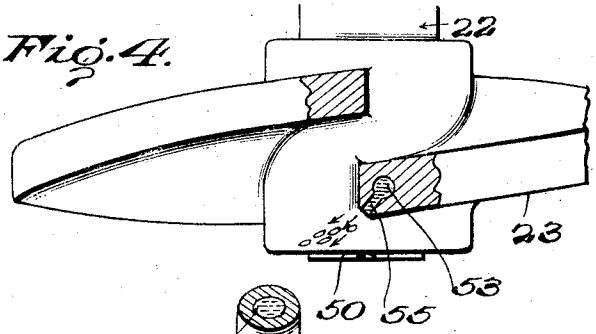
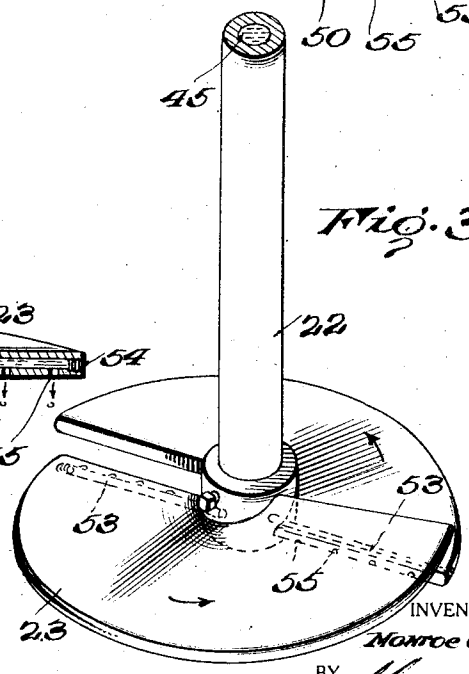


Fig. 3.



WITNESSES

W. A. Williams.

W. F. Duckhays

INVENTOR

Monroe Gotten.

BY Munn & Co.

ATTORNEYS

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UNITED STATES PATENT OFFICE.

MONROE COTTEN, OF MEMPHIS, TENNESSEE.

SACKING, PACKING, AND MIXING MACHINE.

Application filed March 25, 1926. Serial No. 97,437.

The present invention relates to an improvement in sacking, packing and mixing machines and is especially although not necessarily designed and adapted for use in conjunction with mixed feeds.

One of the principal objects of the present invention resides in the provision of a machine of this character which effects the proper admixture of a liquid such as molasses with a granular material such as cotton seed hulls, ground hay, or any other material of like physical character.

Another object of the invention is to provide a machine of the character specified wherein the molasses is mixed with the cotton seed hulls during the sacking and packing operation and in such manner as to obtain a thorough and proper incorporation of the molasses throughout the bulk of the hulls without in any way slowing up or interfering with the sacking and packing operation.

A still further object is to provide a machine having these advantages and capacities and which is of simple and durable construction, reliable and efficient in operation and easy and comparatively inexpensive to manufacture and operate.

Accordingly the present invention consists in the provision, in the usual type of sacking and packing machines, of a hollow shaft on which the packing auger is mounted, the auger having discharge passages and ports which communicate with the interior of the hollow shaft. In conjunction with this hollow shaft means is provided for feeding the molasses thereinto so that as the auger operates to effect the sacking and packing of the cotton seed hulls it also mixes therewith the molasses which is fed through the shaft and through the passages and ports of the vanes or blades of the auger. Preferably the molasses is fed under pressure through the shaft, a pump being employed to effect the feed of the molasses and being automatically driven and controlled from the operating mechanism ordinarily employed for the usual platform or table on which the sack is mounted.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:—

Figure 1 is a perspective view showing a sacking, packing and mixing machine embodying the present invention,

Figure 2 is a fragmentary detail view partly in vertical section and partly in elevation and showing the novel form of auger and auger shaft,

Figure 3 is a fragmentary detail perspective view of the auger and a portion of its shaft,

Figure 4 is a fragmentary detail view partly in perspective and partly in section showing the discharge ports of the auger, and

Figure 5 is a fragmentary detail view partly in section and partly in elevation showing the one-way clutch for driving the pump.

Referring to the drawings it will be seen that the present invention is shown embodied in a sacking and packing machine of the type widely known and used. As shown in the drawings the machine includes a frame designated generally at 1 and having vertical side rails 2 on which a platform 3 is mounted for vertical sliding or reciprocatory movement. The platform 3 is raised or elevated by means of chains 4 having their lower ends connected to the platform and having their upper ends connected to and wound about worms 5 fixed on a shaft 6 rotatably mounted in suitable bearings 7 provided on the frame. The shaft 6 is turned from a hand wheel operated shaft 8 having a sprocket wheel 9 fixed thereto, a sprocket chain 10 being trained over the sprocket wheel 9 and over a sprocket wheel 11 fixed to the shaft 6. Braking mechanism 12 is provided for the shaft 6 and includes the usual brake drum fixed to the shaft and the usual brake band cooperable with the brake drum, the braking force of the brake band being controlled by means of a tensioning lever 13 with which an adjustable weight 14 coacts.

A bag or sack enclosing case 15 is mounted on the platform and is made up of the usual sections 16 and 17 hingedly connected with each other as at 18.

A packing tube 20 is fixed to a cross member 21 embodied in the frame 1 and in this packing tube a rotatable shaft 22 operates, the shaft 22 extending above the packing tube and having a packing auger 23 fixed to the lower end thereof. A beveled gear 24 is fixed to the upper end portion of the shaft 22 and meshes with a pinion 25 fixed on one end of the shaft 26, the shaft 26 being driven through a clutch 27 from a shaft 28 on which a pulley 29 is fixed. The pulley 29 is driven from any suitable or convenient source of power. The clutch 27 is controlled by the usual system of levers 30, the system of levers 30 being biased to throw out the clutch by a spring 31 and having a platform operated lever 32 which may be shifted to position to throw in the clutch by means of a hand lever 33 fulcrumed on the frame 1 and extending through a yoke 34 provided on the lever 32. The lever 32 has a lug 35 integral therewith and designed to engage a shoulder or catch plate 36 provided on the frame 1 to hold the clutch members engaged. At its lower end the lever 32 has a curved portion 37 with which the platform 3 coacts to disengage the shoulder 35 from the catch plate 36 and permit the spring 31 to throw out the clutch 27.

The granular material to be sacked and packed is fed through a hopper 40 under the control of a manually operable slide valve 41 into the upper end of the packing tube 20.

As illustrated to advantage in Figures 2 and 3 the present invention provides the shaft 22 hollow, the shaft 22 having an axial opening 45 which is enlarged at its lower end as indicated at 46 to provide a valve chamber in which a check valve 47 operates, the check valve in its closed position engaging a seat 48 provided in the hollow shaft. A coil spring 49 is provided and has one end engaging the check valve 47 and its other end abutting the plug 50 threadedly connected with the shaft 22 as indicated at 51. By adjusting the plug 50 the tension of the coil spring 49 may be varied. The portion of the shaft 22 in which the valve chamber 46 is formed also has radial ports 52 which register with transverse passages 53 formed in the blades of the auger. The outer ends of the passages 53 are plugged as at 54 but intermediate their ends the passages 53 communicate with discharge ports 55 which lead out through the trailing edges of the blades of the auger as illustrated in Figure 4.

A stuffing box or packing gland 56 is provided at the upper end of the shaft 22 and affords a liquid tight connection between the shaft 22 and the vertical portion 57 of a liquid supply pipe 58 while permitting the shaft 22 to freely rotate relative to the portion 57 of the pipe 58. The pipe 58 leads from the discharge connection of a rotary pump 59, the pump being supplied with liquid, in the present instance molasses, from a pipe line 60 leading from a molasses heater 61 connected up to any suitable source of supply of molasses.

For the purpose of driving and automatically controlling the action of the pump 59 a sprocket wheel 65 is fixed to an extension of the shaft 6 and through a sprocket chain 66 drives a sprocket wheel 67 rotatably mounted on the shaft 68 of the pump 59. The sprocket wheel 67 has a clutch member 69 integral therewith, the clutch member 69 having ratchet teeth 70 cooperable with similar ratchet teeth 71 formed on a clutch member 72 fixed to the shaft 68 as by means of a pin 73. An expansion coil spring 74 urges the clutch member 69 toward the clutch member 72. The clutch members 69 and 72 provide a one-way clutch when permitted to engage, that is, when the sprocket wheel 67 is turned in one direction the teeth 70 of the clutch member 79 will play loosely over the teeth 71 whereas when the sprocket wheel is turned in the other direction the teeth 70 and 71 will engage to positively connect the clutch members and cause the shaft 68 to be driven from the sprocket wheel 67.

In order to automatically disengage the clutch members 69 and 72 at the proper time in the cycle of operations, when this is desired, the hub of the sprocket wheel 67 has a grooved collar 75 integral therewith and with which a fork 76 on a lever 77 coacts, the lever 77 being fulcrumed on a bracket 78 and having its end 79 positioned to be engaged by a cam 80 carried by the platform 3. When the cam 80 engages the lever 77 it shifts the lever to disengage the clutch members 69 and 72 against the action of the spring 74.

In operation the sack or other container is mounted on the case 15 while the platform 3 is in the position shown in Figure 1. The operator then turns the hand wheel operated shaft 8 which rotates the shaft 6 and by winding the chains 4 on the worms 5 elevates the platform 3 during which operation the packing tube 20 telescopes into the sack or container mounted on the case 15. When the platform 3 has been so elevated its downward movement is resisted by the braking mechanism 12. Of course it is to be understood that in accordance with the usual practice the platform 3 is counterbalanced by means of the usual counterweights. The operator then opens the slide valve 41 to permit the material such as cotton seed hulls, ground hay or the like, to flow through the chute 40 into the packing tube 20 and thence into the sack or container. When the valve 41 is opened the operator also manipulates the lever 33 to engage the members of the cone clutch 27 and thereby

cause the power to be applied to the auger shaft 22 as a consequence of which the auger shaft and the auger thereon are turned. The rotation of the auger causes the material flowing through the tube 20 to be packed into the sack or container and as the material is packed in the container the downward thrust which the auger exerts causes the platform 3 to gradually descend against the action of the braking mechanism 12. At this point it will be understood that the tension of the braking mechanism determines the density with which the material is packed. When the operator throws in the clutch 27 to actuate the auger this results in the lowering of the platform and of course the lowering of the platform is accompanied by a rotation of the shaft 6 since the chains 4 must unwind when the platform is lowered. The rotation of the shaft 6 occurring upon lowering of the platform 3 results in an actuation or driving of the pump since the shaft 6 is geared to the pump shaft 68 by the chain and sprocket gearing and by the one-way clutch. Usually the actuation of the pump lags slightly behind the operation of the auger, this being due to the fact that the teeth 70 and 71 of the one-way clutch must come into engagement before the pump can be actuated. Such lagging is desirable as it permits the bottom of the sack or container to be covered with the granular material before the molasses starts to flow. When the pump is actuated it draws a supply of heated molasses from the heater 61 and forces the molasses through the pipe 58 down into the hollow shaft 22, the molasses unseating the check valve 47 and passing into the valve chamber 46 from whence it flows out through the ports 52, passages 53 and discharge ports 55. Thus as the blades of the auger pack the cotton seed hulls or other material they also mix molasses therewith. The location of the ports 55 at the trailing edges of the blades of the auger precludes clogging of these ports. Just before the platform has reached the lower limit of its travel, and this is just before the bag or sack has been completely filled, the cam 80 on the platform engages the end 79 of the clutch control lever 77 to shift this lever 77 and disengage the clutch member 69 from the clutch member 72, thereby stopping the pump. This permits a small amount of cotton seed hulls, ground hay or the like, which is unmixed with molasses, to be placed in the top of the bag, thereby avoiding the sticking up of the upper end of the bag. The periphery of the bag is not stuck up with molasses because the outermost port 55 is located inwardly of the periphery of the auger. Of course the pump would stop when the platform 3 reached the lower limit of its travel since the shaft 6 would then cease to turn but for the reasons stated it will usually be preferred to positively disconnect the clutch members at the time stated.

When the table 3 ascends at the beginning of the operation the pump is not actuated since the teeth 70 play idly over the teeth 71 at this time. As soon as the pump stops running the flow of molasses is stopped by the action of the check valve 47 which closes by virtue of the influence of the spring 49 when the pump stops.

Thus by providing the check valve 47 in the lower end of the hollow auger 22 the molasses is not permitted to spill on the platform or on the bag but is held in the hollow auger.

The merits and value of molasses as an ingredient of mixed feed is now well understood and the present invention provides an easy and practical mode of mixing the molasses with the granular ingredients of the feed during the sacking and packing operation.

I claim:

1. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a hollow auger shaft and an auger mounted thereon and having passages communicating with the interior of the hollow shaft and terminating in discharge ports, and means for supplying a liquid to said shaft.

2. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a packing auger having discharge means, and means for supplying a liquid to said discharge means.

3. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a hollow auger shaft, an auger mounted thereon and having discharge ports in its blades communicating with the interior of the hollow shaft, and means for supplying a liquid to the hollow shaft.

4. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a hollow auger shaft, an auger mounted thereon and having discharge ports in the trailing edges of its blades and having passages communicating with the discharge ports and with the interior of the hollow shaft, and means for supplying a liquid to the hollow shaft.

5. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a hollow auger shaft, an auger mounted on the lower end of the shaft and having discharge ports communicating with the interior of the shaft, means for supplying liquid under pressure to the upper end

of the shaft, and a check valve in the hollow shaft above the point at which the discharge ports of the auger communicate therewith.

6. In a machine of the character described, a hollow auger shaft, an auger mounted thereon and having discharge ports communicating with the interior of the hollow shaft, and means for supplying liquid into the hollow shaft and out through the discharge ports of the auger.

7. In a machine of the character described, an auger shaft having an opening extending therethrough and an auger fixed to the shaft and having blades formed with discharge ports communicating with the opening of the shaft and leading out through the portion of the blades presented to the material upon which the auger blade operates.

8. In a machine of the character described, a hollow auger shaft, an auger mounted on the lower end thereof and having discharge ports in its blades communicating with the interior of the hollow shaft, a stuffing box at the upper end of the hollow shaft, a pipe having a portion fitted in the stuffing box and a pump connected with the pipe for supplying liquid under pressure thereto.

9. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a hollow auger shaft and an auger mounted thereon and having passages communicating with the interior of the hollow shaft, and a pump for supplying liquid under pressure to the hollow shaft.

10. In a machine of the character described, means for sacking and packing the granular material and mixing a liquid therewith including a hollow auger shaft, an auger mounted on the lower end of the shaft, said shaft having a valve chamber in its lower portion and having ports communicating with the valve chamber, said auger having passages terminating in discharge ports, the passages communicating with the ports of the shaft, a spring seated check valve operating in the valve chamber and seating above the ports of the shaft, and means for supplying liquid under pressure to the upper end of the hollow shaft.

11. In a machine of the character described, means for sacking and packing a granular material and mixing a liquid therewith including a reciprocable platform, means for raising and lowering the platform including a shaft, a hollow auger shaft, an auger on the auger shaft having discharge means communicating with the interior of said auger shaft, means for supplying liquid under pressure to the upper end of the auger shaft during the sacking and packing action thereof and including a pump having a discharge line connected with the upper end of the hollow auger shaft, and means for driving the pump from the shaft of the raising and lowering means of the platform and including a one-way clutch.

12. A machine of the character described and in accordance with claim 11 and further characterized by the provision of a throw-out for the clutch, and means moving in synchronism with the platform for actuating the throw-out.

13. In a machine of the character described, means for sacking and packing granular material including a hollow auger shaft, an auger mounted thereon and having discharge ports communicating with the interior of said hollow shaft, a movable platform for supporting the sack or the like, an operating shaft connected with and moving in synchronism with said platform, a pump for supplying liquid to the hollow auger shaft, and means for operating the pump from said operating shaft.

MONROE GOTTEN.