Oct. 27, 1925. 1,558,751

J. NUESKE, JR

CORK PACKING MACHINE

Filed May 28, 1924 3 Sheets-Sheet 1

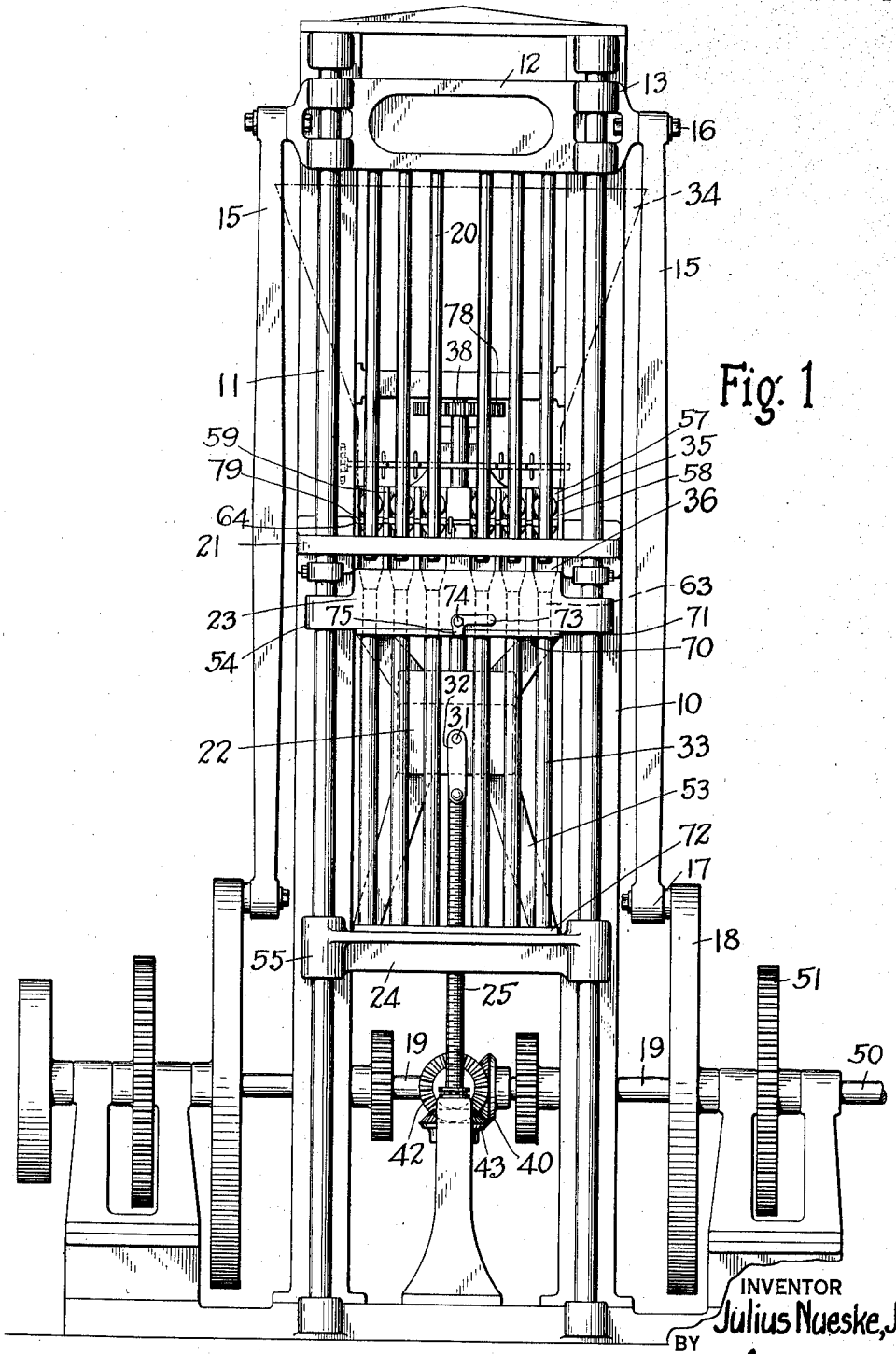

Fig. 1

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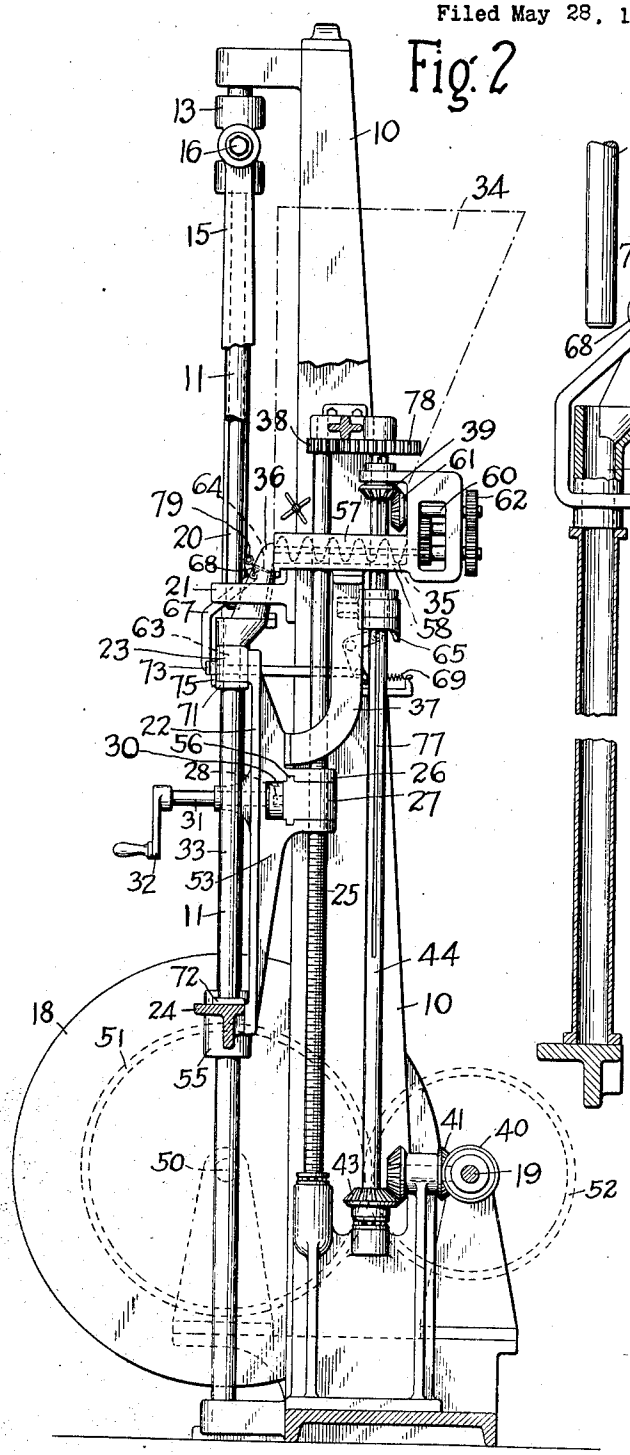
Fig. 2



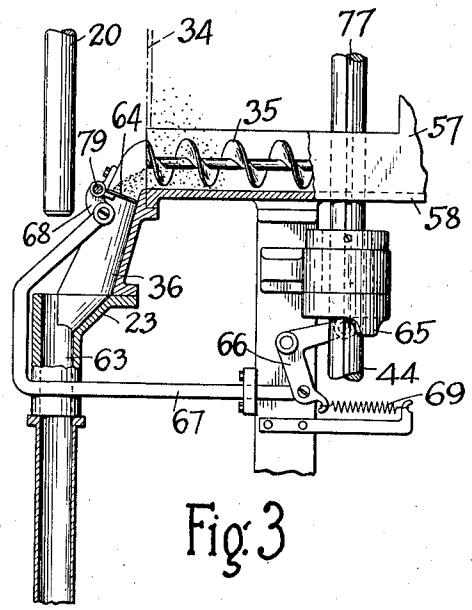
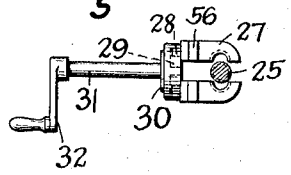


Fig. 3

Fig. 5



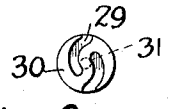


Fig. 6

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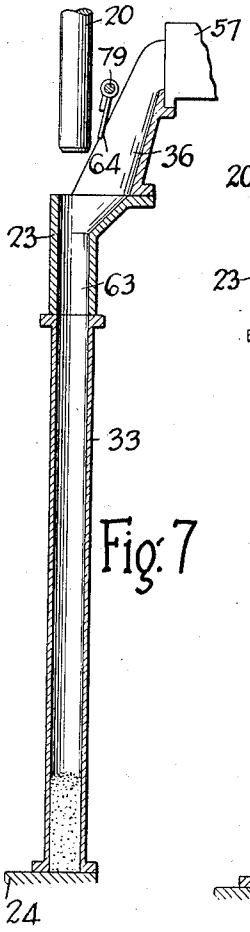

Fig. 7

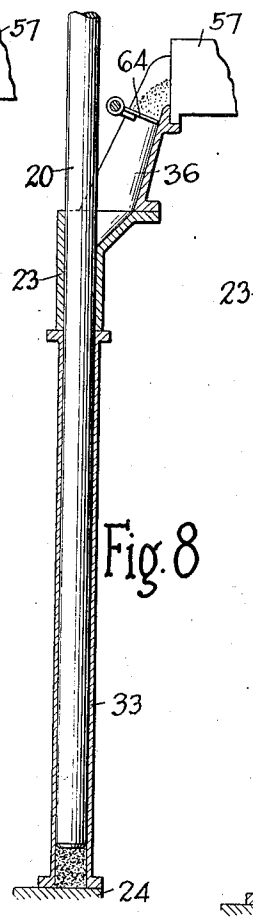

Fig. 8

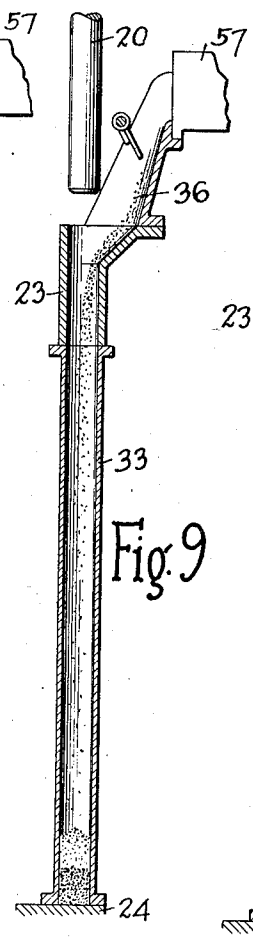

Fig. 9

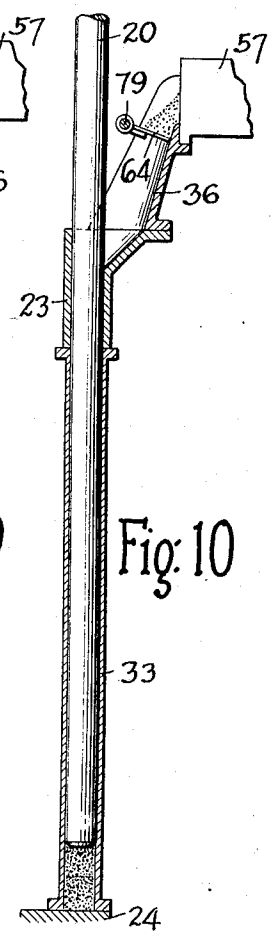

Fig. 10

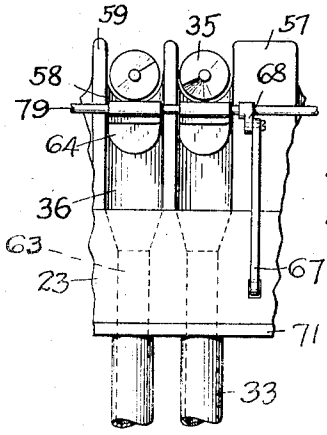

Fig. 4

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UNITED STATES PATENT OFFICE.

JULIUS NUESKE, JR., OF BROOKLYN, NEW YORK, ASSIGNOR TO L. MUNDET & SON, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

CORK-PACKING MACHINE.

Application filed May 28, 1924. Serial No. 716,288.

To all whom it may concern:

Be it known that I, JULIUS NUESKE, JR., a citizen of the United States, residing at the city of New York, in the county of Kings, borough of Brooklyn, and State of New York, have invented certain new and useful Improvements in Cork-Packing Machines, of which the following is a specification.

This invention relates to machines for making rods of composition cork or the like, and as carried out in the illustrated embodiment thereof comprises mechanism wherein in each cycle of operations, treated cork particles are continuously fed at a uniform rate, the stream of particles then being dammed until a predetermined quantity has accumulated, after which the charge of accumulated material is fed preferably by gravity into a continuously moving tube, the charge being compressed in said tube by a plunger having a predetermined constant stroke. In what follows, the term "cork" will be used to refer to the cork particles or the granulated or comminuted cork from which the rods are made. It will be understood that the cork is first suitably treated in a manner well known in the art, to cause the particles to adhere under compression, before being fed to the machine.

In the drawings,

Fig. 1 is a front elevation of a machine embodying my invention.

Fig. 2 is a side elevation of the same.

Fig. 3 is a side elevation partly in section, of the cork feeding means.

Fig. 4 is a front elevation of the same.

Fig. 5 is a top plan view of the means for locking the movable frame of the machine in operative position.

Fig. 6 is a rear view of the locking cam.

Fig. 7 is a vertical section of the supply chute and of the packing tube showing the position of the parts immediately after a charge of cork particles has been fed into said tube.

Fig. 8 is a similar view, showing the cork in the act of being compressed.

Fig. 9 is a similar view during the operation of feeding the cork.

Fig. 10 is a similar view showing a second supply of cork being compressed.

In the preferred embodiment of my invention, a multiplicity of plunger rods are each so mounted as to make simultaneously a complete reciprocation of unchanging length of stroke for each cycle of operations. Toward this end, the main frame 10 carries a pair of upright guides 11 on which is slidably mounted the cross-head 12 as by means of the sleeves 13 through which said guides pass. For operating said cross-head, each of a pair of crank rods as 15 is suitably secured at one end as 16 to said cross-head, the other end 17 of each of said rods being attached to the crank 18. Said crank is mounted on the crank shaft 50, and is driven through a suitable gear 51 on said shaft 50, meshing with the gear 52 on the drive shaft 19, which, in turn, is driven from a source of power not shown. Suitably carried by said cross-head 12 is a number of plunger rods 20, which are preferably guided in their reciprocatory movement by the guide bar 21 arranged transversely of the main frame 10. It will be seen that on each revolution of the crank shaft 50, the cross-head 12, and the plunger rods 20 carried thereby, make a complete reciprocation, of which the length fo stroke is always constant.

A predetermined accurately measured charge is fed into each of the molding tubes 33 at each revolution of the crank shaft 50, the plunger 20 serving to compress the cork to a predetermined density by reason of its predetermined constant stroke and the predetermined downward movement of the tube 33 at each stroke. The frame 22 is mounted for positive movement downwardly at a uniform rate during the operation of the machine, and is designed to carry the molding tubes 33 together with the mechanism for feeding the charge into said tubes. The total distance which said frame and the tubes carried thereby are moved on each complete stroke of the plunger 20 is always exactly

equal to the height of a compressed charge, so that the top of any uncompressed charge is always at a given level at the moment before compression thereof occurs, and the top of the compressed charge is always at another definite level at the moment after compression of the charge is completed. Said frame 22 comprises the charge guide 23, the anvil 24, and the cross braces 53 suitably tying said charge guide and anvil together. For guiding the frame 22 in the movement thereof, suitable sleeves as 54 and 55 on the guide and anvil of said frame respectively engage the stationary uprights 11. For actuating the frame when desired, the lead screw 25 operating in the extension 26 of said frame is adapted to have said extension clamped into operative engagement therewith, as by means of a suitable split nut 27. Said split nut has pins as 28 projecting from each member thereof, and operating in the cam slots 29 of the grooved cam 30, and is guided in its movement into and out of engagement with said screw by the guides 56 operating in suitable slots in said extension 26. Said cam 30 may be manually rotated when desired by means of the cam shaft 31, supported in the frame 22, and having a crank 32 secured to the extremity thereof.

Means are provided for positively feeding a continuous stream of cork of predetermined cross sectional area toward each of the mold tubes 33 during the packing of said tubes. Said means comprises in part a suitable hopper 34, into which the material may be fed in any desired manner, and the measuring feed screw 35 supported in a suitable box 57 closing the lower end of, and receiving cork from said hopper. Said screw is preferably placed close to the rounded bottom 58 of said box 57, and is separated from the adjacent screw by partitions as 59. It will be seen that since the screw 35 is entirely surrounded by cork, and since the bottom 58 and the walls 59 of said box prevent the cork from leaving the screw, a helical mass of cork is advanced by said screw and the quantity of cork fed on each revolution thereof is constant. Said feed screw 35 is operated on the rotation of the main shaft 19 through a suitable train of gears 40, 41, and 42 operatively connected to the bevel gear 43 at the lower end of the shaft 44, and the bevel gear 39 at the upper end of said shaft 44. The bevel gear 39 is keyed to the keyway 77 of the shaft 44 in such a manner as to allow said gear to slide along the shaft while rotating therewith. In the box 57 carried by the bracket 37 on the frame 22 is mounted the shaft 60 carrying at one end the bevel gear 61 meshing with the bevel gear 39, and at the other end, the gear 62 for driving the various screws through suitable spur gears operatively connecting said gear 62 and said screws. Said gears and said screws 35 are so proportioned that at each cycle of operations the screws 35 are given a predetermined number of turns sufficient to feed that quantity of cork which makes a rod section of the desired density on the compression of said cork by the plungers 20, as hereinbefore described.

After the ejection of the cork in a stream from the screw 35, said cork drops into a guide chute 36 provided therefor, and thence passes into the opening 63 in the charge guide 23, if allowed to do so by the trap gate 64. Said trap is suitably pivoted as at 79, and shaped to close said chute for preventing the passage of cork when desired as will be more fully described hereinafter. Since the openings 63 are in registration with the tube openings, the cork, when released by the trap 64 drops to the bottom of the tube ready for the compressing operation. (Figs. 7 to 10 inclusive.)

In order to feed a definite, accurately measured and unvarying charge of cork for compression at each stroke of the plunger 20, not only is the cork fed in a constant stream at a constant rate, but said stream is dammed up by the trap gate 64 during that part of the cycle in which the plunger is in the tube 33, so that a predetermined quantity of cork accumulates behind said trap. After the plunger leaves the tube (Fig. 9) the stream is released by swinging the trap about its pivot 79 as by means of the cam 65 on the shaft 44 through the bell-crank lever 66, the link 67 and the arm 68 on said trap, the spring 69 closing said trap and cutting off the cork supply as the plunger begins its descent.

It will be noted that the box 57 together with the chute 36, the trap 64, and the charge guide 23 all move together as a unit with the frame 22 by which said parts are carried, on the rotation of the lead screw 25 if the split nut 27 is clamped to said lead screw.

The frame 22 is continuously fed downwardly during the formation of the cork rod on the inside of the tube 33, as has been explained above, by means of the lead screw 25. Said screw is actuated through the pinion 38 at the upper end thereof, meshing with the gear 78 at the upper end of the upright shaft 44.

It is to be noted that the feed of said frame 22 is such that the height of the material in the tube 33 is always the same at corresponding positions of the plunger 20, no matter how much of said tube has been previously packed.

It will be understood that the lead screw 25 is continuously operated during the entire cycle of operations but that the frame 22 receives movement from said lead screw only when the split nut 27 is clamped thereto, as is done when it is desired to feed the

frame continuously downwardly during the operation of the machine for packing the tubes 33.

The tube frame 70 comprises preferably an upper plate 71, and a lower plate 72. A number of molding tubes 33 are suitably secured in suitable holes in said plates, said holes being in registration with the openings in said tubes, which, together with said plates form a frame unit whereby the finished rods together with the tubes in which they are packed may be removed from the machine when said rods are finished. Said frame 70 is made of substantially the same length as the distance between the charge guide 23 and the anvil 24, whereby said frame may be readily inserted in the space between said guide and anvil. A locking handle 73 pivoted to the charge guide at 74 and having a cam 75 extending therefrom serves to maintain said frame 70 in position during the operation of the machine, while allowing the ready removal of said tube frame after the rods have been packed therein. This is accomplished by merely turning said handle into a position in which the cam 75 is disengaged from the upper plate 71, and the frame 70 thereby released for removal.

The operation of my improved machine is as follows:

Cork having been placed in the hopper 34, the split nut 27 is disengaged from the lead screw by turning the crank 32 in a counter clock-wise direction, thereby freeing the frame 22 for manual movement. A tube frame 70 having been placed in position between the charge guide 23, and the anvil 24 and locked in place by the handle 73, the frame 22 is now lifted into its uppermost position and locked to the lead screw by turning the crank handle 32 in the proper direction. The main shaft 19 now being set into motion, the feed screws 35 begin to feed cork in continuous streams at a constant rate. It being assumed that the cross-head 12 and the plunger rods 20 carried thereby are near their uppermost positions, the gate traps 64 are open and allow the cork to drop directly to the bottom of the tubes 33. As the plungers 20 descend, the cam 65 through the intervening mechanism closes the traps 64 and the streams of cork are thereby temporarily dammed up. It will be understood that during this time the frame 22 is travelling downwardly at a continuous rate, which rate, of course, is much slower than that a which the plunger rods 20 travel downwardly. As soon as the cork streams are shut off from the tubes 23, the cranks 18 give the plunger rods 20 a rapid downward stroke, causing said plungers to overtake and to enter the tubes 33 and to compress the cork in said tubes from the position indicated in Fig. 7, substantially to the position indicated in Fig. 8. The amount of cork fed at each stroke being always the same, said cork always adds the same height of loose cork to the already packed portion of the rods.

The distance which the frame 22 is fed at each stroke is the additional height of rod packed on each stroke, so that the plunger stroke being constant, it follows that the density of the completed rod must be the same throughout. After the charge has been compressed, the plunger rods are raised out the tubes by the cranks 18, and the trap gates 64, which have been closed during the compressing operation, are again opened to charge the tubes 33 with the material which has meanwhile accumulated behind said traps (Fig. 9) and the operation repeated (Fig. 10) until the tubes 33 are completely packed, at which time the frame 22 is in its lowest position. The tube frame 70 is then removed from the machine and an empty tube frame substituted and locked into place, the frame 22 disengaged from the lead screw and raised into its uppermost position, and the cycle of operations repeated.

It will be understood that any means well-known in the art may be employed for stopping rotation of the shaft 19, the consequent feeding of cork and the rotation of lead screw 25, when the tubes 33 have been completely packed, and said means have not, therefore, been illustrated.

It will be further understood that the form of my invention illustrated is the preferred embodiment thereof, and that numerous changes therein may be made without departing from the scope of my invention as defined in the following claims.

I claim:

1. In a machine of the character described, a tube, a plunger adapted to enter said tube for compressing the material therein, and positively acting means operatively connected to said tube and independent of said plunger for withdrawing said tube and the contents thereof axially of and away from said plunger.

2. In a machine of the character described, a tube, a plunger adapted to enter said tube for compressing a charge in said tube, and means operatively connected to said tube and independent of said plunger for continuously moving said tube away from said plunger in the direction of the axes of said plunger and said tube a distance equal to the height of a compressed charge in said tube on each stroke of said plunger.

3. In a machine of the character described, a removable tube frame comprising an upper member, a lower member, tubes secured in said members, means for charging said tubes with material, plungers adapted to enter said tubes for compressing said material, and positively acting means for continu-

ously moving said frame away from and axially of said plungers.

4. In a machine of the character described, a tube, means for charging said tube with a predetermined quantity of material, a plunger having a constant reciprocatory stroke adapted to enter said tube only for compressing said material, and positively acting means independent of said plunger for feeding said tube axially away from said plunger.

5. In a machine of the character described, a tube, means for charging said tube with a predetermined quantity of material, means for compressing said material, a lead screw, and means operatively connecting said tube with said lead screw.

6. In a machine of the character described, a tube, means for charging said tube with a predetermined quantity of material, a plunger having a predetermined constant reciprocatory stroke for compressing said material, a lead screw, and means operatively connecting said tube with said lead screw for moving said tube axially a predetermined distance at each reciprocation of said plunger.

7. In a machine of the character described, a tube, means for feeding a stream of material continuously at a constant rate toward said tube, means for charging said tube intermittently with a predetermined quantity of material from said stream, a plunger having a constant reciprocatory stroke, adapted to enter said tube for compressing said material, and means independent of said plunger for positively feeding said tube axially away from said plunger.

8. In a machine of the character described, a tube, means for feeding a stream of material at a constant rate toward said tube, means for intermittently damming and releasing said stream for charging said tube with a predetermined quantity of material, means for compressing the charge of material in said tube, and means for continuously withdrawing said tube from said compressing means.

9. In a machine of the character described, a tube, means for feeding a stream of material at a constant rate toward said tube, means for alternately damming and releasing said stream, for charging said tube with a predetermined quantity of material, means for compressing a charge of material in said tube, and means for continuously withdrawing said tube from said compressing means between charges a distance equal to the height of a compressed charge. comprising a lead screw, and means operatively connecting said tube with said screw.

10. In a machine of the character described, a tube, means for feeding a stream of material at a constant rate toward said tube, comprising a helical screw, a trough partly enclosing said screw, a hopper closed by said trough, and means for continuously rotating said screw, means for alternately damming and releasing said stream, for charging said tube with a predetermined quantity of material, means for compressing a charge of material in said tube, and means for continuously withdrawing said tube from said compressing means.

11. In a machine of the character described, a tube, a helical screw for continuously feeding a stream of material toward said tube, means for alternately damming and releasing said stream, for successively charging said tube with a predetermined quantity of accumulated material from said stream, a reciprocatory plunger for compressing the successive charges of material in said tube, a frame removably carrying said tube, a lead screw, and means on said frame operatively engageable to said screw for continuously moving said frame away from said plunger.

12. In a machine of the character described, a tube, means for feeding a continuous stream of material toward said tube, means for intermittently charging said tube with a predetermined quantity of material from said stream, a reciprocatory plunger having a constant stroke adapted to enter said tube for compressing the charge of material in said tube to a predetermined height and means for moving said tube axially of said tube a distance equal to said predetermined height at each reciprocation of said plunger.

13. In a machine of the character described, a tube, means for feeding a continuous stream of material toward said tube comprising a helical screw, means for confining said material in said screw, and means for continuously rotating said screw, means for charging said tube with material from said stream, means for compressing said material and means for continuously withdrawing said tube from said compressing means.

14. In a machine of the character described, a tube, means for feeding a continuous stream of material toward said tube comprising a helical screw, means for confining the material in said screw until ejected, and means for continuously rotating said screw, means for charging said tube with material from said stream, means for compressing said material, and means for moving said tube axially a predetermined distance between charges.

15. In a machine of the character described, a tube, means for feeding a continuous stream of material toward said tube comprising a helical screw, means for confining said material in said screw until ejected, and means for continuously rotating said screw, means for charging said tube with material from said stream, means for compressing

said material, and means for continuously moving said tube away from and axially of said tube between charges a distance equal to the height of a compressed charge, comprising a lead screw and means operatively connecting said tube with said screw.

16. In a machine of the character described, a tube, means for feeding a continuous stream of material at a constant rate toward said tube, means for alternately damming and releasing said stream for charging said tube with a predetermined quantity of material, a reciprocatory plunger having a constant stroke adapted to enter said tube for compressing said material, and means for continuously withdrawing said tube from and axially of said plunger comprising a frame for removably carrying said tube, a lead screw, and means on said frame operatively engageable to said lead screw.

17. In a machine of the character described, a tube, and means for charging said tube with a predetermined quantity of material at regular intervals, comprising means for continuously advancing a stream of material at a uniform rate, a pivoted, oscillatory trap adapted to be alternately interposed in and removed from the path of said stream, for accumulating a charge of material, a revoluble cam, means operatively connecting said cam and said trap for continuously operating said trap, and a chute for directing said stream into said tube.

18. In a machine of the character described, a tube, means for charging said tube comprising means for advancing a continuous stream of material, means interposed in the path of said stream for alternately damming and releasing said stream and means for directing the released material into said tube, a plunger for compressing said material in said tube, and means independent of said plunger for moving said tube axially of said tube.

19. In a machine of the character described, a tube, a frame carrying said tube, positively acting means for continuously moving said frame downwardly, and means for feeding material to said tube carried by said frame.

20. In a machine of the character described, a continuously movable frame, a tube frame adapted to be removably locked to said movable frame, a multiplicity of tubes in said tube frame, means for feeding a predetermined charge of material to each of said tubes, and a multiplicity of reciprocatory plungers of uniform length and stroke each adapted to enter one of said tubes for compressing the material therein to the same level.

21. In a machine of the character described, a continuously movable frame, a tube frame adapted to be removably locked to said movable frame, a multiplicity of tubes in said tube frame, means for feeding a predetermined charge of material to each of said tubes, a multiplicity of reciprocatory plungers of uniform length and stroke each adapted to enter one of said tubes for compressing the material therein to the same level, and means for continuously moving said movable frame away from said plungers a total distance equal to the height of a compressed charge on each reciprocation of said plungers.

22. In a machine of the character described, means adapted to receive a charge of material, and means for intermittently charging said receiving means, comprising means for feeding a stream of material, at a uniform rate, a trap, a revoluble cam, a bell-crank lever operated by said cam, and means operatively connecting said lever and said trap, for giving said trap a complete oscillatory stroke, at regular intervals to cause said trap to dam said stream until a predetermined quantity of material has accumulated behind said trap and to release said accumulated material to flow into said receiving means.

23. In a machine of the character described, a frame, means for receiving a charge of material removably carried by said frame, means for feeding said material to said receiving means carried by said frame, means for compressing said charge, and positively acting means operatively connected to said frame for positively moving said frame axially of said compressing means.

24. In a machine of the character described, a frame, a tube removably carried by said frame, means for charging said tube with material from a continuous stream carried by said frame, a reciprocatory plunger for compressing the charge of material in said tube, and means for moving said frame away from said plunger a distance equal to the height of a compressed charge at each reciprocation of said plunger.

25. In a machine of the character described, a frame, a tube removably carried by said frame, means for charging said tube with material from a continuous stream carried by said frame, a reciprocatory plunger for compressing the charge of material in said tube, means for moving said frame away from said plunger a distance equal to the height of a compressed charge at each reciprocation of said plunger comprising a lead screw, and means for operatively connecting said frame to said screw.

26. In a machine of the character described, a movable frame, a tube frame, a multiplicity of tubes in said tube frame, means for removably securing said tube frame to said movable frame, a multiplicity of helical screws for feeding a stream of material toward each of said tubes, chutes

for directing said material toward said tubes, a trap adapted to be interposed in the path of said stream in each of said chutes, said screws, chutes and traps being carried by said movable frame, a multiplicity of reciprocatory plungers each adapted to enter one of said tubes for compressing the material therein to the same predetermined level, a lead screw, a nut on said movable frame, and means for operatively connecting said nut to said lead screw for continuously moving said frame a distance equal to the height of the material compressed in each tube at each reciprocation of said plungers.

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