

J. J. SULLIVAN.
FEEDING MECHANISM.

APPLICATION FILED AUG. 1, 1907. RENEWED SEPT. 13, 1909.

1,001,231.

Patented Aug. 22, 1911.

3 SHEETS—SHEET 1.

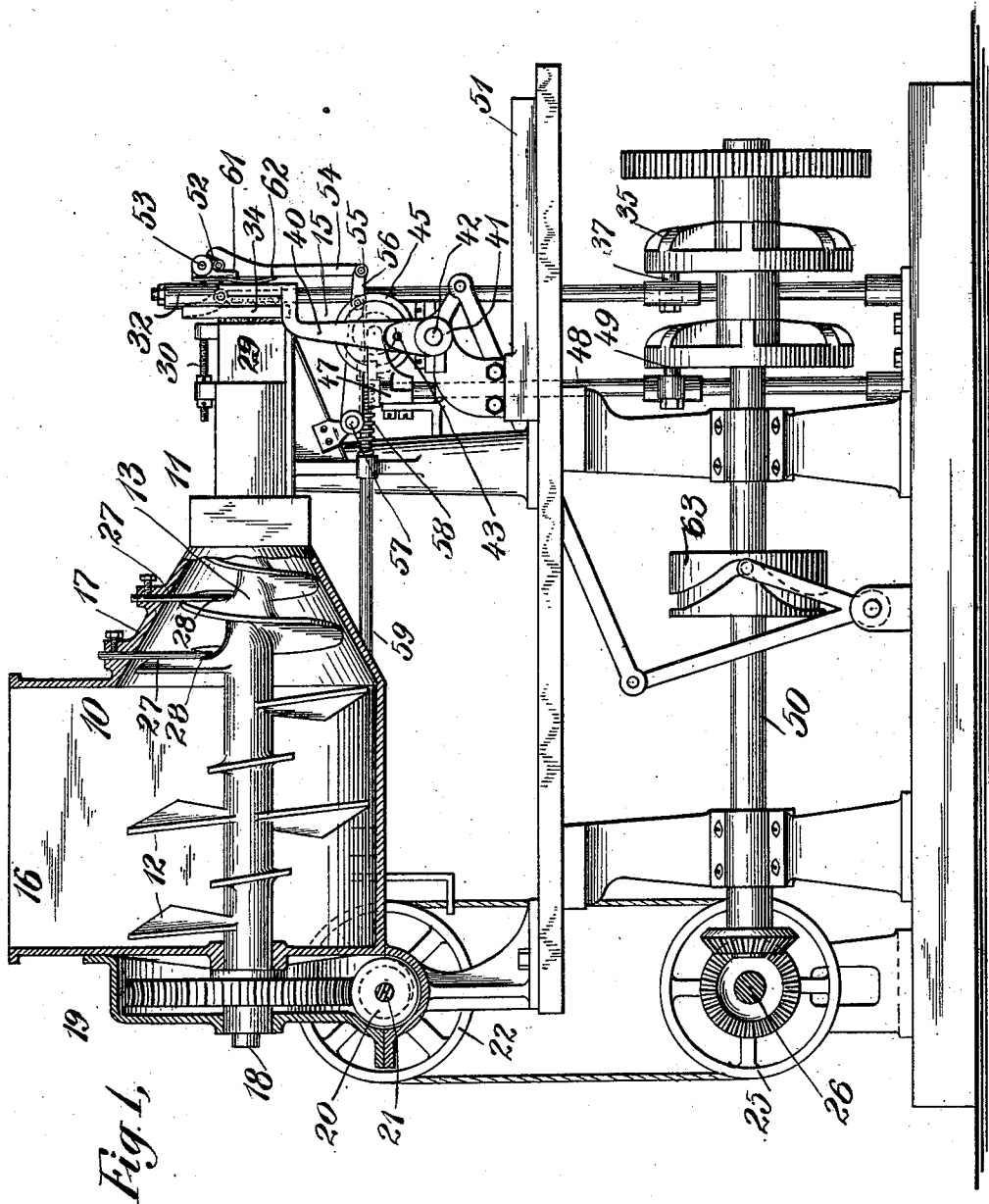


Fig. 1.

WITNESSES:

Gus. A. Klimick
Lyman B. Andrews Jr.

INVENTOR

James J. Sullivan
BY
Chapin Raymond
his ATTORNEYS

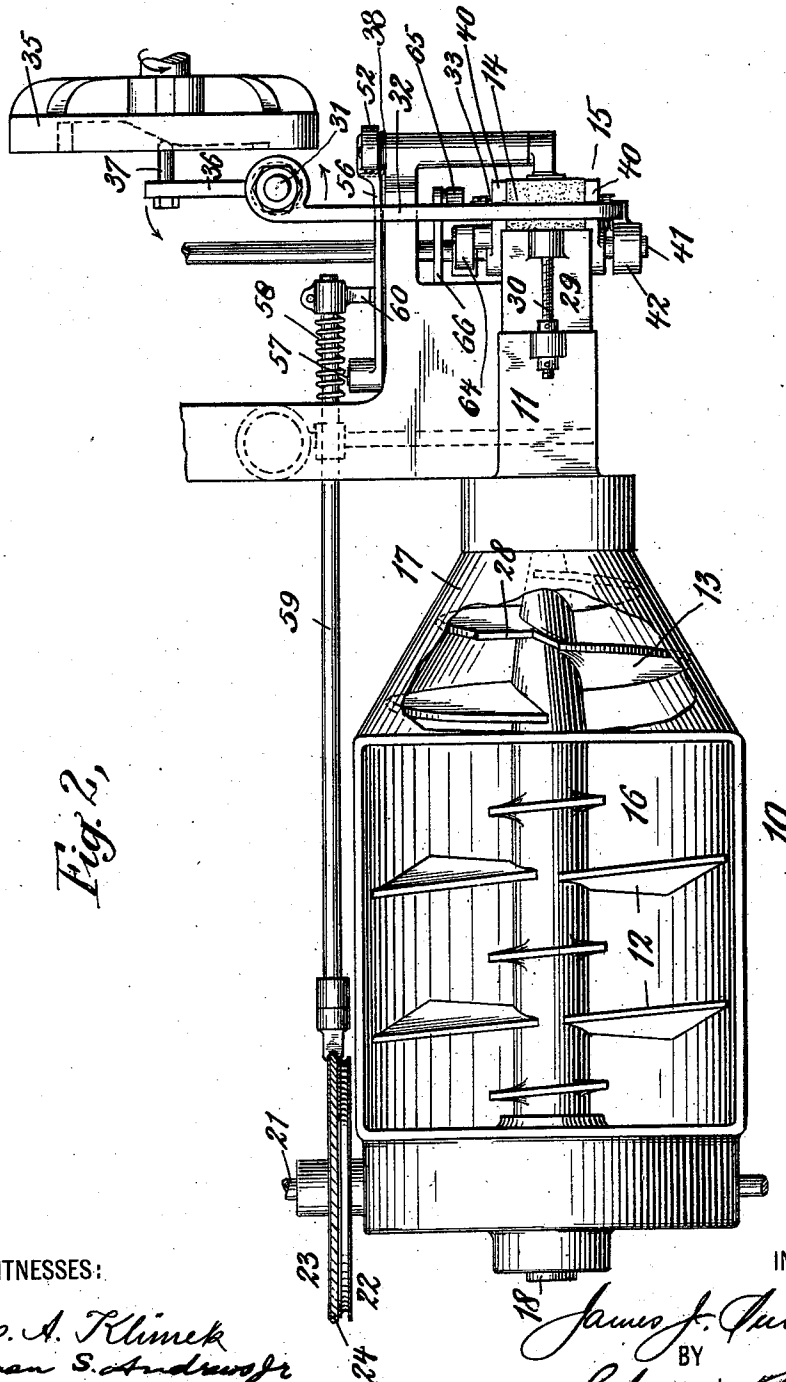
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WITNESSES:

Gus. A. Klimek
Gman S. Andrews

INVENTOR

James J. Sullivan
BY
Chapman & Haywood
ATTORNEYS

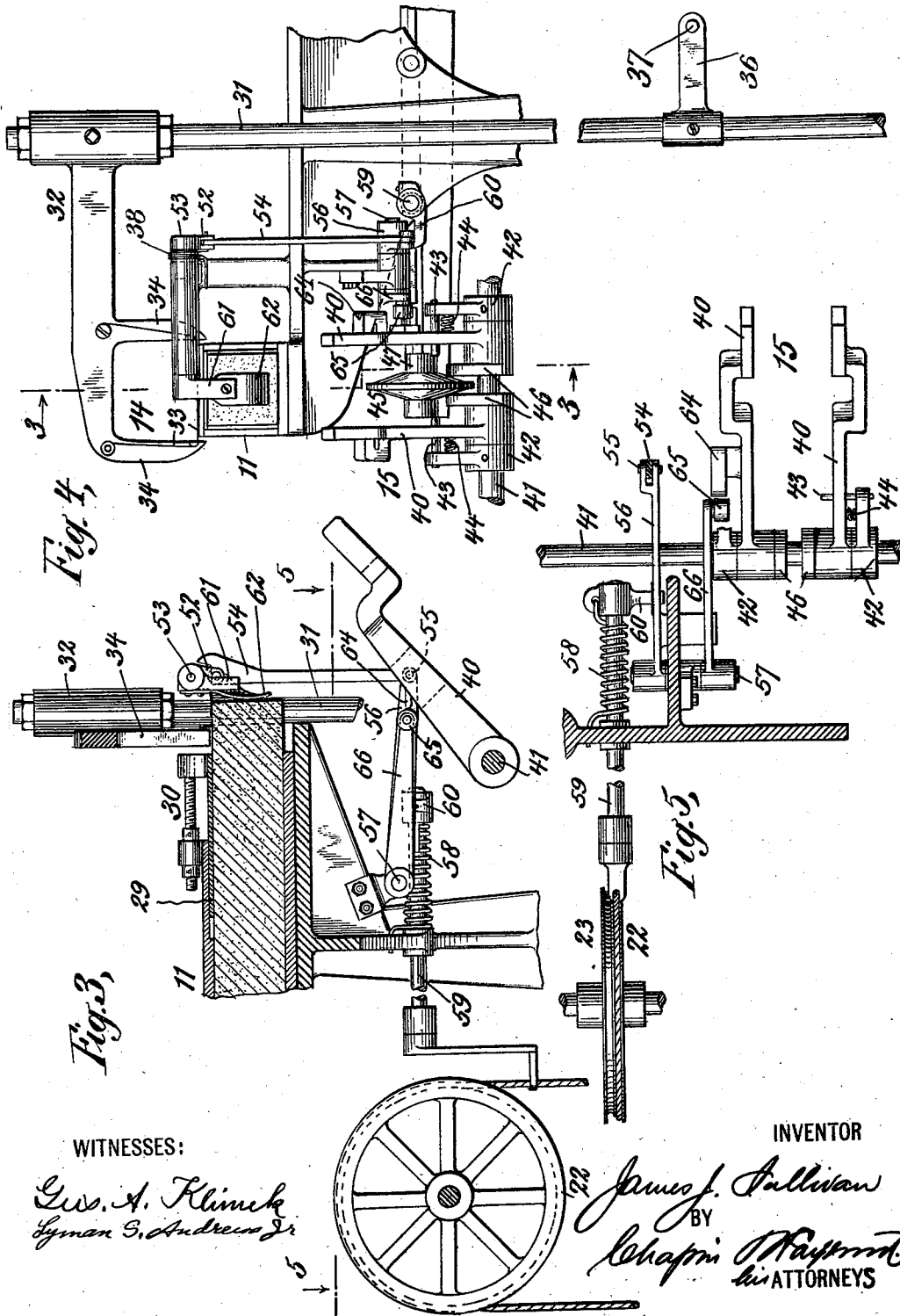
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WITNESSES:

Geo. A. Klimck
Lyman S. Andrews Jr.

INVENTOR

James J. Sullivan
BY
Chapin Raymond
his ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES J. SULLIVAN, OF LONG ISLAND CITY, NEW YORK.

FEEDING MECHANISM.

1,001,231.

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Application filed August 1, 1907, Serial No. 386,598. Renewed September 13, 1909. Serial No. 517,478.

To all whom it may concern:

Be it known that I, JAMES J. SULLIVAN, a citizen of the United States of America, and a resident of Long Island City, county of Queens, and State of New York, have invented certain new and useful Improvements in Feeding Mechanism, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to an improved means for feeding plastic material and segregating predetermined portions thereof, whereby the same may be presented to wrapping or other mechanism for further handling, and my invention is particularly adapted to the handling of a soft yielding material, such as yeast.

The main object of my present invention is to automatically form a mass of plastic material, such as yeast, into cakes of a predetermined size and shape, and to transfer them in such form, to a position to be operated upon by other mechanism, whereby all operations thereon may be entirely automatic.

A further object of my invention is to operate upon and feed the material in such a way that it shall receive a minimum of handling, for it is well known that material such as yeast is affected adversely by handling beyond a certain extent, and especially is this true where such handling is effected manually and in all probability, therefore, non-uniformly.

My invention consists particularly in means for carrying out the foregoing objects, and specifically in many improved details of construction and combinations of parts, as will hereinafter more fully appear, and in order that my invention may be thoroughly understood, I will now proceed to describe mechanism constituting an embodiment thereof having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in partial side elevation and partially in central longitudinal vertical section of a feeding, segregating, and transferring mechanism embodying my invention. Fig. 2 is a top view of the same. Fig. 3 is a detail view in central vertical section through the discharge end of the feeding mechanism. Fig. 4 is a detail view in end elevation of

the same. Fig. 5 is a view in horizontal section taken upon the plane of line 5—5 of Fig. 3, showing certain parts of the operating mechanism.

The mechanism generally comprises a receiving hopper 10 provided with a discharge nozzle 11, mixing blades 12, and a feed screw 13; segregating means consisting of a reciprocating cutter 14; and transferring means including an oscillating carrier 15. The receiving hopper 10 has an open mouth 16 at its upper end for receiving the material, and a portion 17 which converges toward the nozzle 11. The paddle blades 12 and feed screw 13 are mounted upon a shaft 18, the paddle blades being located within the hopper beneath the open mouth 16, while the feed screw 13 is located within the convergent portion 17, said feed screw being progressively of less diameter as it approaches the nozzle 11. The shaft 18 is driven by means of a worm wheel 19 which is in mesh with a worm 20 disposed upon a shaft 21. Mounted upon the shaft 21 are fast and loose pulleys 22, 23, respectively, and a belt 24 connects the said pulleys with a drive pulley 25 located upon a drive shaft 26.

When the material is received within the hopper 16 the bulk thereof is stirred up and mixed by the blades 12, while the portion located near the forward end of the hopper is gradually fed forward toward the nozzle by means of the feed screw 13. The natural tendency, however, of the feed screw and paddle blades is to revolve the material in the hopper, and in order to avoid such revolution of the material I provide a key or keys for engaging the same, such key or keys here shown in the form of pins 27, which are mounted in the wall of the convergent portion 17, the ends of such pins penetrating radially to the interior of a hopper, as will be readily understood by reference to the drawings. The feed screw has cut away portions 28 arranged in the plane in which the pins are located to provide a path for the said pins as the screw revolves. I have found that the engagement of pins of this character with the material tends to prevent the material from revolving, while they have but little effect, owing to the powerful action of the feed screw, in opposing the forward movement of the material. In practice I have found that it is advantageous to be able to vary

the length of the nozzle from day to day in accordance with the varying weather conditions, for under some conditions it is advantageous to have the nozzle longer than under others. To accomplish this I have provided the nozzle with an adjustable portion 29, the adjustment thereof being effected by means of an adjusting screw 30.

The cutter mechanism includes a vertical operating rod 31, and a head 32 carried thereby, said head forming a support and carrier for a wire 33, which constitutes the cutter proper. The wire 33 is stretched taut between extending arms 34 of the head 32 and is arranged in the reciprocating of the rod 31 to cross the path of movement of the material as it is being discharged from the nozzle 11. In the drawings the cutter is shown in its uppermost position with a wire 33 just below the path of movement of the material. The rod 31 is operated by a rotary cam 35, said rod 31 being provided with an arm 36 to which is secured a cam follower 37, which is engaged by the cam groove of the said cam. The cam groove is preferably of varying depths whereby during a certain portion of the revolution of the said cam, force is brought to bear upon the follower to oscillate the rod 31 axially. This oscillation is opposed by a spring 38, said spring causing the end of the cam follower to, at all times, press against the bottom of the cam groove aforesaid. The cam is so constructed and timed as to move the cutter down in one path and to return it in another. In other words, after the cutter has been moved downward to effect a cutting operation it is moved slightly forward and kept in such forward position while it is moved back in front of the face of the material whereby to avoid contact with the said material upon such return movement. This will avoid the liability of any damage being done to the exposed face of the material upon the return movement of the cutter such as might readily occur were the cutter allowed to scrape across the face of the same, as will be easily understood.

The transmitting means includes a carrier consisting of two arms 40 loosely mounted upon a shaft 41. The said arms are secured to partake of the rotative or oscillatory movements of the shaft 41 by their connection with collars 42, which are secured rigidly upon the said shaft, such connection including a pin 43 which laterally projects from each of the said collars and enters a recess or opening in each of the said arms. This connection, while compelling rotative movement of the arms with the shaft, permits limited longitudinal movement thereof, the said arms having a tendency to move toward each other under the influence of springs 44. A cam 45 of disk-like form engages followers 46 which project from the

hubs of the arms 40, said cam being mounted upon a head 47 secured to the upper end of a vertical rod 48 to which reciprocating movement is imparted by means of a cam 49 upon a shaft 50 driven from the main shaft 26.

Oscillating movements are imparted to the shaft 41 through an arc of about 90 degrees. In Figs. 4, 5, and 6 the said shaft and arms carried thereby are in an intermediate position, while in Figs. 1 and 2 the shaft 41 has been moved to a position wherein the arms 40 are in a substantially vertical position. In the other extreme the said arms 40 would be in substantially a horizontal position with their ends in close proximity to a receiving table 51. The cam 49 is constructed and timed to operate upon the vertical rod 48 and through such rod and the disk cam 45, upon the arms 40 whereby to spread the arms apart while they are being moved up to a vertical position, and to release the said arms to allow them to come together when they are in such vertical position. When in a vertical position the ends of the arms will be found to be adjacent to the side edges of the protruding portion of the material as it is fed from the nozzle, and the said arms in drawing together will engage the protruding end of the material and will hold same as such protruding end is being cut off. After the protruding end has been thus cut off by the cutter 14 to form a segregated cake, the said carrier will be moved downward until the arms are in a substantially horizontal position, as above set forth. At this moment the arms will be forced apart by means of the cam 49, as above noted, and the cake held thereby will be dropped upon the receiving table 51.

In order to stop the feeding of the material during the time a portion thereof is being segregated by the cutting mechanism, I have provided automatic tripping means for shipping the belt 24, such means operated by the advance movement of the material itself, and I have devised re-setting means, operated by the carrier in its downward movement, for re-setting the tripping mechanism and for shifting the belt back to its original position. The aforesaid means comprises toggle links consisting of a short link 52 pivoted at 53 to a stationary portion of the machine, and a long link 54 pivoted at 55 to the end of a lever 56. The lever 56 is pivoted at 57 to a stationary portion of the machine and is normally forced upward with a yielding pressure by means of a spring 58 which surrounds a shaft 59, said shaft provided at its end with a toe 60 which engages the under side of the said lever 56. Secured to the pivot pin 53 of the toggle link 52 is an arm arranged directly in the path of movement of the material as it is discharged from the nozzle 11.

When a sufficient quantity of the material has been forced through the nozzle it will engage the finger 62 to thereby slightly rotate the pivot pin 53. The effect of this will be to break joint between the toggle levers 52 and 54 to thereby leave lever 56 free, under the influence of the spring 58, to throw the arm 61 and the finger 62 clear of the advancing end of the material. The rotative movement which is given to the shaft 59 under the influence of the spring 58 when the lever 56 is moved upward, will shift the belt from the fast to the loose pulley to thereby stop the feeding mechanism for the material. The feeding mechanism is arranged to operate a little faster than is necessary, the timing of the cutter and transferring mechanism being effected by the same driving mechanism which times, controls, and operates the wrapping machine or other device which handles the segregated cake after it has been received from the carrier 15. In the present instance the shaft 26 is the element from which the various parts are timed and operated, the cutter 14 being operated by its cam 35 at the proper moment (which is some time after the feeding mechanism has been tripped), and the carrier 15 being operated by a cam 63 through suitable links and levers, the said cam being in driving relation with the shaft 26. In this downward movement the carrier 15 will reset the tripping mechanism by means of a cam 64 with which one of the arms 40 is provided, said cam being arranged to engage a cam follower 65 secured upon the end of an arm 66, which is rotatively connected with the lever 56. In Fig. 3 the carrier is shown in a position with its cam 64 as just beyond its follower 65. The said cam 64 in engaging the cam follower 65 will force the arm 66 and lever 56 downward to its lowermost position against the resistance of the spring 58, straightening out the toggle levers 52 and 54 to the position shown in Fig. 3, and returning the belt 24 from the loose to the fast pulley. This will start in motion the feeding mechanism again and further material will be fed forward in the formation of other cakes.

What I claim is:

1. The combination with a receiver having a forming and discharge nozzle, and means for feeding plastic material therethrough, of a stop motion for the feeding means, means operated by the plastic material as it reaches a predetermined point in its emergence through the said nozzle for operating the stop motion, and means for segregating portions of the material so fed through the nozzle.

2. The combination with means for feeding plastic material, a stop motion for the feeding means, and means operated by the

advancing material for operating said stop motion, of a cutter and means for operating the same to segregate a portion of the material so fed after the feeding means has been thus stopped.

3. The combination with a receiver having a forming and discharge nozzle, and means for feeding plastic material therethrough, of tripping means having a finger arranged in front of the said nozzle in the path of the advancing material, and means operated by the tripping means for stopping the feeding means.

4. The combination with a receiver having a forming and discharge nozzle, and means for feeding plastic material therethrough, of tripping means having a finger arranged in front of the said nozzle in the path of the advancing material, said tripping means including a toggle mechanism to which said finger is connected, and means operated by the tripping means for stopping the feeding means.

5. The combination with means for feeding plastic material, a stop motion for the feeding means, and means operated by the advancing material for operating the stop motion, of means for segregating a portion of the material so fed, and means timed with the segregating means for re-starting the feeding means.

6. The combination with means for feeding plastic material, of tripping means having a finger arranged in the path of the advancing material, means for segregating a portion of the material so fed, and means timed with the segregating means for resetting the tripping mechanism.

7. The combination with means for feeding plastic material, a stop motion for the feeding means, and means operated by the advancing material for operating the said stop motion, of a cutter, and means for operating the same to segregate a portion of the material so fed after the feeding means has been thus stopped, and transferring means for thereafter removing the segregated portion of the material.

8. The combination with means for feeding plastic material, a stop motion for the feeding means, and means operated by the advancing material for operating the said stop motion, of a cutter for segregating portions of the material so fed, transferring means for removing the segregated portions of the material, and means operated by the transferring means for re-starting the feeding means.

9. The combination with a receiver for plastic material and a forming and discharge nozzle therefor, of means including a feed screw for feeding the plastic material through the said nozzle, a stop motion for the feeding means, means operated by direct engagement with the forward end of the ad-

vancing material as it emerges from the nozzle for operating the said stop motion, and means for segregating portions of the material so fed through the nozzle.

- 5 10. The combination with a receiver for plastic material and a forming and discharge nozzle therefor, of means including a feed screw for feeding the plastic material through the said nozzle, a stop motion for
10 the feeding means including a finger arranged in front of the nozzle in the

path of the advancing material whereby the advancing material as it emerges from the nozzle will itself operate to stop the feeding means after a predetermined linear 15 quantity thereof has been thus fed forward, and means for segregating portions of the material so fed.

JAMES J. SULLIVAN.

Witnesses:

D. HOWARD HAYWOOD,
LYMAN S. ANDREWS, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
