May 17, 1932. S. JENNEY 1,858,507

RAVIOLI MACHINE

Filed May 31, 1928 4 Sheets-Sheet 1

Fig. 1

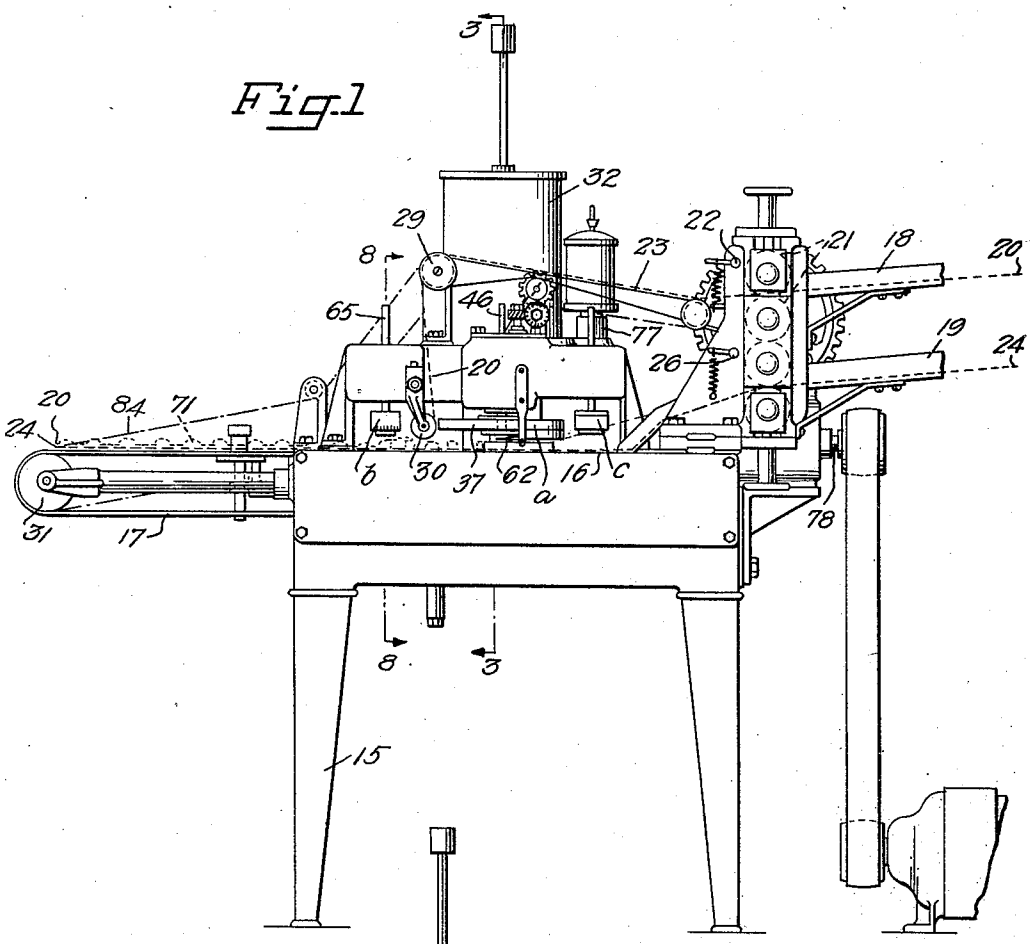
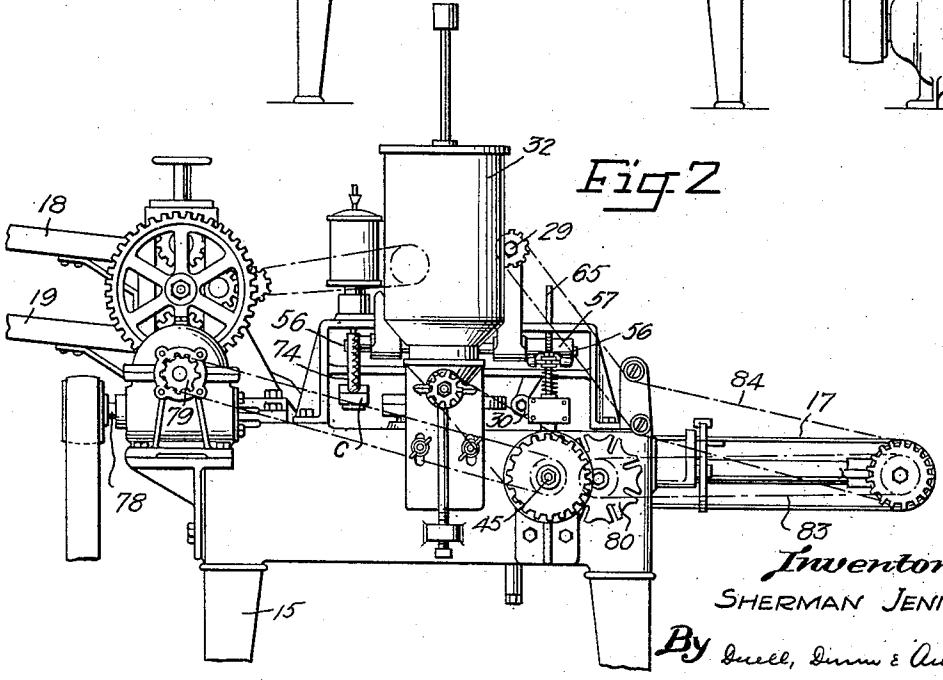


Fig. 2



Inventor:
SHERMAN JENNEY,
By Duell, Dunn & Anderson.
Attorneys.

May 17, 1932. S. JENNEY 1,858,507

RAVIOLI MACHINE

Filed May 31, 1928 4 Sheets-Sheet 2

Fig. 3.

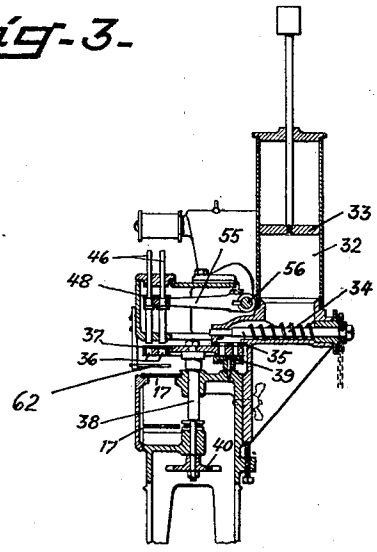


Fig. 4.

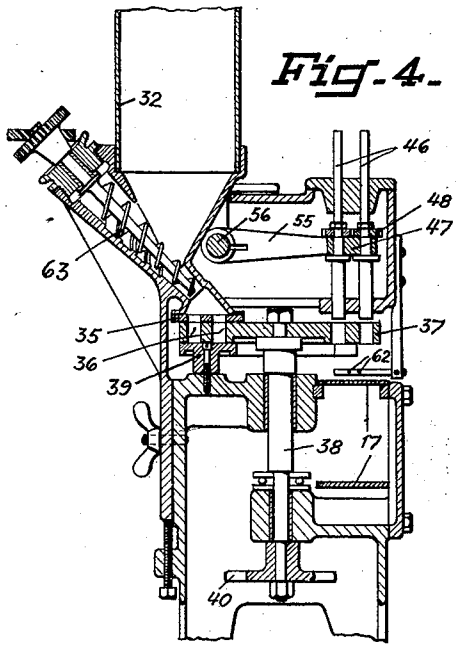


Fig. 5.

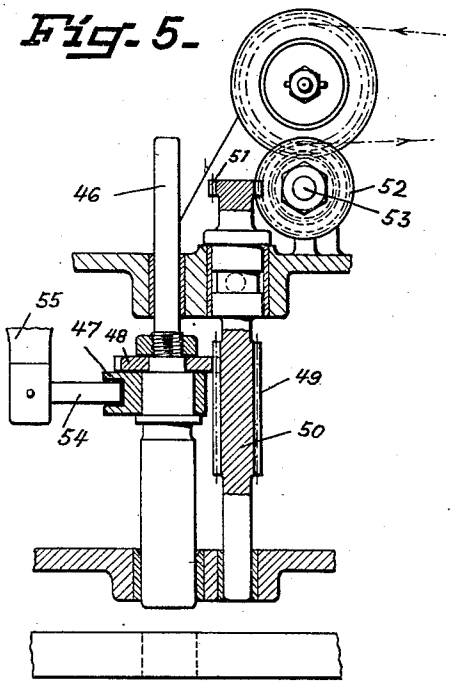
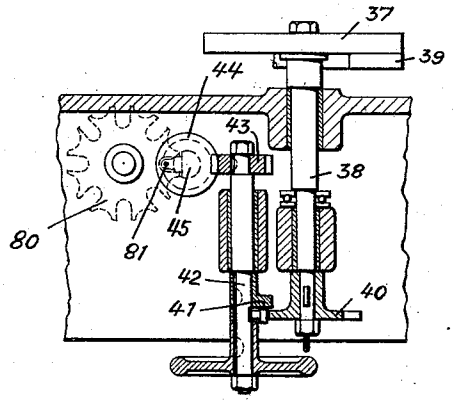


Fig. 6.



INVENTOR.
Sherman Jenney
BY Dunn Dunn & Anderson.
ATTORNEYS.

May 17, 1932. S. JENNEY 1,858,507

RAVIOLI MACHINE

Filed May 31, 1928 4 Sheets-Sheet 3

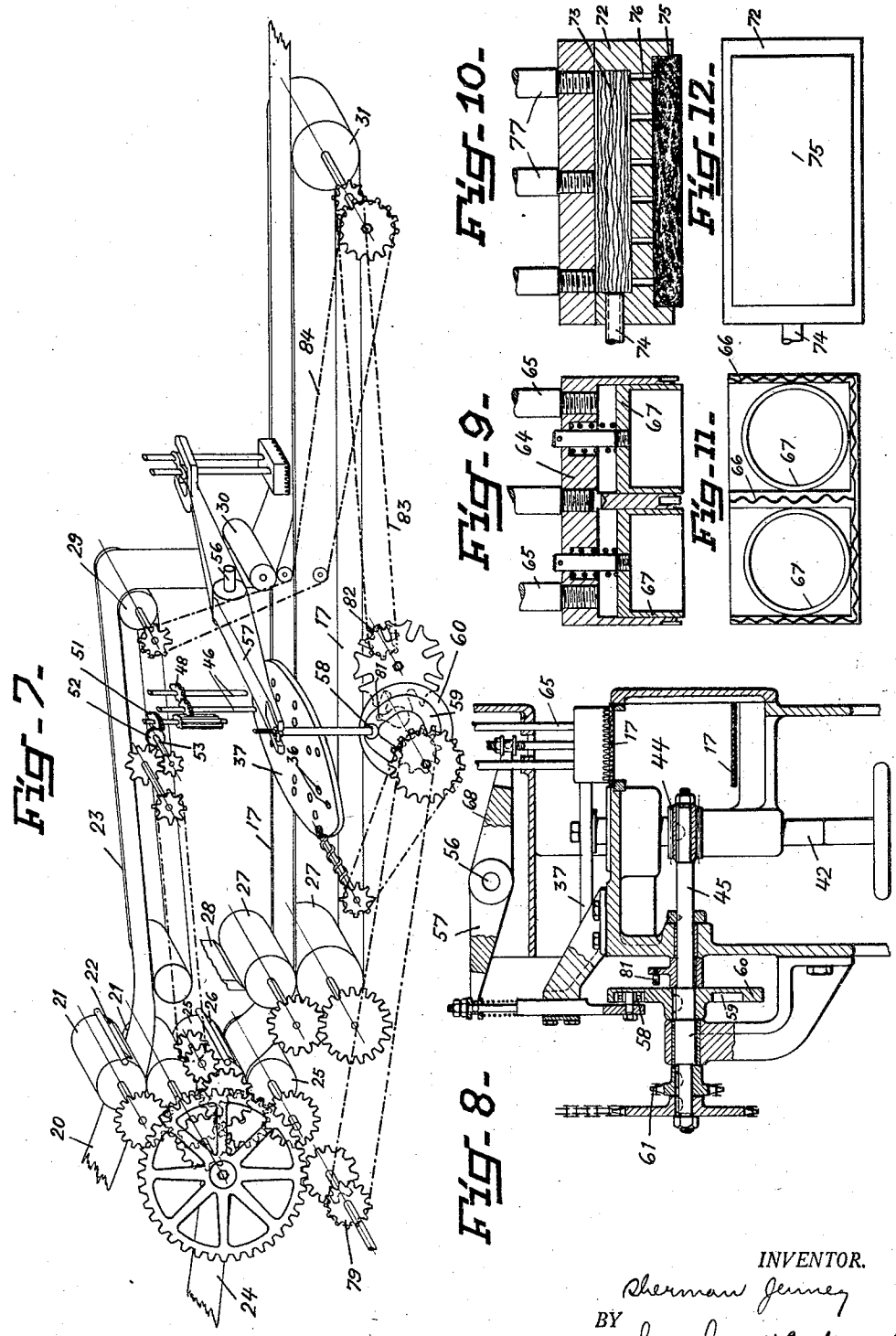


Fig. 7.

Fig. 10.

Fig. 12.

Fig. 9.

Fig. 11.

Fig. 8.

INVENTOR.
Sherman Jenney
BY
Dyer Dunn & Anderson
ATTORNEYS.

May 17, 1932. S. JENNEY 1,858,507

RAVIOLI MACHINE

Filed May 31, 1928 4 Sheets-Sheet 4

Fig. 13.

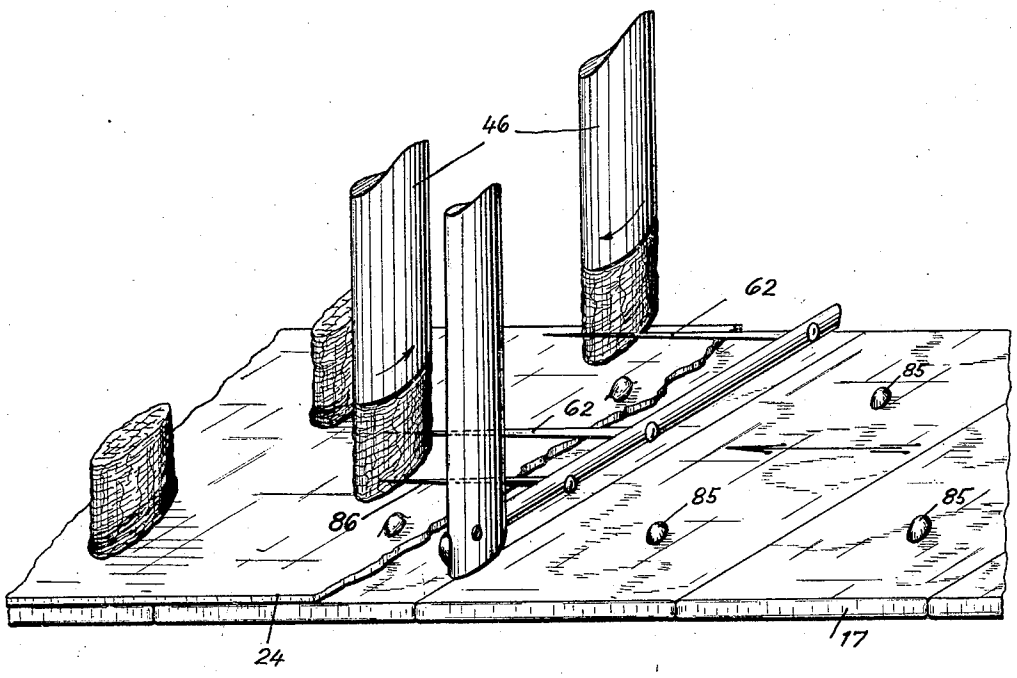
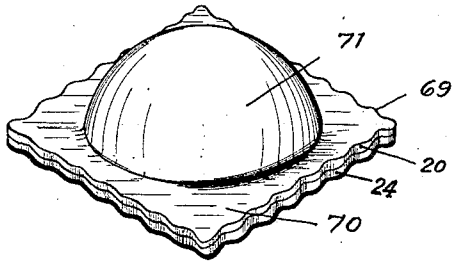


Fig. 14.



INVENTOR
Sherman Jenney
BY
Dunn & Anderson
ATTORNEY

Patented May 17, 1932 1,858,507

UNITED STATES PATENT OFFICE

SHERMAN JENNEY, OF NEW YORK, N. Y.

RAVIOLI MACHINE

Application filed May 31, 1928. Serial No. 281,675.

This invention relates to a machine for the manufacture of filled articles and while devices constructed in accordance with the present invention may be utilized in numerous different associations, it is primarily intended that the invention be employed in connection with the manufacture of food products.

Food products of different types may be manufactured, but the invention will be hereinafter described in connection with such products wherein an envelope or covering of edible material is provided and within which there is disposed a filling also of edible material but of a characteristic different from that of the cover. Such a product may be, for example, ravioli and the present invention has been found to be of particular value in producing a product of this nature.

An object of the invention is that of furnishing a machine by means of which manual handling of the product, as well as the covering and filling, are practically entirely eliminated so that sanitary conditions may prevail in the manufacture and, furthermore, an article will result which will be perfect and uniform in all respects.

Another object of the invention is that of constructing a machine, the parts of which will be relatively few in number and individually rugged and simple in construction so that a device will be presented operating over long periods of time with freedom from difficulty.

An additional object is that of constructing a machine in which, during operation, the possibility of the covering being improperly disposed or the filling being incorrectly deposited with respect to the covering will be reduced to a minimum, so that the manual attention necessary is reduced to a minimum.

Another object is that of furnishing a product which will be far more desirable than similar products as heretofore constructed irrespective of their method of manufacture.

With these and additional objects in mind reference is had to the attached sheet of drawings illustrating practical embodiments of the invention and in which:—

Figure 1 is a side view of one form of machine embodying the present invention;

Fig. 2 is a similar view taken from the opposite side thereof;

Fig. 3 is a transverse sectional view taken along the lines 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 3 on a slightly larger scale and showing a different form of mechanism than that employed in the preceding figure;

Fig. 5 is an enlarged sectional view of the filling-depositing unit of the machine, as well as a portion of the drive mechanism therefor;

Fig. 6 is a similar view showing another portion of the drive;

Fig. 7 is a perspective view showing a somewhat schematic layout of the various units of the machine;

Fig. 8 is a transverse sectional view through the machine taken along the lines 8—8 of Fig. 1;

Fig. 9 is a similar view showing the cutting dies which preferably are employed;

Fig. 10 is a sectional view of the moistener which may be utilized;

Figs. 11 and 12 are bottom plan views of the parts as shown in Figs. 9 and 10 respectively;

Fig. 13 is a perspective view of the lower conveyor and the stripping mechanism cooperating with the spindles, and

Fig. 14 is a face view of one of the units of the finished product.

In these several views the numeral 15 indicates a stand supporting a deck 16 over which an endless conveyor 17 moves and disposed adjacent the upper face of this conveyor is a depositing mechanism generally indicated at "*a*", a cutting and forming mechanism indicated at "*b*" and a moistening mechanism as indicated at "*c*" may be provided in advance of the depositing station.

Adjacent the forward end of the machine a pair of receiving chutes 18 and 19 are provided to which strips of edible material as, for example, dough, are fed in any desired manner. As shown in Fig. 7, the dough strip 20 which is fed to the chute 18 passes between rollers 21, one of which may be provided

with a spring-pressed scraping blade 22 and this strip then comes to lie upon the upper surface of a conveyor 23 which terminates at a point in advance of the forming station "b" and above the same.

The dough strip 24 which moves down the chute 19 passes between a pair of rollers 25, the upper one of which may also be provided with a preferably spring-actuated scraping blade 26 corresponding to the blade 22 and thereupon this strip passes between a pair of rollers 27, the lower of which serves as a mounting for the inner end of the conveyor 17. If desired, the upper face of the dough sheet may be moistened by having a pad member 28 cooperating with the upper roller of this conveyor so that the face of the roller will be dampened and the moisture will be carried over to the upper face of the lower dough sheet 24.

As has been shown in Fig. 1 as well as Fig. 7, the upper dough sheet or strip 20 leaves the conveyor 23 adjacent the roller 29, which latter serves as the outer mounting member for this conveyor. Thereupon, the strip passes downwardly and around roller 30 and is disposed in a plane adjacent the lower dough sheet or strip 24, the purpose of this arrangement being hereinafter more definitely set forth and at this time it will be observed that the rear end of the conveyor 17 passes around a roller 31, it being apparent that as afore brought out, the forward end of this conveyor passes around the lower roller of the cooperating pair 27.

Attention is now particularly directed to Figs. 3, 5 and 6, in which one form of mechanism providing the depositing station "a" has been illustrated. Such mechanism may include a hopper 32 to be filled with suitable material and with the upper surface of which a weighted plunger 33 may cooperate in order to press the mass of material downwardly within the hopper. At its lower end a material feeding and compressing screw 34 is rotatably mounted and this member, when driven, serves to force material through the perforations of a sheet of material 35 into pairs of openings 36 formed in a plate 37 which is secured to a rotatably mounted shaft 38. The lower ends of the openings 36 are normally closed by a plate 39 secured fixedly to the machine and which plate is preferably of arcuate shape and extends from a point adjacent that at which the openings 36 are filled with material to a point slightly in advance of that at which these openings overlie the upper face of the conveyor 17 and the strip of material resting thereon.

The plate 37 is moved intermittently and one form of achieving such motion is by associating a Geneva movement with the shaft 38, one of the elements 40 of such movement being secured to the shaft and the other element 41 thereof being associated with a shaft 42 disposed adjacent the shaft 38. A driving of the shaft 42 is achieved in any desirable manner as, for example, by the use of a worm wheel 43 which is driven as in Fig. 8 by a worm 44 secured to a shaft 45, the latter being rotatably mounted below the deck of the machine.

In the present instance and as afore stated, pairs of openings 30 are provided within the plate 37. It is obvious that any desired number of openings might be arranged in groups and above the path of travel of the sheet of material 24. Adhering to the present exemplification, however, a pair of spindles 46 are rotatably supported in a bearing 47 and mount gear wheels 48, the teeth of which mesh with each other and one of which wheels has its teeth also meshing with teeth 49 of a shaft 50 driven through a medium of gears 51 and 52, the latter being attached to a shaft 53.

The bearing 47 is reciprocated by a pin 54 attached to an arm 55 which arm is secured to a shaft 56 to move with the same. This shaft is in turn coupled to an arm 57 mounting a follower 58 riding within a cam track 59 forming a part of a cam 60. This cam is mounted upon the shaft 45 and the latter is driven, for example, by a gear 61 so that it is obvious, as the shaft is rotated, the arm 57 will be rocked to correspondingly move the shaft 56 and periodically depress and elevate the bearing 47 carrying with it the spindles 46. This projection and retraction will result in the ends of the spindles passing through the pairs of openings 36, thereby expressing any material disposed within these openings on to the upper face of the strip 24, it being apparent in this connection that during the reciprocation of the spindles they will continuously rotate in order to achieve the result desired and that, as has been shown in Figs. 3 and 13, a pair of pins 62 may be disposed to extend adjacent the plugs of material projected from within the openings of the plate 37 and cooperate with such plugs to assure a detachment thereof from the spindle ends and a retention of the material upon the upper face of the strip 24. In this connection it will be observed that the pins extend in the direction of rotation of the plugs of filling material, it having been found that by this construction these plugs will not be broken but that the desired results will be achieved.

Before passing to consideration of other features of the machine, it might be well to refer to the structure shown in Fig. 4, in which all parts are substantially similar to those shown in Fig. 3, with the exception that the compressing and feeding worm 34 which, in the latter figure has been indicated at 63, extends not at right angles to the base of the hopper, but is slightly inclined with respect thereto. By such a construction it has been found that in connection with cer-

tain types of material a more ready feeding is assured and that the machine may be operated at higher speed.

As shown in Fig. 1, the strip 24 immediately to the rear of station "a" will carry a series of plugs of filling material which have been deposited thereon at this station and at this point the strip 20 will come to overlie the strip 24 together with these plugs. The problem now is to provide a complete envelope formed of the strips 20—24, which envelope will contain the filling material properly disposed therein. With this in mind the sealing, shaping and severing mechanism of station "b" is employed which, as shown in Figs. 8, 9 and 11, may include, in the present instance, a housing 64 having rods 65 serving to guide the same and which housing is provided with severing and crimping edges 66. Disposed within this housing is a pair of ejector casings or dies 67 which are preferably spring-pressed and the lower edges of which cooperate with the upper face of the strip 20 to crimp the same into sealing contact with the upper face of the strip 24. A proper operation of this unit of the machine is assured by connecting the same with the shaft 56 by means of an arm 68, it being thus apparent that as the shaft is actuated the mechanism will be operated to cause, first: a proper disposing of the sheet 20 with respect to the sheet 24 and an enveloping of the plugs of material reposing upon the latter. Secondly, these sheets will be forced into sealing contact and, third, lines of severance will be provided between the individual units thus formed so that they may be detached readily from each other, a finished edible article being illustrated in Fig. 14, in which the numeral 69 indicates the serrated edge, 70, the sealed margin of the unit and 71 the raised portion providing the space within which the plug of material is disposed.

In the event that a dampening expedient additional to the pad 28 or as a substitute therefor is to be employed, it will be obvious that a desirable form a mechanism to achieve this purpose is shown in Figs. 10 and 12, in which a block has been indicated at 72 and provides a chamber 73 having connection with a source of fluid through a conduit 74. The chamber of the block communicates with a pad 75 mounted in the lower face of the same by means of a series of passages 76 and this block is mounted similarly to the casing 64 for reciprocation by means of a series of rods 77 having a slidable bearing in the head of the machine and being connected to the shaft 56 by means of an arm similar to either the arm 68 or the arm 55, it being thus obvious that a periodic contact between the pad 75 and the upper face of the strip 24 will be assured, which contact will be simultaneous with the depressing of the spindles and dies.

A form of drive for the entire machine may be provided by, for example, as in Figure 1, suitably rotating a drive shaft 78 which, by means of proper gears (not shown) rotates a sprocket gear 79, this gear driving the shaft 45 to thus intermittently actuate the turn-table plate 37 and by means of the cam and follower 60—58, to rock the shaft 56, thus actuating the spindles and dies as well as the moistening element, conceding that the latter is employed. The rotation of the shaft to which the gear 79 is secured also serves, through the medium of certain gearing shown in Fig. 7, to actuate the pairs of rollers 21 and 25 as well as the shaft 53, which rotates the spindles. At this time it will be understood that in lieu of a shaft for these spindles any desired form of drive might be employed. According to the present embodiment of the invention the strips 20—24 are advanced intermittently and the dampening, depositing and dieing mechanisms cooperate with the strips during their periods of rest. One manner of securing such a drive of the conveyors is, for example, by disposing one element 80 of a Geneva movement adjacent the shaft 45 and securing the other element 81 of such movement to this shaft. Associated with the first element is a sprocket 82 which, by means of a drive 83, actuates the roller 31 which is coupled by a drive 84 to the roller 29, thus serving to impart the desired periodic movement to both conveyors.

With final reference to the conveyor 17 it will be observed that the latter may be formed with a series of plates having raised portions 85 which serve to prevent any possibility of slipping of the strip 24 with respect to the conveyor, these raised portions preferably being disposed in line with those points at which filling material will be deposited upon the lower strip. A machine of this character will operate at high speeds and turn out a large quantity of perfectly finished product.

Reviewing briefly the operation of the machine, it will be perceived, conceding that food products are being manufactured thereby, that the strips 20—24 of edible material are introduced into the guideways 18 and 19 and disposed between the pairs of rollers 21 and 27, these strips being disposed upon the conveyors 17 and 23 and the uppermost strip being passed over the roller 29 and around the roller 30 to a point at which it cooperates with the lower strip. Now, upon the drive mechanism being set in operation both strips will be moved intermittently towards the rear end of the machine. During each period of rest of the strips, filling material will be deposited upon the upper face of the lower strip, which upper face has been moistened in order to assure a proper conditioning of the upper surface of such strip. An exactly proper amount of filling material

will, in each instance, be deposited and such material will be in exact position both with respect to the lower and upper strips as well as the dieing mechanism which is to cooperate therewith. Thereupon, the filling material will be enveloped and an effectual air-tight seal will be provided between the edges of the units formed by the use of this machine, it being finally obvious that, if desired, any suitable form of severing mechanism (not shown) may be employed to periodically, completely detach a group of finished units upon the upper face of the conveyor 17 from a succeeding group of such units.

In conclusion it will be understood that the plugs of filling material are retained on the upper face of the dough strip incident to the fact that as the spindles move downwardly the lower faces of the plugs come in contact with those portions of the dough strip which have been raised incident to the fact that they overlie the portions 85 of the conveyor. This is, of course, conceding that the conveyor embraces such raised portions. Also the spindles do not move downwardly merely to a point at which contact is effected but actually press the plugs of filling material slightly, which results in these plugs having their diameter enlarged. Under these circumstances a stripping of the plugs from the spindles must necessarily follow and this action may, in fact, be even more definitely assured by resorting to the structure suggested in Figure 13. It will be observed, in this figure, that an additional pin 86 may be secured to the bar which supports the pins 62 and this pin may be of slightly shorter length than the former pins and so arranged that the plug of filling material does not contact with it until after this plug has been mashed by the continued downward movement of the spindle with which it is associated.

Thus, among others, the several objects of the invention specifically afore stated are achieved, it being noted, additionally, that by means of the present machine a novel product and method of forming the same are both accomplished. It is intended, however, that numerous changes in construction and rearrangement of parts might be resorted to without departing from the spirit of the invention as defined by the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A machine of the class described including means for moving a strip of material, a plate formed with a series of openings, means for conveying and compressing a filling substance into said openings, means for expressing such substance from said openings on to the upper face of said strip and further means acting during the withdrawal of such expressing means to retain the substance in properly disposed position upon said strip.

2. A machine of the class described including a plate formed with openings, a rotatable spindle, means for projecting and retracting said spindle through said openings, means for delivering a filling substance to the openings of said plate, a strip of material movable adjacent said plate and upon which said substance is to be deposited and a pin lying adjacent said spindle and below said plate to retain said substance during the withdrawal of said spindle.

3. A machine of the character described, including means for moving a sheet of dough, a rotatable plate formed with a series of openings, means for conveying and compressing a filling substance into said plate openings, a plurality of revolving spindles for association with said plate openings, means for projecting and retracting said spindles through said openings, a plurality of pins positioned adjacent said spindles and below said plate to restrain said substance during the withdrawal of said spindles and means for moving a second sheet of dough into a position over said filling substance and said first named sheet so as to form a cover for the same.

In testimony whereof I affix my signature.

SHERMAN JENNEY.