Nov. 18, 1969 C. E. CLOUD ET AL 3,478,492

PACKAGING MACHINE

Filed April 21, 1966 5 Sheets-Sheet 1

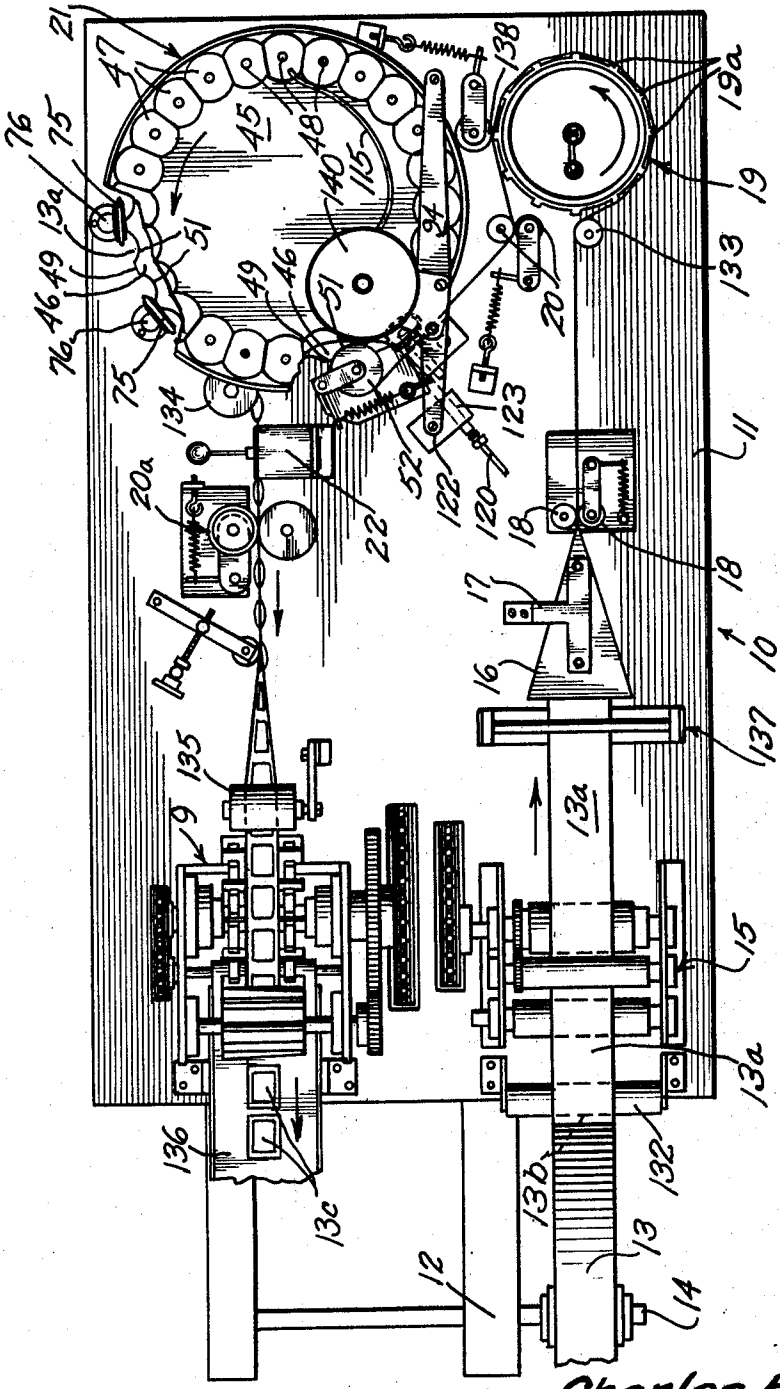

Fig. 1

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PACKAGING MACHINE

Filed April 21, 1966 5 Sheets-Sheet 2

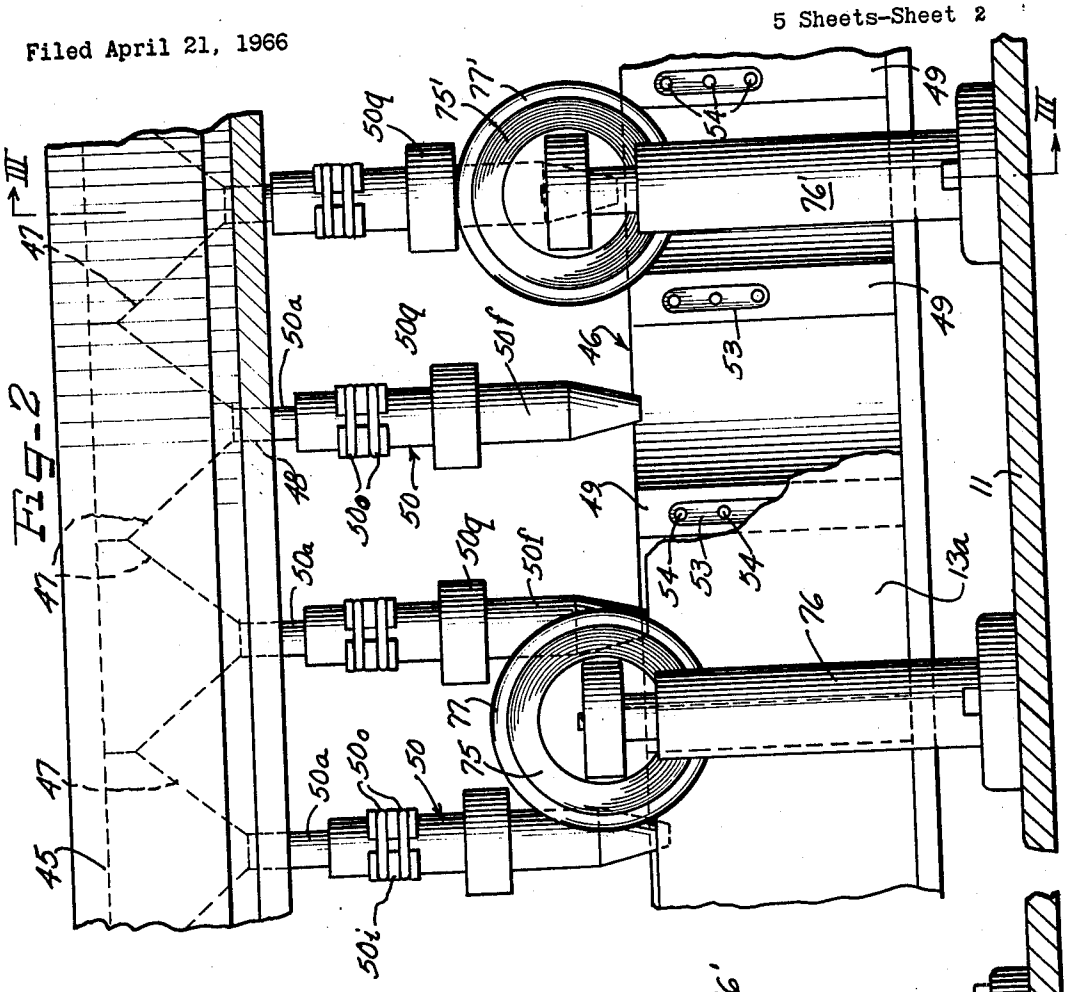

Fig-2

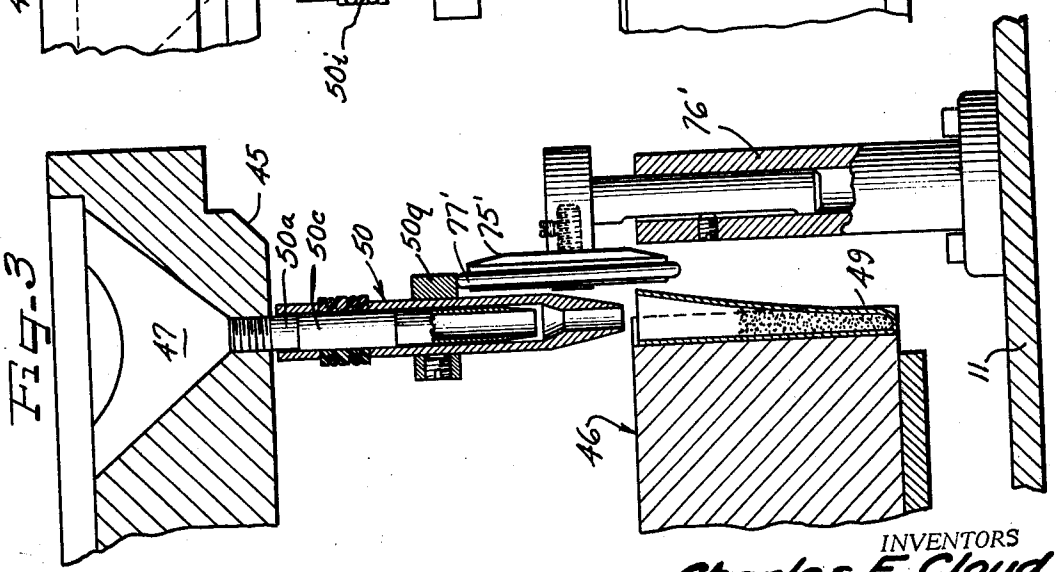

Fig-3

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PACKAGING MACHINE

Filed April 21, 1966 5 Sheets-Sheet 3

Fig-5

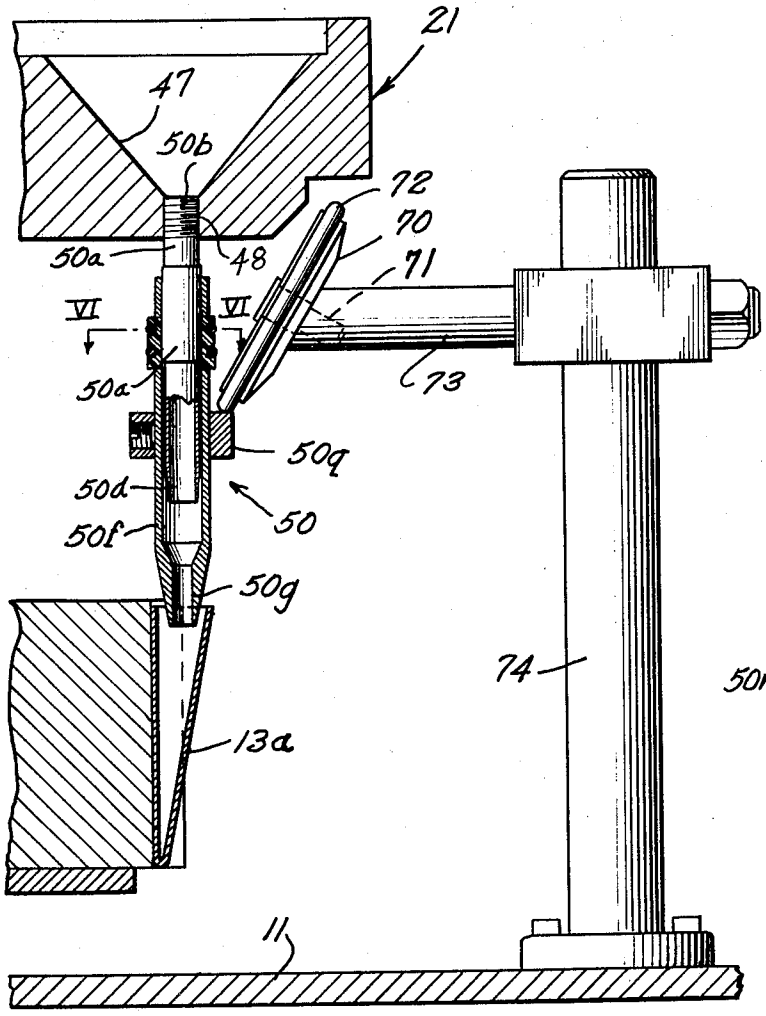


Fig-4

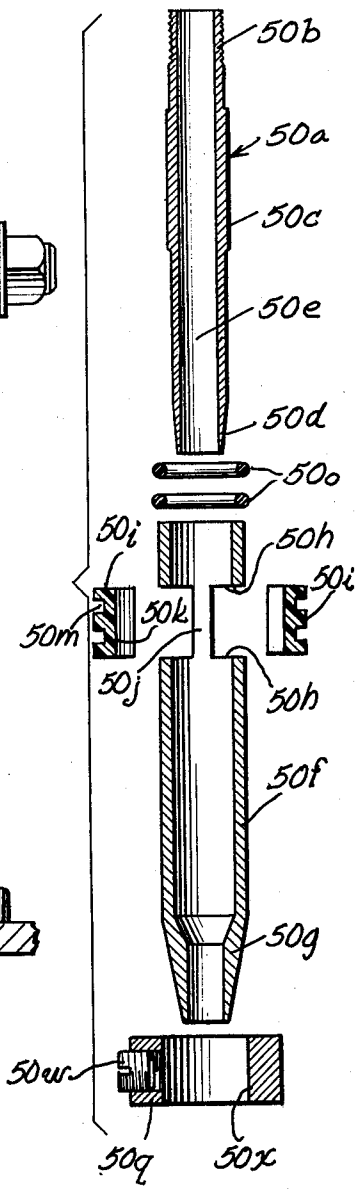
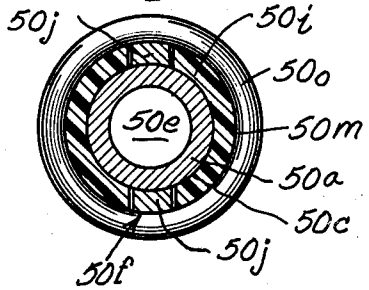


Fig-6



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PACKAGING MACHINE

Filed April 21, 1966 5 Sheets-Sheet 4

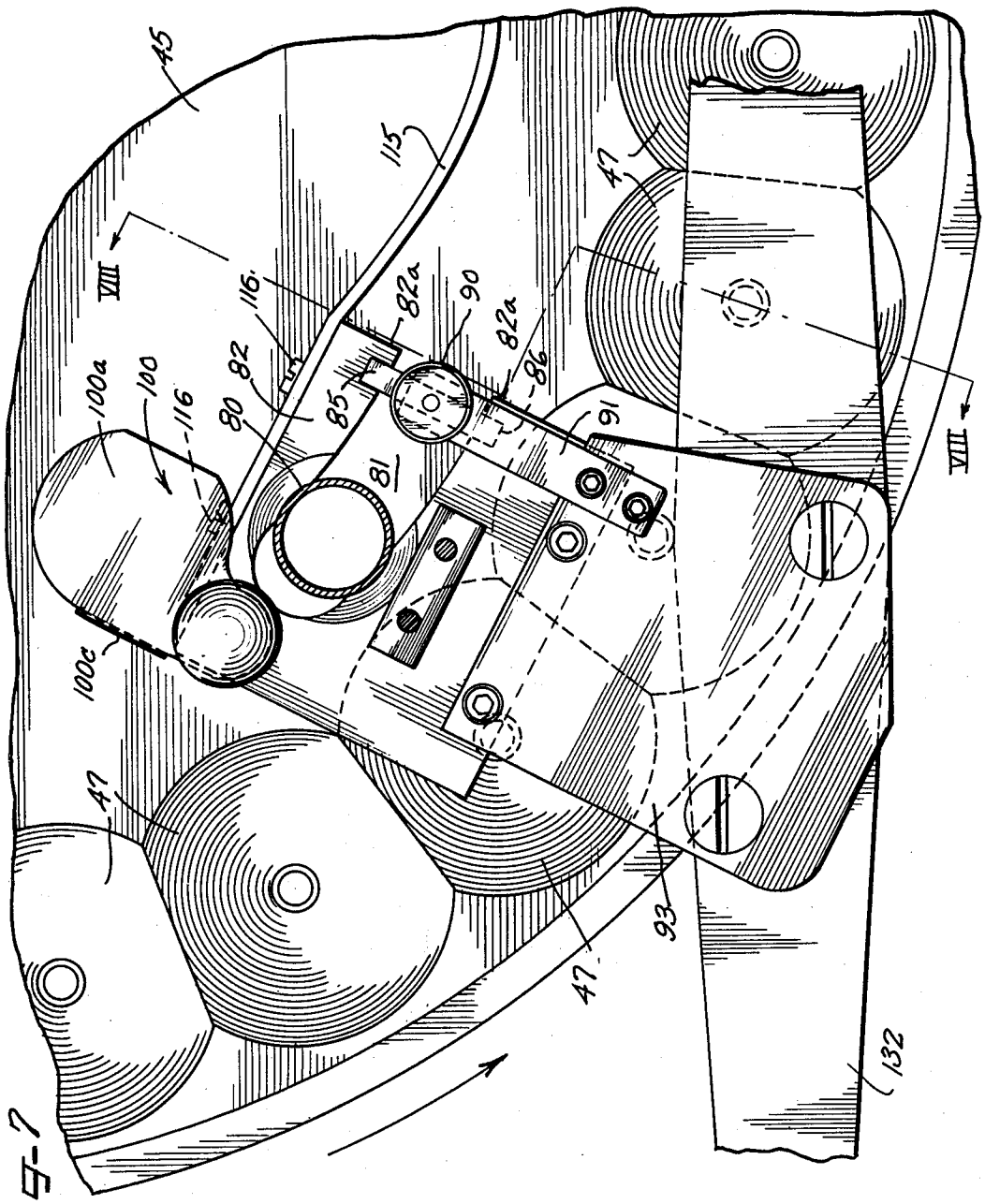

Fig-7

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Nov. 18, 1969 C. E. CLOUD ET AL 3,478,492

PACKAGING MACHINE

Filed April 21, 1966 5 Sheets-Sheet 5

Fig-8

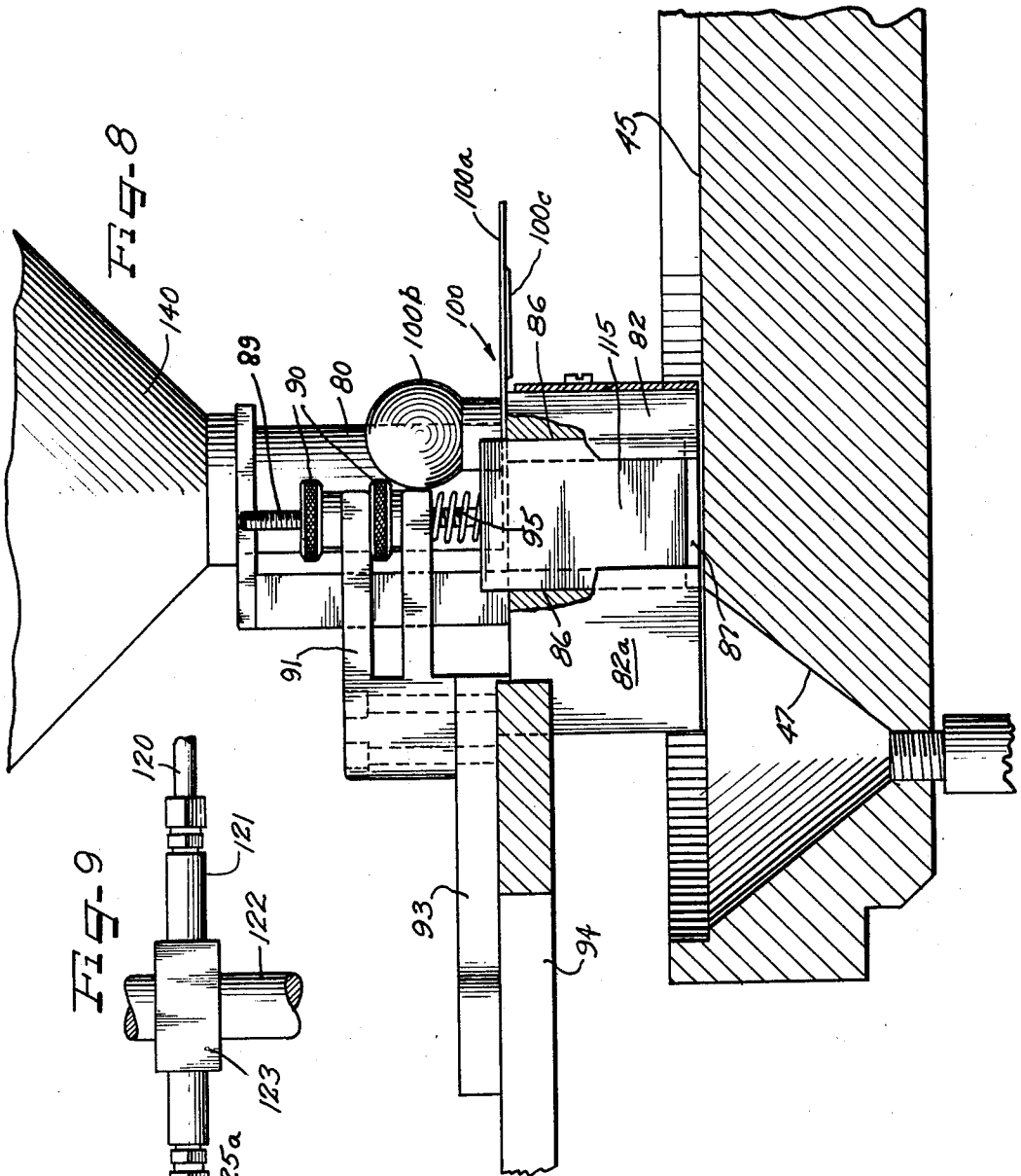

Fig-9

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United States Patent Office 3,478,492 Patented Nov. 18, 1969

3,478,492

PACKAGING MACHINE

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Filed Apr. 21, 1966, Ser. No. 544,301
Int. Cl. B65b 9/08, 37/20, 39/14
U.S. Cl. 53—266 34 Claims

ABSTRACT OF THE DISCLOSURE

A machine for continuously forming packages from strip stock including a vertical heat sealer for forming longitudinally spaced pockets thereby forming pockets in the length of the strip, a filling station, means for training the strip in an arc about the filling station with the station having a series of funnels for loading each pocket, means carried by the rotating filling station or wheel for allowing the extension and retraction of a plurality of feed-outs for transferring a metered quantity of product from the filling station into individual ones of the pockets while the strip is trained in an arc about the filling station, and means for removing these strips from the filling station and for the sealing the filled pockets of the strip.

The present invention relates to a packaging machine and is specifically concerned with an improved packaging machine which forms, fills, seals and slices a continuous strip of packaging material into a succession of individual packages. A packaging machine of this general type, over which the present invention constitutes an advance, is depicted and described in an application for United States Letters patent, Ser. No. 290,725 of Charles E. Cloud entitled "Method and Apparatus for Packaging" which application was filed on June 26, 1963, now Patent No. 3,344,576.

The Cloud machine of the above-referred to application forms individual packages from a continuous strip of packaging material which strip is advanced at an essentially constant speed through the machine. The strip passes through a plow which folds the strip longitudinally at its center line so as to open upward in a V-shaped cross-section. The folded strip is there after passed around the rim of a rotating sealer which forms transverse spaced seals in the strip, thereby defining successive, upward opening, individual pockets. The strip of pockets is then passed about the rim of a rotating horizontally orientated wheel of a filling station where the individual pockets are filled with a measured amount of a product, for example, granulated sugar. Thereafter, the strip of product-filled pockets is top sealed to entrap the product and, finally, the strip is sliced at approximately the mid-line of the transverse seals to form a succession of individually sealed packages of the product.

This machine, which met with great commercial acceptance, provides for the continuous production of a succession of uniform packages at a variable rate in a simplified and economic operation. The filling station of such a machine functions to distribute a measured quantity of the product to individual pockets of the strip. To achieve this goal, each successive pocket must be opened and spread to allow the product to enter and means must be provided for injecting only the desired quantity of the product therein. While the prior machines have functioned in a satisfactory manner, it is generally desirable that an exact measure of the product be positively discharged into each package without spilling or product loss. In some applications, especially in dealing with a product that may be affected by drafts or vibration, some of the product may be airborne away from the package during the filling process.

It is therefore a specific object of the present invention to provide a new and improved filling station for a Cloud-type packaging machine which provides for better filling of individual packages which is relatively safe from the effects of drafts or vibration. However, the herein described invention is of a more general applicability and it is therefore the general object of the present invention to provide a new and improved packaging machine.

The organization and manner of operation of the invention, together with further objects and advantages thereof may best be understood by reference to the following description taken in connection with the accompanying drawings, in the several figures of which like reference numerals identify like elements, in which an exemplification of the invention is illustrated.

FIG. 1 is a top plan view of a packaging machine constructed in accordance with the principles of the present invention;

FIG. 2 is a fragmentary elevational view of a portion of a filling station of the packaging machine depicted in FIG. 1;

FIG. 3 is an elevational view partly in section with some parts broken away to show interior parts, generally as seen from the line III—III of FIG. 2;

FIG. 4 is an exploded sectional view of one part of the machine;

FIG. 5 is an elevational view similar to that of FIG. 3 of another portion of the machine;

FIG. 6 is a sectional view of the one part depicted in FIG. 4, as seen from the line VI—VI of FIG. 5;

FIG. 7 is an enlarged and detailed plan view, partly in section, of a portion of the filling station of the machine;

FIG. 8 is an elevational view, partly in section, of the portion of the machine depicted in FIG. 7 as seen from the line VIII—VIII in that figure; and

FIG. 9 is a fragmentary view, partly in section, of another portion of the machine with parts broken away to show interior construction.

Although the invention, for definiteness of disclosure, will be described in conjunction with a specific embodiment which forms packages from a single strip, it should be understood that the principles of the invention may be employed in other embodiments, for example, a machine using two strips to form the packages.

Referring to FIG. 1 there is depicted a Cloud-type packaging machine generally indicated by the numeral **10**. The machine **10** has a horizontal base **11** supporting various components. Mounted adjacent to the base **11** is means, including a roll stand **12**, for supporting a roll of packing material **13**. The roll **13** is supported on an arbor **14** in such a way that when a strip **13***a* is unrolled therefrom it is disposed in a generally vertical plane at **13***b*. The strip **13***a* is turned to a generally horizontal plane over roll **132** and travels over the base **11**. The strip **13***a* may be of any suitable type material such as paper and can be coated on at least one side with a sealable material such as plastic or other suitable adhesive.

It is contemplated that the outer surface of the strip may be printed with identifying or advertising material. Alternatively, a printing device (not shown) may be incorporated downstream from the roll **132**. The strip **13***a* may be suitable printed by moving it through such a printing device.

Downstream from the roll **132**, the strip **13***a* is fed through and driven by a suitable horizontal roller assembly generally indicated by the numeral **15**. Such assemblies are well known in the art and will, therefore, not be described in detail.

A suitable folding plow **16**, supported on a folding plow bracket **17**, is disposed forwardly of the assembly

15 for folding the strip 13*a* along its longitudinal center line. When the strip 13*a* leaves the plow 16 it is folded and lies in a vertical plane with the fold disposed at the bottom of the strip. The strip 13*a* thus assumes generally a V-shape in transverse cross-section. A feeding horizontal roller bar assembly is positioned in front of the plow 16 to feed the strip 13*a* thereto.

In order to further prepare the strip 13*a* so that filled packages may be formed, a pair of guiding and driving rollers 18, 18 is disposed on the downstream side of the plow and the folded strip 13*a* is guided therebetween to a vertical sealer 19 via a turning roller 133. The vertical sealer 19 is essentially a wheel having a plurality of spaced vertical lands 19*a* about its rim. The folded strip 13*a* is adapted to be pulled and moved through an arc in contact with the lands as the vertical sealer is driven in the direction indicated by the arrow. The vertically extending circumferentially spaced lands 19*a* are heated and serve to form longitudinally spaced vertically extending heat seals in the strip 13*a*. A pressure roll 138 cooperates with the heated lands 19*a* to form a complete seal. The roll 138 also serves to supply a knurling effect upon the strip. As the strip 13*a* is heat sealed in the manner described, individual pockets disposed between a pair of pocket side walls result. The parts heretofore described comprise means for supplying, guiding and longitudinally moving the strip having longitudinally spaced pockets. After leaving the vertical sealer 19, the strip 13*a* is moved past drive rollers 20 through a filling station, generally indicated at 21, constructed in accordance with the features of the present invention, for filling each pocket with a preselected quantity of any suitable material to be packaged. The pockets are filled as the strip 13*a* moves about the filling station 21 and contain the preselected amount of material by the time they reach the take-off roller 134. After leaving the filling station 21, the strip is moved through a top sealer 22 which provides a horizontal heat seal to close each pocket and captivate the product therein.

The generally vertical orientated strip 13*a* is then passed through a second capstan drive 20*a* and is turned under a horizontal roller 135 so as to again move in a generally horizontal plane into a combination indexer and slicer 9. From this mechanism 9, individual seal packages 13*c* fall to and are carried away by an endless conveyor belt 136.

A more detailed discussion of some of the parts of the machine 10 which do not, in themselves, constitute the present invention may be found in the above-mentioned application for United States Letters Patent.

Having described the overall structure and operation of the machine 10, a more detailed description will now be given of the structure and operation of the filling station 21.

As shown in FIG. 1 the filling station 21 includes two wheel-shaped members keyed to a common shaft for rotation in horizontal planes about their centers. These members are an upper feeding table 45 and a lower strip transferring drum 46. The table 45 is preferably constructed of metal such as aluminum or an aluminum alloy and has a plurality of funnel-shaped depressions 47 formed therein extending from the upper planar surface of table 45 to its lower surface above drum 46. The funnels 47 are circumferentially spaced at a common radial distance from the center of the table 45. The funnel-shaped depressions 47 terminate at their lowest level in an opening 48. Affixed to these openings are feedouts 50 constructed in accordance with one feature of the invention. These feedouts 50 and their operation will be described in more detail with respect to the discussion of FIGS. 2, 3, 4, 5 and 6. The drum 46 which is keyed to a common shaft in rotation with the table 45 has an outer rim comprising a plurality of circumferentially spaced alternating lands 49 and valleys 51. It is about the rim of this rotating drum 46 that the pocketed strip 13*a* travels. The strip, after leaving the drive rolls 20, advances to an inserting roll 52 which is formed with a rate of curvature equal to the valleys 51 between the lands 49 and serves to press the strip 13*a* thereagainst. The machine is so arranged and positioned as to align the vertical seals of the strip 13*a* to be juxtaposed with one of the various lands 49 of the drum 46 as the strip 13*a* moves with the drum 46. A system, described in the aforementioned application for letters patent, of selectively distributing a vacuum to various lands as the drum rotates, for holding the transverse seals juxtaposed against the lands, is provided.

As best shown in FIG. 2, the vacuum is distributed to the suction cup areas 53, via openings 54 for holding the transverse seal portions of the strip 13*a* thereagainst. These areas 53 have a vacuum communicated thereto via the openings 54 only during the portion of their rotation in which the strip 13*a* is held against the rim of the drum 46. As the rotating suction area reaches the strip take-off roller 134, the vacuum ceases to be connected to the suction cup areas 53 and the strip is easily removed.

As best depicted in FIGS. 4–6, the feed-outs 50 comprise a fixed nipple tube 50*a* which has an exterior threaded upper end 50*b* for affixing that end of the tube 50*a* at the opening 48 of the table 45. Below the threaded area is an increased diameter outer brake surface 50*c* of cylindrical shape. Below the surface 50*c*, the tube 50*a* has a decreased diameter and a tapering outer diameter at its lower end 50*d*. The interior bore 50*e* of the tube 50*a* is of a constant diameter throughout its length.

The lower end 50*d* of the tube 50*a* is tapered so as to generally conform with the interior diameter tapering of a nipple sleeve 50*f*. The sleeve 50*f* has a generally greater interior diameter than the exterior diameter of the tube 50*a* and fits loosely thereover. At its lowermost end 50*g*, the sleeve 50*f* has a tapered or decreasing interior diameter and a tapering outer diameter to enable it to easily enter the opening pockets of the strip 13*a* on the drum 46 (FIG. 5). The sleeve 50*f* also has two equal area cutout portions 50*h* for allowing brake means comprising a pair of nylon brakes 50*i* to extend therethrough. The cutout portions 50*h* are formed on opposite portions of the tube 50*f* with a pair of longitudinal tube wall portions 50*j* therebetween. The brakes 50*i* are formed with a concave-cylindrical section braking surface 50*k* which forms when the brakes are fitted on the cutout portions 50*h*, a portion of the interior surface of the tube 50*f*. The brake surfaces 50*k* extend within the tube 50*f* for slidably seating against the raised brake surface of the tube 50*a*. The brakes 50*i* are urged toward the interior of the tube 50*f* and against the brake surface 50*c* of the tube 50*a* by means of a pair of rubber O-rings 50*o* set in recesses 50*m* formed in the outer surface of the brakes 50*i*. As best seen in FIG. 6, the thickness of the brakes 50*i* is greater than that of the wall of the tube 50*f* by such an extent that the O-rings 50*o*, despite being within a recess 50*m* are not materially deformed by their passage about the outer surface of the portions 50*j*.

Each of the feedouts 50 also includes a collar 50*q* which is affixed to the sleeve 50*f* by means of a set screw 50*w*. The collar is of a generally annular shape and has an interior bore surface 50*x* sized to fit over the outer surface of the tube 50*f*. The fixed position of the collar is preferably adjustable so as to provide varying vertical travel for the sleeve 50*f*.

The feedouts or feedout tube mechanism 50 is constructed so as to extend downward into the pockets of the strip 13*a* during the filling process and to be retracted from the pockets at the end of the filling process, just before the strip of filled pockets is removed from the filling station 21.

The nipple sleeve tube 50*f* is moved downward, as best shown in FIG. 5, by the co-action of the rotating filling station, the collar 50*q* and a stationary but rotating wheel 70 mounted for rotation about an axle 71 in a plane at an angle to the vertical. The wheel 70 has a rubber rim

72 which makes contact with the collar 50*q* of the feedout mechanism 50 as it advances with the revolving filling station 21. The wheel 70 is mounted on a crossbar 73 which is in turn affixed in a conventional manner to a standard 74 mounted on the base 11. Applicants have found that only one wheel is needed to lower the feedout mechanism 50 into the pockets of the strip 132, while the raising of the feedout mechanism is best accomplished by using two wheels. Thus, as best shown in FIGS. 2 and 3, a first raising wheel 75 and a second raising wheel 75', downstream and higher than wheel 75, are provided to raise the sleeve in two steps. Each wheel 75, 75' is mounted for rotation about an axis in a vertical plane by means of an adjustable height standard 76, 76' affixed to an upstanding from the base 11. The wheels 75, 75', like the wheel 70, have rubber outer rims 77, 77' which make contact with the lower portion of the collars 50*q*.

Referring to FIGS. 7 and 8, there is depicted an enlarged view of the mechanism for governing the flow and distribution of the material to be packaged to the individual funnels and feedout tubes of the table 45. The product is gravity fed from the hopper through a cylindrical tube 80 to an elongated slot or cutout 81 formed in a fixed block 82. The block 82 remains stationary while the table 45 rotates under it. A small clearance is provided between the block 82 so as to allow the product from the discharge tube 80 to pass through the block to the turning table top 45 below it. In shape the cutout 81 extends as a vertical walled canyon which opens downstream at one side wall 82*a* of the block 82. The horizontal cross-section of the cutout 81 follows generally the arc of the turning wheel so that the product discharged therein would be moved directly out of the opening of the wall 82*a* by the turning table 45. However, flow governing means, comprising an adjustable gate 85 is provided to govern the flow therefrom. The gate 85 is of a generally rectangular shape and is slidably fixed into a pair of channels 86 formed therefor in the block 82 on opposite sides of the cutout 81. The height of the gate 85 is precisely adjustable so as to open more or less of an area 87 adjacent to table 45 of the opening of the cutout 81 into a block wall 82*a*.

The height of the metering gate 85 is adjusted by using a threaded screw 89 which is centrally affixed to the upper edge of the gate 85. The screw 89 passes through a pair of knurl nuts 90 supported by a lift bracket 91. The lift bracket 91 is stationary and is affixed in a conventional manner to the support plate 93 which, in turn, is mounted as shown in FIG. 1 to the base 11 via the cross arm 94 and appropriate standards including a standard 122. The plate 93 also serves to support the block 82.

The metering gate assembly also includes a biasing spring 95 for biasing the gate 85 downward and for maintaining sufficient pressure on the knurl nuts 90 to prevent slippage.

The assembly also includes a shutoff valve 100 for stopping the flow from the hopper through the tube 80. This valve comprises a thin plate 100*a* which is rotatable from the depicted open position to a closed position by moving the ball handle 100*b* to move the plate 100*a* between the block 82 and the lower end of the tube 80. A small downturned edge 100*c* of the plate 100*a* serves as a stopper by making contact with the side wall of the block when the plate 100*a* fully covers and closes the tube 80.

Means for moving the product into the funnels 47 after it leaves the metering block 82 are provided. These means include a curving plow 115. As best seen in FIG. 1, the plow curves from the block to a point downstream from the block so as to constantly increase its displacement from the center of the table 45. Thus, as the table 45 turns in the direction of the arrow, the product is forced by the cooperative effort of the plow 115 and the spinning table into the individual funnels 47. As best depicted in FIGS. 7 and 8, the plow is affixed at one end to the block 82 as by the screws 116. The plow is stationary and is so mounted as to have a small clearance between its lower edge and the table 45.

Referring to FIG. 9 there is depicted the pocket spreading mechanism including an air hose 120. This mechanism is mounted adjacent to the drum 46 at the tucking roll 52 and serves to direct a small diameter narrow stream of air directly into the opening of the pockets of the strip 13*a* and thereby spread that opening to allow the nipple assembly 50 to enter. The mechanism includes a cross pipe 121 mounted to a standard 122 rising from the base 11 (FIG. 1) by means of the block 123. The air hose 120, outer one end of pipe 121 and a nozzle 124 are provided at the other end. The nozzle 124 is bent to the proper angle so as to direct the air into the pocket openings from above the strip and is provided with an air flow constricting insert 125. The insert 125 comprises a tubular member with a small passage 125*a* which directs a narrow stream of air into the pockets of the strip 13*a*.

As previously mentioned, in overall operation the filling station 21 serves to fill individual pockets of the strip 13*c* with measured quantities of a product, such as sugar. The product is stored in a hopper 140 from which it passes through a feeding tube 80 into the cutout portion 81 of the block 82, when the valve 100 is open. From the cutout 81 the product is moved by the turning table through the variable opening 87 formed by the position of the metering gate 85. For a given product the quantity of material passing through the opening 87 depends on the rotational speed of the table 45 and the size of the opening 87. The size of the opening 87 is fixed by manually adjusting the nuts 90 to raise or lower the gate 85. As the table 45 turns, it moves the product relative to the stationary block 82 and into the curving wall formed by the plow 115. The product thus is forced to flow outward and to enter the individual funnels 47. For a given speed of rotation and a given product the flow of the product is determined by the opening of the gate 85. The flow is sufficiently uniform to allow an exact amount desired, within close tolerances, of the product to enter each funnel 47.

Coincident with the turning of the table 45 and the movement of the product into the funnels 47 the drum 46 rotates and the strip 13*c* is deposited thereon by the roll 52. Immediately adjacent the roll 52, the pockets of the strip 13 are opened by the narrow jet of air from the nozzle 125. Immediately downstream from the nozzle 125, as best shown in FIG. 5, the moving portion of the filling station causes the feedout mechanism 50 to move into contact with the stationary roller 70. The rubber rim 71 makes contact with the raised collar 50*q* and slides the nipple sleeve 50*f* downward so that its lowest tapering portion 50*g* enters the open pocket of the strip 13*c*. The brake action of the brakes 50*i* against the surface 50*c* of the tube 50*a* prevents the override of the nipple sleeve 50*f* and maintains it within the pockets of the strip 13*c* during the filling process.

The nipple sleeve 50*f* enters the pockets at approximately the position of the block 82 and prior to the entry of the product into the funnel 47. As the product does enter the funnel 47 it passes down therethrough into the tube 50*a*. From the tube 50*a* it passes into the sleeve 50*f* and thence into the pocket.

The product is completely discharged through the feedout tube 50 during the rotation of the filling station from the outermost edge of the plow 115 to the standard 76. At this point, as best shown in FIGS. 2 and 3, the nipple sleeve 50*f* is raised by the first raising wheel 75. As the sleeve 50*f* must be raised against gravity, it has been determined that the raising operation can best be accomplished in two steps by using the raising wheels 75, 75'. The first wheel 75 raises the nipple sleeve 50*f* by making contact with the lower portion of the collar 50*q* and raising the sleeve until its lowermost tip moves out of

the pockets of the strip **13***c*. The second wheel **75'** is at a higher elevation above the base **11** and raises the sleeve **50***f* again in a similar manner to be completely free of the strip **13***c*.

The process is, of course, continuous with each feedout tube going through the cycle of moving into a pocket, discharging the product therein and being removed from a pocket during each rotation of the filling station.

It is now apparent that the above-described, new and improved packaging machine provides for better, less wasteful filling of individual packages by rendering the discharge process relatively safe from the adverse effects of vibrations of air currents.

It will be apparent that many modifications and variations may be effected without departing from the scope and the novel concepts of the present invention.

We claim as our invention:

1. A machine for packaging a product comprising:
means for supplying, guiding and longitudinally moving a continuous strip having longitudinally spaced pockets;
a filling station including:
a rotating portion for receiving and moving the continuous strip, said rotating portion having a horizontally disposed planar surface with at least one depression formed therethrough opening downwardly into one of the pockets,
means for spreading and opening said pockets,
means for distributing a metered quantity of the product to be packaged on said horizontally disposed planar surface of said rotating portion, said distributing means including means forming a metering block stationarily supported above said horizontal surface and having a side wall thereof formed with an opening so that rotation of said planar surface causes the product to be deposited thereon in a continuous stream having a consistent cross-sectional area,
means forming a plow for cooperating with said rotating horizontal surface to direct said stream of the product into said depression;
means for removing the strip from said filling station and for sealing the filled pockets of said strip.

2. A machine for packaging a product as defined in claim **1**, wherein said filling station further includes:
means forming a feedout for each depression for transferring the product from said depression into one of the pockets.

3. A machine for packaging a product as defined in claim **2**, wherein said means forming a feedout includes:
means extending and retracting the effective lengths of said feedout so as to cause the same to enter individual ones of said pockets during the discharge of the product therein and to cause the same to leave the pockets thereafter.

4. A packaging machine as defined in claim **2**, wherein said means forming a feedout includes:
a fixed nipple tube; and
a nipple sleeve slidably mounted therewith.

5. A packaging machine as defined in claim **1**, further characterized by:
said means for spreading and opening said pockets including a source of air stream, said source having a nozzle for directing a small diameter stream of air at the openings of said pockets.

6. A packaging machine as claimed in claim **4** in which said nipple sleeve includes brake means cooperating with said nipple tube for maintaining said nipple sleeve at any one of a plurality of positions in a continuous range, and said filling station further including separate means for raising and lowering said nipple sleeve.

7. A packaging machine as claimed in claim **6** in which said brake means comprises a pair of nylon brakes mounted in cutout portions of said nipple sleeve and said nipple tube has a brake portion thereon for contact with said nylon brakes over said range.

8. A packaging machine as claimed in claim **2** in which said rotating portion of said filling station comprises a table having a plurality of said depressions formed therein and circumferentially spaced therearound to form a plurality of funnels with one said feedout individually affixed at the bottom of each said funnel.

9. A packaging machine as claimed in claim **8** in which said rotating portion further includes a wheel portion having a rim with lands and valleys on which the strip is received and moved with the pockets of the strip aligned with said feedouts so as to enable said feedouts to enter the pockets and discharge the product therein.

10. A packaging machines as defined in claim **9**, in which said feedouts individually comprise a fixed nipple tube and a nipple sleeve slidably mounted therewith.

11. The packaging machine as claimed in claim **10** in which said nipple sleeve includes brake means cooperating with said nipple tube for maintaining said nipple sleeve in any one of a plurality of positions in a continuous range, said filling station further including separate means for raising and lowering said nipple sleeve.

12. A packaging machine as claimed in claim **11** in which said brake means comprises a pair of nylon brakes mounted in cutout portion to said nipple sleeve, and said nipple tube has a brake portion thereon for contact with said nylon brakes over said range.

13. The packaging machine as claimed in claim **12** in which said means for spreading and opening said pockets comprises a source of an air stream, said source having a nozzle directing a small diameter stream of air at the openings of the pockets.

14. A packaging machine as claimed in claim **13** in which said means for spreading includes a cross pipe for mounting said nozzle, said nozzle is bent at an angle to direct the air stream into the pockets of the strip from above and is provided with an air flow constricting insert.

15. A packaging machine as claimed in claim **11** in which said means for raising and lowering said nipple sleeve includes a collar affixed about said nipple sleeve and a plurality of wheels mounted for rotation about an axis fixed in relation to said rotating portion so as to make contact with said collar and alter the position of said nipple sleeve.

16. A packaging machine as claimed in claim **1** in which said metering block has an adjustable metering gate to change the flow of the product from said opening.

17. A packaging machine as claimed in claim **15** in which said plurality of wheels is three in number, one of said wheels serving to extend said feedouts into the pockets of the strip and two of said wheels serving to retract the feedouts, in two stages, out of the pockets and away from the strip.

18. A packaging machine for packaging a product comprising:
means for supplying, guiding and longitudinally moving a continuous strip having longitudinally spaced pockets;
a filling station comprising:
first and second wheel-shaped members keyed to a common shaft for rotation in horizontal planes about their centers,
said first member comprising:
a feeding table having a plurality of circumferentially spaced depressions formed therein at a common radial distance from the center of said table and extending from the upper surface of said table to individual ones of a plurality of feedouts,
said second member comprising:
a rotating drum keyed to a common shaft for rotation with the first member and having an outer rim comprising a plurality of circumferentially spaced alternating lands and valleys for

receiving the strip with the individual pockets opening upward toward the individual ones of the plurality of feedouts; and

a plurality of individual feedouts positioned to receive the product and affixed at the bottom openings of said depressions of said first member and comprising:

a fixed nipple tube having an upper end affixed at that end to the bottom of the opening into the funnel depression of said table,

said fixed tube having an outer brake surface area of increased diameter and of cylindrical shape,

said fixed tube also having an interior bore of constant diameter throughout its length;

a nipple sleeve tube having a greater interior diameter than the outer diameter of said fixed tube for slidably moving thereabout,

said sleeve tube having a tapered and decreasing interior diameter and a tapering exterior diameter at its lowermost end so as to enter the open pockets of the strip with ease,

said sleeve tube having two cutout portions for allowing nylon brakes to extend therethrough,

a pair of nylon brakes for extending through said cutout portions of said sleeve and having a surface conforming to said braking surface of said fixed tube for contact therewith, and further having a pair of semicircular recesses formed in their outer surfaces for receiving a pair of O-rings;

a pair of O-rings for fitting in said recessed surfaces of said brakes and for resiliently urging said brakes against said braking surface; and

a collar affixed to the outer surface of the tube of the nipple sleeve, the tube collar being of a generally annular shape,

whereby said feedouts may be extended and retracted so as to have their lowermost tapered end portions of said sleeve enter and retract from the pockets of the strip during the filling operation;

and means for removing the strip from said filling station, for sealing the filled pockets of said strip and for slicing the strip so as to form individual packages of the product therefrom.

19. A filling station comprising:

first and second wheel-shaped members keyed to a common shaft for rotation in horizontal planes about their centers,

said first member comprising:

a feeding table having a plurality of circumferentially spaced depressions formed therein at a common radial distance from the center of said table and extending from the upper surface of said table to individual ones of a plurality of feedouts,

said second member comprising:

a rotating drum keyed to a common shaft for rotation with the first member and having an outer rim comprising a plurality of circumferentially spaced alternating lands and valleys for receiving the strip with the individual pockets opening upward toward the individual ones of the plurality of feedouts; and

a plurality of individual feedouts positioned to receive the product and affixed at the bottom openings of said funnel-shaped depressions of said first member and comprising:

a fixed nipple tube having an upper end affixed to that end to the bottom of the opening into the funnel depression of said table,

said fixed tube having an outer brake surface area of increased diameter and of cylindrical shape,

said fixed tube also having an interior bore of constant diameter throughout its length;

a nipple sleeve tube having a greater interior diameter than the outer diameter of said fixed tube for slidably moving thereabout,

said sleeve tube having a tapered and decreasing interior diameter and a tapering exterior diameter at its lowermost end so as to enter the open pockets of the strip with ease,

said sleeve tube having two cutout portions for allowing nylon brakes to extend therethrough,

a pair of nylon brakes for extending through said cutout portions of said sleeve and having a surface conforming to said braking surface of said fixed tube for contact therewith, and further having a pair of semicircular recesses formed in their outer surfaces for receiving a pair of O-rings;

a pair of O-rings for fitting in said recessed surfaces of said brakes and for resiliently urging said brakes against said braking surface; and

a collar affixed to the outer surface of the tube of the nipple sleeve, the tube collar being of a generally annular shape,

whereby said feedouts may be extended and retracted so as to have their lowermost tapered end portions of said sleeve enter and retract from the pockets of the strip during the filling operation;

and means for removing the strip from said filling station, for sealing the filled pockets of said strip and for slicing the strip so as to form individual packages of the product therefrom.

20. A packaging machine as claimed in claim **5** in which said means for spreading includes a cross pipe for mounting said nozzle, said nozzle is bent at an angle to direct the air stream into the pockets of the strip from above and is provided with an air flow constricting insert.

21. The packaging machine as claimed in claim **20** in which said air flow constricting insert is of a hollow cylindrical shape and fits snugly within said nozzle.

22. In a device for feeding a product, including a movable filling station and a plurality of feedout tubes for feeding a product into a continuous strip having spaced pockets, the improvement comprising rendering said feedout tubes extendible and retractable and providing means for extending said feedout tubes at the start of the feeding operation and means for retracting said feedout tubes after essentially completing the feeding operation, said feedouts comprising a first fixed feedout tube, a second movable feedout tube slidably affixed about said first tube in any one of a plurality of positions about said first tube, in which said means for extending said feedout tubes comprise a first wheel stationarily affixed for rotation so as to make contact with said feedouts and to extend said second tube into said pockets as said filling station advances said tube into contact with said wheel; and in which said retracting means comprises a pair of similar wheels affixed for contact with and for retracting said second tube.

23. A machine for packaging a product comprising:

means for supplying, guiding and longitudinally moving a continuous strip having longitudinally spaced pockets;

a filling station comprising:

a rotating portion for receiving and moving the continuous strip,

means for spreading and opening said pockets,

means for distributing a metered quantity of the product to be packaged on part of said rotating portion, and

a plurality of feedouts for transferring the metered quantity of the product from part of said rotating portion of said filling station into said individual one of the pockets, said feedouts including means extending and retracting their effective lengths so as to enter individual ones of said pockets during the discharge of the product therein and for leaving the product thereafter, each said feedout including a fixed nipple tube and a nipple sleeve slidably mounted therewith, said nipple sleeve including brake means co-

operating with said nipple tube for maintaining said nipple sleeve at any one of a plurality of positions in a continuous range, and

means raising and lowering said nipple sleeve; and

means for removing the strip from said filling station and for sealing the filled pockets of said strip.

24. A packaging machine as claimed in claim **23** in which said brake means comprises a pair of nylon brakes mounted in cutout portions of said nipple sleeve and said nipple tube has a brake portion thereon for contact with said nylon brakes over said range.

25. A machine for packaging a product comprising:

means for supplying, guiding and longitudinally moving a continuous strip having longitudinally spaced pockets therealong;

a filling station including:

a rotating portion for receiving and moving a continuous strip, said rotating portion including a table having a plurality of circumferentially spaced funnels formed therein and also including a wheel portion having a rim with lands and valleys on which the strip is received and moved with the pockets of the strip aligned with the funnels,

means for spreading and opening said pockets,

means for distributing a metered quantity of the product to be packaged on part of said rotating portion, and

a plurality of feedouts individually affixed at the bottom of said funnels so as to be aligned with the pockets of the strip for discharging the product therein, each said feedout including a fixed nipple tube and a nipple sleeve slidably mounted therewith, said nipple sleeve including brake means cooperating with said nipple tube for maintaining said nipple sleeve in any one of a plurality of positions in a continuous range, and

means raising and lowering said nipple sleeve to cause the feedouts to enter individual ones of said pockets during the discharge of the product therein and to leave said pockets thereafter; and

means for removing the strip from said filling station and for sealing the filled pockets of said strip.

26. A packaging machine as claimed in claim **25** in which said brake means comprises a pair of nylon brakes mounted in cutout portion of said nipple sleeve, and said nipple tube has a brake portion thereon for contact with said nylon brakes over said range.

27. The packaging machine as claimed in claim **26** in which said means for spreading and opening said pockets comprises a source of an air stream, said source having a nozzle directing a small diameter stream of air at the openings of the pockets.

28. A packaging machine as claimed in claim **27** in which said means for spreading includes a cross pipe for mounting said nozzle, said nozzle is bent at an angle to direct the air stream into the pockets of the strip from above and is provided with an air flow constricting insert.

29. A packaging machine as claimed in claim **25** in which said means for raising and lowering said nipple sleeve includes a collar affixed about said nipple sleeve and a plurality of wheels mounted for rotation about an axis fixed in relation to said rotating portion so as to make contact with said collar and alter the position of said nipple sleeve.

30. A packaging machine as claimed in claim **29** in which said plurality of wheels is three in number, one of said wheels serving to extend said feedouts into the pockets of the strip and two of said wheels serving to retract the feedouts, in two stages, out of the pockets and away from the strip.

31. In a packaging machine including means for supplying, guiding and longitudinally moving a continuous strip having longitudinally spaced pockets therealong, and a rotating filling station for receiving and transferring an arcuate portion of a strip thereabout and having a plurality of feedout tubes for discharging a product into individual ones of the pockets of said continuous strip while said strip passes about said rotating filling station, the improvement comprising:

said feedouts including a first fixed feedout tube, a second movable feedout tube slidably affixed about said first tube and brake means for restraining said slidably affixed feedout tube in any one of a plurality of positions about said first tube;

means extending said feedout tubes into said pockets at the start of the filling operation of said pockets; and

means retracting said feedout tubes after essentially completing the filling operation of said pockets.

32. The improvement in a packaging machine as defined in claim **31**, further characterized by:

said means for extending said feedout tubes comprising a first wheel stationarily affixed for rotation so as to make contact with said feedouts for extending said second tube into said pockets as said rotating filling station advances said tube into contact with said wheel; and

said retracting means comprising a pair of similar wheels affixed for contact with said second tube for retracting said second tube.

33. The machine of claim **31** further including:

means for distributing a metered quantity of a product including a metering block defining a cutout for receiving the product, said cutout being in communication with a rotating portion and having an adjustable metering gate so as to change the flow of the product from said cutout portion.

34. The machine of claim **33**, wherein said means for distributing a metered quantity of a product further includes:

a plow affixed above said rotating portion for cooperating therewith and moving the product thereon.

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U.S. Cl. X.R.

53—183, 187, 385; 141—133, 182; 222—168.5, 370