

Oct. 18, 1955

E. F. HISCOCK  
METHOD AND MEANS FOR CONTINUOUS FILLING, SEVERING  
AND PACKAGING OF FLEXIBLE CONTAINERS  
ARRANGED IN STRIP FORM

2,721,017

Filed May 22, 1952

4 Sheets-Sheet 1

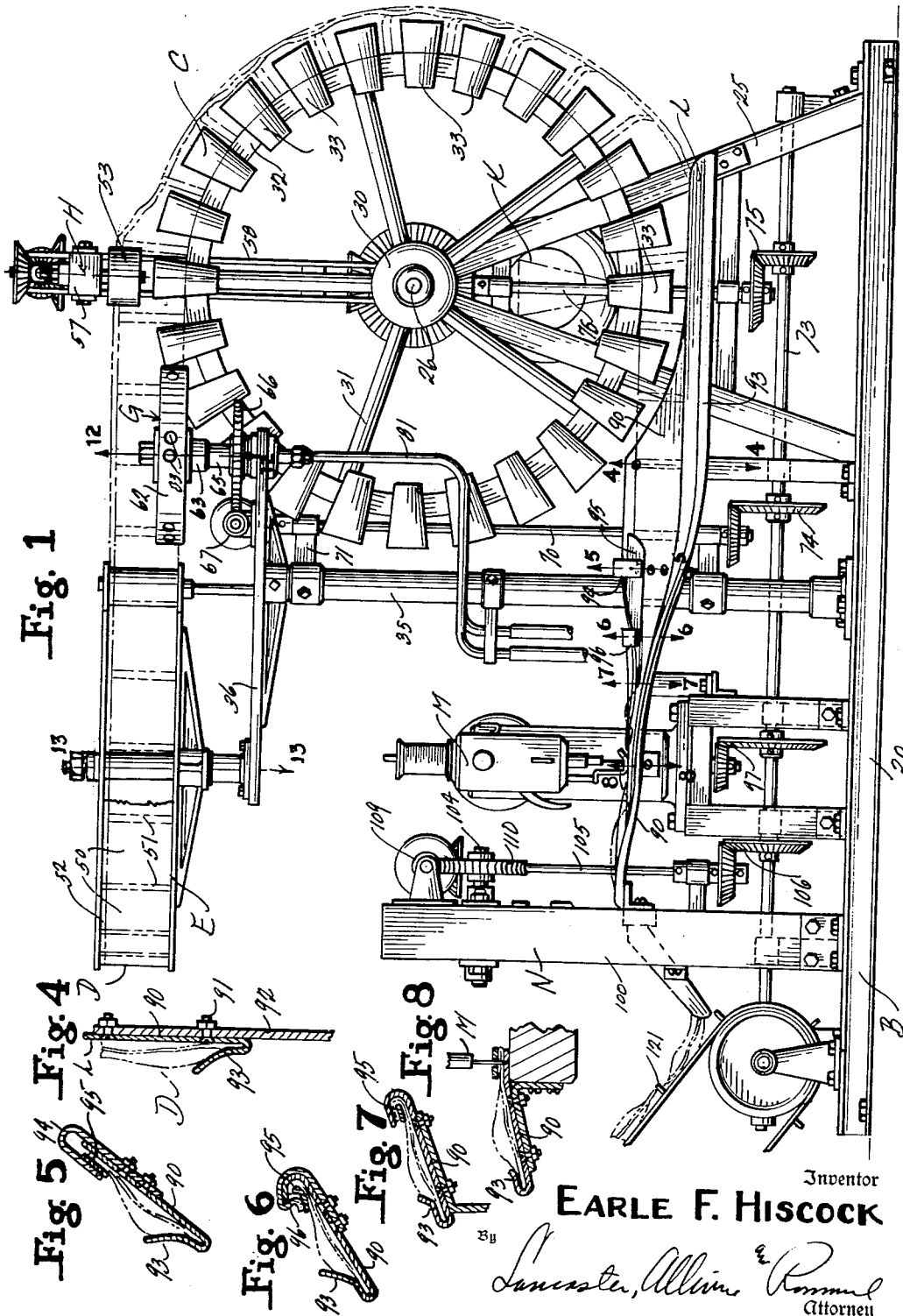


Fig. 1

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

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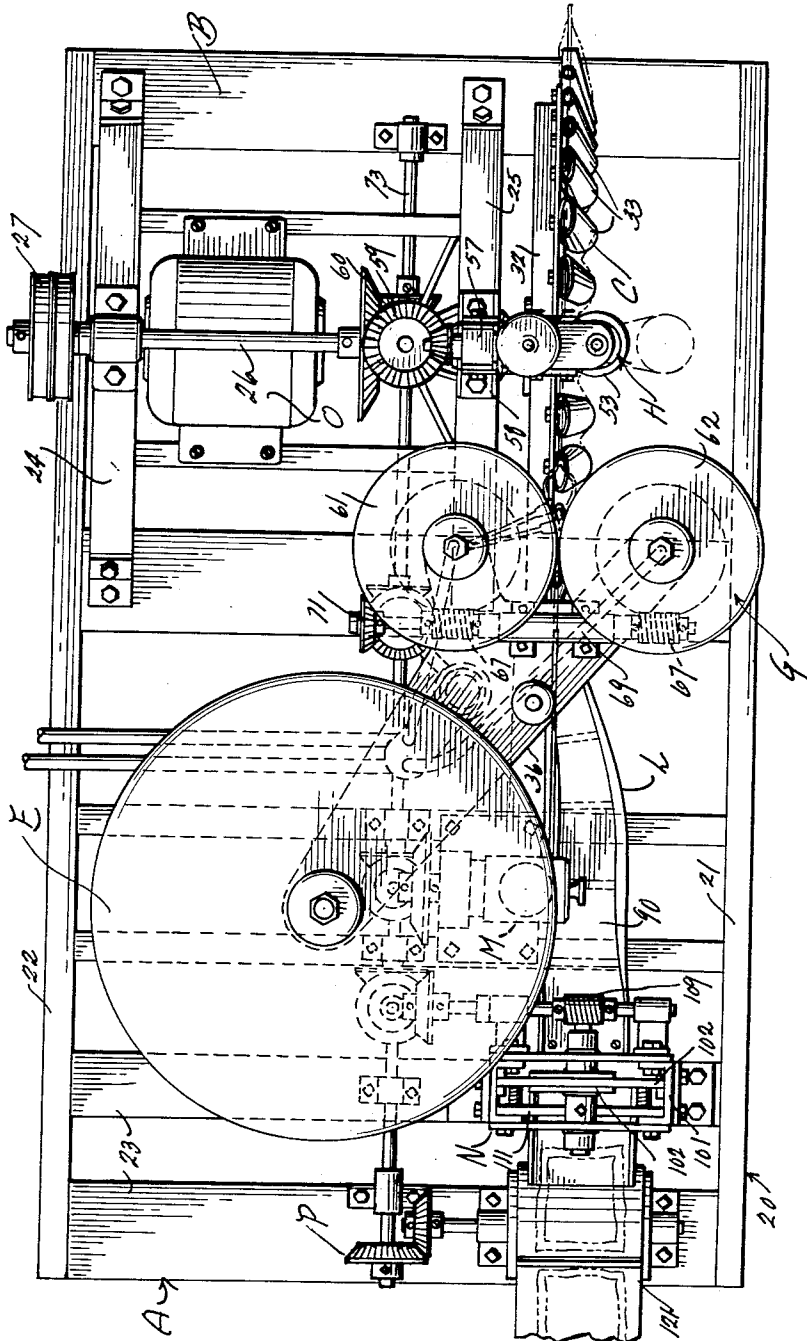
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Fig. 2



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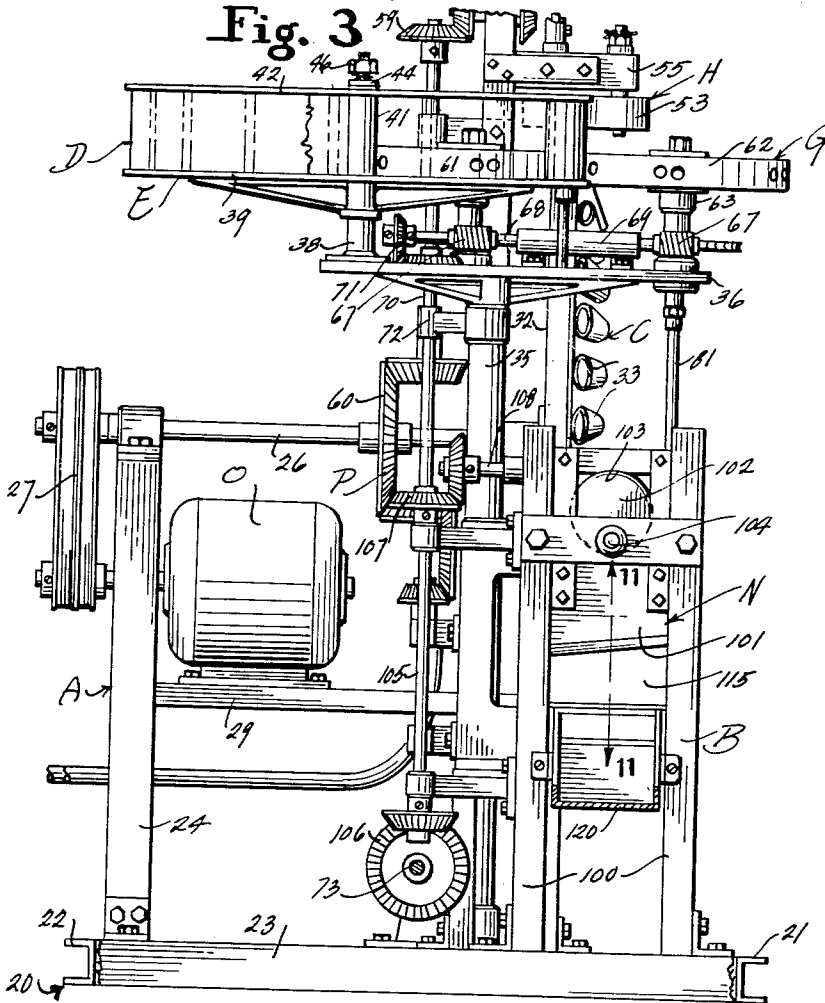


Fig. 10

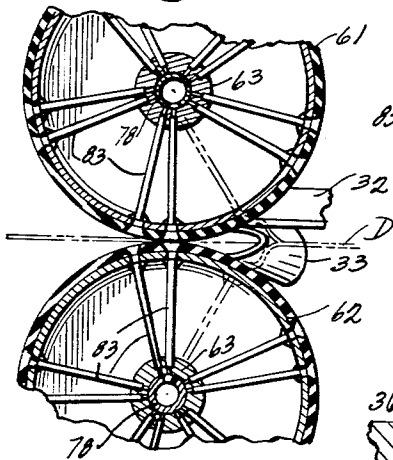


Fig. 12

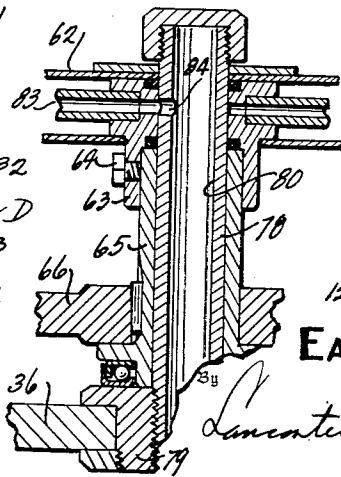
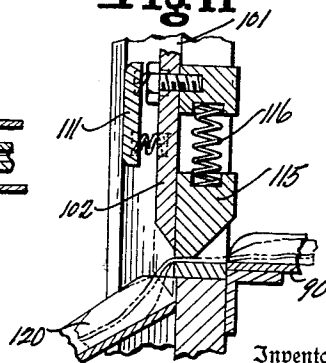


Fig. 11



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Fig. 14

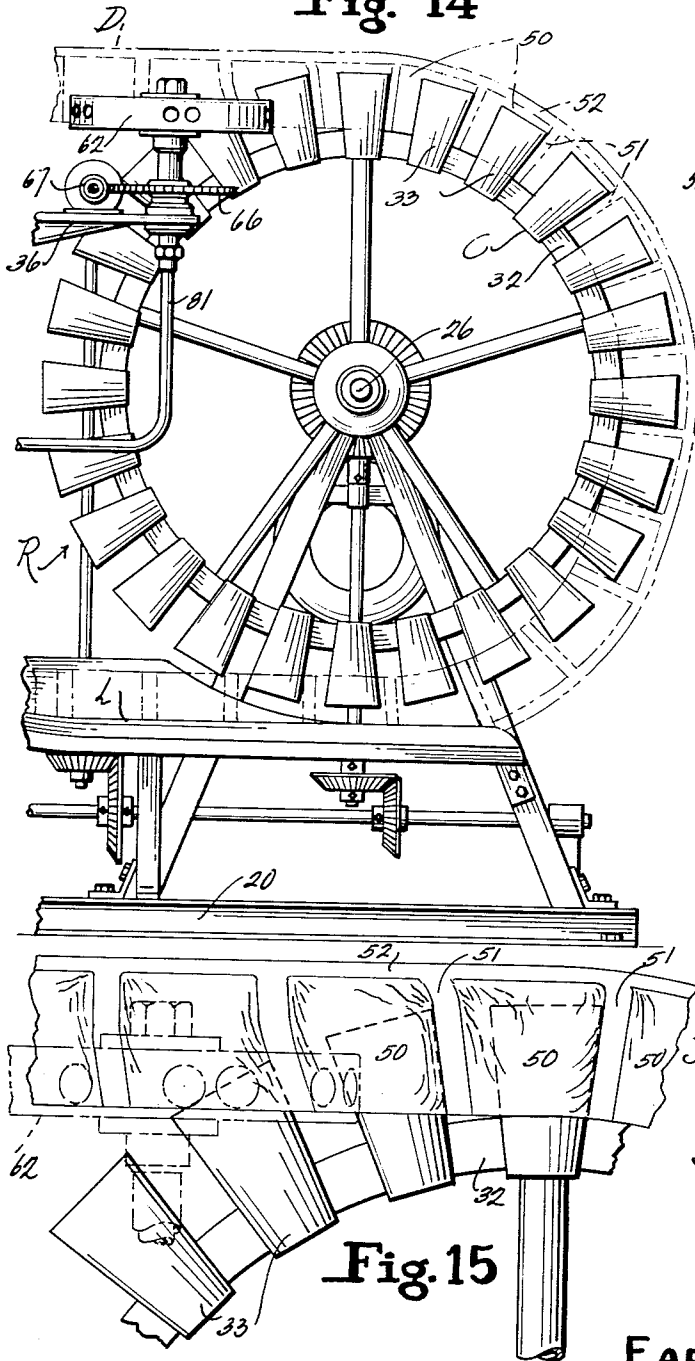


Fig. 9

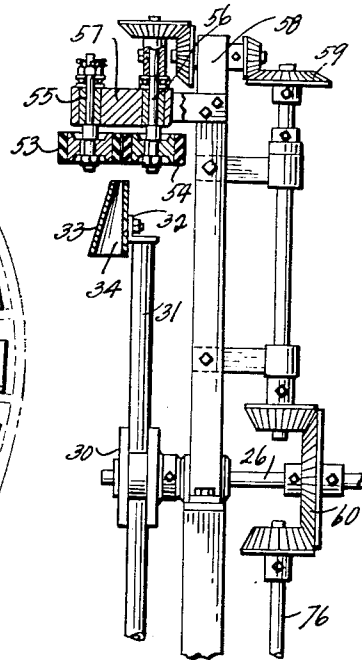


Fig. 13

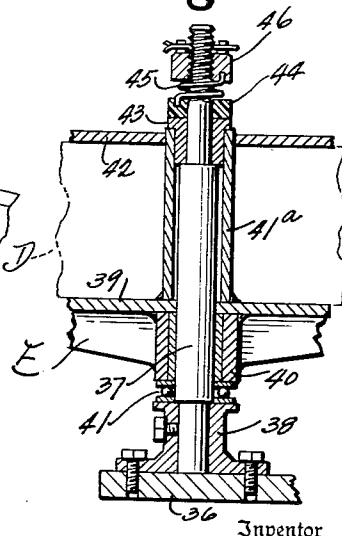


Fig. 15

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2,721,017

**METHOD AND MEANS FOR CONTINUOUS FILLING, SEVERING AND PACKAGING OF FLEXIBLE CONTAINERS ARRANGED IN STRIP FORM**

Earle F. Hiscock, Washington, D. C.

Application May 22, 1952, Serial No. 289,284

18 Claims. (Cl. 226—53)

This invention relates to improvements in methods and means for the continuous filling, severing and packaging of flexible containers with comminuted material, such as coffee, tea, etc.,

The primary object of this invention is the provision of an improved method and machine for the accurate and economical filling of limp containers which are arranged in strip form; the improved machine being adaptable for the filling of the containers with comminuted materials, such as coffee, tea, etc., under conditions enabling the economical merchandising of the commodity containing packets or bags.

A further object of this invention is the provision of an improved method and machine for the filling of flexible bags with coffee so as to produce a coffee packet or sack capable of use in coffee makers of the type set forth in my co-pending applications Serial Nos. 142,670, filed February 6, 1950, now abandoned; Serial 174,476, filed July 18, 1950, and Serial 279,521, filed March 31, 1952. The bags or sacks are preferably of the type set forth in my application Serial 281,354, filed April 9, 1952; the limp material of which the same are constructed being viscose rayon yarn fabricated of regenerated cellulose fiber or woven nylon.

A further object of this invention is the provision of improved automatic machinery for the expeditious and economical sacking of commodities in flexible sacks; improved means being provided for opening the sacks or pockets as they are arranged in strip or ribbon form, check filling the sacks with comminuted materials, and guiding and manipulating the sacks for the purpose of closing and relatively severing the same.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a side elevation of the improved machine, showing the various details thereof, including the strip or ribbon material for the continuous filling, severing and packaging of the comminuted materials in the sacks or bags of the strip.

Figure 2 is a plan view of the improved machine.

Figure 3 is an end elevation of the machine.

Figures 4, 5, 6 and 7 are cross sectional views taken substantially on their respective lines shown in Figure 1, designating the sequential guiding and manipulating of the sacks after the filling thereof and while they are still arranged in strip form preliminary to closing of the same.

Figure 8 is a cross sectional view taken substantially on the line 8—8 of Figure 1, showing the sewing of the sacks or bags.

Figure 9 is a fragmentary view, partly sectional showing a tensioning means for manipulating the strip material as it comes from a drum for the purpose of so

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holding it that a means may effectively operate for the opening of the bags preliminary to the insertion therein of filling funnels of the bag supporting and manipulating wheel.

Figure 10 is a fragmentary cross sectional view showing an improved pneumatic type of bag opening device.

Figure 11 is a cross sectional view taken substantially on the line 11—11 of Figure 3 showing a bag or sack severing means.

Figure 12 is a fragmentary cross sectional view taken substantially on the line 12—12 of Figure 1 thru one of the pneumatic wheel supporting standards.

Figure 13 is a fragmentary vertical cross sectional view taken substantially on the line 13—13 of Figure 1 thru a drum for supporting the roll of pocketed strip material.

Figure 14 is a side elevation of a modified arrangement for advancing the pocketed strip material in its path of travel.

Figure 15 is a fragmentary enlarged view of the manner in which the bags of the strip are manipulated by the filler wheel, in the form of invention shown in Figure 14.

In the drawings, wherein for the purpose of illustration are shown preferred and modified features of the invention, the latter A may generally designate the improved machine. It comprises a frame B supporting a wheel C which acts in general as a sprocket wheel for receiving the bags of the strip material D; the latter being supported upon a drum E mounted upon the framework B. Improved pneumatic means G is provided for opening the individual bags or sacks preliminary to the insertion of the individual filler funnels of the wheel C. A strip tensioning means H is provided for pulling the strip material against resistance offered by the drum E in a cooperative relation with respect to the pneumatic opening means and the filler wheel, so that the individual bag pockets will be properly positioned for opening and reception of the respective filler funnels. Any type of filling means K for check and weighed filling of the comminuted materials within the individual sacks or bags may be provided. In the drawings this is merely shown as a spout, but of course such devices are well known. Track and table means L is provided as a guiding medium for the bags of the strip of material after they have been filled by the means K and left the tooth-type funnels of the wheel C, for the proper positioning of the same without loss of the material contained therein, and so that they will be properly positioned for hemming and closing at the sewing head M. A cutting mechanism N is provided for the severing of individual bags from the strip material. A motor O is provided for synchronous driving of the various parts of the improved machine thru gearing P.

The frame B of the machine preferably comprises a base structure 20. It may include side channels 21 and 22 connected by cross braces 23. Inverted V-shaped uprights 24 and 25 support a horizontal shaft 26, in suitable bearings at the upper ends thereof. This shaft 26 to one side of the machine adjacent the upright structure 25 supports the filler wheel C, which is keyed thereto. The shaft 26 is driven thru a belting arrangement 27 of motor 0 or other source of power. The motor 0 may be supported upon an auxiliary platform 29 constituting part of the frame B.

The wheel C functions as a sprocket wheel, the teeth of which comprise filler funnels or tubes received in the opened inverted pockets of the bags of the strip material. To that end the wheel C includes a hub structure 30 suitably keyed to the shaft 26 in any approved manner. Spokes 31 radiate from the hub and at their outer ends an annular rim 32 of angled cross section is welded or

otherwise secured thereto. The individual filler funnels 33 are bolted or otherwise secured to rim 32 as by welding. The funnels 33 have passages 34 therethrough decreasing in width from the inner mouth end of each towards the outer exit end, as shown in Figure 9. The filling machine K in Figure 1 is shown as a chute. It need not be otherwise shown in this application, since it forms a part of a check weighing machine, well known to those skilled in the art to which this invention relates, and its purpose is merely to deposit a predetermined quantity or weight of material in each funnel 33 as the wheel advances the funnel to the position of the machine K for the intermittent filling of the sacks. It is of course understood that the filling of the pocket is instantaneous, and to that end the size designations of the mouth of the individual funnel in relation to the spout of the check weighing machine may be arranged to suit the continuous rotation of the wheel, or as an alternate form the drive means for the wheel C may be intermittent with an almost imperceptible time stop of the wheel at the time of filling.

The strip material designated at D may be supported in roll form by the frame of the machine upon a drum E. To that end the frame of the machine is provided with a vertical standard 35 which at its upper end is provided with a horizontal supporting plate or table 36. This is intended to support various features of the machine, and one of them is a vertical axle or spindle 37 mounted in a supporting bracket 38 upon the table 36, as shown in Figure 13. The drum E may include a lower horizontal flange 39 having a hub 40 resting upon an antifriction thrust bearing 41, and by this means the drum is rotatably mounted upon the stationary spindle 37. The hub 40 includes a sleeve portion 41a for receiving the center opening of the roll D, and the top flange or plate 42 of the drum E may be movable to adjust itself to a gravity position upon the top of the roll D, to suit the width of the latter. The top of the drum may include a bushing 43. It rotates as part of the hub structure of the drum. To offer frictional resistance to rotation of the drum E, I prefer to provide a friction disc 44 yieldably held against rotation and with downward pressure upon the top of the bushing 43, by means of a spring 45. The latter is connected to a nut 46 which may be adjustable upon the upper threaded end of the spindle 37, as shown in Figure 13. The pressure can be adjusted by the nut 46 to provide the necessary amount of resistance to free rotation of the drum and roll upon the spindle 37.

The strip material D forming the roll has been adequately described in my co-pending applications Serial 142,670, filed February 6, 1950, and Serial 281,354, filed April 9, 1952. For the purpose of this invention the same comprises a plurality of pockets 50 separated by single web woven severing portions 51, the bottoms being closed by a single web portion 52, and the opposite ends of the pockets are opened. The roll is supported upon the drum E with the pockets opening downwardly. The strip tensioning means H is provided for tautly pulling the pockets at and immediately adjacent to the pocket closing web 52 so that the side walls or flaps of the pockets at the opening thereto are loosely in position to be pulled apart by the pneumatic bag opening means G. This enables a funnel 33 to enter each of the pockets as the wheel C rotates. This tensioning means H may consist of a pair of rollers 53 and 54, shown in Figure 9, rotatably supported upon suitable shafts and antifriction bearing means 55 and 56 respectively. The margins of the rollers 53 and 54 may be of rubber or some synthetic material adapted to squeeze the bottom of the bag therebetween. The shafts 55 and 56 are supported upon a bracket arm 57 mounted upon a vertical standard 58 comprising part of the framework B. The drive means for the shaft 56 may consist of shafting and gears 59 connected for drive to a gear 60 keyed upon the shaft 26.

The means G for opening the bags at a location between

the roll E and the tensioning means H preferably comprises a pair of suction wheels 61 and 62, the hubs 63 of which are detachably keyed at 64 to sleeves 65 rotatable therewith. The latter are provided with gears 66 keyed therewith. The gears 66 are driven by means of worm gears 67 keyed upon a shaft 68. The latter is supported in a bearing 69 rotatably mounted upon the bracket plate 36, as shown in Figure 3. The shaft 69 is driven off of a shaft 70 thru bevelled gears 71. The shaft 70 is supported in suitable frame bearings 72 and extends downwardly and is driven off of a horizontal shaft 73 by means of bevelled gears 74. The shaft 73 is in turn driven by bevelled gears 75 thru a shaft 76 which is geared to the main drive shaft 26 as shown in Figure 9. The suction wheel sleeves 65 bear within hollow sealed axles or shafts 78 supported at 79 upon the frame plate 36. The passageways 80 of these hollow shafts 78 receive suction thru ducts or pipes 81 which lead to any suitable vacuum source.

As is shown in Figures 10 and 12, suction is imparted to the periphery of the wheels 61 thru tubes or ducts 83; the hollow sealed tubes or axles 78 being provided with suitable slots or ducts 84 of a length sufficient to permit the tubes 83 to align therewith and hold the pocket opened by pulling its walls apart, as shown in dot and dash lines in Figure 10 of the drawings to a point where the proper filler tube or funnel 33 may enter the same.

If desired the outer peripheries of the wheels 61 and 62 could be provided with some adhesive material to pull the pocket flaps apart, instead of being provided with the vacuum means above described.

In the form of invention shown in Figure 1 the pockets of the strip D after passing the tensioning means H collapse, as shown in dot and dash lines in Figure 1, upon the sprockets of the wheel and pass around to a location where the pockets will drop by gravity onto the container guide track and table L, just short of the material filler K. The table L, as is shown in Figure 4 may include a back wall portion 90 bolted at 91 to a plate 92 of the frame; the lower marginal portion of the track L being flanged at 93, as shown in Figure 4, for receiving the bottom portion of the bag. As the funnels 33 pass the spout K of the check weighing machine, the correct amount of material will be deposited in the larger opened end of the passageway 34 and fall into the pocket into which the funnel projects.

The guide track and table L in advance of the wheel C, after the pockets have received the material, makes a gradual turn thru substantially 90°, so that the wall portion 90 slopes to a point where at the sewing head M, the same is positioned just slightly off horizontal, as is shown in Figure 8. The cross sections of Figures 5—5; 6—6 and 7—7 successively show the forming of the welt or hem upon the opened tops of the bags. To that end the wall 90 of the table in Figure 5 has an inverted U-shaped guide 94 with a strip 95 cooperating therewith to receive the open end of the bag; the strip 95 being turned in advance of the portion 94 for the purpose of folding over the edge of the opened end of the pocket in complementary cooperation with a second folding piece 96; the hem thus being turned around the strip 95 as shown in Figure 7, and held in this position until the folded edge passes under the sewing machine M.

The sewing machine M may be of any approved construction, driven off the shaft 73 by a gear train 97. It includes all of the necessary sewing equipment to sew the welt or hem of the bag with some yarn, preferably nylon, so as to completely encase the coffee or other material in the porous sack. The sewing head also includes a feeding means to pull the filled bags along the guide track and table and pass them along to the cutting mechanism N, but if found necessary some other feeding means for positive feed may be provided for this purpose between the sewing head M and cutter N. Also

in lieu of this the table could be sloped to permit gravity advance of the bags to the cutter.

The cutting head N serves the function of severing the bags from each other along the web divisions 51. It preferably includes track standards 100 mounted upon the base 20, as shown in Figure 3. These tracks slidably support a guillotine type of knife 101 operated for elevation and lowering by means of a cam 102 operating in an opening 103 of the frame of knife 101, as shown in Figure 3. The cam 102 is mounted upon a shaft portion 104. A vertical shaft 105 is driven by means of bevelled gears 106 off of the horizontal shaft 73, as shown in Figure 1, and this shaft 105 extends upwardly and is geared by bevelled gears 107 to a shaft 108 rotatably supported by the top framework of the cutter head. The shaft 108 is provided with a worm gear 109 which drives the gear 110 of the cam shaft 104, as shown in Figures 1 and 3 of the drawings.

A spring actuated pressure slide 111, shown in Figure 11, holds and stabilizes the knife blade 102 in proper position. A spring actuated hold-down clamp 115 is provided, in complementary association with the shear end of the blade 101, for momentarily engaging and holding the strip pockets stationary for severing. This is shown in Figure 11, where the holding clamp 150 is shown as spring actuated at 116. It presses the bag along the rear edging of the web portion 51 so that the shear blade 101 when it drops will directly sever the bags, from whence they drop into a chute 120 and fall upon a conveyor 121.

Referring to the form of invention shown in Figures 14 and 15 the pocket strip material D is moved along and around the wheel C thru the force action of the sprocket tubes 33 within the pockets and bearing against the division webs 51 between the pockets. In Figures 14 and 15 the pulling action of the wheel upon the strip material is correctly shown. The same reference characters have been applied in this form of invention as above given for the form of invention having the tensioning means H.

If found necessary, at any point along the table L, pulley means, such as the means H, may be provided to maintain the position of the strip upon the wheel and table.

The term "comminuted materials" is to be used in the broadest sense, and includes explosive powder as well as coffee or tea.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described without departing from the spirit of the invention or scope of the claims.

I claim:

1. That method of producing bags filled with comminuted material which consists in providing a strip of flexible textile material having preformed pockets arranged in strip form with closed marginal connections between adjacent pockets and one edge of each pocket being opened along a longitudinal edge of the strip, tensioning the strip along the pocket opening edge thereof, successively opening and individually filling the pockets, folding and securing a hem to close the pockets along the pocket opened longitudinal edge of the strip, and subsequently individually severing the pockets with respect to each other.

2. A machine for packaging commodities, such as comminuted materials, comprising a supporting frame, a wheel rotatably supported by said frame for rotation on substantially a horizontal axis having an annular arrangement of filler tubes, a strip of flexible material having preformed pockets arranged therealong and connected by severing portions with one edge of each pocket being opened along one longitudinal edge of the strip, means for feeding said strip onto the wheel so that the filler tubes of the wheel enter the pockets, means for filling the pockets thru said tubes, and means for sub-

sequently closing the individual pockets of the strip and severing the pockets from each other to provide individual commodity containing packets.

3. In a machine for the packaging of flexible containers with comminuted materials the combination of a supporting frame, a wheel supported on said frame in a vertical plane for rotation on the horizontal axis, filler tubes mounted in an annular arrangement upon said wheel radially disposed with inner filler openings and outer exit openings, a strip of flexible pocket providing material having a plurality of preformed pockets arranged therealong with transverse severing connections between the same and with the strip having the pockets opened at one edge of the strip, means for feeding said strip with the pockets in inverted position onto the uppermost portion of the wheel with the tubes at their outer ends entering the individual pockets, means for rotating the wheel to carry the strip of material around to the bottom portion of the wheel, means at the bottom portion of the wheel to feed comminuted material thru the inner ends of said tubes and into the respective pockets into which they enter, and means for subsequently relatively closing and severing said pockets one from the other.

4. In a machine for filling, severing and packaging comminuted materials the combination of a supporting frame, a rotatable wheel mounted upon the frame having an annular arrangement of filler tubes thereon opened at the opposite end portions thereof, a roll of flexible strip material having preformed pockets therealong connected by severing lines and with each pocket opened along a longitudinal edge of said strip, means for feeding the strip of material onto the tubes of said wheel including pneumatic means for opening the pockets by pulling apart the opposite walls thereof at the openings to said pockets, tensioning means to pull the strip material from said roll and acting upon the edge of the strip material opposite from the opened ends thereof at a location at the opposite side of the roll from said pneumatic means, means for individually filling said pockets thru said tubes, and means for closing and severing the pockets one with respect to the other.

5. In a machine for continuously filling, severing and packaging flexible containers with comminuted material the combination of a supporting frame, a rotatable wheel mounted in vertical position upon said frame and operating on a horizontal axis, said wheel having radially disposed filler funnels thereon with passageways having the inner and outer ends thereof opened, a roll of flexible strip material having a plurality of preformed pockets arranged therealong with individual severing lines therebetween and one edge of each pocket being opened along an edge of the roll, drum means rotatably mounted upon the frame for supporting said roll on a vertical axis, tensioning means mounted upon the frame for pulling the material from the roll and acting only at that edge of the strip opposite the opened pocket edge, pneumatic means acting only upon the edge of the roll upon which said pockets open for pulling the flaps of the pocket apart and permitting the insertion of the tubes into said pockets, means for filling the pockets with comminuted material thru said tubes, and means for individually closing and severing said pockets.

6. In a machine for filling and packaging flexible containers the combination of a frame, a wheel rotatably mounted upon the frame having mounted thereon substantially radially disposed filler funnels thereon with passageways therethru opening at their inner and outer ends, a strip of flexible pocket providing material having preformed pockets therealong individually connected along severing lines with respect to each other and with each pocket opened along one longitudinal edge of the strip, means mounting the strip of material upon the frame with the pockets opening downwardly, positive feed means for moving said strip of material into proximity with the top most tubes of the wheel, means for pulling the side

walls of the pockets apart and entering the tubes therein at the top of the wheel, material filling means for filling materials thru the inner ends of said tubes and into said pockets at the bottom of the wheel, and means for closing the pockets and individually severing them one from the other to provide material containing packets.

7. In a machine for the continuous filling, severing and packaging of flexible containers which are arranged in strip form, the combination of a supporting frame, a strip of flexible material having preformed pockets arranged therealong connected by severing portions and closed except for an opening to each along one longitudinal edge of the strip, a supporting table, means for filling materials into the pockets while they are arranged in strip form and moving them along said table, means on the table for folding over the opened ends of the pockets while they are arranged in strip form to provide a hem, means to sew the hem at the folded over portions of the pockets and close the pockets while they are in strip form, and means to subsequently individually sever the pockets one from another along the connecting severing lines.

8. In a machine for the filling, severing and packaging of flexible containers arranged in strip form, the combination of strip material having pockets connected along severing lines and enclosed except for opened ends along one longitudinal edge of the strip, a wheel provided with filler tubes thereon, means rotatably mounting said wheel upon a substantially horizontal axis, means for feeding the strip of material to the upper edge of the wheel onto the outer ends of the tubes so that the latter enter the individual pockets similar to the teeth of a sprocket wheel, a container guide table at the lower portion of the wheel for receiving the strip of material at the lower portion of the wheel, means for filling the individual pockets thru said tubes as they reach the table, means on the table to support and guide the material weighted pocket from an upright to a reclining position, and means associated with said table for individually closing the pockets and severing them one from the other while in reclining position.

9. That method of producing individual bags filled with some material which consists in providing a strip of flexible material having preformed pockets arranged in continuous strip form with closed marginal connections therebetween and with one edge of the strip formed to close all of said pockets, the pockets at the opposite strip edge being opened, moving the strip of material and while so doing opening the individual pockets and filling the same while they are in connected strip form, closing the openings of said pockets while they are connected in strip form, and subsequently individually severing said pockets one from another.

10. In a machine for packing commodities the combination of a supporting frame, a rotatable carriage mounted upon said frame, a strip of material having preformed pockets in connected relation thereon with one edge of each pocket opened at the same edge of the strip, means on the rotary carriage for moving the strip of material therewith, means for opening the individual pockets in successive relation while upon said carriage and while the pockets are still in strip form, means for individually filling said pockets while the same are in opened strip form upon said carriage, means for subsequently permanently closing the openings of said pockets while they are in connected strip form, and means for subsequently individually disconnecting said closed pockets one from another.

11. A machine for packaging commodities as described in claim 10 wherein the rotary carriage operates in a vertical plane and wherein the strip of material is in roll form and mounted upon said frame on a vertical axis from which the strip of material is fed in linear direction onto said rotary carriage.

12. A method of producing individual bags filled with comminuted material which consists in providing a strip

of flexible material in roll form positioned so the roll is disposed on a vertical axis, the roll strip having preformed pockets arranged thereon with closed marginal connections between adjacent edges of the pockets and with one edge of the strip closing each of the pockets and the opposite ends of its pockets being opened along the other edge of the strip, moving the strip in linear direction from the roll, successively pulling the sides of each of the pockets away from each other to open the individual pockets, and after the opening of said pockets by the last mentioned means filling the individual pockets.

13. A method as defined in claim 12 which includes a step of securely closing the pockets while they are still in connected strip form, and then subsequently individually severing the pockets one from another.

14. In a machine for packaging commodities the combination of a supporting frame, a roll of material having preformed pockets in connected strip form and wherein one edge of the strip has each pocket opening thereon, means for unwinding and pulling the strip of material from the roll, means for pulling the sides of each of the pockets away from each other in succession after having been pulled from the roll, means for filling the pockets while so opened with the desired material, means for permanently closing the open ends of the pockets while they are still connected in strip form, and means for individually severing said pockets one from another after having been closed at their open pocketed ends.

15. In a machine for packaging commodities, such as coffee, the combination of a supporting frame, a strip of material in roll form having preformed pockets in connected relation thereon with each pocket opened at the same edge of the strip, means mounting said roll on a vertical axis upon said frame, means offering resistance to pulling of the strip of material from the roll, means to unwind the strip from the roll, pneumatic means in advance of the last mentioned means for fully opening the pockets in succession, means for filling the opened pockets, means for permanently closing the pockets while the same are in strip form, and means to subsequently sever the closed and filled pockets one from another.

16. In a machine for packaging commodities, such as comminuted coffee, the combination of a supporting frame, a roll of material in strip form comprising preformed pockets arranged with all of their marginal edges closed except at one edge of the strip where an opening is provided for each pocket, means mounting the roll upon said frame, means mounted on the frame for pulling the flexible material in strip form from said roll, means for pulling the sides of each of the pockets away from each other at the opening portion of the pockets whereby to distend and open the pockets, means on the frame for filling the thus opened pockets successively, means on the frame for closing the pockets at their open ends, and means for individually severing the pockets.

17. A machine as defined in claim 16 wherein operating means is provided upon said frame for operating the roll unwinding means, the pocket side pulling and opening means, the filling means, the closing means, and the severing means, all in synchronized relation.

18. A method of packaging materials which consists in providing a strip of limp and unrigid flexible porous woven textile material which is non-thermoplastic and nonheatsealable, said material having preformed pockets arranged in strip form with closed woven marginal connections between adjacent pockets and with one edge of each pocket opened along a longitudinal edge of the strip and with the opposing edge of the strip woven to close said opposing edge, moving the strip longitudinally and tensioning the same, successively opening and individually filling the pockets with the desired material,



folding and securing a sewn hem to close the pockets along the pocket opened longitudinal edge of the strip, and subsequently individually severing the pockets one from another along the intermediate portions of the woven marginal connections between adjacent pockets. 5

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