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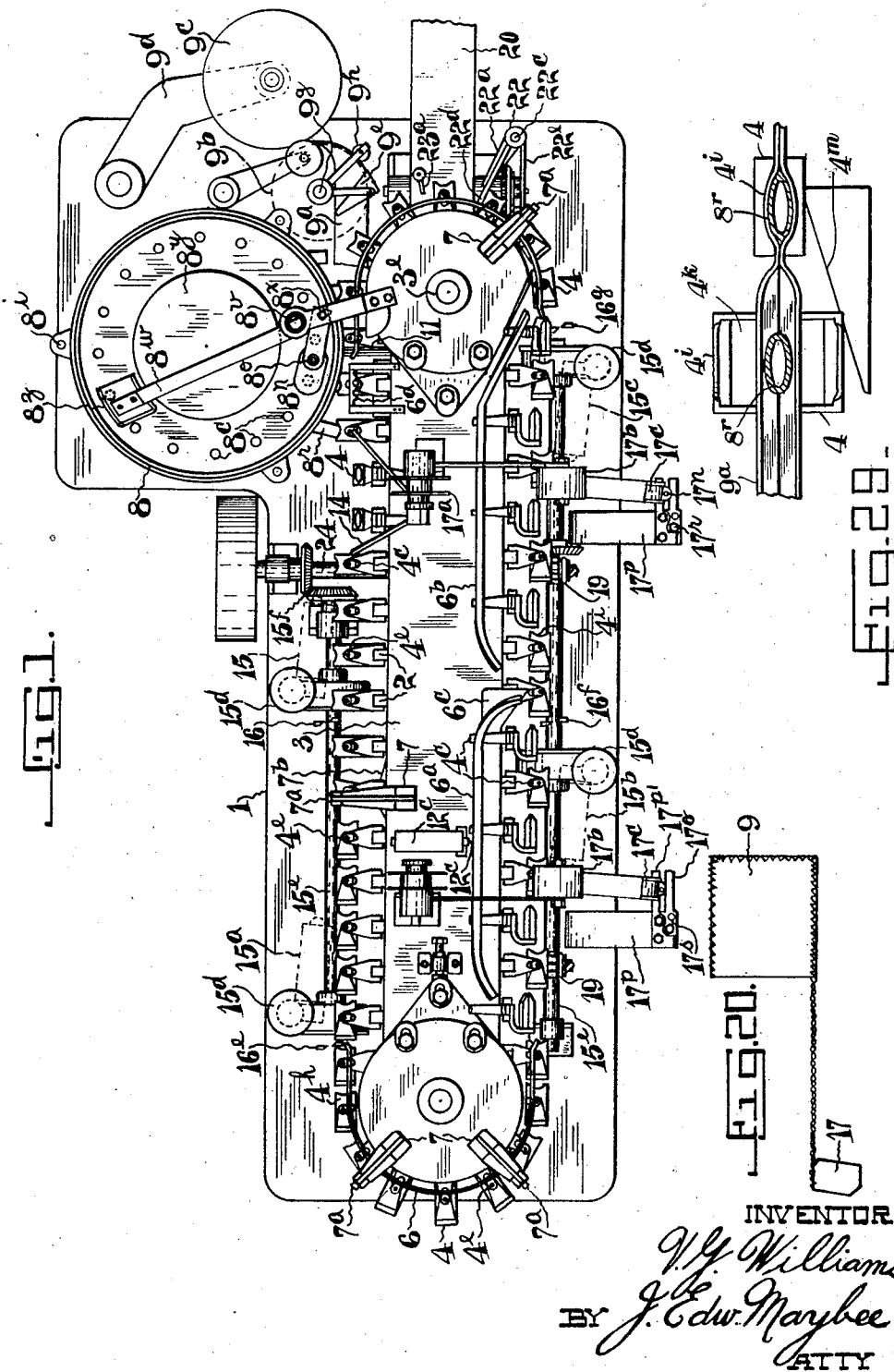
V. G. WILLIAMS

2,071,244

BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 1



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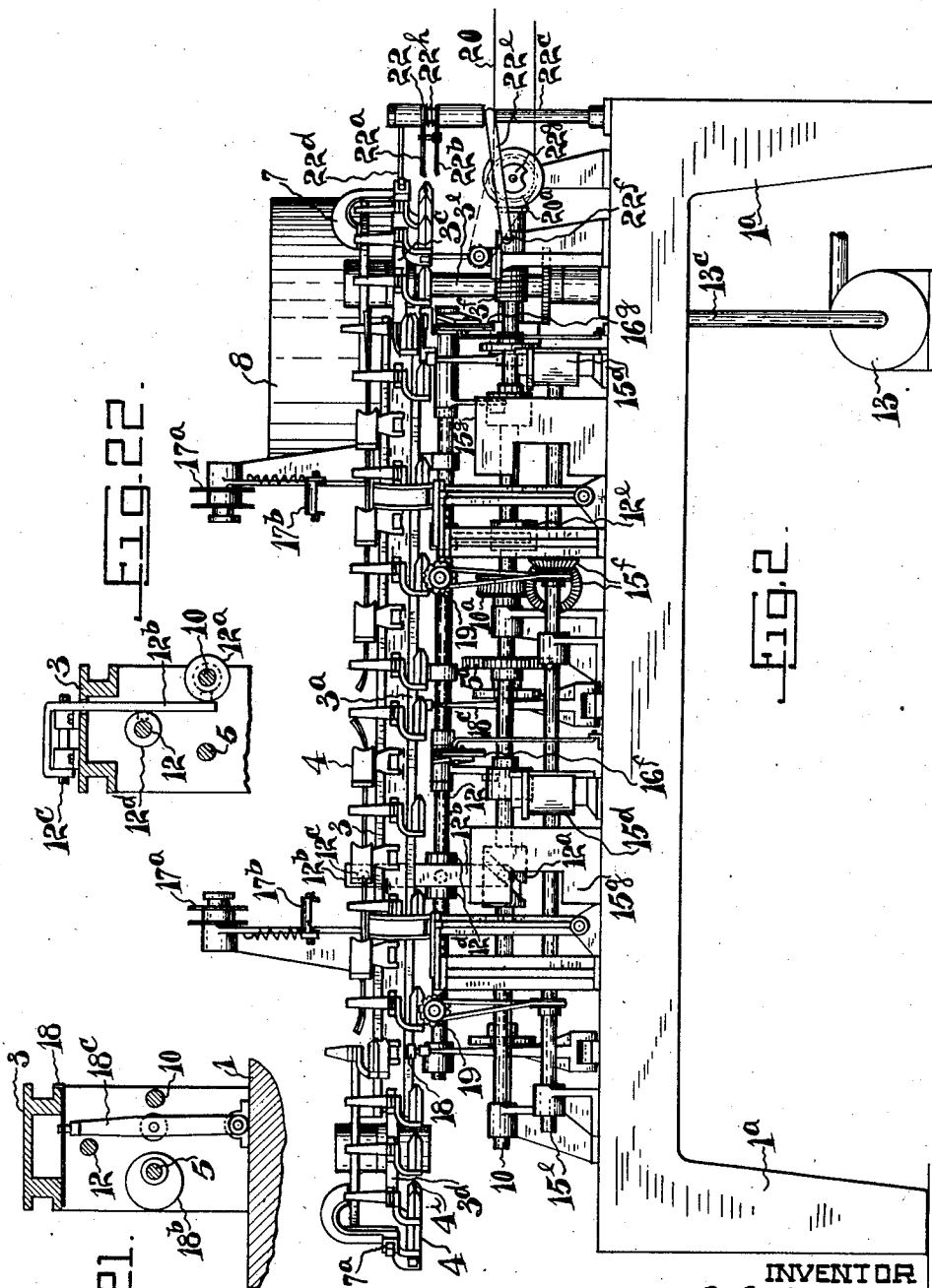
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Filed Feb. 8, 1934

7 Sheets-Sheet 2



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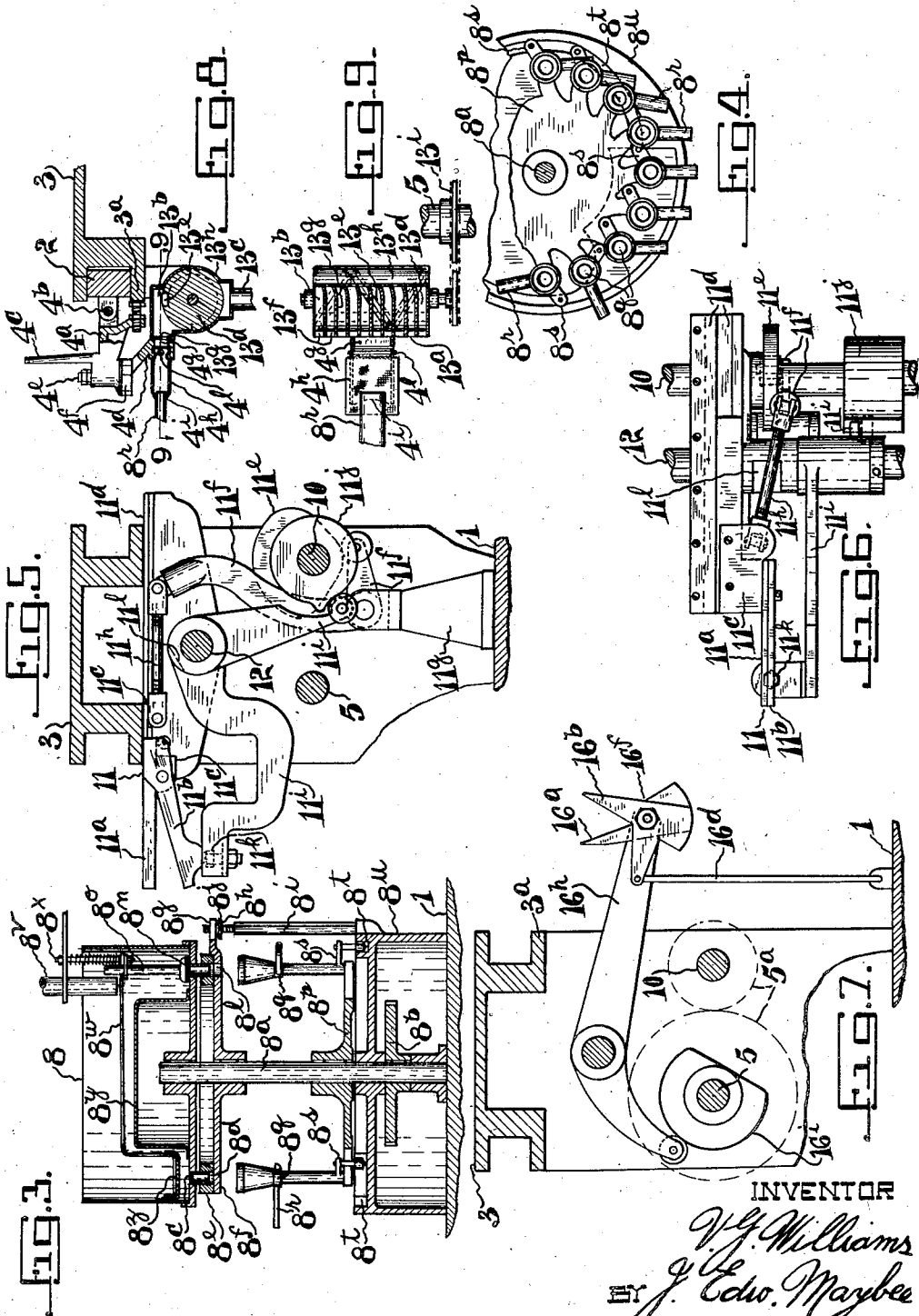
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2,071,244

BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 3



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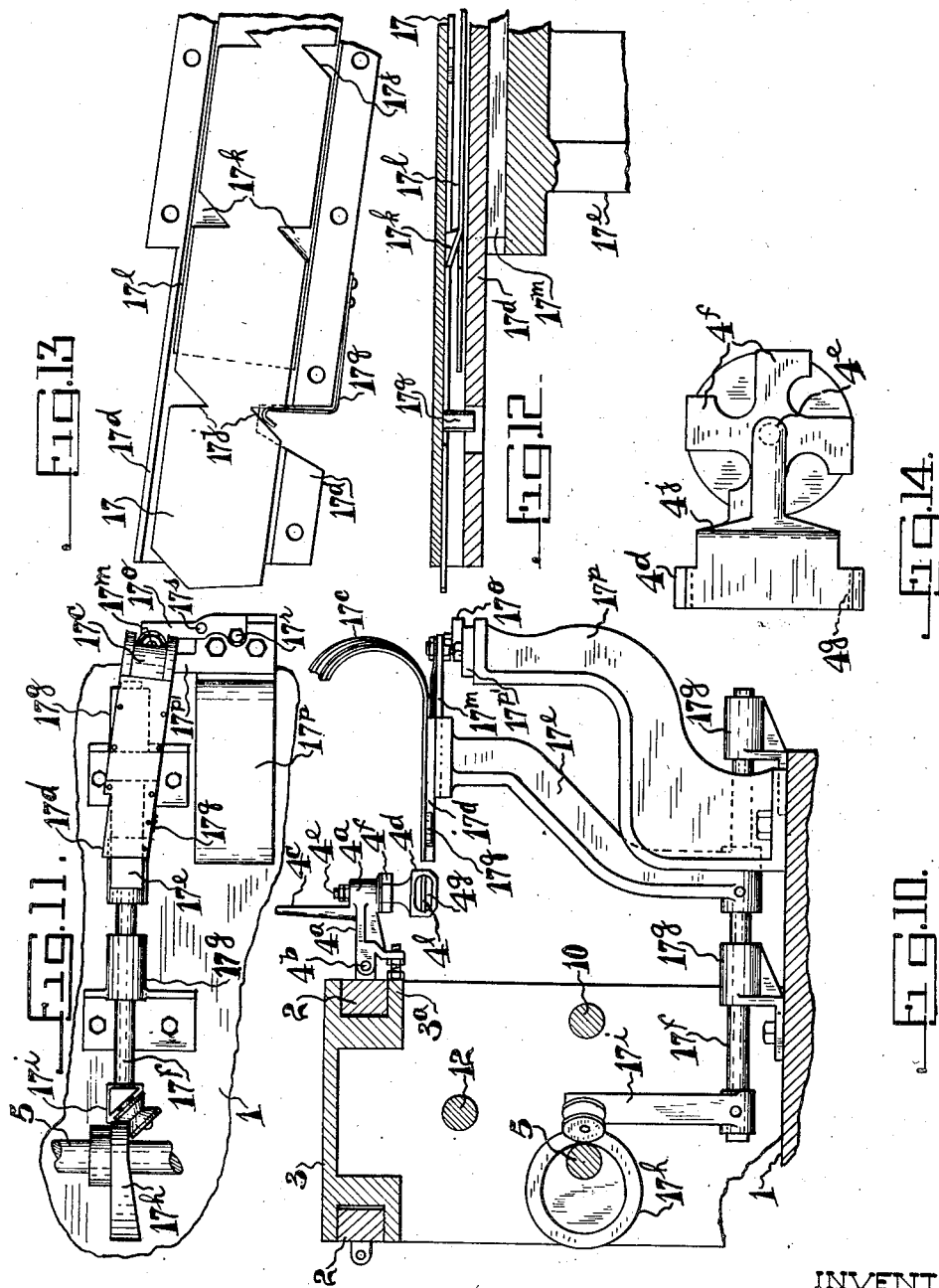
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2,071,244

BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 4



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Feb. 16, 1937.

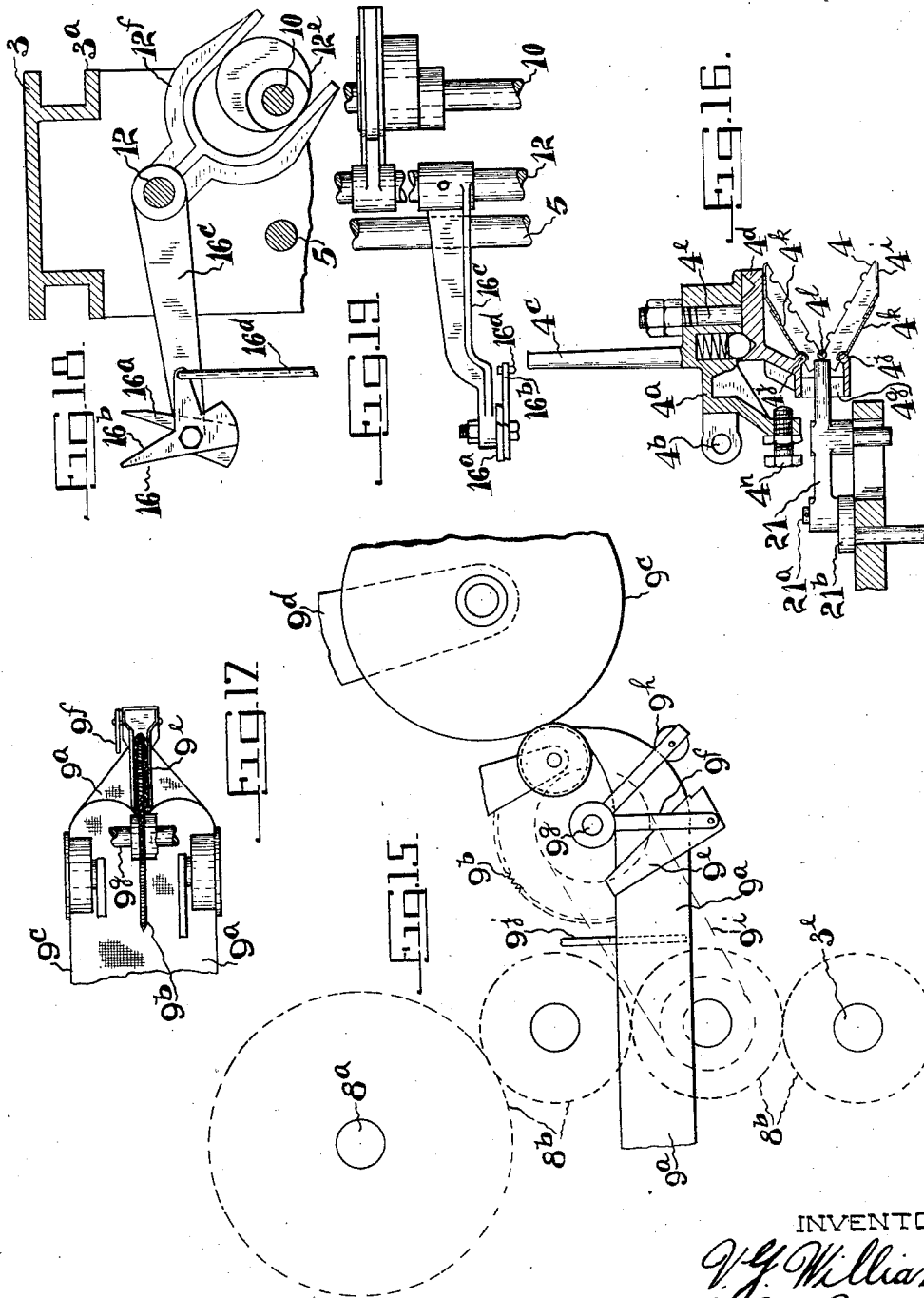
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2,071,244

BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 5



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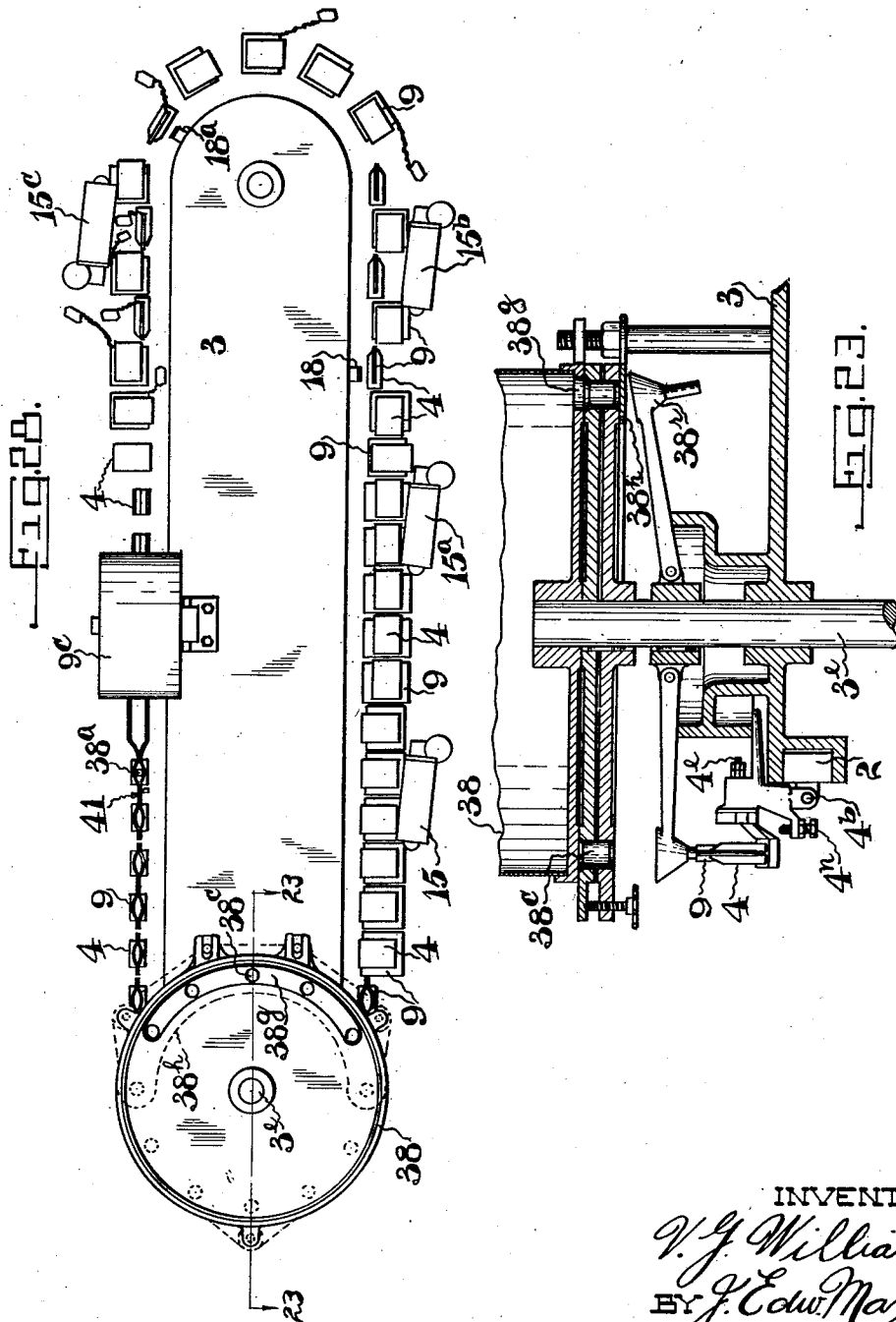
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2,071,244

BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 6



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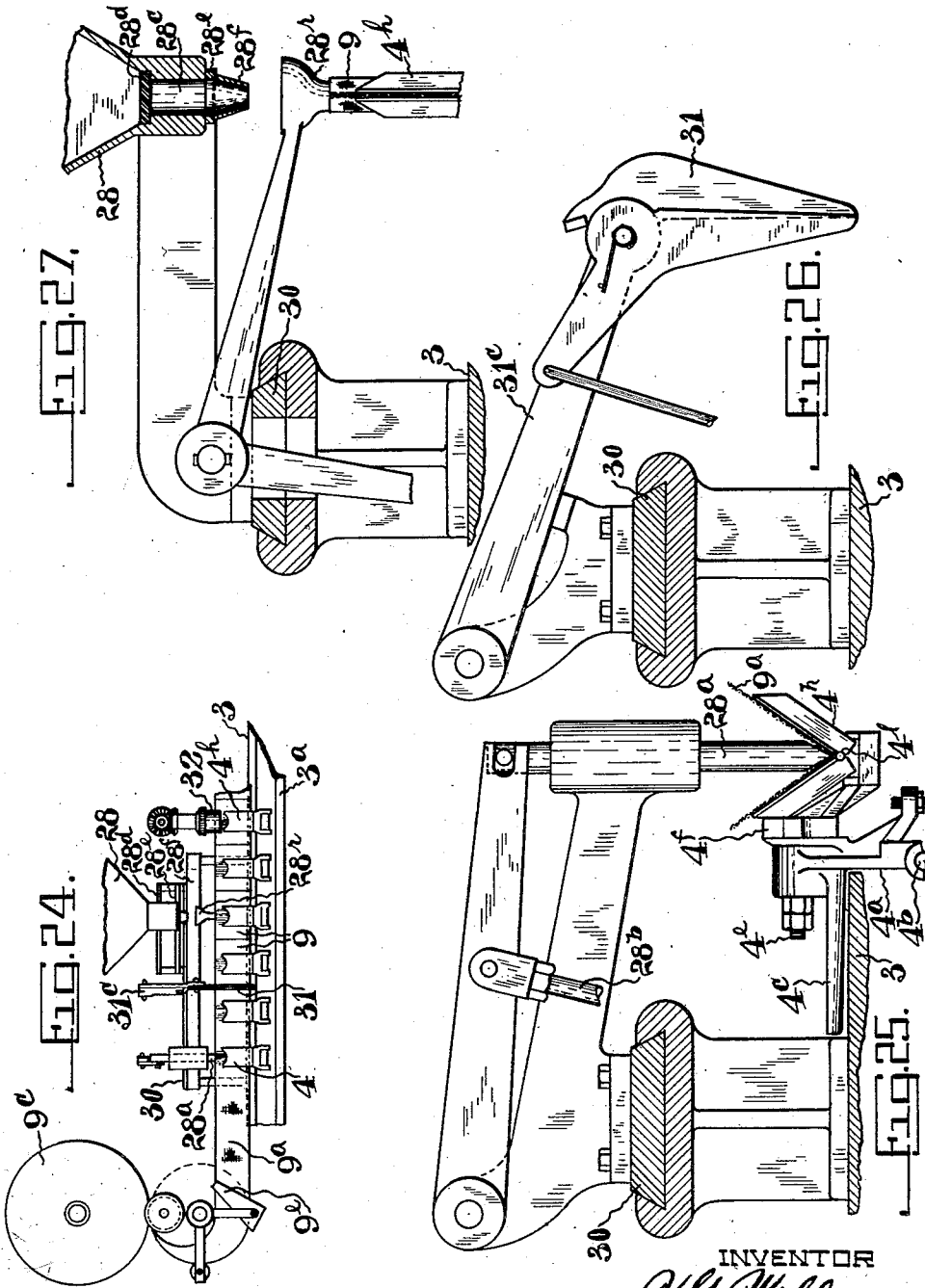
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BAG MAKING AND FILLING MACHINE

Filed Feb. 8, 1934

7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,071,244

BAG MAKING AND FILLING MACHINE

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Application February 8, 1934, Serial No. 710,294

37 Claims. (Cl. 226—53)

This invention relates to machines for making and filling bags and more particularly to machines of this type used for packaging tea in fabric bags having tags attached thereto and my object is to devise simple apparatus of this character in which the speed of production is increased while the speed of the machine is reduced to a minimum, in which the desired quantity of tea will be supplied for each bag and deposited therein, and in which a tag is attached to each bag at a predetermined distance therefrom without varying the rate of speed of the machine or that of the bag.

I attain my object by feeding and simultaneously folding over the longitudinal edges of the lead end of a roll of bag-making fabric so that the folded material passes on opposite sides of nozzles or pegs for forming bags. These nozzles are mounted to rotate externally of a conveyor which carries a plurality of grippers, each being adapted to receive a nozzle and the fabric surrounding it. A cloth knife moving transversely of and also longitudinally with the strip of fabric is adapted to cut the latter transversely, while it is gripped by two of the grippers, to form bag sections. After each bag section is formed, it is filled with tea directed thereinto by the nozzles which are then withdrawn from the bag section carried by the gripper which is subsequently tilted, if a horizontal feed be employed, and shaken or agitated and then moved past a sewing or surging machine which trims and sews the end or mouth of the bag section. The thread is then cut and the gripper is turned 90° and moved past a second sewing machine which trims and sews one side of the bag section. This thread is cut and the gripper is then turned 180° to bring the other side of the bag section into position for being trimmed and sewn by either one of two surging machines.

These machines sew or surge a side of the bag section by means of any suitable stitching such as chain stitching and tags are also fed and sewn to the chain stitches. To space the tags from their bags, alternate grippers are moved to a position in which the bag sections carried thereby will not be engaged by the first of the said two surging machines. The tags are sewn into the chain stitching at a maximum distance from their bag sections and the stitching is cut between the tags and the bag sections adjacent thereto. The grippers carrying the tagged bags are then moved to a position in which the bags will not be engaged by the second of the said two surging machines, and the grippers which were originally moved

out of position for engagement by the first of the two surging machines, are now moved again to position the bag sections carried thereby for engagement with the second of the said surging machines. The stitching between the tags and the bag sections adjacent thereto is then cut, the grippers last thrown out of action moved into alinement with those acted on by the second surging machine and then the grippers are turned 90°, a bag extractor engages the bag sections, the grippers are then opened and the extractor discharges the finished bags on to a conveyor. The grippers remain opened until reaching the position in which their jaws are on opposite sides of the nozzles around which the folded bag making material is passed so that when the grippers are closed, they will engage the material and securely clamp it between their jaws. The nozzles are constantly rotated on a common axis which is offset relative to the grippers and each nozzle is swingable on a pivot so that it is maintained substantially at right angles to the bag-making material and in alinement with a gripper while moving with it.

The constructions are hereinafter more fully described and are illustrated in the accompanying drawings in which

Fig. 1 is a plan view of my machine;

Fig. 2 a side elevation thereof;

Fig. 3 a longitudinal section of the hopper;

Fig. 4 a plan view of the cam for positioning the nozzles, some of the latter being shown;

Fig. 5 a cross-sectional detail of the machine showing a side elevation of the cloth knife in position to cut the bag making material;

Fig. 6 a plan view of the parts shown in Fig. 5, the bridge being omitted;

Fig. 7 a cross-sectional detail showing a side elevation of a knife for cutting the thread between a tag and the following bag section;

Fig. 8 a cross-sectional detail of the valve controlled suction inlet for drawing material through a nozzle into a bag section;

Fig. 9 a horizontal section on the line 9—9 in Fig. 8;

Fig. 10 a cross-sectional detail of the machine showing the tag feeding mechanism in side elevation;

Fig. 11 a plan view of the mechanism shown in Fig. 10;

Fig. 12 a longitudinal sectional detail on an enlarged scale of the tag strip guide and parts associated therewith;

Fig. 13 a horizontal section of the tag strip guide showing the tag strip and its feeder;

Fig. 14 a plan view on an enlarged scale of a gripper frame showing the projections by which it is turned;

Fig. 15 a detail in plan showing the drive between the sprocket shaft, the hopper shaft and the serrated wheel;

Fig. 16 an enlarged longitudinal section of the gripper frame showing the jaws opened by the jaw opening device;

Fig. 17 a detail in side elevation showing the bag making material being folded and advanced by the serrated wheel;

Fig. 18 a detail in side elevation of a thread knife;

Fig. 19 a plan view of the parts shown in Fig. 18;

Fig. 20 a plan view of a finished bag;

Fig. 21 a sectional detail of a push bar and its operating mechanism;

Fig. 22 a sectional detail showing the mechanism for oscillating the axially movable shaft;

Fig. 23 a cross-sectional detail on the line 23—23 in Fig. 28;

Fig. 24 a detail in side elevation of a modified form of feeding mechanism;

Fig. 25 a detail of the bag forming peg shown in Fig. 24;

Fig. 26 a detail of the cloth knife shown in Fig. 24;

Fig. 27 a detail of the feeding mechanism of Fig. 24;

Fig. 28 a diagrammatic view of my machine having a further modification of the feeding mechanism; and

Fig. 29 a detail showing the means for closing the grippers on the bag material and the nozzles. In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is the frame which is suitably shaped to support the various parts of the machine and is provided with legs 1^a. An endless carrier 2 preferably formed as a chain is supported intermediate its ends on a flange 3^a of a bridge 3 which is carried above the frame 1 by suitable supports. The chain carrier 2 meshes with sprocket wheels 3^c, 3^d journaled at opposite ends of the bridge 3, the wheel 3^c being secured to a shaft 3^e for driving the carrier. On the carrier 2 are pivotally mounted a plurality of grippers 4 so that they may be swung in a vertical plane and rotated in a horizontal plane (see Figs. 1, 2, and 8). This is accomplished by providing certain of the chain links with laterally extending blocks on which gripper carrying arms 4^a are pivoted at 4^b to swing in a vertical plane. These arms are provided with upwardly extending fingers 4^c adapted to be engaged by rails 6 carried around the periphery of the bridge to determine the position in a vertical plane of the grippers as desired.

Gripper

Each gripper 4 includes a frame 4^d (Figs. 16 and 8) which is journaled at 4^e to rotate on its carrying arm 4^a at right angles to the pivot 4^b thereof. The frame is provided with a plurality (preferably four) of radially directed projections 4^f (see Figs. 10 and 14) which are equidistantly spaced apart for engagement one by one with stationary pins 7^a carried by brackets 7 mounted around the periphery of the bridge 3 so that as the gripper passes each of the brackets 7 it will be rotated a quarter turn on its pivot 4^e (in a clockwise direction of rotation in Fig. 1 and anti-clockwise in Fig. 14) for a purpose herein-

after described. Any suitable friction or clicking means may be employed to prevent the grippers from moving more than the desired quarter-turn as they move past each bracket. Each frame 4^d is provided with a passageway 4^g which communicates with the space between the jaws 4^h of the gripper (see Figs. 8, 10, and 16). These jaws are adapted when closed, to form a substantially imperforate pocket having its rear end communicating with the passageway 4^g and its front end provided with an opening 4ⁱ for a purpose hereinafter described. The bag making material is adapted, as hereinafter described to extend across the space between the jaws, project beyond the sides and front end thereof and be gripped between the said sides.

The opposed outer ends of each frame 4^d are provided with open bearings or rounded surfaces 4^j on which the top and bottom walls 4^k of a pair of jaws are pivoted. These walls are formed of inserts made of springy material having their free ends rounded to fit the surfaces 4^j. Each set of jaws is also pivotally connected with one another by means of a pin 4^l which extends transversely of the jaws across the front or outer end of the passageway 4^g and engages open bearings in the sides of the jaws. As the jaws are swung on their pivots 4^j to close the jaws, the pin 4^l is moved rearwardly relative to the pivots and when the pin moves beyond an imaginary center line through the pivots 4^j, the spring walls 4^k snap the jaws closed. Similarly as the jaws are opened against the pressure of the spring walls 4^k, the pin 4^l is moved forwardly relative to the pivots 4^j and when the pin is moved past the dead center of the said pivots, the jaws will remain open. These pivotal connections and spring walls 4^k thus form a snap over mechanism whereby the jaws of each set or pair may be closed by moving only one of the jaws towards its closed position and the jaws may be opened by moving the pin 4^l longitudinally of the frame (or the jaws) past the dead center of the pivots 4^j.

Measuring and directing mechanism for the filling material

The tea or other material with which the bags are filled is carried in a hopper 8 secured to a shaft 8^a which is driven by gearing 8^b from the sprocket shaft 3^e (see Figs. 1, 3, and 15). In the bottom of the hopper are formed a plurality of holes in which are suitably secured tubular chambers 8^c. The tubular chambers 8^c depend from the bottom of the hopper and are adapted to be telescopically fitted in holes, forming chambers 8^d, which are formed in a ring 8^e. By raising and lowering the ring 8^e relative to the bottom of the hopper, it is obvious that the capacities of the telescopic chambers 8^c, 8^d will be varied. The ring is supported on a non-rotating disk 8^f which is axially movable on the shaft 8^a and is provided with supporting lugs 8^g. The lugs rest on shoulders formed on nuts 8^h threaded on supports 8ⁱ. To enable the nuts 8^h to be turned simultaneously, and thus move the disk 8^f and the ring 8^e axially away from or towards the bottom of the hopper 8, I provide each nut with sprocket teeth 8^j and connect the sprockets by means of a chain meshed with all of them.

The tea in the hopper drops into the chambers 8^c and 8^d, and the disk 8^f (over which the ring 8^e rotates) prevents the tea from spilling through the chambers until they reach a discharge opening 8^k in the disk. This opening is closable by a slide which moves in a slot in the upper sur-

face of the disk so that the upper surface of the slide will be flush with the upper surface of the disk. To prevent the tea within the hopper above the measuring chambers from passing through the chambers as they come into register with the discharge opening and to ensure all the contents of the measuring chamber in register with the discharge opening being discharged therethrough, I provide a scraper 8^a which is held from rotation in the hopper just above the upper surface of the bottom thereof and provide this scraper with an air vent tube 8^b which extends upwardly above the upper end of the hopper to establish communication with the atmosphere and the chamber in register with the discharge opening.

Secured to the hopper shaft 8^a is a spider 8^c (see Figs. 3 and 4) on which tea receptacles 8^c, located below the telescopic chambers 8^c, 8^d, are rotatably mounted so that each receptacle may be independently turned on its axis while it is being rotated by the spider around the axis thereof. The receptacles are spaced and timed to bring them substantially into alignment with the adjacent grippers 4. Each receptacle is provided with a funnel adapted to receive the contents of the chambers 8^c, 8^d located above it, and is also provided with a nozzle 8^e adapted to be received in the opening 4ⁱ of a gripper.

To align the nozzles with the jaws of the gripper, I provide the receptacles with arms 8^e having depending pins, at the free ends thereof, which project below the underside of the spider and carry anti-friction rollers for engagement with a cam 8^f carried by a support 8^g. This cam is so shaped that while the receptacles are travelling around with the spider, on that portion of its arc remote from the path of travel of the grippers 4, the nozzles are positioned ahead of their receptacles and are thus pointing toward the grippers as they move toward the path of the latter. As each nozzle nears the point of entering between the open jaws of a gripper, the cam is shaped to align the nozzle with the gripper and to maintain it in alignment therewith until the jaws are closed around the nozzle. From this point until the nozzles are fully withdrawn from the jaws by the rotation of the receptacles away from the path of the grippers, the cam is cut away to permit the engagement of the sides of the openings 4ⁱ with the nozzles to maintain the latter in alignment with the jaws of the grippers. After the nozzles are withdrawn from the grippers, the cam 8^f engages the rollers on the arms 8^e and turns the receptacles on their own axes through an angle of nearly 180° so that the nozzles will be pointed toward the grippers as they again near the path thereof.

It is desirable to maintain a predetermined level of tea in the hopper 8 otherwise the quantities of tea in the measuring chambers 8^c, 8^d are likely to vary. A tea spout 8^h leading from a suitable source of supply has its discharge end directed into the hopper (see Figs. 3 and 1). A closure 8^w for the discharge end of the spout is pivoted on any suitable part, such as the rod 8^z for carrying the scraper 8^a and the air vent tube 8^b, to swing across the underside of the mouth of the spout 8^h and thus regulate the quantity of tea discharged therefrom. The central portion of the bottom of the hopper is raised by means of a cylindrical hub 8^v which leaves an annular space for tea above the measuring chambers. The closure 8^w extends across the hub and its free end carries a plate 8^x adapted to be engaged by the tea in the annular space. As the tea is revolved with the hopper it tends to move the plate with it

and thus moves the closure to its position for closing the mouth of the spout. The closure is spring actuated to tend to hold it at least partly open so that the higher the level of the tea in the annular space, the greater the pressure against the plate to overcome the spring.

Bag material feeding and cutting mechanism

The bag making material 9^a is fed or advanced by a rotating serrated wheel 9^b (see Figs. 1, 15, 10 and 17) from a supply roll 9^c, which is journaled on an arm 9^d pivoted on the frame 1, to the grippers 4. The supply roll is axially adjustable relative to the serrated wheel so that the latter may be positioned substantially midway between the edges of the material 9^a on the roll. A U-shaped folder 9^e having its legs on opposite sides of the wheel 9^b is adapted to fold the lead end of the strip of material, as it is being advanced by the serrated wheel, so that the longitudinal edges of the strip lie on opposite sides of the wheel. The U-shaped folder is carried on an arm 9^f which is mounted on the shaft 9^g carrying the wheel 9^b, and on this shaft is also mounted another arm carrying a rubber roller 9^h which maintains the bag making material in engagement with the serrations on the periphery of the wheel.

The wheel 9^b is constantly driven by chain and sprockets 9ⁱ from the gearing 8^b (see Fig. 15) whereby the bag making material is creased longitudinally, folded transversely and advanced so that its doubled over edges pass on opposite sides of the nozzles 8^e. A spreader 9^j, located between the folder 9^e and the point where the nozzles come into the path of the folded material, is adapted to spread apart the folded over edges of the latter to facilitate the entrance of the nozzles therebetween. As the nozzles move along with the strip of material they are positioned at substantially right angles thereto by the cam 8^f, as hereinbefore described, and when the nozzles near the point where their open ends are adjacent the longitudinal crease in the strip of material, the jaws 4^h of each gripper are closed to grip the strip material around the nozzle. The jaws of each gripper may be closed by one of them being engaged by or engaging any suitable means such as a stationary inclined face 4^m, see Fig. 29.

A cloth knife 11 (see Figs. 5 and 6) is reciprocated transversely of the strip of bag making material 9^a between adjacent closed grippers 4 and is actuated to cut the strip, while moving longitudinally with it, to form bag sections 9. The knife comprises a fixed shear blade 11^a secured to a slide 11^c which is mounted to reciprocate transversely of the machine in a guide 11^d. The guide 11^d is mounted on an axially movable shaft 12 which is timed to move at substantially the same rate of speed as that of the grippers 4.

On the fixed blade 11^a is pivoted a movable blade 11^b which is normally positioned in spaced relationship to the blade 11^a so that the blades pass on opposite sides of the folded strip of material as the slide 11^c is moved outwardly. A cam 11^e secured to a rotating shaft 10 engages one arm of a bell crank 11^f pivoted on a bracket 11^g, the other arm of the bell crank being connected by a link 11^h with the slide. The opposite ends of this link are connected by pivotal joints with the slide and bell crank so that the slide may move longitudinally of the machine relative to the bell crank while the slide is being moved transversely of the machine by the bell crank.

The movable blade 11^b is moved relative to the

fixed blade by a bell crank 11¹ journaled on the axially movable shaft 12 and is actuated by a cam 11² secured to the shaft 10. The arm of the bell crank 11¹ remote from the cam is provided with an adjustable tappet 11³ adapted to engage the underside of the movable blade to cause it to co-operate with the fixed blade to cut the bag making material. The bell crank 11¹ is mounted between two collars secured to the axially movable shaft 12 so that the bell crank, and thus the tappet, moves longitudinally of the machine with the knife blades to permit the cut to be made during the travel of the blade with the bag making material. Of course the length of the cam 11² is such that the axially moving bell crank 11¹ is always actuatable thereby to operate the movable blade of the knife. After the bag material has been cut, the knife blades are opened as hereinafter described, the slide is withdrawn by the cam 11² to move the blades from the path of the grippers 4, then the slide and blades are moved by the shaft 12 longitudinally of the machine in the direction opposite to the travel of the grippers and are next moved by the cam 11² outwardly again so that the blades are positioned ahead of the next gripper. The blades then move with the bag material and the grippers, and are actuated again by the cam 11² to cut the material so that each gripper carries a bag section 9. The movable blade is formed as a bell crank, one arm having a cutting edge and the other having a roller which, on the withdrawal movement of the blades after the bag making material has been cut, is adapted to engage a stationary inclined face 11⁴ to cause the cutting edge to move away from the cutting edge of the fixed blade. Any suitable means disposed on the pivot of the movable blade for frictionally engaging both blades is adapted to retain the movable blade as positioned by the face 11⁴ or the tappet 11³.

Filling mechanism

After the bag sections are formed and before the nozzles 8^a are withdrawn therefrom, the tea in the receptacles 8^a is transferred from the latter to the bag sections (see Figs. 8, 9, and 1). This may be accomplished by employing suction means for drawing the tea from the receptacles through the nozzles into the bag sections. The inlet 13^a of the suction means is carried by the bridge 3 so that the passageways 4^a of the grippers 4 will be successively registered therewith as the grippers move past the inlet. The latter communicates with a suction chamber 13^b which is connected by a pipe or tube 13^c with the inlet of a suction fan 13.

To confine the suction to that part of the inlet in communication with the passageway 4^a of a gripper as it moves along the inlet, I provide a valve formed as a rotating cylinder 13^d having a helical groove 13^e cut in its periphery and provide the inlet with a series of openings 13^f separated by partitions 13^g. The cylinder rotates in a cylindrical casing 13^h which communicates at opposite sides with the chamber 13^b and the inlet openings 13^f. The lead or pitch of the helical groove 13^e equals the distance between the grippers 4 so that a portion of the groove is always in communication with those openings 13^f that are in register with the passageway of a gripper as the latter moves relative to the inlet. The length of the inlet is such that, as one gripper nears the point where it will move out of engagement with the inlet, the groove will establish com-

munication between the suction means and the following gripper until it too moves past the rear end of the inlet. As the bag making material 9^a is porous, and the jaws 4¹ are substantially imperforate, all the tea in the receptacles 8^a will be drawn into the bag sections as they are carried by the grippers 4 past the suction inlet 13^a.

To facilitate the filling of the bag sections, the receptacles are vented opposite the nozzles whereby the rush of air beneath the tea in the receptacles will ensure all the contents thereof being drawn therefrom. Further, each gripper as it moves into register with the inlet 13 is slightly agitated by a spring rail 6^d which is provided with one or more projections for engaging the finger 4^c of each gripper.

The nozzle 8^a is withdrawn from the gripper after the bag section carried thereby is filled. The finger 4^c of this gripper then engages a cam rail 14 to rock the gripper carrying arm 4^a on its pivot 4^b so that the contents of the bag section will drop by gravity to the bottom of the bag section. To ensure this being accomplished, the rail 14 is provided with one or more projections for engaging the finger 4^c as it moves along the rail to cause the tea in the bag section to be shaken to the bottom thereof. The rear end of the rail 14 is so directed that the gripper 4 will be lowered again to a substantially horizontal position.

Bag closing mechanism

As the gripper continues its movement around the bridge 3, the mouth of the bag section 9 is simultaneously trimmed and sewn by a sewing or surging machine 15 which, of course, operates on the material of the bag section projecting beyond the mouth of the gripper jaws 4^h (see Fig. 1). As this type of sewing machine which produces a continuous chain of locked stitches is well known in this art, it is not described nor shown in detail. To prevent the contents of the bag section from spilling during the sewing of the mouth thereof, the grippers 4 and the table of the sewing machine may be set at a slight angle to the horizontal.

The stitching between adjacent bag sections is cut by a thread knife 16 (see Figs. 18 and 19) which is moved upwardly into the path of the stitching, and is actuated to cut the thread while travelling longitudinally of the machine with the thread. The fixed blade 16^a of the knife is secured to and the movable blade 16^b is pivoted on an arm 16^c which is secured to the axially moving shaft 12. The latter is also oscillated to rock the arm 16^c upwardly so that the blades, which are normally open will pass on opposite sides of the stitching. The movable blade 16^b is connected eccentric to its fulcrum by a link 16^d and ball joints with the frame 1 so that as the arm 16^c and thus the fulcrum of the blade 16^b moves upwardly, the cutting edge of this blade is swung into the path of the thread and into co-operation with the fixed blade to cut the thread. During the downward swinging movement of the arm, the blades are opened and when clear of the grippers 4 are moved longitudinally with the shaft 12 in a direction opposite that of the grippers for positioning the blades ahead of the next gripper. The blades then travel with the grippers and are actuated, as hereinbefore described, to cut the thread after the mouth of the next bag section is sewn.

The gripper frame 4^d is turned one-quarter revolution, in a clockwise direction of rotation, 75

on its pivot 4^c by the engagement of the pin 7^a on a bracket 7 with a projection 4^f on the frame as the gripper moves along the bridge 3. The jaws 4^b are thus turned with each gripper frame, as it passes the bracket 7, to present an unsewn edge of the bag section carried thereby for closure by the sewing machine 15^a. To facilitate this turning movement, the gripper is preferably elevated slightly by a cam 7^b out of the path of the other grippers. The cam 7^b is secured to the flange 3^a of the bridge and the carrying arm 4^a of each gripper is provided with an adjustable regulator 4ⁿ adapted to engage the flange 3^a to limit the downward movement of the gripper on its pivot 4^b. The engagement of the regulator 4ⁿ with the cam 7^b causes the gripper as a whole to tilt on the pivot 4^b while its frame is being turned on the pivot 4^c.

An unsewn side of the bag section 9 is now positioned by the gripper jaws 4^b to be trimmed and sewn or surged by a sewing machine 15^a which is the same as sewing machine 15. After this side of the bag section is sewn and trimmed, the thread is cut by a thread knife 16^e which is identical with the previously described knife 16 and is carried on the oscillating and axially moving shaft 12.

During the travel of the gripper 4 around the sprocket wheel 3^d, the frame 4^d is turned one-half revolution, in a clockwise direction of rotation, on its pivot 4^c. This is accomplished by providing two brackets 7, each having a pin 7^a for engaging a projection 4^f on the frame. The engagement of a projection 4^f with the first of these two pins causes the frame to be turned one-quarter of a revolution which positions the closed folded over bottom of the bag section parallel with the carrier 2. As this edge does not require stitching, the frame is immediately turned again by the second of the said pins to position the other side of the bag section to be trimmed and sewn by one of two sewing or surging machines 15^b, 15^c which also attach tags 17 to the bag sections.

Tag attaching mechanism

To enable the tags 17 to be spaced a predetermined distance from their bag sections, alternate grippers 4 are moved to a position in which their bag sections will not be engaged by the machine 15^b so that the distances between the bag sections sewn by this machine will be increased and thus the hereinbefore described continuous chain stitching between adjacent bag sections will be lengthened (see Figs. 1 and 2). The tags are sewn on to the ends of the chain stitching remote from their bag sections, thus the tag of each bag section is close to the following bag section and is subsequently separated therefrom by a thread knife 16^f (see Fig. 7). The regulators 4ⁿ on alternate grippers 4 are engaged by a push bar 18 (see Fig. 21) which is mounted to reciprocate transversely of the bridge 3 on the underside thereof and which is adapted to tilt the alternate grippers sufficiently for their fingers 4^c to engage the inside edge of the entering end of a rail 6^a. As the fingers travel along this entering end of the rail they are gradually lowered to a substantially horizontal position so that their grippers are tilted to a substantially vertical position and are maintained in this position by the rail until they pass the surging machine 15^b. The latter thus operates only on the bag sections carried by the other grippers which were not tilted by the push bar 18. A cam 13^b on a

half-speed shaft 5 engages an anti-friction roller carried intermediate the ends of a lever 18^c which has a pin and slot driving connection with the push bar to actuate it once for every two grippers which move past it.

To ensure the passage of the lead edges of the bag sections 9 (carried by the alternate grippers 4 which were not thrown out of action by the push bar 18) along the upper side of the table (not shown) of the surging machine 15^b, I provide a rotating disk 19 having its periphery serrated for engaging and elevating the lead edges just before they reach the said table or a continuation thereof.

After each of the spaced apart bag sections has its open side trimmed and surged by the surging machine 15^b, a tag 17 is fed beneath the usual presser foot of the said machine so that the needle thereof will pass through the tag and thus the latter will be sewn into the chain stitching (see Figs. 10 to 13). Preferably the tag 17 is on the lead end of a strip of tags and is severed from the strip by the usual trimmer of the machine 15^b which also trims the edge of the bag section.

The strip of tags is carried on a supply roll 17^a and the lead end thereof is passed around a tensioning device 17^b and around the curved rear end of a top plate 17^c which is secured to a channel shaped guide 17^d and both plate and guide are secured to an arm 17^e. The latter is secured to a spindle 17^f which is axially movable and rotarily mounted in bearing blocks 17^g carried by the frame so that the upper end of the arm 17^e and thus the guide 17^d may be moved transversely of the machine and longitudinally thereof whereby the lead tag may be directed transversely of the bridge 3 into the path of the chain stitching and then longitudinally of the bridge past the needle and the trimmer of the surging machine 15^b to attach the tag to the chain stitching and to sever the tag from the strip. These axial and rotary movements are imparted to the spindle 17^f by a cam 17^h having high and low portions on its periphery and also on a side face thereof. This cam is secured to the half speed shaft 5 and engages both faces of a substantially 90° V groove in the periphery of a roller journaled on a cam arm 17ⁱ which is secured to the spindle, the axis of the roller being substantially 45° to the axis of the cam.

After the lead tag is severed from the strip, the cam arm 17ⁱ, and thus the guide arm 17^e, is moved transversely away from the bridge and during this movement the fresh lead tag is fed forward through the guide 17^d to be positioned for attaching to the stitching just before the next bag section is surged. The sides of the tag strip are provided with a series of cut-out portions 17^j to reduce the width of the tags at the junction thereof and thus facilitate the severing of the lead tag and to shape each tag so that it may simulate a packet of tea in perspective. The forward edges of the cut-out portions 17^j on opposite sides of the strip are engaged by correspondingly shaped shoulders 17^k on a feeder 17^l formed of resilient material freely carried in the channel shaped guide 17^d beneath the strip of tags. The feeder is secured to a guide bar 17^m which is slidably mounted in the upper end of the guide arm 17^e beneath the strip guide 17^d and is provided with a pin 17ⁿ adapted to be received between the legs 17^p, and 17^o of a fork secured to a stationary bracket 17^p.

The forked legs are directed longitudinally of

the bridge to prevent the guide bar 17^m and the feeder 17^e from movement transversely of the bridge so that the strip of tags is held from moving with the guide 17^d while the latter is drawn away from the chain stitching whereby the fresh lead tag on the strip is fed forward relative to the guide. A spring finger 17^f passes through an opening in the side of the guide 17^d to frictionally engage a cut-out portion 17^j to prevent relative movement of the strip and its guide 17^d while the latter is moved longitudinally of the machine in a direction opposite that of the grippers, then transversely towards the grippers 4 and then longitudinally with the grippers. During the transverse movement of the guide towards the grippers, the strip guide 17^d moves relative to the guide bar 17^m and feeder 17^e so that the latter is positioned behind the tag previously engaged thereby whereby the fresh lead tag of the strip will be fed forward on the next outward transverse movement of the guide.

Of course, the guide bar 17^m and feeder 17^e move with the strip guide 17^d when the spindle 17ⁱ is oscillated to move the guide longitudinally of the machine and this movement of the guide bar is permitted by the longitudinally directed fork 17^o. The outer leg of the latter is pivotally mounted at 17^r on the body of the fork and is releasably locked in operative position by a removable pin 17^s.

After each bag section 9 and the tag connected therewith at a distance therefrom passes the sewing machine 15^b, the short length of chain stitching between the tag and the following bag section is cut by the knife 16^c (see Fig. 7) which operates in the same manner as the hereinbefore described knives 16 and 16^e but is actuated only once for every two operations of each of the said knives. The knife 16^c is provided with a fixed blade 16^a, a movable blade 16^b and a link 16^d, the blades being carried on a lever 16^h which is journaled intermediate its ends on the axially moving and oscillating shaft 12 between two collars secured thereto so that the lever moves axially with the shaft but does not oscillate with it. The end of the lever remote from the blades is provided with an anti-friction roller which engages a cam 16ⁱ secured to the half-speed shaft 5. The width of the face of this cam is such that the roller may move axially of the cam without being disengaged therefrom.

After the thread is cut between the bag sections 9 operated on by the surging machine 15^b so that the tags 17 will be the greatest possible distance from their bag sections, the other bag sections which were positioned by the rail 6^a reach the exit end thereof. This end is flared outwardly to control the lowering of the grippers by a cam 6^c secured to the bridge 3. This cam engages the fingers 4^c to gradually lower the grippers 4 into alignment with those grippers 4 carrying the tagged bag sections. The last mentioned grippers are now raised by a push bar 18^a which is identical to the push bar 18 except that it is timed to engage the regulators 4ⁿ which were not engaged by the bar 18. The fingers 4^c of the grippers 4 carrying the tagged and completely sewn bag sections are thus elevated sufficiently to engage the inside edge of the entering end of a rail 6^b which is identical to the rail 6^a and which is adapted to maintain these bag sections in a position in which they will not be engaged by a second surging or sewing machine 15^c. The latter is identical with the machine 15^b and is also provided with a

rotating disk 19. A second tag feeding device comprising all the parts 17^a to 17^s of the hereinbefore described tagging device is positioned adjacent the surging machine 15^c for operation therewith in the same manner as the first tag feeding device co-operates with the surging machine 15^b so that the alternate bag sections missed by the machine 15^b will have their third sides surged and the tags 17 attached thereto by the surging machine 15^c. The continuous chain stitching produced by the machine 15^c is cut by a thread knife 16^e which is identical in every respect to the hereinbefore described knife 16^c so that the bag sections surged and tagged by the two sets of devices 15^b, 17^a to 17^s, and 15^c, 17^a to 17^s, will be identical.

The grippers 4 carrying the first tagged bag sections 9 which were held by the rail 6^b out of alignment with the stitching produced by the surging machine 15^c now reach the exit end of the rail where they are lowered until their regulators 4ⁿ rest against the edge of the bridge flange 3^a or a wear strip secured thereto.

All the grippers 4 are thus in a substantially horizontal position so that the projections 4ⁱ on the frames 4^d will engage the pin 7^a of a fourth bracket 7 to cause the frames to be turned another quarter-revolution on their pivots 4^e. This final partial turn of each frame returns it to its initial position with the longitudinal center line of the jaws 4^h at right angles to the pivot 4^b of the carrying arm 4^a, and with the pivot pin 4ⁱ of the jaws in front of the passageway 4^e and behind the mouth opening 4ⁱ.

Bag discharging mechanism

As the grippers 4 move around the sprocket wheel 3^c their jaws 4^h are opened to discharge the tea bags on to a conveyor 20. A jaw opening device comprising a suitably guided kicker bar 21 reciprocated by a crank pin 21^a carried by a disk 21^b is so mounted that the free end thereof is adapted to enter the passageway 4^e and engage the pivot pin 4ⁱ to move it past the line of centers of the pivots 4^j whereby the jaws are opened. To ensure the discharge of the tea bag from the opened jaws, I may provide a nozzle which may be connected with the air discharge outlet of the suction fan 13 and be located behind the passageway 4^e for directing a blast of air therethrough. Preferably the tea bags will be removed from the opened jaws of the grippers by a device 22 having a pair of clamping members 22^a, 22^b adapted to grip or clamp the bags one by one before the jaws are opened, swing them clear of the grippers 4 after the jaws thereof are opened and deposit them on to the conveyor 20. The clamping member 22^a is secured to a spindle 22^c which is suitably journaled to oscillate and on which is keyed the member 22^b so that it will turn with the spindle and move axially relative thereto.

To turn the spindle 22^c on its axis the hub of the fixed member 22^a may be provided with a projection 22^d which extends into the path of the gripper frames 4^d so that it would be engaged thereby. The movable clamping member 22^b is actuated, to co-operate with the fixed member 22^a to clamp a tea bag between them, by means of an arm 22^e having one end pivoted at 22^f and the other end engaged with the underside of the hub of the movable member 22^b. A roller carried intermediate the ends of the arm 22^e engages a cam 22^g having high and low portions whereby the arm and thus the movable clamping member

is alternately raised and lowered to clamp and release a tea bag.

When the gripper frame 4^d which is engaging the projection 22^d moves out of the path thereof, a spring returns the spindle 22^c and thus the projection to its initial position in which the projection will engage the next frame 4^d. When this occurs the high portion of the cam 22^e moves the arm 22^e and thus the movable member 22^b to clamp the tea bag lying in the closed jaws 4^h of the gripper frame. As the frame continues its movement the jaws 4^h are opened and the clamping members are swung by the frame to swing the tea bag clear of the jaws 4^h. The low portion of the cam engages the roller on the arm to permit a spring 22^h to open the clamping members just before the projection disengages the gripper frame so that the tea bag is released before the members return for a fresh bag.

The cam 22^e may be secured to the conveyor drive spindle.

A V-shaped switch arm 23^a, of a suitable safety-switch connected in the circuit of the motor for driving the machine, is adapted to be engaged by the jaws 4^h to stop the machine if the jaws be closed when they pass the switch arm. The latter is located ahead of the mechanism for advancing the bag making material to ensure the jaws being open to receive the folded material.

Driving mechanism

A drive shaft 24, which is driven by the motor in any suitable manner, is arranged transversely of the machine and drives, by means of worm gearing 10^a, the shaft 10 which in turn is connected by one to two gearing 5^a with the half speed shaft 5. The cylindrical valve 13^d in the suction inlet 13^c is driven by a chain 13ⁱ and sprockets having two to one gear ratio from the shaft 5. The sprocket shaft 3^e at the hopper end of the machine is driven by worm gearing 3^f from the shaft 10 which also drives the conveyor 20 through the bevel gearing 20^a. The crank disk 21^b for actuating the jaw opening device 21 is driven from the conveyor roller spindle adjacent thereto.

The axially moving and oscillating shaft 12 is axially moved by a cam 12^a secured to the shaft 10. This cam has an endless cam groove in its periphery adapted to receive an anti-friction roller carried by a lever 12^b which extends upwardly through an opening in the bridge 3 and is fulcrumed at 12^c above the latter. Intermediate the fulcrum and the anti-friction roller, the lever carries another anti-friction roller which engages the adjacent sides of two spaced collars 12^d secured to the shaft 12 (see Figs. 2 and 22). The shaft 12 is oscillated by an eccentric 12^e secured to the shaft 10 and engaging the bifurcated ends of a yoke or fork 12^f secured to the shaft 12 (see Fig. 18).

The surging machines 15, 15^a located on one side of the machine are driven by spiral gears in casings 15^d from a shaft 15^e driven by bevel gears 15^f from the drive shaft 24. The surging machines 15^b and 15^c at the other side of the machine are similarly driven by another shaft 15^e which is driven by bevel gears 15^f from the drive shaft. Each surging machine is detachably mounted on a support 15^g and its drive connection is also detachable and self aligning so that a surging machine may be readily removed and placed in position again. The rotating disks 19 are driven by pulleys and belts from the second mentioned shaft 15^e.

Any suitable mechanism such as suction means and spouts (not shown) may be employed to draw the trimmings of the bag sections away from the surging machines. It will be understood that all levers and arms which engage cams will be maintained by suitable means in engagement therewith.

In Figs. 24 to 27 is shown a modified mechanism for filling the bag sections by gravity. When this mechanism is employed, the gripper arms 4^a are swung on their horizontal pivots 4^b after the jaws 4^h have been opened so that the latter are directed upwardly. The bag-making material is fed as hereinbefore described to the open jaws 4^h except in this case the feeding mechanism is turned so that the axis of the supply roll 9^c is horizontal and the doubled over edges of the bag-making material passes on opposite sides of a bag form such as a peg 28^a which is carried on an arm pivotally mounted on a reciprocating slide 30. This slide is mounted on top of the bridge 3 and may be connected with the axially movable shaft 12 in any suitable manner so that the peg 28^a will travel along with each gripper 4 until the jaws 4^h have been closed to grip the bag-making material around the peg. The latter is then raised, by a rod 28^b which may be actuated by a cam on the shaft 10, to lift the peg clear of the grippers so that it may be returned to its initial position for insertion between the open jaws of the next gripper. I have found that the bag sections will remain open, after the withdrawal of the peg.

The slide 30 also carries a cloth knife 31 which performs the same operation as that accomplished by the hereinbefore described cloth knife 11. In this case the blades of the knife are moved vertically on a pivoted arm 31^e into and out of the path of the folded strip of bag-making material. After the bag-making material is cut into bag sections the latter are filled by gravity from a stationary hopper 28 having one or more measuring chambers 28^c in the bottom thereof. The upper and lower ends of the chamber or chambers are alternately opened and closed by a pair of cut-off slides 28^d, 28^e having openings there-through adapted to be registered alternately with the opposite ends of a chamber.

The lower slide 28^e is provided with a spout 28^f for each opening therein and each spout communicates with a nozzle 28^g which is pivotally mounted on the reciprocating slide 30 so that it may be inserted in the mouth of a bag section and move along with it while the bag section is being filled. It will be understood that while the peg 28^a is being used to form a bag section, the nozzle 28^g will be filling a previously formed bag section.

The cut-off slides 28^d and 28^e are connected in any suitable manner with the reciprocating slide 30 so that, as the latter travels in a direction opposite that of the grippers 4, the lower slide 28^e will be moved to close the underside of the chamber 28^c and at the same time the upper slide 28^d will be moved to establish communication between the chamber and the hopper. Of course, this communication is not established until the lower slide has been moved a sufficient distance to close the underside of the chamber. The latter is thus filled at the end of the reverse stroke of the slide 30 and on the forward stroke of the latter, the lower slide 28^e is moved to open the underside of the chamber after the upper end thereof has been closed by the upper slide 28^d. The contents of the chamber pass through

the spout 28^f and through the nozzle 28^r which has been lowered during the forward movement of the slides to direct the tea into a bag section. The nozzle is raised at the end of this forward stroke so that it will clear the grippers on its return stroke.

Before the mouths of the filled bag sections are sewn and trimmed by the sewing machine 15 they are passed between a pair of rotating rollers 32 which close them. If it is desired to fill more than one bag section at a time; the cut-off slides 28^d and 28^e will be returned at a rate of speed to permit the corresponding number of grippers to be positioned beneath them 15 before the slides are moved with the grippers.

In Figs. 28 and 23 is shown a modified arrangement of the parts of the machine and a further modification of the filling mechanism. In this case the hopper 38 is carried concentric to the shaft 3^c for driving the carrier 2 and the telescopic measuring chambers 38^c are located beneath the hopper and are driven by the said shaft. The chambers are filled through an arcuate opening 38^c formed in the bottom of the hopper at the side thereof remote from the side above the grippers 4 as they pass around the outside of the sprocket wheel 3^c. An arcuate scraper 38^a lies beneath the opening 38^c and in contact with the underside of the measuring chambers to prevent the material in the hopper from dropping through the chambers until the latter are positioned above the bag sections carried by the grippers. Nozzles 38^r, which are pivotally mounted on a hub secured to the shaft 3^c so that the nozzles rotate with the chamber and the grippers around an end of the machine, are lowered into the open bag sections as the latter move into position beneath the chambers at one side of the machine. The nozzles thus direct the tea into the bag sections from the chambers remote from the scraper 38^a. As the chambers travel around beneath the hopper, which in this case is stationary, the nozzles are raised to clear the bag sections and the grippers before the latter move out of the circular path of the nozzles at the other side of the machine. When this type of hopper is employed, it is necessary to mount the supply roll 9^c along the side of the machine between the second tagging device 15^c and the point where the carrier 2 first engages the sprocket 3^c, and to locate a bag form 38^a, and a cloth knife 41 between the supply roll and the said point. The finished bags would thus be discharged from the grippers at a point along the side of the machine. The bag form 38^a may be the oscillatable and reciprocable peg 28^a in which case the knife 41 would be identical to the knife 31.

What I claim as my invention is:

60 1. A packaging machine comprising means for advancing a plurality of separate bags; two devices for attaching tags to the bags, the said means including provisions for advancing certain bags only to one device and for advancing 65 only the other bags to the other device; and means for operating the tag attaching devices simultaneously.

2. A packaging machine comprising means for advancing bags; two devices for attaching tags 70 to the bags, one device being adapted to attach tags to certain bags and the other device being adapted to attach tags to the other bags; means for moving certain bags to a position in which they will not be engaged by the first of the said 75 tag attaching devices; and means for moving

the tagged bags to a position in which they will not be engaged by the second of the said tag attaching devices and for moving the untagged bags into position for engagement by the said second tag attaching device.

3. A packaging machine comprising means for advancing a plurality of separate bag sections each having an open side; two devices for sewing together the open sides of the bag sections and for attaching tags to a continuation of the sewing beyond the edges of the said bag sections, one device being adapted to sew the open sides of certain bag sections and to attach tags to a continuation of the sewing beyond the edges of the said bag sections, the other device being 15 adapted to sew the open sides of the other bag sections and to attach tags to a continuation of the sewing beyond the edges of the last mentioned bag sections, the said means including provisions for advancing said certain bags to the first device and the other bags to the second 20 device; and means for operating the said two devices simultaneously.

4. A packaging machine comprising two devices arranged in spaced relationship longitudinally of the machine for forming continuous stitchings; 25 means for advancing bag sections having open sides past the said devices; means for moving certain bag sections out of alignment of the stitching produced by the first of the two devices; means for feeding tags to be attached to the stitching passed through the other bag sections at points remote therefrom; means for cutting the last mentioned stitching between the tags and the bag sections closest thereto; 30 means for moving the tagged bag sections out of alignment of the stitching produced by the second of the said devices and for moving the untagged bag sections into position for being stitched by the said second device; means for feeding tags to be attached to the stitching passed through the last mentioned bag sections at points remote therefrom; and means for cutting the last mentioned stitching between the tags and the bag sections closest thereto. 35

5. A packaging machine comprising a plurality of nozzles; means for advancing a strip of bag making material doubled over on itself to pass on opposite sides of the nozzles; grippers for engaging portions of the strip around the nozzles; means for cutting the strip transversely 50 between two grippers to form bag sections carried by the grippers; and means for feeding material successively into the bag sections through the nozzles.

6. A packaging machine comprising a gripper for carrying a porous container having an open mouth, the gripper having a passage therethrough; a nozzle adapted to be received in the open mouth of the container and in the outer 60 end of the passage; and means co-operating with the opposite end of the passage to create suction therein and in the nozzle.

7. A packaging machine comprising a constantly moving gripper for carrying a porous container having an open mouth, the gripper having a passage therethrough; a constantly moving nozzle adapted to be received in the open mouth of the container and in the outer end of the passage; and suction means including a 70 member having a moving inlet adapted to travel with the gripper substantially in register with the end of the passage opposite the nozzle.

8. A packaging machine comprising a constantly moving gripper for carrying a porous 75

container having an open mouth, the gripper having a passage therethrough; a constantly moving nozzle adapted to be received in the open mouth of the container and in the outer end of the passage; a suction box; a member mounted in the box and having a moving inlet communicating with the interior of the box, the inlet being adapted to travel with the gripper substantially in register with the end of the passage opposite the nozzle.

9. A packaging machine comprising a plurality of nozzles rotating about a common axis and each being adapted to swing individually; means for advancing a strip of bag making material doubled over on itself to pass on opposite sides of the nozzles; means for swinging the nozzles so that they will be positioned substantially at right angles to the bag material as they approach it, and grippers for engaging portions of the strip around the nozzles.

10. A packaging machine comprising a gripper for carrying a container comprising a frame having a passage therethrough; a pair of jaws having a pivotal connection with one another and being pivoted on the frame, the said pivotal connection being shiftable relative to the pivots on the frame to hold the jaws open or closed; and means adapted to enter the passage and actuate the said pivotal connection to open the jaws.

11. A packaging machine comprising a supply roll of bag making material; a rotatable serrated wheel positioned substantially midway between the edges of the material on the roll for advancing the material; means for folding the material so that its edges lie on opposite sides of the wheel; and means for cutting the material transversely thereof to form bag sections.

12. A packaging machine comprising means for advancing a strip of bag making material doubled over on itself; means for cutting the material transversely to its longitudinal edges to form bag sections, the said cutting means including a pair of blades; means for moving the blades transversely of the doubled strip on opposite sides thereof; means for moving the blades longitudinally of the machine in the direction of travel of the strip and at substantially the same speed as the latter; and means for actuating the blades to co-operate with one another to cut the strip while the blades are moving with it.

13. A packaging machine comprising a plurality of grippers, means for advancing the grippers, each gripper having a pair of opened jaws; means for advancing a strip of bag making material doubled over on itself into the path of the opened jaws; means for closing the jaws on the material; means for cutting the material transversely of its longitudinal edges between two grippers to form bag sections; and means for filling the individual bag sections carried by the grippers.

14. A packaging machine comprising means for advancing bag sections having open sides; apparatus for sewing or surging the open sides, the said apparatus being adapted to produce a continuous stitching and being provided with a knife for trimming the sides of the bag sections; and means for feeding tags to be attached to the stitching passed through the bag sections at points remote therefrom, the tags being in a strip and being fed one by one into the stitching and moved with it past the trimming knife to sever the lead tag from the strip.

15. A packaging machine comprising means for advancing a gripper for carrying an unsewn bag section having an open mouth; means for filling the bag section through the mouth thereof; means for agitating the bag section while it is being filled; and means for sewing the mouth and sides of the bag section.

16. A packaging machine comprising means for advancing a strip of bag making material doubled over on itself; a bag form adapted to be passed between the doubled over portions of the bag making material; grippers for engaging portions of the strip around the form; and means for cutting the strip transversely between two of the said grippers to form bag sections carried by the grippers.

17. In a machine of the class described, the combination of means for conveying a series of bag sections; means for displacing alternate bag sections to thus form two series of spaced bag sections; separate sewing means for operating on the bag sections of the two series; and means for positioning tags in the spaces between the bag sections of each series for operation thereon by the respective sewing means.

18. A packaging machine including a device for forming continuous stitches; means for advancing a container having an open side past the said device; an arm movable transversely and longitudinally of the machine; and a tag guide carried by the arm for directing a tag into the path of the stitching and for moving the tag longitudinally of the machine relative to the said device to attach the tag to the stitching.

19. A packaging machine including a device for forming continuous stitches; means for advancing a container having an open side past the said device; an arm movable transversely and longitudinally of the machine; a tag guide carried by the arm; means for moving the arm and thus the guide inwardly towards the stitching to direct the lead tag of a strip of tags carried by the guide into the path of the stitching, the said means being adapted to move the arm and thus the guide and strip of tags longitudinally of the machine relative to the device so that the lead tag will be attached to the stitching, the device having trimming means for cutting off the lead tag during the movement thereof longitudinally of the machine; and means for feeding a fresh lead tag through the guide on its outward movement by the first mentioned means away from the path of the stitching.

20. A packaging machine including a device for forming continuous stitches; means for advancing a container having an open side past the said device; an arm movable transversely and longitudinally of the machine; a tag guide carried by the arm; means for actuating the arm to move the guide inwardly towards the stitching, longitudinally past the device in the direction of travel of the container, outwardly away from the stitching, and then longitudinally in a direction opposite to that of the container, the inward movement of the guide being adapted to direct the lead tag of a strip of tags carried by the guide into the path of the stitching, the first longitudinal movement of the guide being adapted to cause the lead tag to be attached to the stitching, the device having a knife for cutting off the lead tag during the first mentioned longitudinal movement of the guide; a feeder slidably mounted in the guide for engagement with the strip of tags; means for holding the feeder stationary during the inward and out-

ward movements of the guide and for permitting the feeder to move longitudinally with the guide; and a finger carried by the guide for frictionally engaging the strip of tags to move the strip with the guide relative to the feeder on the inward movement of the guide, the feeder being adapted to feed the fresh lead tag forward relative to the guide and finger on the outward movement of the guide.

21. A gripper for carrying a container including a pivoted arm adapted to swing in a vertical plane; a frame rotatably mounted on the arm; means tending to limit each turning movement of the frame to a predetermined portion of a revolution thereof; a pair of movable jaws carried by the frame for engaging the container; and means for retaining the jaws in their open or closed positions.

22. A packaging machine comprising means for advancing a strip of bag making material doubled over on itself; a bag form adapted to be passed between the doubled over portions of the bag making material; grippers for engaging portions of the strip around the form; means for cutting the strip transversely between two of the said grippers to form bag sections carried by the grippers; means for filling the bag sections while being carried by the grippers; means for sewing the mouths of the bag sections, each gripper being rotatably mounted to present different sides of a bag section to the outside of the machine; means for turning the grippers one by one; means for sewing a side of each bag section; means for turning the grippers to position the other unsewn side of each bag section to be sewn; means for sewing the last mentioned sides of the bag sections; and means for driving the first mentioned means and the grippers continuously at a constant rate of speed.

23. A packaging machine comprising means for advancing a strip of bag making material doubled over on itself; a bag form adapted to be passed between the doubled over portions of the bag making material; grippers for engaging portions of the strip around the form; means for cutting the strip transversely between two of the said grippers to form bag sections carried by the grippers; means for filling the bag sections while being carried by the grippers; means for sewing the mouths of the bag sections, each gripper being rotatably mounted to present different sides of a bag section to the outside of the machine; means for turning the grippers one by one; means for sewing a side of each bag section; means for turning the grippers to position the other unsewn side of each bag section to be sewn; two separate means for sewing the last mentioned sides of the bag sections and for attaching tags thereto, means for moving certain grippers to a position in which their bag sections will not be engaged by the first of the said two separate means; and means for moving the other grippers to a position in which their tagged bag sections will not be engaged by the second of the said two separate means and for moving the grippers carrying the untagged bag sections into position for engagement by the said second means.

24. A packaging machine including means for advancing a strip of bag making material doubled over on itself; grippers for engaging portions of the strip; means for moving the grippers at substantially the same speed as the strip; a knife for cutting the strip transversely between two of the said grippers to form bag sections carried by the grippers; means for reciprocating the knife longi-

tudinally of the said strip; means for reciprocating the knife transversely of the strip into and out of its path; and means for actuating the knife to cut the strip while the knife is moving with the strip.

25. A packaging machine including means for advancing a strip of bag making material doubled over on itself; grippers for engaging portions of the strip; means for moving the grippers at substantially the same speed as the strip; a shaft axially movable in a direction substantially parallel to the said strip; means for reciprocating the shaft at substantially the same speed as that of the strip; a guide carried by said shaft; a slide mounted in the guide to move transversely to the strip; and a knife carried by the slide for cutting the strip transversely between two of the said grippers while the knife is moving with the strip to form bag sections carried by the grippers.

26. A packaging machine including means for advancing a strip of bag making material doubled over on itself; grippers for engaging portions of the strip; means for moving the grippers at substantially the same speed as the strip; a shaft axially movable in a direction substantially parallel to the said strip; means for reciprocating the shaft at substantially the same speed as that of the strip; a guide carried by said shaft; a slide mounted in the guide to move transversely to the strip; a knife having fixed and movable blades carried by the slide for cutting the strip transversely; means for reciprocating the slide to move the knife into and out of the path of the strip; and means for actuating the movable blade to co-operate with the fixed blade to cut the strip while the knife is moving with it.

27. A packaging machine including means for advancing a strip of bag making material doubled over on itself; grippers for engaging portions of the strip; means for moving the grippers at substantially the same speed as the strip; a shaft axially movable in a direction substantially parallel to the said strip; means for reciprocating the shaft at substantially the same speed as that of the strip; a guide carried by said shaft; a slide mounted in the guide to move transversely to the strip; a knife having fixed and movable blades carried by the slide for cutting the strip transversely; a bell crank fulcrumed on a stationary part; a pivotal link connection between the bell crank and the slide adapted to permit the latter to be reciprocated with the shaft relative to the bell crank; a cam for actuating the bell crank to reciprocate the slide, the blades of the knife being normally open to pass on opposite sides of the strip; a second bell crank fulcrumed on and movable with the axially movable shaft for actuating the movable blade to co-operate with the fixed blade to cut the strip; and a second cam for moving the second bell crank to actuate the movable blade.

28. A packaging machine including means for advancing a strip of bag making material doubled over on itself; grippers for engaging portions of the strip; means for moving the grippers at substantially the same speed as the strip; a knife having fixed and movable blades for cutting the strip transversely between two of the said grippers to form bag sections carried by the grippers, the blades being normally open to pass on opposite sides of the strip; means for moving the knife into the path of the strip and grippers; means for moving the knife in the direction of travel of the strip and at substantially the same speed as the latter; and means for actuating the movable

blade to co-operate with the fixed blade to cut the strip while the blades are moving with it, the third mentioned means being adapted to withdraw the knife from the path of the grippers after the strip has been cut, the fourth mentioned means being adapted to move the knife in a direction opposite to that of the grippers after it has been withdrawn from the path thereof.

29. A packaging machine including means for advancing a bag section having an open mouth; means for sewing the bag section to close the mouth thereof; a knife for cutting the thread after the mouth has been closed, the knife being normally out of the path of the bag section; means for moving the knife into position for cutting the thread; means for moving the knife in the direction of travel of the bag section; and means for actuating the knife to cut the thread while the knife is moving with the bag section.

30. A packaging machine including means for advancing a bag section having an open mouth; means for sewing the bag section to close the mouth thereof; an oscillating shaft axially movable in a direction substantially parallel to and at substantially the same speed as that of the bag section; an arm secured to the shaft; a knife having fixed and movable blades carried by the arm for cutting the thread after the mouth has been closed; a pivotal connection between the movable blade and the arm; means for connecting the movable blade eccentric to the pivotal connection with a stationary part whereby the said blade will be moved to co-operate with the fixed blade when the shaft is rocked in one direction of rotation; and means for rocking the shaft to move the knife into and out of the path of the thread and for causing the movable blade to co-operate with the fixed blade to cut the thread while the knife is moving with the bag section.

31. In a machine of the class described, the combination of means for conveying a series of bag sections; means for displacing alternate bag sections to thus form two series of spaced bag sections; separate sewing means for operating on the bag sections of the two series; means for positioning tags in the spaces between the bag sections of each series for operation thereon by the respective sewing means, each sewing means being adapted to produce continuous stitching, the tags being connected with the stitchings at a distance from their bag sections; and separate means for cutting the stitchings between the tags and the bag sections closest thereto.

32. In a machine of the class described the combination of grippers for conveying a series of bag sections having open mouths; an oscillating shaft axially movable in a direction substantially parallel to and at substantially the same speed as the bag sections; means for sewing the bag sections to close the mouths thereof; an arm secured to the shaft; a knife carried by the arm to cut the thread after each mouth has been closed; means for displacing alternate bag sections to thus form two series of spaced bag sections; separate sewing machines for operating on the bag sections of the two series; means for positioning tags in the spaces between the bag sections of each series for operation thereon by the respective sewing means; two arms freely pivoted on the shaft and movable longitudinally therewith; knives carried by the last mentioned arms for cutting the threads produced by the said sewing machines, the knives being normally out of the path of the threads; and means for oscillating the last mentioned knives to cut the threads

while the knives are moving with the bag sections, the last mentioned knives being each oscillated once for every two oscillations of the first mentioned knife.

33. A packaging machine including grippers for conveying a series of bag sections, the grippers being pivoted to swing in a vertical plane; a push bar for engaging alternate grippers to raise them out of the path of the other grippers; means for retaining the said alternate grippers in their raised position to form an upper and a lower series of spaced bag sections; sewing means for operating on the bag sections in the lower series; means for positioning tags in the spaces between the bag sections of the lower series for operation thereon by the said sewing means, the said retaining means being adapted to lower the raised grippers; a second push bar for engaging and raising the grippers carrying the tagged bag sections; a second means for retaining the last mentioned grippers in their raised position; sewing means for operating on the untagged bag sections; and means for positioning tags in the spaces between the untagged bag sections for operation thereon by the second mentioned sewing means.

34. A packaging machine comprising means for advancing grippers, each gripper having a pair of opened jaws; means for advancing a strip of bag making material doubled over on itself into the path of the opened jaws; means for closing the jaws on the material; means for cutting the material transversely of its longitudinal edges between two grippers to form bag sections; means for filling the individual bag sections carried by the grippers, the said filling means comprising a hopper having a measuring chamber; two reciprocating slides for controlling the filling and the emptying of the measuring chamber; and means for moving the slides in the direction of travel of the gripper during the emptying of the measuring chamber and in the opposite direction during the filling of the chamber.

35. A packaging machine comprising an endless carrier for advancing grippers, each gripper having a pair of opened jaws; means for guiding the carrier around opposite ends of the machine; means for advancing a strip of bag making material doubled over on itself into the path of the opened jaws; means for closing the jaws on the material; means for cutting the material transversely of its longitudinal edges between two grippers to form bag sections; means for filling the individual bag sections carried by the grippers, the said filling means comprising a hopper concentric to the guiding means at one end of the machine; measuring chambers rotatably carried on the underside of the hopper for registration with the bag sections, the underside of the hopper having a discharge opening therethrough communicating seriatim with the chambers at the side of the hopper remote from the bag sections; and means for closing the underside of the chambers until they are brought into registration with the bag sections.

36. A packaging machine comprising a plurality of closable grippers moving about a common axis for carrying containers; a pair of clamping members pivotally mounted on an axis substantially parallel to the first mentioned axis and adapted to clamp the containers seriatim as they are being carried by the grippers; means for opening the grippers one by one to release the container clamped by the said members; means for engaging the grippers to swing the pair of

clamping members in the same direction of movement as the grippers so that the container carried by the members will be swung away from its gripper when the latter is opened; means for opening the clamping members to release the container when it is clear of the gripper; means for swinging the pair of clamping members in the opposite direction of movement when the gripper moves out of the path of the said engaging means so that the latter will engage a fresh gripper; and means for closing the clamping members to clamp a fresh container.

37. A packaging machine comprising a gripper for carrying a porous container having an open mouth, the gripper having a passage there-through; a nozzle adapted to be received in the open mouth of the container and to communicate with the passage; means for moving the gripper and the nozzle when they are in communication; and suction means including a member having a moving inlet adapted to travel with the gripper substantially in register with the end of the passage opposite the nozzle.

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