

[54] MACHINE FOR MAKING FILLED PACKAGES

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[58] Field of Search.....53/180

[56] References Cited

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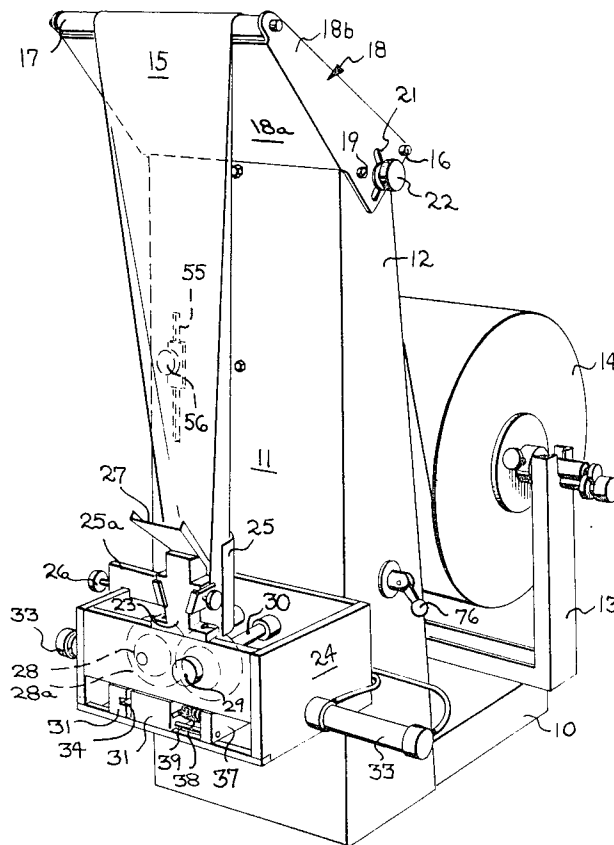
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[57] ABSTRACT

A machine for making filled packages by which an air-operated rack bar drives pull rolls by which the bag material is unrolled from a supply roll. The bag material has pressure-sensitive coating and, after passing upwardly from the supply roll over guide rollers, it passes downwardly over a mandrel in a troughlike form and to which the articles to be packaged are delivered through a chute. During the downward operation of the rack bar, the pressure rolls operate to advance the sheet material. However, when the rack bar retracts or moves upwardly, the pull rolls do not operate, and at that time pressure blocks move against the bag material, and, as it is clamped, a knife severs the material so that the upper end of the filled packages is sealed and cut off, and at the same time the bottom end of the next succeeding bag is sealed. The bag material can be advanced by the pull rolls in the next cycle of operation. The machine is operated by compressed air and may operate either automatically or by actuation of a foot valve.

7 Claims, 4 Drawing Figures



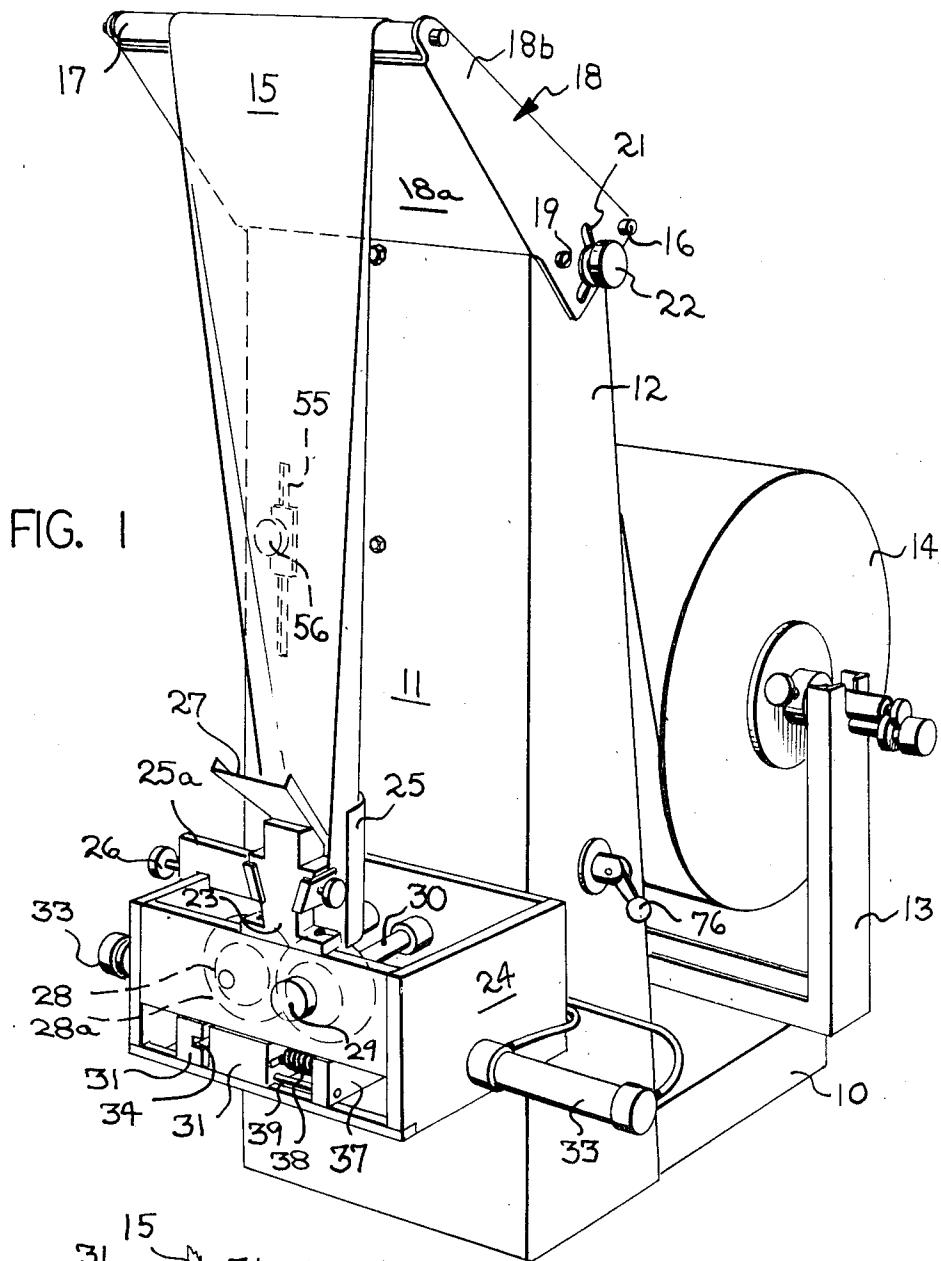


FIG. 1

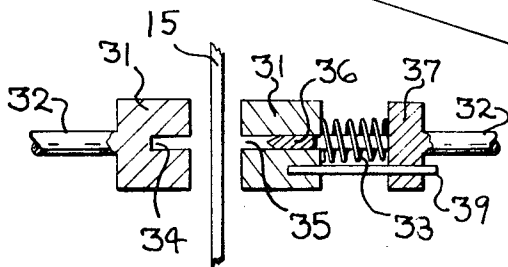


FIG. 3

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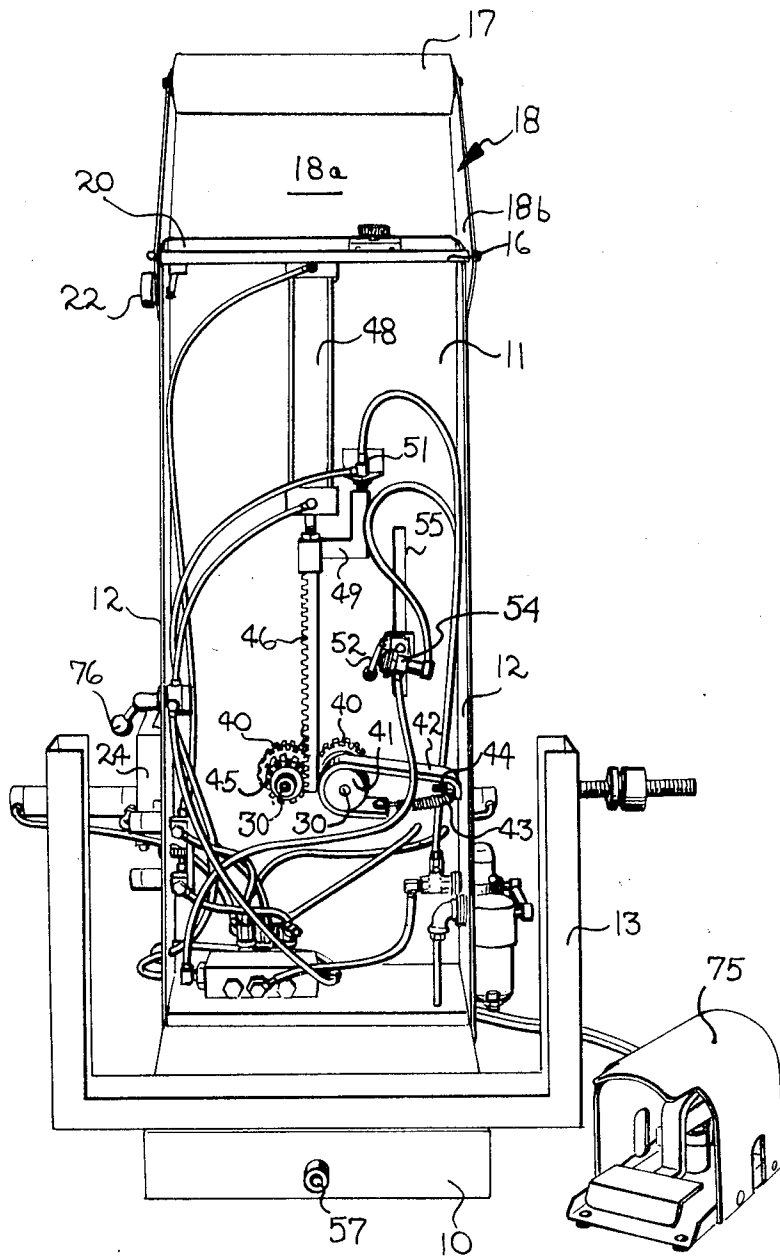


FIG. 2

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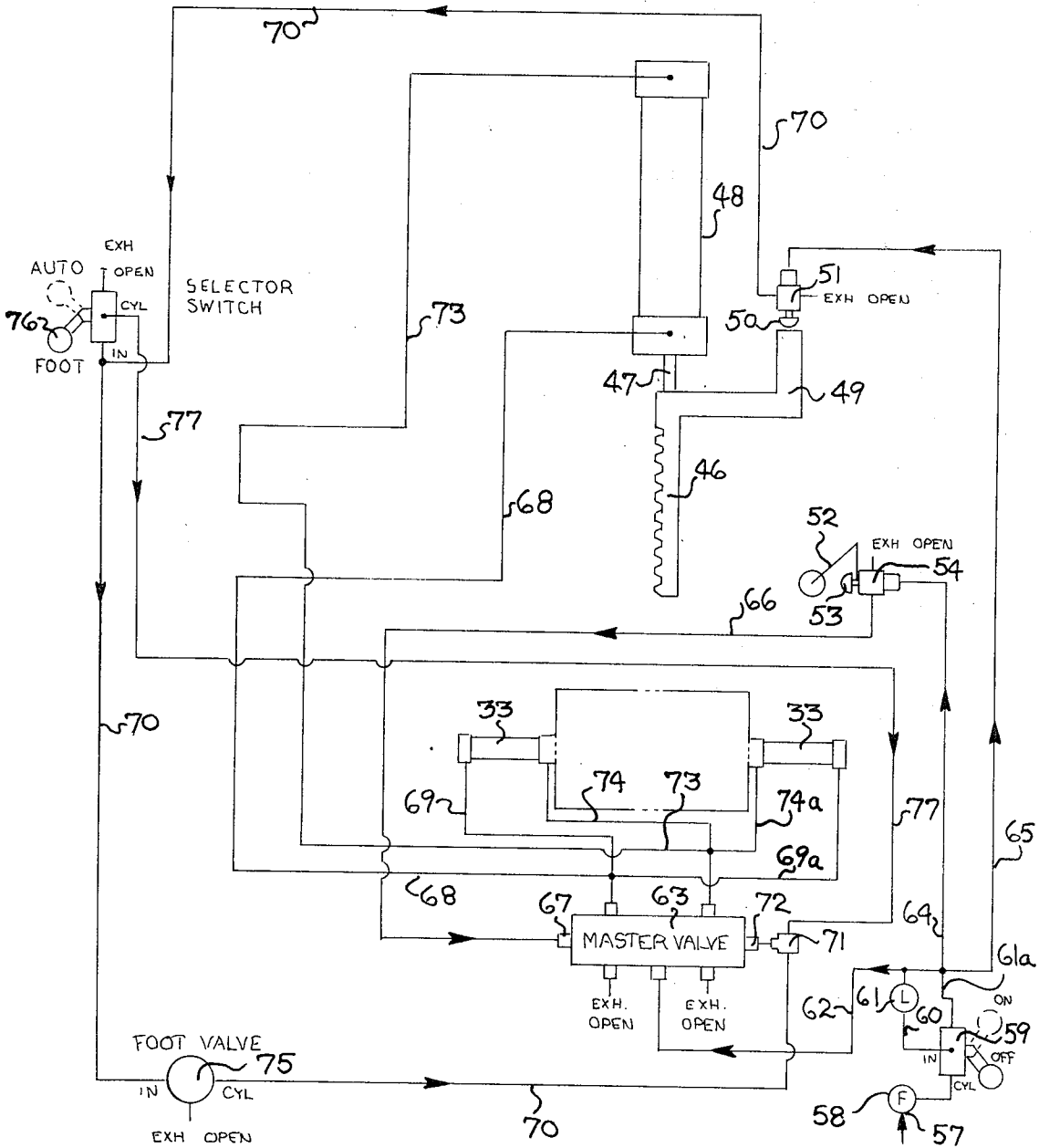


FIG. 4

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MACHINE FOR MAKING FILLED PACKAGES

It is an object to produce a simple and efficient machine for making filled packages by employing an endless strip bag material having a pressure sensitive coating, the material being formed in troughlike manner to receive the articles to be packaged and pull rolls operate against the material recurrently to advance the material and bag clamping and severing means operate during the period when the pull rolls are inoperative.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective elevation of a machine for making filled packages;

FIG. 2 is a rear end elevation of the machine;

FIG. 3 is a fragmentary sectional view showing the sealing blocks or members, and the knife for severing within the sealed area for closing the top of a filled bag and the bottom of the next succeeding bag; and

FIG. 4 is a diagrammatic view of the pneumatic system for operating the machine.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The illustrated embodiment of the invention comprises an upright sheet metal frame having a boxlike base 10 at the front end of which is an upright panel 11 provided with a pair of parallel inwardly extending sidewalls or wings 12. At the rear of the base 10 is an upright U-shaped support 13, which is adapted to support for free rotation a roll 14 of bag-forming sheet material 14. The sheet material has a pressure-sensitive coating on one side so that when the coatings are pressed together, the pressure-sensitive material coheres as will be readily understood by those skilled in the art. The free end of the strip 15 from the roll 14 extends upwardly over a transverse roller guide 16 located generally at the top of the upright panel 11. From the guide 16, the strip material passes upwardly and forwardly over a larger guide roller 17, and thence downwardly as shown on FIG. 1. The guide rollers 16 and 17 are carried by an adjustable sheet metal bracket 18 having a flat sheet metal body 18a and triangular side wings 18b. The bracket 18 is pivoted on a rod 19 carried by a rear panel retaining block 20, the latter being secured as by rivets to the panel 13. One of the side wings 18b has an arcuate slot 21 through which extends a pin secured to the upright sidewall panel 12. A knurled nut 22 secures the bracket 18 in its adjusted position.

As shown in FIG. 1, the strip material 15 is gradually folded into troughlike shape as it descends from the guide roller 17. The strip passes over a guide or mandrel 23, and in back of the strip material is a curved rear guide 25 which is secured to a bracket arm 25a that hooks over a wall of a box 24 and is secured in place by a knurled screw 26. The mandrel 23 is also fixed to the box bracket 24. For feeding articles to be packaged into the troughlike form of the bag material 15, a chute 27 is shown resting against the mandrel 23. Articles may be delivered to the chute in any desired manner.

The strip 15 is advanced recurrently by a pair of parallel pull rollers 28 disposed downstream from the mandrel 23 to engage the opposite uncoated sides of the folded sheet material. Each of the rollers 28 has an elastomeric tire 28a which engages the sheet material and is of sufficient flexibility to yield when a packaged article is encountered. On the outer side of the bracket box 24 is a manual feed knob 29 to enable manual operation of the rollers, such as for threading the sheet material into position. The pull rollers 28 are mounted on shafts 30 which have bearings in the front and rear walls of the box bracket 24.

Disposed downstream of the pull rollers 28 is a pair of transversely movable pressure members 31 between which the folded packaging strip 15 passes. The action of the pressure members 31 engaging opposite sides of the strip is to ensure the sealing engagement of the coated sides in this area and intermediate this sealed area the strip is severed. In this connec-

tion, the pressure members 31 are moved to and fro transversely by piston rods 32 respectively, which have pistons reciprocating within cylinders 33. In the face of one of the pressure members 31 is a notch 34 and the other pressure member has a slot 35 extending completely through it. A severing knife 36 reciprocates within the slot 35 and projects into the slot 34. Connected to one of the piston rods 32 is a block 37 to which the knife 36 is attached. Between the block 37 and the adjacent pressure block 31 is a coil spring 38 which operates to retract the knife 36 after bag severing has been accomplished. A guide rod 39 between the block 37 and the adjacent block 31 ensures the proper travel of these parts.

The shafts 30 for the pull rollers project through the frame panel 11 and on the inner side of the panel 11 and mounted on the shafts 30 are gears 40 which are in mesh with each other. On one of the shafts 30 adjacent the respective gear 40 is a brake drum 41 about which extends the brake band 42. The ends of the brake band 42 are resiliently connected by a coil spring 43. The brake band is secured to the inside of the adjacent side frame panel 12 by a fastener 44. The brake band 42 prevents backlash.

The other shaft 30 is equipped with a pinion 45 having as a part thereof a one-way clutch, enabling the pinion 45 to rotate in one direction for driving the shafts 30 through the gears 40 and permitting free rotation of the pinion independent of the respective shaft 30 in the opposite direction. Actuation of the pull rollers is effected by a vertical rack bar 46 which meshes with the clutch pinion 45. The rack bar 46 is secured to a piston rod 47, which has a piston reciprocable in a vertical cylinder 48 secured to the rear face of the frame panel 11. Manifestly, when the rack bar 46 is driven downwardly, the pressure rollers are concomitantly driven in order to advance the bag material 15, and when the rack bar moves upwardly, or is retracted, no movement is then imparted to the feed rollers.

Secured to the upper end of the rack bar 46 is a L-shaped valve operating arm 49, which is so arranged as to engage on the up-stroke a spring-biased button 50 for operating a valve 51. On the downstroke, the arm 49 engages a pivoted arm 52, which in turn actuates a spring-biased button 53 for operating a valve 54. As will hereinafter appear, the valve 51 is opened momentarily to permit the passage of pressure fluid to actuate a pilot valve to shift a master valve for admitting pressure fluid to the upper end of the cylinder 48 for driving the rack bar downwardly. On the other hand, when the button 53 is depressed, pressure fluid then is allowed to pass through the valve 54 to a pilot valve to shift a master valve to enable pressure fluid to pass to the lower end of the cylinder 48 to drive the rack bar 46 and associated parts upwardly.

It should be pointed out that the assembly, which includes the pivoted arm 52, the spring-biased button 53, and valve 54, is mounted for vertical adjustment with respect to the frame panel 11. As shown, these parts are mounted in a vertical slot 55 and are secured in a selected position by a knurled nut 56 (FIG. 1). This adjustment enables the length of the bag formed by the machine to be increased or shortened, as desired.

The motive fluid for operating the machine in this instance is air under pressure, and it is introduced to the machine through the fitting 57. It first passes through a filter 58 and then to a three-way manually operated selector valve 59. According to the position of the selector valve 59, air either passes to the line 60 and through a lubricator 61, or through a line 61a, bypassing the lubricator 61. It should be pointed out that at certain times during the operation of the machine, the air should pass through the lubricator 61 for conveying lubricant to the several valve mechanisms and other parts, but under ordinary operating conditions the air does not pass through the lubricator. It will be seen that both the lines 60 and 61a connect with a line 62, leading to a four-way master valve 63, and also to a line 64 leading to the valve 54, and to a line 65 leading to the valve 51. Consequently, air is available at each of the valves 51 and 54 so that when they are opened

momentarily, sufficient pressure fluid is available for that particular purpose.

When the rack 46 is moved downwardly a sufficient distance to enable the arm 49 momentarily to open the valve 54, air passes through the line 66 to a pilot valve 67 for shifting the master valve 63 sufficiently to enable air to pass through the line 68 to the lower end of the cylinder 48 for driving the rack 46 upwardly. At the same time, air passes through lines 69 and 69a to the cylinders 33 for driving the pressure blocks 31 toward each other and actuate the knife 36 for severing the bag material.

When the rack 46 has moved upwardly sufficiently to enable the arm 49 to open the valve 51, air then passes through the line 70, through a shuttle valve 71 to a pilot valve 72 for shifting the master valve 63 sufficiently to enable air to pass through the line 73 to the upper end of the cylinder 48 to drive the rack 46 downwardly. At the same time, air passes through the line 74 and 74a to the inner ends of the cylinders 33 to retract the pressure blocks 31 as well as the severing knife 36. Accordingly, the pressure rolls can then be actuated to advance the bag material. It will be understood that when the lines 73, 74a, and 74 are under pressure, exhaust occurs through lines 68, 69 and 69a. Similarly, when lines 68, 69, and 69a are under pressure, exhaust occurs through lines 73, 74 and 74a.

The mechanism can be automatically operated so that the above-described operation will be carried on continuously, or it can be operated by a foot treadle 75 as shown on FIG. 2. For this purpose, a selector switch 76 is provided and in its broken line position on FIG. 4 it is in automatic position enabling the system to operate continuously. However, when the switch is swung to the full line position, shown on FIG. 4, then the system only operates upon depression or actuation of the treadle or foot valve 75, whereupon the parts actuate through one cycle and then stop. It will be understood that if the foot valve or treadle is held down, the machine will operate continuously so that it is a matter of depressing the treadle and then releasing it to effect one cycle of operation. Leading from the selector switch 76 is a line 77 which leads to the shuttle valve 71.

I claim:

1. In a machine for producing filled packages from a continuous web of plastic sheet comprising means for guiding the sheet material, means to cause the free edges of the sheet material to overlap to form a tube, means to feed material to be packaged into the tube as it is being formed, a pair of feed rollers for engaging the sheet material transversely thereof and disposed downstream of said edge overlapping means, rack and pinion means for recurrently driving said feed rolls and including clutch means enabling driving of said rolls upon actuation of said rack in one direction and retraction of said rack without roll movement, means for supplying pressure fluid, a piston and cylinder assembly for imparting vertical to-and-fro movement to said rack,

a pilot operated valve controlling the passage of pressure fluid from said supply means to opposite ends of said cylinder, tubes extending respectively from said valve to opposite ends of said cylinder, means for actuating the pilot of said valve at opposite ends of the stroke of said rack thereby alternately to direct pressure fluid to one or the other end of said cylinder, said actuating means including tubes to said valve respectively from said pressure fluid supply means, a valve arranged adjacent each end of said rack stroke and in position to be engaged thereby for momentarily opening same to admit pressure fluid for pilot operation to cause pressure fluid alternately to flow to one end or the other of said cylinder, means for recurrently sealing together an area of the sides of the tube, means to sever the tube between the sealed area for closing the upper end of one package and the lower end of another package, and pressure fluid means for actuating said severing means in timed relation to said rack movement.

2. In a packaging machine as claimed in claim 1, comprising means for adjusting the position of the valve engaged by said rack in its movement thereby to determine the length of the package, said means including an adjustable manual mounting for said valve.

3. In a packaging machine as claimed in claim 1, comprising a spring tensioned brake associated with said pinion means for preventing back lashing.

4. In a packaging machine as claimed in claim 1, comprising a selector valve which upon adjustment renders said rack operated valves and associated tubes inoperative, a treadle, and an operative connection between said treadle and the pilot of said valve, thereby manually to actuate said rack when said selector valve is appropriately adjusted.

5. In a packaging machine as claimed in claim 1, in which said material feeding means comprises a chute for guiding material to the mouth of the tube, and means partially embracing the tube and arranged in rear of bottom end of said chute for preventing damage to the tube by the material fed thereto.

6. In a packaging machine as claimed in claim 1, comprising a frame having a base and an upright frame part, means to mount said piston and cylinder assembly and rack and pinion means on said upright frame part, means to support a roll of plastic sheet material on said base at one side of said upright frame part, an adjustable guide roller for the plastic sheet material at the upper end of said upright frame part, and means to mount said feed rollers on the other side of said upright frame part.

7. In a packaging machine as claimed in claim 6, comprising an open ended box secured to the side of said upright frame opposite to said sheet material roll support, means to mount said feed rollers in said box, and means in said box for mounting said tube pressing and severing means.

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