May 12, 1959 H. H. HACKETT 2,885,902

PNEUMATIC FEED ATTACHMENT FOR TAPE DISPENSERS

Filed Oct. 21, 1953 2 Sheets-Sheet 1

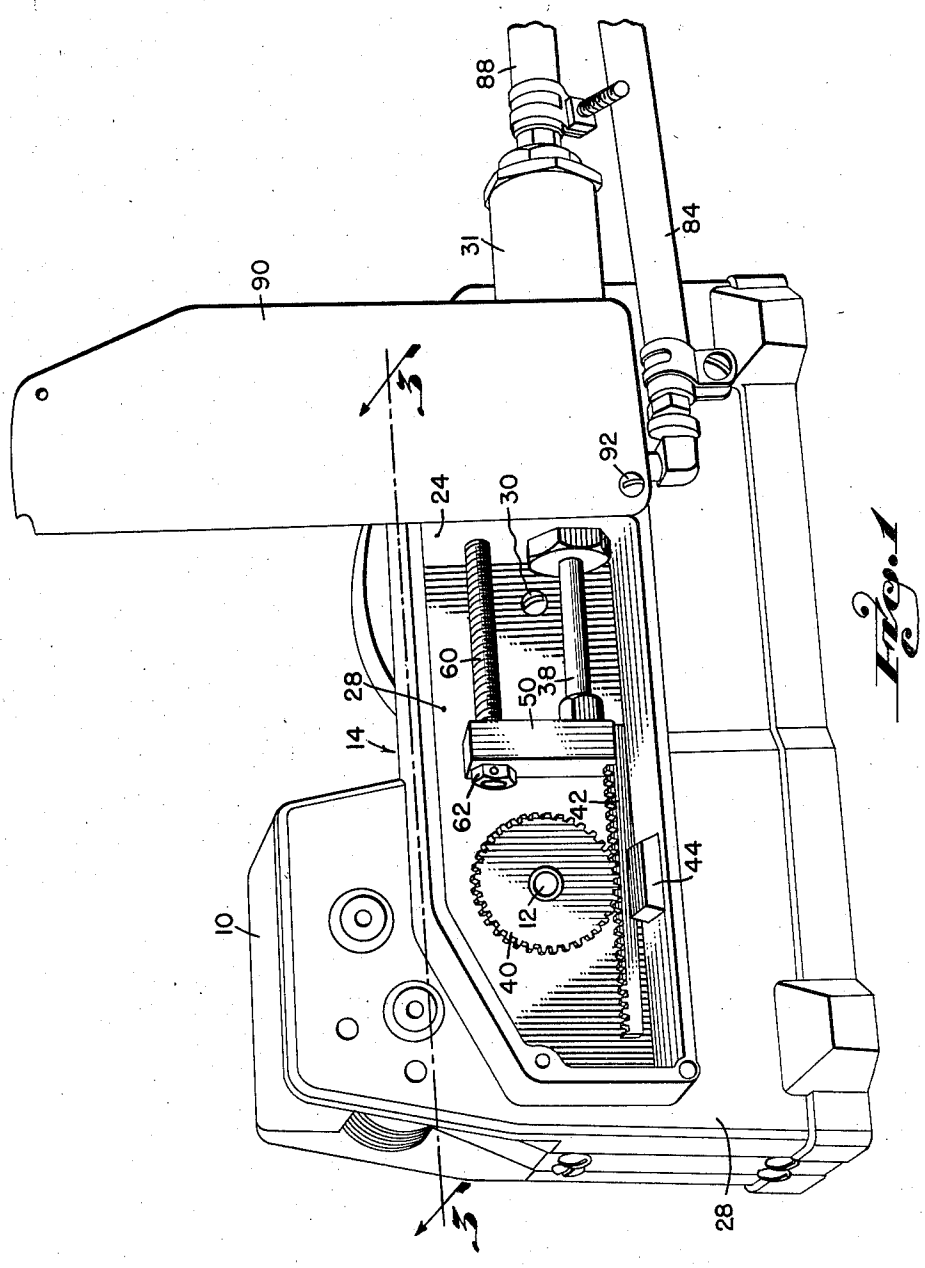


Fig. 1

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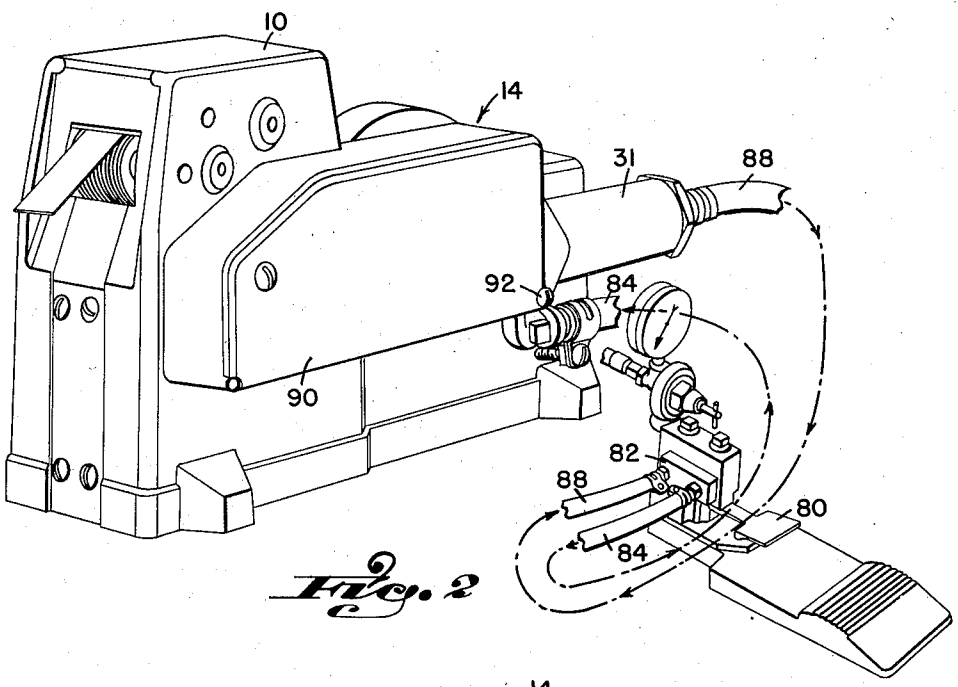


Fig. 2

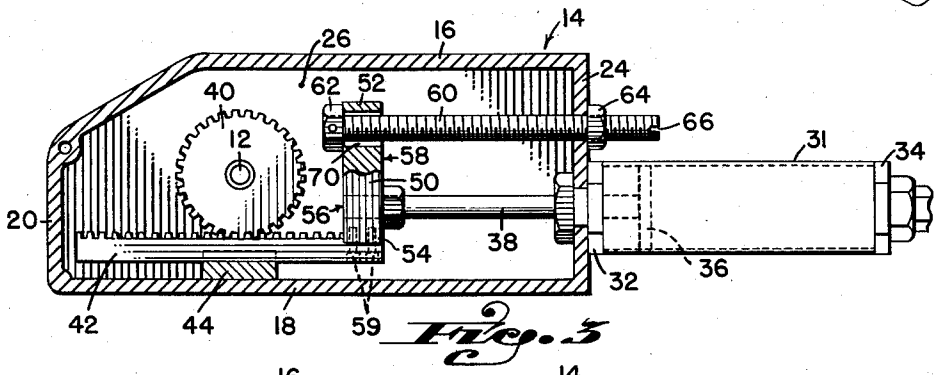


Fig. 3

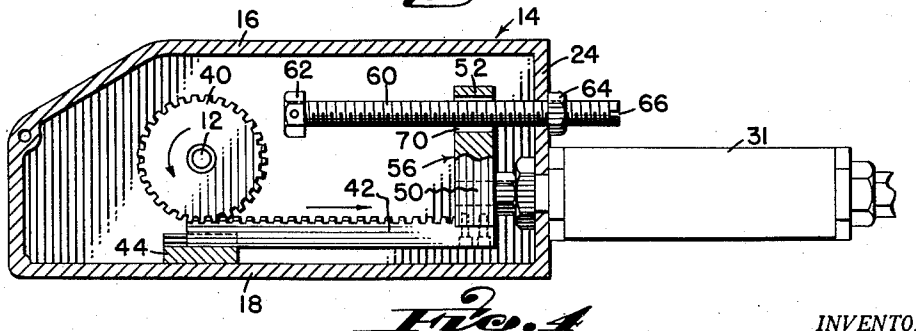


Fig. 4

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United States Patent Office 2,885,902 Patented May 12, 1959



2,885,902

# PNEUMATIC FEED ATTACHMENT FOR TAPE DISPENSERS

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Application October 21, 1953, Serial No. 387,499

9 Claims. (Cl. 74—422)

This invention relates to a pneumatic feeding mechanism for driving the rocker shaft which controls the feeding cycle of a conventional tape dispensing machine.

An object of the invention is to provide a pneumatic actuating mechanism to replace the hand lever by which the rocker shaft which controls the tape feeding cycle of the machine is controlled.

A further object of the invention is to provide a pneumatic actuating mechanism which may be quickly and easily associated with a tape dispensing machine by merely replacing the oscillatable hand lever with a gear engageable with a reciprocable rack comprising part of the pneumatic actuating mechanism.

Another object of the invention is to provide a pneumatic actuating mechanism for driving the rocker shaft which controls the feeding cycle of a standard tape dispensing machine, which mechanism is characterized by its ability to operate at frequent intervals over prolonged periods of time in a highly efficient and economical manner.

Still another object of the invention is to provide a pneumatic actuating mechanism having the hereinabove described characteristics, which is provided with means easily accessible to an operator for enabling the stroke of the piston to be varied for thereby controlling the length of tape dispensed each time the mechanism is actuated.

These and other objects are attained by the means described herein and as disclosed in the accompanying drawings, in which:

Fig. 1 is a perspective view of a typical tape dispensing machine provided with a pneumatic actuating mechanism embodying the teachings of the invention, wherein the access cover of the actuating mechanism has been swung to an open position for more clearly revealing the structural details of the device.

Fig. 2 is a view similar to Fig. 1, but wherein the access cover has been closed, and illustrating a typical manually operable control mechanism operatively associated with the device.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1, with the piston at the forward end of its stroke.

Fig. 4 is a view similar to Fig. 3 illustrating the relationship of the parts when the piston has been fully retracted.

In the light of hindsight the problem solved by the subject mechanism seems quite simple, however American industry has long sought a satisfactory mechanism for inexpensively, efficiently and accurately dispensing predetermined lengths of tape. Tape dispensing machines, per se, are, and heretofore have been, provided with a rocker shaft to which a manually operable lever has been attached, whereby a length of tape may be dispensed each time the manually operable lever is actuated. However, in those instances wherein large quantities of tape are used, the length of tape dispensed from a given machine will vary considerably during the working day of an operator. In the morning, when an operator is alert and fresh, the manually operable lever will usually be moved throughout its entire stroke for thereby dispensing a full length of tape, however when an operator tires, or when an operator endeavors to speed up an operation rate, the lever is seldom actuated throughout its entire stroke, thereby resulting in improper lengths of tape being dispensed.



Efforts to actuate tape dispensing devices by means of electrical motors, solenoids and the like have proven highly unsatisfactory not only from the initial expense involved, but also by reason of the high operating expenses and inherent dangers which are prevalent whenever electrical power is utilized. As of this writing I am unaware of any satisfactory electrical mechanism for driving the rocker shaft of a tape dispensing machine.

The subject pneumatic actuating mechanism enables a conventional tape dispensing device to be quickly and inexpensively converted for full automatic operation subject, however, to control of an operator. Since I utilize pneumatic means for driving the rocker shaft of a tape dispenser, the length of tape dispensed each time the device is actuated will be consistently uniform, thereby effecting tremendous economical savings. Solely by way of example, it should be noted that use of the subject feeding device on conventional tape dispensers at the General Electric Company plant at Ft. Wayne, Indiana, resulted in direct savings of $75,000.00 per year. Comparable savings have been noted in all other installations using the subject pneumatic actuating mechanism.

The present invention is primarily directed to the specific structural details of a simple, highly efficient, light-weight, self-contained device illustrated in Figs. 3 and 4.

With reference now to the drawings, the numeral **10** denotes generally any so-called conventional tape dispensing machine, it being understood that this invention is neither directed to nor concerned with the particular structural details of such a dispenser, except insofar as the machine includes a rocker shaft **12** which controls the feeding cycle of the machine. Reference may be made to the R. E. Engberg Reissue Patent No. 22,945, and particularly to Figs. 6, 7, 12 and 13 thereof, for a description of the actuating characteristics of rock shaft **12**, and the manner in which it drives, in a step-by-step manner, the tape dispensing mechanism of the tape dispensing machine.

The subject mechanism preferably comprises a housing **14** which includes top, bottom, front, rear and side walls **16**, **18**, **20**, **24** and **26**, respectively. The pneumatic actuating mechanism may be secured to side wall **28** of a tape dispensing machine **10** such as, by way of example, a set screw **30** passing through wall **28** of the housing **14**, note Fig. 1.

A cylinder **31** having front and rear ends **32** and **34** is securely mounted to and with its forward end **32** in contacting relationship with rear wall **24** of the housing. Cylinder **31** includes a piston **36** reciprocable therein, and a piston rod **38** secured to and carried by the piston, and which extends forwardly through the front end **32** of cylinder **31** and through rear wall **24** of the housing. A gear **40** is suitably secured to and carried by rock shaft **12**, it being understood that the rock shaft is of sufficient length whereby to project outwardly through side wall **26** of housing **14**.

A rack **42** is mounted to engage gear **40**, and in the preferred embodiment of the invention a rack guide **44** may be provided for insuring axial motion of the rack and its engagement with gear **40** throughout its stroke.

The numeral **50** denotes generally a stop member having an upper and a lower end **52** and **54**, and a forward and a rear face **56** and **58**. The rear end of rack **42** is fixedly secured to the lower end of member **50** with the rack extending forwardly from forward face **56**. The

rack may be fastened to member 50 by means of bolts 59, or the like.

The forward end of piston rod 38 is likewise fixedly secured to the lower portion of member 50, said rod projecting rearwardly from face 58.

From the foregoing, it will be noted that stop member 50 is interposed between and interconnects adjacent ends of rack 42 and piston rod 38, whereby reciprocation of the piston will be imparted to the rack.

An elongate element 60 is secured to and carried by rear wall 24, said member extending through and on opposite sides of the rear wall of the housing. In the preferred embodiment of the invention, element 60 is provided with external threads which engage a threaded bore through rear wall 24 of the housing. An abutment 62 is secured to and carried by element 60, it being understood that the location of said abutment is adjustable with respect to rear wall 24 of the housing incident to turning elongate element 60 for feeding it into or out of rear wall 24. A lock nut 64 may be provided on that portion of element 60 which projects rearwardly of rear wall 24 for thereby enabling element 60 to be securely, though releasably, anchored or locked with respect to cylinder 31 and the rear wall of the housing.

Suitable means such as, by way of example, a slot 66, may be provided in the rear end of element 60 for enabling an operator to alter the relationship of abutment 62 with respect to cylinder 31, without requiring the operator to have access to the interior of the housing.

The upper end of the stop member is provided with an opening 70 dimensioned to loosely and slidably receive element 60 which extends therethrough, it being noted that abutment 62 is located forwardly of front face 56.

With particular reference now to Fig. 2, the numeral 80 denotes generally a manually operable foot treadle which, when depressed by an operator, serves to actuate a valve denoted generally by the numeral 82 for thereby introducing air under pressure via line 84 to the forward end of cylinder 31 for thereby automatically and rapidly driving piston 36 to the rear end of its stroke and for disposing the parts of the actuating mechanism in the relative positions illustrated in Fig. 4 for thereby positively driving rock shaft 12 throughout an exact and predetermined angular displacement. When foot treadle 80 is released air under pressure will be introduced through line 88 into the rear end of cylinder 31 for driving the piston forwardly. With reference to Fig. 3, it will be noted that the forward stroke of piston 36 will be limited by engagement of the front face 56 of stop member 50 with abutment 62. Quite obviously the spacing of abutment 62 from rear wall 24 of the housing will determine the effective stroke of the piston since the rearward stroke of the piston is fixed and uniform.

Reference is hereby made to the D. E. Beckett, et al. Patent No. 2,586,906 for a detailed description of the structural details of a typical valve such as denoted generally in Fig. 2 by the numeral 82, it being understood that the present invention is neither directed to nor concerned with the particular structural details of such a valve, so long as the valve is capable of introducing air under pressure on one side or the other of piston 36 for positively driving the piston to one end or the other of its stroke, each time manually operable means 80 is actuated. In this manner a full actuating stroke will be obtained each time the foot treadle 80 is depressed, even though said treadle be depressed but for a fraction of a second.

A cover plate 90 hingedly secured to the housing as at 92 may be provided for thereby completely enclosing the moving parts of the pneumatic actuating mechanism. By thus enclosing the mechanism and by providing adjustment means for the elongate element 60 externally of rear wall 24, adjustment of the piston stroke may be conveniently affected without subjecting the operator to a hazardous condition such as would exist in the event that it became necessary that adjustment of element 60 required access to the interior of the housing.



It should be understood that various changes and modifications may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a pneumatic cylinder, a piston reciprocable therein, a piston rod in driven relationship with the piston, a stop member, a rack engaging the said driving gear, means securing an end of the rack to said stop member, said rack projecting forwardly of the stop member, means securing the piston rod to and in driving relationship with said stop member, an elongate element, means securing said element for endwise adjustment relative to the cylinder for disposing a portion of the element in spaced parallelism with the axis of the rack, and means on said element engageable by the stop member for limiting the forward stroke of the piston.

2. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a pneumatic cylinder, a piston reciprocable therein, a piston rod in driven relationship with the piston, a stop member, a rack engaging the said driving gear, means securing an end of the rack to said stop member, said rack projecting forwardly of the stop member, means securing the piston rod to and in driving relationship with said stop member, an elongate element, means securing said element for endwise adjustment relative to the cylinder for disposing one end of the element projecting rearwardly over the cylinder and the other end projecting forwardly over the path of travel of the piston rod, and means on the forwardly projecting portion of said element engageable by the stop member for limiting the forward stroke of the piston.

3. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a housing having a rear wall, a pneumatic cylinder one end of which is secured to and carried by the rear wall of the housing, a piston reciprocable within the cylinder, a piston rod in driven relationship with the piston and projecting through the rear wall of the housing, a member on that side of the rear wall opposite from the cylinder, a rack engaging the said driving gear, means securing an end of the rack to said member, said rack projecting forwardly of the member, means securing the piston rod to and in driving relationship with said member, an elongate element extending through the rear wall of the housing with its ends disposed on opposite sides thereof, means securing said element for endwise axial movement relative to said wall, means on that end of said element remote from the cylinder engageable by the member for limiting the forward stroke of the piston, the other end of the element being freely accessible for imparting endwise axial movement thereof relative to the rear wall of the housing.

4. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a housing including a side, top, bottom, front and rear walls, a pneumatic cylinder having a front and a rear end, means securing the front end of the cylinder to and projecting rearwardly from the rear wall of the housing, a piston reciprocable within the cylinder, a piston rod extending through the front end of the cylinder and the rear wall of the housing, said piston rod in driven relationship with the piston, a rack adapted to engage said gear, an elongate element secured to, carried by and extending through the rear wall of the housing, a member interposed between adjacent ends

of the rack and piston rod, said member movable relative to said element incident to reciprocation of the piston, an abutment secured to and carried by said element and engageable by said member for limiting the forward stroke of the piston.

5. In an actuating mechanism as described in claim 4, means for mounting the elongate element for axial adjustment relative to the rear wall of the housing for changing the relative position of the abutment carried thereby.

6. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a pneumatic cylinder, a piston reciprocable therein, a piston rod in driven relationship with the piston, a stop member including upper and lower ends and front and rear faces, a rack engaging the said driving gear, means securing an end of the rack to the lower end of said stop member, said rack projecting forwardly from the front face of the stop member, means securing the piston rod to and adjacent the lower end of and in driving relationship with said stop member, said piston rod extending rearwardly from the rear face of said member, an elongate element, means securing said element for endwise adjustment relative to the cylinder for disposing a portion of the element in spaced parallelism with the axis of the rack, and means on said element engageable by the stop member for limiting the forward stroke of the piston.

7. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a pneumatic cylinder, a piston reciprocable therein, a piston rod in driven relationship with the piston, a stop member, a rack engaging the said driving gear, means securing an end of the rack to said stop member, said rack projecting forwardly of the stop member, means securing the piston rod to and in driving relationship with said stop member, said stop member having an opening therethrough in spaced parallelism with the axis of travel of the piston rod, an elongate element, means securing said element relative to the cylinder for disposing a portion of the element through the opening in the stop member and in spaced parallelism with the axis of the rack, and means on said element engageable by the stop member for limiting the forward stroke of the piston.

8. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a housing adapted to be secured to a tape dispensing machine for enclosing the aforesaid driving gear, said housing including top, bottom, front and rear walls, a pneumatic cylinder having a front and a rear end, means securing the front end of the cylinder



to and projecting rearwardly from the rear wall of the housing, a piston reciprocable within the cylinder, a piston rod extending through the front end of the cylinder and the rear wall of the housing, said piston rod in driven relationship with the piston, a rack adapted to engage said gear, an elongate element secured to, carried by and extending through and on opposite sides of the rear wall of the housing, a stop member interposed between and interconnecting adjacent ends of the rack and piston rod, said member movable with the piston rod and rack and relative to said elongate element incident to reciprocation of the piston, an abutment secured to and carried by that portion of the elongate element forwardly of the rear wall of the housing, said abutment engageable by said member for limiting the forward stroke of the piston.

9. A pneumatic actuating mechanism for a driving gear secured to and carried by the rocker shaft which controls the feeding cycle of a tape dispensing machine; said mechanism comprising a pneumatic cylinder, a piston reciprocable therein, a piston rod in driven relationship with the piston, manually operable means for introducing air under pressure on one side or the other of the piston for positively driving the piston to one end or the other of its stroke each time the said manually operable means is actuated, a stop member, a rack engaging the said driving gear, means rigidly securing the rear end of the rack to said stop member, said rack projecting forwardly of the stop member, means rigidly securing the forward end of the piston rod to and in driving relationship with said stop member, an elongate element, means for fixedly though adjustably securing said element relative to the cylinder for disposing a portion of the element in spaced parallelism with the path of travel of the rack, and means on said element engageable by the stop member for limiting the forward stroke of the piston.


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