United States Patent

Cristiani

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[54] **GLUE DISPENSER FOR CIGARETTE MAKING MACHINE**

[72] Inventor: **Athos Cristiani,** Bologna, Italy

[73] Assignee: **AMF Incorporated**

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[52] **U.S. Cl.** **222/1,** 222/2, 222/333, 222/386

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[58] **Field of Search**.....222/1, 2, 333, 386

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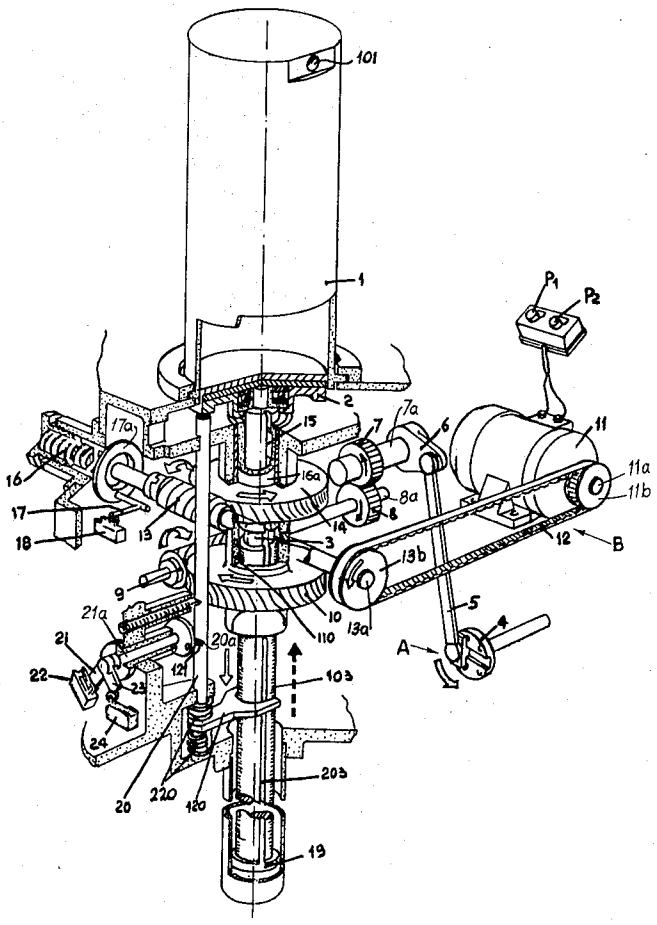
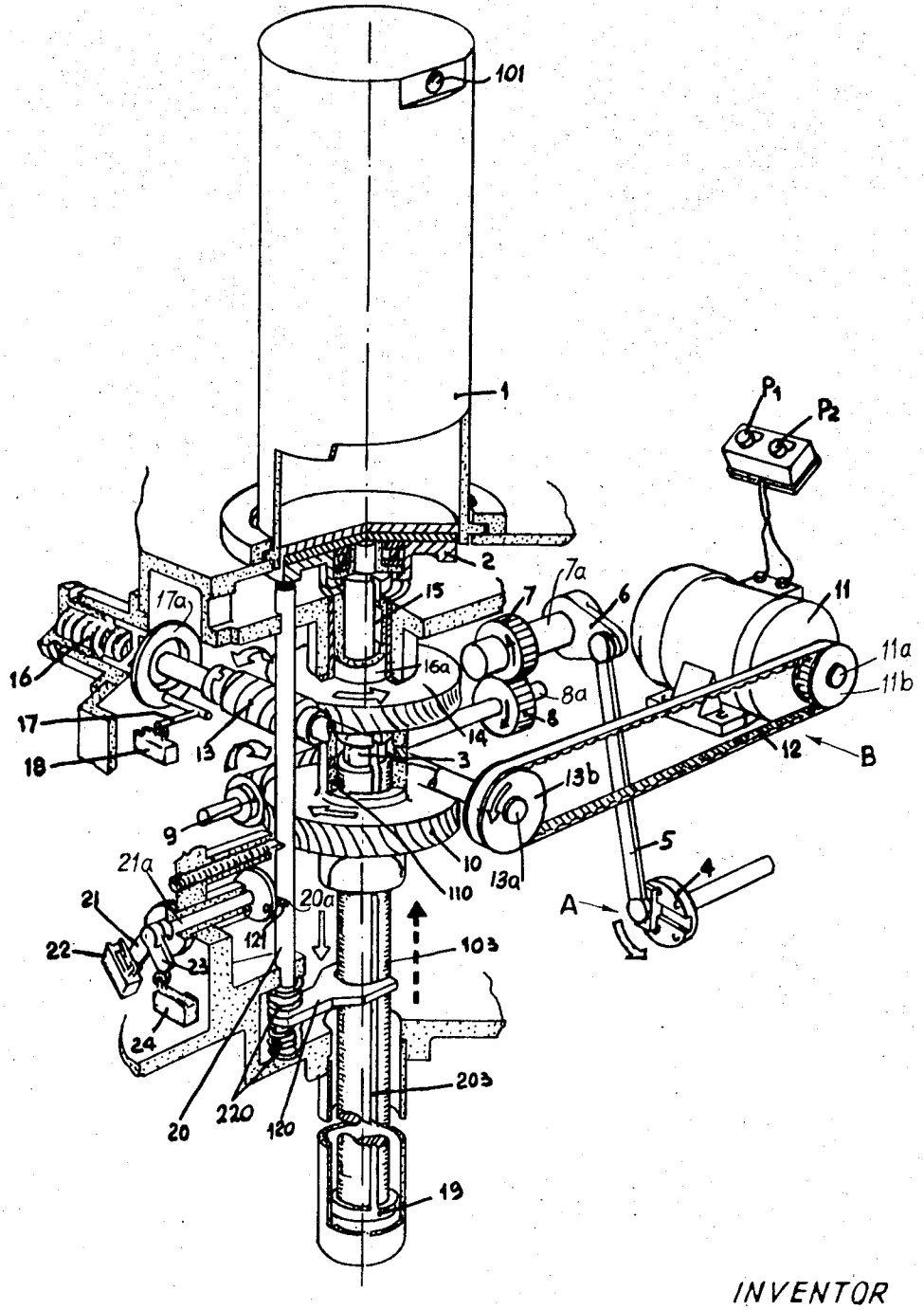
Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—Thomas C. Culp, Jr.
Attorney—George W. Price et al.

[57] **ABSTRACT**

Apparatus for dispensing glue for use with a cigarette maker, which comprises a cylinder having an outlet orifice therein, a plunger mounted for slidable movement in the cylinder and operable to dispense glue out said orifice, means coupling the plunger and the cigarette maker for driving said plunger toward said orifice at a rate commensurate with the demand for glue of the cigarette maker, and means coupled to the plunger independent of the cigarette maker for driving said plunger toward and away from said orifice.

9 Claims, 1 Drawing Figure





INVENTOR
ATHOS CRISTIANI

BY

ATTORNEY

GLUE DISPENSER FOR CIGARETTE MAKING MACHINE

BACKGROUND

This invention relates to glue dispenser units and more particularly to glue dispensers used in cigarette making machines to apply a film of glue along one edge of the paper tape that receives the tobacco braid in order to enable the closing and sealing of the tape around the braid to form the continuous rod from which the individual cigarettes are cut.

A glue dispenser unit generally comprises means for applying a thin film of fluid glue on an edge of the cigarette paper tape and dispenser means for feeding the glue to the aforementioned glue applying unit. The glue applying means and the glue dispensing means are interconnected by a suitable duct or hose or the like. This arrangement allows the glue applying unit only to be placed in the rod forming area while the glue dispensing unit, which is somewhat larger, to be located in a more suitable or convenient position for the service and/or maintenance thereof.

Briefly, the glue feeding means, or dispenser, consists of a cylindrical housing within which a plunger is mounted for slidable movement. The plunger is coupled to the cigarette maker proper to assure a flow of which is proportionate to the cigarette maker rate of production.

In the past, this arrangement has involved some inconveniences. More specifically, every time the cigarette maker is started, the machine operator must actuate a handwheel to move the plunger forward in the cylinder to bring the glue to the required distribution pressure. And, every time the cigarette maker is stopped, the glue distribution must also be stopped and this result is obtained by moving the plunger in the glue pot backward by means of the same handwheel. Furthermore, when the supply of glue in the cylinder is exhausted, in order to remove the empty cylinder and replace it with a full one the plunger must be returned to its start position by turning the handwheel.

SUMMARY

It is accordingly an object of this invention to provide an improved glue supply system.

It is a further object of this invention to provide an improved glue dispenser system used on a cigarette maker.

It is a still further object of this invention to provide an improved glue feeding unit coupled to a cigarette maker wherein the feeding unit is responsive to the cigarette maker but operable independently thereof as well.

It is a more specific object of this invention to provide a glue dispenser unit for a cigarette maker with dual actuation means, one means being a coupling to the maker and the other be independent thereof.

In accordance with these and other objects, an improved glue dispensing unit according to the invention may comprise a cylinder having an outlet orifice therein, a plunger mounted for slidable movement in the cylinder and operable to dispense glue out said orifice, means coupling the plunger and the cigarette maker for driving said plunger toward said orifice at a rate commensurate with the demand for glue of the cigarette maker, and means coupled to the plunger independent of the cigarette maker for driving said plunger toward and away from said orifice.

DESCRIPTION OF THE DRAWINGS

The single FIGURE of the drawing is a perspective view of a glue dispensing unit according to the invention with parts thereof broken away.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the single FIGURE of the drawing, a preferred embodiment of the invention comprises a glue cylinder **1** having a plunger **2** mounted for slidable movement therein and a glue dispensing orifice **101** adjacent the top thereof. The glue is disposed above the plunger **2** and the upward movement thereof in cylinder **1** dispenses glue from the orifice **101**. A piston rod or stem **3** having a threaded section **103** and a longitudinal groove **203** is rotatably mounted to the plunger.

The plunger **2** is normally moved upwardly in cylinder **1** to dispense glue by a drive chain A coupled to the cigarette maker. Drive chain A includes an eccentric **4** mounted on a driving element of the maker, a connecting rod **5** mounted on the eccentric, the other end of which is connected to a crank **6**. The crank **6** is keyed to a shaft **7***a* having a toothed wheel **7** thereon that meshes with a second toothed wheel **8**. The second toothed wheel **8** is mounted on a shaft **8***a* having a worm screw **9** mounted on the other end thereof that meshes with a helical wheel **10**.

A threaded section **110** is formed in the inside of the hub wheel **10** and the threaded section **110** is mounted on the threaded section **103** of piston rod or stem **3**. The wheel **10** is mounted to the frame of the device such that the rotation thereof by worm screw **9** will drive the stem **3** upwardly or downwardly, depending on the direction of rotation of wheel **10**.

When the cigarette making machine is in operation, the rotation of eccentric **4** causes the gradual forward motion of plunger **2** within cylinder **1** through drive arrangement A. This forward movement is in proportion with the quantity of glue normally required by the machine and the elements of drive arrangement A are so chosen and sized.

In addition, the upward and downward motion of plunger **2** in cylinder **1** can be caused by an actuating mechanism B that is operable independently from the drive arrangement A. Actuating mechanism B comprises a reversible electric motor **11** having an output shaft **11**a. A pulley **11***b* is mounted on output shaft **11***a* and a pulley **13***a* is mounted on a shaft **13***b* mounted in spaced relationship with shaft **11***a*. A drive belt **12** drives shaft **13***b* from output shaft **11***a*. A worm screw **13** is mounted on shaft **13***a* and meshes with a toothed wheel **14** with helical toothing. Toothed wheel **14** is mounted around stem **3** and is supported in such a way as to rotate about the axis of the stem **3**, without moving longitudinally therealong. The toothed wheel **14** includes a hub portion **14***a* that is provided with an inwardly extending tongue **15** that is mounted in the groove **203** provided in the stem **3** to transfer rotational movement of toothed wheel **14** to the stem.

This arrangement results in the actions of the drive arrangements A and B being cumulative. That is, both

the maker and the motor **11** can drive the stem **3** upward at the same time and the upward velocity imparted thereto and thus to plunger **2** will be additive. If wheel **14** is rotated faster than wheel **10**, and in the opposite direction, then the stem and plunger will be driven downwardly.

The motor **11** can be coupled to the cigarette maker such that it starts running automatically when the maker is started and both drive arrangements, A and B, drive the plunger **2** upwardly to impose a pressure on the glue in the cylinder. In another arrangement, motor **11** is not coupled to the maker and can be actuated while the maker is off to impose pressure on the glue before the maker is turned on so glue can be dispensed immediately upon the commencement of the making sequence. With either arrangement, when the pressure in the cylinder reaches the pre-established dispensing value, the shaft of screw **13** is submitted to a back pressure, resulting in an axial stress along shaft **13***a* that counteracts a force along that shaft provided by calibrated spring **16**, the purpose of which is to withstand the axial stress resulting from the coupling between worm screw **13** and helical wheel **14**. The back pressure causes a rod **17** affixed to shaft **13***a* through a mounting disc **17***a* to actuate a microswitch **18**, which is coupled to the circuit of motor **11** to stop the same. When the motor **11** is stopped, the forward motion of plunger **2** in cylinder **1** will be determined only by drive arrangement A, which is the rate at which the cigarette maker is running.

Every time the cigarette maker itself stops, a circuit coupled to motor **11** automatically starts the latter running in the reverse direction to move the plunger downwardly in cylinder **1**. A suitable timer (not shown) stops the motor **11** when the pressure in cylinder **1** is exhausted.

While the cigarette maker is running, the operator can, by means of a pushbutton P1, run motor **11** in such a way as to increase the glue pressure in the pot, since, as stated above, the coupling of the mechanism B driven by motor **11** to the stem **3** is additive to the coupling of the mechanism A from the cigarette maker to the stem **3**. Conversely, the actuation of a pushbutton P2 causes motor **11** to rotate in such a way as to lower plunger **2** in cylinder **1**.

When plunger **2** reaches the end of its stroke at the top of the cylinder, a disk or flange **19** integral with the lower end of stem **3** engages a fork **120** which receives the stem **3** between its tines. Fork **120** is mounted on a rod **20** which is mounted parallel to stem **3** and is maintained elastically balanced between two helical positioning springs **220** acting in opposite directions against the fork **120**. A crank pin **121** rides in a notch **20***a* provided in rod **20** and is mounted on shaft **21***a* driving a cam **21**. The engagement of disc **19** with fork **120** causes the upward displacement of the latter and a consequent axial upward sliding of rod **20**. This sliding causes an angular rotation of crank **121** whereby cam **21** rotates in such a way as to actuate a microswitch **22** included in a circuit which stops the maker or motor **11**.

If it is required to substitute the empty cylinder **1** with a full one, the motor **11** is run to lower the plunger **2** in its position out of the lower end of the empty cylinder. In this position, plunger **2** engages the top free end of rod **20**, whereby the rod is caused to slide downward against the action of positioning springs **220** and the consequent rotation of crank **121** causes cam **23** to actuate microswitch **24**. The actuation of this microswitch causes motor **11** to stop. The empty cylinder can then be substituted with a full one and subsequently the cigarette maker can be re-started.

A double cylinder and plunger unit can be provided according to the invention, each associated with actuating devices as set forth above. In this embodiment, the depletion of the glue in one cylinder does not necessitate the stopping of the maker. Instead, by providing solenoid-operated couplings on the respective shafts that drive the eccentrics **4** of the two dispensers involved, the signal from actuation of the microswitch **22** at the end of the upper stroke of plunger **2** can be used to cause the switching of the coupling of the glue applicator from one dispenser to the other. By so doing, it is possible to easily substitute the depleted cylinder of the exhausted dispenser while the maker continues to run fed by the other dispenser. To avoid interferences between the two alternately operating dispensers, non-return valves could be provided in the delivery ducts of the cylinders.

Having now fully set forth both structure and operation of preferred embodiments of the concept underlying the present invention, it may be that various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will occur to those skilled in the art upon becoming familiar with said underlying concept. All such embodiments, variations and modifications as incorporate the spirit of the invention and depend upon its underlying concept are consequently to be considered as within the scope of the claims appended herebelow, unless the claims by their language expressly state otherwise.

I claim:

1. Apparatus for dispensing liquids, which comprises:
- a cylinder having an outlet orifice therein,
- a plunger mounted for slidable movement in the cylinder,
- a piston rod affixed to and depending from the plunger,
- first means coupled to the piston rod for driving the plunger toward the orifice, and
- second means coupled to the piston rod for driving the plunger toward and away from the orifice,
- the operation of the first and second drive means on the plunger being cumulative.

2. Apparatus according to claim **1**, wherein the piston rod is provided with a threaded portion and the first driving means is coupled to the piston rod by an axially fixed, internally threaded gear threadedly mounted on the threaded portion of the piston rod.

3. Apparatus according to claim **2**, wherein the piston rod is provided with an axially extending groove and the second driving means is coupled to the piston rod by an axially fixed gear mounted on the piston rod and having an internal key thereon that is received in the piston rod groove.

4. Apparatus for dispensing glue for use with a cigarette maker, which comprises:

a cylinder having an outlet orifice therein,

a plunger mounted for slidable movement in the cylinder and operable to dispense glue out said orifice,

means coupling the plunger and the cigarette maker for driving said plunger toward said orifice at a rate commensurate with the demand for glue of the cigarette maker, and

means coupled to the plunger independent of the cigarette maker for driving said plunger toward and away from said orifice.

5. Apparatus according to claim **4**, further comprising:

means responsive to the attaining of a predetermined glue pressure in the cylinder for de-activating the independent plunger driving means.

6. Apparatus according to claim **4**, further comprising:

means responsive to the exhaustion of glue in the cylinder for de-activating the plunger driving means.

7. Apparatus according to claim **4**, further comprising:

a piston rod mounted to said plunger, and

means coupling both of said plunger driving means to said piston rod for cumulative driving of said plunger.

8. A method of dispensing glue for use in a cigarette making operation, comprising the steps of:

providing a cylinder with a plunger and an outlet,

driving the plunger toward the outlet with at least a first drive means until a predetermined glue pressure has been attained,

de-activating the first drive means upon the attaining of the predetermined glue pressure,

driving the plunger toward the orifice with a second drive means that is coupled to the cigarette maker,

sensing the exhaustion of the glue in the cylinder, and

de-activating the drive means upon the sensing of the exhaustion of glue in the cylinder.

9. A method according to claim **8**, comprising the further step of:

driving the plunger away from the orifice and out of the cylinder after the exhaustion of the glue therein.

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