Dec. 26, 1933. M. BERGER 1,941,429

APPARATUS FOR SUPPLYING A MACHINE WITH MATERIAL

Filed Dec. 16, 1931 3 Sheets-Sheet 1

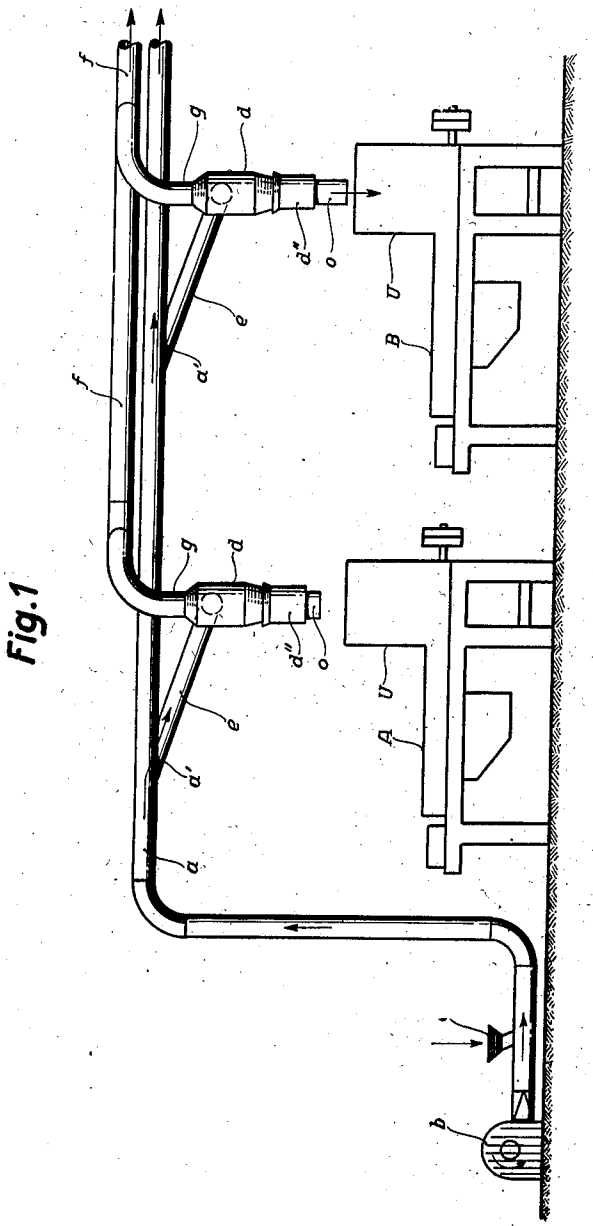


Fig.1

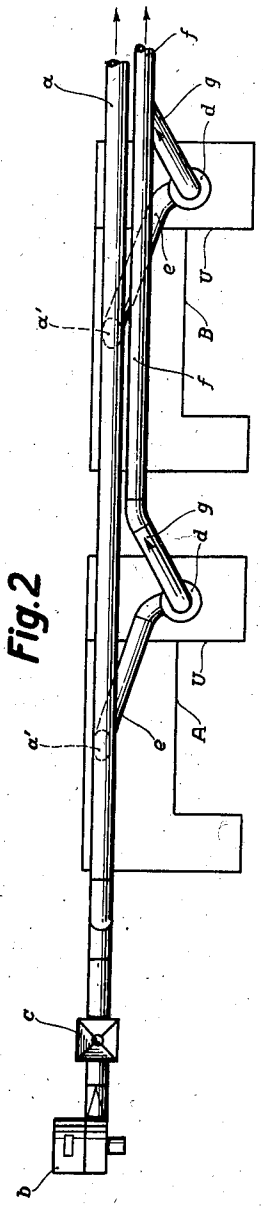


Fig.2

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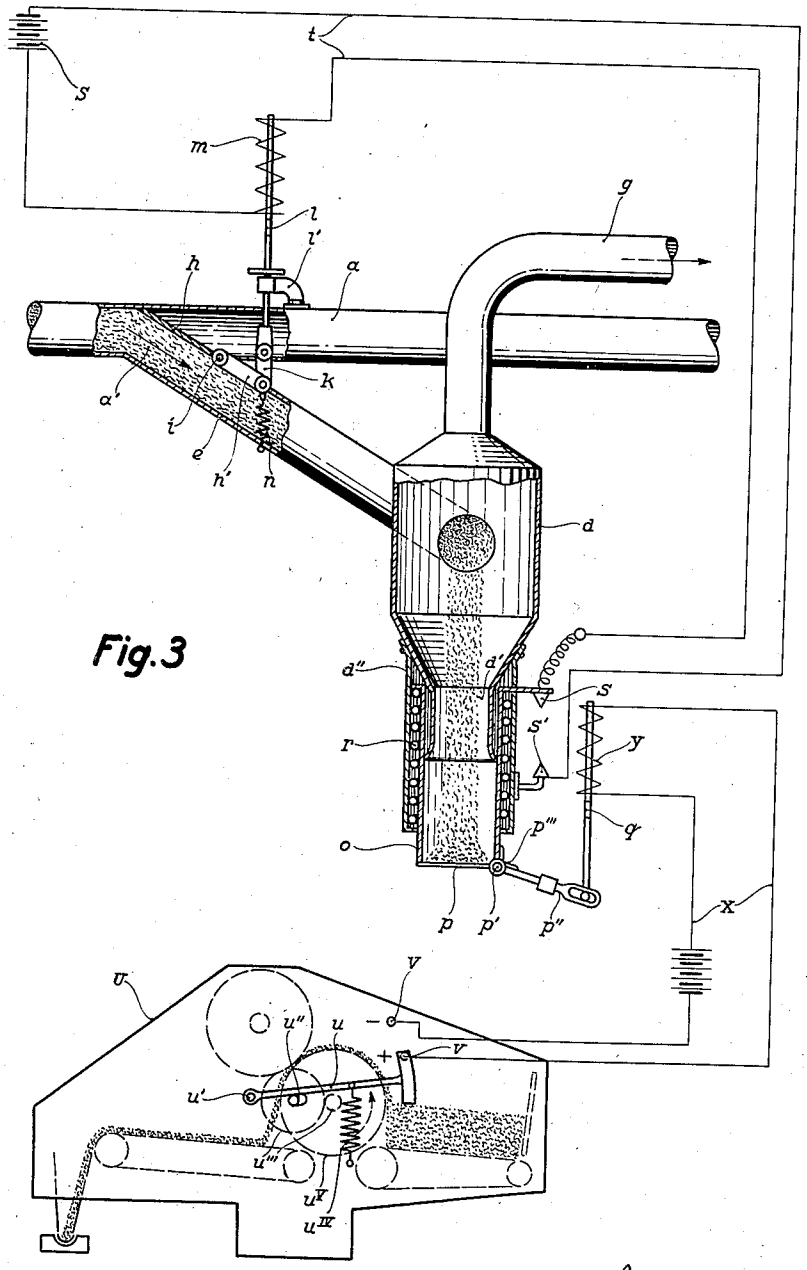


Fig.3

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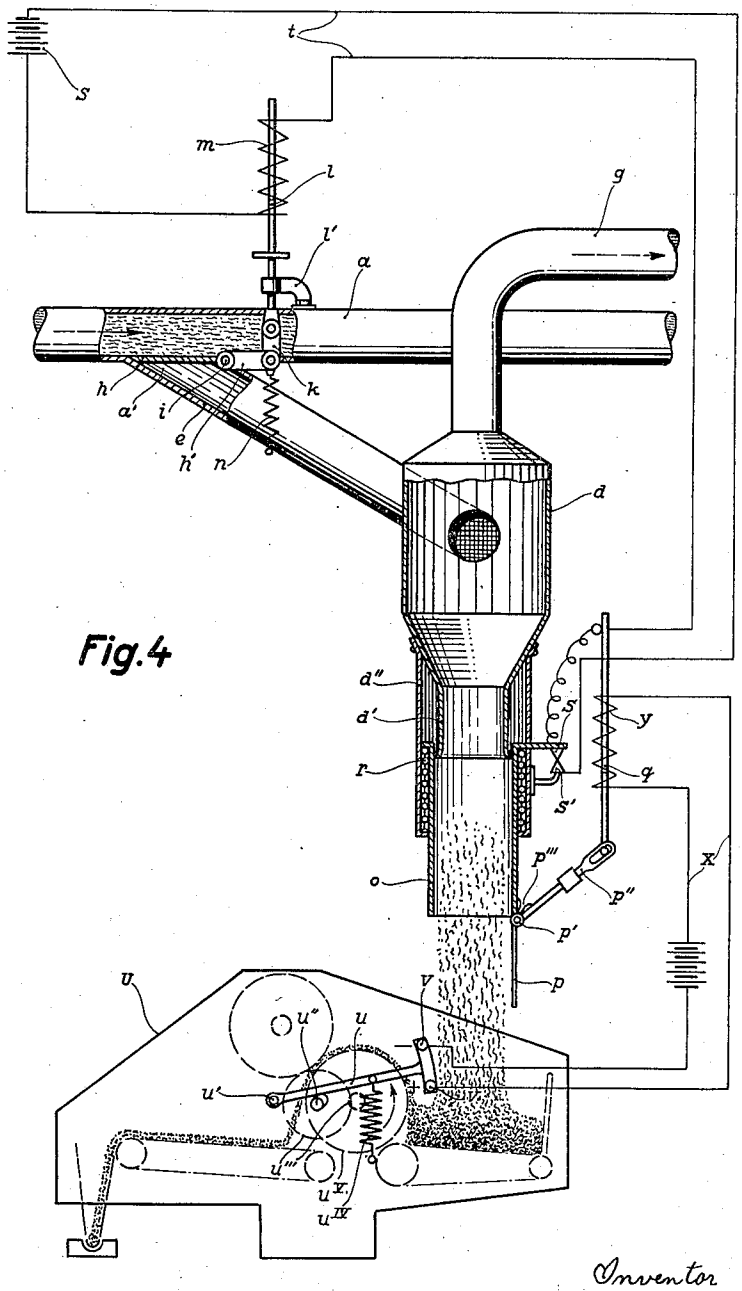


Fig.4

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APPARATUS FOR SUPPLYING A MACHINE WITH MATERIAL

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10 Claims. (Cl. 302—28)

The pneumatic supply of several cigarette machines with tobacco is known, the cut tobacco being conveyed to the tobacco separator through pneumatic conduits.

This invention deals with the effecting of the supply in an automatic manner so that after a predetermined quantity of tobacco has been used in the spreader, a corresponding replenishing supply of tobacco may be brought to the said separator.

It has been known for some time that the prick rollers of a tobacco spreader are most effective with a certain optimum height of tobacco pile in the spreader. This height of the pile depends on different circumstances, such as the shapes of the cigarette to be made, their lengths, normal weight, and also upon the number of revolutions of said roller. Attempts have been made to continuously maintain the said optimum height of tobacco pile in the spreader and to this end, markings have been provided in the spreader to enable the attendants to maintain the pile within the limits of these markings. Experience has shown, however, that this is not practical because only small quantities of tobacco are necessary to be added at any one time to maintain the desired optimum height of the said pile and, therefore, said attendants always wait until the pile has sunk considerably below the optimum height before replenishing the pile. Then in replenishing they fill the spreader much above the optimum height in order to save time and labor.

Accordingly, the present invention consists in the provision of collectors, one between each spreader and a common feeder, which collectors are designed to receive said tobacco quantities and from which quantities, whenever required, by proper control means, the supply in the spreader is replenished.

In this manner, it is possible to replenish the tobacco in corresponding amounts to the consumption and the quantity necessary to maintain the optimum height is supplied when necessary. In other words, the height of the tobacco pile in the spreader is always between predetermined limits which, of course, must lie within range of the most favorable operation.

The arrangement is advantageously such, that tobacco from the main feed line will pass from a dust separator in a branch of that line into a collector, which after receiving a certain tobacco quantity, automatically moves into a new position at which, for instance, by closing an electric-circuit to an electro-magnet or the like, the latter is so actuated as to cause the closing of a valve which interrupts further supply of tobacco to the corresponding dust separator.

The arrangement may also be such that the collector be in form of a pipe displaceably mounted on the mouth of the tobacco dust separator and closed at the bottom by a valve, the pipe being under the action of a spring or the equivalent, whereby after the pipe has received a certain quantity of tobacco it will move downwardly into a position in which electric contacts will close resulting in the closing of the electric circuit of said electromagnet hereinbefore mentioned.

Advantageously, the collector has an outlet valve which in turn is controlled by a solenoid whose electric circuit is closed and opened by a contact lever automatically actuated from the tobacco spreader.

My invention may be more fully understood by reference to the accompanying drawings which form part of this specification and in which similar reference characters denote corresponding parts.

In the drawings:—

Fig. 1 is a diagrammatic side elevation of the device;

Fig. 2 is a diagrammatic top plan view; and

Figs. 3 and 4 are enlarged sectional detailed views of two different positions of operation of my device.

Referring to the drawings A, B denote respectively two cigarette machines arranged endwise relative to one another, and which are supplied with tobacco by a pneumatic feeding conduit *a*. The air pressure for feeding the tobacco is produced by a blower *b*. The tobacco may be delivered to the conduit *a* at the inlet *c*. Arranged over each cigarette machine is a dust separator *d* of any well known construction, whose upper part is cylindrical and lower part funnel shaped. Each dust separator is connected to the main conduit *a* by a branch conduit *e*. The air used in feeding the tobacco in conduit *a* saturated with dust is conducted in known manner from the dust separator into a common discharge pipe *f* through a branch pipe *g*. At the points *a'* where the branch pipes *e* join the main pipe *a* are trap or flap valves *h* pivoted at *i*. Each valve is provided with a lever h^1 which by a rod *k* is operatively connected to the armature *l* of a solenoid *m*. Each armature *l* is supported in a bearing l^1 and is actuated by a spring *n* (Fig. 3), or an equivalent connected to the lever h^1 so that when there is no current passing through the solenoid the armature *l* is pulled downwardly into the position

shown in Fig. 3 in which the valve h directs material into the branch pipe a'.

Slidably mounted on the cylindrical outlet portion of the dust separator d in a telescopic manner is a pipe o which is guided by a sleeve or pipe d'' fixed to the dust separator d. The lower opening of the pipe o is closed by a flap valve p pivoted at p' to the pipe o having a lever p'' operatively connected to the armature q of a solenoid y. A spring p'' or its equivalent tends to keep flap p in the closed position shown in Fig. 3. A spring r or its equivalent tends to hold pipe o in the upper position shown in Fig. 3.

When a certain quantity of tobacco has accumulated in the pipe o, then the latter on overbalancing the force of spring r will sink into the position shown in Fig. 4 in which the contact piece s fixed to the pipe o will be brought into contact with the contact piece s' fixed to the guide or pipe d''. These contact pieces s, s' are connected to the electric wires t leading from an electric source S through the solenoid m. Thus as soon as the contact pieces s, s' are closed the solenoid m is energized and the flap h is caused to swing into closing position (Fig. 4), so that the further supply of tobacco to the corresponding dust separator d is interrupted.

In the tobacco spreader U of each cigarette machine A, B, there is a contact lever u pivoted at u' and controlled by a cam u'', which through a set of transmission gears u''' is rotated from the receiving prick roller shaft. After a certain number of rotations of the prick roller shaft the cam u'' is brought into the position shown in Fig. 4 at which time the contact points v are bridged electrically through the contact piece of the lever u, whereby the electric circuit is closed and the solenoid y energized. As a result thereof the armature q of said solenoid is pulled upwardly into the position shown in Fig. 4. This causes the flap valve p to swing into the opening position so that the tobacco contained in the pipe o is allowed to pass into the tobacco spreader U.

When this is effected the pipe o under the action of spring r returns into its initial position shown in Fig. 3 thereby the circuit through the wires t is broken and consequently the flap valve h returns into its opening position while the flap valve p again closes the bottom of pipe o so that a quantity of tobacco again accumulates in the pipe o.

A spring u'''' or the equivalent tends to keep the lever u in the position of Fig. 3.

It is to be noted that the contact lever u is so actuated by the cam u'' that the quantity of tobacco removed from the spreader U by the prick rollers corresponds to that accumulated in the pipe o.

In operation my device works as follows:

Assume that collector d associated with machine A has sufficient tobacco in it to weigh pipe o of said collector down into the position shown in Fig. 4. Assume further that pipe o of collector d associated with machine B is in the position of Fig. 3, i. e. just after it has discharged its supply of tobacco to the latter machine.

In such positions, contacts s, s' of machine A are closed resulting in energization of solenoid m thereof and consequently flap valve h associated with machine A is in the position of Fig. 4 closing off branch line e thereof so that no tobacco from said conduit a is diverted into said branch line e of machine A.

At the same time, since contacts s and s' associated with machine B are separated as shown in Fig. 3 solenoid m of the latter machine is deenergized and therefore flap valve h of the said machine is rotated into conduit a and diverts the tobacco and air stream into channel e associated with machine B from whence the diverted stream enters collector d of said machine. The tobacco enters pipe o and the air and dust, through branch pipe g, are led out to common discharge pipe f. When the filling of pipe o of machine B is complete, the said pipe moves down to the position of Fig. 4 whereupon contacts s and s' thereof close and the flap valve h thereof assumes the position of Fig. 4.

In the filling interim of pipe o of machine B, the cam u'' of machine A has rotated to the position of Fig. 4 and caused arm u to close the electric circuit through solenoid y of machine A resulting in the opening of flap valve p operated thereby, with the result that the contents of pipe o of said machine have been emptied into the spreader A. Said pipe o then assumes the position of Fig. 3 resulting in flap h of said machine assuming the position of Fig. 3 so that the tobacco air stream is now diverted from main conduit a to pipe o of machine A. Of course, cam u'' of machine A moves to cause arm u to open the circuit through solenoid y and consequently close flap p before the tobacco enters pipe o.

Likewise during the filling of pipe o of machine A, the emptying of pipe o of machine B is effected in the same manner as that of machine A.

The timing between cams u'' of machine A and u'' of machine B, of course, should be such as to effect the above described successive action of levers u.

My invention is not limited to two machines, but may be equally applied to larger numbers of machines by proper arrangement of the cams u'' on each of the successive machines.

My invention may be modified in many ways without departing from the spirit thereof and I do not wish to be limited to the details shown and described.

What I claim is:—

1. Apparatus for supplying the tobacco spreaders of a plurality of cigarette machines with tobacco by means of a common pneumatic feed conduit formed with branch conduits leading therefrom, including collecting means for said tobacco connected with each branch conduit in advance of each machine and having a movable outlet to the spreader of the respective machine, a movable closure means for each outlet, means at the junction of each branch conduit with said common conduit for deflecting said material from the said common conduit to the respective branch conduit, electrical means between said movable outlet and said deflecting means to interrupt the feed of the tobacco into the branch conduit of the respective collector when said movable outlet has been lowered by the weight of the tobacco collected therein and electrical means controlled from the spreader and actuating said closure means so that at a predetermined instant which coincides with that when the tobacco pile in said spreader reaches a certain level the closure of the respective collector will be opened to permit the said tobacco to drop to replenish said pile.

2. Apparatus for supplying the tobacco spreaders of a plurality of cigarette machines with tobacco by means of a common pneumatic feed conduit formed with branch conduits leading therefrom including tobacco collecting means connected with each branch conduit in advance of each cigarette machine and having a gravity ac-

tuated movable outlet to its respective machine, movable closure means for each outlet, means at the junction of each branch conduit and said common conduit for deflecting tobacco from the common conduit to the respective branch conduit, spreader controlled electrical means to actuate said closure means, and electrical means controlled by said movable outlet for actuating the respective deflecting means.

3. Apparatus for supplying tobacco spreaders of cigarette machines with tobacco by means of a common pneumatic feed conduit formed with branch conduits leading therefrom including a dust separator connected with each branch conduit and having a tobacco outlet, a movable collector at the tobacco outlet of each separator, in advance of each machine, said collector having a tobacco outlet leading to its respective machine, movable closure means for each collector outlet, means at the junction of each branch conduit and said common conduit for deflecting tobacco from the common conduit to the respective branch conduit, spreader actuated electrical means to actuate said closure means and electrical means for actuating the respective deflecting means, said electrical means including make and break mechanism operated by said movable collector.

4. In an apparatus for supplying the tobacco spreader of a cigarette machine with tobacco, a movable tobacco collector, a feed conduit leading into said collector, a movable closure on said collector, means for controlling the feed of tobacco from said conduit into said collector, means controlled from said movable collector for actuating said feed controlling means and means actuated by said spreader for controlling said closure means of said collector.

5. An apparatus as set forth in claim 4, in which the movable portion of said collector is gravity actuated and spring controlled.

6. An apparatus as set forth in claim 4, in which the means actuated by said spreader includes a cam.

7. In an apparatus for supplying the tobacco spreader of a cigarette machine with tobacco, a feed conduit, a gravity actuated movable collector connected thereto, a movable electrically controlled closure on said collector, a spring actuated electrically controlled trap for controlling the feed, a make and break means actuated by said movable collector to control the circuit controlling said trap, so that when said collector is lowered by the weight of the tobacco accumulated therein the trap thereof will close, and a spreader actuated make and break means to control the electric circuit for said closure means so that at a predetermined instant which coincides with that when the height of the tobacco pile in said spreader reaches a certain level said closure will open and the tobacco accumulated in said collector will drop to replenish said pile.

8. An apparatus as set forth in claim 7, in which the electric means controlling said trap comprises a solenoid, the armature of which is operatively connected to said deflector.

9. An apparatus as set forth in claim 7, in which the make and break means of the electric circuit controlling said trap comprises a stationary contact and a contact on said movable collector.

10. An apparatus as set forth in claim 7, in which the spreader actuated make and break means comprises two contact points, a bridging member therefor and a cam driven from said spreader and actuating said bridging member.

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