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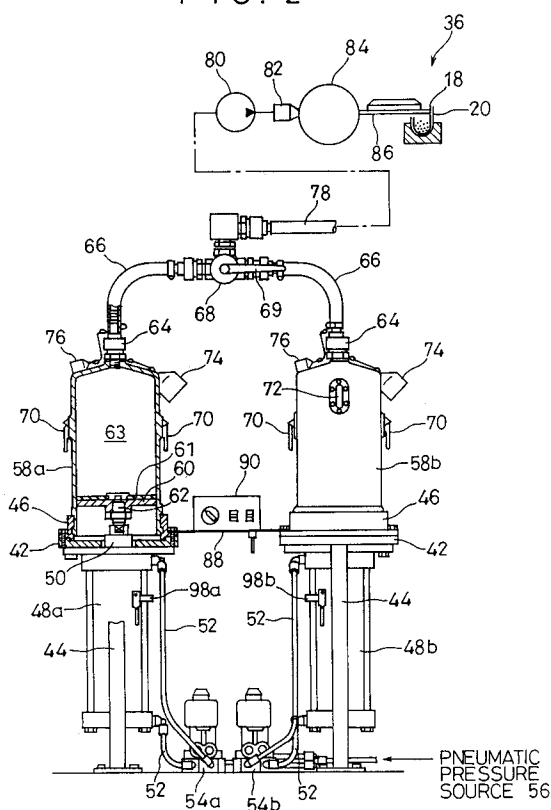
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**D-80801 München (DE)**(54) **A paste feeding apparatus for a cigarette manufacturing machine.**

(57) A paste feeding apparatus according to the present invention comprises a pair of paste pots (58a,58b), a pair of supply cylinders (48a,48b) for moving movable walls (60) in the paste pots (58a,58b) to pressurize paste in the pots (58a,58b), a selector valve (68) for connecting one of connecting hoses (66), which extend individually from the pots (58a,58b), to a pasting section (36) of a cigarette manufacturing machine by means of a paste feeding hose (78), the selector valve (68) having a manual lever (69) for switching, and a pair of solenoid valves (54a,54b) for controlling the operation of the supply cylinders (48a,48b).

**FIG. 2****EP 0 594 184 A1**

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention relates to a paste feeding apparatus for feeding paste to a pasting section of a manufacturing machine for manufacturing cigarette rods.

### Description of the Related Art

In a cigarette manufacturing machine, cut tobacco is wrapped in a wrapping paper to continuously form a cigarette rod, and the cigarette rod is then cut into individual cigarettes with a predetermined length.

In order to obtain the cigarette rod in the manufacturing machine, it is necessary to bond the opposite side edges of the wrapping paper to each other. In general, there are two systems for this bonding work.

According to the one system, polyvinyl acetate (PVAC) is used as the material of the paste, which is applied to one side edge of the wrapping paper. Since the viscosity of PVAC is relatively low, a pasting section of the manufacturing machine is provided with a nozzle such that the paste material can be fed from the nozzle to be applied directly to the paper edge.

According to the other system, carboxymethyl cellulose (CMC) is used as the paste material. Since CMC is more viscous than PVAC, no nozzle can be used for this material. Accordingly, the pasting section is provided with a pasting wheel in place of the nozzle, and the paste of CMC from the pasting wheel is applied to the one side edge of the wrapping paper.

Unlike PVAC or other chemical paste materials, the CMC paste never spoils the flavor of the smoke from cigarettes. Thus, CMC is a suitable paste material to be used in the manufacture of cigarettes.

In the cigarette manufacturing machine, the CMC paste is supplied from a paste pot to the pasting wheel through a paste feeding path. Since the capacity of the paste pot is limited, the working paste pot must be replaced with a new filled paste pot at regular intervals or when the residual quantity of the paste therein becomes insufficient.

Replacing the paste pot, however, requires an interruption of the operation of the manufacturing machine. Thus, the operating efficiency of the machine, that is, productivity for cigarettes; is lowered.

The operating speed of modern cigarette manufacturing machines has been becoming higher and higher, entailing a greater paste consumption, and therefore, a higher frequency of replacement of the paste pot.

The frequency of replacement of the paste pot can be lowered by increasing the capacity of the pot. If this is done, however, the paste pot is increased in size and weight, so that more labor is inevitably required for the replenishment, replacement, and transportation of the paste pot.

## SUMMARY OF THE INVENTION

The object of the present invention is to provide a paste feeding apparatus in which paste can be continuously fed to a pasting section of a manufacturing machine, so that the operating efficiency of the manufacturing machine is improved, and paste pots can be handled with ease.

The above object is achieved by a paste feeding apparatus according to the present invention, which comprises a pair of paste pots stored with a paste, a paste feeding path capable of connecting the paste pots and a pasting section of a cigarette manufacturing machine, delivery means for delivering the paste in one of the paste pots as a working pot to the pasting section through the paste feeding path, detecting means for outputting a detection signal when the residual quantity of the paste in the working pot is reduced below a predetermined value, and alarm means for giving an alarm in response to the detection signal from the detecting means.

According to the paste feeding apparatus described above, when the residual quantity of the paste in the working pot is reduced below the predetermined value, the detecting means detects this, and outputs the detection signal. When the alarm means gives the alarm in response to this detection signal, an operator can realize the time for the replacement of the working pot.

The paste feeding apparatus of the present invention is furnished with the pair of paste pots in advance. If the working pot is emptied, therefore, the paste can be continuously supplied to the pasting section of the cigarette manufacturing machine by only replacing the working pot with the other paste pot which is on standby. Thus, the paste pot can be changed without interrupting the operation of the cigarette manufacturing machine, so that the productivity for cigarettes can be improved.

While the paste is being supplied from the other paste pot, the empty paste pot is replaced with a new filled paste pot.

According to the paste feeding apparatus of the present invention, as described above, the paste can be supplied alternately from the paired paste pots, so that each paste pot may be of a relatively small capacity. Thus, labor for the replacement and transportation of the paste pots can be reduced considerably.

Preferably, each paste pot includes a hollow container, having a closed end and an open end, and a seat member movably disposed in the container and defining a paste chamber in the container.

In this case, the paste in the paste pot is pressurized by the seat member, so that it can be supplied to the pasting section through the paste feeding path.

In order to pressurize the paste in the pot, the delivery means includes a pair of movable walls independent of the seat members and movably fitted into the paste pots through the open ends thereof, and a pair of supply cylinders having piston rods connected individually to the movable walls, the movable walls causing the corresponding seat members to pressurize the paste in the paste chambers when the respective piston rods of the supply cylinders are extended. Preferably, each supply cylinder is made of an air cylinder.

Preferably, moreover, each seat member moves together with the movable wall corresponding thereto when the piston rod of the corresponding supply cylinder is extended, and is separated from the movable wall when the piston rod of the supply cylinder is contracted. In this case, the movable wall and the seat member are not connected, so that the used or empty pot can be easily separated from the movable wall, that is, the paste pot can be changed with ease.

In the case where the paste feeding path includes branch lines, each connected to the paste chamber of the corresponding paste pot, and a junction line connected to these branch lines on one side and to the pasting section on the other side, the delivery means can use a three-way valve having a manual lever, as first valve means for alternatively connecting one of the branch lines and the junction line.

The extension and contraction of the respective piston rods of the supply cylinders can be controlled by switching solenoid valves as second valve means to control the supply of air to the supply cylinders. Each solenoid valve can be switched by means of a changeover switch.

If an alarm is given from the alarm means, in this case, the operator switches the three-way valve by means of the manual lever, and at the same time, switches the solenoid valves to extend the supply cylinder associated with the other paste pot which is on standby. Thereupon, the paste in the other paste pot is pressurized by the supply cylinder, and is fed to the pasting section via the three-way valve.

When the operator switches the solenoid valves to contract the supply cylinder associated with the empty paste pot, thereafter, the movable wall on the supply cylinder side and the paste pot

are automatically separated from each other, so that the empty paste pot can be replaced with a new filled one.

The detecting means includes sensors for detecting the respective positions of pistons in the supply cylinders in order to determine whether or not the residual quantity of the paste in the paste pot is reduced below a predetermined amount.

If the three-way valve can be switched by means of a motor, moreover, the paste feeding apparatus further comprises a control circuit for controlling the switching operation for a motor-operated three-way valve and a pair of solenoid valves. This control circuit can automatically switches the three-way valve and the solenoid valves on receiving a detection signal from a sensor.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given herein below and the accompanying drawings which are given by way of illustration only, and thus, are not limitative of the present invention, and wherein:

Fig. 1 is a front view showing a cigarette manufacturing machine;

Fig. 2 is a cutaway view showing a paste feeding apparatus incorporated in the manufacturing machine;

Fig. 3 is a diagram showing a control circuit of the feeding apparatus of Fig. 2; and

Fig. 4 is a diagram showing an alternative control circuit.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to a cigarette manufacturing machine shown in Fig. 1, cut tobacco is attracted to a conveyor unit 12 through a chimney 10, and is deposited in a layer on a suction belt (not shown) of the conveyor unit 12. Thereafter, the stratified cut tobacco is fed from the suction belt onto a wrapping paper 18. The paper 18 passes together with a garniture tape 20 through a wrapping section of the manufacturing machine. In the process of this passage, the cut tobacco is wrapped in the wrapping paper, whereupon the opposite side edges of the paper 18 are joined and bonded together. Thus, cigarette rod is continuously delivered together with the garniture tape 20 from the wrapping section.

The garniture tape 20 is run in one direction as a driving roller 26 rotates. The wrapping paper 18 is supplied from a roll (not shown) to the wrapping section through a printing section 40.

In Fig. 1, a pasting section 36 for the wrapping paper 18 is disposed on the upstream side of the wrapping section, and a pair of dryers 28 and 30 are arranged in succession on the downstream side of the pasting section 36.

The cigarette rod delivered from the wrapping section then passes through a detecting section 32 and a cutting section 34, whereupon it is cut into pieces or individual cigarettes with a predetermined length. The detecting section 32 detects the diameter of the cigarette rod, for example.

The pasting section 36 is supplied with paste from a paste feeding apparatus, which is shown in Fig. 2. The following is a description of the paste feeding apparatus.

The paste feeding apparatus comprises a pair of pot rests 42. Each rest 42 is supported in a horizontal position by legs 44.

A ring-shaped pot holder 46 is fixed on the upper surface of each pot rest 42. Supply cylinders 48a and 48b, each made of a double-acting air cylinder, are suspended individually from the respective lower surfaces of the pot rests 42. Each cylinder 48 includes a piston rod 50, which extends upward through each corresponding pot rest 42 into the pot holder 46.

A pair of air hoses 52 extend from each supply cylinder 48, and are connected to a pneumatic source 56 through a solenoid valve 54a or 54b. Each solenoid valve 54 is a four-port three-position directional control valve.

Paste pots 58a and 58b are removably mounted on their corresponding pot rests 42. Each pot 58 is in the form of a hollow cylinder, whose lower end is inserted in the pot holder 46 of its corresponding pot 42 from above.

Since the paste pots 58a and 58b have the same construction, only the one pot 58 will be described below.

A rubber seat 61 is movably fitted in the paste pot 58, and defines a paste chamber 63 in the pot.

Also, a piston-shaped movable wall 60 is fitted in the paste pot 58 so as to be situated outside the rubber seat 61. A projection is formed in the center of the outer surface of the movable wall 60, and a connector rod 62 is screwed in the projection. The connector rods 62 connects the distal end of the piston rod 50 of the supply cylinder 48 and the movable wall 60. Thus, when the piston rod 50 of the cylinder 48 is extended upward, the rubber seat 61, along with the movable wall 60, ascends in the paste pot 58.

The paste pot 58 is filled with paste which is made of carboxymethyl cellulose (CMC). A discharge connector 64 protrudes from the top of the paste pot 58, and the paste in the pot can be discharged through the connector 64.

The discharge connector 64 is connected to a selector valve 68 by means of a connecting hose 66. The valve 68 is formed of a manually-operated three-way valve. Thus, the connecting hose 66 is connected to one inlet port of the selector valve 68. The other inlet port of the valve 68 is connected to the other paste pot by means of another connecting hose.

Arranged on the outer wall surface of the paste pot 58 are a pair of handles 70 and a viewing window 72. Thus, the paste in the pot 58 can be visually checked for residual quantity through the window 72.

The discharge connector 64 and the connecting hose 66 are provided with caps 74 and 76, respectively. In the state shown in Fig. 2, the caps 74 and 76 are disengaged from the connector 64 and the hose 66, respectively.

The selector valve 68 has one outlet port, which is connected with one end of a paste supply hose 78. The hose 78 extends toward the pasting section 36, and the other end thereof is connected to a gear pump 80. The pump 80 is located in the vicinity of the pasting section 36. The gear pump 80, which is driven by means of a servomotor (not shown), has a discharge nozzle 82 at its discharge port.

The discharge nozzle 82 is in contact with the peripheral surface of an intermediate wheel 84, which rotates within a vertical plane. Further, a pasting wheel 86, which rotates within a horizontal plane, is in rolling contact with the intermediate wheel 84. The wheels 84 and 86 are in plane contact with each other. More specifically, a circumferential groove is formed on the outer peripheral surface of the intermediate wheel 84, and its profile has the shape of a circular arcuate surface which mates with the outer peripheral surface of the pasting wheel 86. The wheels 84 and 86 are rotated at an optimum peripheral speed for the running speed of the wrapping paper 18 passing through the wrapping section.

The pasting wheel 86 is located so that part of its outer peripheral edge crosses the region right over the wrapping section. As the wrapping paper 18 passes through the wrapping section, as shown in Fig. 2, it is first bent into the shape of a U, so that the outer peripheral surface of the pasting wheel 86 can come internally into contact with one side edge of the paper 18.

A supporting plate 88 is stretched between the respective pot rests 42 of the paste pots 58a and 58b, and a control box 90 is mounted on the plate 88. As shown in Fig. 3, the control box 90 is provided with a selector switch 92 for changing the paste pot and manual switches 94a and 94b for the supply cylinders 48a and 48b.

The control box 90 is connected electrically to a control circuit 96 of the relay sequence type. Switching signals from the individual switches on the control box 90 are supplied to the control circuit 96.

Also, the control circuit 96 is supplied with detection signals from a pair of residual quantity sensors, as well as an operation signal for the cigarette manufacturing machine. Each of these sensors can output a detection signal or empty signal when the residual quantity of the paste in its corresponding paste pot 58 is reduced below a predetermined level. In this embodiment, the residual quantity sensors include reed switches 98a and 98b which are mounted on the outer surfaces of the supply cylinders 48a and 48b, respectively. The switches 98 detect the respective positions of pistons 49 of the supply cylinders 48. More specifically, the piston 49 of each supply cylinder 48, which is made of a magnetic material, turns on its corresponding reed switch 98 when it reaches a position near the switch 98.

Limit switches may be used in place of the reed switches 98 as the residual quantity sensors. In this case, each limit switch can detect the stroke of the piston rod 50 of its corresponding supply cylinder 48, and detects the residual quantity of the paste in its corresponding paste pot 58 from the detected stroke.

The solenoid valves 54a and 54b are connected to the control circuit 96. The circuit 96 delivers a switching signal to each of the valves 54, and the empty signal for each paste pot to the manufacturing machine.

The following is a description of the operation of the paste feeding apparatus.

Here let it be supposed that the paste pots 58a and 58b are mounted on their corresponding pot rests 42, and are filled up with the paste. In this state, the manual switches 94a and 94b are shifted to UP and OFF, respectively. Further, the selector valve 68 is in a first shift position in which the paste pot 58a and the gear pump 80 are connected by means of its operating lever 69 (see Fig. 2), and the paste pot 58b and the pump 80 are disconnected.

In this state, the operation of the cigarette manufacturing machine is started. When an operator shifts the selector switch 92 on the control box 90 from OFF to A, a position in which the one paste pot 58a is selected, both the operation signal for the manufacturing machine and the switching signal from the selector switch 92 are applied to the input of the control circuit 96.

On receiving the operation signal and the switching signal, the control circuit 96 drives the servomotor or the gear pump 80. At the same time, the circuit 96 switches the solenoid valve 54a on

the side of the paste pot 58a selected in response to the switching signal, thereby supplying a pneumatic pressure to the supply cylinder 48a to extend the piston rod 50 of the cylinder 48a. Accordingly, the movable wall 60 of the paste pot 58a receives a lifting force from the supply cylinder 48a, and subjects the paste in the paste pot 58a to a given pressure. At this time, the solenoid valve 54b on the side of the other paste pot 58b is kept in a neutral position.

When the paste in the paste pot 58a is pressurized in this manner, it is satisfactorily forced out of the pot 58a, and is supplied to a suction port of the gear pump 80 via the connecting hose 66, selector valve 68, and paste supply hose 78.

Thus supplied with the paste, the gear pump 80 discharges a given quantity of paste through the discharge nozzle 82. The discharged paste is first received on the outer peripheral surface of the intermediate wheel 84, and is then transferred from the wheel 84 to the pasting wheel 86. Thus, the pasting wheel 86 can receive the paste in a smoothed layer with a uniform thickness.

As mentioned before, the pasting wheel 86 can apply the paste to one side edge of the U-shaped wrapping paper 18 traveling over the wrapping section by being brought into contact with it. As the wrapping paper 18 further travels, thereafter, the both side edges of the U-shaped paper 18 are joined together by means of the paste. Thus, the cut tobacco is entirely wrapped in the paper 18, whereupon a cigarette rod is completed.

As the paste in the paste pot 58a is consumed during the operation of the manufacturing machine, the movable wall 60 of the pot 58a, that is, the piston of the supply cylinder 48a, ascends.

When the residual quantity of the paste in the paste pot 58a is reduced below the predetermined value, the piston of the supply cylinder 48a ascends to the level of the reed switch 98a. The switch 98a detects the ascent of the piston, and supplies a detection signal to the control circuit 96. At this time, the control circuit 96 delivers the empty signal to a display unit or CRT 100 (see Fig. 1) of the manufacturing machine, whereupon the CRT 100 displays an alarm based on the empty signal.

On visually recognizing the alarm displayed on the CRT 100, the operator of the manufacturing machine operates the operating lever 69 of the selector valve 68, thereby disconnecting the paste pot 58a and the gear pump 80 and connecting the paste pot 58b and the pump 80. Further, the operator shifts the manual switch 94b on the control box 90 from OFF to UP, and also shifts the selector switch 92 from A to B. As this is done, the control circuit 96 switches the solenoid valve 54b having so far been in the neutral position, and supplies the

pneumatic pressure to the other supply cylinder 48b, thereby raising the piston rod 50 of the cylinder 48b.

The supply cylinder 48b, like the supply cylinder 48a mentioned before, starts to pressurize the paste in the other paste pot 58b, whereupon the working paste pot is changed from the pot 58a to the pot 58b. Thus, the paste in the other paste pot 58b can be supplied to the manufacturing machine or the gear pump 80 without interrupting the operation of the machine.

When the operator shifts the manual switch 94a on the control box 90 to DOWN while the paste is being supplied from the paste pot 58b, the control circuit 96 can switch the solenoid valve 54a to contract the piston rod 50 of the supply cylinder 48a to a predetermined position.

Thereupon, the movable wall 60, which is connected to the piston rod 50, is lowered together with the rod 50 to its lowermost level, although the rubber seat 61 is separated from the wall 60, remaining in its up position.

Thereafter, the operator disengages the connecting hose 66 from the discharge connector 64 of the paste pot 58a, attaches the caps 74 and 76 to the open ends of the connector 64 and the hose 66, respectively, and removes the empty paste pot 58a from the pot holder 46 on its corresponding pot rest 42. Then, the operator mounts a new filled paste pot 58 on the pot holder 46, and removes the cap 74 from the discharge connector 64 of the new pot 58.

Further, the operator shifts the manual switch 94a to UP. As a result, the piston rod 50 of the supply cylinder 48a ascends to pressurize the paste in the new paste pot 58, thereby removing bubbles from the new pot 58.

Thereafter, the operator connects the uncapped connecting hose 66 to the discharge connector 64 of the new paste pot 58, and restores the manual switch 94a to OFF, whereupon the replacement of the paste pot is completed.

The empty paste pot 58a removed from the pot rest 42 is fill again with the paste, and then stored in place.

When the reed switch 98b on the side of the paste pot 58b detects a critical reduction of the residual quantity of the paste in the pot 58b, the alarm is displayed on the CRT 100 of the manufacturing machine in the same manner as aforesaid. This time, the operator replaces the paste pot 58b in like manner.

The present invention is not limited to the embodiment described above, and various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention. According to the above-described embodiment, for example, when the

CRT 100 displays the alarm indicative of the insufficiency of the residual quantity of the paste in one of the paste pots, the operator is expected to operate the switches on the control box 90 and the operating lever 69 of the selector valve 68 in order to change the paste pot. However, this series of operations can be automated.

Referring to Fig. 4, there is shown a motor-operated selector valve 102 which used in place of the selector valve 68 shown in Fig. 3. A motor (not shown) for the valve 102 is connected electrically to a control circuit 104. The circuit 104 is a programmable circuit which includes a microcomputer.

Arranged on the side of each paste pot 58, besides the reed switch 98, are upper- and lower-limit reed switches 106 and 108, situated above and below the switch 98, and a proximity switch 110 on the pot holder 46 on the pot rest 42.

The reed switches 106 and 108 detect the upper and lower limit positions, respectively, of the piston of their corresponding supply cylinder 48, while the proximity switch 110 determines whether or not the paste pot 58 is mounted on the pot holder 46. These switches are connected to the control circuit 104, so that their detection signals can be supplied to the circuit 104.

Also in the embodiment shown in Fig. 4, moreover, the control box is connected to the control circuit 104. However, one of shift positions for the selector switch 90 and the manual switches 94 is AUTO.

Let it first be supposed that every switch on the control box 90 is shifted to AUTO, and the paste is being supplied from the paste pot 58a.

When the reed switch 98a on the side of the paste pot 58a outputs a detection signal in this state, the control circuit 104 receives this, and causes the CRT 100 of the manufacturing machine to display a cautionary alarm against the insufficiency of the residual quantity of the paste.

When a detection signal from the upper limit reed switch 106a is supplied to the control circuit 104 in response to the critical reduction of the residual quantity of the paste in the paste pot 58a, moreover, the circuit 104 switches the solenoid valve 54a to the neutral position, thereby stopping the pressurizing operation of the supply cylinder 48a. Then, the control circuit 104 switches the solenoid valve 54b on condition that the proximity switch 110b on the side of the other paste pot 58b is on, thereby causing the supply cylinder 48b to start pressurizing the paste in the pot 58b. At the same time, the control circuit 104 switches the selector valve 102 to change the working paste pot from the paste pot 58a to the paste pot 58b. Thus, also in this case, the paste can be supplied from the other paste pot 58b without interrupting the operation of the manufacturing machine.

When the selector valve 102 is switched, the control circuit 104 switches the solenoid valve 54a to contract the piston rod of the supply cylinder 48a. When the piston is detected by means of the lower-limit reed switch 108a, the solenoid valve 54a is restored again to the neutral position, whereupon the cautionary alarm on the CRT 100 is changed into an instructive alarm for replacement.

Thus, according to this embodiment, the operator is expected only to replace the empty paste pot 58a with a new filled paste pot in the same manner as aforesaid, on visually recognizing the instructive alarm for replacement on the CRT 100.

When the proximity switch 110a is turned on again after the replacement of the paste pot is completed, the control circuit 104 clears the CRT 100 of the instructive alarm for replacement. During the replacement of the paste pot, moreover, bubbles in the pot can be removed by manually operating the supply cylinder 48a by means of the manual switch 94a on the control box 90.

#### Claims

1. An apparatus for feeding paste from a paste pot to a pasting section (36) of a cigarette manufacturing machine, the pasting section (36) being used to apply the paste to one side edge of a wrapping paper (18) for continuous formation of a cigarette rod, characterized in that said apparatus comprises:
  - a pair of paste pots (58a,58b) stored with the paste;
  - a paste feeding path (66,78) capable of connecting said paste pots (58a,58b) and the pasting section (36);
  - delivery means (48a,48b,60) for delivering the paste in one of said paste pots (58a,58b) as a working pot to the pasting section (36) through said paste feeding path (66,78);
  - detecting means (98a,98b) for detecting the residual quantity of the paste in said working pot and outputting a detection signal; and
  - alarm means (100) for giving an alarm in response to the detection signal from said detecting means.
2. An apparatus according to claim 1, characterized in that each said paste pot (58) includes a hollow container, having a closed end and an open end, and a seat member (61) movably disposed in the container and defining a paste chamber (63) in the container.
3. An apparatus according to claim 2, characterized in that said paste feeding path includes branch lines (66), each extending from the

closed end of each corresponding paste pot (58) and having one end connected to the paste chamber (63), and a junction line (78) connecting the pasting section (36) and the respective other ends of the branch lines (66); and said delivery means includes a pair of movable walls (60) independent of the seat members (61) and movably fitted into said paste pots (58) through the open ends thereof, a pair of supply cylinders (48a,48b) having piston rods (50) connected individually to the movable walls (60), the movable walls (60) causing the corresponding seat members (61) to pressurize the paste in the paste chambers (63) when the respective piston rods (50) of the supply cylinders (48a,48b) are extended, and first valve means (68) provided at the junction between the junction line (78) and the other ends of the branch lines (66) and alternatively connecting the junction line (78) to the other end of one of the branch lines (66).

4. An apparatus according to claim 3, characterized in that each the seat member (61) moves together with the movable wall (60) corresponding thereto when the piston rod (50) of the corresponding supply cylinder (48) is extended, and is separated from the movable wall (60) when the piston rod (50) of the supply cylinder (48) is contracted.
5. An apparatus according to claim 3, characterized in that each the supply cylinder (48a,48b) includes a double-acting air cylinder, and said delivery means further includes second valve means (54a,54b) for controlling the supply of air to the supply cylinders (48a,48b).
6. An apparatus according to claim 5, characterized in that said second valve means includes four-port three-position directional control solenoid valves (54a,54b) associated individually with the supply cylinders (48a,48b).
7. An apparatus according to claim 6, characterized in that said detecting means includes a pair of sensors (98a,98b) associated individually with the supply cylinders (48a,48b) and used to detect the respective positions of pistons (49) in the supply cylinders (48a,48b).
8. An apparatus according to claim 7, characterized in that the first valve means includes a three-way valve (68) having a pair of inlet ports connected individually to the respective other ends of the branch lines (66), an outlet port connected to the junction line (78), and a manual lever (69) for alternatively connecting one

of the inlet ports to the outlet port.

9. An apparatus according to claim 7, characterized in that the first valve means includes a motor-operated three- way valve (102) having a pair of inlet ports connected individually to the respective other ends of the branch lines (66) and an outlet port connected to the junction line (78).

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10. An apparatus according to claim 9, characterized in that said apparatus further comprises a control circuit (104) for supplying the paste in said other paste pot to the pasting section (36) by automatically switching the solenoid valve (54a,54b) associated with said other paste pot and the three-way valve (102), on receiving the detection signal from the sensor (98) on the side of said working paste pot.

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FIG. 1

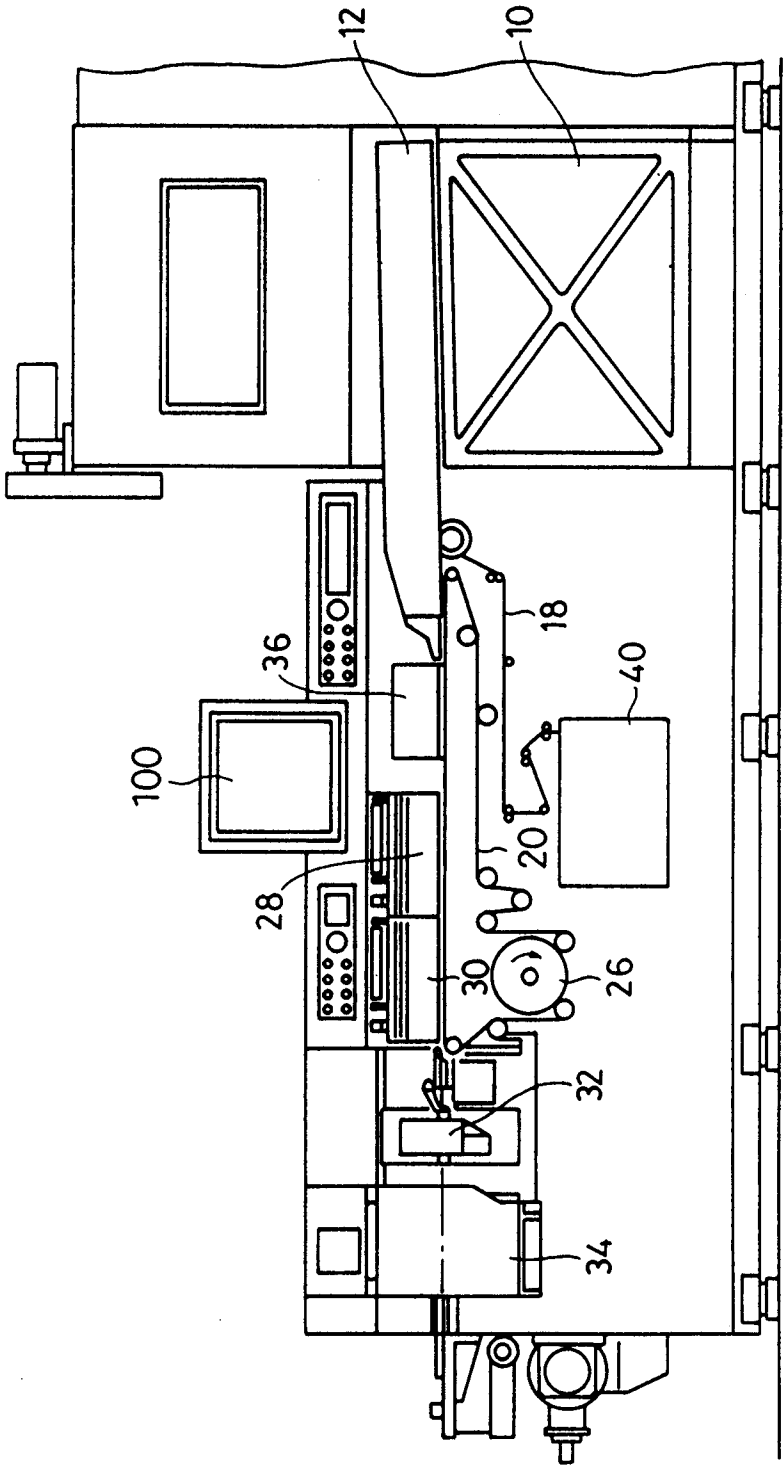


FIG. 2

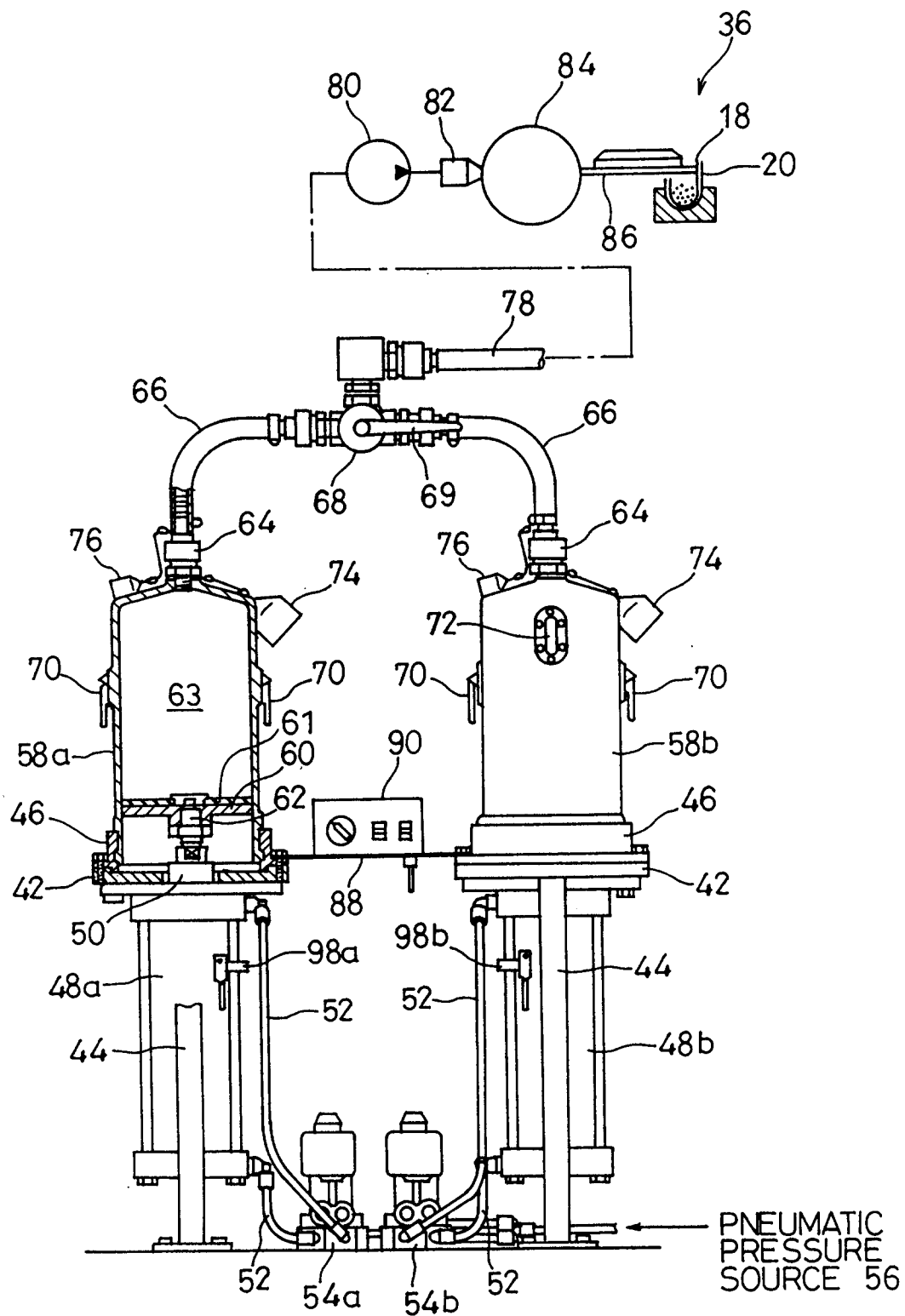


FIG. 3

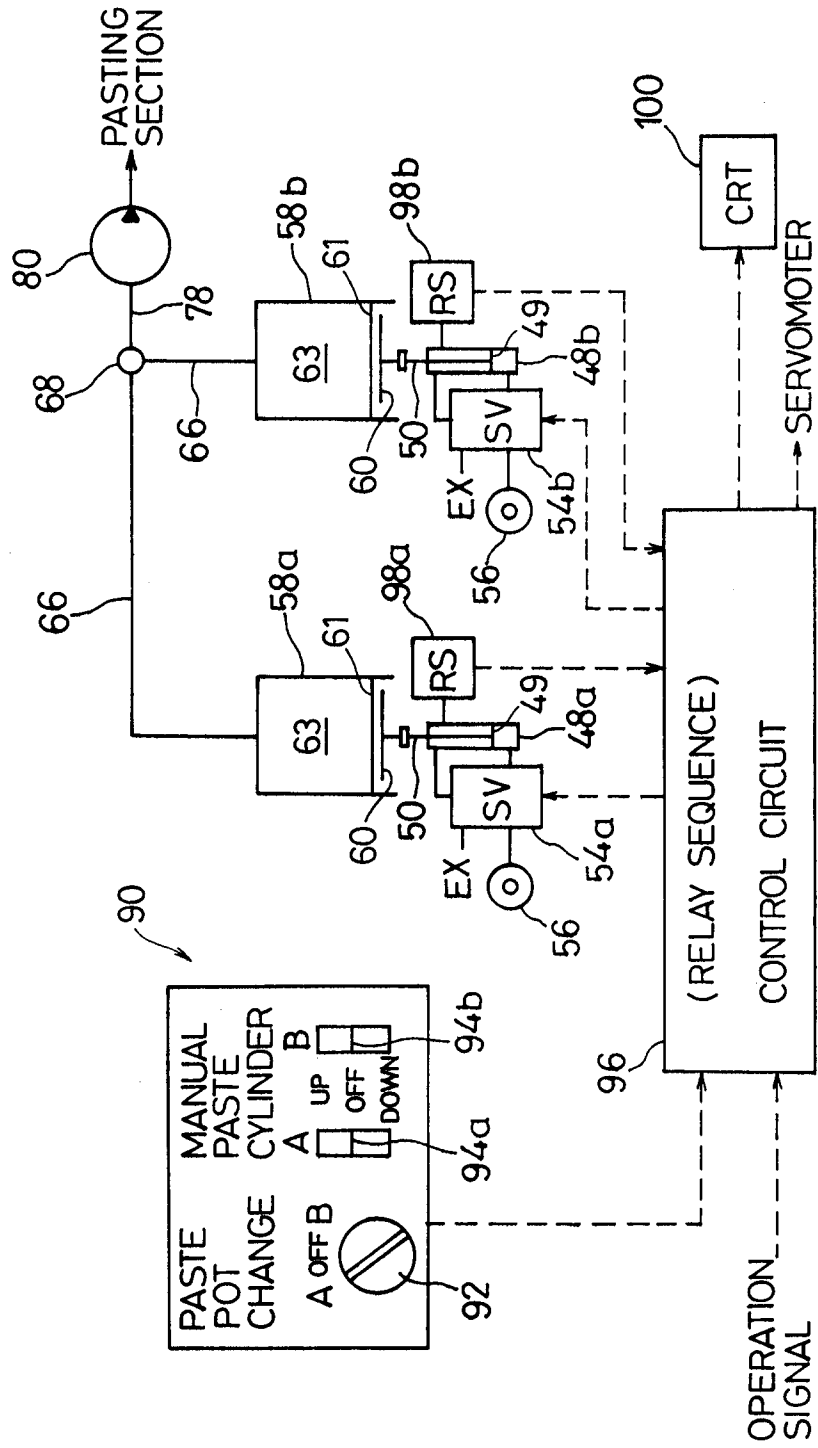
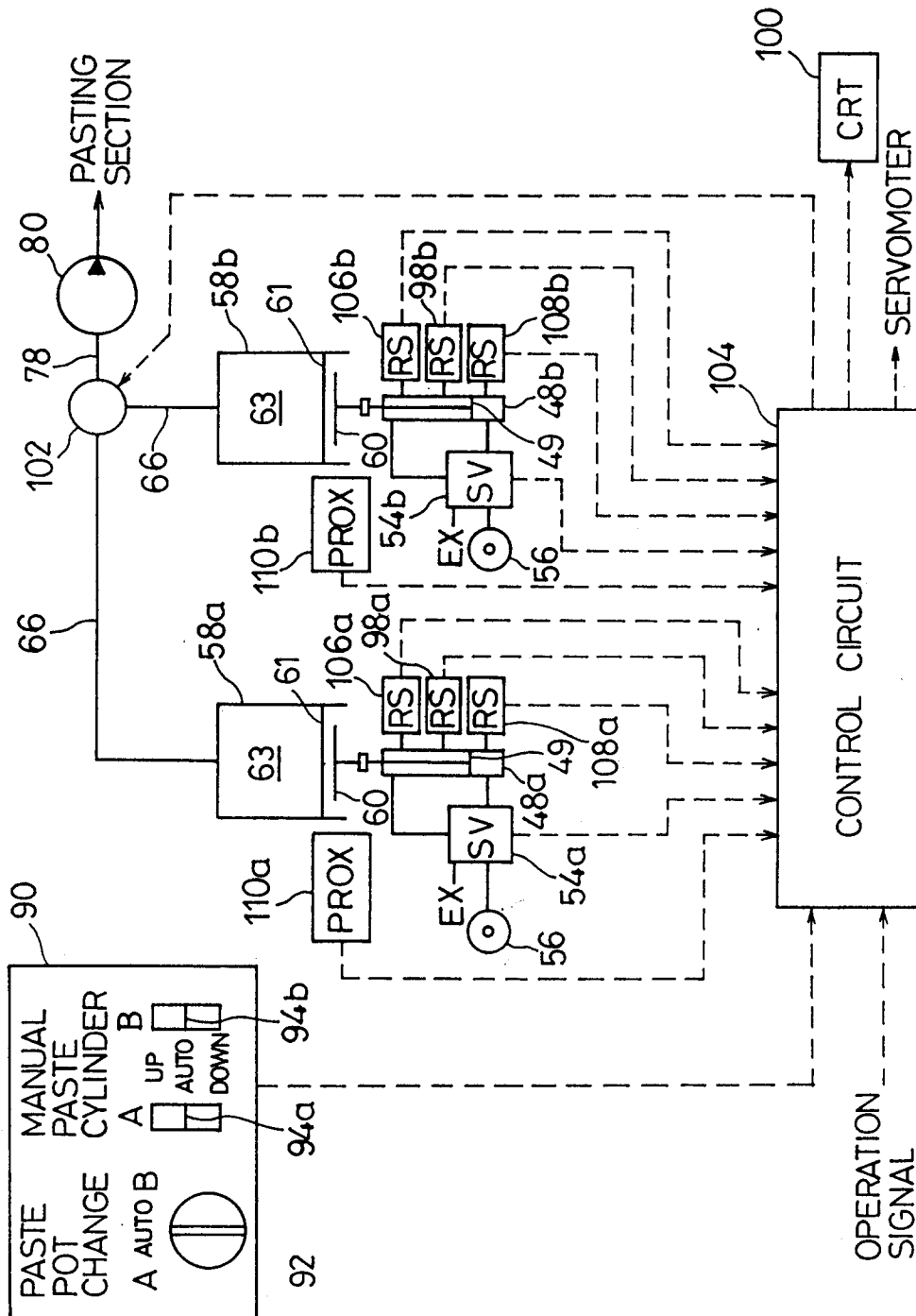


FIG. 4





European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 93 11 7143

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	US-A-3 684 135 (SCHORR) * the whole document *	1,2	A24C5/24
A	---	3-10	
A	US-A-1 838 112 (RUNDELL) * the whole document *	1-3	
A	---		
A	FR-A-760 404 (SOCIETE ANONYME DES USINES DECOUFLE) * page 2, right column, line 1 - page 3, left column, line 5; figure 5 *	1-3	
A	---		
A	GB-A-1 088 608 (KORBER) * the whole document *	4	
	-----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A24C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 January 1994	Examiner RIEGEL, R
<b>CATEGORY OF CITED DOCUMENTS</b>			
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