

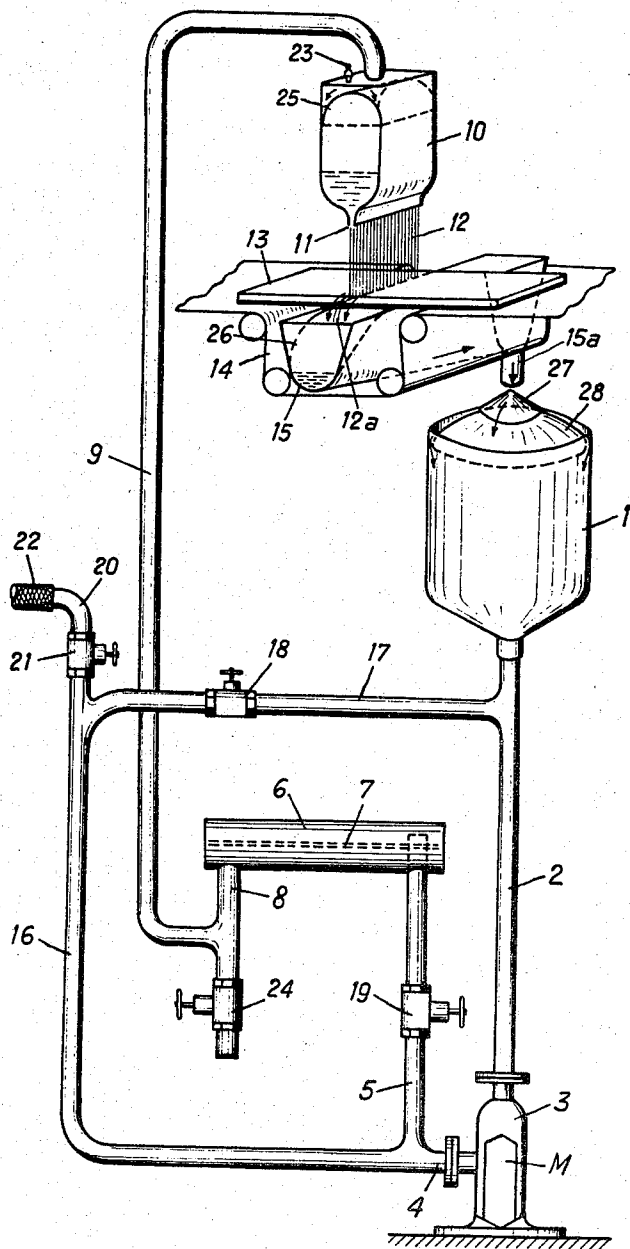
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VARNISH FEEDING ARRANGEMENT FOR POURING MACHINES

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VARNISH FEEDING ARRANGEMENT FOR POURING MACHINES

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The present invention relates to a varnish feeding apparatus for a varnish pouring machine, which includes a pouring vessel with a nozzle, and a conveyor passing a work piece below the nozzle of said pouring vessel.

It is an object of the present invention automatically and continuously to supply varnish to be applied to a work piece from a tank into the said pouring vessel from which the varnish flows continuously and in accurate dosage or metered quantities to the passing work piece while the excess varnish dripping from the work piece flows into a collector trough from which it is again supplied to the said vessel.

It is also an object of this invention to assure that the varnish will flow upon the work piece in a uniform variable quantity and will be entirely free from dust and air bubbles in order that a perfect varnish coat may be obtained.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawing diagrammatically illustrating a varnish feeding arrangement according to the present invention.

The primary feature of the arrangement according to the present invention consists in that the supply from the pump to the pouring vessel is passed through a control valve and a filter, while the rate of supply is adapted to be varied with the aid of a by-pass line by-passing said filter and leading from the pressure side of the pump to its suction side. In this way, the pump delivery can remain constant. The arrangement according to the invention also includes deviating plates or the like to prevent the formation of foam in the varnish while it is being poured upon the work piece.

Referring now to the drawing in detail, the arrangement shown therein comprises a varnish tank 1, from which the varnish passes through a pipe 2 to a pump 3, e.g. a gear pump, and hence through the pipe lines 4 and 5 to a filter-box 6 with a filter screen 7, through the latter and through pipe lines 8 and 9 into the pouring vessel 10. The varnish 12 flows through a nozzle 11 at the bottom portion of vessel 10 upon a work piece 13 which is passed below the nozzle 11 by means of a conveyor belt 14. The excess varnish 12a flows from the work piece 13 into a collector trough 15 and through an outlet pipe 15a thereof back into the varnish tank 1.

Branching off from pipe 4 is a by-pass circuit comprising pipe lines 16 and 17 with a valve 18. The said by-pass circuit by-passes the filter-box 6 and leads into the supply line 2 which latter leads to the suction side of pump 3. Arranged in pipe 5 is a valve 19 by means of which the supply from the pressure side of pump 3 through line 5 to the filter box 6 can be varied. Said valve 19 may also for certain purposes referred to below be closed whenever necessary. Communicating with pipe 16 is a discharge pipe 20 comprising a valve 21 and being connected to a hose 22.

Inasmuch as the delivery by the pump 3 which is driven by a motor M cannot be accurately adjusted to

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the required discharge of the pouring vessel 10, the by-pass pipe lines 16, 17 convey a portion of the varnish supplied by pump 3 back into the suction line 2. Thus, by means of the valves 18 and 19 the rate of supply of varnish to the pouring vessel 10 can be accurately adjusted, while the pump delivery remains constant. The pouring vessel 10 is provided with a venting valve 23.

For purposes of cleaning the pipes and containers, the valve 23 is opened first and the pump 3 is stopped so that the varnish of the pouring vessel will flow into the collector trough 15 and from there into the varnish tank 1. The valve 21 which is normally closed is then opened while the valves 18 and 19 are closed and pump 3 remains in operation. In this way, the tank 1 is emptied through pipes 16 and 20 and hose 22 into a container not shown. As soon as tank 1 is empty, valve 18 is opened so that the by-pass circuits 16, 17 will likewise drain. Opening of the small venting valve 24 will also allow draining of the pipe 9.

Subsequently, a solvent is poured into the varnish tank 1, and the motor M is started again, whereupon the solvent is discharged through hose 22 in the manner described above while simultaneously a cleaning of the circuit and parts therein will be effected. A second cleaning cycle for the vessels and pipe lines is then performed with a fresh solvent likewise in the manner described. The solvent used in the first cleaning cycle contains much varnish and can again be used for diluting the varnish. The second solvent is preserved and may be employed for performing the above mentioned first cleaning cycle when another cleaning operation of the arrangement is required.

In order to prevent air bubbles from entering the varnish, it is necessary for the varnish flow to enter the pouring vessel and the collector trough 15 and tank 1 without any material drop so that foaming and the enclosure of air will be avoided. To this end, the pouring vessel 10 has arranged therein deviating plate means such as a plate 25 which deflects the varnish flow entering through pipe 9 toward the walls of the vessel 10 in order to cause the varnish to flow along the walls of container 10. Also the collector trough 15 may have similar plates 26 arranged therein which will prevent the varnish draining from the work piece from freely dropping into the trough. Also tank 1 is advantageously provided with deviating plate means 27, 28 for deflecting the varnish supplied thereto toward the tank wall.

It is, of course, to be understood that the present invention is, by no means, limited to the particular construction shown in the drawing but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. In combination in a varnish feeding arrangement: a reservoir adapted to receive and store varnish, said reservoir being provided with a discharge opening; a gear pump having a pressure side and a suction side, first conduit means leading from the discharge opening of said reservoir to the suction side of said pump, a varnish feeding vessel closed at the top and having a discharge slot at its bottom for discharging varnish upon a work piece passing therebelow, second conduit means leading from the pressure side of said pump to said feeding vessel for conveying varnish thereto from the pressure side of said pump, third conduit means interconnecting said discharge opening and the pressure side of said pump for causing varnish delivered by said pump to by-pass said second conduit means, and valve means arranged in at least one of said second and third conduit means and operable to control and vary the rate of supply of varnish through said second conduit means to said varnish feeding vessel.

2. In combination in a varnish feeding arrangement:

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a reservoir adapted to receive and store varnish, said reservoir being provided with a discharge opening; a gear pump having a pressure side and a suction side, first conduit means leading from the discharge opening of said reservoir to the suction side of said pump, a varnish feeding vessel closed at the top and having a discharge slot at its bottom for discharging varnish upon a work piece passing therebelow, second conduit means leading from the pressure side of said pump to said feeding vessel for conveying varnish thereto from the pressure side of said pump, filter means in said second conduit means for filtering the varnish passing there-through, first valve means arranged in said second conduit means between the pressure side of said pump and said filter means, third conduit means interconnecting said discharge opening and the pressure side of said pump for causing varnish delivered by said pump to by-pass said second conduit means, and second valve means arranged within said third conduit means and operable to control the flow of varnish therethrough, thereby controlling the rate of supply of varnish through said second conduit means to said varnish feeding vessel.

3. In combination in a varnish feeding arrangement: a reservoir adapted to receive and store varnish, said reservoir being provided with a discharge opening; a gear pump having a pressure side and a suction side; first conduit means leading from the discharge opening of said reservoir to the suction side of said pump, a varnish feeding vessel closed at the top and having a discharge slot at its bottom for discharging varnish upon a work piece passing therebelow, second conduit means leading from the pressure side of said pump to said feeding vessel for conveying varnish thereto from the pressure side of said pump, third conduit means interconnecting said discharge opening and the pressure side of said pump for causing varnish delivered by said pump to by-pass said second conduit means, valve means arranged in at least one of said second and third conduit means and operable to control and vary the rate of supply of varnish through said second conduit means to said varnish feeding vessel, a collecting vessel arranged below and in spaced relationship to said varnish feeding vessel so as to define therewith a passage for passing work pieces to be varnished therethrough, said collecting vessel having discharge means leading to a point adjacent said reservoir for conveying collected varnish thereto, and means arranged in said feeding vessel for guiding varnish entering the same downwardly along the inner wall surfaces of said feeding vessel.

4. In combination in a varnish feeding arrangement: a reservoir adapted to receive and store varnish, said reservoir being provided with a discharge opening; a gear pump having a pressure side and a suction side; first conduit means leading from the discharge opening of said reservoir to the suction side of said pump, a varnish feeding vessel closed at the top and having a discharge slot at its bottom for discharging varnish upon a work piece passing therebelow, second conduit means leading from the pressure side of said pump to said feeding vessel for conveying varnish thereto from the pressure side of said pump, third conduit means interconnecting

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said discharge opening and the pressure side of said pump for causing varnish delivered by said pump to by-pass said second conduit means, valve means arranged in at least one of said second and third conduit means and operable to control and vary the rate of supply of varnish through said second conduit means to said varnish feeding vessel, a collecting vessel arranged below and in spaced relationship to said varnish feeding vessel so as to define therewith a passage for passing work pieces to be varnished therethrough, said collecting vessel having discharge means leading to a point adjacent said reservoir for conveying collected varnish thereto, and deviating plate means arranged within said collecting vessel and extending from the upper portion of said collecting vessel at an incline with regard to the bottom portion thereof toward wall portions of said collecting vessel for smoothly conveying excess varnish dripping off from a work piece between said feeding vessel and said collecting vessel into the latter to thereby prevent said dripping off varnish from mixing with air bubbles.

5. In combination in a varnish feeding arrangement: a reservoir adapted to receive and store varnish, said reservoir being provided with a discharge opening; a gear pump having a pressure side and a suction side; first conduit means leading from the discharge opening of said reservoir to the suction side of said pump, a varnish feeding vessel closed at the top and having a discharge slot at its bottom for discharging varnish upon a work piece passing therebelow, second conduit means leading from the pressure side of said pump to said feeding vessel for conveying varnish thereto from the pressure side of said pump, third conduit means interconnecting said discharge opening and the pressure side of said pump causing varnish delivered by said pump to by-pass said second conduit means, valve means arranged in at least one of said second and third conduit means and operable to control and vary the rate of supply of varnish through said second conduit means to said varnish feeding vessel, a collecting vessel arranged below and in spaced relationship to said varnish feeding vessel so as to define therewith a passage for passing work pieces to be varnished therethrough, said collecting vessel having discharge means leading to a point adjacent said reservoir for conveying collected varnish thereto, and deviating plate means within said reservoir and extending from a point near said discharge means toward wall portions of said reservoir for smoothly conveying varnish from said discharge means into said reservoir to thereby prevent air from being enclosed in the varnish during its passage from said discharge means of said collecting vessel to said reservoir.

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