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SHEET REVERSING CYLINDER WITH BLOWING TUBES FOR STOP-CYLINDER PRINTING MACHINES

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Fig.1

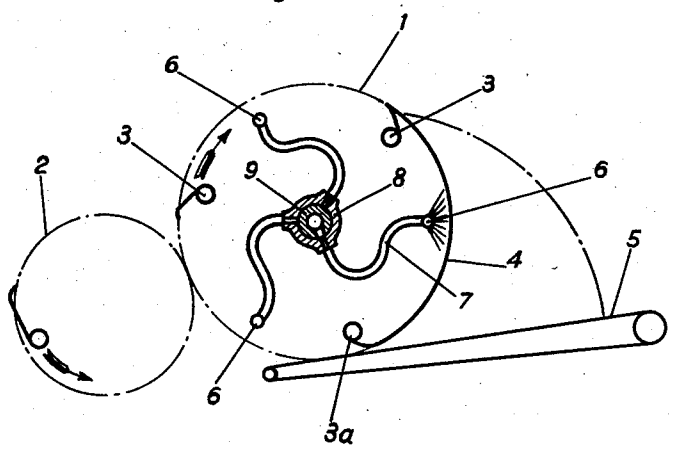


Fig.2

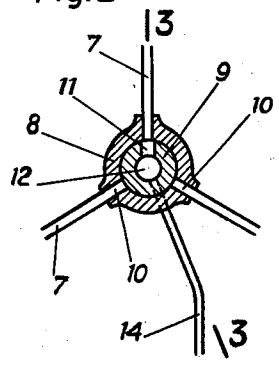
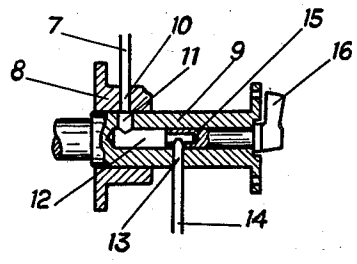


Fig.3



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SHEET REVERSING CYLINDER WITH BLOWING TUBES FOR STOP-CYLINDER PRINTING MACHINES

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3 Claims. (Cl. 271—74)

It is known, that the sheet-turning or sheet-reversing cylinders used in printing machines of the stop-cylinder type serve the purpose of turning up the printed sheet taken off the impression cylinder and then causing it to be stretched, with the freshly printed face turned upwards, on the conveying member that carries the sheet to the collecting table.

However, with large sized sheets and certain kinds of paper there may occur the known inconvenience that the sheet, instead of stretching out regularly on the conveying member, warps or rolls up, thus disturbing the operation of the printing machine.

The measures hitherto adopted to obviate these inconveniences consist particularly in the use of blowing tubes which, by striking the sheet with one, or more jets of air on the freshly printed face help it separate from the cylinder and stretch itself smoothly on the conveyor.

However, with the constructions hitherto known the efficiency of such blowing tubes is very low, inasmuch as they are disposed in a fixed position, either in the axis of the sheet-reversing cylinder or externally to this latter. In either case, the blowing tubes are located relatively far from the paper sheet. This ensues the necessity of very strong air jets and consequently, of a great consumption of compressed air, while making it impossible to localize the action of the jet on the areas of the sheet where it would be more effective and also to make the jet act with the most suitable orientation.

All these inconveniences are eliminated in the sheet-reversing cylinder according to the present invention, which is essentially characterized in that the blowing tubes are incorporated in the sheet-reversing cylinder and, consequently, rotate together with it. This permits to arrange the blowing tube in the most convenient position in respect to the paper sheet in the tilting period, in particular very near to the cylinder periphery and hence to the sheet itself, so as to enable the blowing tube to act on the area of the sheet where the action of the jet is more efficient. The blowing tubes are connected with the distributor of compressed air preferably by means of flexible tubes, which enables to adjust the blowing tubes as to their position and orientation relative to the sheet.

The device according to the invention is also characterized by a particular distributor of compressed air to feed the blowing tubes; this distributor constitutes at the same time the connection between the fixed part and the rotating part of the pneumatic equipment, and permits to control the moment where the jet is produced. In addition, a cock incorporated in the distributor permits to adjust also the intensity of the jet.

An embodiment of a sheet-reversing cylinder according to the invention is diagrammatically shown, by way of example, in the accompanying drawing in which:

Figure 1 shows the sheet-reversing cylinder together with the impression cylinder and the conveying member, so as they are disposed in the printing machine;

Figure 2 is an enlarged cross section of the connecting distributor coupling together the fixed part and the rotating part of the pneumatic equipment, and

Figure 3 is a section along the line 3—3 of Fig. 2.

The sheet reversing cylinder 1 is set in rotation in a known manner by the impression cylinder 2. By each complete revolution of the impression cylinder, the sheet-reversing cylinder accomplishes, in the example shown, ⅔ of a revolution so as always to have one of the three gripper rods 3, more precisely that one (3*a*) which, in the preceding period, took the printed sheet 4 off the impression cylinder, in a low position proximate to the conveyor 5.

Three blowing-tubes 6 are distributed along and nearest to the periphery of the sheet-reversing cylinder 1, being positioned about halfway between the two consecutive gripping rods 3, so that the jet of air strikes the sheet at about the middle of the maximum sheet size when the blowing tube is approximately on the horizontal diameter of the sheet-reversing cylinder.

The blowing tubes 6 are provided with perforations for the air jet and are fixed to the cylinder 1 in any suitable and known way, not shown, preferably in an adjustable manner.

To feed compressed air to the three blowing tubes 6, these are connected by preferably flexible tubes 7 with corresponding openings in a ring or hub 8 rotating together with the sheet-reversing cylinder 1 on a fixed shaft 9. The openings extend into radial holes 10 which open towards the fixed shaft 9. A radial hole 11 provided in the fixed shaft communicates with an axial cavity 12 formed in said shaft and to which is connected at 13 a duct 14 connected in turn with a supply of compressed air, for example a compressor (not shown). A cock 15 located in the axial cavity 12 and operated from outside by the lever 16 permits to control the air inflow.

The assembly 8–9 constitutes thus an automatic rotary distributor. The three holes 10 of the ring 8 by passing in succession past the hole 11 of the fixed shaft 9 establish successively the communication between the compressed air source and the blowing tubes at the desired instant and for the most convenient duration.

The fixed shaft 9 is conveniently adjustable into the desired position by rotating it about its own axis so as to vary the instant at which the radial hole 11 of the shaft meets wtih a hole 10 of the rotating hub, and therefore also to vary the instant at which the air jet is produced.

From the foregoing, the operation of the device is evident. The sheet reversing cylinder 1 takes the freshly printed sheet 4 off the impression cylinder 2 and carries it to the conveyor 5. As the sheet 4 arrives at about the position shown in Fig. 1, the corresponding blowing tube 6 is caused to communicate, by means of the distributor 8–9, with the compressed air inlet, and the sheet, struck by the air jet, stretches itself smoothly, without getting warped or rolled up, on the conveyor 5.

In its mechanical particulars, the described device may of course be realized in any desired manner without departing from the scope of the invention.

What we claim is:

1. In a stop-cylinder printing machine having an impression cylinder, a sheet-reversing cylinder driven in rotation by the impression cylinder, a plurality of sheet-gripping members circumferentially spaced about the sheet-reversing cylinder, perforated blowing tubes adjustably mounted on said sheet-reversing cylinder near the periphery thereof, each substantially halfway between two adjacent gripping members of said sheet-reversing cylinder and rotating with said cylinder and positioned to direct an air jet on the printed sheet carried thereby, means supplying compressed air, a fixed shaft on which said sheet-reversing cylinder is rotatably mounted, said

shaft having an axial cavity therein, means connecting said cavity to said compressed air supply means, said shaft being rotatably adjustable in its position about its axis, a manually operated cock controlling the flow of air from the supply means to said cavity, said shaft having a radial discharge opening communicating with said axial cavity, a hub rotating with said sheet-reversing cylinder on said fixed shaft and positioned to rotate about the portion of the shaft having the radial discharge opening, said hub having a plurality of circumferentially spaced radial holes extending through the hub and registrable with the radial discharge opening in the shaft during determined positions of rotation of the hub about the shaft, and flexible tubes connecting the blowing tubes with the radial holes in the hub to establish successively communication between the compressed air supply means and said blowing tubes.

2. In a stop-cylinder printing machine according to claim 1 in which the shaft is provided with a radial inlet

opening for the flow of air from the supply means to the cavity in the shaft and the cock comprises a body rotatably mounted in the cavity of the shaft and cooperating with the inlet opening.

3. In a stop-cylinder printing machine according to claim 2 in which the body is provided with a bore opening into the cavity and a radial aperture registrable with the radial inlet opening for controlling communication between the bore in the body and the inlet opening.

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