May 8, 1962 C. HIRSCH 3,033,111

ATTACHMENT FOR PRINTING PRESSES

Filed July 25, 1961

Fig. 1

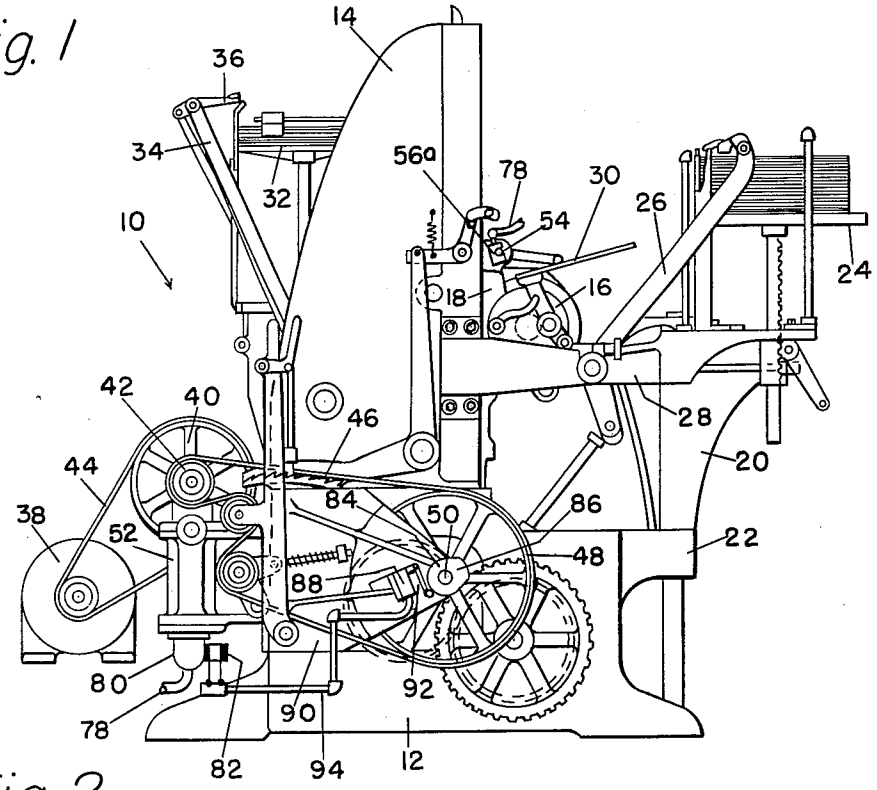


Fig. 2

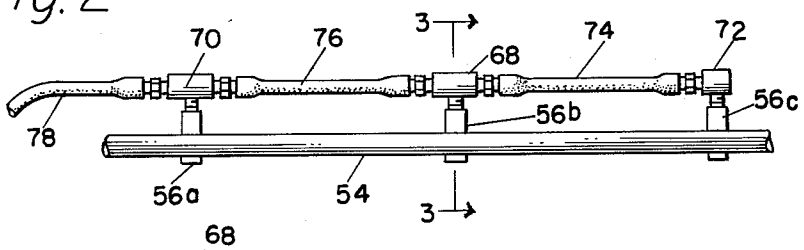
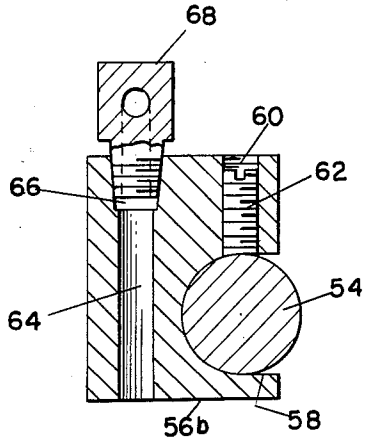


Fig. 3



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United States Patent Office

3,033,111
Patented May 8, 1962

3,033,111

ATTACHMENT FOR PRINTING PRESSES

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Filed July 25, 1961, Ser. No. 126,663
7 Claims. (Cl. 101—272)

The present invention relates to an attachment for printing presses, and more particularly to a vertical air sheet control attachment for vertical bed, cylinder printing presses.

In the delivery of the sheets of paper from the cylinder of a vertical bed printing press to the delivery table, the sheets of paper have a tendency to curl or arch as they are drawn from the cylinder. Thus, as the sheet of paper is drawn from the cylinder the top surface of the sheet contacts and scrapes across the underside of the transfer table and the front edge of the sheet of paper on the transfer table being fed to the cylinder. This causes the printing on the sheet to be scratched or smeared, which is undesirable. Therefore, it is highly desirable to maintain the sheet being delivered relatively flat to prevent the scratching or smearing of the printing thereon.

It is an object of the present invention to provide an attachment for a printing press.

It is another object of the present invention to provide an attachment for vertical bed, cylinder printing presses.

It is still another object of the present invention to provide a printing press with means for maintaining the printed paper sheet depressed as it is transferred from the cylinder to the delivery table.

It is a further object of the present invention to provide a printing press with a mechanism for delivering a blast of air against the sheets of paper as they are pulled from the cylinder toward the delivery table to keep the printed image free from smears, scrapes and distortion marks.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a side elevational view of a vertical bed, cylinder printing press having the improvement of the present invention.

FIGURE 2 is a front elevational view of the air blast mechanism of the present invention.

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 2.

Referring initially to FIGURE 1, the printing press shown therein is generally designated as **10**. The press **10** is in large part of well known construction in wide commercial use at the present time and for some years past. The present invention is exemplified herein by additions to, and modifications of a Miehle vertical press of well known construction. The details of the construction and operation of such a press are shown and described in U.S. patent to E. Cheshire No. 1,567,177 and U.S. patent to F. V. Toppin No. 2,027,797. Since the improvement of the present invention can be used on any type of vertical bed, cylinder press, a detailed description of the press **10** shown in FIGURE 1 is not believed to be necessary or even desirable, particularly since such details are well known in the art. However, a general description of the press **10** will be given to provide a clear understanding of the improvement of the present invention and its relationship with a press.

As shown in FIGURE 1, press **10** comprises a base frame **12** supporting an upright way frame **14**. A type bed, not shown, is mounted for vertical reciprocation in the way frame **14**. An impression cylinder **16** extends across the front of the way frame **14** and is mounted on a cylinder frame **18**. The cylinder frame **18** is mounted on the way frame **14** for vertical reciprocation in opposition to the movement of the type bed. Thus, when the type bed moves vertically downwardly, the impression cylinder **16** is moved vertically upwardly, and vice versa. When the impression cylinder **16** is moved vertically upwardly, it is rotated to impress a paper sheet, gripped thereby, against a type form set up on the type bed.

A platform **20** is mounted for pivotal movement on an arm **22** extending from the base frame **12**. The platform **20** supports the stock supply table **24** and its related mechanisms. A feeder frame **26** is journaled between a pair of arms **28** extending from the platform **20**. The feeder frame **26** is pivotal between a position in which the top thereof is over the supply table **24**, and a position in which the top is over a transfer table **30**. The transfer table **30** is mounted on the cylinder frame **18**, and is positioned over the cylinder **16** so as to guide the sheets of paper placed thereon to the cylinder. The feeder frame **26** is of the suction type so that the feeder frame can pick up the sheets of paper from the supply table **24** and transfer the sheets to the transfer table **30**.

A delivery table **32** is mounted between the side walls of the way frame **14** behind the type bed. A delivery frame **34** is journaled between the sides of the way frame **14**, and is pivotable between a position over the back edge of the delivery table **32** and a position over the cylinder **16**. The delivery frame **34** is provided with grippers **36** for gripping an edge of the sheets of paper on the cylinder **16** and transferring the sheets to the delivery table **32**.

The press **10** is driven by an electric motor **38**. The motor **38** is drivingly connected through pulleys **40** and **42**, and drive belts **44** and **46** to a fly wheel **48** mounted on a fly wheel shaft **50**. The fly wheel shaft **50** is drivingly connected to the type bed, impression cylinder **16**, feeder frame **26** and delivery frame **34** through various gears, cams and linkages described in detail in Patents No. 1,567,177 and No. 2,027,797. The electric motor **38** also drives an air pump **52** mounted on the base frame **12**. The press **10** so far described is of well known construction in wide commercial use at the present time, and the details of which form no part of the present invention.

The air blast mechanism of the present invention includes a mounting rod **54** supported between the cylinder frames **18** parallel to and over the impression cylinder **16**. As shown in FIGURE 2, three air blast nozzle blocks **56***a*, **56***b* and **56***c* are mounted in spaced relation on the mounting rod **54**. As shown in FIGURE 3, nozzle block **56***b* is provided with a groove **58** in one of its side edges, which groove is adapted to receive the mounting rod **54**. A threaded hole **60** extends through the nozzle block **56***b* from the top thereof to the groove **58**. A set screw **62** is threaded in the hole **60** and engages the mounting rod **54** to secure the nozzle block **56***b* to the mounting rod. A passage **64** extends through the nozzle block **56***b* from the top to the bottom thereof. A threaded counterbore **66** is provided at the top end of the passage **64**. The nozzle blocks **56***a* and **56***c* are identical in construction to the nozzle block **56***b* as described above.

The leg of a T-fitting **68** is threaded in the counterbore **66** in the nozzle block **56***b*. A similar T-fitting **70** is secured to the nozzle block **56***a*, and an L-fitting **72** is secured to the nozzle block **56***c*. The open end of the L-fitting **72** is connected to one end of the head of the T-fitting **68** by a pipe or flexible hose **74**. The other end of the head of the T-fitting **68** is connected to one end of the head of the T-fitting **70** by a pipe or flexible hose **76**. One end of

a pipe or flexible hose **78** is connected to the other end of the head of the T-fitting **70**. The other end of the pipe or hose **78** is connected to the outlet end of a valve **80** on the outlet port of the air pump **52**. The valve **80** is electrically operated by a solenoid **82**. Although the pipe or hose **78** is shown as being connected to an air pump mounted on the frame of the press **10**, the pipe **78** may be connected to a separate supply of air under pressure. The line between the air supply, such as the air pump **52**, and the nozzle blocks **56***a*, **56***b* and **56***c* may include suitable pressure regulating valves and pressure gauges to permit control of the pressure of the flow of air to the nozzle blocks.

As shown in FIGURE 1, a cam **84** is mounted on the fly wheel shaft **50**, and has a camming projection **86**. A switch **88**, such as a micro-switch, is mounted on a plate **90** secured to the base frame **12**. The switch **88** is positioned adjacent the cam **84**, and has an operating arm **92** slidably engaging the periphery of the cam. The switch **88** is normally open, and is closed when the camming projection **86** engages the operating arm **92**. The switch **88** is electrically connected to the solenoid **82** by wires passing through the conduit **94**. The solenoid **82** is connected to a source of current, not shown, through the switch **88** so that when the switch is closed, the solenoid **82** is energized to open the valve **80**. When the switch **88** is open, the solenoid **82** is deenergized so that the valve **80** is closed.

In the operation of the press **10**, the feeder frame **26** transfers the sheets of paper from the supply table **24** to the transfer table **30**. The transfer table **30** guides the sheets to the impression cylinder **16**. As the impression cylinder **16** is moved upwardly by the cylinder frame **18**, the cylinder is rotated to wrap the sheet therearound and impress the sheet against the type form on the type bed which is moving downwardly. When the cylinder **16** has reached the upper-most point of its stroke, the printing has been completely applied to the sheet. At this point, the delivery frame **34** has pivoted to a position in which the grippers **36** are over the cylinder **16**, and grip an edge of the sheet. The delivery frame then pivots back to remove the sheet from the cylinder **16** and transfer the sheet to the delivery table **32**.

When the cylinder **16** has reached the upper-most position of its stroke, the cam **84** has rotated to bring the camming projection **86** into engagement with the operating arm **92** of the switch **88**. This closes the switch **88** to energize the solenoid **82**, and thereby open the valve **80**. When the valve **80** is open, air from the air pump **52** or other source of air under pressure passes through the hoses **78**, **76** and **74** and the fittings **70**, **68** and **72** to the passages in the nozzle blocks **56***a*, **56***b* and **56***c*. The nozzle blocks **56***a*, **56***b* and **56***c* are positioned so as to direct the air passing through their passages against the top surface of the sheet being removed from the cylinder **16** by the delivery frame **34**. It has been found that the blast of air against the top surface of the sheet prevents the sheet from curling or arching, and maintains the sheet relatively flat as it is transferred from the cylinder **16** to the delivery table **32**. Thus, the top surface of the sheet being delivered to the delivery table **32** does not scrape across the under surface of the transfer table **30** or the front edge of the sheet of paper on the transfer table so that the printing on the sheet is not scratched or smeared.

The camming projection **86** of the cam **84** is of a circumferential length that when the sheet is completely removed from the cylinder **16**, the camming projection **86** has rotated past the operating arm **92** of the switch **88** so as to open the switch **88**. This deenergizes the solenoid **82** so as to close the valve **80** and stop the flow of air to the nozzle blocks **56***a*, **56***b* and **56***c*. Thus, the blast of air from the nozzle blocks **56***a*, **56***b* and **56***c* is provided only during the time that the sheet is being drawn from the cylinder **16**. By providing the blast of air from the nozzle blocks **56***a*, **56***b* and **56***c* only during the period of time that the sheet is being drawn from the cylinder **16**, the air pump **58** or other source of air is not overloaded so that it can provide air to other parts of the press **10** where it may be needed.

Although the air blast mechanism of the present invention is shown as including only three nozzle blocks, it may be provided with additional nozzle blocks if desired. However, it has been found that three nozzle blocks uniformly spaced across the cylinder **16** provides sufficient blasts of air against the sheet to prevent curling or arching of the sheet. By means of pressure control valves in the line to the nozzle blocks, the force of the air blasts can be controlled for various types and thicknesses of the sheets.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. In a printing press having a vertical type bed, a cylinder mounted for reciprocation and rotation across the type bed to impress a sheet of paper against the type, means for feeding a sheet of paper to the cylinder and means for transferring the sheet of paper from the cylinder to a delivery table when the cylinder is at its uppermost point of reciprocation, means mounted above and along the cylinder for delivering a blast of air against the top surface of the sheet of paper as the sheet is drawn from the cylinder.

2. A printing press in accordance with claim 1 including means for supplying air to said air blast means only during the period of time that the sheet of paper is being drawn from the cylinder.

3. A printing press in accordance with claim 2 including a mounting rod extending across the top of the cylinder and mounted to reciprocate with said cylinder, and the air blast means comprises a plurality of nozzles mounted in spaced relation on said rod, each of said nozzles having a passage directed downwardly toward said cylinder, and means for connecting the passages in said nozzles to a source of air under pressure.

4. A printing press in accordance with claim 3 in which each of the nozzles comprises a block having a notch in one side edge thereof which receives the mounting rod, a threaded hole extending through said block to said notch, a set screw threaded in said hole and engaging said mounting rod to secure the block to said rod, and a passage extending through said block through which the air passes.

5. A printing press in accordance with claim 4 in which the means for connecting the passages in the blocks to a source of air comprises an L-fitting in the inlet end of the passage in the block at one end of the mounting rod, T-fittings in the inlet ends of the passages in the other blocks, tubes connecting said fittings in series, and a supply tube connecting the fitting on the block at the other end of the mounting rod to the source of air under pressure.

6. A printing press in accordance with claim 5 including a solenoid operated valve connected between the source of air and the supply tube, electrical circuit means connecting the solenoid of said valve to a source of current, switch means in said circuit to control energization and deenergization of said solenoid, and camming means operated by said press to operate said switch between its open and closed positions.

7. A printing press in accordance with claim 6 in which said camming means is arranged to cause the valve to be opened only during the portion of the cycle of the press that the sheet of paper is being drawn from the cylinder.

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