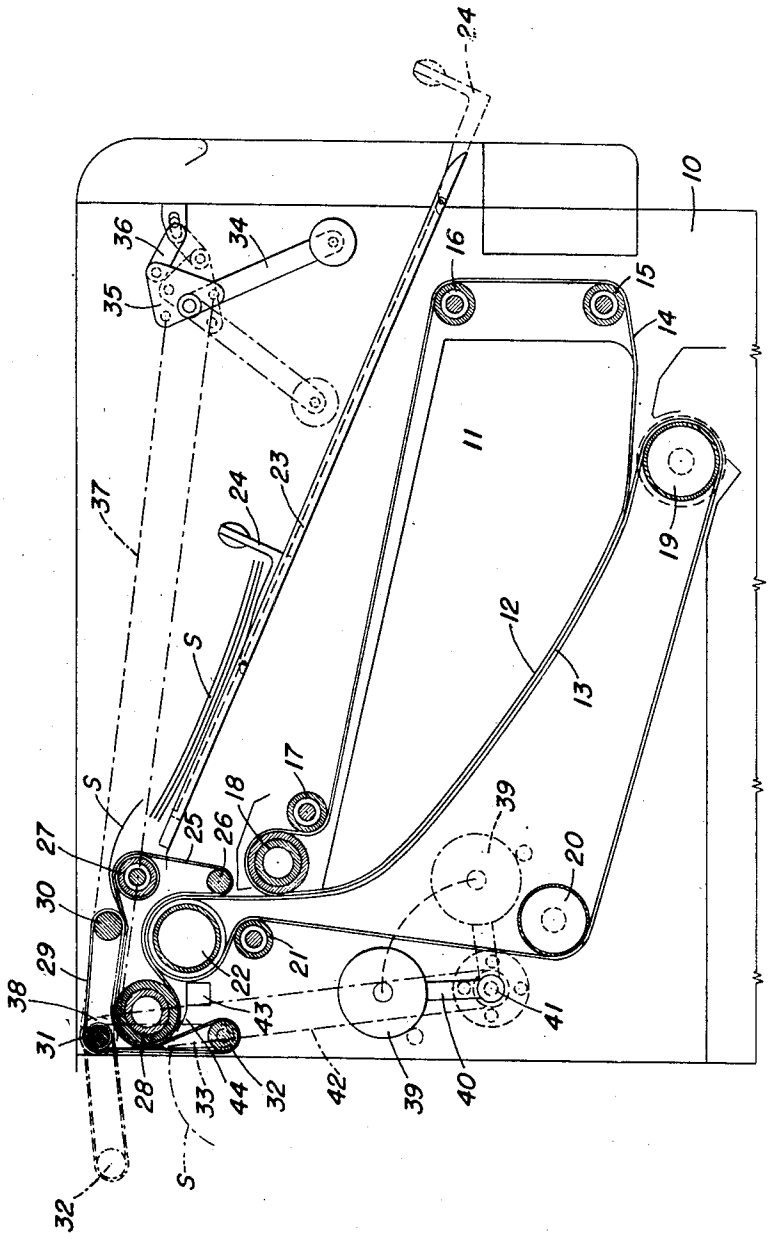
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FRONT AND REAR DELIVERY MEANS
FOR DRY PRINTING MACHINES
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FRONT AND REAR DELIVERY MEANS FOR DRY PRINTING MACHINES

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This application pertains to an invention in front or rear delivery means for dry printing machines or the like. More specifically, the invention involves a certain mechanism including belts or tapes, the position of which may be varied for positively directing printed or developed material selectively in either of two directions.

It is an object of the invention to devise relatively simple, yet effective means for delivering printed material either to the front or to the rear of a dry developing machine or other similar machine, by means of a relatively simple belt or tape system.

Another object of the invention is to provide front or rear delivery means for machines of the type described in which the so-called sealing sleeve functioning to convey the printed material through a developing zone is employed in conjunction with other simple belt or tape systems for effecting selective delivery of the material.

A further object of the invention is to devise the front and rear delivery means in such a manner that by movement of a minimum number of parts, the mechanism may be switched from delivery in one direction to deliver in the other direction while maintaining definite control of the material at all times.

Several front and rear delivery systems have been employed heretofore for machines of the type described. Some of them involve belt or tape systems capable of being switched to different positions in which they act to cause delivery of the material selectively in one or another direction. Most of these tape systems are relatively complicated, involve fairly heavy movable parts and also entail a certain amount of difficulty in driving them when in one or another of their respective positions.

According to the present invention, the front and rear delivery means has been applied to a dry type developing machine in which the sealing sleeve positively driven for conveying the printed sheets through a developing zone or past the developing surface of a vaporizing chamber, is employed as a part of or as a means for conveying the developed sheets to the front or rear delivery means itself. The general function of the sealing sleeve is to cover the surface of the vaporizing chamber and hermetically seal the space between which the sensitized material is subjected to the developing vapors while conveying this material past the developing surface. These functions in the present arrangement are not varied beyond slight changes in the position of certain guide means for controlling the sleeve after it leaves the developing zone. The sleeve itself is supplemented by a series of short tapes or belts, or possibly, one single wide belt, adapted to be driven at substantially the same surface speed as the sealing sleeve and so guided by a plurality of rollers or other appropriate means as to pass in contact with the sealing sleeve as it is moved about one of its driving or guiding elements.

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The said series of tapes or belts which make contact with the sealing sleeve are in turn supplemented by a second series of short tapes, belts, or the like, similarly adapted to function upon the developed material and to convey it in one direction when these last-mentioned tapes are so positioned as to receive the developed sheets as they are guided between a plurality of flexible or spring-like fingers or presser members and the said first series of tapes. When in their other position, this second series of tapes has no effect upon the developed, delivered material which is ejected from between the spring members and the first series of tapes while being directed toward the back of the machine at which it is then discharged.

The invention will be described in greater detail by reference to one specific embodiment thereof as applied to a typical dry developing machine pertinent parts of which are shown in the accompanying figure of drawings. In the figure, which is a transverse section through a typical dry printing machine, the invention has been illustrated in conjunction with those parts of the machine necessary to a full understanding thereof.

Now referring to the figure, a casing 10 is shown which may contain a printing and developing mechanism adapted for continuous operation, any combination of these parts, or in fact, a developer only. As much of the developer mechanism is shown as is necessary for the understanding of the invention. A vaporizing chamber 11 has a lower, downwardly inclined perforated side, through which the developing vapors may pass to reach the printed sensitized material as it is conveyed along that side of the machine by frictional contact with a sealing sleeve 13. While the same is not entirely necessary, it is preferable that the sealing sleeve function in coordination with a mesh belt 14 adapted to diffuse the vapors and to assist in conveying the material without damage thereto,

even though the emulsion side of the sensitized layer may be of a relatively delicate nature.

The belt 14 is passed about a plurality of rollers 15, 16, and 17 and a larger roller 18 which is preferably rubber covered and driven at a speed consistent with the speed at which material is to be advanced through the developing zone.

The sealing sleeve is likewise guided about guide rollers 19, 20, 21, and 22, the latter preferably being a driving element and positively rotated in a manner well known to those skilled in the art.

Directed toward the front of the machine is an inclined material receiving or stacking tray comprised of a flat base member 23 and a plurality of stops 24. These stops 24 are movable along the inclined base 23 and are positioned and held at desired points by a suitable retentive mechanism not shown here. These stops are set so as to accommodate the particular size of material being handled, for example, the sheets S, a plurality of which are shown stacked adjacent the upper or inner end of the receiving means.

The developed, sensitized sheets are carried upwardly and remain in contact with the sealing sleeve 13 after the same has left the vicinity of the developing zone and these sheets are then guided between the outer surface of the sleeve 13 as it passes about roller 22 and a plurality of tapes, belts, or the like 25 passing about the guide rollers 26, 27, and 28. The roller 28, preferably rubber covered and of greater diameter than the others, is driven and tends to advance the said tapes 25 at the same surface speed as the sealing sleeve. If desired, the separate tapes or belts 25 may be supplanted by one single belt or sheet member although generally this is less satisfactory than the series of independent members spaced a few inches apart.

The tapes 25 will hereinafter be referred to as the first series of tapes. A second series of tapes 29 is caused to function with the first, these being effective during front delivery. These tapes 29 pass about a plurality of rollers 30, 31, and 32, and, normally, no one of these is positively driven since they function satisfactorily by contact with their companion tapes. However, if desired, some one of the members about which these tapes 29 pass may be positively rotated.

The roller 32 mounted at the lower end of a pair of arms 33 pivoted at 31 may be swung upwardly to the dot and dash line position. This movement is effected by a control lever 34 which forms a projection from a triangular plate 35 connected to the machine casing by a link 36. The plate 35 interconnects with the arms 33 by a chain 37 having its ends connected at spaced points on the plate and passing over a sprocket 38 fixed to one of the arms 33, to swing the said second series of tapes to and from the full line and dot and dash line positions.

A counterweight 39 at the end of an arm 40 may be swung about pivot 41 and is controlled through a chain 42 which also passes upwardly and about a sprocket fixed to the pivot member 31 by which the arms 33 are swung as above described. This counterweight just balances the weight of the tapes, the arms 33 and the roller 32 so that the force required to move the parts from one position to another and for maintaining them in any position is held at a minimum.

A supporting beam 43 crosses the machine parallel to the rollers 22, 28, etc., and has attached for support thereon a plurality of spring presser fingers 44 which bear against the tapes 25 as they pass about the roller 28. These presser fingers engage the material S as it is delivered from between the sealing sleeve and tapes 25 and guide it as shown in the dot and dash lines, outwardly at the back of the machine in the event the second series of tapes 29 have been moved to the dot and dash line position (rear delivery). When the series of tapes 29 is in the full line position (front delivery), then the fingers 44 direct the sensitized layers so that they continue along with the tapes 25, being maintained in contact therewith by the second series of tapes 29 until the sheet material S is delivered over the top of roller 27 to be stacked or otherwise disposed of at the front of the machine. The roller 27 is positioned as shown in the figure so that the sheets will, when the stops 24 are properly set, cause stacking of the material as shown.

The delivery of the material to the front or to the rear may be to any receptacle, for example, one in which stacking is not contemplated. The driving of the first series of tapes 25 may be dispensed with and those tapes are then moved due to the frictional contact between them and the sealing sleeve. The tapes themselves may be spaced throughout different extents depending upon conditions and upon the material to be handled. The material from which they are made may vary although fabric tapes are found quite satisfactory and are normally preferred.

The spring presser fingers may take different forms so long as they guide the material being delivered so that it must enter between the tapes 25 and 29 when the latter are in the full line position, but so that the said material will be ejected toward the back of the machine at other times.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This application is, therefore, not to be limited to the precise details described, but is intended to cover all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. Front and rear sheet delivery means for dry developing machines having a perforated developer vaporizing chamber over the perforated portion of which printed sensitized material is moved for development, a sealing sleeve overlying said perforated portion of the chamber and means for advancing said sleeve for moving the said sensitized material past the chamber, said front and rear delivery means comprising a portion of the said sealing sleeve extending beyond the perforated chamber, a roller over which said sleeve is passed and two series of tapes cooperating therewith, the first said series of tapes having guide means by which the tapes are maintained in engagement with the sealing sleeve as it passes over said roller and are also positioned to receive sheet material after it has moved through the developing zone, said second series of tapes having guide means over which they pass and by which they are maintained in contact with said first series of tapes over a portion of the extent of their travel, one said guide means being movable for varying the extent of said contact, and a plurality of presser means engageable with the

sheet material as it emerges from between the said sealing sleeve and first series of tapes for positively guiding that material between the first and second series of tapes when the second series of tapes is in one position, but for ejecting that material at the rear of the machine when said second series of tapes is in its other position.

2. Front and rear sheet delivery means for dry developing machines having a perforated developer vaporizing chamber over the perforated portion of which printed sensitized material is moved for development, a sealing sleeve overlying said perforated portion of the chamber and means for advancing said sleeve for moving the said sensitized material past the chamber, said front and rear delivery means comprising a portion of the said sealing sleeve extending beyond the perforated chamber, a roller over which said extending portion of said sleeve is passed and two series of tapes cooperating therewith, the first said series of tapes having guide means by which the tapes are maintained in engagement with the sealing sleeve as it passes over said roller and are also so positioned and maintained in contact with the said sleeve as to receive sheet material after it has moved through the developing zone, said second series of tapes having guide means comprising a plurality of rollers over which the said tapes pass and by which they are maintained in contact with said first series of tapes as said first series of tapes passes about one of its guide means and to a point adjacent the next guide means therefor, one of said rollers about which the second series of tapes is passed having supporting means by which it may be displaced for varying the extent of said contact between the two series of tapes, and a plurality of presser means engageable with the sheet material as it emerges from between the said sealing sleeve and first series of tapes for positively guiding that material between the first and second series of tapes when the second series of tapes is in one position, but for ejecting that material at the rear of the machine when said second series of tapes is in its other position.

3. Front and rear sheet delivery means according to claim 2, wherein there is provided sheet material receiving means adjacent the first series of tapes and slightly below a level at which sheet material is discharged from between the two said series of tapes when the mechanism is set for front delivery whereby the said delivered material is so deposited in the said receiving means as to be stacked in sequence.

4. Front and rear sheet delivery means according to claim 2, wherein the said first series of tapes is passed about three guide rollers, one of which is positively driven, two of said guide rollers being positioned adjacent that roller over which the sealing sleeve is passed so that the tapes guided thereby are maintained in contact with that sealing sleeve for substantially 180°.

5. Front and rear sheet delivery means according to claim 2, wherein said second series of tapes is passed about three guide rollers two of said rollers being relatively fixed in position while the third is mounted at the ends of arms adapted to be swung about a pivot so that the contact of the said second series of tapes with the first may be increased or diminished adjacent that point at which the first said series of tapes passes about one of their guide means adjacent the presser means.

6. Front and rear sheet delivery means according to claim 2, wherein the said presser means comprises a plurality of spring elements and means on which said spring elements are supported so that they bear against the said first series of tapes at a position adjacent that point at which the said first and second series of tapes are in contact when the mechanism is set for front delivery, said presser means and the support therefor extending toward the sealing sleeve as it passes about its guide means so that sheet material emerging from between the said sealing sleeve and first series of tapes is constrained to pass between the said tapes and presser means.

7. Front and rear sheet delivery means according to claim 2, wherein manual control means is provided for swinging the said movable guide member to and from its extreme positions thereby to vary the contact between the first and second series of tapes, and counterbalancing means for said movable guide means for the second series of tapes.

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