

May 4, 1943.

E. W. BELLUCHE ET AL

2,318,451

SHEET DELIVERY

Filed Jan. 21, 1941

Fig 1

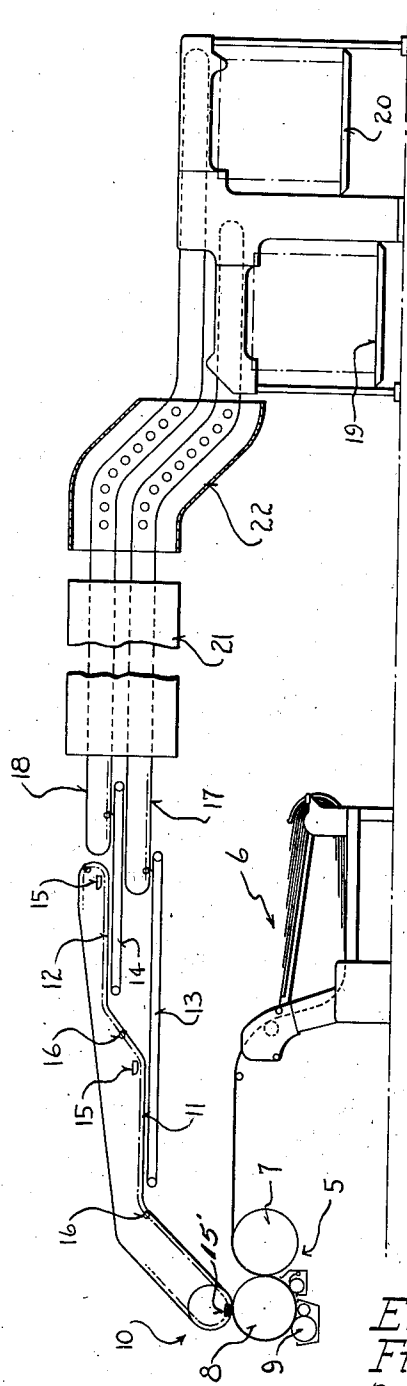
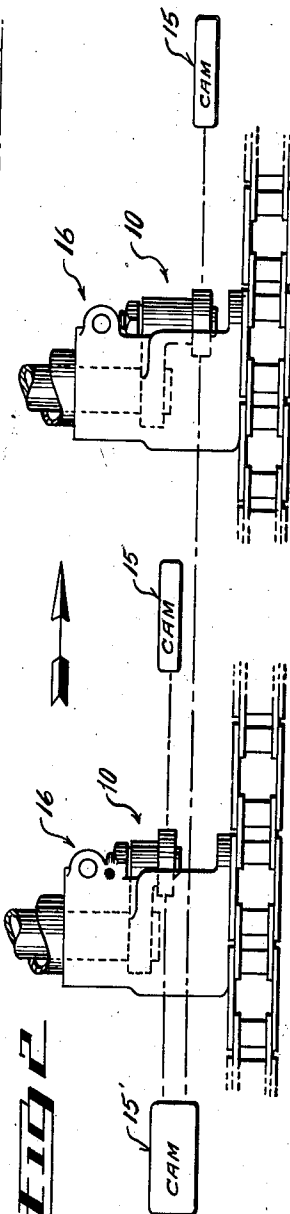


Fig 2

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UNITED STATES PATENT OFFICE

2,318,451

SHEET DELIVERY

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Application January 21, 1941, Serial No. 375,192

9 Claims. (Cl. 271-64)

This invention relates to sheet handling equipment and refers particularly to a sheet delivery mechanism for use with printing machines and especially with varnishing machines.

In some types of printing, and particularly in varnishing, it is necessary that the sheets be dried before being piled on the delivery platform.

Heretofore, this has entailed a long delivery conveyor running through a drying oven and possibly a cooler to obtain sufficient drying time. The space required for such an installation is obviously an important factor, for in many instances the overall length of the unit was considerably greater than one hundred feet.

It is, therefore, an object of this invention to provide an improved delivery mechanism especially adapted for the delivery of sheets from a varnisher or the like which is so designed that it is materially shorter than past practice necessitated, but which at the same time retains the desirable characteristics of proven types of sheet conveyor mechanisms.

To this end, the invention proposes generally the provision of a plurality of slow moving sheet conveyors to carry the sheets through a drying chamber or chambers at a linear speed much less than the speed at which the sheets are discharged from the machine, and suitable transfer mechanism for carrying sheets from the varnisher or other machine successively to the plurality of slow moving conveyors. This arrangement effects a considerable saving in space and assures adequate drying time without sacrifice of output.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a diagrammatic view in side elevation illustrating one embodiment of this invention, and

Figure 2 is a fragmentary top view illustrating the manner in which sheets are released from the delivery conveyor to the different slow moving conveyors.

Referring now more particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 5 designates generally a varnisher or other printing press to which sheets are fed by a feeder 6, which in this instance, is a continuous feeder. Any other type of feeder may be employed if desired.

As the sheets enter the varnisher they pass over a feed-in cylinder 7 which transfers them to a varnish cylinder 8. In their travel with the varnish cylinder they are carried past a varnish roll 9 and then transferred to a delivery conveyor indicated generally by the numeral 10.

Obviously, the linear speed of the delivery conveyor 10 must be that of the varnisher or press and for purposes of illustration, it may be assumed that the linear speed of the press and delivery conveyor is seventy-five (75) inches per minute.

The delivery conveyor 10 is of the conventional endless-chain-gripper-bar type trained about suitable sprockets and guided by tracks (not shown) to have two horizontal discharge runs 11 and 12. These two discharge runs are on different levels and endwise spaced.

Beneath the discharge runs 11 and 12 are transfer conveyors 13 and 14 respectively. These conveyors may be conventional tapes trained about suitable rolls. They have a linear speed less than that of the delivery conveyor, which for purposes of illustration, may be fifty (50) inches per minute.

At each discharge run there is also a gripper opening cam 15. These cams are offset transversely and the cam followers of the gripper bars 16, which may be like that shown in United States Letter Patent No. 2,024,140, issued December 17, 1935, to Frank R. Belluche, are alternately equally offset and so positioned that the grippers of alternate bars are opened at each discharge run. This is illustrated in Figure 2. Hence, successive sheets are deposited first on one and then the other of the transfer conveyors.

At the receiving end of the delivery conveyor 10 where the sheets are taken from the varnish cylinder 8, a cam 15' wide enough to be engaged by the offset cam followers of all of the gripper bars opens the grippers in time to receive and grip the sheets.

Each transfer conveyor carries the sheets received thereby to a separate endless-chain-gripper-bar-type sheet conveyor traveling at a relatively slow speed, which, for purposes of illustration may be twenty-four (24) inches per minute. The slow moving conveyor which is fed

by the transfer conveyor 13 is indicated by the numeral 17 and the other slow moving conveyor which receives sheets from the transfer conveyor 14 is indicated by the numeral 18.

It is to be observed that these slow moving conveyors are superimposed one above the other and have their receiving end portions disposed above the discharge ends of the transfer conveyors so that the gripper bars are in position to have sheets fed thereto by the transfer conveyors.

It is also to be noted that each slow moving conveyor leads to a separate discharge point. These discharge points may be conventional pile platforms 19 and 20 respectively associated with the conveyors 17 and 18.

The superimposed portions of the slow moving conveyors may carry the sheets through any treating zone desired, but when the equipment is used with a varnisher these slow moving conveyors carry the sheets through a driving chamber or chambers shown in this instance as an oven 21 and a cooler 22.

Because of the slow linear speed of the sheets as they are carried along by the conveyors 17 and 18, adequate time is available for drying or other treatment without entailing an excessively long unit and without in anywise sacrificing total output volume.

The advantages of the reduction in required space which this equipment effects are quite apparent, but it is desired to also point out that the slow linear speed of the conveyors 17 and 18 permits bringing the sheets slowly to the delivery platforms 19 and 20.

It will also be readily apparent to those skilled in the art to which this invention appertains that while the delivery mechanism has been illustrated and described in conjunction with a varnisher, it is equally susceptible to use with any machine from which sheets are discharged at a relatively high speed and wherein further treatment of the sheets, requiring time, is necessary.

What I claim as my invention is:

1. A sheet delivery for paper treating machines such as printing presses, comprising: a conveyor for carrying sheets from the machine; a plurality of conveyors for carrying sheets to separate delivery points, said plurality of conveyors having their sheet conveying stretches traveling in the same direction and along substantially parallel paths so that sheets carried thereby move simultaneously and adjacent to each other along said parallel paths, and said conveyors having a linear speed considerably less than that of the first named conveyor; and means for transferring successive sheets carried by the first named conveyor to different ones of said plurality of conveyors.

2. Sheet delivery mechanism for carrying sheets slowly through a treatment zone from a machine which discharges sheets rapidly, comprising: a fast moving conveyor for receiving sheets from the machine; a plurality of slow moving conveyors having their sheet conveying stretches traveling in the same direction and along substantially parallel paths extending through said treatment zone so as to simultaneously carry sheets through the treatment zone; and means for transferring successive sheets from the fast moving conveyor first to one and then another of said slow moving conveyors.

3. Sheet delivery mechanism for carrying sheets slowly through a treatment zone from a machine which discharges sheets rapidly, com-

prising: a fast moving conveyor for receiving sheets from the machine; a plurality of slow moving conveyors having their sheet conveying stretches traveling in the same direction and along substantially parallel paths extending through said treatment zone so as to simultaneously carry sheets through the treatment zone to separate delivery points; and means for transferring successive sheets from the fast moving conveyor first to one and then another of said slow moving conveyors.

4. A sheet delivery mechanism for receiving sheets from a fast discharging machine and for carrying them slowly through a defined zone, comprising: a fast moving gripper-bar type of sheet conveyor adapted to receive sheets discharged from the machine; a plurality of slow moving gripper-bar type sheet conveyors having their conveying stretches traveling in the same direction and along substantially parallel paths, said paths extending through said defined zone so that sheets carried by the slow moving conveyors travel simultaneously through the defined zone and each conveyor having a separate discharge point; and means for successively transferring sheets carried by the gripper bars of the fast moving conveyor first to a gripper bar of one slow moving conveyor and then to a gripper bar of another slow moving conveyor.

5. A sheet delivery mechanism for receiving sheets from a fast discharging machine and carrying them slowly through a given zone, comprising: a fast moving gripper-bar type of sheet conveyor adapted to receive sheets from the machine, said fast moving conveyor having a plurality of substantially horizontal discharge runs disposed on different levels; an equal plurality of slow moving gripper-bar type sheet conveyors having portions thereof superimposed and each being adapted to carry sheets through said zone to a separate discharge point; and transfer conveyors connecting each discharge run of the fast moving conveyor with one of the slow moving conveyors for carrying sheets from the fast moving conveyor to the slow moving conveyors.

6. In sheet handling equipment the combination of: a fast moving chain type sheet conveyor having a plurality of discharge runs disposed on different levels; transfer conveyors under the discharge runs of the fast moving conveyor to successively receive sheets from said fast moving conveyor; and slow moving endless chain type conveyors, each having a receiving end in juxtaposition to one transfer conveyor to receive sheets therefrom and carry them slowly to separate discharge points.

7. In sheet handling equipment the combination of: a fast moving chain type sheet conveyor having a plurality of discharge runs disposed on different levels; transfer conveyors under the discharge runs of the fast moving conveyor to successively receive sheets from said fast moving conveyor; slow moving endless chain type conveyors, each having a receiving end in juxtaposition to one transfer conveyor to receive sheets therefrom and carry them slowly to separate discharge points; and means in the path of the slow moving conveyors for treating sheets as they are carried along by said slow moving conveyors, the slow moving conveyors being superimposed adjacent to said means so that a plurality of sheets are carried past said means at the same time.

8. Sheet delivery mechanism for use with machines for treating or performing work on sheets,

comprising: a single delivery conveyor for receiving sheets from the machine at the speed of the machine, said delivery conveyor having a plurality of discharge points and being adapted to successively discharge sheets carried thereby at said successive discharge points; a plurality of slow moving sheet conveyors for carrying sheets from said discharge points to separate sheet receiving stations; and means for successively transferring sheets at the discharge points of the delivery conveyor successively to one and then another of said plurality of slow moving conveyors.

9. In a sheet delivery mechanism: a fast moving endless chain gripper-bar type sheet con- 15

veyor having a plurality of discharge runs on different levels; a transfer conveyor in juxtaposition to each discharge run for receiving sheets therefrom; gripper opening means at each discharge run so coordinated with the gripper bars and so related to each other that successive gripper bars are opened at different discharge runs so that successive sheets are fed to different transfer conveyors; and a plurality of slow moving sheet conveyors, each adapted to receive sheets from one transfer conveyor, said plurality of slow moving conveyors carrying the sheets to separate discharge points.

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