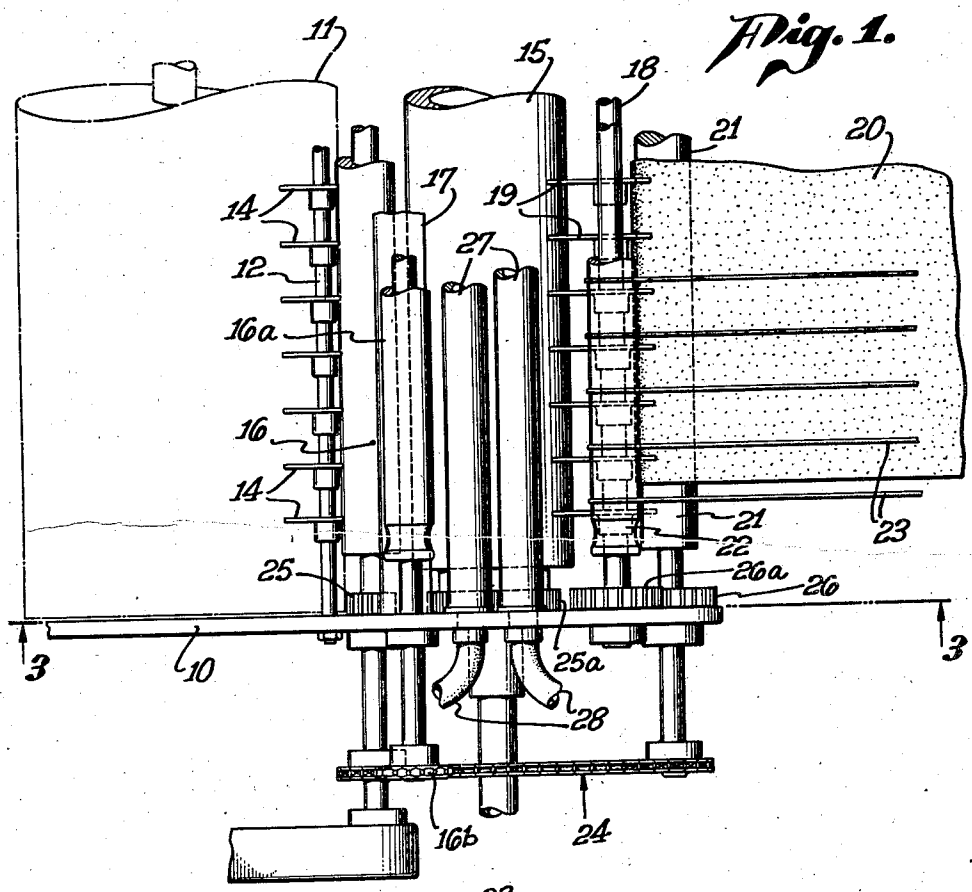
Oct. 1, 1946. N. S. WELK 2,408,498

APPARATUS FOR COOLING AND HARDENING WAX CARBON COATINGS

Filed April 24, 1944 2 Sheets-Sheet 1

Fig. 1.



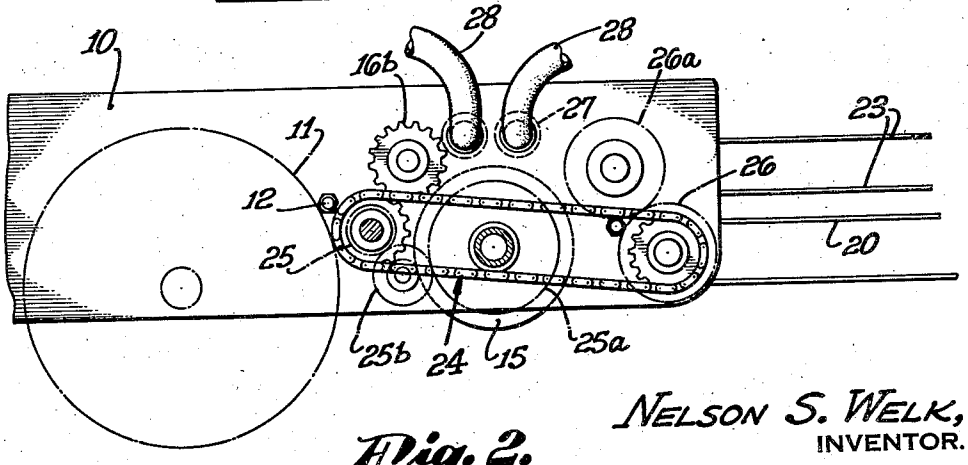


Fig. 2.

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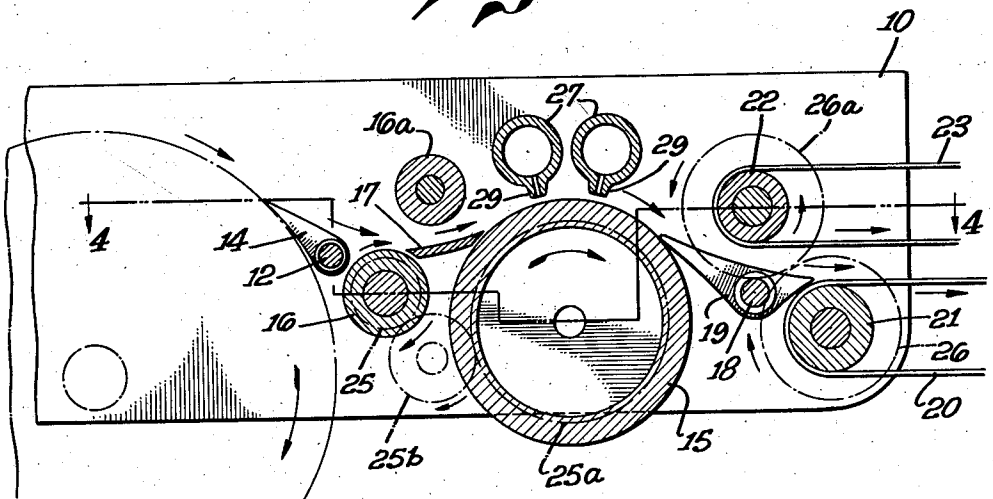
BY Oscar A. Mellin
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Oct. 1, 1946. N. S. WELK 2,408,498

APPARATUS FOR COOLING AND HARDENING WAX CARBON COATINGS

Filed April 24, 1944 2 Sheets-Sheet 2

Fig. 3.



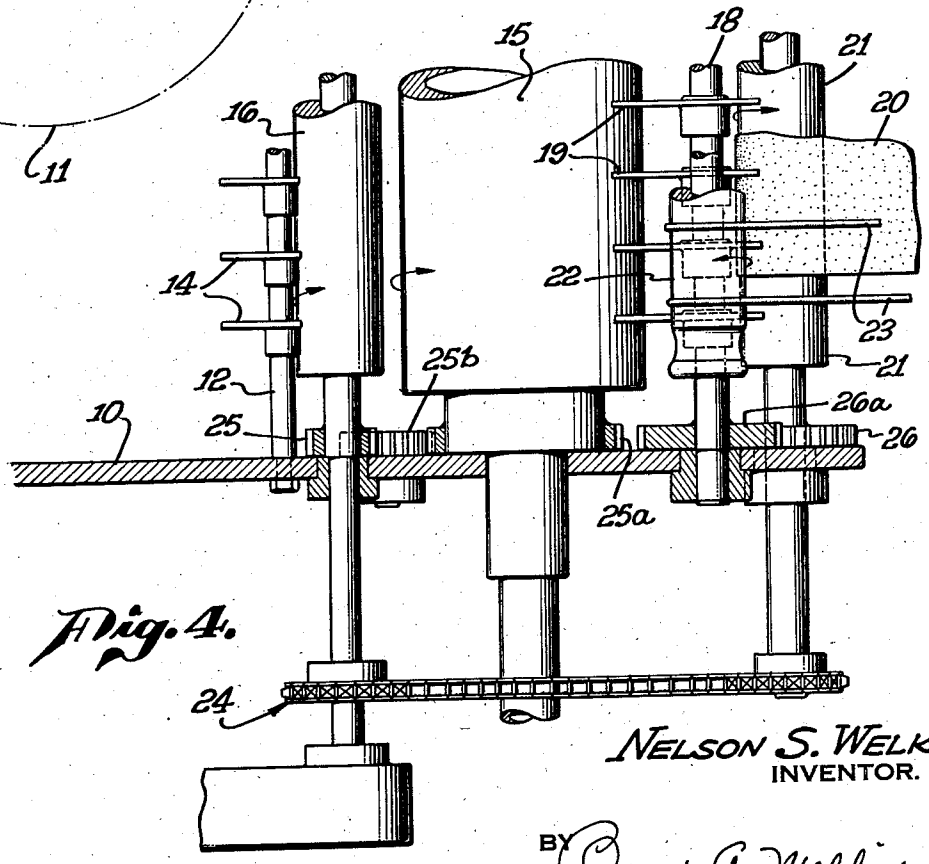


Fig. 4.

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Patented Oct. 1, 1946

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UNITED STATES PATENT OFFICE

2,408,498

APPARATUS FOR COOLING AND HARDENING WAX CARBON COATINGS

Nelson S. Welk, Athens, Ohio, assignor to The McBee Company, Athens, Ohio, a corporation

Application April 24, 1944, Serial No. 532,524

1 Claim. (Cl. 101—416)

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This invention relates to presses for the application of wax carbon to sheets of paper. Such a press is disclosed in Letters Patent of the United States No. 1,860,957. In general, such a press is widely known in the art as a "Kelly" type press and is especially equipped as shown in the aforesaid patent for applying wax carbon spots to wax sheets. For the reason that the construction and operation of such a press is well known it is not illustrated and described herein.

It is the principal object of my present invention to provide such presses with an improved means to cool the wax carbon coating of the paper sheets as they are delivered from the printing cylinder in order to harden the carbon and give it gloss prior to the final delivery of the sheets from the press.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a plan view of the apparatus embodying the preferred form of my invention.

Fig. 2 is a side view of the same.

Fig. 3 is a longitudinal section taken on line 3—3 of Fig. 1.

Fig. 4 is a longitudinal section taken on line 4—4 of Fig. 3.

Referring more particularly to the accompanying drawings, 10 indicates a pair of side frames formed as a rigid part of the printing press frame and located at the delivery end of the press. The main frame of the press, of course, carries in the usual manner a printing cylinder 11 (shown in dot and dash lines) which operates in the conventional fashion. Extending laterally between the side frames 10 is a stripper bar 12 carrying stripper fingers 14 so positioned that they will strip the printed sheets from the printing cylinder 11 and direct them substantially horizontally rearwardly between the frames 10.

In the present instance the printing is the application of heated wax carbon to one side of a sheet of paper run through the press. When the sheets are delivered from the printing cylinder 11 the wax carbon coating will be uppermost so that the under or uncoated side of the sheet will be engaged by the stripper fingers 14.

Arranged rearwardly of the printing cylinder at a spaced distance therefrom is a cooling cylinder 15 having its ends suitably journaled in the side frames 10. To direct the printed sheets over this cooling cylinder 15, a transfer roller 16 and a guide roller 16a are provided intermediate the printing cylinder 11 and the cooling cylinder 15.

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The transfer roller 16 is arranged closely adjacent the stripper bar 12 so as to receive the sheets from the fingers 14. A suitable bridge 17 secured at its ends to the side frames is arranged between the transfer roller 16 and the cooling cylinder 15 so as to guide the paper from the transfer roller 16 to the cooling cylinder 15.

At the rear side of the cooling cylinder 15 is a second stripper bar 18 carrying stripper members 19 so formed as to strip the sheets from the cooling cylinder 15 and direct them onto the top flight of a conveyer 20. This conveyer as illustrated in the drawings, is composed of a plurality of narrow fabric belts spaced apart as shown. These belts are disposed over a roller pulley 21 journaled in the side frames 10 as illustrated. Disposed over the conveyer 20 is a roller pulley 22 journaled in the side frames 10. A plurality of spaced string belts 23 are arranged over this roller in parallelism with the top flight of the conveyer 20. The bottom flights of the string belts 23 are spaced slightly above the top flight of the conveyer 20 and travel in the same direction at the same speed so that they will act to hold the paper sheets flatwise on the conveyer 20 for delivery at the end of the conveyer for stacking.

It should be pointed out that the printing cylinder 11, the transfer roller 16, the cooling cylinder 15, the conveyer roller 21 revolve in the same direction at the proper relative peripheral speeds so that sheets directed from the printing cylinder 11 will be transferred by the transfer roller 16 to the cooling cylinder 15 and thence to the top flight of the conveyer 20 for delivery from the machine. It is obvious, of course, that the string belt roller pulley 22 revolves in a direction opposite from the roller 21 at the same peripheral speed so that the lower flight of the string belts 23 and the upper flight of the conveyer 20 will travel in the same direction at the same rate of speed.

To drive the rollers, as just described, a drive (not shown) is transmitted from the driving mechanism of the press proper to the shaft of the transfer roller 16. A sprocket and chain drive 24 transmits a drive from the shaft of the transfer roller 16 to the shaft of the conveyer roller pulley 21. Spur gears 25 and 25a on the shaft of the roller 16 and the shaft of the cooling cylinder 15 effects driving of the latter. Spur gears 26 and 26a effect a drive between the roller pulleys 21 and 22. The shaft of the guide roller 16a is fitted with a sprocket 16b which engages the

chain of the drive 24 to effect driving of that roller.

To cool or chill the cooling cylinder 15, the latter is hollow so that a cooling fluid or liquid may be circulated therethrough to cool or chill its cylindrical wall. For this purpose the end shafts of the cooling cylinder 16 are hollow and suitably connected at their outer ends with fluid or liquid conducting connections so that at all times during the operation of the cylinder 16, a cooling fluid or liquid may be circulated therethrough.

In order to effect a rapid cooling of the carbon on sheets passing over the roller 15, I have provided means for causing the sheets to be placed in firm contact with the exterior of the peripheral wall of the cylinder 15 during the passage of the sheets thereover. This means comprises a pair of air-conducting tubes 27 arranged parallel to the cylinder 15 and fixed at their ends to the side frames 10. One end of the tubes are connected to flexible conduits 28 communicating with a source of air under pressure. The tubes 27 are, of course, stationarily fixed in the frame as illustrated.

Each tube 27 is formed with a row of spaced nozzles 29 directed toward the peripheral surface of the cylinder 15 at the upper side thereof. When air under pressure is directed to the tubes 27 a multiplicity of fine jets or streams of air will emanate from the nozzles 29 and cause the sheet directed between the nozzles and the cylinder 15 to be pressed in firm contact with the cylinder. The combined effect of the air nozzles and the cooling action of the cylinder 15 is sufficient to cause rapid cooling and hardening of the carbon so that it will discharge from the cylinder 15 hardened and with a glossy surface and may be promptly delivered from the machine and stacked.

In operation of my apparatus, sheets printed in the "Kelly" press and delivered by the printing cylinder 11 may be stripped therefrom by the stripper fingers 14 and transferred by the transfer roller 16 and the bridge 17 to the upper surface of the cooling cylinder 15. As the sheets pass over this cylinder they will be pressed in close contact therewith by the action of the air jets emanating from the nozzles 29 of the tubes 27. This cooling action will result in hardening and cooling the carbon on the sheets. After

the sheets pass the nozzles 29 they will be stripped from the cooling cylinder 15 by the stripper members 19 and will be directed flatwise onto the upper flight of the conveyer 20. They will be held in a flat condition by the lower flight of the string belts 23 superposed over the conveyer 20. As the sheets are delivered by the conveyer 20 they are, of course, stacked in the usual fashion and this can be accomplished without smearing or otherwise disturbing the carbon due to the fact that it has been cooled and hardened before delivery as previously described.

From the foregoing it is obvious that I have provided a very simple but effective apparatus for cooling and hardening the wax carbon coating of paper sheets as the latter are delivered from the printing cylinder of a press. It should be pointed out that by so hardening the carbon it is given a glossy surface which enhances its appearance.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made therein by those skilled in the art without departing from the spirit of the invention as defined in the appended claim.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

In combination with a printing press for printing wax carbon on sheets of paper, said press including a printing cylinder, a cooling cylinder arranged at a spaced distance from the printing cylinder with its axis parallel thereto and revolving at substantially the same peripheral speed, transfer means between the printing cylinder and the cooling cylinder for transferring the sheets from the printing cylinder over the cooling cylinder, a plurality of nozzles arranged longitudinally over the cooling cylinder to direct air jets towards the upper surface thereof whereby sheets directed to the cooling cylinder will pass between said jets and said cooling cylinder, a conveyer for receiving sheets from the cooling cylinder and discharging them from the machine, and transfer means between said conveyer and said cooling cylinder for stripping the sheets from the cooling cylinder and directing them to the conveyer, and string belts overlying the conveyer with their bottom flights spaced over the conveyer to maintain the sheets flatwise on the conveyer.

NELSON S. WELK.