

W. A. SPURRIER.
 DRYING APPARATUS FOR PRINTING PRESSES.
 APPLICATION FILED MAY 15, 1911.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

1,050,399.

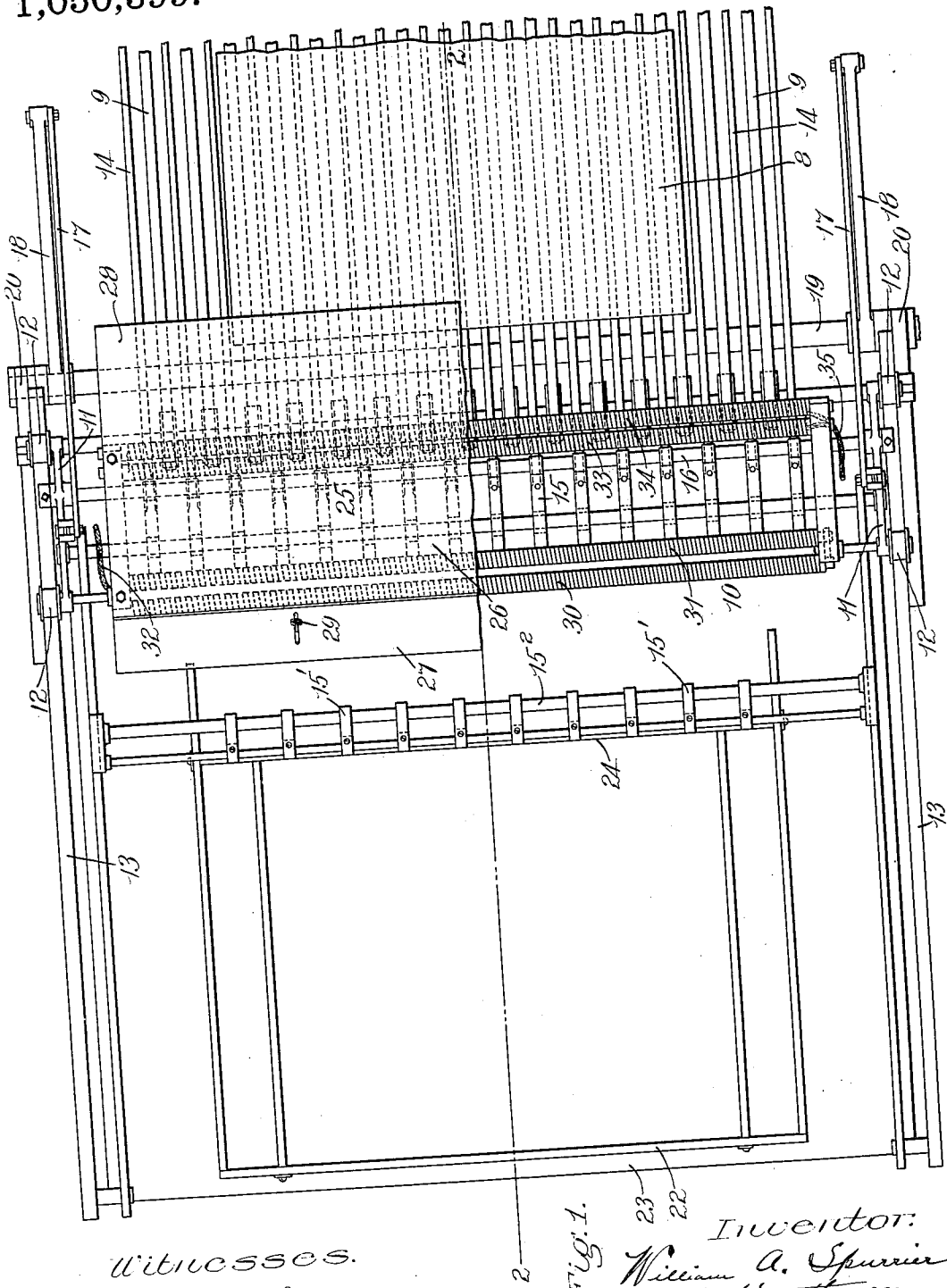


FIG. 1.

WITNESSES.
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 Sydney E. Taft.

Inventor:
 William A. Spurrer,
 by his attorney,
 Charles S. Gooding.

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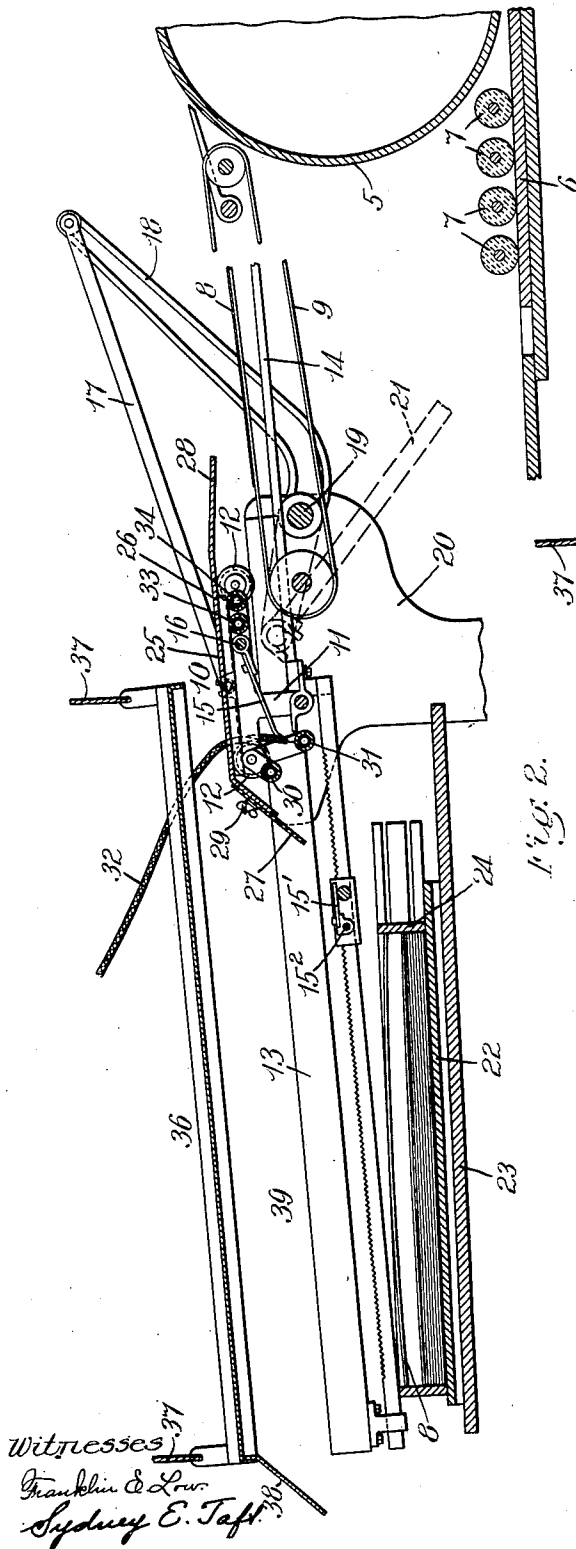


Fig. 2.

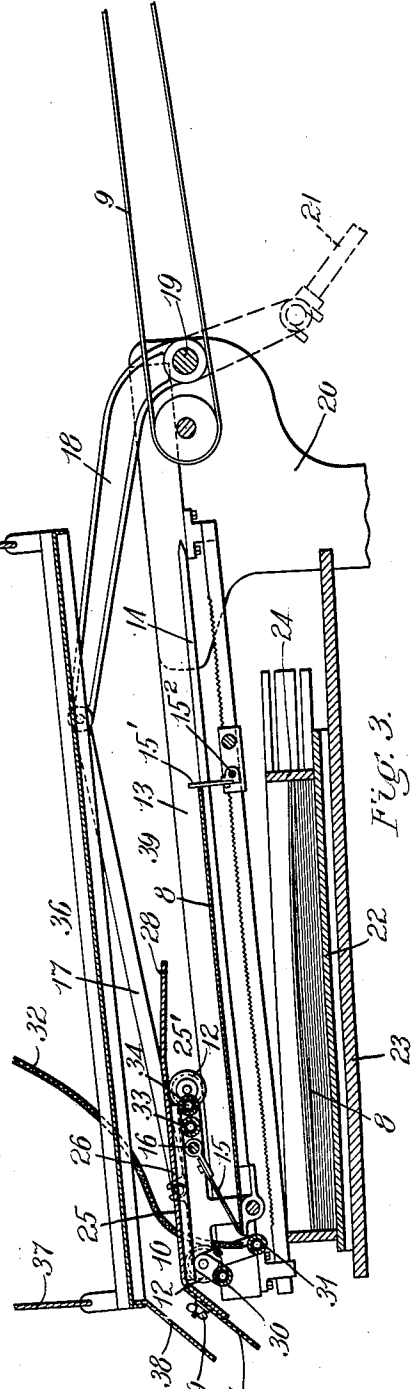


Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM A. SPURRIER, OF NEWTON, MASSACHUSETTS.

DRYING APPARATUS FOR PRINTING-PRESSES.

1,050,399.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed May 15, 1911. Serial No. 627,238.

To all whom it may concern:

Be it known that I, WILLIAM A. SPURRIER, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Drying Apparatus for Printing-Presses, of which the following is a specification.

This invention relates to an apparatus for drying freshly printed ink upon the surface of sheets of paper and is also adapted to dry sheets of paper whether the same have ink freshly printed upon their surface or not, the same being adapted to dry sheets of paper or to "season" the same in readiness to be used in printing and lithographing.

The object of the invention is to dry the sheet of paper and the ink thereon, either or both, as the same is passing from the impression cylinder of a printing press to the receiver or frame, in which the sheets are placed one by one by suitable delivery mechanism well known to those skilled in the art. In general, to accomplish this result the apparatus of my invention embodies means for holding sheets of paper freshly printed, or otherwise, and by a suitable carrying mechanism moving said sheets of paper through an air chamber in which the air is heated, preferably by electrically heated tubes, and finally delivering the said sheets one at a time to a suitable receptacle, the apparatus being provided with a hood or hoods to contain and to deflect the heated air upon the pile of sheets on the delivery table and upon both surfaces of the sheet.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a plan view of an apparatus embodying my invention. Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1, illustrating in addition to the parts shown in Fig. 1 the impression cylinder of a printing press and the type bed thereof, the same being broken away to save space in the drawings. Fig. 3 is a sectional elevation, similar to Fig. 2, illustrating the parts in different relative positions.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 is the impression cylinder of a printing press.

6 is the type bed.

7, 7 are inking rollers.

A reciprocatory motion is imparted to the type bed 6 and a rotary motion is imparted to the impression cylinder 5 in a manner well known to those skilled in the art. The sheets of paper 8 after being printed pass from the impression cylinder 5 onto tapes 9, 9 constituting a holder for said sheets and these sheets of paper are delivered by the tapes 9, 9 to a carrier 10 which consists of a sliding frame 11 mounted upon rollers 12, 12, which rollers are adapted to roll along the upper surface of a frame 13. Said carrier also has fastened thereto a series of sticks 14, 14 upon which the sheets 8 rest as the carrier is moved forward, the sheets during the forward movement of the carrier being held on said carrier by fingers 15, 15, as illustrated in Fig. 3.

The fingers 15, 15 are fastened to a rock shaft 16 to which a rocking motion is imparted by suitable mechanism, not shown in the drawings, but well known to those skilled in this art, at the proper time to operate said fingers to grip the ends of the sheet 8 and to release the same during the return movement of the carrier 10. Another set of fingers 15', 15' are provided which rock upon a pivot 15'', these fingers constituting stop fingers to prevent the sheet 8 from returning with the carrier upon the return movement of said carrier. Said fingers are rocked from the position illustrated in Fig. 2 to the position illustrated in Fig. 3 and vice versa by suitable mechanism well known to those skilled in this art at the proper time to hold the sheet 8 from returning with its carrier and also at the proper time to clear said sheet 8 as it is brought forward by said carrier.

A reciprocatory motion is imparted to the sliding frame 11 together with the sticks 14 fast thereto and forming a part of said carrier, by links 17, 17 which are connected at one end to said carrier frame and at the other end to rocker arms 18, 18, the rocker arms 18 being pivoted at 19 to the frame 20 of the machine and having a rocking movement imparted thereto by links 21, 21 which are connected to a suitable mechanism to impart a reciprocatory motion thereto, whereby the rocker arms 18 are given a rocking movement and through the links 17, 17 a reciprocatory movement is imparted to the

carrier 10. When the sheet upon the carrier frame arrives at the position illustrated in Fig. 3, which is the extreme forward position of said carrier, the motion of the carrier frame is reversed and the same is moved toward the right from the position illustrated in Fig. 3 to that illustrated in Fig. 2 to receive another sheet. The fingers 15 at the first part of this return movement are lifted to release the sheet 8 and allow the same to drop into the receiver 22, said receiver being located upon a suitable table or shelf 23 and having an adjustable side 24 to enable the same to be adjusted to receive different sizes of sheets.

A hood 25 is fastened to the carrier frame 11, this hood consisting of a top plate 26 with a downwardly inclined baffle plate 27 at the front end thereof and another downwardly inclined baffle plate 28 at the rear end thereof. The baffle plates 27 and 28 extend transversely of the hood 25, the baffle plate 27 being adjustably fastened to said hood by means of clamp nuts 29, 29 so that said baffle plate 27 may be moved upwardly or downwardly to increase the distance to which the forward baffle plate of the hood 25 extends downwardly below the top plate 26 of said hood.

The space included beneath and within the hood 25 constitutes an air chamber 25' on the carrier 10 and in this air chamber are located a plurality of heater members which extend transversely of the carrier and are formed of tubing heated by an electric current. The tube 30 is a heater member which extends transversely of the carrier 10 above the plane in which the sheet 8 rests while on said carrier, while the tube 31 is a heater member which extends transversely of the carrier and is located below the plane in which the sheet 8 rests while on said carrier. The heater members 30 and 31 consist of tubes surrounded by an electric conductor, as seen in Figs. 1 and 3; said conductor passes through a conduit 32 and is wound around the tube of the member 30, thence extends across to the tube of the member 31, and after being wound around that member, returns into the conduit 32, and from thence said electric conductor is connected to a suitable source of electric power. In addition to the heater members 30 and 31 there are two heater members 33 and 34, also consisting of tubes surrounded by an electric conductor which is wound around one of the tubes 33, then crosses over to the other tube 34 and is then carried by means of a conduit 35 to a source of electric power, whereby the different heater members are kept continually heated without danger of combustion or setting fire to the sheets of paper.

Above the receiver 22 is permanently located a hood 36 which may be raised and

lowered by means of cords 37, 37 to any desired height or distance from said receiver. The hood 36 has a downwardly inclined baffle plate 38 at the front end thereof and the space included between said hood 36 and the receiver 22 constitutes an air chamber 39.

The general operation of the mechanism hereinbefore specifically described is as follows: The sheet of paper 8 passes from the impression cylinder 5 onto the tapes 9 and by them is carried into the heated air in the chamber 25' and placed upon the sticks 14 forming a part of the carrier 10. The fingers 15 hold the forward end of the sheet 8 as the carrier frame 11 is moved forward, together with the sticks 14 and the hood 25 from the position illustrated in Fig. 2 to that illustrated in Fig. 3. As the sheet is thus carried forward, it is carried through the heated air into the chamber 39 and the heat is at this time applied both at the top and bottom of the sheet 8, but more especially to the top surface or printed side of the sheet as the sheet enters the chamber upon its forward movement, the hood 25, it being understood, traveling with said sheet together with the heated air in the chamber 25' and upon the return movement of the carrier the sheet passes between the heater members 30 and 31 and settles downwardly into the receiver 22 after leaving the sticks 14. As the hood 25 returns with the carrier frame, the deflector or baffle plate 27 throws the heated air in the chamber 25' downwardly upon the freshly printed upper surface of the sheet 8. Thus the sheet is given two direct and distinct applications of heat upon the freshly printed side thereof, first, upon its being brought forward into the chambers 25' and 39, and second, upon the air being forced down onto it while it is dropping into the receiver 22 by the hood 25 and the baffle plate 27 thereof during the return movement of the carrier frame and the hood 25. By moving the baffle plate 27 downwardly, more heated air may be thrown against the surface of the sheet 8 as it descends into the receiver and by moving said baffle plate upwardly less heated air may be thrown upon the surface of the sheet, as may be desired. By lowering the hood 36, the heated air in the chamber 39 is brought more closely into contact with the sheet 8 as it is brought forward and is held under more confined conditions within said hood during the forward movement of the carrier hood 25.

It will be understood that the delivery frame is made adjustable to fit the size of the sheet which is being delivered to it, about a quarter of an inch space being allowed outside of the sheet all around between the edges of the sheet and the inner surface of the receiver. It will also be seen

and understood that as the sheet falls from the carrier into the receiver, the carrier with the hood 25 is retreating and the sheet passes between the heater members 30 and 31, the heater member 30 being above the sheet and the heater member 31 being beneath the sheet, and further that as the sheet falls into the receiver 22, it falls slowly, the frame inclosing the hot air under the falling sheet and retaining said hot air for a considerable period, thus causing the sheets to rest upon heated air as they fall into the receiver instead of falling close one upon the other and thus not only dries the ink upon the surface of the paper, but also prevents the top sheet from being pressed closely against the second sheet from the top when it descends into the receiver. In this manner, the heat is applied to both sides of the sheet, but more especially to the top surface or printed side of the sheet as the sheet enters the heated chamber 25' and also when said sheet enters the heated chamber 39 during its forward movement and as the sheet settles after leaving the carrier the deflector throws the heat from the chamber down upon the freshly printed surface of the sheet, thus giving a continuous application of hot air to the top and under surface of the sheet from the time that it leaves the tapes 9 until it is delivered into the receiver 22 and finally settles down upon the sheets which have been previously delivered to said receiver.

35 While I have described the chamber 39 as covered by a hood 36, with a baffle plate 38 at the front end thereof, and the chamber 25' as covered by a hood consisting of a top 26 and baffle plates 27 and 28 at the front and rear ends of said hood, respectively, and while I prefer this construction for confining the heated air, both within the chambers 29 and 25', respectively, it is evident that the baffle plate 38 might be left off of the hood 36 and the baffle plates 27 and 28 removed from the hood 25 without departing from the spirit of my invention, so long as a hood of some form is used, even though it be a flat plate. Such a device would come within the meaning of the term "hood" as employed in the foregoing specification and in the following claims, for such a device would confine the heated air above the receptacle 22 or above the sheet while it is held upon the carrier 10 and would, therefore, perform the same function as the specifically formed hoods which I have described, although to a less extent.

What I claim and desire by Letters Patent to secure is:

1. An apparatus for drying sheets of paper and the ink thereon, having, in combination, a holder and a receiver for said sheets, a carrier adapted to carry said sheets one by one from said holder to said receiver,

a hood on said carrier adapted to extend over the sheet carried thereby and a heater member on said carrier beneath said hood.

2. An apparatus for drying sheets of paper and the ink thereon, having in combination, a holder and a receiver for said sheets, a carrier adapted to carry said sheets one by one from said holder to said receiver, a hood on said carrier adapted to extend over the sheet carried thereby, a heater member on said carrier beneath said hood, another hood located above said receiver, and mechanism adapted to move said carrier to and fro beneath said last named hood between said holder and said receiver.

3. An apparatus for drying sheets of paper and the ink thereon, having in combination, a holder and a receiver for said sheets, a carrier adapted to carry said sheets one by one from said holder to said receiver, a plurality of heater members on said carrier, one of said heater members located above and the other beneath the plane of the sheet held on said carrier.

4. An apparatus for drying sheets of paper and the ink thereon, having in combination, a receiver for said sheets of paper, a hood located above said receiver, a baffle plate extending across said hood, a carrier adapted to deliver sheets one by one to said receiver, a heater member on said carrier, and mechanism adapted to move said carrier to and fro beneath said hood.

5. An apparatus for drying sheets of paper and the ink thereon, having, in combination, a receiver for said sheets of paper, a carrier adapted to deliver sheets one by one to said receiver, a hood on said carrier, a baffle plate extending transversely of said hood, and a heater member on said carrier beneath said hood.

6. An apparatus for drying sheets of paper and the ink thereon having, in combination, a receiver for said sheets of paper, a carrier adapted to deliver sheets one by one to said receiver, a hood on said carrier, downwardly inclined baffle plates extending transversely of said hood at opposite ends thereof, respectively, and a heater member on said carrier beneath said hood.

7. A printing-press having, in combination, an impression cylinder, a receptacle for printed sheets, mechanism adapted to carry said printed sheets one at a time from said cylinder to said receptacle, said mechanism embodying a carrier, a hood on said carrier adapted to project over a sheet carried thereby, there being an air chamber therebeneath through which chamber said sheets pass while being carried from said cylinder and deposited in said receptacle, and means adapted to heat the air in said chamber.

8. A printing-press having, in combination, an impression cylinder, a receptacle for printed sheets, there being an air cham-

ber located above said receptacle, means adapted to heat the air in said chamber, means adapted to confine the air so heated above said receptacle, mechanism adapted to
3 carry said printed sheets one by one from said cylinder through said chamber to said receptacle, said mechanism embodying a carrier, a hood on said carrier adapted to project over a sheet carried thereby, there
10 being an air chamber therebeneath through which chamber said sheets pass while being carried from said cylinder and deposited in said receptacle, and means to heat the air in said last-named chamber.
In testimony whereof I have hereunto set
my hand in presence of two subscribing witnesses.

WILLIAM A. SPURRIER.

Witnesses:

CHARLES S. GOODING,
LOUIS A. JONES.