Oct. 15, 1929. O. R. WOLF 1,731,603

DRYING APPARATUS

Filed June 7, 1926 4 Sheets-Sheet 1

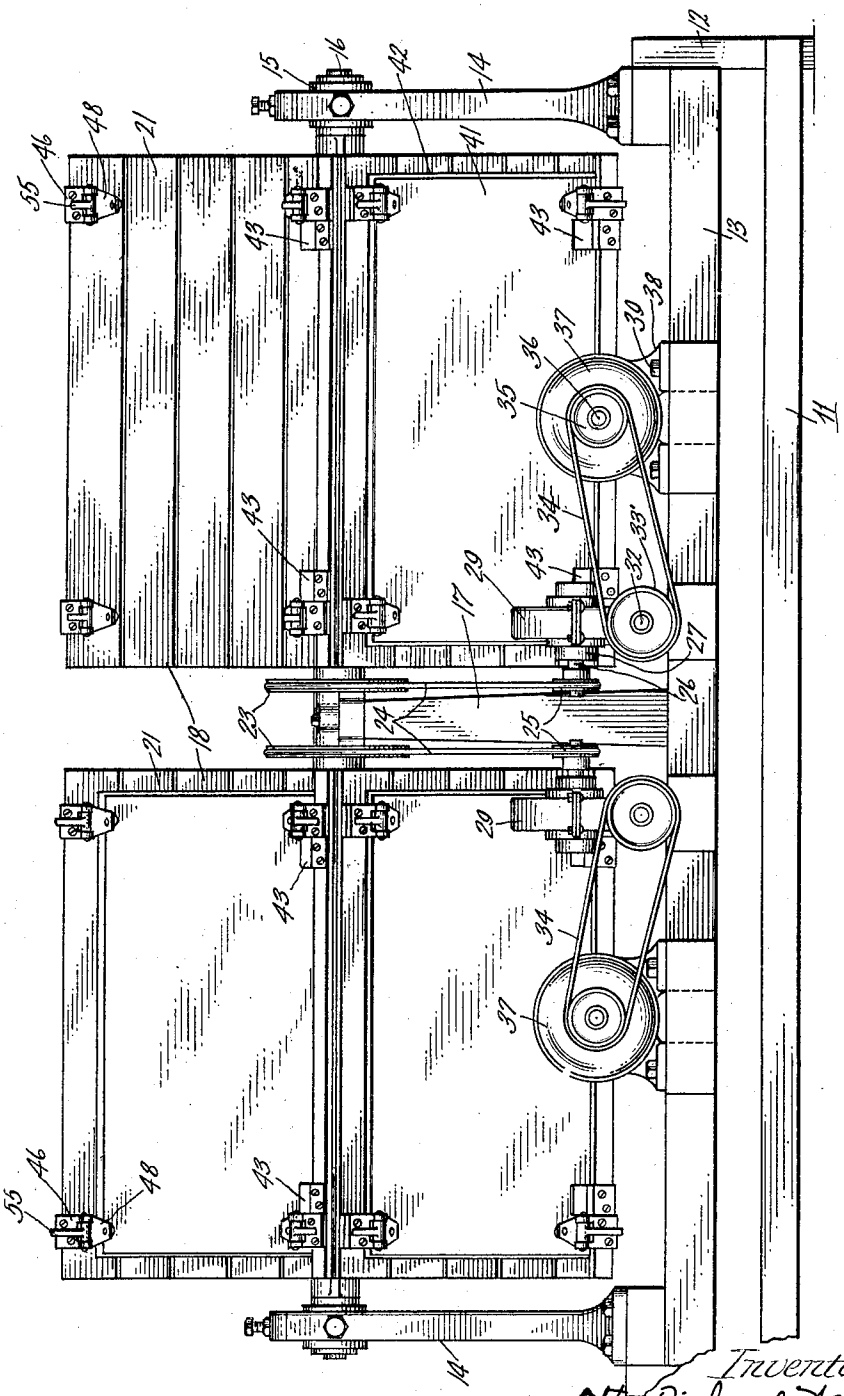


Fig. 1

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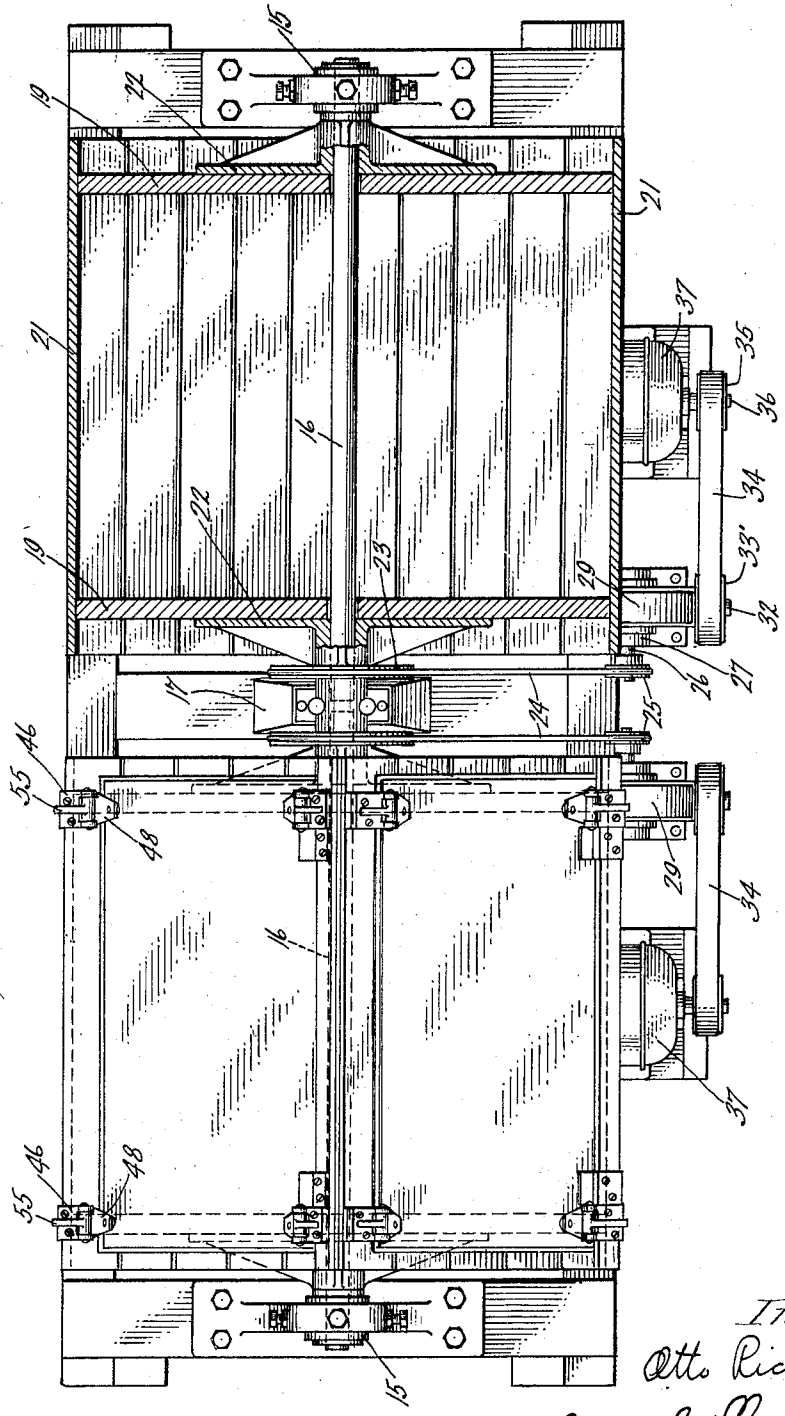


Fig. 2

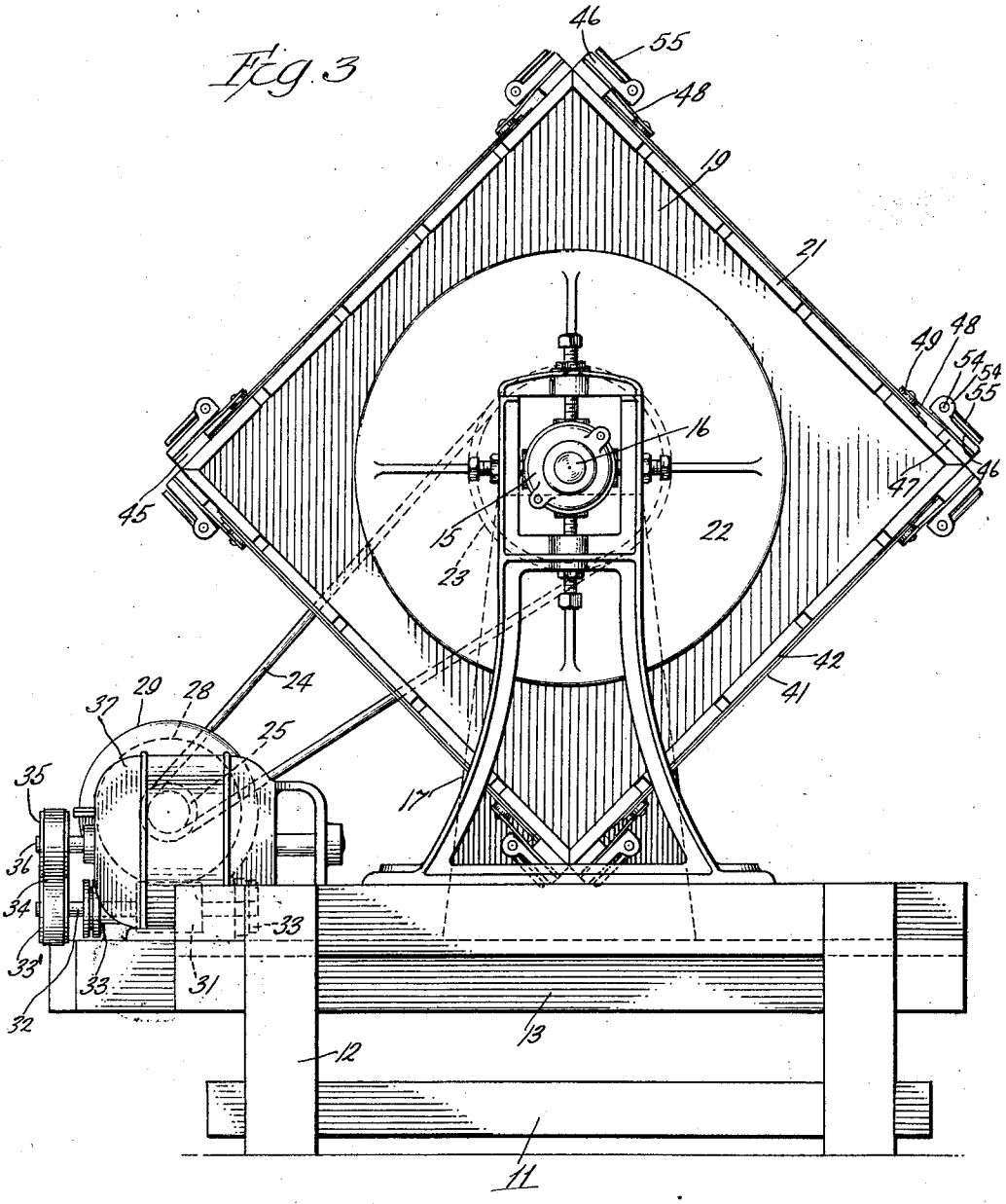
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Fig. 3



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Fig. 4

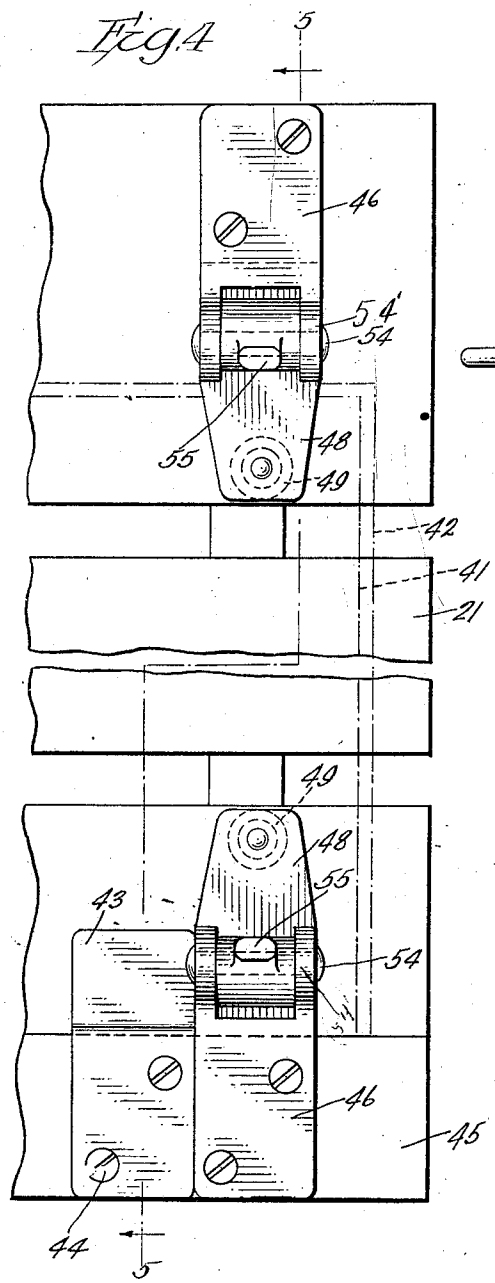
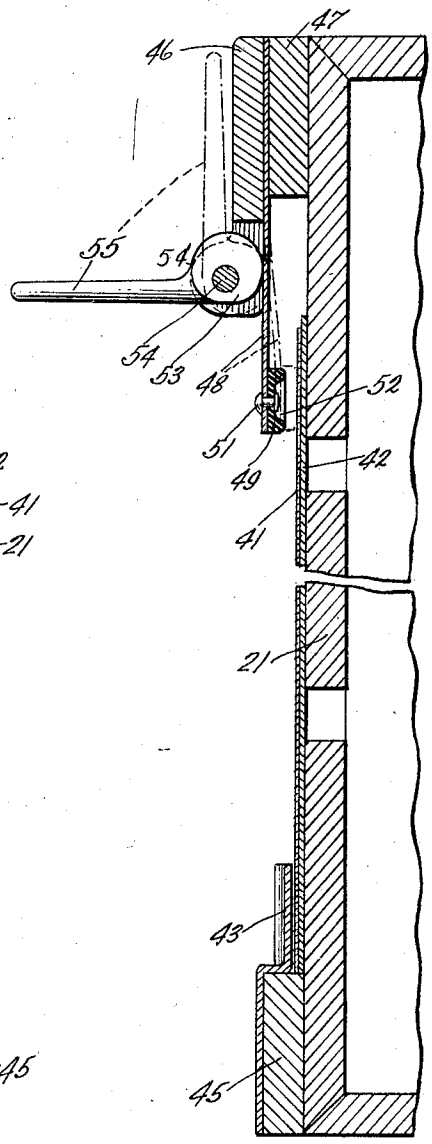


Fig. 5



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Patented Oct. 15, 1929 1,731,603

UNITED STATES PATENT OFFICE

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DRYING APPARATUS

Application filed June 7, 1926. Serial No. 114,165.

This invention relates to drying machines and has for its primary object the provision of a machine particularly adapted for drying pigment paper which is used for carbon prints in the process of printing in intaglio, or by means of copper cylinders in which the characters are formed beneath the surface through the action of acid passing through the pigment paper which is applied to the cylinders, and which has been rendered variably resistant to acid by varied exposure to light conformable to the picture or other characters to be printed.

In order that absolutely uniform results may be obtained, it is highly desirable that the pigment paper (which, as ordinarily used, has a gelatin coating) should be uniformly dried after being treated to render it sensitive to light, such sensitizing treatment involving the passing of the sheets through a bath of appropriate solution, and my invention contemplates the provision of a machine adapted to dry all parts of the sheets simultaneously and in controlled manner to the end that a high degree of uniformity may result.

Another object of the invention is the provision of a machine suited to this purpose which is simple in construction and operation and is capable of economical manufacture and use.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings,

Figure 1 is an elevational view of a dryer unit consisting of two drums and associated driving mechanism mounted on a single frame;

Fig. 2 is a top plan and horizontal sectional view thereof;

Fig. 3 is an end elevation, looking toward the left in Fig. 1;

Fig. 4 is an enlarged view of one of the sides of a drum, partially broken away and showing in detail the clamping devices for the ferrotype plates; and

Fig. 5 is a sectional view, taken substantially on the section lines 5—5 in Fig. 4

Upon said drawings, illustrating the best manner in which I have thus far contemplated applying the principles of my invention, the reference character 11 indicates a base having uprights 12 at the opposite ends thereof supporting a bed 13 upon which the operating elements of the machine are mounted. Standards 14, arising from the opposite ends of said bed, support adjustable journal boxes 15, in which a longitudinal shaft 16 has bearings, a central standard 17 being in the present instance provided on the bed 13 to support the shaft at the center, said upright being disposed between two aligned rectangular frames or carriers 18, which are identical in structure and of which, therefore, only one need be described in detail. Said drums comprise end members 19, to which slats 21 are secured in any desired manner, said end members and slats being made of wood, in the present embodiment, and metal plates 22 being secured exteriorly to the end members and in turn secured to the shaft 16, which, as shown, is divided centrally, as clearly indicated in Fig. 2 of the drawings.

A pulley 23 is mounted on the inner end of each shaft section 16 and is connected by means of a belt 24 with a pulley 25 on a short shaft 26, which is journaled in a bearing 27 and carries a worm wheel 28 enclosed in a casing 29, said worm wheel being driven by a worm 31 carried on a shaft 32, journaled in bearings 33 in the frame and disposed at right angles to the shaft 26. Said shaft 32 carries at its outer end a pulley 33′, driven by means of a belt 34, taking over a pulley 35 on a shaft 36 of a motor 37, having a frame part 38 secured to the bed 13 by bolts 39, said motor being of any suitable or preferred type and the operation thereof being controllable by means of a suitably located switch (not shown).

Referring now in detail to Figs. 4 and 5, the means for mounting the pigment paper on the sides of the carrier will be described. The sheet to be dried, which is indicated by the reference character 41, is placed upon a ferrotype plate 42 in such manner as to cause

it to adhere thereto and the plate is then arranged upon a side of the carrier, the latter being provided at the lower side with sheet metal guides 43 secured by screws 44 to an abutment 45 at the bottom of the carrier side, considering the latter as disposed in the position shown in the drawings. Said guides are of angular formation with respect to the face of the carrier to facilitate the positioning of the plates, which may be moved in endwise and toward the right, viewing Fig. 4, to position beneath the clamping devices, to be presently described, and then moved to the left to the final position shown. For the purpose of releasably attaching the plates and adhering sheets to the sides of the carrier, I employ clamping devices at the corners of each side of said carrier, comprising a fixed plate 46 secured to an edge block 47, a spring member 48 being secured between said blocks and projecting inwardly therefrom, said member having a rubber contact piece 49 secured to the outer end thereof by means of a rivet 51, said contact piece being cup-shaped and the inner end of said rivet being disposed in the depression 52 thereof. A cam 53 is mounted on a cross pin 54 carried by ears 54′ formed on the block 46, said cam being provided with a handle 55. When the handle 55 is arranged in the projecting position shown in full lines in Fig. 5, the cam permits the spring member 48 to assume the normal full line position shown in said Fig. 5 and the movement of said handle to the dotted line position after the ferrotype plate has been positioned causes said cam to move said spring member 48 inwardly to the dotted line position of Fig. 5, thereby clamping the ferrotype plate tightly to the side of the carrier. After the plates have thus been positioned, the motor may be started by pressing a button conveniently located and the carrier will begin to revolve, causing the different portions of the sheet to be subjected, during the rotation of the carrier, to all drying conditions to which any part thereof is subject, thus producing uniform and rapid drying, which may be hastened by the use of suitably located fans (not shown) if desired.

The frames or carriers 18 may be arranged in pairs, as shown in the drawings, or in any desired number and relationship and could, if desired, be mounted for operation by a single source of power, separate driving means, however, being shown in the present instance and obviously providing for greater flexibility of use of the apparatus.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts, without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A machine for drying pigment paper used in the process of intaglio printing, comprising a horizontally disposed shaft, a carrier mounted on said shaft and adapted to carry sheets of said paper suitably mounted on ferrotype plates or other light excluding supports, means for securing a plurality of said plates independently to the exterior of said carrier without perforating the sheets, said means being adapted to press the plate against the carrier, and means for rotating said carrier.

2. A machine for drying pigment paper used in the process of intaglio printing, comprising a horizontally disposed shaft, a polygonal carrier mounted on said shaft and adapted to carry sheets of said paper suitably mounted on ferrotype plates or other light excluding supports, means for securing a plurality of said plates independently to the exterior of said carrier without perforating the sheets, said means being adapted to press the plates against the carrier, and means for rotating said carrier.

3. A machine for drying pigment paper used in the process of intaglio printing, comprising a rotatable carrier mounted on a horizontal axis, means for releasably securing a plurality of separate sheets of pigment paper to the exterior of a wall of said carrier without perforating the sheets and with the same exposed and in position to be uniformly affected by atmospheric conditions during rotation of the carrier, said means being adapted to press the plates against the carrier, and means for rotating the carrier.

4. A machine for drying pigment paper used in the process of intaglio printing, comprising a rotatable carrier mounted on a horizontal axis, means for releasably securing sheets of pigment paper to a wall of said carrier with the same exposed and in position to be uniformly affected by atmospheric conditions during rotation of the carrier, and means for rotating the carrier, said securing means comprising spring clamps and manually operable cams for moving the same into clamping position.

5. A machine for drying pigment paper used in the process of intaglio printing, comprising a rotatable carrier mounted on a horizontal axis, means for releasably securing sheets of pigment paper to a wall of said carrier with the same exposed and in position to be uniformly affected by atmospheric conditions during rotation of the carrier, and means for rotating the carrier, said securing means comprising spring clamps arranged at the corners of said wall and normally spaced therefrom and manually operable cams for moving the same into clamping position.

6. A machine for drying pigment paper used in the process of intaglio printing, comprising a rectangular carrier mounted for rotation on a horizontal axis, controllable means for driving said carrier, and independent means for releasably and yieldingly clamping sheets of pigment paper to each of the four sides of said carrier, with each of said sheets arranged in flat condition on one side only of the carrier, rotation of the carrier serving to subject the entire surface of each sheet to the same drying conditions thereby drying the same uniformly throughout and speeding the drying action by successively presenting each complete sheet to the perhaps differing atmospheric conditions prevailing at different points in the periphery of the carrier.

7. A machine for drying pigment paper used in the process of intaglio printing, comprising a horizontally disposed shaft, a carrier mounted on said shaft and adapted to carry sheets of said paper suitably mounted on ferrotype plates or other light excluding supports, means for yieldingly clamping said plates with pigment paper thereon to the exterior of said carrier, means for rotating said carrier, and angular guides on said carrier for facilitating the positioning of said plates.

8. A machine for drying pigment paper used in the process of intaglio printing, comprising a frame, a plurality of uprights on said frame, a horizontal shaft having bearings in said uprights, a polygonal carrier secured to said shaft, means for rotating the shaft, and means on each of the sides of said carrier for clamping thereto a separate sheet of said pigment paper suitably mounted on ferrotype plates or other light excluding supports, the movement of said sheets through the atmosphere during rotation of said carrier tending to hasten the drying action and to subject each sheet and all parts thereof to the same atmospheric conditions, thereby drying the same uniformly throughout and in minimum time.

9. A machine for drying pigment paper used in the process of intaglio printing, comprising a frame, a plurality of uprights on said frame, a horizontal shaft having bearings in said uprights, a polygonal carrier secured to said shaft, means comprising a motor mounted on said frame and driving connections for rotating the shaft, and means on each of the sides of said carrier for clamping thereto a separate sheet of said pigment paper suitably mounted on ferrotype plates or other light excluding supports, the movement of said sheets through the atmosphere during rotation of said drum tending to hasten the drying action and to subject each sheet and all parts thereof to the same atmospheric conditions, thereby drying the same uniformly throughout and in minimum time.

10. In a machine for drying pigment paper used in the process of intaglio printing, the combination of a revoluble supporting structure and means for clamping ferrotype plates having pigment sheets applied thereto to an exterior part of said revoluble supporting structure, said means exerting pressure upon the pigment sheet to hold the same to the ferrotype plate when the sheet is dry.

11. In a machine for drying pigment paper used in the process of intaglio printing, the combination of a revoluble supporting structure and means for clamping ferrotype plates having pigment sheet applied thereto to an exterior part of said revoluble supporting structure in manner to hold the pigment sheet to the ferrotype plate when the sheet is dry, said clamping means including a contact member of soft material adapted to be pressed against the pigment sheet without damage to the latter.

12. In a machine for drying pigment paper used in the process of intaglio printing, the combination of a carrier providing exterior surface areas to which plates carrying sheets of pigment paper in flat condition may be secured, means for clamping said plates to said carrier, said means serving also to clamp the sheet upon the plate to prevent buckling of the sheet, and means for rapidly rotating said carrier to dry the sheets.

In witness whereof, I hereunto subscribe my name to this specification.

OTTO RICHARD WOLF.