

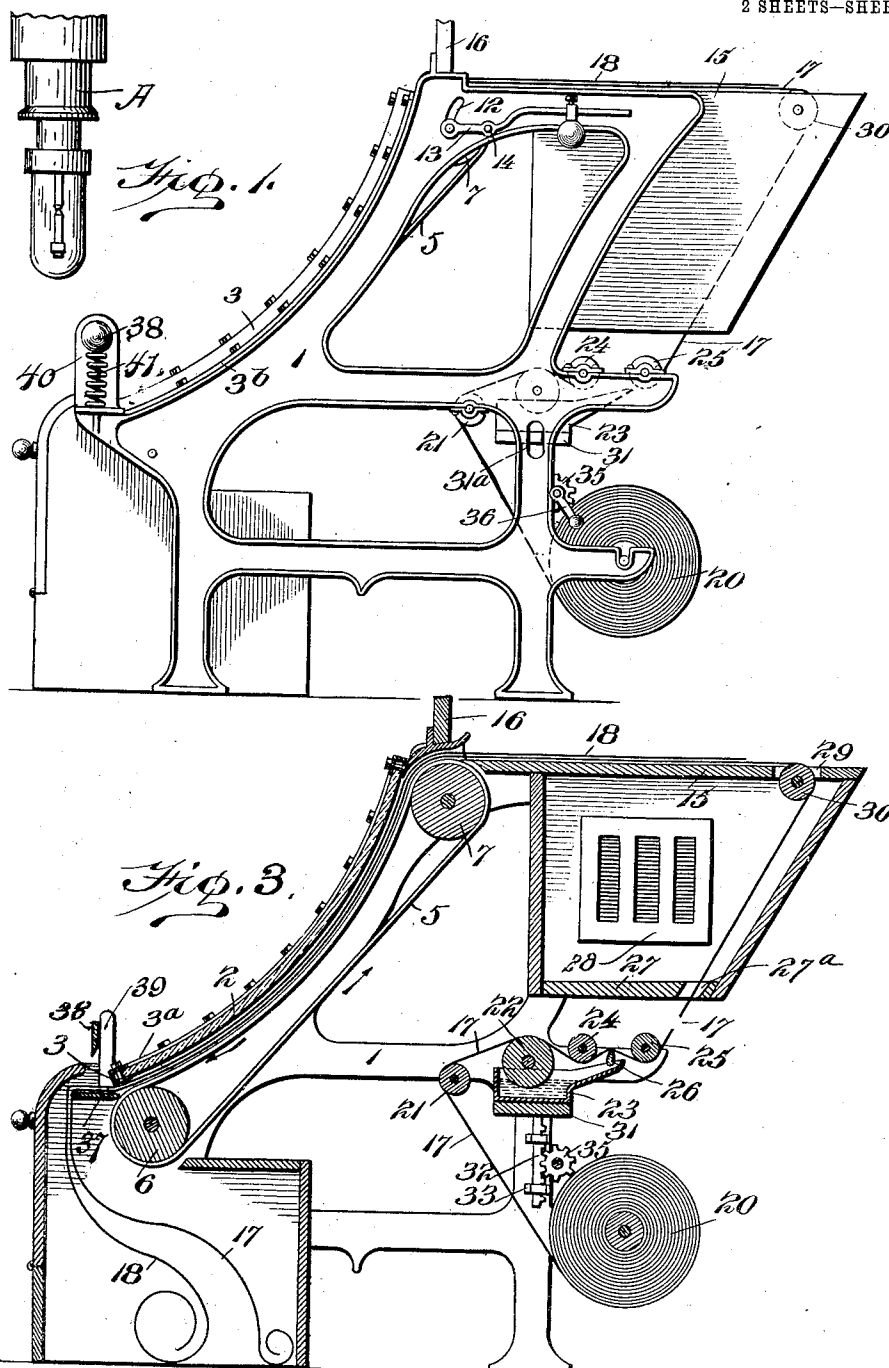
No. 836,660.

PATENTED NOV. 20, 1906.

G. N. WINSLOW.
PHOTOGRAPHIC PRINTING MACHINE.

APPLICATION FILED NOV. 15, 1904.

2 SHEETS—SHEET 1.



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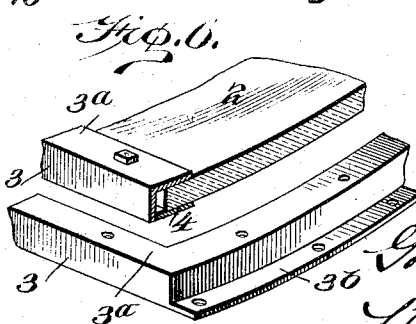
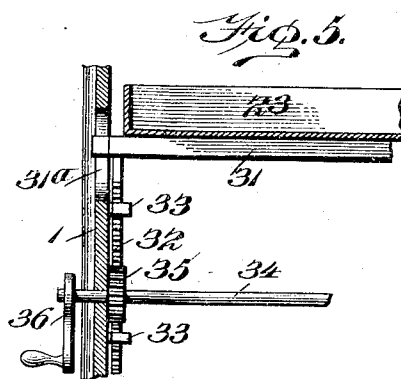
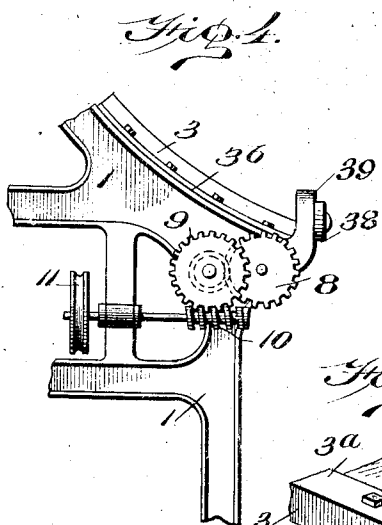
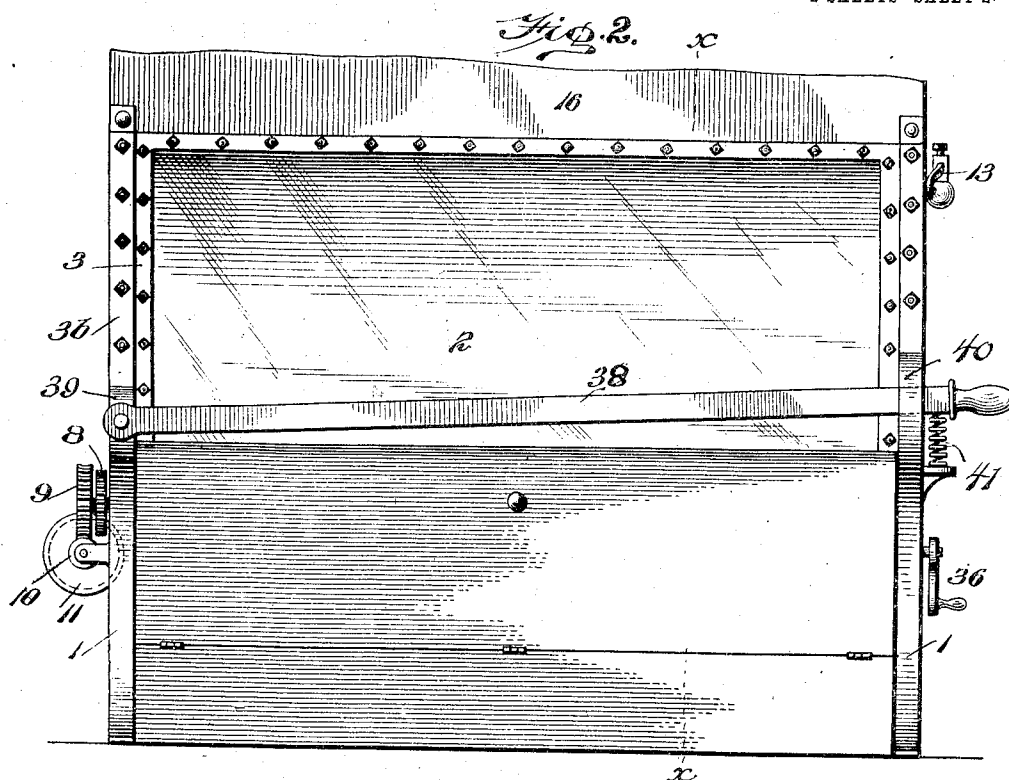
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GORHAM N. WINSLOW, OF WASHINGTON, DISTRICT OF COLUMBIA.

PHOTOGRAPHIC-PRINTING MACHINE.

No. 836,660.

Specification of Letters Patent.

Patented Nov. 20, 1906.

Application filed November 15, 1904. Serial No. 232,784.

To all whom it may concern:

Be it known that I, GORHAM N. WINSLOW, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Photographic-Printing Machines, of which the following is a specification.

My invention relates to improvements in that class of photographic-printing machines in which the sensitized material and accompanying negative are subjected to the action of a strong light while they are moving, so as to produce a continuous operation for the printing of long sheets.

The primary object of the invention is to provide a machine for continuous printing over a fixed transparent medium that will present a concave surface or field of exposure to a centrally-arranged source of light; and to this end the invention consists in the combination, with a fixed cylindrical platen, of transparent material arranged to present its concave face to a centrally-arranged source of light, of means for carrying the combined negative and sensitized sheet in moving contact with and conformation to the convex surface of said platen.

Another object of the invention is to provide a machine for continuous printing in which the sensitizing of the sheet to be printed will take place during and as a result of the operation of the machine in printing and the quantity sensitized governed by the printing demand, thereby insuring the use of only freshly-sensitized material, with superior results in printing.

Another object is to provide a combined printing and sensitizing machine with provision for cutting the sensitized sheet as required without interrupting the printing or the sensitizing operation.

For the accomplishment of the above and other objects the invention further consists in certain novel features in the construction and arrangement of parts, all as hereinafter described, and specifically pointed out in the appended claims.

In the accompanying drawings, illustrating the invention, Figure 1 represents the machine in side elevation; Fig. 2, a view in front elevation; Fig. 3, a vertical transverse section taken through the machine on the line *x x* of Fig. 2; Fig. 4, a detail showing the power-transmission gears of the machine; Fig. 5, a detail showing a portion of one of the side frames as viewed from the rear and

shown in section, and Fig. 6 is an enlarged detail view showing in perspective portions of the frame in which the transparent platen is mounted.

The side frames 1 constitute the main supporting structure of the machine, which frames are preferably formed each with an inwardly-curved front edge adapted to conform to the transparent cylindrical segment 2, which is designed to be supported thereon between the frames and which is preferably formed of glass.

A frame is provided for suitably mounting the cylindrical segment and comprises a main frame 3, having a flange 3^a to overhang the concave side of the segment and a frame 4 adapted to be applied on the convex side of the segment and between which frames the segment is clamped by means of the bolts shown. The main frame 3 is provided on its curved sides with a flange 3^b, which is supported on the curved front edge of the side frames and bolted thereto.

An endless conveyer or apron 5 is arranged so as to contact with and conform to the convex surface of the transparent segment and by reason of the location of the friction-rolls 6 and 7 in close proximity to the segment at its upper and lower edges. The lower roll 6 is the driven roll and is operated by power transmitted thereto by the reducing-gearing shown in Fig. 4, in which the roll-pinion 8 meshes with a small pinion carried by the gear 9, which latter is driven by the worm-shaft 10, carrying a pulley 11 to be driven by a belt from any suitable motor. Each journal of the roll 7 projects through a slot 12 and is mounted on a lever 13, pivoted at 14 and provided with a counterweight by means of which the conveyer may be placed under a proper yielding tension to secure the requisite pressure of the conveyer on the convex surface of the exposing-segment.

A table 15 is supported on the top of the side frame and is screened from the source of light A by an upstanding shield 16, arranged at the front of the table. This table is so arranged as to be flush with the top of the roll 7 and to bring said roll between the end of the front edge of the table and the transparent segment, so that the sensitized sheet 17, with the tracing 18 thereon, will readily engage the conveyer or apron and be directed, by means thereof and the curved guide 19, against the convex surface of the said segment, over which it will be drawn by the

conveyer and pressed in close contact therewith during its movement thereover.

In practicing the invention the conveyer or apron employed is preferably a rubber coated or filled fabric in order to present a friction-surface that will prevent movement of the sensitized sheet thereon and also admit of the conformance of the conveyer to the convex polished surface of the segment, which will not only hold the tracing and sensitized sheet upon the segment, but will cause the pressure of the conveyer to be uniformly distributed, so that the friction between the tracing and glass surface will be much less than that between the tracing and sensitized sheet, thereby preventing any slipping of the tracing. As the present invention also provides for the sensitizing of the sheet to be printed in one continuous operation of printing, the roll 20 of unsensitized sheet is supported in brackets at the rear of the machine, the roll being placed thereon so that the under surface of the sheet, which is preferably the surface to be coated with the sensitizing solution, will contact with the tension and guiding roll 21, over which the sheet is drawn and from which it passes to the solution-roll 22. The sheet is drawn over the solution-roll so as to bring the under surface of the sheet in contact therewith, thereby rotating the roll and receiving the solution carried thereby through its rotation while partly immersed in the solution contained in the pan 23. From the solution-roll 22 the sheet 17 passes under a tension-roll 24, which not only maintains the sheet in ample contact with the solution-roll, but also acts in conjunction with the roll 25 to cause the sheet to be drawn with its under side in pressure contact with a knife or scraper 26, which acts to distribute the solution on said surface and to remove the surplus thereof, which surplus will be returned to the solution-pan in the manner shown. Beneath the table 15 is provided a drying-box 27, in which is located an electric heater 28 or other suitable heating device. Through this box the sensitized sheet passes on its way to the table, a slot 27^a in the bottom of the box being provided for the entrance of the sheet, while a slot 29, formed in the table-top, provides for its exit after passing over a roll 30, located within said slot.

The solution-pan 23 is carried by a vertically-movable support 31, having its ends working each in a slot 31^a, formed in the side frames. A depending rack 32 is secured to the pan-support on the under side thereof and adjacent each end and extends through guides 33. A shaft 34 is rotatably mounted on the side frames and is provided with a pinion 35 at each end for operating the adjacent rack, a crank-handle 36 being provided for the rotation of said shaft.

The foregoing provision not only enables

the convenient removal of the pan, which removal must be made frequently in order to clean the same and remove the solution, but admits of the regulation of the submergence of the solution-roll therein in order to secure the uniform and proper application of the sensitizing solution to the sheet.

As the sensitizing of the sheet 17 is dependent upon the operation of the conveyer-apron in drawing the sheet, provision is made for cutting the sheet at the delivery end of the apron. To this end a bed 37 is arranged in close proximity to the conveyer at that point, so as to direct the sensitized sheet and tracing over said bed and furnish a support on which the sheet may be cut. In the present instance a knife 38 is arranged above the bed and pivoted at one end to the standard 39, while it is sustained in normally raised position in the guide 40 at its other end by means of a spring 41. By this arrangement the knife is readily brought into contact with the sheet 17 to quickly sever the same without interruption of any kind to the operation of the machine.

By means of the construction herein set forth it will be seen that the results accomplished depend principally upon the employment of the glass cylindrical segment to furnish an antifriction-surface. From this follows the advantage not only of causing the work under exposure to travel past the source of light in an arc so that the light will fall perpendicularly thereon, resulting in uniformity and sharpness of printing and in reducing the time required for the exposure to the minimum, but also admitting of these results in a continuous-printing machine capable of being used in pairs with a common source of light. It will also be appreciated that by reason of the comparatively slow feeding movement of the sensitized sheet in printing it has been possible to utilize the slow feeding of the sheet to provide for its sensitization in the same machine in order that the sensitizing and printing of the sheet will take place in one continuous operation.

What I claim is—

1. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, of a source of supply of unsensitized sheet, means for applying a sensitizing solution to said sheet, and means for drying the solution thereon, substantially as described and for the purpose set forth.

2. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, of a sheet-supply roll, a sensitizing-bath for the sheet, and a drying-box intermediate the bath and the exposing medium, substantially as and for the purpose set forth.

3. In a photographic-printing machine, the combination with a transparent exposing medium and means for continuously advancing the sensitized sheet and negative during exposure thereon, of a sheet-supply roll, a sensitizing-bath for the sheet and means for drying said sheet, substantially as and for the purpose set forth.

4. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, of a sheet-supply roll, a sensitizing-bath, a table carrying a roll over which the sensitized sheet is drawn, and means for drying the sheet arranged intermediate the bath and the table, substantially as described and for the purpose set forth.

5. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, of a sheet-supply roll, a sensitizing-bath, a table to receive the sensitized sheet, and a drying-box intermediate said table and bath through which the sensitized sheet is drawn, substantially as described and for the purpose set forth.

6. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, a source of supply of unsensitized sheet, a sensitizing-bath for said sheet, means for drying the sheet on its passage to the said advancing means, and means whereby the sheet may be cut as it emerges from the discharge end of the exposing medium, substantially as described and for the purpose set forth.

7. In a photographic-printing machine, the combination with a transparent exposing medium and means for advancing the sensitized sheet and negative thereon, a source of supply of unsensitized sheet, a sensitizing-bath for the sheet, and a bed arranged at the discharge end of the exposing medium and adapted to direct the sheet over the same for cutting, substantially as described and for the purpose set forth.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

GORHAM N. WINSLOW.

Witnesses:

EUGENE E. YOUNG,
HUGH M. STERLING.