

No. 746,087.

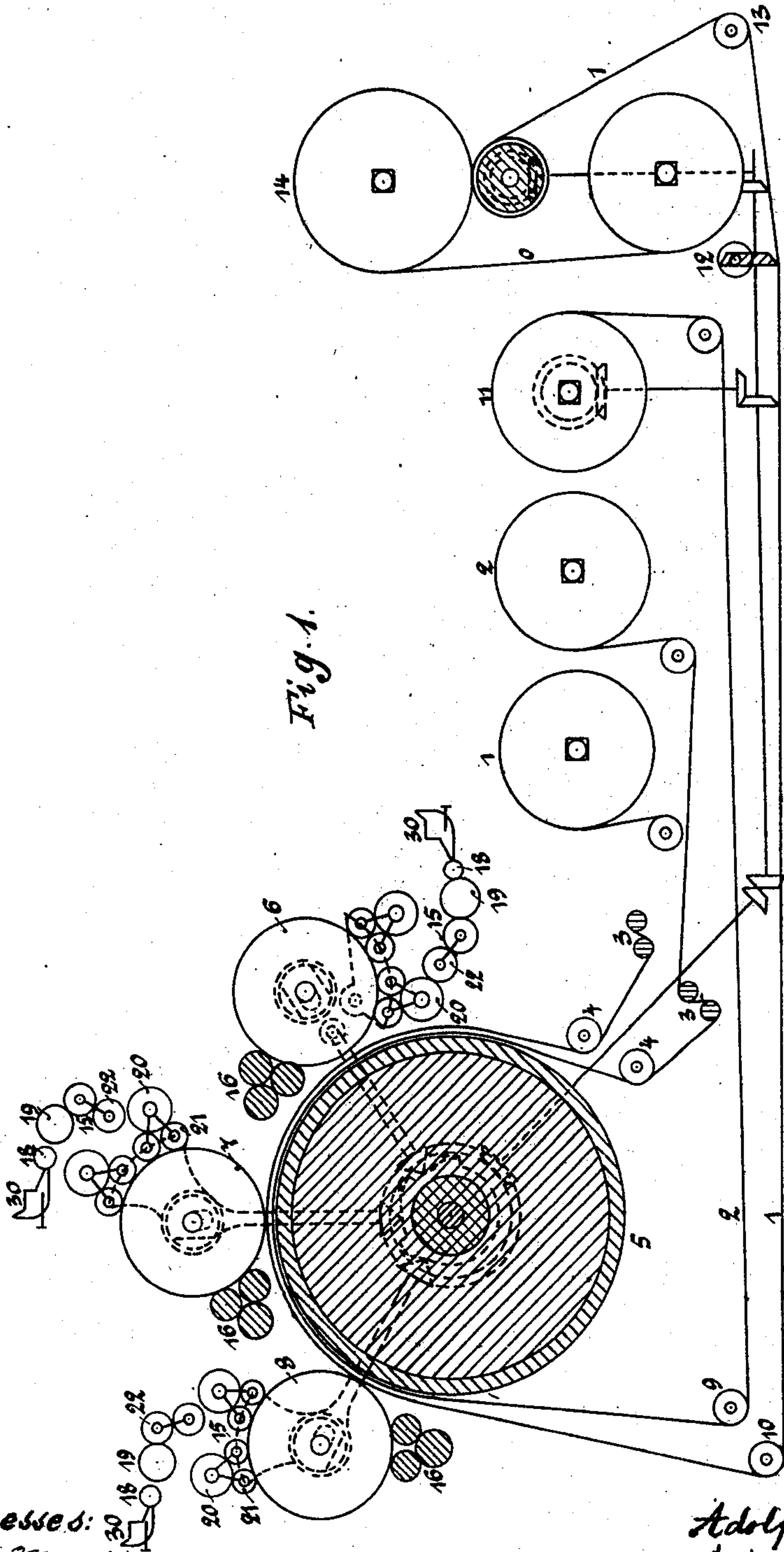
PATENTED DEC. 8, 1903.

A. HOZ.
PRINTING PROCESS.

APPLICATION FILED MAY 19, 1900.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

M. E. Massie.

Anton A. Goezner

Inventor:
Adolf Hox,
by *Max Ingli*
attorney.

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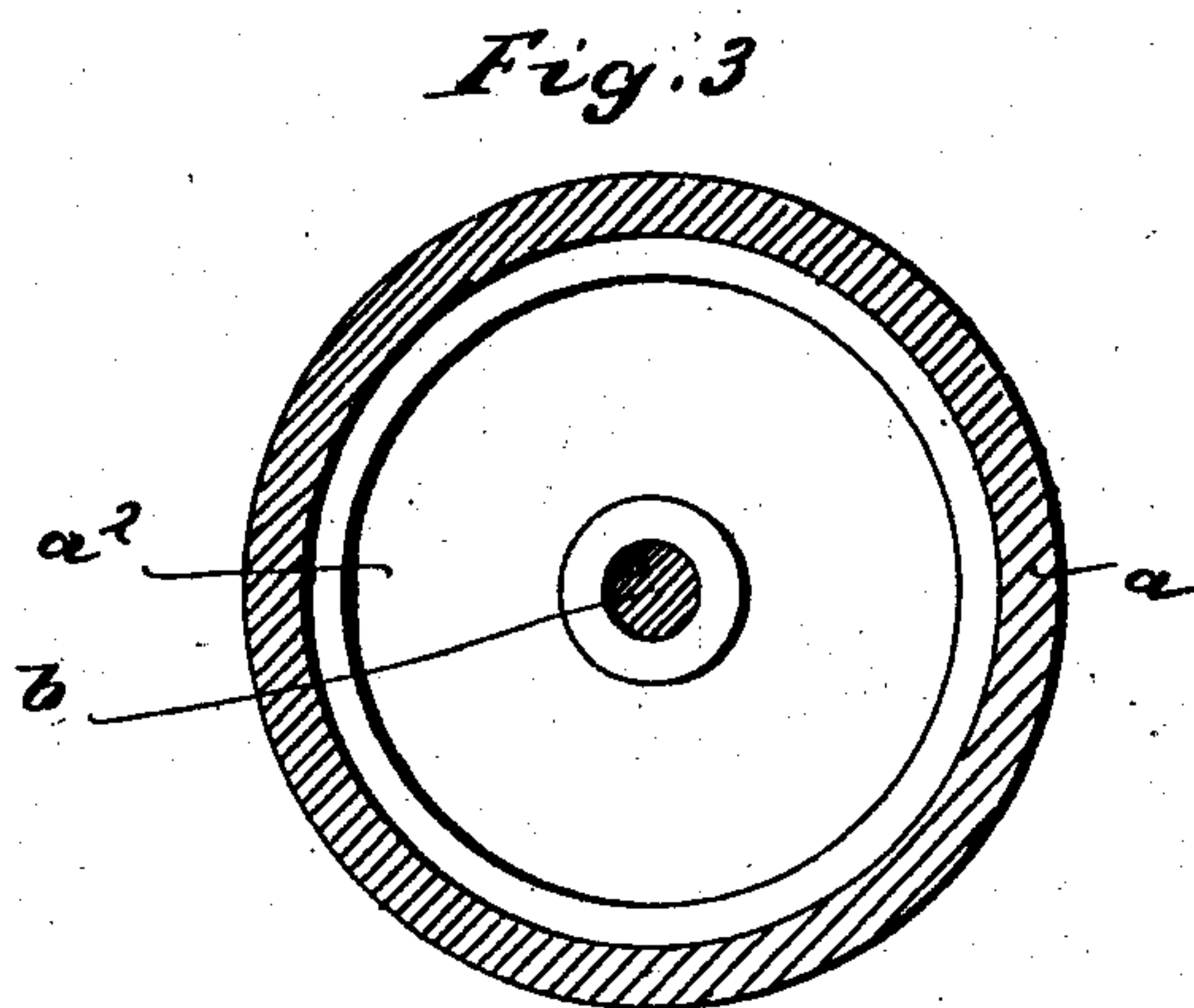
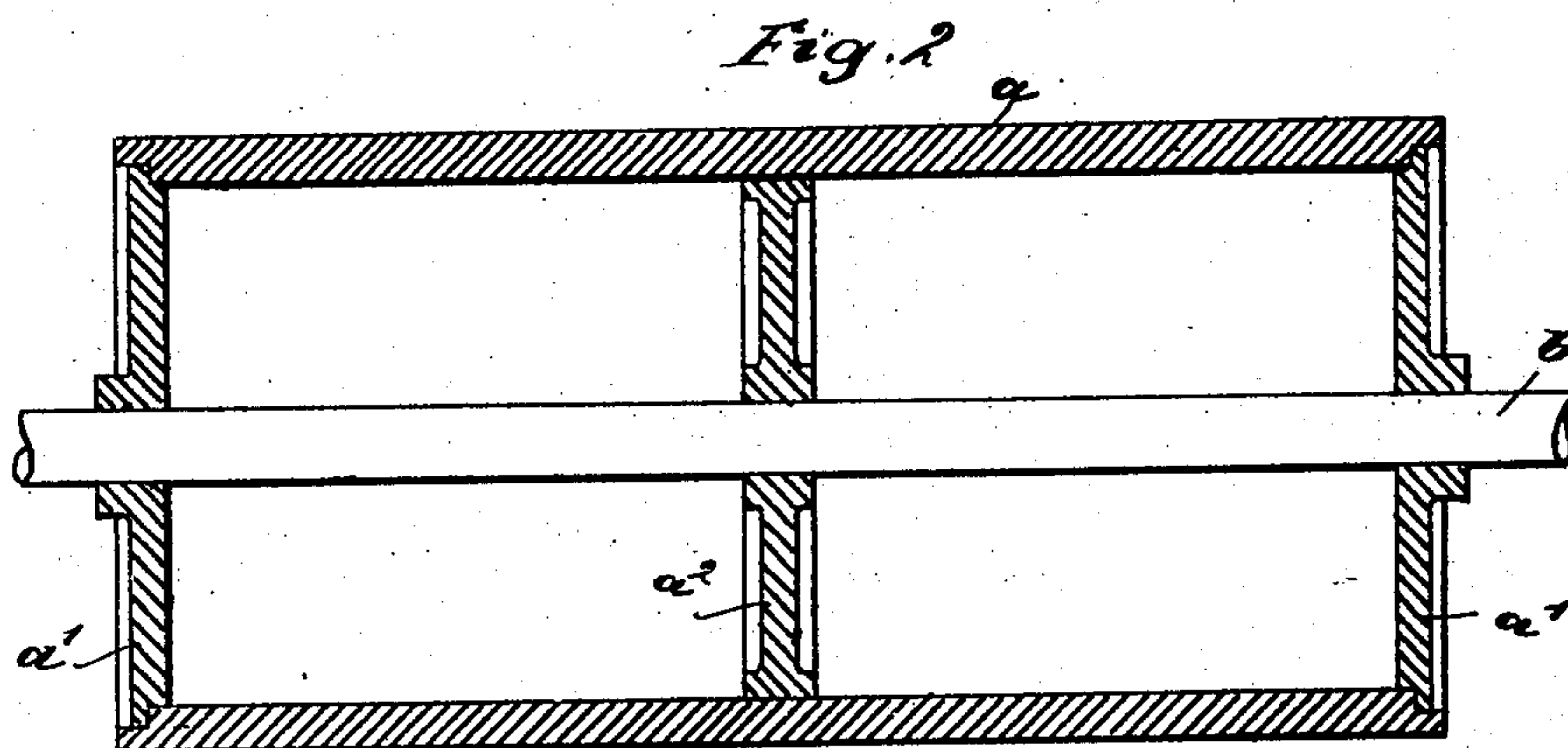
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M. C. Massie.

Anton A. Gloetzer

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UNITED STATES PATENT OFFICE.

ADOLF HOZ, OF RORSCHACH, SWITZERLAND.

PRINTING PROCESS.

SPECIFICATION forming part of Letters Patent No. 746,087, dated December 8, 1903.

Application filed May 19, 1900. Serial No. 17,312. (No specimens.)

To all whom it may concern:

Be it known that I, ADOLF HOZ, manufacturer, a citizen of Switzerland, residing at Rorschach, Switzerland, have invented certain new and useful Improvements in Printing Processes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the art of printing continuous materials or webs—such as textiles, wall-paper, and the like—the object being to furnish a process whereby a permanent and ineffaceable design is formed on such materials by the printing operation alone and without the aid of subsequent fixing or mordanting steps or treatments except the usual steaming in the case of printing on textile, the object being, moreover, to introduce considerable economy into this art and to enable the same printing surfaces or roller to be used in succession for printing any number of different designs, thus making a small stock of surfaces or rollers to answer the demands of a large printing establishment.

With these objects in view my invention involves the combination of planographic with chemical printing—that is to say, under said invention I print the design on the textile or wall-paper material in such a way that the design is not only printed on such fabric in the manner known as “lithographic printing,” but is also in the same printing operation developed and fixed or mordanted or prepared to be developed and fixed or mordanted on the said fabric in such a way as to be permanent and ineffaceable. This I effect by preparing any smooth surface of metal or material suitable for planographic printing with the desired design in such a manner as to adapt it for lithographic printing and then successively damping and inking the same with an ink containing, besides the dye or color and usual or suitable greasy ingredients employed for lithographic inks or crayons, a “mordant,” by which term I intend to cover any reagent or substance whereby the dye or color is fixed or developed and fixed on the “textile fabric” or “paper,” both of which

terms are included under the general designation “fabric.”

Heretofore lithographic printing from rollers having a lithographic surface of stone or suitable metal, such as zinc, has been well known. It has also been proposed to employ engraved or relief rollers of aluminium or nickel for the purpose of printing in the usual way on fabrics with colors or dyes. I, however, am the first to propose and to carry into successful operation a process whereby the lithographic process can be combined in one operation with the process of printing fabrics with colors containing the necessary mordants or fixing agents, whereby the design printed thereon will be made permanent and ineffaceable after the usual steaming operation, as is necessary in the art of calico-printing and allied arts. This is entirely the result of my discovery.

In carrying out my process I take a smooth roller of suitable metal adapted for lithographing, preferably aluminium or an alloy thereof, and provide the same with a design in such a manner as to print therefrom in the usual manner of lithographic or planographic printing, as is well known. I prefer to proceed as follows: I first prepare the design on a transfer-sheet by printing or otherwise marking the same thereon with lithographic ink or crayon—that is to say, with an ink containing a large quantity of grease. The transfer-sheet for this purpose may be specially-prepared paper usually employed in this connection or a gelatin sheet, zinc-foil an india-rubber sheet, or the like. After the transfer-sheet has been suitably stretched on a flat plate the metal roller is passed or rolled over the same with sufficient pressure to take up the design perfectly. This design is then fixed on the roller, and the latter is prepared according to the usual methods employed in lithography or planographic printing—that is to say, so that the design portion of its surface will repel moisture and take up greasy ink, while the remaining portions thereof will absorb moisture and repel the ink. To print from such a roller under my invention, the same is alternately damped and inked with an ink containing, besides the dye or color,

which may be in solid form or in solution, grease in suitable quantity, such as employed for lithographic purposes, and the necessary mordant or fixing agents for fixing or developing and fixing the dye or color on the fabric to be printed. It is the latter step which distinguishes my invention from all former printing methods, since I am the first to have recognized and discovered that the lithographic and color-fixing agents can be combined and employed on such printing-surfaces so as to carry out the planographic printing process and fix or mordant the color or prepare for the fixing or mordanting processes at one operation.

In all fabric-printing, and particularly in printing on cotton—such, for example, as calico-printing—several operations have without exception been required for preparing and finishing the printed products, while under my process the design is printed in such a manner that the dye is fixed or developed and fixed and the greasy medium evaporated all in one operation. In addition my process enables me to print calicos and fabrics and mordant or fix the colors from plain or smooth rollers, whereas formerly such operations have been invariably carried out with engraved or relief rollers. This enables me to use the same roller over and over again for a great variety of designs, besides saving the cost of engraving. I am thus enabled to reduce my stock of rollers to a very small quantity and to cheapen the cost of the individual rollers. Moreover, my process enables me to introduce into the lithographic art the luminous and brilliant colors or dyes hitherto employed only in textile printing and dyeing and compared with which the lithographic inks heretofore employed appear dull and faded and insipid. My colors or inks are, moreover, much cheaper than the lithographic inks usually employed, and, moreover, they require only one subsequent treatment in textile printing—viz., steaming—whereas the former methods of textile printing necessitated several treatments before and after printing.

In the accompanying drawings I have represented an example of a machine on which my process can be carried out.

In the drawings, Figure 1 represents a diagrammatic representation, in vertical sectional elevation, of a calico-printing machine resembling in principle the well-known calico-printing machines; and Fig. 2 a longitudinal central section, and Fig. 3 a transverse section, of one of the printing-rollers employed in such machine under my invention.

From Fig. 1 it will be observed that a machine on which my process may be carried out comprises the usual bed or platen roller 5, over which the fabric to be printed is fed, the printing-rollers 6, 7, and 8, which are inked by the usual inking-trains 15 18 19 20 22, and ink-fonts 30. The printing-machine in the present instance is, however, dis-

tinguished from the forms of calico-printing machines hitherto employed by the fact that the printing-rollers 6, 7, and 8 are smooth-surfaced lithographic rollers and that each of them is provided with damping-rollers, such as employed in lithographic printing. The printing-rollers 6, 7, and 8, as shown in Figs. 2 and 3, consist of smooth seamless metal tubes a , of a metal suitable for lithographing, but which will not be attacked by the chemical materials employed for mordanting or fixing the dyes. For this purpose I have found aluminium or its alloys particularly valuable. These metal tubes may be mounted on the shaft b in any suitable way—*e. g.*, by means of the metal disks or spiders $a' a^2$, which may be of copper or the like.

While I have herein referred to the use of printing-rollers of aluminium or aluminium alloy, I do not here claim the same specifically, since such rollers constitute the subject-matter of my application for Letters Patent, Serial No. 43,522, filed January 8, 1901.

What I claim, and desire to secure by Letters Patent, is—

1. The process of printing which consists in preparing a lithographic design on a smooth surface then damping and inking the same with an ink containing grease and a mordant, and then printing.
2. The process of printing which consists in preparing a lithographic design on a smooth roller of material adapted for planographic printing, then damping and inking the same with an ink containing, besides the dye or color, grease and a mordant medium, and printing therefrom.
3. The process of printing endless fabrics which consists in preparing a lithographic design on a smooth roller of metal adapted for lithographic printing, then damping and inking the same with an ink containing, besides the dye or color, grease and a mordant, and printing therefrom.
4. The process of printing fabrics which consists in damping a lithographically-prepared roller of metal adapted for lithographic printing with an ink containing, besides the dye or color, grease and a mordant, and printing therefrom.
5. The process of printing fabrics which consists in transferring a design in fatty ink to a smooth roller of metal adapted for lithographic printing, then preparing said roller for lithographic printing, then damping and inking the said roller with an ink containing, besides the dye or color, grease and a mordant.
6. The process of printing fabrics, which consists in preparing a lithographic design on a smooth surface, then damping and inking the same with an ink containing a liquid dye combined with grease and a mordant, and printing therefrom.
7. The process of printing fabrics, which consists in damping a lithographically-prepared roller, then inking the same with an ink containing a liquid dye combined with

grease and a mordant medium, and printing therefrom.

5 8. The process of printing fabrics, which consists in preparing a lithographic design on a smooth surface, then damping and inking the same with an ink containing a dye combined with grease and a mordant, then printing the fabric with said surface, then steaming the said fabric.

10 9. The process of printing fabrics, which consists in damping a lithographically-pre-

pared surface, then inking the same with an ink containing a liquid dye combined with grease and a mordant, then printing the fabric from said surface, and, finally, steaming 15 the fabric.

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

ADOLF HOZ.

Witnesses:

ROBERT MADER,
JOSEPH SIMON.