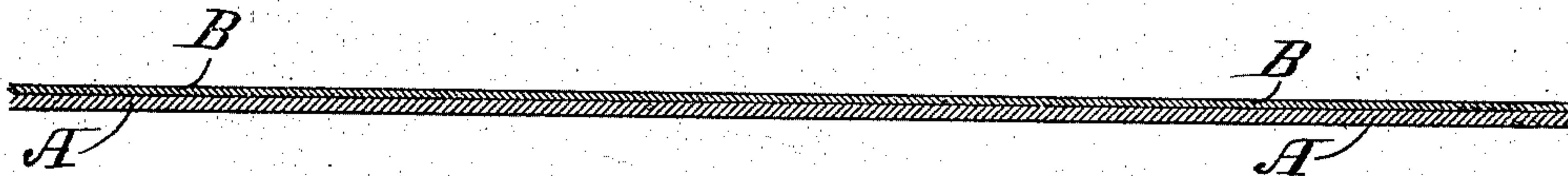


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G. E. PANCOAST.  
ART OF LITHOGRAPHIC TRANSFERRING.  
APPLICATION FILED FEB. 10, 1899.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE E. PANCOAST, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE AMERICAN LITHOGRAPHIC COMPANY, A CORPORATION OF NEW YORK.

## ART OF LITHOGRAPHIC TRANSFERRING.

SPECIFICATION forming part of Letters Patent No. 748,003, dated December 29, 1903.

Application filed February 10, 1899. Serial No. 705,156. (No specimens.)

*To all whom it may concern:*

Be it known that I, GEORGE E. PANCOAST, a citizen of the United States, and a resident of Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in the Art of Lithographic Transferring, of which the following is a specification.

My invention has reference to the art of lithographic transferring. It has for its object to attain more accurately and reliably than heretofore the transfer of a design from a printing-surface to another surface adapted to receive it and to be thereafter developed itself into a printing-surface.

It consists of the novel method herein set out.

Heretofore in the art of lithographic transferring it has been customary to print an impression of the design in ink upon paper which has been specially prepared for the purpose and which is called "transfer-paper." It is a somewhat soft paper whose surface has been prepared with suitable sizing. It is adapted to be soaked off from the printing-surface after it has been turned over upon it and has given its ink to it, and it has a more or less soluble face and composition to that end. These peculiarities render it exceeding liable to stretching and shrinking longitudinally and laterally, and hence constitute it a variable and unreliable conveyer where the accuracy of location of the design as a whole upon the printing-surface and all the parts of the design one part with respect to another is important. This liability to error is exemplified by the liability of the paper to stretch with handling—for instance, when it is being lifted from the stone or printing-surface. This tendency is increased by the circumstance that the transfer-paper is ordinarily made use of in a dampened condition, the dampening rendering it more or less soft and extensible. Moreover, the paper has the tendency to vary its length and breadth, depending upon the extent to which it is dampened. If too much dampened, it has a tendency to elongate and widen. If too dry, it will be found to have slightly shrunk. The difficulty is especially great in dealing with a large design where a large superficies of the trans-

fer-sheet is made use of in transferring a design from one printing-surface to another. For example, it is not an unusual circumstance for the design upon a large sheet of this transfer-paper to be as a whole an eighth of an inch or more longer than the design on the stone from which the impression has been taken in the case of a design, say, twenty inches by twenty-eight inches. For this reason the use of large sheets of transfer-paper in transferring is avoided wherever possible. For instance, where the printing-surface, as is ordinarily the case, is large and contains a great many designs placed close together if duplicate printing-surfaces are desired it is customary to painstakingly stick up on a setting-up plate the various transfer impressions of the separate small designs on the small pieces of transfer-paper each time a new printing-surface is to be made exactly in the same slow, tedious, and expensive manner used for making the first printing-surface.

My invention will prevent all distortion and inaccuracies caused by the stretching or shrinking of the transfer sheet or conveyer, and will therefore also obviate the necessity of painstakingly and by hand grouping the small designs that are to go onto one printing-surface more than once.

In place of the transfer-paper as the material of the transfer sheet or conveyer I have devised and employ a sheet or conveyer that is non-stretchable and non-shrinkable longitudinally and laterally and that has an even and uniform surface suitable to receive an imprint of a design from a printing-surface. In its preferred form the sheet or conveyer consists of a thin foundation-layer of hard-rubber composition, as vulcanite, and a thin surface-cushioning layer of softer rubber, the two layers being secured to one another at all points and preferably made integral by being vulcanized together. The foundation-layer of hard rubber is about one-sixteenth of an inch in thickness and is of such a character as to be non-stretchable and non-shrinkable longitudinally and laterally. The surface-cushioning layer is about one thirty-second of an inch thick and is evenly and uniformly surfaced. In carrying out my invention I first suitably cleanse the



surface of the sheet and then preferably apply to it a uniform layer of suitable size, such as will receive the ink. After that is suitably dry I print the design in ink or  
 5 other suitable medium from any suitable printing-surface which is to be reproduced upon the uniform-sized surface of the conveyer-sheet. I then bring the thus-printed face of the sheet into contact with a suitable  
 10 and suitably-prepared stone or other planographic surface prepared to receive the design and adapted to be thereafter developed into a printing-surface for the design, applying pressure with or to said contact, but in  
 15 such way as not to shift in the slightest degree the position of the conveyer-sheet as a whole upon the planographic surface after the contact has once been made. I then remove the conveyer-sheet, after which I suitably develop the planographic surface into  
 20 a printing-surface of the character desired—for instance, into a planographic or lithographic printing-surface by suitable light etching, or into a relief printing-surface by  
 25 suitable deep etching, supplemented by routing out, if desired, &c. I prefer the construction of conveyer-sheet herein specifically described and involving the presence of two layers secured together at all points;  
 30 but my invention in its broader aspect would be embodied if the conveyer-sheet be evenly and uniformly surfaced and be of such construction that it is non-stretchable and non-shrinkable longitudinally and laterally and  
 35 capable of having printed upon it the design that is to be transferred in ink or other suitable medium and to communicate the same or enough of it to constitute the design to the planographic surface adapted to receive  
 40 the design from the conveyer-surface and to be thereafter developed into a printing-surface for that design.

For the purpose of making a first large printing-surface which is to have a plurality  
 45 of smaller designs grouped on its face for purposes of economy, as is usual in the printer's art, I take a number of small conveyer-sheets—such, for example, as have been heretofore described—one for each of the separate  
 50 designs and of proper size for that design, cleanse and size or otherwise prepare its surface properly, and print upon it from the original stone containing that design. I then take all of these conveyer-sheets, each  
 55 with its own design printed upon it, and properly arrange them painstakingly by hand on a suitable setting-up plate and as accurately as desired and in accordance with registering marks on the setting-up plate, practically just as the corresponding pieces of  
 60 transfer-paper are to-day grouped and stuck up. I then cement the conveyer-sheets on the setting-up plate in exact position or otherwise attach them to the setting-up plate.  
 65 The latter is then brought into contact with the lithographic stone or the surface to be developed into a printing-surface and is sub-

jected to pressure, as heretofore. In this way the ink of the several separate designs is communicated in proper position and location to the lithographic stone or surface to be  
 70 developed into a printing-surface, the ink of the conveyer-sheets or enough of it leaving the conveyer-sheets to constitute the design and every part of it on the lithographic stone.  
 75 The setting-up plate is then removed, which removes also the separate conveyer-sheets cemented to it, leaving the design or group of designs in ink on the face of the stone. Care  
 80 should be taken that the separate small conveyer-sheets employed are all substantially the same thickness, or other means may be adopted to the end that all receive sufficient pressure during contact to carry over the ink  
 85 from the face of the conveyer-sheets to the face of the stone. The stone is then suitably developed into a printing-surface. The first large printing-surface is thus prepared. When a duplicate of that large printing-surface  
 90 is required, instead of again going through the laborious operation just described I take a large conveyer-sheet of the character herein set out, large enough to cover the superficies of the large lithographic stone,  
 95 and having suitably inked up the stone and suitably cleansed and sized or otherwise suitably prepared the face of the conveyer-sheet I lay the latter face down upon the stone and  
 subject it to pressure, thus accurately printing upon the conveyer-sheet the design upon  
 100 the stone. The conveyer-sheet is then placed face down and while the ink upon it is still damp upon another suitable clean lithographic stone or other planographic surface and again subjected to suitable pressure,  
 105 when the ink or sufficient of it will leave the surface of the conveyer-sheet and attach itself to the clean lithographic stone or other surface to constitute thereon an exact duplicate in all respects of the large design as a  
 110 whole or group of designs that appears on the first printing-surface. This second printing-surface is then developed suitably into a printing-surface. A third printing-surface may be made in the same way, and any number  
 115 of duplicate printing-surfaces, each one of which will be an exact duplicate of the first. This process of duplicating printing-surfaces may therefore be carried on indefinitely, thereby producing any number of  
 120 printing-surfaces desired without resorting to the manual process of sticking up and arranging the design upon the setting-up plate except for the purpose of making the first printing-surface.

In the accompanying drawing, which forms a part hereof, the conveyer-sheet of my invention in its preferred form is diagrammatically represented in section.

A is the foundation-layer of hard rubber, and B is the relatively thin surface-cushioning layer of softer rubber, to be integrally united therewith at all points. The surface of the cushioning-layer B is evenly and uniformly



finished and is adapted to receive a uniform layer of suitable sizing or to be otherwise suitably prepared to receive an imprint of a design. Preferably, also, the foundation-layer A, of hard rubber, which is non-stretchable and non-shrinkable longitudinally and laterally, is of even and uniform thickness and has an even and uniform surface on the back, adapting it to rest upon a suitable level support or plate, such as a setting-up plate, whereby an even pressure during contact may be applied to every part of the conveyer-sheet. The pressure may be attained by the use of an ordinary scraper passing across the back of the setting-up plate from end to end, or it may be a rolling pressure, or it may be a whole surface contact and pressure. Where scraping or rolling pressure is used, the surface layer A, of soft rubber, should be as thin as possible, for the thinner this layer is made the less will be the local distortion of the design due to the local application of pressure. In all cases, however, the conveyer-sheet of my invention itself directly carries the ink constituting the design and conveys it to the new surface that is to be developed into a printing-surface, and the contact between the conveyer-surface and the printing-surface in the application of the pressure to such contact is such that the conveyer-surface does not shift or slip on such surface after contact is once begun; but the two surfaces are accurately and reliably brought together, so that the one exactly reproduces the other in reverse so far as concerns the design. After the design is transferred to the planographic surface, as herein described, that surface may manifestly be developed into any character of printing-surface desired, whether planographic, relief, intaglio, or otherwise.

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

1. The improvement in the art of lithographic transferring which consists in printing the design in ink or other suitable medium from any suitable printing-surface upon a uniformly-surfaced conveyer-sheet having a foundation layer of material which is non-stretchable and non-shrinkable longitudinally and laterally and a relatively thin surface-cushioning layer secured thereto at all points, bringing the printed face of said conveyer-sheet into contact with a planographic surface prepared to receive the design and adapted to be thereafter developed into a printing-surface for the design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, and suitably developing the planographic surface into a printing-surface of the character desired, substantially as described.

2. The improvement in the art of lithographic transferring which consists in print-

ing the design in ink or other suitable medium from any suitable printing-surface upon a uniformly-surfaced conveyer-sheet having a foundation layer of hard rubber which is non-stretchable and non-shrinkable longitudinally and laterally and a relatively thin surface-cushioning layer of softer rubber secured thereto at all points, bringing the printed face of said conveyer-sheet into contact with a planographic surface prepared to receive the design and adapted to be thereafter developed into a printing-surface for the design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, and suitably developing the planographic surface into a printing-surface of the character desired, substantially as described.

3. The improvement in the art of making printing-surfaces, which consists in accurately sticking up by hand upon a suitable setting-up plate a plurality of suitable transfer-sheets each having a design printed in ink or other suitable medium upon its face, applying such setting-up plate to a suitable planographic surface prepared to receive the plurality of designs and adapted thereafter to be developed into a printing-surface for said designs as a whole, applying suitable pressure to said contact, whereby the ink of the designs is communicated to the planographic surface, removing the setting-up plate and the transfer-sheets, suitably developing the planographic surface into a printing-surface of the character desired, printing the design as a whole from said printing-surface in ink or other suitable medium upon a single uniformly-surfaced conveyer-sheet which is non-stretchable and non-shrinkable longitudinally and laterally, bringing the printed face of said conveyer-sheet in contact with a planographic surface prepared to receive the design as a whole and adapted to be thereafter developed into a printing-surface for that design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, suitably developing the planographic surface into a second printing-surface of the character desired for the design; and so on for each successive printing-surface, whereby a plurality of printing-surfaces for a plurality of designs grouped thereon may be made with but a single grouping of the separate designs, substantially as described.

4. The improvement in the art of making printing-surfaces which consists in accurately sticking up by hand upon a suitable setting-up plate a plurality of suitable transfer-sheets each having a design printed in ink or other suitable medium upon its face, applying such setting-up plate to a suitable planographic surface prepared to receive the



plurality of designs and adapted thereafter to be developed into a printing-surface for said designs as a whole, applying suitable pressure to said contact, whereby the ink of the designs is communicated to the planographic surface, removing the setting-up plate and the transfer-sheets, suitably developing the planographic surface into a printing-surface of the character desired, printing the design as a whole from said printing-surface in ink or other suitable medium upon a single uniformly-surfaced conveyer-sheet having a layer of material which is non-stretchable and non-shrinkable longitudinally and laterally, bringing the printed face of said conveyer-sheet in contact with a planographic surface prepared to receive the design as a whole and adapted to be thereafter developed into a printing-surface for that design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, suitably developing the planographic surface into a second printing surface of the character desired for the design; and so on for each successive printing-surface, whereby a plurality of printing-surfaces for a plurality of designs grouped thereon may be made with but a single grouping of the separate designs, substantially as described.

5. The improvement in the art of making printing-surfaces which consists in accurately sticking up by hand upon a suitable setting-up plate a plurality of suitable transfer-sheets each having a design printed in ink or other suitable medium upon its face, applying such setting-up plate to a suitable planographic surface prepared to receive the plurality of designs and adapted thereafter to be developed into a printing-surface for said designs as a whole, applying suitable pressure to said contact, whereby the ink of the designs is communicated to the planographic surface, removing the setting-up plate and the transfer-sheets, suitably developing the planographic surface into a printing-surface of the character desired, printing the design as a whole from said printing-surface in ink or other suitable medium upon a single uniformly-surfaced conveyer-sheet having a foundation layer of material which is non-stretchable and non-shrinkable longitudinally and laterally and a thin surface-cushioning layer secured thereto at all points, bringing the printed face of said conveyer-sheet in contact with a planographic surface prepared to receive the design as a whole and adapted to be thereafter developed into a printing-surface for that design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, suitably developing the planographic surface into a second printing-sur-

face of the character desired for the design; and so on for each successive printing-surface, whereby a plurality of printing-surfaces for a plurality of designs grouped thereon may be made with but a single grouping of the separate designs, substantially as described.

6. The improvement in the art of making printing-surfaces which consists in accurately sticking up by hand upon a suitable setting-up plate a plurality of suitable transfer-sheets each having a design printed in ink or other suitable medium upon its face, applying such setting-up plate to a suitable planographic surface prepared to receive the plurality of designs and adapted thereafter to be developed into a printing-surface for said designs as a whole, applying suitable pressure to said contact, whereby the ink of the designs is communicated to the planographic surface, removing the setting-up plate and the transfer-sheets, suitably developing the planographic surface into a printing-surface of the character desired, printing the design as a whole from said printing-surface in ink or other suitable medium upon a single uniformly-surfaced conveyer-sheet having a foundation layer of hard rubber which is non-stretchable and non-shrinkable longitudinally and laterally and a thin surface-cushioning layer of softer rubber secured thereto at all points, bringing the printed face of said conveyer-sheet in contact with a planographic surface prepared to receive the design as a whole and adapted to be thereafter developed into a printing-surface for that design, applying pressure with or to said contact without shifting the position of the conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, suitably developing the planographic surface into a second printing-surface of the character desired for the design; and so on for each successive printing-surface, whereby a plurality of printing-surfaces for a plurality of designs grouped thereon may be made with but a single grouping of the separate designs, substantially as described.

7. Improvement in the art of making printing-surfaces which consists in accurately sticking up by hand upon a suitable setting-up plate a plurality of suitable transfer-sheets, each having a design printed in ink or other suitable medium upon its face, applying said setting-up plate to a suitable planographic surface prepared to receive the plurality of designs and adapted thereafter to be developed into a printing-surface for said design as a whole, applying a suitable pressure to said contact, whereby the ink of the designs is communicated to the planographic surface, removing the setting-up plate and the transfer-sheets, suitably developing the planographic surface into a printing-surface of the character desired, printing the design as a whole from said printing-surface in ink or other suitable medium upon a single uni-



formly-surfaced conveyer-sheet which is non-stretchable and non-shrinkable longitudinally and laterally, bringing the printed face of said conveyer-sheet in contact with a planographic surface prepared to receive the design as a whole and adapted to be thereafter developed into a printing-surface for that design, applying pressure with or to said conveyer-sheet as a whole upon the planographic surface after contact, removing the conveyer-sheet after such contact, suitably developing the planographic surface into a second printing-surface of the character desired for the design, removing the remnants of the ink from the conveyer-sheet, again printing the design from the first printing-surface upon

the conveyer-sheet, transferring the design from the conveyer-sheet to a second planographic surface, and developing said second planographic surface into a printing-surface as before; and so on for each successive printing-surface, whereby a plurality of printing-surfaces having a plurality of designs grouped thereon may be made with but a single grouping of the separate designs, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE E. PANCOAST.

Witnesses:

GEO. H. BARNES,  
EDWIN SEGER.