

Sept. 3, 1940.

L. C. ANTRIM

2,213,645

MANIFOLDING

Original Filed Dec. 13, 1937

Fig. 1

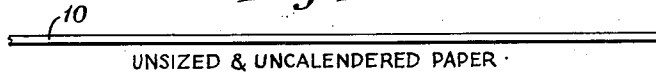


Fig. 2

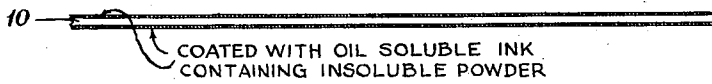


Fig. 3

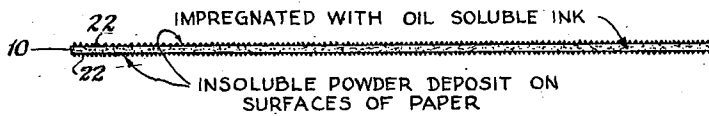


Fig. 4

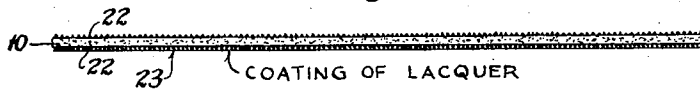
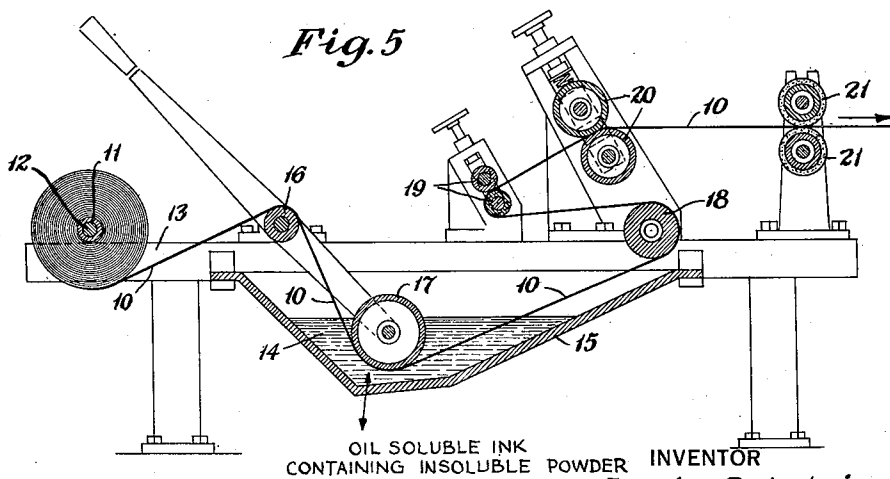


Fig. 5



INVENTOR

Louis C. Antrim,

BY *Johnson, Kline & Smyth*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,213,645

MANIFOLDING

Louis C. Antrim, New York, N. Y., assignor to
Autographic Register Company, Hoboken, N. J.,
a corporation of New Jersey

Original application December 13, 1937, Serial No.
179,436. Divided and this application Febru-
ary 17, 1939, Serial No. 256,956

11 Claims. (Cl. 282—28)

This invention relates to manifolding, and more particularly to transfer devices for use in manifolding.

This application is a division of my copending application Serial No. 179,436, filed December 13, 1937.

In transfer devices, it is desirable that the transfer medium or paper carry a maximum quantity of ink so that the device will last over a considerable period of time. However, it has been found that such transfer paper will produce undesirable smudges and will bleed or lose the ink quite rapidly when in use. To overcome this difficulty, applicant has devised a new transfer sheet.

According to the present invention, a porous sheet is impregnated with an oil-soluble ink and is provided with a layer or coating in intimate contact with the sheet providing a porous cover for the sheet which will effectively control the amount of ink permitted to leave the paper when an impression is made from the paper, and which will prevent smudges due to excessive ink on the surfaces of the paper.

The layer or porous cover is composed of finely divided material which is insoluble in the ink solution and which is also incapable of chemical reaction with the constituents of the ink. This material adheres firmly to the paper and is retained thereby for substantially the life of the paper.

The transfer device of the present invention is made by the process claimed in my copending application, wherein the paper is simultaneously impregnated with the ink solution and coated with the finely divided ink-retarding material. This enables the production of the paper to be effected very rapidly.

In carrying out this method, the finely divided material is held in suspension in the ink solution and, as the ink is absorbed in the paper, the finely divided material will be deposited on the surface thereof. It will be seen that the deposit will be in proportion to the amount of ink absorbed in the paper so that, when only a small amount of ink is absorbed, only a thin coating is formed on the surface and, conversely, when a large amount of ink is absorbed, the deposit on the surface will be thicker. The deposit or layer is slightly porous so that it will control the flow of ink from the paper to another medium when impressions are made therefrom.

If desired, one side of the paper can be rendered nontransferring by providing it with an

impervious coating of lacquer or the like, so that, when used in a typewriter, the paper will only make one transfer impression.

Other features and advantages of the invention will be apparent from the specification when considered in connection with the drawing, in which:

Figure 1 is a sheet of paper.

Fig. 2 shows a section of the sheets slightly impregnated with the ink and having a thin coating of insoluble powder on the surface.

Fig. 3 shows a section of the paper which is fully impregnated with oil-soluble ink and having a heavy deposit of insoluble powder on the surface.

Fig. 4 shows a section of the paper which has been fully impregnated and coated with the finely divided material and having a backing coat of lacquer thereon.

Fig. 5 shows a view of the paper-inking machine.

According to the invention, a paper 10 is used as the base material. The paper is unsized and uncalendered so that it is very porous. It must be understood, however, that any type of porous material may be used, according to this invention. The paper is usually wound into a roll 11 which is mounted on a spindle 12 at the receiving end of an inking machine 13. A mixture of oil and pigment or dye 14 is mixed and placed in the trough 15. A suitable quantity of finely divided or powdered material, which will not chemically react with the ink solution and which is insoluble in the ink solution, is next mixed with the ink solution in the trough 15 so as to be suspended in the inking solution. The solution and powdered material may be completely mixed before being placed in the trough 15 if desired.

The finely divided material or powder may be a metal such as aluminum or bronze, a metal alloy, a metal oxide such as iron oxide, soap stone, or the like. For example, iron oxide makes a very effective coating material for black transfer paper.

The paper from the roll 11 is passed over a guide roller 16 and into the solution in the trough. A guide roller 17 is mounted so as to be positioned in the trough to hold the material submerged in the mixture. As the paper passes through the mixture, it will absorb the ink and the finely divided material or powder, which is in suspension in the solution, will be deposited on the surface, as shown at 22 in Figs. 2 and 3. Fig. 2 diagrammatically shows the paper in the condition when the ink solution first contacts it and

places a light deposit of the powdered material on the surface. Fig. 3 diagrammatically shows the sheet when fully impregnated with the ink and coated with the insoluble powder deposit.

As is indicated by these two figures, the amount of powdered material deposited on the surface is in proportion to the amount of ink absorbed by the paper. When a small amount of ink is absorbed by the paper, the light coating of powdered material which is deposited will be sufficient to prevent the paper from smudging or bleeding. However, when a larger amount of ink is absorbed by the paper, to thoroughly saturate the same, the danger of smudging is much greater and a larger amount of coating on the surface is necessary to prevent the smudging or excessive bleeding of the ink. This will be present because the increased absorption of the ink into the paper will be operative to deposit by filtration larger quantities of coating material on the paper, and this will be sufficient to prevent the ink from passing from the paper too freely when used. The amount of ink absorption and coating can be controlled by the speed at which the paper is carried through the solution.

The paper, upon leaving the solution, is passed around a guide roll 18, through a pair of squeezing rollers 19, between a pair of spring-pressed feed rollers 20 and through a pair of felt-covered rollers 21. The paper in leaving the tank has the excess ink squeezed therefrom by the rollers 19, which also function to press the powdered material into more intimate contact with the paper. The layer of finely divided material, when in intimate contact with the paper, will adhere thereto for the life of the paper without the use of adhesives or other bonding means. Should there be any unevenness in the coating or any surplus ink solution on the surface of the strip, it will be absorbed and evenly deposited by the felt rollers 21. The strip is then led to a winding means or other take-up device (not shown) where it is allowed to dry.

This process produces a transfer sheet provided with two transfer sides, each capable of giving an impression. If desired, one surface of the impregnated strip can be rendered nontransferring. This may be done in various ways. For example, a backing material or lacquer 23 can be applied directly to the paper if the backing material or the lacquer is impervious to the ink solution. If the material is not completely impervious to the ink solution or will not properly adhere to the paper, a bonding or filler coat can be first applied to the paper and then the lacquer applied to complete the seal of the back of the paper. This prevents offset impressions when the paper is used in a typewriter or the like.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A transfer device for repeated manifolding use comprising a semiporous paper saturated with an oil-soluble ink and having a filtered layer on each side of the paper of finely divided material which is insoluble in the ink and which will not chemically react with the ink, said layer retarding the flow of ink from the paper.

2. A transfer paper for repeated manifolding use comprising a semiporous paper saturated with an oil-soluble ink and having a coating on each side of the paper of finely divided metal oxide which is proportional to the amount of ink in the paper for retarding the flow of ink from

the paper, said metal oxide being insoluble in the ink and will not chemically react with the ink.

3. A transfer paper for repeated manifolding use comprising a semiporous paper saturated with an oil-soluble ink and having a coating on each side of the paper of finely divided iron oxide which is proportional to the amount of ink in the paper for retarding the flow of ink from the paper, said iron oxide being insoluble in the ink and will not chemically react with the ink.

4. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper in proportion to the amount of ink solution in the paper to retard the flow of ink therefrom, said powdered material being insoluble in the ink solution and incapable of chemical reaction with the ink solution.

5. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material including metal oxide on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper to retard the flow of ink therefrom, said powdered material being insoluble in the ink solution and incapable of chemical reaction with the constituents of the ink, and the thickness of the layer being proportional to the quantity of the ink solution absorbed by the paper.

6. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material including finely divided material on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper to retard the flow of ink therefrom, said powdered material being insoluble in the ink solution and incapable of chemical reaction with the constituents of the ink, and the thickness of the layer being proportional to the quantity of the ink solution absorbed by the paper.

7. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material including powdered metal on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper to retard the flow of ink therefrom, said powdered material being insoluble in the ink solution and incapable of chemical reaction with the constituents of the ink, and the thickness of the layer being proportional to the quantity of the ink solution absorbed by the paper.

8. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material including iron oxide on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper to retard the flow of ink therefrom, said powdered material being insoluble in the ink solution and incapable of chemical reaction with the constituents of the ink, and the thickness of the layer being proportional to the quantity of the ink solution absorbed by the paper.

9. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil and pigment ink solution; a layer of powdered material including aluminum powder on each side of the paper in intimate contact therewith and forming a slightly porous coating for the paper to retard the flow of ink therefrom,

said powdered material being insoluble in the ink solution and incapable of chemical reaction with the constituents of the ink, and the thickness of the layer being proportional to the quantity of the ink solution absorbed by the paper.

- 5 10. A transfer device for repeated manifolding use comprising a porous paper impregnated with an oil-soluble ink and having a filtered coating of finely divided material thereon in intimate contact with the paper, the finely divided material
10 being insoluble in the ink and incapable of chemical reaction with the ink; a coating of bonding

or filler material on one surface of the paper; and a coating of material which is impervious to the ink solution covering the bonding material.

11. A transfer device comprising a porous, ink-impregnated fabric having a layer of flow-re- 5
tarding material on the surface thereof for controlling the flow of ink therefrom during use, said layer being directly proportional to the amount of ink in the fabric to produce a uniform flow
10 therefrom during transfer.

LOUIS C. ANTRIM.