R. Ferguson & J. Clark.

Printing Calico.

No. 4476. Patented Apr. 25. 1846

Fig 2.

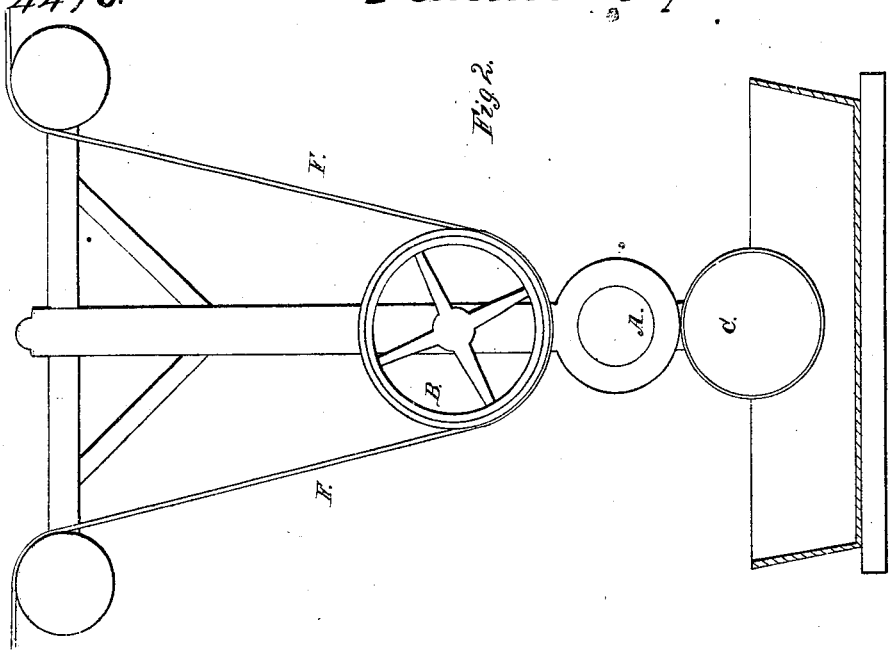
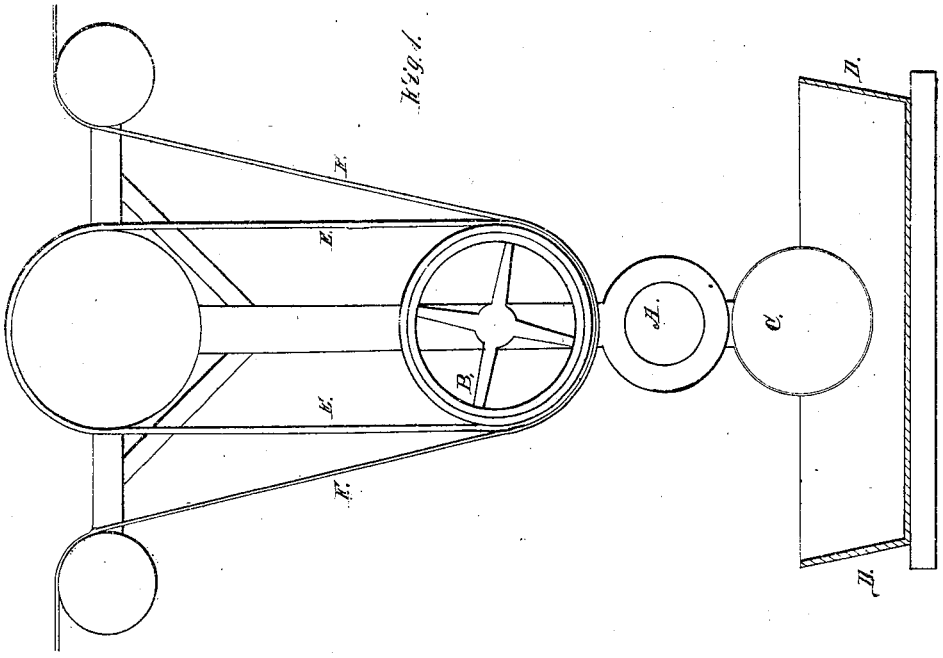


Fig 1.



UNITED STATES PATENT OFFICE.

ROBT. FERGUSON AND JNO. CLARK, OF GLASGOW, SCOTLAND.

PRINTING CALICO.

Specification of Letters Patent No. 4,476, dated April 25, 1846.

To all whom it may concern:

Be it known that we, ROBERT FERGUSON and JOHN CLARK, of the city of Glasgow, in that part of the Kingdom of Great Britain called Scotland, have made a new and useful improvement in apparatus used for the printing of calicos, and of other fabrics either in the operation of printing by means of cylinders or by blocks; and we do hereby declare that the following is a full and exact description thereof—that is to say, our invention relates, first, to machinery used in printing calicos and other fabrics by means of rollers and flat plates; secondly, our invention relates to the apparatus used when printing calicos and other fabrics by means of blocks, and in order that our invention may be fully understood and readily carried into effect we will proceed to describe the means pursued by us.

In printing calicos and other fabrics by means of rollers engraved or cut in relief it is well known that in cylinder or other machine printing a cylinder is used commonly called a bowl and such cylinder or bowl is usually covered by means of a fabric called lapping and with such cylinder or bowl an endless blanket of wool cotton or other material against which the fabric to be printed is pressed by the roller or rollers of the machine (gray calicos are now frequently used betwixt the blanket or felt and the fabric to be printed).

Now the object of the first part of our invention is to apply to such cylinder or bowl a better surface by means of which the ordinary covering of lapping is rendered unnecessary and the employment of an endless blanket will not be required as the surface applied according to our invention will be in itself sufficiently smooth and elastic for obtaining the impression from the roller or rollers whether engraved or cut in relief. In place of applying the ordinary lapping to the surface of a cylinder or bowl of a printing machine and in place of the blanketing we coat or cover the cylinder or bowl in the following manner. The cylinder or bowl being well cleaned we rub it over with gum senegal liquor (that is gum senegal dissolved in water at the rate of about eight pounds weight of gum to one gallon of water) having now a plain copper roller in the machine we then take cotton cloth coated on the one side only with india rubber cement (that is india rubber dissolved) put the uncoated side next the bowl and having a blanket betwixt the said cloth and the copper roller we put a slight pressure on the machine and roll on one round of the said cloth cutting it so as to make a good join. We then take what is now known as Clark's patent india rubber cloth (for which Letters Patent were granted in Great Britain to James Clark in the year 1843). Cotton cloth, mouseline de laine thin flannel or fine woolen cloth whichever of these is used being coated on one or on both sides with india rubber cement or the composition called Jeffrey's patent marine glue being an elastic water proof composition (for which Letters Patent were granted in Great Britain to Alfred Jeffrey in the year 1842). Cut the end of this straight lay it on the bowl and put a slight pressure on the machine as before but without having the blanket of this we roll on from twenty to thirty rounds according to the kind of cloth used and as may be required for the style of work to be printed taking care to cut the end correctly opposite the previous end avoiding overlapping so as to make a good join and in the course of rolling on the twenty or thirty rounds although only a slight pressure is used at first we increase the pressure a little every five rounds ending with a pressure similar to what is used in printing. We let the machine run with the pressure for half an hour taking care to keep the copper roller clean by rubbing it with cloth slightly dampened with water having a little soap in it to prevent the india rubber or marine glue sticking to the roller. We then coat the surface of the cylinder with india rubber cement well mixed with lamp black about $\frac{1}{16}$ part of an inch thick put on with a gage or roller the coating will then dry or we take Clark's patent cloth as before described well coated with the india rubber mixed with lamp black and put one round of it making a good join and by means of a chisel on a rest (the cylinder revolving as in a lathe) we cut the sides of the elastic surface thus applied to the cylinder neatly and to the width required. We then continue to revolve the cylinder or bowl for about an hour using the pressure roller and keeping it clean as before directed the coating to the cylinder or bowl being thus rendered smooth it is to be what is called cured by rubbing it over with sulfuric or muriatic acid the former

may be used full strength and the latter diluted with water to 60° of the Twaddell hydrometer. We let this remain for about fifteen minutes turning the bowl all the time and then wash it off with clean water and the cylinder is fit for work in the machine and is worked in the ordinary way except that we do not use the endless blanket as before and we attach to the machine a roller covered with sponge or cloth kept moist which we cause to revolve pressing slightly against the bowl for the purpose of cleaning the elastic surface of the bowl and we also attach a lint or dry doctor so called to take up the superfluous matter left by the immediately before mentioned roller. In printing with the use of gray cloth however the roller and dry doctor are not necessary. They are so when printing without the gray cloth.

Another of the means pursued by us in applying to the cylinder or bowl of a printing machine a smooth and elastic surface is as follows. We take flannel or other suitable material coated with India rubber cement on both sides and cut it into long narrow bands or fillets about three inches broad. We coat the edges of these with india rubber cement after coating the cylinder with gum senegal liquor (as before described) and putting on one round of cotton cloth or other material coated on the outer side with india rubber cement as before described we commence at the end of the cylinder on its surface to lay on the band or fillet by rolling it on tightly around the cylinder by the use of a copper roller pressing against it until the band or fillet reaches the other end of the cylinder. We then coat this wrapping on the bowl or cylinder with india rubber cement well mixed with lamp black and allow it to dry. Cut it at the sides and cure it with acid all as before described. The elastic cylinder or bowl is now ready for printing in the usual manner.

Another method by which we apply a smooth and elastic surface to cylinders for printing calicos or other fabrics is as follows, viz: by taking a quantity of the elastic water proof composition known as Jeffrey's patent marine glue before mentioned and No. 4 or No. 5 of that composition. We put it into a suitable vessel and apply a heat from 200° to 300° Fahr. which brings it to a liquid. We cover the cylinder or bowl with a few rounds of lapping in the ordinary way and then put on with a gage or roller a quantity of the aforesaid glue melted as above, turning the bowl and continuing to apply the glue till a quantity is on sufficient to give the elasticity required. The bowl or cylinder is then fit for use.

In the accompanying drawings Figure 1 represents the manner in which the printing is ordinarily effected by means of cylinders, and Fig. 2 the cylinder apparatus as used by us.

A Fig. 1 is the engraved cylinder; B is the large iron drum roller or cylinder which is covered by lapping represented by the blue lines. C is the clothed wooden roller which dips into the coloring matter D D in a trough below it; E E is the endless apron of blanketing represented by the yellow line and the red line F F shows the fabric to be printed.

In Fig. 2 the same apparatus is shown, with the exception of the endless apron of blanketing; the green line around the cylinder B representing the wrapping which we employ of india rubber fabric, which takes the place of both the lapping and of the blanketing. F, is the cloth that is being printed.

The second part of our invention consists of applying a smooth elastic and level surface composed in manner before described in reference to cylinder printing to printing tables for receiving and having spread thereon calico or other fabric to be printed by means of blocks.

Having given such minute particulars as are herein described for making a surface to a cylinder or bowl a workman will readily apply a surface composed as before described on a proper table for block printing taking care to keep the same smooth and level.

Having thus described the nature of our invention and the manner of performing the same we would have it understood that we make no claim to the applying india rubber or Jeffrey's patent marine glue to the surfaces of fabrics or materials that process being well understood and commonly employed for various purposes and we would have it understood that what we do claim is—

1. The application to cylinders or bowls for printing machines for calicos and other fabrics of a smooth elastic surface in manner herein described.

2. The applying an elastic bed or surface for block printing as herein explained.

ROBERT FERGUSON.
JNO. CLARK.

Witnesses:
ROB. LAMOND,
ARCHD. POLLOCK.