

XLII. Specification of the Patent granted to Mr. GEORGE JEFFREYS, of the Parish of St. Luke, Old-street, Scarlet-dyer ; for a Method of dying Woollen Cloths, Stuffs, and other Materials, in various Colours, and of any Figure, Pattern, or Design required, by Means entirely new.

WITH TWO PLATES.

Dated March 18, 1791.

TO all to whom these presents shall come, &c. NOW KNOW YE, that in compliance with the said proviso, I the said George Jeffrey do hereby declare, that my said invention of a method of dying woollen cloths, stuffs, and other materials, in various colours, and of any figure, pattern, or design required, by means entirely new, is described in the several drawings hereunto annexed, and in manner following; that is to say, let well-dried tobacco-pipe-clay be finely powdered, and gradually added, with incessant agitation,

tation, to an equal weight of tallow, of the best kind, heated previously to its boiling heat. Continue the heat for two or three hours, or until the mixture acquires such consistence that it will grow solid by cooling, and that, when the whole charge is suffered to cool in the boiler, no part of the tallow shall appear distinct and unmixed near the surface. If any tallow should thus appear, the whole must be boiled and agitated again, for two or three hours, or more, if the quantity be great. If the composition be duly prepared, it will have the following properties, and serve for the following purposes. When heated so much as to acquire the fluidity of thick cream, it will run freely through the perforated plates hereafter described, and sink deeply into woollen stuffs placed under the plates, without spreading laterally beyond the limit of the perforations in the plates; and any traces made with the melted and liquid composition on woollen stuffs, will become hard, and dry, as quickly as they are suffered to cool; and woollen stuffs, striped, or traced, or figured with the composition, will not smear each other by contact after they become

cold. The composition duly applied, in the manner hereafter described, to woollen stuffs, so as to sink into them, and cover the nap in form of stripes, or in figures, will prevent the parts of the woollen stuffs which are charged with it from receiving a dye or colour, in any usual dying process that is competent for the dying of all the other parts of such stuff; and thus it enables the artist to preserve the native colour of the woollen stuff in the form of stripes or figures, or any dyed colour of the woollen stuff in stripes or figures, whilst all the other parts of the woollen stuff may be made to receive any chosen dye; and thus a great variety of stripes, figures, and colours, may be made in woollen stuffs. The composition has also this property, that it may be easily extracted from the woollen stuff, by means of fullers-earth, in the fulling-mill or stocks; and the extraction requires only twice as much fullers-earth as is commonly used for extracting the grease out of cloths.

The mechanical part of the art of making stripes across the breadth of a piece of woollen stuff, is as follows. Let the figure A B C D

(Plate

(Plate XVI. Fig. 1.) represent a plate of brass, one-twentieth of an inch in thickness; let the black parts of this figure represent the substance of the plate of brass, and let the white spaces or lines represent the long parallel apertures, made by cutting through the substance of the plate, so as to make it into a kind of grate, whose apertures shall be long enough to extend quite across the breadth of the woollen stuff which is to be striped, and whose apertures shall have the width of the intended stripes. Let EFGH represent the horizontal plane of a long table; and let IKLMNO represent a piece of woollen stuff lying smooth upon the table. When the brass grate is to be applied to this piece of stuff, the edge AB must be parallel with IK, and beyond the edge of the woollen stuff at IK; and the edge DC must be parallel with the line ON, so that the whole breadth of the woollen stuff may be seen through the brass grate. Let 1 2 3 4 represent a brass frame or box, whose four sides are parallel, and inclose a space of the length and breadth represented, and of the depth of one inch and a half, or two inches; and let this frame, when it

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is placed on a true plane, touch and fit the plane so accurately, that the brass frame may be filled with the melted composition, without suffering any of it to pass away between the frame and the plane. Now let this brass frame 1 2 3 4 be placed on the brass grate, at D C, so that the side at 4 3 shall stand within D C, and shall be parallel with D C, and that the side 1 2 shall be at some distance from the apertures of the brass grate; and so that the unperforated part of the brass grate, near D C, shall serve as a bottom to the brass frame, and that thus a trough be formed, capable of holding the liquid composition. Now let the frame 1 2 3 4, so placed, and charged with the melted composition, be briskly slid along the brass grate to the end A B; the composition will sink upon the woollen stuff, forming stripes upon it, in the order and direction of the apertures of the brass grate, whose thickness determines the quantity of composition thus to be lodged on the woollen stuff. When the brass frame is thus slid beyond the edge A B of the brass grate, whatever part of the charge of the composition is superfluous runs off into a trough, placed under the
edge

edge of the table, between E and H, and is therein saved for future use. In order that the frame 1 2 3 4 may slide regularly on the brass grate, from the end DC to the end AB, the brass grate is provided with a ledge or rising at the edge AD, and at the edge BC; within which ledges the brass frame may slide freely, always maintaining its first parallelism. 5 6, represents the horizontal plane, and prominent ledge, of the brass grate ABCD. When the composition is thus deposited in stripes, the brass grate is to be taken off the cloth, by raising it perpendicularly, and rather in the direction of the stripes than across them; and this brass grate (or another of the like apertures) is to be cleared for farther use, by heating it on a hot iron plate, and rubbing it clean with coarse woollen cloths; and, on the next application of the brass grate, in order to continue the process of striping with the composition, care must be taken that the edge AD, of the brass plate, shall be parallel with the former stripes made on the woollen stuff, and at such distance from the contiguous stripe, that all the stripes successively made shall have the required distances

distances and parallelisms. As the brass frame, when charged with the melted composition, is too hot to be griped by the naked hand, a wooden cover with a ledge is put on each end of the brass-frame; by the intervention of which, the workman can catch and slide the frame, without touching the hot parts. Any person who will construct these instruments, and arrange them to use, in the manner above described, will readily perceive, that the brass grate A B C D may be stayed in the required position on the woollen stuff, either by an assistant, or by pins so placed that they shall not obstruct the motion of the brass sliding-frame; and will also perceive, that if the apertures in the brass grate are spiral lines, or represent figures of various kinds, the composition will be deposited on the woollen stuff in spiral lines, or figures corresponding with such apertures, so as to produce a great variety of patterns of different stripes or figures, and of different colours, as may more fully appear under the description of dying stuffs so striped or figured with the composition. With the aforesaid composition, work may be executed in the manner of the

wax

wax calico-printers or dyers, particularly on thin woollen stuffs ; and it is to be observed, that when the composition is applied to cloth or thick stuff, care must be taken that it shall penetrate, and also completely cover the nap.

To make the composition run in stripes along the whole length of the stuff or cloth, the mechanism is as follows. A brass plate *A B C D* (Plate XVI. Fig. 22.) is cut, from the edge *D C* to the extent between *D E* and *C F*, so as to form apertures, of the breadth of the intended stripes of the composition. On the unperforated part of this brass plate, and within *A B F E*, a brass frame or box, similar to that above described, but much larger and deeper, in order that it may hold a much greater charge of the melted composition, is to be placed, preparatory to the intended operation. When a piece of stuff or cloth is drawn over a smooth table, and between it and the brass plate, and advances under the brass plate to meet the line *a b*, then the brass frame, charged with the composition, is made to slide quickly, from the unperforated part of the brass plate to the perforated part thereof, between *E F* and

and *a b*: the stuff or cloth is at the same time drawn, with uniform and brisk motion, in the direction *A D B C*, and this receives the composition, in the form of parallel stripes, through its whole length; the brass frame being all the while supplied with the composition, as fast as it is expended. At the line *a b*, a ledge of brass is screwed on the brass plate, and serves two purposes; the first is, to stop the charged brass frame, and to determine the position of it, when it rests over the apertures: the second is, to determine the depth or quantity of the composition which forms the stripes; and, in order to produce this latter effect, the brass ledge *a b* sinks into the apertures across which it lies, to such depth as is found convenient for different kinds of woollen stuff. If a thin stratum or stripe of the composition be required, the brass ledge is made to sink into the apertures deeply; if a thick stratum or stripe of the composition be required, the brass ledge is made not to sink so deeply; in general, the facets of the brass ledge, which sink into the apertures, ought not to be above one-thirtieth of an inch from the under surface of the
plate

plate A B C D. In order that the stuff or cloth may run freely, steadily, and smoothly, under the perforated brass plate, it is previously rolled smoothly on a cylinder of wood, whose axis is parallel with A B; and the beds in which the extremities of this axis move round, are made in the foot or frame of the table on which the work is executed. In order that the cylinder may deliver the cloth with a steady uniform motion, the axis of the cylinder is made to project half a foot beyond the bed; so that a rope, which is fastened to the ceiling, may pass round the projecting axis, then upwards, and then, turning over a pulley, may have a weight suspended to it. According to the quantity of weight thus applied, the axis of the cylinder will be pressed, more or less forcibly, to one side of the box in which it turns round; by which means, a tremulous motion is prevented, at the same time that the friction of the rope, on the axis, makes the cylinder to deliver the stuff or cloth more steadily. It is to be observed, that the plate A B C D must be fastened on the table by bolts or pins, placed near the edges C D. It is also to be observed, that the

brass frame or box, in order to be kept steady and close when charged, and made to deliver the composition, is required to be loaded with leaden weights; and, when this brass frame or box is large, its opposite sides require to be stayed or supported by several pieces of thick brass, standing at right angles with them, and foldered or rivetted to them. In order that the stuff or cloth, in passing under the brass plate, may be pressed equally at all parts within the space *E F a b*, a pad is fastened to the table, under *E F a b*; which pad rises one-eighth of an inch, or less, above the plane of the table, and consists of near two folds of woollen cloth, covered with parchment, in order to lessen the friction of the cloth against the pad. When many pieces of cloth are to be thus treated, they are to be neatly darned end to end; and, being duly placed on the cylinder above described, they may be striped with the composition, as fast as they can be conveniently drawn through; the frame or box containing the composition being kept constantly supplied, whilst the stuff or cloth is passing. When woollen stuff or cloth, thus placed on the cylinder, is

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to be drawn through, and striped with the composition, the end on which the operation is to commence is to be hooked to a piece of wood, of a yard or more in length, having tenter-hooks on the upper surface thereof, for that purpose; and, to this piece of wood a rope is to be fastened, exactly at the middle of the breadth of the stuff; the other end of the rope, being passed over a pulley; at any required distance, and in the proper direction, is then fastened to a windlass. As fast as a workman turns the windlass round, the piece of wood is drawn towards the windlass, and the cloth is drawn through and striped with the composition, which sets and dries, by cooling, as fast as it is necessary; inasmuch that in a few seconds the stuff or cloth may be thrown into folds, or otherwise, without smutting. If the table or plane, along which the woollen stuff is to be drawn, be made to slope a little downwards towards the windlass, the operation will be the more easily performed.

Plate XVII. contains two views of the machine, supposed to be at work.

In dying woollen cloth or stuff that has been charged with the stripes or figures of the composition,

position, care must be taken that the surfaces of the cloths shall not touch each other. Their contact is prevented by means of a frame, (Plate XVI. Fig. 3.) fitted to the top of the kettle, to the several bars of which frame one of the lifts of the cloth is hooked, whilst leaden weights are hung to the other lift. The middle or longest bars of this frame extend beyond the circumference of the kettle, resting upon the top of it, and serve as handles, by which the frame is raised and lowered, from, and into, the dying-liquor, so as to produce an even dye, without causing the surfaces of the cloth to touch each other. Divers compositions may be made with earthy powders and unctuous bodies, which may be used as substitutes for the composition, provided they possess the general properties above described; and the composition may be delivered on stuffs or cloths by various mechanism, and in ways different from those described; all which will naturally occur to an artist, after he has practised in the manner above described, and thus learns the general principle and purpose of this art. In witness whereof, &c.

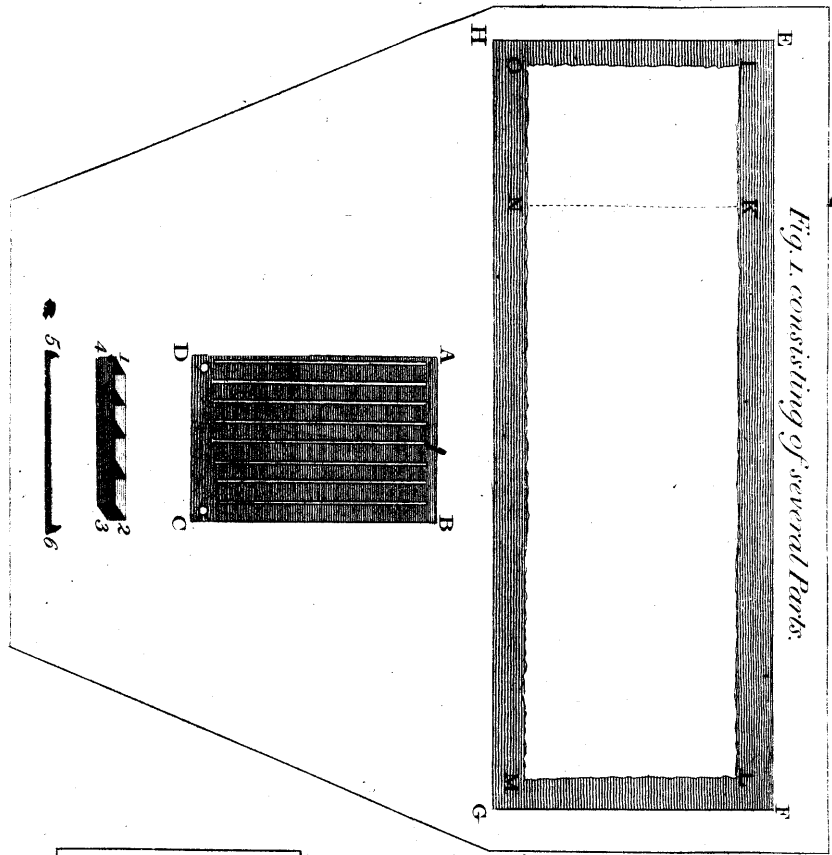


Fig. 1. consisting of several Parts.

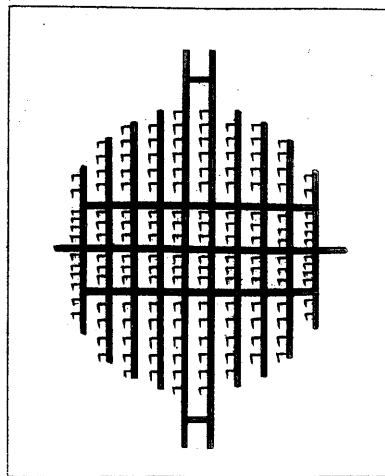


Fig. 3.

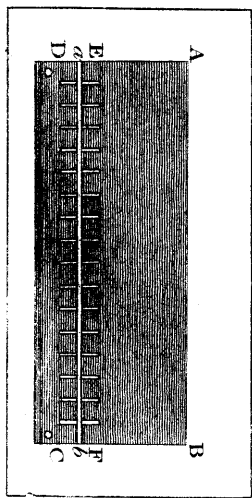


Fig. 2.

Two Views of the Machine, supposed at Work.

