Sheet 1-3 Sheets.

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Making Prussiate of Potash.

Patented Apr. 23, 1834.

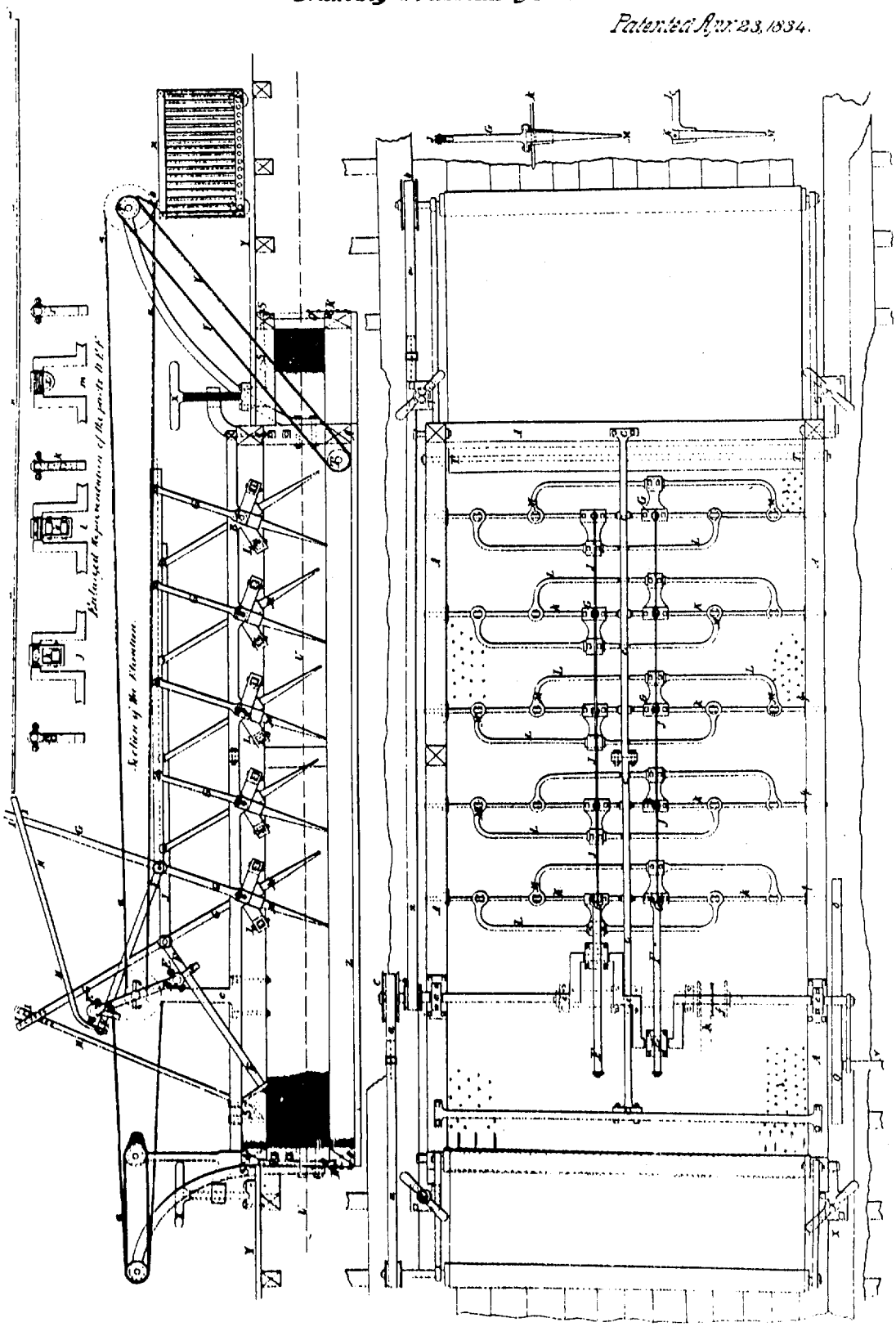
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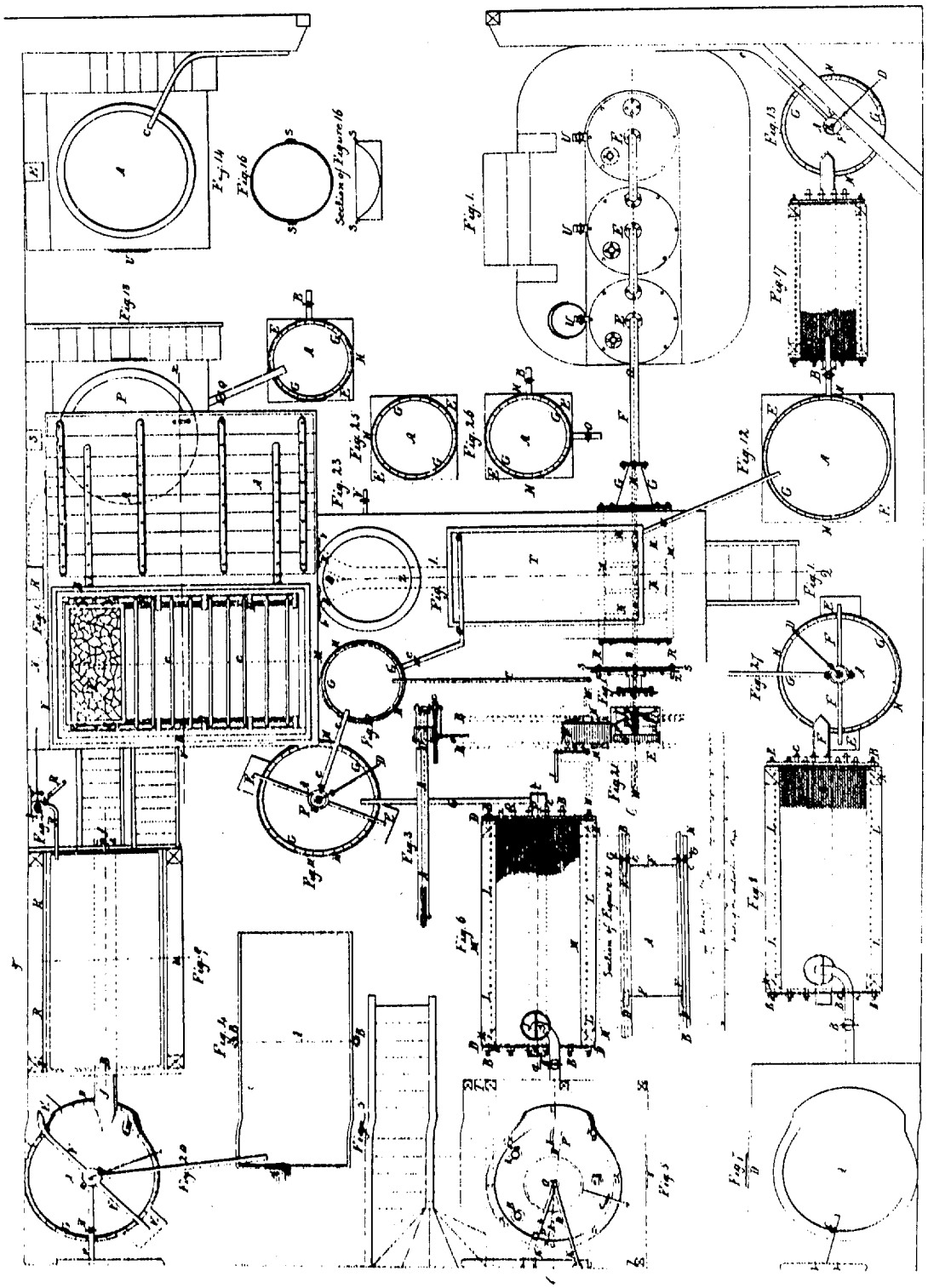
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Felix Fossard

Letters Patent

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Felix Fossard, himself of his improvement in the machine or closed vessel for manufacturing the Prussiates of Potash and Soda; and also certain machinery, apparatus and utensils, to be used in the said manufacture, and in the scouring, dyeing and washing of Wool, in the fleece, stocks, skein, piece blanket or otherwise; also in the dyeing of silk, cotton, linen and other textile or organic substances.

The principle articles on which my claims are founded. 1st. On the construction of a closed vessel (and its employment) as well as certain apparatus, methods and processes for manufacturing the Prussiates of Pot ash and of Soda. That vessel bearing a cylindrical or any other form, placed horizontally or vertically, resting on itself or being steady and the materials being stirred into it by machinery or without it.

2nd. On the importance of plunging wool or the cloth, blanket &c. into an acid bath, in order of cleaning it thoroughly, and on the general advantage arising from the use of this bath, not only for woollens intended to be dyed by the Prussiate of iron, but also for all kinds of woollen materials, whether intended to be dyed by the ordinary processes or not.

3rd. On the means of producing a pure textile substance, an uniform saturation of the protoxide and deutoxide of iron, or an oxide more oxigenated by means of a current of air heated and blown afresh there by means of a bellows in a particular apparatus.

4th. On the means of dying the Prussiate of copper by fixation of the oxide. 5th. on the means of obtaining black, bronze and a great many other colors with or without a blue tint by calcinating and combining the oxide of iron with almost all the coloring materials known. The blue tint when desired being given by prussiate of soda or indigo, indigo being rarely employed before, during or after the saturation of the oxide of iron by means of prussiate of potash, soda or materials

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intended for Blue to give them a peculiar shade. The baths of oxide of iron of prussiate acid and other coloring substances being used below or at boiling heat. 6th On the method of expressing the liquid from the cloths &c. as they pass out of the baths, by means of pressing rollers or peculiar flexible cylinders.

7th On the employment of a clothed stove to expel the humidity from the cloth &c. 8th On the adaptation of various systems of levers, eccentrics, screws &c to the construction and employment of a machine for washing wool. and on the employment of certain Cranes apparatus and utensils and their arrangement as a means of performing the general and particular processes for which they are intended, not only for treating woollens and other materials to be dyed by the Prussiate of iron but also every kind of materials in any dye house.

9th On the principle the characters, the effects and consequences of the preceding articles, either combined with the means and processes of the patent granted me under the date of the fourteenth day of December 1822. or not, and either used in the whole or in part in the manufacture of the dye house.

Many of the things which are represented in the drawings annexed with this specification, and described in the various processes are not strictly speaking my inventions, but I claim them only as applied to the practical and special application to which I adapt them in the processes of washing, securing, dyeing and manufacturing

Processes of manufacturing the Prussiates.

The different vessels and apparatus described in plates 1st & 2d are erected and placed in a place sufficiently large. Heat the cast iron cylinder M Figure 1. to a low red heat as it has been previously stated in the specification of my patent of December 1822. place the first disk I and its pin on the fore part N. of the agitator, and the pin a little after having introduced it into the holes of the collar of the disk and the agitator &c the plates, and description of them deposited in the Patent Office.

Place the agitator in the cylinder, so that the round pointed end

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H. rest about a foot on the support J. the cross bars K being placed horizontally in the axis; then fix the hinder disk W. on the agitator by means of the pins or wedges j. close it by means of the hinges D of the movable part W. of the disk (8). Then throw the before mentioned mixtures quickly into the cylinder.

This done remove each part of the mixtures as may remain behind the part of the disk N. by means of a broom, raise the part W. and place the ring O. against the parts W and N. by this means the suffix part W. will be firmly closed. During this time fill the groove G of the door of the cylinder and the opening L of the screw H. with potters earth mixed with hair to form a lute of a proper consistency. At the same time the prolongation S. of the agitator must be passed into the stuffing Box and lute stuffed all round the agitator as far as O. On turning the door T. on its hinges the extending piece R. will be reached. Here introduce the square end of the part H. of the agitator into the fork Q of the hinder part. place them so that the holes H. and S. come opposite to each other, so as to pass the pin P through them which must be bent a little so that it may not fall out of these holes without force.

That done push the door against the extending piece R. pass a lever in the ring U. of the collar A and force them so that the parts R. and T may be closely joined by means of the bars and fixing marked B. in the form of the letter S. which pass underneath the cylinder collar D. guided by the staples F. the projecting part V. enters the groove G. and lutes the entrance to the cylinder. Then introduce the wedges L. of the stuffing box in the agitator S. pass a lever in the ring U. of its collar. force the braces or wedges L. against the bottom O. of the stuffing box (previously coating with lute in the manner already described) these 2 parts of the different pieces. Put the screwed socket E. upon the agitator S. raise the resting piece A. of the support d (9) put the two pins C. into the holes of the pieces a, a, d. place the key or piece b. into the space between the thread of the screw E. and place the toothed wheel

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A

G on the agitator. The teeth of that wheel entering those of the brass wheel F. Then place the pin q into the hole made at the end of the axis of the agitator, next turn the handle I, affixed upon the axis of the wheel F, and thus continually stir up the animal and other substances submitted to calcination in the cloud cylinder (C). The gaseous products will be passed into the first vessel of the Woulfe apparatus, by means of the tube E, and afterwards (by means of the tubes B.) into the other vessels. But of these gaseous substances are condensable, as the empyreumatic oil and the ammoniacal gas, will be contained the carbonic and hydrogen gas, which escape by the tube A.

When the agitator has been made to work a few times in the cylinder, by means of the screw a distance between two of the transverse iron bars K, the workman shall turn the handle I, and pass to the other side of the agitator; and turn the handle in the same way by which motion the agitator will be carried in the reverse direction of the first movement, when arriving at the same distance he must again pass to the other side, and proceed thus during the operation of calcining, but more quickly than at the first turning, continue thus about one hour and then much more quickly. And when he finds less resistance in the interior of the cylinder, and that the movement is more easy, (and to this great attention must be paid) he must then turn very quick for about ten or twenty minutes, for then the substances are in general brought near to the desired state of calcination: a few minutes after previously stick himself upon the aperture Q, and if but little smoke is observed, then the calcination, if may then be supposed has arrived at its proper period.

Then immediately proceed to discharge the cylinder thus: take out the pin q of the wheel G, at the same time letting out those of the sliding piece x, the support d, and the screw (if the supports are used under the carriage figure 21) Then remove the carriage from underneath the sliding piece of the agitator

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A of the agitator by means the ~~edge~~ I. Take off the screw F. unfasten the ~~screw~~ collar A. of the feeder and open it halfway. Take out the pin P. which confines the two parts of the agitator. Open the door entirely and by means of a crooked piece of iron (which must be passed into the handle of the disk I. draw the agitator out of the cylinder quickly and the calcined matter fall into the conical mould B. of the carriage figure 2. (11.) placed under the extension of the cylinder K. Not withdrawing the agitator from the cylinder it must be held by the hook M. B. of the crane figure 3. The agitator being withdrawn from the cylinder the little calcined matter which remains adhering to it must be removed by means of a brush formed of Aneallo wires. and with a rake remove such of the calcined matter from the cylinder as was not withdrawn by the first disk I. of the agitator. Take the carriage from under the extension of the cylinder and immediately recharge the cylinder &c in the first instance. A mixture of the above named materials should always be had in readiness for that purpose. The calcined matter being cooled (12) conveyed to the moistening vessel figure 4. and when moistened as described in the specification of my Patent of December 1822. put it into the funnel A. of the boiler of the steam vessel Figure 6.

Charge the Boiler to about three fifths of its height. and then admit water (or a dilute and the weak solution in the reservoir) raised by the pump Figure 20. to within about one foot of the lid.

Things being thus disposed. fill the reservoir D to about half its height with a mixture of one part of sulphuric acid to ten parts of water. Screw the bell E. on the axis G. of the agitator, until the lower part of it is about two inches from the bottom of the reservoir D. Then place the tube B. with its cock open into the first vessel of the Woulfe's apparatus. that is. into the first of two vessels placed at a little distance from the Boiler figure 5. fill the first one to about half its height, with a solution of the muriate of lime

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which we will suppose to be about 15 degrees of the aræometer for salts. and in the second vessel (left entirely open) put about as much water (as in the neighbouring vessel) acidulated as in vessel D. Fire must then be placed under the boiler and the substances kept boiling, for about one hour and a half as before prescribed, and during this time the matter in the boiler must be continually stirred by means of a candle fixed on the apex, one of the bevel wheels E. after this a linen cloth must be spread on the grating A of the filtrer figure 6. and be fastened to the front I. and drawn tight against the padding I. the cock C being closed. Between the doors D. & Z. lightly fastened by the wedges B. the gutter placed underneath the filtrer, and a second linen cloth is put between them to receive the liquid which may proceed from the sides and conduct it to the gutter, with the emptied filtered liquid. The bucket or pail P of the cock R. being placed at the end of the pipe of the boiler and kept there by means of the step S. shut the cock of the pipe B. open the cocks V & R. taking care to stir the agitator P briskly during the time the liquid and its deposed mass on the filtrer.

The liquid being drawn off to the height of the cock R. close this cock, and recharge the boiler with fresh matter, and proceed as in the first instance. When the liquid above the cock C. of the filtrer is clear let it run into the gutter by means of a moveable pipe suspended underneath a cock by a cord, which pipe may be carried from one cock to another as required

The calcined substances is afterwards put and boiled in the boiler figure 7. in the manner already described. and drawn into the filtrer figure 8. by means of the tube B. being sufficiently drained it is then to be carried to the drawer figure 9. where it must be washed (to obtain the crude solution, of which mention has been made for boiling the calcined substances) with hot water proceeding from the cock of the carriage figure 2. which water must be received in to the steamer by means of a pump or otherwise.

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The fmuciate water of the two belongs of the calcined matter being brought into the common solution in the reservoir figure 10. by means of the pump of the reservoir figure 11. let it fall into the Boiler T. figure 1. by the cock C. and the pipe O.

The solution of the fmuciate being concentrated in the Boiler until it form a pellicle (in consequence of my patent of the 11th December 1832.) on the surface of the boiling liquid open the cock in the pipe V. (which is to be about 4 inches diameter) and the solution will fall into the crystallizer figure 12.

When the fmuciate is crystallized and the solution cooled, open the cock B. of the crystallizer figure 12. and the crystals opposite to the tube and the mother waters will flow (that is to say the solution of Carbonate of Potash) into the reservoir figure 13. after which the crystals are to be thrown on to the filterer figure 14. to be drained, and the solution conducted (by the pump belonging to the reservoir) to the boiler figure 14. for the purpose of being concentrated. When the calcined substances are sufficiently leached and drained in order to obtain the required weak waters close the registers V and V. of one of the stoves figure 15. in order to direct the heat and smoke into the other stove.

Place the calcined substances on the handles F. of the feed stove and when the required number of handles are placed in it, shut the door A, of which the projecting edge I. will enter into the groove B. running all round and filled with sand, open the registers, and when the matter has become dry, shut them again and take out the handles.

Having concentrated the solution of Potash in the Boiler figure 14. &c. the ...ined matter being dryed as fast as possible it is to be carried to the stoves figure 16. placed close to the boiler 14. and worked in as it has been described in the first patent. The liquid must be added until the calcined matter becomes cool, and so on for succeeding operations.

At the second crystallization the operation is done by suspen-

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at the Letter figure K. This will be afterwards discharged to the copper tallier Fig 19. NB. The mixtures referred to are those given in my Specifications ... patented on the fourteenth December 1832. Equal parts of animal substance, and of Potash to which after ingredient substance has previously been added.

In fact all the mixtures used in the manufacturing of fruitrate may give the same advantageous result if treated in my cylinder and by my economical way of manufacturing.

1st Process of Scouring.

The mode of freeing the wool in the fleece from its grease may be by the ordinary way, or by means of a strainer managed by a crane in which strainer the wool is freed from as much as possible from grease, drained and washed (14) after this operation fill another strainer loosely with the same wool and put it in Cask No 1. (13.) Soon after the wool has been in this Cask it should be raised, and lowered again and allowed to remain for 10 minutes. Then be stirred about for a short time & raised again. If the operation is accomplished place the strainer or vessel containing the wool, on a stand or frame for ten minutes then turn it on the other side and leave it for 10 minutes more afterwards introduce it into the Cask No 2. and treat the wool in the same manner, and during the same time as in No 1. or about.

The Cask (12.) will be found more serviceable and advantageous for wool which has been recently shorn from the animal and in all cases where the wool is in the fleece, because the wool soiled into cloth has in general been fulled and therefore the Casks 1 & 2. are considered as less necessary.

For common wool it may be only necessary to pass it into Cask No 1. which will entirely destroy the pellicle that covers its roots and which pellicle prevents its imbibing the dye when used in the ordinary way, or if it does imbibe it, the colour is soon destroyed and the cloth becomes white at the edges and seams. On the other hand for common sewing yarn

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washing, a vessel employing bath No 2 | the wool may be put into bath No 3 for dyeing as is the case when operating on cloth or fulled wool. but the omitting of this operation is not recommended as it will be much less perfect.

The baths No 2 intended for blankets cloths or stuffs may be formed in the ordinary vessels used by dyers and the work conducted as in ordinary cases when the observation that all these goods be exactly fulled by the rapids as an inequality of shade would be the result of defect in this operation. Wool may also be put in a loose state into the vats. Wool in the piece passed into the baths No 1 & 2 and afterwards washed with water will be free from all smell proceeding from the oil or grease which it originally contained, whether not fulled in the ordinary way however good and complete may have been the means employed to clean and cleanse it. will always preserve more or less that smell which it is desirable to get rid of. General means of applying the invention (15) is of freeing the hairy side of woven cloths and other fabrics in general fit for dyeing by the employment of hydrosulfite of iron &c (16)

We will commence first with wool in the piece, then with that in cloth, hats or piece and afterwards with wool and all other matters or materials in the skein. Besides the two principle methods of applying the invention described in my first patent there are many others which can be resorted to, as for example. 1st In producing a change in the hydroxide on the wool fibre when this change shall be simply produced by the decomposition of the acid of the protosulfite of iron which it comes in contact with the air or arising from decomposition of the cloth by conducting a current of hot air to the wool to evaporate the hydrosulfite and to produce that oxygenation in a prompt and equal manner on all parts of the mass of wool.

2nd On the number of immersions of the wool in the baths 3rd on the manner of preparing the baths on heating and maintaining them in a fit state for subsequent use when applying the invention and on so doing with celerity and economy. 4th On the employment of the various machinery, reels, stands &c, constructed for the diverse operations of applying the two baths when they are arranged in a proper manner to carry on the

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and will accomplish it more rapidly and correctly. 5th. The first method of the first special may be dispensed with, that is to say, that first smoke-dried to decomposition, and the operation of applying Thurwoodant or the other specifics may be carried on as if the aid of this decomposition had been resorted to &c. The wool having been prepared by the baths 1. 2 &c. and used as already pointed out, is to be put (from undergoing it by the first method of the first patent) into the vessel or steamer, which vessel has been previously filled with Bath No 3. The wool may be packed rather close when the quantity required is to be used, open the vessel at the bath and leave it open about immediately after this operation a second time throughout the vessel on the frame. The wool thus placed (the vessel being turned on its other side during that time) will be sufficiently drained in half an hour (or at least until first which is in the upper part of the vessel) to be put into the Bath No 4. The small quantity of wool which lies at the bottom of the vessel should be squeezed or wrung before it is put into that bath. The more the wool has been drained after its last washing before being put into bath No 3. the better in fact if it be quite dry it would be preferable. but in that case it will take the water with greater difficulty, and care must then be taken not to put too great a quantity into the vessel, as it would be necessary to stir it about in order that it might be equally wetted with the bath.

For Bath No 4. The wool placed in the steamer is treated as directed in the former specification, and after having remained there for about ½ an hour take out the vessel and place it on the frame in an inclined position (1) for about 10 minutes and then change its position from 3 to four and vice versa in order to equalize the distribution of the liquid upon the wool which is to be spread afterwards on a hot stove till the per-oxigenation is completed.

Being placed again in the steamer it is proceed to bath 5. as soon as it touches the liquid let it be moved as quickly as possible to a heat the middle of the bath of liquid when the wool may be turned over with facility by means of sticks. after having remained in the bath for about 5 minutes take out the vessel and place it on the frame, or

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to some Address as before, because the Work will not be contained within the Circumference of 3. On this account it will not be necessary to extend the Work into the Hot Stove, but if instead of putting it into the Bath 3 it should be determined to impregnate it with the Bath 4 by the ordinary Cells, to keep it steadily immersed by the second method of the first Specifications, it will be found convenient and desirable to expose it a second time to the Hot Stove, and in the case of the latter mode of affixing the immersed, it will be useful to apply Heat with Intermissions after each immersion. Four or four Gradual and complete immersions should be made in the Bath 3. without placing the work on the Frame, except for a short time only after the last immersion, for affixing the immersed by the first mode, towards of plating Steel into the Baths may be changed if desired. Viz. Put into Bath No 4. at 3 degrees of Thermometer, put into Bath No 3 at 6 degrees. But at each immersion a mark of these fields will be found than of necessity be had to the method already formed with the use of these Baths. Bath No 6. to be used about the same as No 5. For Bath No 7. the work may be retained into the former pleased as the rest to be withdrawn all at one time. Nothing will be very useful after this Bath, and may be discarded after each one of the operations of immersing work proceeds it. Mode of affixing the salts of copper as mentioned for fixing the rods of Steel metal on Iron, Cubelaney. There no Caption etc. to be operated upon. I must add to the directions of the first Specifications, that 1st It is desirable that the vessel in which the Bath 3 is formed with lime for example, should be as high as 3 or 4 times the length of the Rod being in order that several portions of time may always be contained in the vessel, and held by a very little screw, this Rods may fall to the bottom and remain there as a deposit. By this means the copper part of the Solution will be limpid when the Rods are plunged into it.

2d Photos may be taken of any other material to be immersed besides the vegetables in which you are operating, follows.

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these same directions, but in general operating the first method with a combined alkaline bath, such as No 3. and by the second method as for other tender substances. No 2. Nitre bath into which the substances should be fastened, may be either 3 or 4. No 10 will be preferable to No 3. and in either the ingredients to be marked or noted afterwards, for plenty of water. But I recommend making the following substances mordanted by the acids, or to be placed into the proper bath to produce a black or such shades as to assist the action of the sun and washing.

No. Sherrades of iron, and of copper may both be fixed in the substances by this same stone by means of the bath No 4. composed of the salts of iron and of copper. So simply the operation being performed with a bath of iron or a bath of copper as it will be thought necessary.

No 5. For mordanting by the salts of copper the alkaline bath No 3. may be preferable, instead of the cooking alkaline Caustic me: especially if it is chosen to use a bath at the ordinary temperature.

The wool being prepared as already directed a good color is to be selected for fixing colors prepared from dye woods as may dye shops. But it is intended for blue the shades of iron must be selected by means of prussic acid as follows.

A requisite quantity being placed into a steamer commenced for fixing into bath No 8. withdraw the vessel quickly. Just above the surface of the bath and let it remain about 15 minutes, then immerse it, repeat this 2 or 3 times and after this immersion let remain 15 minutes. Take the vessel and wool then be carried instantly out of the bath for half fixing. This mode of proceeding will be same different solutions to be used to keep up the acidity in all parts of the bath. The wool may now be blue colour. Take the following baths prepared to dissolve and only to go into boiling water, according to the shades and strength of the colour intended to be dyed. Each mixture will require the better result they may also be mixed. Note to be observed that bath

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Note. It is only a few Luminary baths which can be registered. Only Steel may be employed before, during, or after the Coloration of the oxide of Iron by means of Prussic acid, to guard it a fortiori. Note (22). Thus one may be clad of many other substances which it is unnecessary to enumerate here, as it will be supposed to be one of patent specification. Observations and notes referred to. The Figures from one to 7 inclusively are intended to illustrate some of the articles on which my claims are founded. The numbers to be looked for in the explanations corresponding with the Plates, thus (no. one) number ... deposited in the Patent Office.

Note. The forms of the vessels are not obligatory, and they may be constructed of wood or of metal, except such of them as are intended to contain acids, for which wood is forbidden.

1st. After a proper preparation is finished, the baths should be brought into the states already indicated in speaking of their formation, before commencing the operation. The baths are understood, all kinds of liquids, gas, vapor, or steam, in the actions of which the textile substances are exposed. All the baths should be heated by steam.

2d. The air may be heated by means of the hot stove, either by passing through a cast iron cylinder, placed by the fire place, or in the double chimney of a furnace, or by steam passed through a double conductor, or pipe, as indicated on the Plates, or by any other convenient mode. In all cases where a current of air is forced in by the force of bellows, they should be placed at such a distance from the place where the heat spreads, as will ensure a perfect and a general diffusion of air on three grand planes.

3d. It is advisable that the stoves should be covered at their upper part, and be surrounded with some woollen cloth. This will leave a free passage for the humidity to pass without loosing much of the heat which has been introduced. This will be found a very advantageous mode, and superior to the ordinary setting up of stoves, where the humidity stagnates, and escapes through openings in the roof, and where more heat than humidity passes off that way.

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The Forging and Finishing of the several Cranks of different materials, and the various methods of performing the several Operations of Forging, Welding, Hammering and Finishing the Cranks at the Forge, as also the Methods of Forging, Welding and Finishing the Cranks at the Anvil, with the Tools and Implements used thereto, should be performed in the following manner, viz.

The Iron Bars must be previously split into small Rods of proper Size, either by Slitting Mill, Cold Chisels and Hammers, or Shearing Machine, to the Marks or Gauges at each End of the Bars, &c. as directed &c.

See the reference B in the Plan of the Forge, a Hearth may be placed similar to that marked A, which must not be fixed to the Cylinder until after it has been charged &c. The Hearth is required to render the Bellows A, A and Iron Pipes more durable, the Damper A

Figure III. must be employed, when Charging the Fire Hearths or the Platform H, that as little Cold Air as possible, by Means of the Pipes B, B affixed to the ground, there being Pipes Valves moveable and Valve Box Bellows, but when it is desired to render it forced, &c. to form the Ends only and Sides without Joints, the Casings ought to be in Two Ends W

When the several Hearths are not made use of, the Register must be effectually Shut from the Blowing Cylinder to prevent the forced Blast from A, A, H from Escaping or Evaporating Discharging and Loading &c.

The Construction of a Blowing Cylinder may be seen Figure II. B, B, B,

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recharged, the water must be drawn off from the Cask of the damaged by
Lock C. and then be refilled with cold water before another cal-
culation is made. and again drawn off from the Cask. Close the Cocks
R.C. take hold of the Carriage at the part L. by the Cocks B. of the
same. figure 3. and which Carriage must be carried to a convenient
height, and then be turned over, the Colored matter will then follow
out of the Cocks E. and before it is carried to the room figure
II (or some other closed place) must be thrown through the carrying
gate A. which is to be closed immediately after.

1st. Section of one of the former Specifications.

2d. Drawing shows the Construction of the Baths in my former
Specifications of Stoves &c. adding only that the Baths alluded to
must be worked detached Baths, unless the centre may be slated.

This Observation may be understood for every Bath, that will be quoted
hereafter. 3d. The Steaming Chest which is intended to
help and should be well worked. The Skeleton Kilns and at present
employed in many distilleries from in many instances part of the wood, be-
ing Crossed and pressed into small pellets, by the Sticks usually em-
ployed in turning it over, becomes unfit to accomplish its purpose, it becomes
so imperfectly that different shades of color, are suggested, there-
fore in withdrawing it from the Baths. But the employment of this
method is now invented, will much completely obviate this difficul-
ty, and disadvantage, and for facility of which a much greater quanti-
ty can be worked in shorter given time, than can be done by
any of the means now employed for the purpose (see Plate 3)
The machine being placed in a current of water, for the wood in the
state it will be, when put the machine into regular movement by means
of the handle N. and the Crank H. the wood will then fall into the water.
the current of which will conduct it towards the Spikes M. and then
successively from one Spike to another, until it be conducted towards
the Cocks V. which in consequence of the movement it receives from the
Cocks T. will not take up the Wood, will remain and be taken
out for that it may fall into the Carriage or basket W.

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11.

The Carriage of water in the machine can be regulated by a gate of the
exit which may be more or less opened as shall most readily convey
the water to or from the spikes in the most expeditious facility and quick-
ness. We all know regulating the depth of water under the machine
when it is in motion. The treadmill style, the crambler, the
double acting, and many other kinds of wheels for raising water
by giving it a circular motion may be substituted instead of the
system of buckets or flights of floats above below or
on the sides of the ring of the floats marked G or M. It is to cause
a regular backward and forward motion of that part of the circle which
acts on the spikes M. which lay hold of the work
This machine may be constructed entirely of metal, or some part
of metal and the rest of wood. There is no occasion for describing it
further; it is to be understood that this machine is used for that purpose.
13th. The spur and trundle Leg is to bring the wheels of the
upon the tryste substituted may be added by a particular description
of the manner where the horse is standing is not intended to be
fixed into both No 8 or others
14th. The door at A is not to be stopped and will be
drawn forward on the tryste substituted on the side of the It regulates the
liquid it will be necessary for each to have the end contain-
ing the work or frame of those which may be placed next to the exit
containing the pail. This small shall be placed to the side and be re-
cessed towards one to the opposite side, that the liquid may flow
freely from the side of the trough to the exit and thereby prevent an
irregularity of water and to prevent the pail and shall should
be taken from the work when the bucket is filled or against
the side of the well in the first instance from running there
if the pail is not filled shall then be brought as near the
pail as possible, this is to prevent the water being discharged
unnecessarily into the pail and when the pail is pointing in a
direction from the pail to the pail from both sides as
from No 3 and 4 and 5 and 6 the pail is filled by the liquid

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ends be much more exciting after the baths Nos 3. 4. & 6. have been used, than when forming with the other baths. As regards the use of the latter bath No 6. it may be well to observe that the liquid should be well and equally distributed, but that the wool should be drained, as much as possible, when it is taken into bath No 7. If it is worn dry to much the better. The printed or stained goods may be fixed upon cloth or other substances intended to be dyed black by various means, to give to them what is practically termed a blue tint. Stone may be done by way of double decomposition, by using any of the alkalies or alkaline earths which have been spoken of as to their performance for bath No 5. or by saturating the oxide of iron in an acid bath formed with a double prussiate for instance, before or after producing black or other colors. This black shade has hitherto been produced by indigo and it can be so done yet, with the application of the oxide of iron by any process. And again the double decomposition or using the alkaline prussiate, in order to obtain the blue shade, can be extended in applying the protoxide or dark side of iron by the process already given.

Other Observations

All the iron parts of the vessels, or utensils employed in the said baths should be varnished to defend them against the action of the acids, and the same to be renewed from time to time.

Instead of using liquid ammoniacal gas in order to deepen the blue shade, you may employ ammoniacal gas more or less dry in the stove. In fact the ammonia may be introduced in the dark ornaments as previous the best results, and the same observation applies to the red bath. The oxide of iron may be impregnated after bath No 4. or without taking the wool out from the strainer by introducing a current of warm air into its interior as described in the 5th and 6th bleaching combined with them.

The oxide of iron may also be applied by impression (see the plates and explanations) After the mordant has remained about a quarter of an hour in the wood let it out and when it is nearly run off introduce the current of warm air as above for ¼ of an hour.

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Observations on the baths. — 1st. It is allowed, except nitre and sulphur, no salt is required, and some alcalis, as the salts of tartar &c. are bad for the baths. — 2d. Copper for domestic and ordinary use is preferable to iron, taking care to clear it about and to take only the small est parts for use. — 3d. A bath composed of equal quantities of water and vinegar, will only dissolve the same degree as the other alkalis; the alkalis are sought for baths for the sake of their mildness. — 4th. Baths must be avoided as much as possible when treating on animal substances, principally for baths No 3. — 5th. Iron baths may be rendered neutral, before it is employed as well as in the course of operation. This is done by an excess of this order of iron by acidities or the alkalis or carbonats, but more particularly by the carbonates of lime. Here it may be necessary to remark as a thing of much importance and to establishing a fact of clear distinction between my process and those already known, or practised for seeking the oxyd of iron, or for dissolving with the graduate of iron, that by my process the baths and liquids of No 1. are kept constantly neutral to produce the effect of seeking the oxyde of iron in a more figurated state. Whereas by the other processes the baths become more and more acid during the process of their use. — 6th. Iron precipitated in a more than neutralized state with a more than neutralized solution of about 20 degrees of the aerometer for salts, 15 of which must be decomposed by an acid. Then add to the solution taken about 160 to 212 degrees of Fahrenheit, a well carbonized alkali, for example, soda; the alkalis principle of which resolves about the one half of the same principle of which the acid is composed. [illegible] another mode may be employed to neutralize this bath, viz. after having added to all the carbonates but the last to the solution with a sufficient quantity of oil or grease to saturate the alkali. It is that after this saturation shall have taken place a very trifling portion of oil or grease may remain in the bath. Instead of employing first neutralized iron, or in other words a caustic alkali in employing that which has been combined with the alkalis carbonates. Instead of employing in a deoxygenating solution, you may use the weak solution of an alkalis carbonate or of a caustic alkali which must be boiled with some animal substance such as wool, cloth or white

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of the Cup of the valve, that a head made with several pieces of strong linen,
Leather may be supported by a staple or by other means, and be sufficient
Ground from the bottom of the receiver, to prevent its drawing off any portion
of the liquids which may be found there. This Instrument to withdraw
part of the liquids, the sticking fixing of the pump prevents sufficiently
(I do not allow the liquids to be conducted) to the dried vessels, by means of
pipes or channels, because the liquids can be transported much more quick-
ly and without the waste occasioned by transporting them by hand.
Two measures Figures 11. 13. 22. 27. and three figures 10. 12. 19. 26.
should be about three feet high. The first one being sunk in the ground about
a foot. The remaining should be plunged especially near the cylinder. Should
be emptied often and kept clean.

Every practical man will readily perceive the difference between the common process
of dying silk, and cotton by the frugality of mind and the one described
in the following (being aware of the entirely different nature and properties
of the products, and of the faculty of iron) and understand why a process
that succeeds tolerably well on those two materials, does not succeed on wool
that must be submitted to so many tryings operations in order to its being trans-
formed into cloth. Although combining precisely by the means indicated
I could allegate yet experience has taught me that the one literally they
are formed, also for the composition of baths, their degree of saturation,
and their degree of temperature; the construction of machinery described in
the plates and its arrangement and employment, the more advantageous will
be the result towards. But I do not mean to say that, by your combina-
tions of the pieces in different, new and new improvements, cannot be obtained
many of the advantages of the new principles to upon, to investigation
and to be extended field; But only as regards the fixation of Prussian
and; But also for the obtaining of new colors by substituting the manner-
ing to be indicated here. I shall mention here but one example to show
how the improvements may be extended without entitling the application
to the want of discovery. Two processes of scarlet dying are known
the one in the flocce, the other in the piece by using Prussian I can produce
a scarlet dyed in the piece, that will exhibit all the characters of having been

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