

THE TEXTILE COLOURIST.

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1. On the Dip-blue Styles of Calico Prints.

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THE indigo dip-blue style in calico printing is that style in which indigo is the only or chief colouring matter upon the calico, and is obtained by the process of dipping or submerging the cloth in an extended state into the dyeing vat; when a design or pattern is required it is in most cases previously printed upon the cloth with a resisting composition.

There are various classes of work in this style, but they all depend upon the vat for the indigo with which they are coloured. The styles to be treated of are the following:—

Sky blue.

Azure.

Azure, discharge style.

Navy blue and white, small patterns and bafts.

Navy two blues, small patterns and bafts.

Greek styles: blue, orange, and white.

Blocked styles: blue, orange, and yellow.

Fancies: Blue and green.

Blue, white, and green.

Two blues and green.

Blue and yellow.

Blue, white, and yellow.

Two blues and yellow.

French two blues and white; block work or cylinder.

Two blues, green, and yellow.

Swiss Chintzes: Two blue, red, yellow, green, and white.

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Red cross-over and blue; red (madder), chocolate, and white.

Green and yellow, with berries, bark, or lead yellow.

Arrangement, setting, and working of the vats.—In a well arranged dyehouse each set is allowed ten vats at the least; nine for dipping in, and one lime vat. The vats are made of either wood, stone, or iron, and have a capacity of about 830 gallons, their size being nearly as follows: 6 feet 6 inches deep; 6 feet 6 inches long; and 3 feet 6 inches in breadth; each set of vats is supplied with a rake, a muddler, and a skimmer.

The rake is a shaft of ash wood 9 feet long; the head of the rake being made of iron plate, 12 inches by 6 inches. This rake is used for raking the vats up at night when the day's work is done; also for raking up the lime vats when necessary.

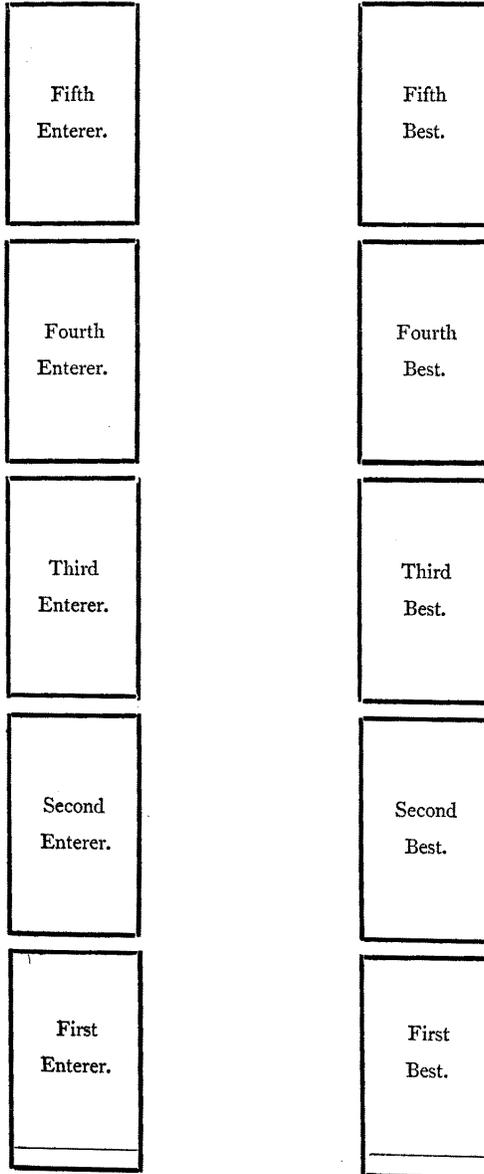
The muddler is a rake similar to the preceding, the shaft of which is only about 7 feet long, and the head, which is of wood, 10 inches by 6 inches. Its use, as the name implies, is confined to muddling or stirring the vats whilst in the process of dipping, especially the entering vats, because of the rapid precipitation of indigo in them by their absorption of oxygen from the pieces entered, and from the air.

The skimmer is used for skimming off the florry or scum that rises in the top of the vats, especially the weaker ones, were this not done the pieces when entered would take this scum on their surface into the vat and produce an unevenness of shade when the goods were finished.

In the arrangement of a blue dyehouse there ought to be every facility for obtaining a sufficient supply of water, and with every convenience for supplying the vats; below the bottom of the vats soughs or drains ought to be laid from each set running into one main channel, and then into a large pit or well in which the bottoms of the spent vats can undergo some subsequent treatment for the recovery of the small quantity of indigo remaining in them, details of which will be found further on.

The vats are best arranged in the dyehouse in sets of ten, with one vat extra, which is used as a lime vat, making a

total of eleven vats in each set. The dyeing vats are laid down and named as follows:—



Such an arrangement enables the dipper to have always nine vats for working with, for three days in the week he has the use of the whole of the ten vats ; thus, suppose the dipper to have a new vat set for him on a Friday, he will then on Saturday dip in the whole of his set of vats ; when finished dipping on Saturday afternoon, he will rake up his first entering vat which is left standing till Monday, the clear liquor in it is then syphoned off, there may be 3 feet deep of clear, the thick portion is carried or run into the recovering pit or vat to extract what indigo it contains, as will be afterwards particularly explained ; the vat being now quite emptied, is filled up with water, in which is put the necessary quantity of indigo and green copperas, it is raked up until the copperas is completely dissolved, the proper amount of lime is next added, and the whole well raked up from the bottom, and left at rest for ten or fifteen minutes, then the raking is repeated in a systematic manner, the workman going slowly round the vat, and again left to repose, and this can be repeated say ten or a dozen times before the day's work is finished ; in the night-time it is again raked up in the same way a few times, and left to settle. When the dipper arrives in the morning, the new vat is ready for use. It is now Tuesday, and he can dip in all the ten vats. The first enterer vat is raked up in the evening, and left to settle for syphoning and emptying on Wednesday morning ; on Wednesday it is set and ready for use on Thursday ; thus, in three days the dipper has all his ten vats available, on the alternate days he has but nine.

Generally the dipper has three new vats given him in the week, and these on alternate days, say Monday's, Wednesday's, and Friday's in the afternoon.

Supposing the weight of indigo to be 36 lbs., the vat would be set with

36 lbs. ground indigo.
60 lbs. green copperas.
80 to 87 lbs. lime.

From experience in the dye-house it is found that the lime works best in the vats after it has been well "slutched," and it

is therefore recommended to use slouched lime, not only in setting the vats, but also in freshening them up during working. A good dipper always endeavours to keep up the strength of his best vat, and works it very little in the earlier part of the day, relying more upon his back vats, and when these become exhausted or knocked down (as it is said) by constant dipping during the day, he has his best vat comparatively fresh, and consequently finishes his last frames with greater ease. This manner of working the vats contributes considerably to the economy of indigo. A dipper should always enter his frame in his first enterer, and then pass it regularly up the set until it acquires the requisite shade; this rule should be enforced except at starting in the morning, when it is allowable to fill three vats off hand, but after this, the rule should be insisted upon. The reason is obvious, for in all Navy and Baft styles, and even in very light orange patterns the goods may be entered dry in the first enterer, these styles not requiring liming in the lime vat, and as the first enterer is the weakest vat of the series, and dry cloth absorbing more liquor than wet or limed cloth, it absorbs also proportionably more indigo, and so the vat is reduced in strength, until it is all but exhausted of the indigo which it held in solution, an object which should always be aimed at.

The strength of an entering vat, when it is no longer available for dyeing, should not exceed $1\frac{1}{2}$ to 2 lbs. of indigo if the workman has properly managed and fed his vats.

The following shews the weight of indigo in each vat as deduced from observation and judgment in the practical dyeing: it is supposed that the vats have been each set with 36 lbs. of indigo, and that the dipper has worked all the vats well and systematically.

| | |
|---------------------|----------------|
| First enterer | 2 lbs. indigo. |
| Second „ | 3 lbs. „ |
| Third „ | 5 lbs. „ |
| Fourth „ | 7 lbs. „ |
| Fifth „ | 11 lbs. „ |
| Fifth best | 16 lbs. „ |
| Fourth „ | 22 lbs. „ |

| | |
|------------------|-----------------|
| Third best | 28 lbs. indigo. |
| Second „ | 32 lbs. „ |
| First „ | 36 lbs. „ |

In the usual course of working, the vats require feeding or freshening up at the termination of each day's work; this should be done with great care and circumspection, and the duty devolves on the foreman of the dyehouse, who ought to see each vat raked up at the close of the day's work, and judge of the quantity of lime and copperas which should be added. In most cases it is not necessary to feed the first and second vats for the first three days of their working, after that time the indigo being "knocked down" (precipitated) by the process of dipping, it becomes requisite to freshen up the vats. The foreman judges by the appearance of the vats during the raking what quantity of lime and copperas should be added, and according as it is pronounced to be "fresh" or "sickly," so does he prescribe the quantity and the nature of the "feed." As vats decrease in strength, and pass into the class of enterers, a greater quantity of feed is necessary; in the case of the lower best vats, half a scope full of copperas liquor at 36° Tw., and an equal measure of well slouched lime is found sufficient, but when an enterer vat is found to be sickly (that is, when upon raking up it does not shew the thick dark blue veins, which shew themselves in healthy vats, the veins being of a lighter blue, and in very weak enterers edged with a slight blue film, and a total absence of blue bubbles and very few veins), as much as one and a half scopes full each of the copperas liquor and the lime may be added. Upon such addition the dipper must well rake up the vat, going round it several times, and bringing the bottoms well up each time.

The Lime Vat.—This vat is of the same dimensions as the dyeing vats, and it is set by throwing into it, when full of water, three or four hundredweights of lime, which is allowed to slack in the water, and when required for use it is raked up by the dipper. The successful working of the lime vat for orange styles is not so simple as might be supposed, for upon the proper management of the frame whilst in this vat depends in great measure the goodness of the work when

raised in the chrome-beck. The manner of working it is as follows, and the remarks apply chiefly to the orange styles. After the cloth is hooked upon the frame, it is placed in the vat, and then screwed up to the proper tension, not too tight, or the paste colour will "break;" nor yet too slack, or the piece will "flap," that is, touch in the middle of the flap. According to the strength of the pattern, the frame must be left a longer or shorter time in the lime vat, with the lime raked up accordingly; for very light orange patterns the dipper frequently omits the lime vat, and enters the frame into the first enterer, but this must only be when the first enterer is "hard." This is a dyehouse term indicating that the enterer contains a large quantity of lime, so much so, in fact, that it is sufficiently strong for light patterns without separately liming the cloth. When the pattern is of a very massive character, the lime vat is raked up well from the bottom, and the piece limed from seven to seven and a half minutes. In very large patterns there is another object to be kept in view besides the good quality of the orange, it is to ensure a good white; when there is a heavy body of white ground there is a great tendency for the white paste to slip or run, and it is necessary that the piece should be well limed before it gets into the enterer, so that the salts of copper may be completely precipitated on the cloth, and thus the tendency of the colour to run or slip is overcome. Although there may be a greater amount of orange colour upon the surface of the cloth constituting the pattern, it does not follow from that that it requires more liming, but on the contrary, less, when the body of the orange is less solid or compact, and the edges of the two lines or border of the pattern are closer together; such a pattern only requires about five minutes' liming in a moderately hard vat.

Further remarks upon defects arising from excessive or defective liming (or, as it is called, hard and soft liming) are deferred until the orange style has been fully described.

Skying.—The operation called skying is intended to give a uniform light-blue colour to the whole cloth; this is effected

by passing the cloth over roller through the sky vats, taking care to keep it evenly stretched out so as to avoid "scrimps," and giving plenty of head room over the vats to ensure a perfect oxidation before it is banded up on the floor. For this operation one man and six or seven boys are required; the man sees to the wiring, etc., of the cloth, and the regulation of the vats, whilst the boys are employed in turning the rollers, opening and keeping out the scrimps, and banding up the pieces as they come over the airing frames. In working the vat it is necessary to have two sky frames, so that the weak vat can be further exhausted by passing the cloth first into the weak vat, and then into the stronger. When the weak vat requires exhausting in this manner, and the cloth goes through the last set or stronger vat, the rollers must go much quicker than if only one vat is employed, otherwise a much darker shade will be given than is required.

Cloth simply skied is seldom required in the trade, as the object of skying cloth is but preparatory to some other style in which a two blue, or a two blue and green, or a blue and green effect is required; these will be explained under their respective heads.

The management of a sky vat is very simple, the only care that is required is the proper feeding of the vat, and its good raking after the day's work is done.

A sky vat is generally set with from 60 to 70 lbs. of Bengal indigo, of good quality, averaging from 46 to 50 per cent. of pure indigo, about 100 to 120 lbs. of copperas, and about 160 to 170 lbs. of lime; after setting, the vat must be well raked, and left at rest for about eight or twelve hours before being worked. After the vat has been used for skying, so long as it is profitable to do so, the dipper in the adjoining set uses it as an enterer. The speed at which the frame works is always in proportion to the shade required.

Azure Style.—The azure style of blue printing is one in which a white figure on a light blue ground is produced. This is effected by first printing the cloth of the required pattern with the following paste, known as

Azure Paste.

8 lbs. light British gum.
 8 lbs. dark „
 12 quarts water.
 4 lbs. soft soap.
 10 lbs. sulphate of zinc,
 3 gills nitrate copper.

This batch of colour makes $4\frac{3}{4}$ gallons.

Then drying from the machine and skying through the sky vat to the required shade. The following patch illustrates the style; after skying, the pieces are bowled up and washed and then made up for the market.



Indigo Blue: Azure Style.

Considerable care must be exercised in passing the cloth over the rollers through the sky vat so as to prevent "tailing" of the colour. In entering the sky vat the pattern or face of the cloth must be towards the bottom roller.

Discharge Azure Style.—The discharge style, in which the cloth is first skied a dark shade in the sky vat, is one in which a white figure or pattern appears on a blue ground, and is produced by the oxidation of the indigo by chromic acid liberated from bichromate of potash by an excess of oxalic acid printed upon the padded cloth.

The process is as follows;—The cloth is first dipped or

skied to the required shade, then bowled, soured, and washed, then padded with the following liquor:—

2 lbs. bichromate potash.
1 lb. pearlash.

These are dissolved in water and the liquor made to stand at 6° T. (it requires about 6 gallons of water to do so), the cloth is then padded through this liquor and dried over the drying machine; then the following discharge colour is printed on with the required pattern:—

1 gallon starch thickening.
2 lbs. oxalic acid.

When printed with the above colour, the cloth is hung a few hours in a warm room, or all night, it is then passed in warm water and cleared with very weak caustic soda. Of course the strength of the oxalic discharge colour employed always depends upon the depth of the blue to be discharged, and must be varied accordingly.



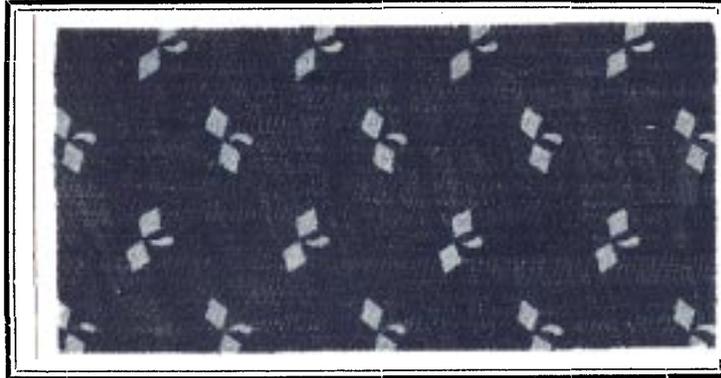
Indigo Blue: Discharge White.

Navy Blues. Small Patterns.—The navy blue style is simply a white figure upon a blue ground. The cloth is printed of the desired pattern with the following paste, and then dipped up to proper shade.

Navy Paste.

36 lbs. sulphate of copper.
 8 lbs. brown sugar of lead.
 38 lbs. flour.
 1½ lbs. British gum.
 1½ lbs. dark British gum.
 10 gallons water.

Weight of 1 gallon of this paste is 15 lbs., and the above quantities measure 12½ gallons. After the cloth is printed, it is hooked and entered in the first enterer, and sent regularly up until the desired shade is acquired, it is then stripped, bowled, soured, and washed; dried and made up.



Navy Blue: Small White.

Navy Blue Bafts.—Navy blue baft is a similar style to the navy blues, the only difference being that this cloth is generally of a lower quality, and the patterns always larger. The cloth is first printed with the following paste, and then dipped.

No. 1 Navy Baft Paste.

32 lbs. sulphate of copper.
 7 lbs. brown sugar of lead.
 20 lbs. sulphate of lead.
 21 lbs. flour.
 7 lbs. calcined farina.
 8 gallons of water.

Measures 10¾ gallons, weighs 163 lbs.

Another Baft Paste.

36 lbs. sulphate of copper.
 8 lbs. brown sugar of lead.
 30 lbs. flour.
 3 lbs. dark British gum.
 10 gallons water; boil, and add
 3 quarts orange paste.

Measures $12\frac{3}{4}$ gallons, weighs 206 lbs. For large patterns of this style the printed cloth is limed some minutes, more or less, according to the strength of the pattern and the hardness of the enterers. If the pattern be not above the average size it will do without liming, allowing extra time in the first enterer, say that it remains in fifteen minutes, that is two dips, and when lifted up must be entered into the second enterer before the gum is quite off—even the largest patters will do without liming if the enterers are very hard, allowing a double dip in the first.



Navy Blue with Larger White.

Navy Two Blue Bafts are the same patterns as the preceding, except that there are two blues instead of blue and white. The cloth being skied either before dipping or afterwards; if skied before, it is always best to ensure good work

to print with the white paste, because the white paste is much more easily removed from the surface of the cloth, and having no lead in its composition, it leaves the blue clear and bright; but if skied after printing, and when the baft paste has been used as a resist, the dried cloth after bowling should be washed, then a few ends give in muriatic acid, again washed and winced, a few ends in weak caustic, which entirely removes the lead that remains in the cloth, and it then takes the sky vat evenly.



Navy Two Blues.

Blue, Orange, and White Style.—The cloth is printed with two resist pastes, one of which is called the “white colour,” and the other the “orange colour.” The white colour is always worked first in the machine, and it is necessary that it be always hot when put into the colour box, because of the large quantity of sulphate of copper that it contains, and its tendency to crystallize therein; besides this property, it “furnishes” much better when hot, and does not stick in the engraving.



Blue, Orange, and White, Medium Pattern.

The two following receipts are employed in this style:—

White Paste.

- 13 lbs. sulphate of copper.
- 2 lbs. sulphate of zinc.
- 9 quarts water.
- 3 quarts acetate of lime.
- 11 lbs. flour.
- 1 lb. dark British gum.
- 1 lb. gum substitute.
- 1 pint nitrate copper from 70° to 80° Tw.

Another White Paste.—(Stronger).

- 16 lbs. sulphate of copper.
- 3½ lbs. sulphate of zinc.
- 8 oz. glue.
- 10½ lbs. flour.
- 2 lbs. light British gum.
- 7 quarts acetate of lime.
- 9 quarts water.
- 1 quart nitrate copper.

Acetate of Lime.

- 4 gallons of acetic acid.
- 6 lbs. slacked lime (the dry hydrate of lime).

Orange Paste.

30 lbs. sulphate copper.
28 lbs. nitrate lead.
50 lbs. sulphate of lead.
21 lbs. flour.
3 lbs. farina.
6 gallons water.

Measures 40 quarts ; weighs 189 lbs.

Strong Orange.

3 gallons sub-acetate of lead.
4½ quarts sulphate of lead, thick.
12½ lbs. nitrate of lead.
30 lbs. sulphate of copper.
11½ lbs. best flour.
1½ lbs. dark British gum.
1 lb. light British gum.
2½ quarts water.

These quantities weigh about 123 lbs.

Sub-Acetate of Lead.

64 lbs. acetate of lead.
32 „ litharge.
16 gallons water.

One gallon of this Sub-Acetate weighs 13 lbs.



Blue, Orange, and White. Small Design.

After the cloth is printed, it is hooked and dipped, previously entered in the lime vat for the necessary length of time, and then screwed up (that is, the cloth is hooked slack, and then screwed up to the proper tension whilst in the vat); it is then entered in the first enterer, and passed up regularly until it has acquired the desired shade; a good quality of cloth requires longer dipping to acquire its shade than a low quality. When the desired shade is attained, the cloth is stripped from the frame, and immediately carried to the bowling machine, thrown into the pit, and completely immersed in it. This pit should always be acid, so that marking off may be prevented. Marking off is owing to the cloth lying too long in the water of the bowling pit, or on the ground before coming in contact with sulphuric acid. When the cloth is stripped from the frame, the lead of the pattern exists as oxide of lead, and is in a very soft and pulpy state, so soft indeed that the pattern will easily "mark off" on to any other portion of the cloth with which it comes into contact, and the longer the contact is allowed, the greater will be the marking off; as stated before, to prevent this, the bowling pit (or pit into which the cloth is thrown after stripping, previous to going through the washing machine) should be kept always acid with sulphuric acid, so that the oxide of lead may become sulphate of lead, and thus prevent the marking off in consequence of the hardening of the colour, and its being fixed in the cloth by its combination with sulphuric acid. The acidity of the bowling pit is the best possible preventative to "marking off" that I know of, and has done more to reduce "marking off" and "greening" than anything else that has been proposed. After the pieces have gone through the bowling machine, in which they are first bowled, soured, then washed in the same machine, they are banded up separately, taken to the raising becks, and there raised orange. For process of Raising, see further.*

[*To be continued.*]

* The printed specimens in this article do not purport to have been done by the processes, or with the receipts therein detailed. They are inserted to illustrate the different styles, and have been obtained from various houses.

2. *Classified List of Letters Patent concerning Bleaching, Finishing, Dyeing, Printing, and Colouring matters, which passed the Great Seal in the year 1875.*

Singe Plates and Singeing.

3812. WILLIAM SUMNER, of Salford, in the county of Lancaster, and ERIC HUGO WALDENSTROM, of the same place, engineers, for an invention of "Improvements in the manufacture of copper singe plates."—Dated 4th November, 1874.—*Specification published, price 4d.*

1537. GEORGE BRIGGS, of Cleckheaton, in the county of York, dyer and stover, and HORATIO STEAD, of Halifax, in the same county, machine maker, for an invention of "Improvements in the means or apparatus for singeing woven fabrics and yarn."—Dated 27th April, 1875.—*Specification published, price 4d. For abridgement see p. 96.*

Bleaching.

4087. THOMAS NIGHTINGALE PALMER, of Lansdowne Road, Galston, in the county of Middlesex, for an invention of "Improvements in bleaching wool, textile fabrics, and fibres."—A communication to him from abroad by Louis Prospère Hippolite Plantron Balma, of Reims, in the republic of France.—Dated 28th November, 1874.—*Specification published, price 4d.*

499. THOMAS HOLLIDAY, of Huddersfield, in the county of York, manufacturing chemist, for an invention of "Improvements in effecting the bleaching of cotton and other fabrics produced from vegetable fibres."—A communication to him from abroad by Alexandre Schultz, of Paris, in the republic of France.—Dated 10th February, 1875.—*Specification published, price 4d. For abridgement see p. 49.*

1382. FRANK WIRTH, of the firm of Wirth and Company, patent agency, Frankfort-on-the-Main, in the empire of Germany, for an invention of "Improvements in bleaching fabrics, yarns, fibres, paper pulp, and other articles."—A communication from Vincenz van Baerle, manufacturer, a person resident at Worms, in the empire of Germany.—Dated 15th April, 1875.—*Specification published, price 4d. For abridgement see p. 50.*
2812. THOMAS JAMES SMITH, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents, for an invention of "Improvements in bleaching silk and other fibres."—A communication to him from abroad by Cyprien Marie Tessié du Motay, of Paris, France.—Dated 10th August, 1875.

Printing.

2623. EDWARD LEE, of 99, High Holborn, in the county of Middlesex, lithographer, for an invention of "Improvements in the mode of producing designs or patterns on surfaces by the aid of stencil plates."—Dated 27th July, 1874.—*Specification published, price 4d.*
2921. GEORGE ASHLEY WILSON, of Liverpool, in the county of Lancaster, engineer, for an invention of "Improvements in and connected with rotary web printing machines."—Dated 26th August, 1874.—*Specification published, price 4d.*
1428. FREDERICK BENNETT, of the firm of John Bennett and Son, of Birch Vale, in the county of Derby, calico printers, for an invention of "Improvements in printing cloth or fabrics."—Dated 19th April, 1875.—*Specification published, price 4d. For abridgement see p. 96.*

Patterns and Designs.

4471. JOHN BRIGGS, of Lower Crumpsall, near Manchester, in the county of Lancaster, engraver to calico printers, RICHARD HUDSON, of Chorlton-cum-Hardy, near Manchester aforesaid, designer, and HENRY GRIMSHAW, of Manchester aforesaid, hatter, for an invention of "Im-

- provements in ornamenting and transferring patterns to fabrics."—Dated 30th December, 1874.
707. ALEXANDER MELVILLE CLARK, of 53, Chancery Lane, in the county of Middlesex, patent agent, for an invention of "Improved apparatus for enlarging and reducing designs, prints, and other delineations."—A communication to him from abroad by Victor Guérin, of Paris, France.—Dated 26th February, 1875.—*Specification published, price 1s. 10d. For abridgement see p. 50.*
1426. FREDERICK BENNETT, of the firm of John Bennett and Son, of Birch Vale in the county of Derby, calico printers, for an invention of "Improvements in producing patterns or designs in metals, on cloth, or fabrics."—Dated 19th April, 1875.—*Specification published, price 4d. For abridgement see p. 96.*
2161. HENRY EDWARD NEWTON, of the Office of Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer, for an invention of "Improvements in ornamenting or producing patterns or designs of various kinds on fabrics, and in the apparatus to be used for such purposes."—A communication to him from abroad by Pierre Nos D'Argence, of Paris, in the republic of France, and François Delamare, of Paris aforesaid."—Dated 12th June, 1875.

Ageing, Steaming, and Fixing.

4236. JOHN THOM, of Birkacre, near Chorley, in the county of Lancaster, calico printer, for an invention of "Improvements in ageing printed fabrics, and in apparatus connected therewith."—Dated 9th December, 1874.—See also French patent, No. 108,139.—*Specification published, price 1s. 4d.*
479. HONORE FRANCOIS ADOLPHE CORDILLOT, of Sepouchoff, near Moscow, in the empire of Russia, calico printer, and WILLIAM MATHER, of the firm of Messieurs Mather and Platt, of Salford, in the county of Lancaster, engineer, for an invention of "Improvements in apparatus for steaming printed fabrics."—Dated 9th February, 1875.

—See also French patent, No. 107,890.—*Specification published, price 1s. 10d. For abridgement see p. 50.*

1303. JAMES SMITH, engineer to Messieurs Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain, for an invention of "Improvements in apparatus for subjecting printed or other fabrics to the action of steam."—Dated 10th April, 1875.—*Specification published, price 1s. 6d. For abridgement see p. 97.*
1587. ALEXANDER MELVILLE CLARK, of 53, Chancery Lane, in the county of Middlesex, patent agent, for an invention of "Improvements in developing and fixing colours on fabrics, and in apparatus for the same."—A communication to him from abroad by Charles Thierry-Mieg, of Paris, France.—Dated 29th April, 1875.—See also French patent, No. 106,687, and certificate of addition thereto.—*Specification published, price 4d. For abridgement see p. 98.*
2033. HORATIO STEAD, of Halifax, in the county of York, engineer, and BENNETT APPELYARD, of Wakefield, in the same county, crabber and finisher, for an invention of "Improvements in machinery or apparatus for steaming woven fabrics."—Dated 2nd June, 1875.

Drying.

2766. JOHN STOTT, of the firm of John Stott and Brothers, of Wardle, near Rochdale, in the county of Lancaster, woollen manufacturers, and JOHN BARKER, of the firm of Jonathan Barker and Sons, of Todmorden, in the county of York, engineers, for an invention of "An improved machine or apparatus for drying textile fabrics."—Dated 10th August, 1874.—*Specification published, price 1s. 2d.*
3636. SAMUEL KNOWLES, of Tottington, near Bury, in the county of Lancaster, bleacher and calico printer, and JAMES KAY, of Bury aforesaid, engineer, for an invention of "Improvements in apparatus for drying yarns, woven fabrics, paper, and other materials."—Dated 22nd October, 1874.—*Specification published, price 8d.*
2290. THOMAS FLETCHER, of Newton, Hyde, in the county

of Chester, for an invention of "Improvements in the construction of valves to be applied to steam drying cylinders or rollers used in various machines."—Dated 23rd June, 1875.

Dyeing Apparatus and Processes.

2982. ALBERT SAUVÉE, of 22, Parliament Street, Westminster, in the county of Middlesex, civil engineer, for an invention of "Improvements in the apparatus used for dyeing materials, either woven, spun, or in skeins or hanks."—A communication to him from abroad by Monsieur César Corron, dyer, of Saint Etienne (Loire), France.—Dated 1st September, 1874.—*Specification published, price 8d.*
1094. JEAN BAPTISTE CHARLES HENRI PETITDIDIER, of St. Denis (France), dyer, for an invention of "An improved process of dyeing silk, woollen, cotton, and other fabrics."—Dated 25th March, 1875.—*Specification published, price 4d. For abridgement see p. 53.*
1294. JAMES WORRALL, of Manchester, in the county of Lancaster, dyer, for an invention of "Improvements in the mode of and apparatus for coloring pile fabrics."—Dated 9th April, 1875.—*Specification published, price 1s. 4d. For abridgement see p. 95.*
3214. GEORGE CANTRELL GIBBS, of Brentford, in the county of Middlesex, for an invention of "Improvements in machinery for or apparatus for dyeing and colouring felt, silk, and other textile or porous materials."—Dated September, 1875.—*Specification published, price 8d.*

Aniline Black and Bronzing.

3632. ALEXANDER MELVILLE CLARK, of 53, Chancery-lane, in the county of Middlesex, patent agent, for an invention of "Improvements in dyeing threads, yarns, and fabrics aniline black."—A communication to him from abroad by William Jules Samuel Grawitz, of Paris, France.—Dated 21st October, 1874.—*Specification published, price 4d.*
1620. ALEXANDER MELVILLE CLARK, of 53, Chancery-lane,

in the county of Middlesex, patent agent, for an invention of "Improvements in the production of aniline black for printing and other purposes, and in dyeing aniline black."—A communication to him from abroad by William Jules Samuel Grawitz, of Paris, France.—Dated 1st May, 1875.—*Specification published, price 4d. For abridgement see p. 94.*

608. WILLIAM THACKRAH, of the firm of Thackrah and Company, of Dewsbury, in the county of York, woollen manufacturers, for an invention of "A new process for bronzing or giving a metallic appearance to textile fabrics."—Dated 19th February, 1875.—*Specification published, price 4d. For abridgement see p. 54.*

Alizarine, Aniline, Anthracene, Indigo, and other Colouring Matters.

2841. FELIX DE LALANDE, of Rue d'Enfer, 22, at Paris, civil engineer, for an invention of "Improvements in the treatment of alizarine for the production of different colours or hues therefrom in dyeing and printing."—Dated 18th August, 1874.—*Specification published, price 4d.*
3757. MAXIMILIAN ZINGLER, of 19, Buckland Crescent, Belsize Park, in the county of Middlesex, for an invention of "Improvements in treating aniline and other dyes to prepare them for use in dyeing, printing, and coloring."—Dated 30th October, 1874.—*Specification published, price 4d.*
4421. DAVID CLOVIS KNAB, chemist, of Saint Denis, in the department of the Seine, in the republic of France, for an invention of "Improvements in the manufacture of black for painting or printing, which is also applicable to discoloring sugar and for use as a disinfectant."—Dated 23rd December, 1874.—*Specification published, price 4d.*
4433. JOHN SCUDAMORE SELLON, of Hatton Garden, and ROBERT PINKNEY, of Bread Street Hill, both in the city of London, for an invention of "Improvements in dyeing and printing, and in improved compounds for such pur-

- purposes.—Dated 24th December, 1874.—*Specification published, price 4d.*
124. FREDERICK ALBERT GATTY, of Accrington, in the county of Lancaster, manufacturing chemist, for an invention of "Improvements in preparing certain materials employed in printing and dyeing cotton fabrics and yarns."—Dated 13th January, 1875.—*Specification published, price 4d. For abridgement see p. 53.*
498. THOMAS HOLLIDAY, of Huddersfield, in the county of York, manufacturing chemist, for an invention of "Improvements in operating with indigo in the printing of cotton and other fabrics."—A communication to him from abroad by Alexandre Schultz, of Paris, in the republic of France.—Dated 10th February, 1875.—*Specification published, price 4d. For abridgement see p. 53.*
1031. THOMAS HOLLIDAY, of Huddersfield, in the county of York, manufacturing chemist, for an invention of "Improvements in the manufacture of colouring matter suitable for dyeing and printing."—Dated 20th March, 1875.—*Specification published, price 4d. For abridgement see p. 52.*
1038. FREDERICK VERSMANN, of 12, Brecknock Crescent, Camden Town, in the county of Middlesex, Ph.D., consulting and analytical chemist, for an invention of "Improvements in the manufacture of colouring matters."—Dated 20th March, 1875.—*Specification published, price 4d. For abridgement see p. 54.*
1604. ALEXANDER MELVILLE CLARK, of 53, Chancery Lane, in the county of Middlesex, patent agent, for an invention of "An improved process for the manufacture of red sulphide of mercury."—A communication to him from abroad by William Jules Samuel Grawitz, of Paris, France.—Dated 30th April, 1875.—*Specification published, price 4d. For abridgement see p. 93.*
1712. CHRISTIAN HEINZERLING and GEORGE MCGOWAN, both at present residing in Glasgow, in the county of Lanark, North Britain, for an invention of "A new or improved process for oxidising anthracene, and improve-

ments in the colouring matter produced therefrom."—
Dated 8th May, 1875.—*Specification published, price 4d.*
For abridgement see p. 93.

- 2421.—JUSTUS WOLFF, of Wyke, near Bradford, consulting and engineering chemist, and RALPH BETLEY, of Wigan, analytical and consulting chemist, for an invention of "Improvements in the production of aniline dyes."—
Dated 5th July, 1875.
2422. JUSTUS WOLFF, of Wyke, near Bradford, consulting and engineering chemist, and WILLIAM ASCROFT BYROM, of Wigan, solicitor, for an invention of "Improvements in obtaining aniline, and in the employment of the same or of compounds thereof."—Dated 5th July, 1875.
2448. JUSTUS WOLFF, of Wyke, near Bradford, consulting and engineering chemist, and RALPH BETLEY, of Wigan, analytical and consulting chemist, for an invention of "Improvements in the production of dyes from naphthaline and its derivatives."—Dated 7th July, 1875.

Felted Fabrics, Floor Cloths, Paper, &c.

16. BENJAMIN RHODES and THOMAS BROWN RHODES, both of Armley, near Leeds, in the County of York, for an invention of "Improvements in machinery for flocking woollen or other woven or felted fabrics."—Dated 1st January, 1875.—*Specification published, price 6d.* *For abridgement see p. 52.*
35. MICHAEL BARKER NAIRN, of Kirkaldy, Scotland, for an invention of "Improvements in machinery for preparing floor cloths for printing."—Dated 4th January, 1875.—*Specification published, price 2s. 4d.* *For abridgement see p. 51.*
361. LOUIS FERDINAND TAVERNIER and JOHN PYPER MATHESON, of the Perseverance Mills, Dewsbury Road, Leeds, in the county of York, patent coactile cloth manufacturers, for an invention of "Improvements in the manufacture of felted fabrics, and in the production of mixed colours in felted fabrics by cheap and simple

processes."—Dated 30th January, 1875.—*Specification published, price 4d. For abridgement see p. 51.*

1573. EDWIN SALT, of Darwen, in the county of Lancaster, engineer, for an invention of "Improvements in machinery or apparatus to be used for the manufacture, colouring, veneering, and enamelling of paper and paper cloth and such like materials."—Dated 29th April, 1875.

Yarns, Warps, Threads, Wool Washing.

2658. THOMAS DICKINS, ALBERT LANGLEY DICKINS, and HARVEY HEYWOOD, all of Middleton, in the county of Lancaster, dyers and printers, for an invention of "Improvements in machinery or apparatus used in dyeing yarns or threads of silk."—Dated 30th July, 1874.—*Specification published, price 10d.*
3364. GEORGE ROURKE BRYANT, of the firm of T. P. Pocock and Co., of Waterford Mills, Chippenham, Wilts, woollen manufacturers, for an invention of "Improved machinery for washing wool."—Dated 1st October, 1874.—*Specification published, price 1s. 4d.*
3603. JOHN CRAWFORD MUNN, of the firm of Munn and Hughes, of the city of Glasgow, in the county of Lanark, North Britain, for an invention of "Improvements in dyeing yarns for warps."—Dated 20th October, 1874.—*Specification published, price 4d.*
4095. JOHN CLOUGH, of the Manchester Road, Bradford, in the county of York, for an invention of "Improvements in apparatus employed in the washing and cleansing of wool and other fibres."—Dated 30th November, 1874.—*Specification published, price 8d.*
4179. CHARLES HOYLE, WILLIAM SHACKLETON, and WILLIAM PRESTON, of the firm of Messrs. Shackleton, Hoyle, and Company, of Keighley, in the county of York, machinists, for an invention of "Improvements in machinery for washing wool and other fibrous substances." Dated 4th December, 1874.—*Specification published, price 8d.*
1432. SAMUEL GIBSON RHODES, MICHAEL SHILLITO, and

JOHN IRELAND SPEED, of the firm of Shillito, Rhodes, and Co., yarn finishers, Leeds, in the county of York, for an invention of "Improvements in finishing yarn and threads, and in apparatus connected therewith.—Dated 20th April, 1875.—*Specification published, price 8d. For abridgement see p. 95.*

1868. JACOB BEHRENS, of Bradford, in the county of York, and of Manchester, in the county of Lancaster, merchant, for an invention of "Improvements in the treatment of wool either in the raw or in a manufactured condition."—A communication to him from abroad by Henrich Caro, of Mannheim, in the empire of Germany, Chemist.—Dated 21st May, 1875.
2215. SIDNEY EMSLEY, agent, of Bradford, and SAMUEL SMITH, machine maker, of Low Bridge Works, Keighley, both in the county of York, for an invention of "Improvements in drying and stretching fibrous materials in hanks, and in apparatus connected therewith.—Dated 16th June, 1875.
2866. MAXIMILIAN BAERLEIN, of Manchester, in the county of Lancaster, for an invention of "Improvements in the method of mordanting, dyeing, and sizing yarns."—Dated 14th August, 1875.
3166. DAVID PORTEOUS, of Whaley Bridge, in the county of Chester, manufacturer, and JOHN ORMEROD, of the same place, overlooker, for an invention of "Improvements in apparatus for sizing yarns or warps.—Dated 9th September, 1875.—*Specification published, price 10d.*

Gum Making.

3639. PAUL LOUIS MANBRE, of Valenciennes, in the republic of France, but temporarily of Penge, in the county of Surrey, brewer, for an invention of "Improvements in the process and apparatus for the conversion of starch and fecula into gum, compounds of gum and glucose, glucose, caramelized glucose, and other analogous products."—Dated 22nd October, 1874.

Finishing, Beetling, Stretching, Measuring, etc.

2415. WILLIAM MELLOR, mechanic, EUSTACE WIGZELL and JOSEPH POLLIT, engineers, all of Sowerby Bridge, in the county of York, for an invention of "Improvements in machinery for rigging, pressing, and cuttling fabrics."—Dated 9th July, 1874.—*Specification published, price 1s. 4d.*
2492. JOHN HENRY GARTSIDE and CHARLES TIMOTHY BRADBURY, of Buckton Vale, in the county of Chester, for an invention of "Improvements in machinery or apparatus for finishing woven fabrics."—Dated 16th July, 1874.—*Specification published, price 4d.*
2736. GEDEON GRIOT and LOUIS POLITO, merchants, of Boulevard Voltaire, Paris, France, for an invention of "Improvements in rendering textile substances water and damp proof."—Dated 7th August, 1874.—*Specification published, price 4d.*
2748. JOHN SMITH, of Collyhurst, in the city of Manchester, bleacher, dyer, and finisher, for an invention of "Improvements in beetling machines."—Dated 8th August, 1874.—*Specification published, price 10d.*
3752. LOUIS EDWIN BROADBENT, of Dewsbury, in the county of York, for an invention of "Improvements in machinery employed in weaving and finishing woollen, cotton, or other fabrics."—Dated 30th October, 1874.—*Specification published, price 2s.*
4131. GEORGE LOWRY, of Salford, in the county of Lancaster, machinist, for an invention of "Improvements in machinery for beetling fabrics or fibrous substances, for driving piles, and for stamping, boring, crushing, and hammering animal, vegetable, and mineral substances."—Dated 2nd December, 1874.—*Specification published, price 1s. 4d.*
158. JOHN HENRY GARTSIDE and CHARLES TIMOTHY BRADBURY, of Buckton Vale, in the county of Chester, for an invention of "Improvements in machinery or apparatus for finishing woven fabrics."—Dated 15th

- January, 1875.—*Specification published, price 10d. For abridgement see p. 51.*
370. WILLIAM STARK, manager of bleach works to Messieurs John and Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain, for an invention of "Improvements in apparatus for breadthening and drying woven or other web fabrics."—Dated 1st February, 1875.—*Specification published, price 1s. 4d. For abridgement see p. 55.*
572. PETER LAYCOCK, of Leeds, in the county of York, for an invention of "Improvements in the means and machinery employed for stiffening and staining woollen or other woven or felted fabrics."—Dated 17th February, 1875.—*Specification published, price 4d. For abridgement see p. 52.*
1019. JOHN MITCHELL and THOMAS MITCHELL, both of Rochdale, in the county of Lancaster, for an invention of "An improved machine for stretching calico or other woven fabrics."—Dated 19th March, 1875.—*Specification published, price 10d. For abridgement see p. 54.*
1457. ALFRED VINCENT NEWTON, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman, for an invention of "Improvements in apparatus for tentering, straightening, drying, and finishing cloth and other fabrics."—A communication to him from abroad by Isaac Emerson Palmer, of Middletown, in the state of Connecticut, United States of America.—Dated 21st April, 1875.—*Specification published, price 1s. 8d. For abridgement see p. 96.*
1833. WILLIAM MATHER POLLOCK, of the Lounsdale Bleach Works, in the county of Renfrew, North Britain, for an invention of "Improvements in machinery for stentering or finishing woven fabrics."—Dated 18th May, 1875.
2661. WILLIAM ROBERT LAKE, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London, for an invention of "An improved method of measuring and indicating the quantity in a roll or package of cloth or other like material."—A communication

to him from abroad by Samuel Chancey Talcott, of Ash-
talanla, Ohio, United States of America, gentleman.—
Dated 27th July, 1875.

3. *Abstracts from complete Specifications of Patents.*

VERMILION.—Melville Clark's patent (communicated by Grawitz, of Paris), No. 1604, for the manufacture of red sulphide of mercury, claims the process of dissolving without the aid of heat, and whilst protected from the action of light, either binoxide of mercury, or the salts of binoxide of mercury in an aqueous solution of a soluble hyposulphite. When binoxide of mercury is employed, it is preferable to add to the liquor a small quantity of chloride of ammonium, or of a weak acid, to prevent the liquor becoming too alkaline. When the solution is complete, the temperature is gradually raised, whereupon sulphide of mercury (the red modification) is deposited, the tints of which vary from orange-red to crimson-red-violet. The precipitate after being washed is then brightened by washing with soda and nitric acid. It is stated that the colour obtained in the above manner resists the action of light, heat, or acids.

OXIDIZING ANTHRACENE.—Heinzerling's and Mc Gowan's patent, No. 1712, is for a new process of oxidizing anthracene for the purpose of converting it into alizarine. The anthracene is first purified by treatment with carbon disulphide, and then with bleaching powder and hydrochloric acid. The patentees describe two ways of subjecting the anthracene to treatment, the wet way and the dry way; in the wet way a compound is obtained which may either be at once treated with fuming sulphuric acid, or by the other well-known processes for the production of alizarine. In treating the anthracene in the dry way it is mixed with excess of bleaching powder and very little water, with or without the addition of

hydrochloric, or an equivalent acid. The mixture is heated gently for some time, and then raised to a higher temperature when anthraquinone sublimes. Alizarine may then be produced from the before mentioned products by any of the known methods. The alizarine so produced is treated either in solution or in the solid state with cyanide or sulpho-cyanide of potassium, which improves the colour.

ANILINE BLACK.—Melville Clark's patent for improvements in aniline black, No. 1620, communicated by Grawitz, of Paris, "relates to the production of aniline black by the concurrent reaction on aniline or its salts of certain metallic salts, and of certain chromates or bichromates, the oxidizing action of the latter being produced in a distinct operation which may either follow or precede the action of the metallic salts." The metallic salts are those, like iron, susceptible of two degrees of oxidation. The processes described in this patent seem irreconcilable with what knowledge we have of aniline black, and we shall simply give in the words of the specification the method of producing the black on textile fibres.

"I may employ either of the three following methods:—

(1.) I print with the aid of a suitable thickening, such as starch or gum tragacanth, a mixture consisting of, 1st, a salt of aniline; 2nd, a salt of either of the metals before mentioned (iron, copper, manganese, cerium, aluminium, chromium, nickel, etc.); and, 3rd, a soluble bichromate or chromate. The colour is then developed in the drying room.

(2.) I print with a mixture of an organic salt of aniline, and a metallic chromate, which is readily decomposable, and I then steam.

(3.) I print with a mixture of salt of aniline and a salt of one of the metals before mentioned, and afterwards pass it through a weak neutral, or preferably, acid solution of a soluble chromate or bichromate.

The proportion of aniline mixture may vary from 5 to 10 per cent.

The best relative proportions of the aniline, the metallic salt, and the chromate or bichromate, are those of their chemical equivalents."

COLOURING PILE FABRICS.—Worrall's patent, No. 1294, is for a new method of obtaining a bloom on pile fabrics, and is particularly applicable to cotton velvets, velveteens, and cords, and consists essentially in the use of a machine for brushing up the pile which has been more or less crushed or laid by the padding or dyeing process. The machine was patented 3rd December, 1873, No. 3969, by Worrall, and is mainly an arrangement of cylindrical brushes and a series of chains of brushes working at right angles to the cylindrical brushes, and placed above a table bearing the fabric under treatment. Reference is also made to a dressing machine patented by Worrall and Lawrence, 8th June, 1861, No. 1458, which may be employed for the same end. These brushes are also employed to communicate colour to the pile while the body of the cloth may have been previously dyed another colour, for example, to produce a rich black velvet the fabric is dyed black in the ordinary manner and then a blue colour is applied to the pile; or the pile may be first dyed by means of the brushes in some dark colour, and the fabric subsequently dyed of a light shade, as blue, gold, green, etc. A pattern can be obtained upon this double-dyed fabric by cutting away parts of the black or other dark coloured surface pile by the shearing machine. The brushes are not necessarily made of bristles or similar fibres, but may be pads of velvet or flannel. Further details can only be understood with the aid of drawings of the machinery.

FINISHING YARNS AND THREADS.—This patent, No. 1432, to Rhodes and others, is for setting and giving lustre to yarn and threads in hanks and on bobbins, doing away with the present plan of washing and drying after gassing. It consists in nothing else than submitting the materials to the action of high-pressure steam for from five to fifteen minutes in a jacketed cylinder; the yarns, threads, or braid may be either dry or wetted, or the interior cylinder may contain water to moisten them; though steam at 60 lbs. is used, it is stated that the pressure on the inside of the cylinder is only 2 lbs. per square inch, but will increase with the pressure of the steam employed, and in another place it is said that the tem-

perature in the inside of the cylinder is about 250° F., but that pressure may be employed to produce a higher superheated temperature.

FINISHING CLOTH.—Palmer's patent, No. 1457, communicated to Newton, relates to a machine for the stentering and straightening of cloth and other fabrics, and cannot be explained apart from the drawings. The claims are fifteen in number.

SINGEING WOVEN FABRICS OR YARNS.—Briggs and Stead's patent, No. 1537, is for singeing, at one operation, fabrics or yarns composed of mixtures of animal and vegetable fibres, and it consists of combining in one apparatus gas singeing and plate singeing, that is to say, the fabrics or yarns pass first over flames of gas, which is said to burn off the animal fibres, and then over the copper plate, which burns off the vegetable fibres. There is no drawing, and the claim is "for the combination of gas jets and hot plates in one apparatus, arranged in such manner that the fabrics or yarns may be passed over both in continuation or succession."

METALLIC PRINTING.—Bennet's patent, No. 1426, is for an improved method of obtaining effects in those styles known as bronze brocade or gold patterns, which are at present produced by printing with block a varnish or some adhesive matter on the fabric, and then by means of another block dipped in the metallic powder, transferring a sufficient quantity of it to the adhesive matter. The improved method is by printing the adhesive matter with copper or surface roller, and then passing the cloth through a box containing the required metallic powder, which is caused to adhere to the adhesive matter by means of running the cloth under a roller which works in the metallic powder.

IMPROVEMENTS IN PRINTING FABRICS.—Bennet's patent for this purpose, No. 1428, refers to what are known as Swiss or blue chintzes. The title is somewhat misleading, it might perhaps be better described as a patent for a new style of print than an improvement in printing, and the specification is by no means clear or easy to understand. The blue chintzes are in this style to have a black ground, which is

obtained by printing with red and resist paste where yellow is to fall. The piece is then dyed light blue in the indigo vat, and afterwards the red and block yellow are dyed. This plan is said to save two blockings.

Another plan is to put on the black and resist paste by roller, dye light blue in the vat, dye red and block yellow.

A third plan is to put on the black ground and red by roller, block the resist paste, dye light blue in the vat, dye red and block yellow. The two latter methods save one blocking.

CONTINUOUS STEAMING APPARATUS.—Smith's patent, No. 1303, is for steaming in a continuous and uninterrupted manner. The steaming chamber is constructed of a rectangular form, and may be of brick or stone, with an arched brick ceiling carried on transverse girders, or constructed in some other way. The goods to be steamed are fed into the steaming chamber, and hang in long vertical loops or loose folds, on transverse horizontal rods, the ends of these rods rest on two parallel endless chains placed horizontally, and the links of which are formed with cavities or seats for the rods, and for keeping them at a regular distance apart. The endless chains are at one end passed round a pair of polygonal pulleys on a transverse horizontal shaft, which is driven at a suitable speed; and at the other end it passes round pulleys on a shaft, the bearings of which are adjustable by screws, by means of which the chains can always be properly distended.

When the goods have been carried forward from the entering end to the exit end, the cloth is drawn up from the loop, the bar is released from the endless chain, and returned outside the machine to the entering end. The time occupied in the travelling from the entering to the withdrawing end can be varied according to the styles under treatment. The important details of the entering and withdrawing of the cloth cannot be described in an intelligible manner without the aid of drawings. The claims made are:—

1. The combining of a system of rods carrying vertical loops or folds of printed or other fabric, and moved progressively along a chamber with appliances for entering and

withdrawing the fabric; for steaming it; and for preventing injury by condensation.

2. The arrangement and combining together of mechanism for entering printed or other fabric into a steaming chamber, and for withdrawing the fabric from such a chamber when combined with progressively moving rods or equivalent mechanism in the chamber.

FIXING COLOURS BY STEAM AND HOT AIR.—Thierry-Mieg's patent, No. 1587, communicated to Melville Clark, is for a method of steaming which apparently involves some new principles. "The object of the improved method of this invention is to unite the advantages" of hot ageing and ordinary steaming, "and consists in combining the two processes by employing hot air and steam, either simultaneously or alternately. The treatment with steam is thus wholly or partially replaced by that with hot air, the operation being carried on in a chamber either entirely closed or ventilated. To this end hot air or steam is supplied to the chamber or vat by separate pipes, forming in the vat a mixture of heated air and steam, the temperature and proportions of which can be regulated as desired. The fixation of the colours may thus be readily controlled, means being provided for regulating the supply both of the steam and of the air, and also for regulating the ventilation of the vat. The operation may also be effected in a closed chamber, with or without the aid of steam."

"By the process of this invention, using a temperature of about 212° F., the colours may be fixed as perfectly as by the method now employed, and at much less cost, as 1 lb. of air at 212° absorbs twenty-five times less heat than the same weight of steam. The operation may also be performed at a still higher temperature without necessarily working under pressure, whereby novel effects may be obtained. The presence of the air, far from being injurious, assists in increasing the intensity of certain colours without impairing the others."

The economy of fuel is stated to be three-fourths or four-fifths of that now required. No particular apparatus for

heating the air is described, but there is a drawing of what may be described as a deep circular vat with a double bottom ; the goods lie upon the false bottom which is perforated, and the steam and air are introduced underneath : a steam coil between the true and false bottom gives the means of heating the air or steam as required.

HARLEY'S PATENT FOR COMBINING ANILINE COLOURS WITH MADDER COLOURS.—There are two American patents in the name of James Harley, Nos. 168,991 and 170,626, titles of which are given in this and the preceding number of the Textile Colourist. We have received specimens of prints purporting to be done by these or one of these patents from two independent sources. They are a five-colour pattern with black, orange, red, purple, and green, of the cashmere style, well covered ; the general effect is very good, full, and rich. The colours are all exceedingly loose, and greatly injured by a slight soaping. The specimens examined have not come from Mr. Harley direct, and may therefore not truly represent what can be done by his process.

IMPROVEMENTS IN DYEING.—This communication to Hughes from Hanover, No. 1764, is for the use of "mectane" in dyeing. There is not the slightest intimation of what "mectane" is, and the language of the provisional specification is obscure. The following words occur, "cautchuck," probably for catechu ; "common salts," "sesqui - ferrocyanate of potash," "arsenate of natron," "nigrosin," "alcalious salt," and other unusual or unique combinations. The invention received provisional protection only.

FINISHING THREADS.—Forster's patent, No. 1930, is for treating the thread with paraffin, stearine, spermaceti, wax, tar, or bitumen, dissolved in any of the unoxidizable solvents of such matters, by preference, coal oil, bisulphide of carbon, or ammonia. The object being to make the threads more easily workable, either in sewing machines or with hand sewing. Coal oil is the solvent preferred by the patentee.

SATURATING YARNS.—Reed's patent, No. 1811, was not completed. The idea is to convey the yarns into and out

of the vessel by a pair of endless webs which are led round a series of guide rollers, the yarns being between the two webs.

TREATMENT OF WOOL.—Behren's patent, No. 1868, a communication from Heinrich Caro, is for treating wool in a raw or manufactured state so as to diminish, or altogether destroy, what is known as shrinking, curling, or felting. This is said to be accomplished by causing the wool to absorb chlorine, for example in the following way:—One hundred parts of wool preferably scoured and bleached are soaked in 4000 parts water, and about 50 parts by weight of concentrated muriatic acid, or spirits of salts; after a thorough impregnation of the acid has taken place, a clear solution of bleaching powder, containing from 10 to 20 parts by weight of dry powder, is slowly run in the cistern containing the wool in such a manner that the chlorine is absorbed as fast as liberated, and there must be no smell of chlorine. The wool absorbs the chlorine without being injured in strength or colour, with the diminution or destruction of the curling, shrinking, or felting properties. Any perceptible excess of chlorine injures the wool, and must be carefully avoided. Ten parts of bleaching powder to 100 parts of wool are employed when the object is simply to diminish the shrinking properties; 20 parts when it is desired almost completely to deprive it of these properties; but even 30 or 40 parts can be advantageously employed in exceptional cases.

NEW METHOD OF MAKING GARANCINE.—We are indebted to the *Moniteur de la Teinture* for the following account of a French patent to M. Avon for garancine making. He takes the madder root and submits it to contact with vapour of hydrochloric acid, or to vapours of nitric acid, or to a mixture of these vapours. The operation is conducted in a close vessel at a temperature of about 176° F., and continues for four hours; pressure is needless, and the vessel is closed simply to prevent loss of the acid vapours. The duration of the operation, the temperature employed, and the degree of concentration of the acid vapours are modified according to the strength of product which it is desired to obtain.

When the roots have cooled down, they are put upon a

filter and submitted to a first washing ; they are then ground to a paste, and the ground mass subjected to a fresh washing to remove all the acid. The pasty mass is pressed, dried, ground to powder, packed and delivered to the trade. The patentee does not confine himself to acting upon madder roots only, but operates in the same way upon other madder products.

USE OF BARYTA IN SILK BLEACHING AND DYEING.—Tessié du Motay's French patent, 17th August, 1874, No. 104,650, is for the use of caustic baryta as a substitute for soap in boiling off raw silk ; and it appears to be proposed as a substitute for lime or alkalies in precipitating or fixing metallic oxides upon the same material.*

NEW INDIGO VAT WITH SOLUBLE STANNITES.—The following is the subject of a French patent granted to Descat Brothers and Seloise, and is abstracted from the *Moniteur de la Teinture*, p. 289. This process consists in applying the reducing properties of the protoxide of tin or stannous oxide when dissolved in an alkali or an alkaline earth to indigo dyeing. It is stated that the very marked reducing powers of the stannous oxide have been long known and used in printing, but have not been successfully employed in blue dyeing on account of the excessively caustic nature of the solution. The patentees have discovered that common salt, nitrate of potash, nitrate of soda, and generally other neutral salts which do not precipitate alkaline solution of tin, diminish in a sensible manner the causticity of the solution, and its destructive character, without depriving it of its alkalinity and appearing even to facilitate the solution of the stannous oxide. For the solution of tin, to which a sufficient quantity of one of these salts has been added, is not precipitated by addition of even a large quantity of water, and, moreover, the dark coloured anhydrous oxide of tin is much less liable to be precipitated by a prolonged ebullition. The solution of oxide of tin in alkali, and one of these salts is best made at a high temperature.

* Bull. de la Soc. Chem. de Paris, xxv., p. 481.

4. Japan Wax in Size.—Note upon the Inconveniences arising from the use of Japan Wax in Sizing Cloth intended for Printing.

BY M. CH. BENNER.

DURING the time of the scarcity of American cotton the weavers made trial of a multitude of substances to give body and strength to their warps, and frequently without giving thought to the difficulties which they would cause in bleaching. Some weavers found that a small quantity of Japan wax added to the size answered their purposes, the warp threads were not so liable to break in weaving, and the cloth felt well in the hand.

At this time a batch of cloth which I bleached gave stains which occurred three or four times in the length of a piece, they were perfectly invisible in the white, but took colour in the dye like a mixture of iron and alumina mordant. I cut out some of the stains, and having tested them with acidulated prussiate of potash, I was certain they were not due to a mordant, but to a fatty body. The shape of these stains resembled that of a drop of squozen colour, oblong, pear shaped, without shading off, the edges sharp and of a dimension of about 2 inches long, and $1\frac{3}{4}$ inches in width.

By floating the white pieces upon water I was able to discover the stains which dyed up in madder, by the differences of shade in the wet piece, and they were precisely of the same shape as those which were in the finished goods. My attention was aroused by finding that it was only the cloth from one weaving mill which shewed these stains, though in the one batch bleached there had been three different kinds of cloth. From this it was easy to conclude that some peculiar fatty matter, hitherto unmet with on grey calico, had been employed by the weaver, and that it was of a nature to resist my system of bleaching.

I separated all the pieces which took the water irregularly, and had them steeped in muriatic acid at 3° Tw. all night, washed and boiled in rosin soap, thinking that by this double operation I should have decomposed and dissolved out the fatty matter which had dyed in the madder.

Unfortunately it was not so, the pieces still dyed up with stains in madder, not quite so strongly as before, but they were quite visible.

I then examined the grey pieces of this lot for the parts stained with this fatty matter which could resist the madder bleach ; by floating the pieces twice on water, and cutting out those parts which did not take the water, treating them with boiling alcohol, sulphuric ether, and benzine, I obtained a body of a waxy appearance.

To be certain of the conclusion that the stains were due to this wax, I applied to the end of a grey piece specimens of all the fatty matters which the trade of the place could supply for the use of weavers or printers. I learned then, for the first time, of the existence and use of Japan wax in sizing.

All the fatty matters which I applied to the cloth were saponified and completely disappeared in bleaching, except Japan wax, and the white and yellow bees' wax; for upon dyeing up the trial these three gave exactly the same kind of stains as those which caused the investigation to be made.

The manner in which these stains arose was as follows :— The box through which the warps passed to be sized was fed with hot size which gradually cooled ; by cooling a portion of the wax separated from the size under the form of clots ; these clots by the ascending movement of the warp through the size agglomerated into little balls, which, attaching themselves to the warp, and passing between the rollers, were compressed, and produced the elongated shape which I knew so well.

Visiting a short time ago a sizing establishment where the newest machinery was working splendidly, my attention was drawn to a stock of Japan wax which I perceived in the store room of the works. The sight of this material renewed in me the memory of all the troubles I had experienced from this

substance, and I impressed upon the manager of the place the necessity of replacing this wax by any other fatty or greasy matter which could possibly fulfil the intention of its use, and by no means to employ Japan wax for printers' cloth, because this body is not saponifiable by our method of bleaching, and even when it does not get separated from the size by cooling, it gives rise to defective bleaching, and that it was simply too bad to increase the difficulties the printer had with sizing by incorporating wax in it.

Bulletin of the Industrial Society of Rouen.

5. *Upon the Production of Aniline Black by Electrolysis.*

BY M. J. J. COQUILLION.

WHEN a concentrated solution of sulphate of aniline is submitted to the action of a couple of Bunsen's elements employing platinum electrodes, the positive electrode becomes coated with a purplish-blue pellicle, greenish in some parts. This had been previously observed by Letheby. If the experiment be prolonged for twelve or twenty-four hours, the positive pole becomes covered with a tolerably adherent black mass easily detached from the wire. This substance after treatment with ether and alcohol is a black, amorphous substance, with a greenish reflection, and is insoluble in most fluids. With sulphuric acid on porcelain it acquires a greenish colour; alkalis restore its velvety black appearance. Nascent hydrogen has no action upon it, and if electrodes of gas carbon be employed the same substance is obtained.

Nitrate of aniline furnishes an analogous, but not precisely similar body, since it is turned of a maroon-brown by sulphuric acid. The hydrochlorate gives a granular body, and with this salt it is probable the oxidising action is complicated by the influence of chlorine.

The acetate yields a soft black substance, partly soluble in excess of the salt; the tartrate gives no colour.

From these experiments it may be concluded—(1) that it is possible to obtain aniline black without intervention of any metal, and (2) that various aniline salts are differently affected by nascent oxygen.*

In the *Comptes Rendus* of the 20th December, 1875, there is an extract from a communication of M. A. Rosenstiehl upon the above paper, which is as follows:—In the present state of science aniline black can only be obtained upon tissues in a practicable and regular manner by the action of a chlorate and a metallic substance; copper has been adopted for those blacks which become developed at a temperature of about 350°,† and iron for those which have to be steamed at a temperature of 212° F. If we were not bound by certain economical or technical conditions, aniline black could be obtained upon cloth without either chlorates or metallic salts, simply by means of active oxygen. It has also been long known that, apart from cloth, aniline black can be obtained without the intervention of any metal by means of chlorates. M. Coquillion's experiments shew further that the black can be obtained free without chlorates and without metals, and is an elegant demonstration of the action of active oxygen upon aniline salts; it is probable that by this method the black matters derived from aniline may be obtained in a state of purity which will enable us to ascertain their elementary composition; the great interest attached to this question has caused the Industrial Society of Mulhouse to include it in their list of prizes.

* *Comptes Rendus*, lxxxi., p. 408; p. 1,257.

† It is printed 350 degrees in the original, which is of course an error, it is probably 35 degrees centigrade which is meant, equal to 95° F.



6. *Improvements in Steaming.*

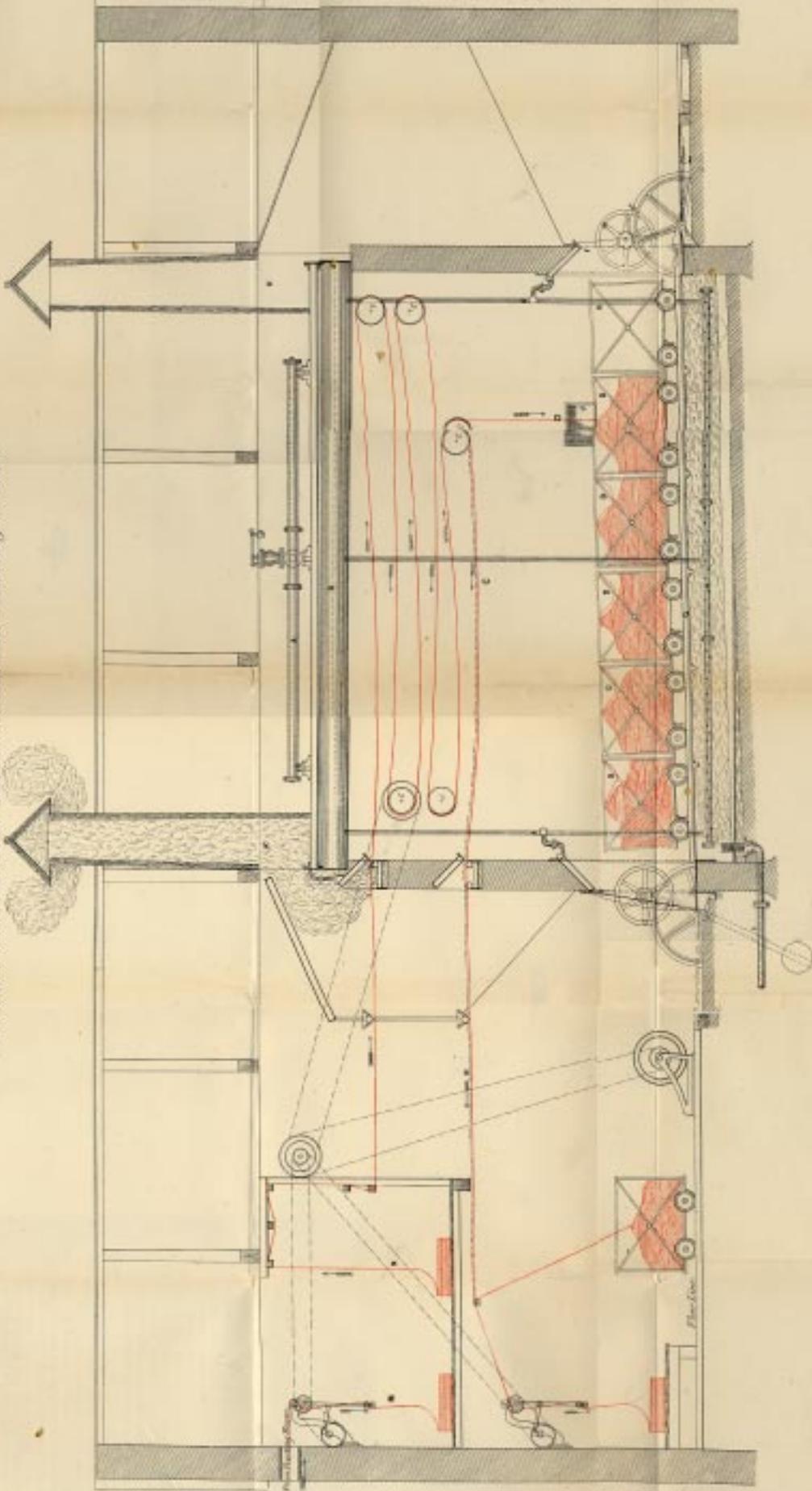
ONE of the great wants in calico printing for some time past has been a continuous steaming arrangement; the inconveniences of the common steaming chamber are so keenly felt that several inventors have lately turned their attention to this point. In the present number a brief account of Smith's apparatus is given, and also Thierry-Mieg's patent; two or three other patents bearing upon the same subject are upon the point of being completed. In our last number there was a paragraph upon Cordillot and Mather's patent; since that was written we have, through the kindness of Messrs. Ledeboer, Bros., and Co., of the Hodge Print Works, had the opportunity of seeing the arrangement at work. The patentees have, at our request, furnished us with a drawing of the apparatus, and we have much pleasure in laying before our readers a lithograph from the drawing, with the result of our inspection of the machine at work.

The method of working can be pretty well deduced from the drawing and references. The goods to be steamed are brought direct from the printing or ageing, and placed in lots in front of the apparatus, the first lot being connected with the second, and so on by a piece of "grey;" or simply by a stitch which can be readily drawn out. The steaming chamber is heated to the required temperature, and the steam turned in at a pressure of $\frac{1}{3}$ lb. All the parts liable to induce condensation are heated to a higher temperature than the vapour in the chamber, and no drops can be formed along the path of the cloth.

When the required temperature has been obtained the attendant will observe through the window that the atmosphere in the chamber is clear, and he may at once proceed to enter the cloth.

Passing through the opening in the end of the chamber (whence also escape the steam and disengaged gases or

Cordell's and Mathers' Patent Continuous Steaming Chamber



N. Cloth passing continuously into Steaming Chamber.
 O. Cloth being deposited by drawing drum c. into wagon.
 P. Cloth passing out of Chamber when not required to be steamed more than a few minutes, such as in making kerchiefs, &c.

J. Winder is Chamber is built similar to one cloth placed in Wagon.
 KK. Ventilators for the escape of vapour and gases.
 L. Wagon being emptied after Steaming.
 M. Cloth from Agency and Finishing Department.

E. Row Frame with Deer Cloth.
 F. Deer Frame with Deer drawn open.
 G. Cart box Back to Chamber for Wagon.
 H. Perforated Steam Pipe.
 I. Disk Pipe.

A. Steam Supply Pipe.
 B. Inside Cover Back.
 C. Steaming Chamber.
 c. Horse Holed by Steam.
 D. Wagon for Cloth.

REFERENCES.

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vapours), the piece is drawn over the copper cylinder heated by steam, and after running the length of the chamber a few times, it is deposited into the waggon, and there piles up and falls right and left until one lot has been run in. The attendant looks out for the "grey" connecting the lots together, and after a few folds have fallen into the waggon he stops the machine. The doors back and front are instantly opened (no fastenings being needed) and the full waggon at once glides quickly out, being followed by the one next to take its place, while an empty waggon is pushed in at the other end. The attendant in the meantime has drawn the stitching out of the "grey," which joins the lots in the waggons, and so liberated the contents of the waggon which was ejected from the chamber from the next waggon behind it. This operation of stopping the machine and taking out and putting in waggons occupies not more than one minute. The machine is again started, and the pieces deposited into the empty waggons as before. The waggons are rendered quite hot, being of metal, so that no condensation takes place, and they are lined with coarse "Hessian cloth." The waggon on emerging from the chamber is run to any convenient place in front of a plaiter and stripped quickly, whence it is sent back to the entering end of the chamber ready to take the place of the one before it when another full waggon is taken out.

We watched the arrangement working for more than two hours, and were somewhat astonished as well as pleased to see that prints could be steamed in as continuous a manner as they could be washed or dunged; and the obliging managing partner, Mr. Gibson, was quite satisfied with the efficiency of the steaming. The goods we saw passing through consisted of pigments, alizarines, and aniline blacks. There were no very heavy patterns, and the time allowed was somewhat under an hour. The pieces deposited in the waggons were thoroughly heated to the very centre, and there seems to be no doubt that as far as the temperature of the chamber goes the cloth is well steamed. We had anticipated difficulties from marking off by the cloth lying soft in folds; this had not been felt to any considerable extent in practice, and it was hoped

that by causing the piece to traverse the chamber once or twice more before being deposited in the waggons this defect would be cured.

We are inclined to think that for a certain number of styles which are very much in demand at present, Messrs. Cordillot and Mather have solved the problem of continuous steaming. It is very evident that there are many styles which could not be steamed by this arrangement without imminent risk or certainty of unevenness and marking off. The temperature can never rise above 212° , and generally must be some degrees lower than that temperature.

It will be seen that there is an arrangement for passing pieces right through the steam chamber without going into the waggons. This arrangement is used to develop aniline blacks, which require no more than one and a half minutes in the steam.

7. COLLECTED RECEIPTS.

BLACK COLOURS FOR PRINTING (CONTINUED).

No. 72. Black for Block; Madder.—*Spirk*.

$6\frac{1}{2}$ gallons iron liquor at 14° — $2\frac{1}{2}$ gallons red liquor at 11°
— $\frac{1}{2}$ pint logwood liquor at 20° — $8\frac{1}{2}$ lbs. starch—boil and add
 $\frac{1}{2}$ pint gallipoli oil.

No. 73. Gum Black for Madder; Block.—*Spirk*.

2 gallons water—5 gallons iron liquor at 20° —1 quart acetic
acid at 11° —1 quart logwood liquor at 30° —20 lbs. gum
senegal.*

* The "Praktisches Handbuch" of the late Dr. Anthony Spirk contains many very good receipts, but typographical errors in the weights and measures are numerous. We have corrected them where they were apparent, but some may have escaped our observation.

No. 74. Black for Madder; Block.—*Spirk.*

3½ gallons iron liquor at 18°—4 gallons water—1 quart logwood liquor at 20°—4½ lbs. starch—4½ lbs. flour—3 pints oil.

No. 75. Black for Madder; Block.—*Spirk.*

5¾ gallons iron liquor at 13°—1 gallon water—½ gallon logwood liquor at 30°—8 lbs. starch—8 lbs. gum substitute.

No. 76. Black for Steam or Alizarine.—*Spirk.*

3 lbs. starch—3 lbs. light gum substitute—2 gallons logwood liquor at 30°—½ gallon gall liquor at 30°—1¾ gallons iron liquor at 20°—1 gallon acetic acid at 9°—½ lb. yellow prussiate—2 oz. chlorate of potash. Well boiled together, and before using, 4 lbs. nitrate of iron at 62°.

No. 77. Steam or Garancine Black.—*Spirk.*

2¼ gallons logwood liquor at 30°—2½ gallons acetic acid—8 lbs. starch—3½ gallons iron liquor at 14°—2 quarts oil.

No. 78. Washing off Black.—*Spirk.*

½ gallon logwood liquor at 30°—7 gallons water—15 lbs. starch—3 pints iron liquor at 14°—1 pint red liquor at 22°—1 lb. lard.

No. 79. Steam Black.—*Spirk.*

6 gallons oxidised logwood liquor at 8°—8½ lbs. starch—12 lbs. light British gum—8½ lbs. red prussiate—3 lbs. prussiate of tin—5 lbs. Tartaric acid—4 oz. nitrate of iron at 100°.

No. 80. Gum Black; Steam; Calico.—*Spirk.*

4½ gallons logwood liquor at 30°—1 gallon red liquor at 14°—1 gallon acetic acid at 11°—1 gallon iron liquor at 20°—1 quart oil—thicken with 25 lbs. gum senegal.

No. 81. Starch Steam Black.—*Spirk.*

4¼ gallons logwood liquor at 11°—1 gallon red liquor at 14°—1 gallon acetic acid at 11°—1 gallon iron liquor at 20°—1 quart oil—9 lbs. starch.

No. 82. Steam Black.—*Spirk.*

1½ lbs. starch—3 lbs. acetic acid at 11°—1 quart logwood liquor at 30°—½ pint fustic liquor at 30°—boil and add gradually a mixture of 4 oz. bichromate of potash—1 pint acetic acid at 11°—½ pint of muriatic acid; stir well and add 1 lb. light British gum.

No. 83. Steam Black for Chroming.—*Spirk.*

2¼ gallons logwood liquor at 30°—2½ gallons acetic acid at 11°—10 lbs. starch—3 lbs. calcined farina—1¼ gallons water—1¼ gallons red liquor at 16°—1¼ gallons iron liquor at 21°—¾ lb. lard—¾ lb. turpentine.

No. 84. Steam Black for Soaping.—*Spirk.*

3½ gallons logwood liquor at 14°—1 gallon water—½ gallon acetic acid at 11°—26 lbs. light British gum—boil and add 3½ gallons acetate of chromium at 25° and 2½ lbs. chlorate of potash dissolved in 1 quart of water.

No. 85. Acetate of Chromium for No. 92.—*Spirk.*

3 lbs. bichromate of potash—4 lbs. sulphuric acid at 170°—5 gallons water; dissolve and add in small portions 1 lb. of starch; when the reaction is over and the liquor cool add 11 lbs. of acetate of lead, and mix; use the clear.

No. 86. Steam Black for Delaine.—*Spirk.*

4 lbs. starch—20 lbs. soluble gum substitute—4½ lbs. extract of indigo—3½ gallons logwood liquor at 30°—3¾ gallons iron liquor at 21°—boil well.

No. 87. Steam Black for Delaine.—*Spirk.*

23 lbs. gum substitute—2½ gallons logwood liquor at 30°—2 gallons iron liquor at 21°—½ gallon acetic acid—4 lbs. carmine of indigo—1½ gallons bark liquor at 30°—boil and cool—7 lbs. nitrate of iron—1½ lbs. chlorate of potash.

No. 88. Steam Black for Wool.—*Spirk.*

3½ lbs. starch—4 gallons iron liquor, at 21°—1½ gallons

archil at 14°—3 pints bark liquor at 30°—3 pints extract of indigo—2 gallons logwood liquor at 30°—15 lbs. gum substitute.

No. 89. Steam Black for Dyed Grounds; Wool.—*Spirk.*

2 gallons logwood liquor at 30°—1½ gallons archil at 14°—1 pint bark liquor at 30°—3½ lbs. starch—2 quarts of acetate of lime at 22°—3 gallons iron liquor at 21°—4 lbs. extract of indigo—15 lbs. gum substitute—when somewhat cold, 2½ lbs. of oxalic acid—and when quite cold, 4 lbs. nitrate of iron at 74°.

No. 90. Topical Black.—*Parnell.*

1 gallon logwood liquor at 8°—4 oz. green copperas—1 pint per-nitrate of iron at 50°.

No. 91. Topical Black.—*Parnell.*

1 gallon logwood liquor at 8°—2 oz. copperas—1 pint per-nitrate of iron at 8°—1¼ lbs. starch.

No. 92. Steam Black.—*Parnell.*

1 pint red liquor at 18°—2 pints iron liquor at 24°—1 gallon logwood liquor at 8°—1¾ lbs. starch—1½ pints pyroligneous acid at 7°.

No. 93. Steam Black.—*Parnell.*

3½ pints peachwood liquor at 6°—7 pints logwood liquor at 6°—12 oz. starch—14 oz. British gum—3 oz. sulphate of copper—1 oz. green copperas—3 oz. of a neutral solution of per-nitrate of iron, made by mixing 1 lb. acetate of lead with 3 lbs. common acid nitrate of iron at 122°.

No. 94. Black for Madder.—*Higgin.*

4 gallons iron liquor at 24°—4 gallons pyroligneous acid—4 gallons water—24 lbs. flour—boil and add 1 pint oil.

No. 95. Black for Garancine.—*Higgin.*

7½ gallons water—3 gallons iron liquor at 24°—1½ gallons purple fixing liquor—24 lbs. flour—1 pint oil.

No. 96. Purple Fixing Liquor for No. 95.

2 gallons water—25 lbs. soda crystals—22½ lbs. arsenious acid—boil, and when dissolved add 50 gallons wood acid previously heated to 120° F., let stand a day or two till the tar of the acid is settled, and add 3 quarts muriatic acid.

No. 97. Black for Turkey Red.—Higgin.

7 gallons logwood liquor at 8°—1 gallon pyroligneous acid—10 lbs. starch—boil and add 2 lbs. 10 oz. copperas—boil again and cool—3½ pints nitrate of iron at 80°—1 gallon blue paste.

No. 98. Blue Paste for No. 97.

6 lbs. green copperas dissolved in 2 quarts water—4 lbs. prussiate dissolved in another 2 quarts water—mix and add 1 quart red liquor—1 quart nitric acid at 60°.

No. 99. Steam Black for Calico.—Higgin.

1 gallon logwood liquor at 12°—1 quart gall liquor at 9°—1 quart mordant below—2 lbs. flour—6 oz. starch—boil ten minutes and add ½ pint nitrate of iron.

No. 100. Mordant for No. 99.

1 quart acetic acid—1½ quarts acetate of copper at 3°—1½ quarts iron liquor at 24°—1 quart red liquor at 20°

No. 101. Black for Anilines and Pigments.—Higgin.

5 gallons logwood liquor at 12°—1 gallon bark liquor at 12°—1¼ gallons acetic acid at 8°—14 lbs. starch—3 lbs. delaine gum—boil and add 1¼ lbs. chlorate of potash dissolved in 5 quarts of hot water—cool and add 4 quarts of chromium mordant.

No. 102. Mordant for No. 101 Black.—Higgin.

6 gallons water—12 lbs. bichromate potash—16 lbs. sulphuric acid diluted with 3 quarts water—add by degrees 2 lbs. brown sugar, and when the effervescence has ceased add 19½ lbs.

nitrate of lead, 19½ lbs. acetate of lead dissolved in 1 gallon water—let settle, and use the clear.

No. 103. Spirit Black.—*Higgin.*

1 gallon logwood liquor at 8°—1 gallon water—10 oz. copperas—3 lbs. starch—boil and add ½ pint nitrate of iron at 8°.

No. 104. Aniline Black.—*Lightfoot's Original, 1863.*

1 gallon starch paste at 1 lb. starch per gallon—4 oz. chlorate of potash—8 oz. aniline—8 oz. muriatic acid—4 oz. chloride of copper at 88°—2 oz. salammoniac.

No. 105. Aniline Black.—*Cordillot's Patent, 1863.*

1700 parts starch paste—45 chlorate of potash—120 muriate of aniline—120 red prussiate of potash.

No. 106. Aniline Black.—*Lauth's Patent, 1864.*

1 gallon starch paste—16 oz. aniline salt—4 oz. sulphide of copper—4 oz. chlorate of potash.

No. 107. Aniline Black for small objects.—*Communicated. French.*

7½ lbs. starch—5 gallons water—boil and add 1¼ lb. chlorate of potash—1¼ lb. salammoniac—4 lbs. salammoniac—1½ lb. sulphide of copper.

No. 108. Aniline Black for Stripes or Blotch.

Communicated. Russian.

16 gallons water—17¼ lbs. salammoniac—17¼ lbs. chlorate of potash—36 lbs. aniline oil—64 lbs. starch—32 lbs. dark British gum—4 gallons water—2 gallons glycerine—boil and make up to 360 lbs. weight; equals 10 per cent. of aniline oil. Take 5 gallons of the above—6 lbs. sulphide of copper, and when required for use add 5½ lbs. muriatic acid at 30°—5½ lbs. water.

No. 109. Sulphide of Copper for No. 108.

20 lbs. caustic soda at 68°—3¾ lbs. flowers of sulphur—32 gallons of water in which previously dissolve 18½ lbs. sulphate of copper—drain to 40 lbs. paste.

No. 110. Aniline Black for Block.—*Spirk.*

2½ gallons hot starch paste—5 oz. acetate of copper—
5 oz. chlorate of potash—2½ oz. salammoniac—when cold
12 oz. of muriate or nitrate of aniline.

No. 111. Aniline Black. Block or Roller.—*Spirk.*

1 gallon starch paste at 1½ lbs. per gallon—1 gallon traga-
canth jelly at ¾ lb. per gallon—1 gallon light gum substitute
water—12 oz. chlorate of potash—when quite cold add 18 oz.
muriate of aniline—10 oz. sulphide of copper.

No. 112. Aniline Black with Tartaric Acid.—*Koechlin.*

20 lbs. starch—20 lbs. dark British gum—2¼ gallons aniline
oil—2¼ gallons water—add 11 lbs. chlorate of potash and
11 lbs. salammoniac dissolved in 8 gallons water—boil, cool,
and add 1 gallon sulphide of copper; before printing add to
each gallon of the above 22 oz. of tartaric acid dissolved in 1
pint hot water.

No. 113. Black with Oxalate of Aniline.—*Spirk.*

1 gallon starch paste—1 gallon tragacanth jelly—1 gallon
light British gum water—8 oz. chlorate of potash—1 lb. chlo-
ride of calcium—boil well and add when cool—1½ lbs. oxalate
of aniline—3 oz. salammoniac—9 oz. sulphide of copper.

No. 114. Aniline Black with Tungstate of Chromium.—*Spirk.*

2 gallons water—3 lbs. starch—4 lbs. tungstate of chromium
paste—boil well and add while lukewarm 6 oz. chlorate of
potash—3 oz. salammoniac—2 lbs. muriate of aniline.

No. 115. Aniline Black with Disulphocyanide of Copper.*Higgin.*

1 gallon water—1 lb. starch—1 lb. dark British gum—2 oz.
of disulphocyanide paste—boil and add 8 oz. chlorate of
potash—cool and add 1 lb. muriate of aniline.

No. 116. Aniline Black with Chlorate of Soda.—*Lightfoot.*

1 gallon chlorate paste (below)—3 lbs. muriate of aniline
(below)—1 pint sulphide of copper.

No. 117. Chlorate Paste for No. 118.

10 gallons water—23 lbs. wheat starch—5½ lbs. salammoniac—4 lbs. chlorate of potash—2 gallons chlorate of soda (below)—boil and cool.

No. 118. Chlorate of Soda for No. 119.

3¼ gallons hot water—7¼ lbs. tartaric acid—1 gallon caustic soda at 70°—dissolve hot 12 lbs. chlorate of potash and add 7¼ lbs. tartaric acid dissolved in 6½ quarts water—reduce the clear to 28° Tw.

No. 119. Muriate of Aniline for No. 116.*

8 measures aniline oil—6 measures muriatic acid at 34° Tw.

No. 120. Aniline Black for Ageing or Steaming.—Bardsley.†

1 gallon water—2 lbs. aniline salt—2 oz. aniline oil—2 lbs. starch—8 oz. British gum—boil separately 1 gallon sodium chlorate—2 lbs. white starch—8 oz. British gum—8 oz. salammoniac—when cool mix and add 1 pint copper paste.

No. 121. Aniline Black with Chlorate of Ammonia.—Dreyfus.‡

3¾ gallons chlorate of ammonia—6 to 8 lbs. starch—6 to 8 lbs. British gum—boil well and cool—7 pints of neutral aniline salt at 8 lbs. per gallon—¾ to 1 pint sulphide of copper.

No. 122. Aniline Black.—Pinkney's Patent.

150 parts muriate of aniline or aniline salt—18½ parts salt of vanadium—20 parts chloride of nickel—100 to 150 parts chlorate of potash or soda—1200 parts water thickened with gum or gum substitute.

* These four receipts from Ure's Dictionary.

† Chemical Review, December 1875, p. 44.

‡ Journal of Soc. Prom. Scientific Industry, i., p. 83.

WOOL DYEING WITH ANILINE PURPLE.—A correspondent of the *Muster Zeitung*, No. 1, p. 4, writes, It is well known that the dyer is frequently annoyed by unevenness and stains in dyeing wool with either iodine or methyl violet. Although as a general rule unevenness is attributable to want of care, or to great haste on the part of the dyer, yet some of it is owing to differences in the commercial products which require different treatments and times. He has found by many trials that all the aniline purples in trade, from whatever manufactory obtained, can be made to die evenly and in a uniform period of time by addition of sulphate of zinc, and salammoniack to the dye liquor. He has not discovered what the action of these salts is, but it is certain that the stains are much fewer, or it may be said, entirely absent. The method of dyeing consists in adding solution of the dye-stuff in portions to the bath, which is gradually heated, and containing already the above-named chemicals, and the wool dyed at boiling heat, being kept in continual movement all the time of dyeing.

VIOLET OR PURPLE ON LOOSE WOOL.—For 25 lbs. wool there will be required 2 oz. of methyl violet of the shade required, the clear solution is mixed with 1 lb. of sulphate of soda, boiled, cooled, and the wool entered and dyed at quick boil.—*Färber Zeitung*.

GREEN UPON WOOL FROM SOLUBLE METHYL OR IODINE GREEN.—We take the following from the *Muster Zeitung*, No. 1, p. 3. It would appear to be the practical application of Lauth's discovery of mordanting by hyposulphite of soda (see p. 36). For 10 lbs. of wool, prepare a bath with 2 lbs. hyposulphite of soda, 1 lb. alum, and $\frac{1}{2}$ lb. sulphuric acid, heat it with the wool in up to 145° F., and work the wool for 1½ hours, raising the heat up to about 180°, take out and leave the wool for some hours. Rinse, and enter into the dye-bath, to which has been added the requisite amount of green, and also 3 oz. acetate of soda, 4 oz. borax, and, if necessary, a quarter to half-an-ounce of picric acid. Heat up from 120° F. to 180° F. in 1½ hours; rinse in a soap lather, and dry carefully.

A modification of this process consists in taking 1 lb. hyposulphite, $\frac{1}{2}$ lb. of muriatic acid, warm up to 170° or 180° , enter the wool and keep it in $1\frac{1}{4}$ hours, leave twelve hours, wash, and dye as above.

Care must be taken that there is no metal in contact with the wool and the hyposulphite; the steam pipe must also be non-metallic.

CHESNUT AND BROWN ON WOOL FROM ANILINES.—Two new aniline colours are announced in the foreign journals under the name of purpuraline and aniline blue-black. Purpuraline produces browns and chocolates upon all fibres, and according to advertisements is destined to displace archil and its extracts, being cheaper, easier to use, and faster. The aniline blue-black is to be the supplanter of sulphate of indigo, giving dark colours when strong, and by dilution beautiful greys: it mixes perfectly with archil and other dye-stuffs; is soluble in water, and applicable to all sorts of fibrous matter. The purpuraline is advertised at about three shillings the pound, and the aniline blue-black at from eight to nine shillings. In the *Moniteur de la Teinture*, p. 284, there is a sample of dark chesnut on wool, obtained from Bismarck, darkened by addition of the aniline blue-black. The dyeing is commenced with sufficient of the latter colour to give a medium grey, it is then covered with the Bismarck. If too much blue-black be employed, the result will be the so-called bronze green. A combination of purpuraline and Bismarck gives reddish chocolates of various shades according to the proportions of the materials employed; and mixtures of the three colouring matters can be made to yield a variety of dark colours.

FAST RED ON WOOLLEN YARN FROM ALIZARINE.—For 10 lbs. of wool, boil $1\frac{1}{2}$ hours with $1\frac{1}{2}$ lbs. of sulphate of alumina, and $\frac{1}{2}$ lb. of tartar; rinse, and dye with $6\frac{1}{2}$ oz. of artificial alizarine paste, containing 10 per cent. dry alizarine, enter into the dye cold, and bring up to the boil. Fancy brown shades can be obtained by adding fustic and extract of indigo to the dye, along with a further amount of sulphate of alumina and bisulphate of soda.—*Färber Zeitung*, 1876, p. 20.

IMITATION INDIGO BLUE ON WOOL.—Boil 5 lbs. of woollen goods for forty-five minutes, with 1 lb. of tartar, $1\frac{1}{2}$ oz. of bichromate of potash, $1\frac{1}{2}$ oz. of sulphate of copper; leave to cool on the mordant, and dye for half an hour at boil in a fresh bath made from $2\frac{1}{2}$ lbs. Domingo logwood, and $1\frac{1}{2}$ oz. of sulphuric acid. This blue-black resists the sulphuric acid test, and is turned yellow by nitric acid.—*Färber Zeitung*, 1876, p. 20.

GREEN ON WOOL.—This is said to be a half-fast green, nearly a billiard green. For $17\frac{1}{2}$ lbs. bleached woollen, mordant with $1\frac{3}{4}$ lbs. alum, and $\frac{1}{2}$ lb. bichromate of potash, and boiled with 5 lbs. weld, again treated with weld, $12\frac{1}{2}$ lbs. The blue part is given by the indigo vat.—*Muster Zeitung*.

CHROME BLACK UPON UNSPUN WOOL.—For 25 lbs. wool boil $1\frac{1}{2}$ hours, with $\frac{1}{2}$ lb. bichromate of potash, $\frac{1}{2}$ lb. sulphate of copper, and $\frac{1}{2}$ lb. sulphuric acid; take out, and dye in a liquor made from 10 lbs. logwood, and 2 lbs. fustic; one hour at boil. If the fustic be left out, or a lesser quantity taken, the black will be more or less bluish.—*Färber Zeitung*.

CRIMSON ON SILK.—The silk is boiled off with Marseilles soap, washed, and then for 5 lbs. weight of it left all night in a solution of 4 or 5 lbs. of alum. Rinsed and dyed with $1\frac{1}{4}$ lbs. cochineal, 6 ozs. tartar, 6 ozs. galls, and 6 ozs. of a tin mixture made from 4 parts salammoniac, 25 parts water, 25 parts nitric acid, 10 parts grain tin.

The cochineal and galls are boiled with the quantity of water requisite for dyeing, then the tartar and tin solution added, the whole cooled a little and the silk entered and kept at dyeing heat for an hour, left to cool in the liquid, and then washed off. The shade is clear; to make it heavier it must be again dyed in cochineal and red wood.—*Muster Zeitung*.

RED UPON COTTON FROM SAFFRANINE.—For 5 lbs. of cotton prepare it by boiling for an hour with $\frac{1}{2}$ lb. of turmeric, lift and pass in sufficient cold water containing $\frac{1}{2}$ lb. of oil of vitriol, lift and sumach for three hours and boil with 1 lb. of sumach. The cotton thus prepared is dyed at a hand heat with a clear solution of saffranine to shade.—*Färber Zeitung*.

NEW ACID ISOMERIC WITH ALIZARINE.—Schunck and

Roemer have communicated to the Berlin Chemical Society an account of a product accompanying artificial alizarine, furnished to them by Perkins' manufactory in London. When purified they examined the portion soluble in cold baryta water, hoping to find it to be mono-oxyanthrachinon, but they were disappointed, the analysis indicating the formula $C_{14}H_8O_4$. It yields large crystals of considerable brilliancy and is isomeric but not identical with anthraflavic acid. It has no tinctorial power.—*Berichte d. D. Chem. Gessellschaft*, No. 19, p. 1628.

LIVING COCHINEAL.—Mr. W. Schönlanck, of Berlin, has succeeded in bringing to that city a species of large cactus covered with living cochineal insects; this extreme rarity for that latitude may be inspected by visitors in the reptile house of the Zoological Gardens of Berlin, where it has apparently found suitable quarters.—*Färber Zeitung*.

MEDIUM AND LIGHT GREEN FOR SILK PRINTING.—One gallon of berry liquor at 4° Tw., 9 ozs. alum, 3 lbs. of a solution made from 1 gallon of hot water, $2\frac{1}{4}$ lbs. extract of indigo in paste, and 5 ozs. cream of tartar; thicken with say 3 lbs. of gum. For light shades reduce with gum water. For dark shades take 1 gallon of berry liquor at 4° Tw., 9 ozs. alum, $4\frac{1}{4}$ lbs. of the solution of extract of indigo and tartar given above. Thicken with dry gum; steam as usual.—*Muster Zeitung*, No. 1, 1876.

DEEP RED ON COTTON YARN.—For 10 lbs. of yarn, steep in a bath containing 1 lb. of catechu and 4 oz. of sulphate of copper, and heated to 170° F.; wring out and enter into a bichromate liquor containing 4 oz. bichromate and heated to 109° F.; then follow with tin mordant, about 4 oz. of crystals of tin, with a little muriatic acid in sufficient water; the dyeing is done with 3 lbs. of red wood at a temperature of 133° F. Addition of logwood makes the colour darker, turning to brown.—*Muster Zeitung*, No. 1., 1876.

8. *British and Foreign Patents, from the Commissioners of Patents Journal, December 17th, 1875, to January 18th, 1876, inclusive.*

Rollers, Engraving, Patterns, Designs.

4515. HENRY WILDE, of Manchester, in the county of Lancaster, Engineer, for an invention of "Improvements in the manufacture of metal rollers for printing calico and other textile fabrics, part of which is applicable to the refining of copper."—Dated 28th December, 1875.
4524. WILLIAM ROBERT LAKE, of the firm of Haseltine, Lake, & Co., Patent Agents, Southampton Buildings, London, for an invention of "Improvements in pantograph engraving machines."—A communication to him from abroad by John Hope, of Providence, Rhode Island, United States of America.—(Complete specification).—Dated 29th December, 1875.—Notice to proceed was given on the same date.
4541. CHARLES BATTY ANDREW, WILLIAM BURROWES, and GEORGE BERESFORD ATKINS, of the city of Manchester, in the county of Lancaster, for an invention of "Improvements in producing patterns or designs in metals, on silk handkerchiefs, ladies' scarves, and silk piece goods."—Dated 30th December, 1875.
- 105,191. DESCoubET and LEPRINCE, for "A machine for producing designs on tissues."—Dated 4th June, 1875.—French patent.

Singeing.

BLANCHE has given notice to proceed with his patent for singeing woven fabrics.—See this Journal, i., p. 39.

Ageing or Steaming.

2943. EDWARD JAMES JONES, of the firm of James Black & Co., Calico Printers, of Dalmonoch Works, in the county of Dumbarton, North Britain, has given notice to proceed in respect of the invention of "Improvements in apparatus for ageing or steaming woven or other web fabrics or yarns."

Apparatuses and Processes of Dyeing and Printing.

2845. RICHARD MARSDEN, JOHN DAY MARSDEN, and HENRY MARSDEN, of Dewsbury, in the county of York, have given notice to proceed in respect of the invention of "Improvements in machinery or apparatus for dyeing, washing, and scouring fabrics."
3005. WILLIAM FOTHERGIL BATHO, of the city of Westminster, Engineer, and JOHN TREADWAY HANSON, of "Thames Chambers," Adelphi, in the county of Middlesex, Architect, have given notice to proceed in respect of the invention of "Improved apparatus for printing and stamping wall paper or other substances for decorative purposes."
4177. ANDERSON and ROTHERHAM have received provisional protection for their patent improvements in dyeing silk and cotton.—See this Journal i., p. 41.
- 169,859. SAMUEL M. SMITH and CHAS. T. SMITH, of Bradford, England, for "A dyeing apparatus."—Application filed 31st July, 1875.—American patent.
Brief.—"The dye is admitted into a vertical revolving cylinder, whence it passes, by centrifugal force, through perforations filled with bristles, and between gauze disks, against the material to be speckled or covered with solid color."
- 170,307. ALEXANDRE SCHULTZ, of Paris, France, for "Processes of dyeing fabrics."—Application filed 10th September, 1875.—American Patent.—See English patent, No. 498, in this Journal, i., p. 53.
Brief.—"The fabric is printed with a mixture of indigo white, oxide of tin, and gum-senegal, and is then steamed to fix the color."
- 170,626. JAMES HARLEY, of Lowell, Mass., for "Dyeing and printing textile fabrics."—Application filed 27th November, 1875.—American patent.
Brief.—"Prints the aniline tints upon the fabric at the same time with the mordants, for the madder colors. The 'carrier' solutions of the aniline colors are such as resist the action of the dye-baths, and thus prevent blending and bleaching."
Claim.—"1, the improved process herein described for dyeing in madder and garancine styles, in combination with aniline purples and violets, consisting in first fixing the latter upon the cloth with the mordants, and then passing the cloth through the dye-bath, whereby it is then dyed up in madder and indigo styles, substantially as specified. 2, the combination of aniline greens and purples upon cloth with mordants suitable for dyeing up in

- madder colors, substantially as specified. 3, the new fabric herein described, having an aniline purple, substantially such as described, in combination with one or more madder colors. 4, the combination of aniline purple upon fabrics with mordants suitable for dyeing with garancine, alizarine, and similar dye-stuffs, substantially as set forth."
- 108,358. LAINE, PAILLARD, and Co., for "Black dyes for mixed fabrics."—Dated 10th June, 1875.—French patent.
- 104,113. GONIN, for "Fast dyes for cotton."—Dated 30th June, 1875.—French patent.
- 108,525. LE TELLIER and VERSTRAET, for "A pressure-roller for machines employed in printing fabrics and other articles."—Dated 23rd June, 1875.—French patent.
- 108,538. SELLON and PINKNEY, for "Improvements in dyeing and printing."—Dated 24th June, 1875.—French patent.
- 38,366. J. A. ROULE, of Andrimont-Verviers, for "A process for printing fabrics."—Dated 4th December, 1875.—Belgian patent.

46. THOMAS LEEMING and RICHARD RAY, both of Manchester, in the county of Lancaster, Lithographers, and FRANCIS GASCOIGNE LYNDE, of Kirkby Stephen, in the county of Westmoreland, Civil Engineer, for an invention of "Improvements in machinery for bronzing, colouring, or otherwise ornamenting paper and other materials."—Dated 4th January, 1873.
49. THOMAS AITKEN, of Manchester, in the county of Lancaster, for an invention of "Improvements in printing calico and other textile fabrics."—Dated 4th January, 1873.

The Stamp duty of £50 has been paid upon these two Patents.

Yarns, Hanks, &c.

3379. FERGUSSON's patent for applying size and colour to yarns and threads has passed the great seal.—See this Journal, i., p. 44.
- 106,996. CAPRON & Co., for "A machine for drying yarn in skeins."—Dated 16th June, 1875.—French patent.
29. THE FLOSS-SILK SPINNING COMPANY, of Meina, for "A machine with automatic discharge for finishing thread."—3 years.—Dated 10th July, 1875.—Italian patent.
131. G. SERRA-GROPELLI, of Milan, for "Portable gas-stoves for drying silks and other textile substances, and also for titrating silk."—3 years.—Dated 17th September, 1875.—Italian patent.

103. G. DE RITTER and Co., of Görtz, for "A machine for cleaning and glazing yarn."—6 years.—Dated 26th August, 1875.—Italian.

The following Patents have become void.

3703. FREDERICK WILKINSON, of Manchester, in the county of Lancaster, Yarn Agent, for an invention of "Improvements in sizing, dressing, or preparing yarns or threads and woven fabrics of cotton and other fibrous materials, applicable also to colouring the said yarns or threads."—Dated 6th December, 1872.
3770. JOHN BULLOUGH, of Accrington, in the county of Lancaster, Machinist, for an invention of "Improvements in machinery for sizing and drying yarn, and in means or method of and apparatus for utilizing waste heat therefor."—Dated 12th December, 1872.
72. HENRY CARMICHAEL, of Leeds, in the county of York, Bleacher, for an invention of "An improved process and apparatus for bleaching, dyeing, and washing linen, cotton, and other yarns and fabrics."—Dated 7th January, 1873.

Colouring Matters.

4138. CLARK'S patent for artificial purpurine, a communication from Grawitz, has received provisional protection.—See this Journal, i., p. 42.
4296. ANDRÉ BRESSON, engineer, 10, Dacres Road, Forest Hill, Kent, for the invention of "An improved process for producing benzine, light oil, and anthracene from hydrocarbons."—This patent has received provisional protection.
4484. HORACE MOUNTFORD WILKINSON, of 2, Place des Barricades, in the city of Brussels, in the kingdom of Belgium, at present residing at 5, Charlotte Street, Portland Place, in the county of Middlesex, for an invention for "The manufacture of a new ink, applicable also for dyeing, colouring, and other purposes."—A communication to him from abroad by Camille Joly, of Rue d'Anderlecht, No. 3, Brussels.—Dated 24th December, 1875.
44. JUSTUS WOLFF, of Wyke, near Bradford, consulting and engineering chemist, and RALPH BETLEY, of Wigan, analytical and consulting chemist, for an invention of "Improvements in the production of colouring matters capable of being employed for the purposes of dyeing and printing."—Dated 4th January, 1876.
- 108,295. LEMOINE, of Paris, for "Applying the colouring properties

- of dichroic and fluorescent substances, and especially of fluoresceine, for decorating purposes."—Dated 3rd June, 1875.—French patent.
20. A. GRAETZEL and H. C. C. PEGO, of Hanover, for "A process for obtaining a blue dye from wood-tar."—3 years.—Dated 27th November, 1875.—Belgian patent.

Water Purification.

2521. WOLLASTON'S patent for purifying and decolorizing dye waters, etc. (see this journal, i., p. 43) has passed the great seal.

Wool Treatments.

2480. EDWARD THOMAS HUGHES, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London, for an invention of "Improvements in machinery or apparatus for washing and scouring wool."—A communication to him from abroad by Victor Weiss, of Langensalza, Prussia.—Dated 9th July, 1875.—This patent has passed the great seal.
2587. JOSEPH JEFFERSON, CORNELIUS JEFFERSON, LAZARUS JEFFERSON, and MORDECAI JEFFERSON, all of Bradford, in the county of York, machine and iron and brass founders, for an invention of "Improvements in machinery for washing wool and other fibres."—Dated 20th July, 1875.—This patent has passed the great seal.
4088. ALEXANDER has given notice to proceed with his patent for the carbonization of vegetable matters in wool.—See this Journal, i., p. 45.
4211. NICHOLLS'S patent for apparatus for washing wool or other fibres has received provisional protection.—See this Journal, i., p. 46.
- 108,572. THE CHEMNITZ SAXON ENGINE-WORKS COMPANY, for "A machine for cleaning wool, cotton, flax, silk, and other vegetable and animal textile fibres."—Dated 29th June, 1875.—French patent.
- 38,237. V. WEISS, for an imported invention of "An automatic apparatus for scouring wool."—Dated 16th November, 1875.—(French patent, 5th July, 1875).—Belgian patent.
- 38,307. D. MICHEL, for an imported invention of "Charring vegetable matter in wool."—Dated 25th November, 1875.—Belgian patent.

Finishing Processes.

4243. NICKOLS' patent for machinery for plaiting fabrics has received provisional protection.—See this Journal, i., p. 47.
4454. WILLIAM KEMPE and ARTHUR KEMPE, both of Holbeck Mills, Leeds, in the county of York, for an invention of "Improvements in raising the nap upon cloths and fabrics, and in apparatus employed therein."—Dated 22nd December, 1875.
- 100,408. ENOULT, jun., for "A machine for glazing cloth."—Dated 21st June, 1875.—French patent.
- 108,275. VEYRON, of Voiron, for "An apparatus for polishing or smoothing tissues."—Dated 7th June, 1875.—French patent.
- 108,591. GANTILLON and Co., for "Using a new substance for dressing and dyeing tissues."—Dated 30th June, 1875.—French patent.

The following Patent has become Void.

3849. ALEXANDER MELVILLE CLARK, of 53, Chancery Lane, in the county of Middlesex, patent agent, for an invention of "An improved calendar."—A communication to him from abroad by Jean Marc Louis Parisod, and Jean Eléonor Gustave Prochasson, both of Paris, France.—Dated 18th December, 1872.

9. CORRESPONDENCE.

MR. R. WARINGTON (not Warrington, as printed in the last number of this journal) writes to us that the abstractor of his paper on citric and tartaric acid has made some errors which arise from his having confounded lime juice with lemon juice, evidently considering them to be the same thing when they are different. For instance, it is said, p. 3, that "lime juice is principally imported from Sicily and South Italy," it should be lemon juice; lime juice comes from the West Indies; no Bergamot comes from the West Indies. This misapprehension runs throughout the citric acid part of the paper.

W. H. D., Lindley.—Whether the acetate of iron you refer to will answer your purpose or not is entirely a question for your own decision after trial made.

To the Editor of the Textile Colourist.

Manchester, January 18th, 1876.

Dear Sir,—Anyone who has watched the extension of the various manufactories on the continent for some years back, will have noticed that they have made much progress. I believe this is due to a great extent to the numerous technical journals published abroad, whereas in this country few such publications are found. I have therefore been glad to see that you are going to supply a real want, and a journal like that which you have started will do much good. I have read with great interest the first number, and have found much useful information in it. I should have liked to see more about the dyeing of yarns or cloth, of silk, wool, etc. It is true that in the first number you cannot fully develop the plan laid out, and which I believe to be a good one, but some small space might have been found for either of the branches omitted. I do not mean that you should give so called "practical receipts" for dyeing, copied from German or other journals, and which in most cases are not worth the paper on which they are written, but by describing the properties and preparation of the chemicals and dye wares mostly used, you will give information which will be very acceptable to those interested.

A feature that you intend introducing in your publication, namely, information that is valuable in the history of dyeing, calico printing, &c., and, as I understand it, of individual processes and styles or application of dyes, is a very valuable one. It is interesting at least, if not important, that the literature of processes be well known to those who apply them: in many cases such knowledge saves much time, which would otherwise be devoted to experiments and trials, the results of which are known already.

The articles are good, useful, and practical. I only make a reservation on the collected receipts: it is my opinion that the space you devote to these might be given to more useful matter. A collection of any amount of such receipts (and I could give you myself hundreds of them) is only of questionable interest. All printworks have many such receipts in their books, and after long practice the preference is given of course to those that give the best results. I have known many instances where a receipt gave a good result at one printworks, and was a perfect failure at another: the conditions of working have much to do with the success of a receipt. I am afraid I have already trespassed too much on your space, and I conclude by wishing you all the success which your well-meant efforts deserve.

Yours very truly,

CHARLES DREYFUS.

ERRATA:—p. 25, in No. 15, black for Delaine, instead of 16 gallons logwood liquor, read 48 gallons.

Page 53, nine lines from top, No. 1064 should be No. 1094.