

**Specification of James Pillans : separation and preparation of hematosin, &c.;**

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Pillans, James.

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A.D. 1854 . . . . . N° 2752.

# SPECIFICATION

OF

JAMES PILLANS.

SEPARATION AND PREPARATION OF  
HEMATOSIN, &c.

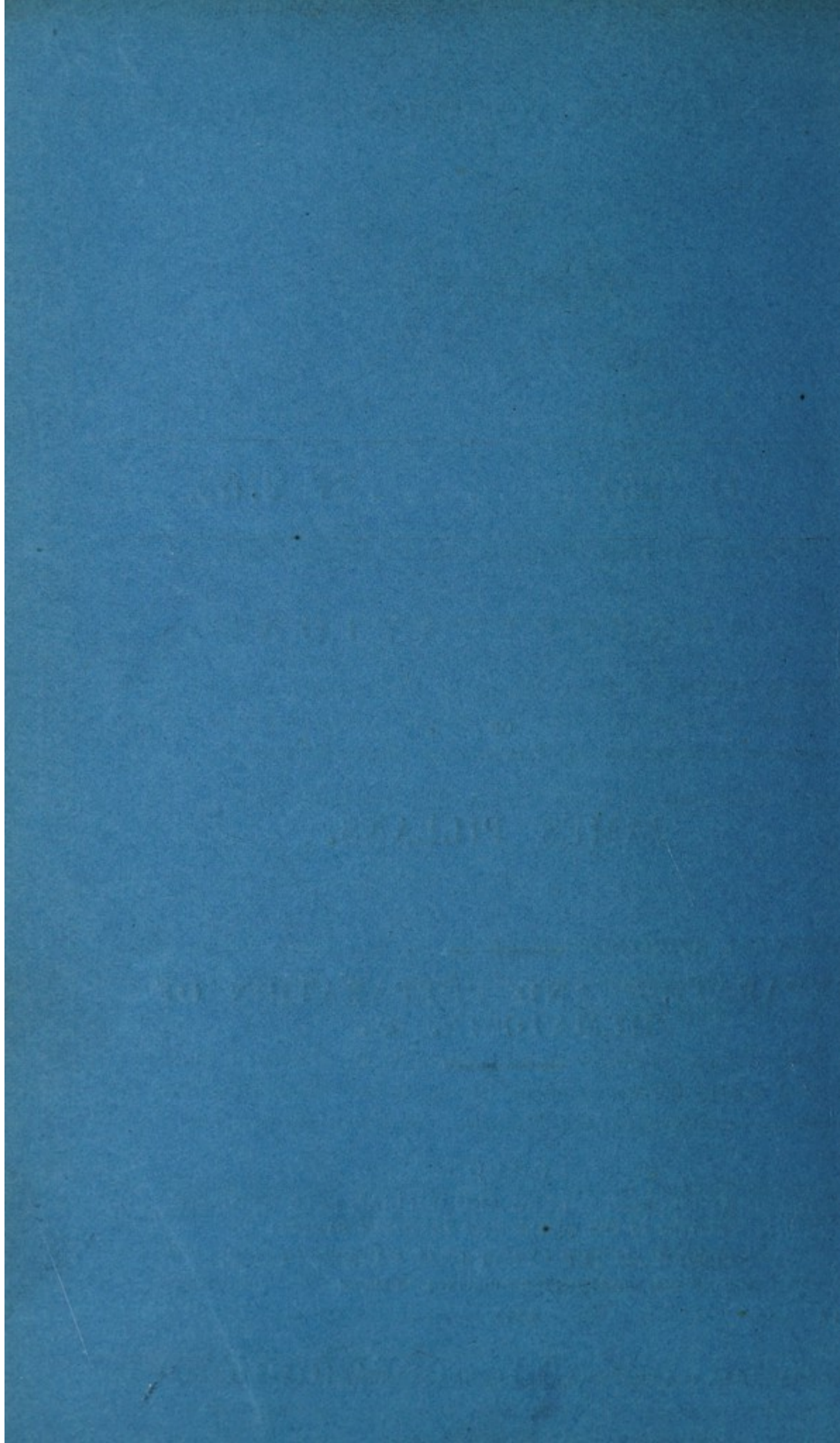
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A.D. 1854 . . . . . N° 2752.

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Separation and Preparation of Hematosin, &c.

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**LETTERS PATENT** to James Pillans, of 40, Brompton Crescent, in the County of Middlesex, for the Invention of "**IMPROVEMENTS IN THE PREPARATION OF HEMATOSIN, AND FIBRINOUS AND SEROUS MATTERS.**"

Sealed the 22nd June 1855, and dated the 29th December 1854.

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**PROVISIONAL SPECIFICATION** left by the said James Pillans at the Office of the Commissioners of Patents, with his Petition, on the 29th December 1854.

I, JAMES PILLANS, of 40, Brompton Crescent, in the County of Middlesex, do hereby declare the nature of the Invention for "**IMPROVEMENTS IN THE PREPARATION OF HEMATOSIN, AND FIBRINOUS AND SEROUS MATTERS,**" to be as follows :—

I divide the blood of animals (that of oxen being the most suitable) into two parts, by allowing the liquid part to separate from the coagulated clot. The latter, or more solid portion, contains the hematosin, or coloring matter of the blood, besides a certain proportion of serous matter still retained by it. I then, by a series of knife blades arranged on a handle, cut this coagulated clot into small pieces, or it may be ground conveniently betwixt two rollers, or in a mill resembling a coffee or sausage mill, the effect in each case being to break up the clot; or I attain the same end by pressing the clot, so as to obtain



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all the moisture from it, thus separating the fibrine in a comparatively dry state. I then introduce the article thus prepared into a drying room, through which a current of hot air is made to pass. When quite dry I grind it into smaller or larger pieces, or into powder, and it is then fit for being employed by the Turkey red and other dyers, sugar refiners, and others, who at present use blood in its natural state. The liquid or serous portion of the blood, when purified, I dry in the same manner, and it is suitable for the use of printers of textile fabrics, also for the fining of wine.

I claim, under this Patent, the separating and preparing of the solid colouring portion of the blood, as well as the separating and preparing of the serous portion of the blood, by the methods and for the purposes above stated.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said James Pillans in the Great Seal Patent Office on the 28th June 1855.

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES PILLANS**, of 40, Brompton Crescent, in the County of Middlesex, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-ninth day of December, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said James Pillans, Her special licence that I, the said James Pillans, my executors, administrators, and assigns, or such others as I, the said James Pillans, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE PREPARATION OF HEMATOSIN, AND FIBRINOUS AND SEROUS MATTERS**," upon the condition (amongst others) that I, the said James Pillans, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.



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**NOW KNOW YE**, that I, the said James Pillans, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof (that is to say):—

I divide the blood of animals (that of oxen being the most suitable) into two parts, by allowing the liquid part to separate from the coagulated clot. The latter, or more solid portion, contains the hematosin, or coloring matter of the blood, besides a certain proportion of serous matter still retained by it. I then, by a series of knife blades arranged on a handle, cut this coagulated clot into small pieces; or it may be ground conveniently betwixt two rollers, or in a mill resembling a coffee or sausage mill, the effect in each case being to break up the clot; or I attain the same end by pressing the clot, so as to obtain all the moisture from it, thus separating the fibrine in a comparatively dry state. I then introduce the article thus prepared into a drying room, through which a current of hot air is made to pass. When quite dry I grind it into smaller or larger pieces, or into powder, and it is then fit for being employed by the Turkey red and other dyers, sugar refiners, and others, who at present use blood in its natural state. The liquid or serous portion of the blood, when purified, I dry in the same manner, and it is suitable for the use of printers of textile fabrics, also for the fining of wine.

The following is the method in which I prepare the hematosin, and the fibrinous and serous parts of the blood of cattle, sheep, and other animals:—

**FIRST OPERATION.**

The blood must be obtained warm, and if possible should be caught as it flows from the animal in shallow receiving vessels, the most convenient size of which I find to be such as will contain about fourteen to twenty pounds of blood; if circular and flat bottomed with perpendicular sides, which I find on the whole the best shape, though they may be of any other, they would thus be somewhere about thirteen and a half inches in diameter by about three and a half inches deep; they may, however, be made smaller, particularly when sheep's blood is operated on; or, on the other hand, somewhat larger than above. It is convenient to have two handles on each vessel, attached to its outer circumference near the bottom, the handles being opposite to each other.

When the receiving vessels thus described have been filled with blood, or nearly so, I allow them to stand for two to six hours, according to the weather; if it be hot, less time is necessary than when it is cold; but the nature of the blood, which varies greatly even in animals of the same species, also influences



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the time it should stand, and it should not be moved till it is quite firm, and shews a disposition to expel the serum. Though the said period is the most advantageous in a general way, the blood in some cases requires to stand for a longer or shorter time before it is subjected to the next operation, which is as follows :—

#### SECOND OPERATION.

I have what I call a straining vessel, of the same shape as the receiving one only it must be somewhat wider, say, by about two or three inches, but without restricting it to these precise dimensions, which I state as such as I find convenient; in depth it may be the same, or a little less than the receiving vessel, and its bottom must be pierced with a number of small holes (its sides also if preferred), which may conveniently be made round, and of about one quarter of an inch in diameter; but they may be of any other figure, or somewhat larger or smaller. It is also convenient to have two handles on this vessel, one on each side, fixed on its external circumference, nearly on a level with the bottom. After the blood has remained in the receiving vessel for the time above stated, I transfer it (in the shape of a clot) to the straining vessel, having first poured off any serum that may have separated itself, and set it aside, to be used as hereafter to be explained.

A convenient substitute for this straining vessel is one of similar size and shape, but of which the bottom and sides are formed of two detached pieces. The bottom is to be pierced like the other, with small holes; the sides thus consist of a broad hoop, and if found more convenient said hoop may be formed by a straight band of elastic material, which admits of being bent into a circle, and retained in that position by a clasp or other fastening. The part forming the detached bottom, when the clot has to be transferred from the receiving vessel, must be placed over the mouth of the latter, which is then to be turned upside down; by this proceeding the clot is made to rest on the said bottom. When this is effected, and before removing the receiving vessel, the hoop or elastic band is to be put over it, so as to embrace it round its circumference, while said hoop or band rests on the detached bottom near its edge, thus forming a recipient for the clot when the receiving vessel is lifted off, which must now be done.

#### THIRD OPERATION.

The blood in the shape of clot now lying in the straining vessel (constructed in either of the above modes) is to be cut, by means of a knife, or several blades arranged on a handle, into small pieces; it may, however, be cut into a



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few large pieces, or even not cut at all; but I prefer the first-named method, as giving a better result. When the clot is thus cut, the serum it contains begins to flow from it. At first, it is so highly colored by the hematosin that this portion must be set aside, so that it do not mix with the subsequent  
5 portions, which would be otherwise injured. It is impossible to give any precise directions as to the quantity that must be thus set aside, as it varies in different animals even of the same species; the eye alone, guided by long practice, can decide when the serum has ceased to flow of too dark a colour. As soon as this occurs, the straining vessel containing the clot must be  
10 lifted up and placed over another of similar shape, which may be called the depositing vessel, so that the serum which drains through the holes of the straining vessel shall fall into it, with which view it should be a trifle wider than the straining vessel, to prevent the serum dropping beyond it, and its sides may be either perpendicular or sloping inwards. The latter arrangement  
15 is convenient, particularly when the straining vessel has been made comparatively wide.

The depositing vessel must have a hole pierced in its bottom, of about an inch in diameter, or other convenient size, which is to be stopped by a cork, a piece of vulcanized india-rubber, or other suitable substance; through this  
20 substance is to be inserted a tube, of sufficient diameter to allow of the flow of the liquid through it, and which must be long enough to project about two inches, more or less, in the inside as well as on the outside of the vessel; it must fit accurately, but it must also admit of being moved up and down, and its upper orifice must be covered or plugged so long as the serum  
25 is dropping to prevent its running through; in some cases it may be convenient to have more than one hole fitted with the apparatus in question. An arrangement also very suitable is to have instead of the hole and tube a narrow moveable sluice, fitted accurately into the circumference of the depositing vessel at one or more points, and admitting of being gradually and  
30 gently lowered. A third substitute would be a syphon, the orifice of whose shorter leg should project inside the depositing vessel, and admit of being gradually lowered; in fact, many analogous contrivances might be used. In each of the above and other similar arrangements, the gradual flow of liquid may be regulated by means of a float, or other self-acting apparatus.

35 Into a depositing vessel, as thus described, the serum is allowed to drain, till it appears that most of it readily obtainable from the clot has flowed out; the period required for this is usually ten to twenty hours (more or less in exceptional cases), depending on the temperature of the weather, and the facility with which the serum leaves the clot, which varies considerably.



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When the proper interval has elapsed, the straining vessel is moved from over the depositing one, and the serum now collected in the latter (to which the small quantity obtained before cutting the clot has been previously added) is allowed to stand till it becomes clear, for which twelve to twenty-four hours are generally required, subject to the exception as to temperature, just alluded 5 to. The straining vessel, after having been removed from the depositing one, may be placed over another, exactly like the last named, or even over a plain, flat, or other dish or recipient, whereby a small additional quantity of clear serum may be had, by allowing the clot to drain till there is a risk of its becoming decomposed; the straining vessel must then be put aside, or it may be put 10 aside at once on being removed from the first depositing one; in either case the clotted part left in the former is to be kept, in order to be treated as hereafter to be described.

#### FOURTH OPERATION.

The clear serum now contained in the depositing vessel or vessels must be 15 drawn off by gradually lowering, either by the hand or self-acting contrivance, the sluice, before alluded to, or the tube or syphon, or other similar apparatus, so that the grounds alone remain at the bottom, which must be added to the highly-colored serum obtained when the clot was cut.

I have minutely described the kind of receiving, straining, and depositing 20 vessels I find convenient, but the process can be also performed in corresponding vessels, different in size and form; and provided the same method of proceeding be followed, and the object for which each is intended kept in view, the result will be the same, though the quantity of product may vary.

By these several operations I have now obtained the blood separated into 25 three distinct portions; viz<sup>t</sup>, first, the clot in a comparatively dry state, comprising hematosin, a portion of serum, and all the fibrine; second, a portion of serum highly colored by hematosin; third, the clear serum. And I proceed to describe the treatment of each.

The first portion may be treated in one of two methods: it may either be 30 cut up by a knife, or series of blades arranged on a small handle or frame, or similar contrivance, into smaller pieces, and then placed in a well-ventilated drying room on trays or shelves, those of wire work being convenient; or it may be put between rollers or into a press, by which nearly all the moisture left in it may be squeezed out. This liquid part, as well as the solid part remaining 35 in the press, or resulting from the rollers, which latter is mostly fibrine, is then to be transferred to the drying room and dried on separate trays or shelves, the temperature in this as well as in the preceding case being kept under that



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at which hematosin coagulates, so that when dry it may remain soluble in water. I find about one hundred and ten to one hundred and fifteen degrees a convenient heat.

The second portion of the blood, that is, the serum highly coloured by  
5 hematosin, can be added to the liquid part, resulting from the press or rollers in the preceding operation, so as to be dried along with it. Should the clot be dried without being pressed or rolled, this second portion of blood can be dried separately. When these two portions of blood, which I distinguish by  
10 the name of hematosin, are dry, they may for convenience sake be ground to powder, and they are suited in a greater or less degree, particularly, with the exception of the fibrinous part, for certain manufacturing processes, for instance, in dyeing and sugar refining.

I now come to the third portion of the blood, or clear serum, which is to be placed in the drying room, and at a temperature as above described, on  
15 level shelves or trays, and in shallow strata, and when it is quite dry it is to be removed; it is then, after being ground, if necessary, in a fit state to be employed under the name of albumen, or other, by printers of textile fabrics, chiefly for fixing ultramarine blue, and other colours that can be fixed by egg albumen; also for fining various liquids; as indeed for the other purposes for  
20 which said egg or other albumen is suited. Instead of drying at once the clear serum in its natural state, it may be previously mixed when either cold or warm with a small portion (about  $\frac{1}{2}$  p.  $\%$  is usually sufficient) of oil of turpentine; some of the other vegetable, particularly volatile oils, are also more or less suitable, preferring such as have been exposed to the air. A further  
25 addition may be made, if desired, of 10 or 20 p.  $\%$ , or even more, of pure water, which appears to have a favorable effect in some degree, though it retards the drying; and ultramarine or other suitable color may also be added in the proportion in which the two articles can be used together; an addition of thickening material may also be made. The whole is then to be placed in  
30 the drying room, and managed as the pure serum, taking care that under no circumstances it is to be exposed to a heat high enough to coagulate it.

The utensils and apparatus alluded to above may be made of a great variety of materials, and I will proceed to name some of them.

For the receiving, straining, and depositing vessels, glass, the material  
35 made from iron slag, gutta percha, vulcanized caoutchouc, zinc, and iron protected by glaze, enamel, or otherwise, will answer (the flexible materials being used only for the bands); tin and tinned vessels should be avoided, if possible, as tending to discolor the serum. For the tubes, sluice, or syphon of the depositing vessel, glass may be named as convenient; and for the trays or



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shelves of the drying room, glass, the material made from iron slag, zinc and iron, glazed or otherwise protected; earthenware does not answer well for this apparatus, or vessels above alluded to, principally from the difficulty of getting it sufficiently level. When the tube or sluice is fitted into the depositing vessel it is well to lubricate it with oil, to make it move easily; in fact, oil or 5 other fatty substance may be useful also to rub on the other vessels.

In mentioning the above materials, I do not intend to limit my Specification to them, but to extend it to any others (of which there are many) not prejudicially affected by blood, and that admit of being suitably formed into the shapes required for the apparatus. 10

I claim, under this Patent, the separating and preparing of the solid coloring portion of the blood, as well as the separating and preparing of the serous portion of the blood, by the methods and for the purposes above stated. 15

In witness whereof, I, the said James Pillans, have hereunto set my hand and seal, this Twenty-second day of June, in the year of our Lord One thousand eight hundred and fifty-five. 15

JAMES PILLANS. (L.S.)

Witness,

WALTER CHARLES BACON, Clerk,  
38, Allsop Terrace, New Road, London. 20

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