Specification of Edward Taylor : treating excreta, &c.; for manufacturing manure.

A.D. 1871, 27th JULY. N° 1969.

SPECIFICATION

OF

EDWARD TAYLOR.

TREATING EXCRETA, &c. FOR MANUFACTURING MANURE.

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Treating Excreta, &c. for Manufacturing Manure.

LETTERS PATENT to Edward Taylor, of Rochdale, in the County of Lancaster, for the Invention of "IMPROVEMENTS IN THE TREATMENT OF HUMAN EXCRETA, AND OF BLOOD, AND TOWNS REFUSE FOR THE MANUFACTURE OF MANURE THEREFROM."

Sealed the 10th November 1871, and dated the 27th July 1871.

PROVISIONAL SPECIFICATION left by the said Edward Taylor at the Office of the Commissioners of Patents, with his Petition, on the 27th July 1871.

I, EDWARD TAYLOR, of Rochdale, in the County of Lancaster, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN THE TREATMENT OF HUMAN EXCRETA, AND OF BLOOD, AND TOWNS REFUSE, FOR THE MANUFACTURE OF MANURE THEREFROM," to be as follows :—

My Invention consists first of an improved process for the conversion of human excreta, the nightsoil of towns, into valuble manure by the admixture with the same, firstly, of a compound prepared in the following manner :—To one part of sugar I add ten parts of commercial chloride of lime (bleaching powder) and four parts of water. When the chemical action has ceased I add one hundred parts more water,

and ten parts of commercial alum (either potash or ammonia alum). I place beneath each closet seat a receptacle containing a small quantity of the above compound, in which the fæces and urine are collected, the vessels being removed weekly or more frequently if required; an important feature of my process being the retardation of fermentation of the excreta, so as to prevent it from fouling the atmosphere, and from being depreciated in value as a manure, which is effected by frequent removal of the receptacles prepared as above directed.

The cinders, ashes, and refuse from the houses are in like manner collected in tubs or other receptacles, and removed to the same depôt as the excreta, where they are sifted, separating the cinders, refuse, vegetable matter, and the fine ash. The vegetable matter is burnt, and its ash and the fine coal ash are used for the purpose of my Invention, while the coarser portions are employed for other purposes. The fine coal and vegetable ash is mixed with the excreta from the prepared receptacles, after which sulphuric acid is added to the mixture, and this is allowed to remain in a heap, say, for seven days, whereupon it must be examined from time to time, and if the heat produced gives any appearance of charring the whole heap should be turned over, and be again examined in, say, three or four days time, and such turning over be repeated if required. The heap is then allowed to stand for about seven days longer, after which it may be passed through a screen so as to insure perfect mixing. It is then a damp powdery manure, containing all the constituents of the fæces and urine, except a large portion of the water.

The proportions of the ingredients which I prefer to employ for producing the manure in a state ready for sale would be about 12 cwts. of fine ash, to 24 cwts. of excreta, and 45 lbs. of sulphuric acid. I do not however limit myself either to these proportions nor to the precise mode of mixing the ingredients and turning over of the compound as above described. The peculiarity of my process being the admixture of the sulphuric acid and the ashes without the use of fire heat, and without mechanically separating the urine, as by the condensation and heat produced by the action of the sulphuric acid on the excreta and ashes a considerable portion of the watery particles are evaporated, while another portion is absorbed in the formation of the sulphates produced by the use of the sulphuric acid. Thus whatever lime, ammonia, magnesia, or soda is present, each would require its equivalent of water to form the

crystallized salt. It would be found advantageous that the fine ash should be as dry as possible before admixture, even though it should have to be dried specially for the purpose, also any tendency of the compound to char should be carefully prevented by frequent turning over as above described. With these precautions a valuable manure will be produced which will allow of the addition of nitrates, phosphates, or chlorides, or other materials, but which addition is not a necessary part of my process. I also use for the mixing with the excreta the deposit found in the flues of large furnaces and boiler fires, which is known as "flue dust," and which contains a valuable quantity of sulphuric acid.

By the above method of collecting and treating the nightsoil and refuse of towns there is nothing lost, all is made profitably available, the cinders will be found sufficient to raise steam for any motive power required in the process of preparing the manure, and for all drying and evaporating purposes, and all other kinds of refuse, such as glass, iron, etc. can be disposed of for their usual purposes.

The urine from the public urinals and that portion which can be collected from dwelling houses, I treat as follows:—I put into the tanks of the urinals a quantity of the same before described mixture, which I put into the receptacles for nightsoil, and I collect the urine at least once a week and take it to the depôt. It is there evaporated whilst in a state of freshness before decomposition has set in, and thus the evaporation can be accomplished without causing any offensive smell. When it is reduced to about one-eighth part of its bulk it may be thrown on the before described prepared manure.

The blood from the slaughter houses I treat as follows:—When the animal is slain I catch the blood in a vessel containing the common commercial alum, in the proportion of $^1/_{20}$th part of alum to the blood, the blood immediately solidifies, and can be conveniently carried, being free from the danger of spilling, and from offensiveness, it can also be dried on hot iron plates without giving off offensive smell. After drying it can be ground up with the nightsoil manure before described, or if required it may be sold as a separate manure. It may be mixed with dry clay, a convenient proportion would be $^1/_6$th part of clay to one part of blood.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Edward Taylor in the Great Seal Patent Office on the 23rd January 1872.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, EDWARD TAYLOR, of Rochdale, in the County of Lancaster, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-seventh day of July, in the year of our Lord One thousand eight hundred and seventy-one, in the thirty-fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Edward Taylor, Her special licence that I, the said Edward Taylor, my executors, administrators, and assigns, or such others as I, the said Edward Taylor, 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 TREATMENT OF HUMAN EXCRETA, AND OF BLOOD, AND TOWNS REFUSE, FOR THE MANUFACTURE OF MANURE THEREFROM," upon the condition (amongst others) that I, the said Edward Taylor, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, 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.

NOW KNOW YE, that I, the said Edward Taylor, 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 :—

My Invention consists, first, of an improved process for the conversion of human excreta, the night soil of towns, into valuable manure by the admixture with the same, firstly, of a compound prepared in the following manner:—To one part of sugar I add ten parts of commercial chloride of lime (bleaching powder) and four parts of water. When the chemical action has ceased I add one hundred parts more water and ten parts of commercial alum (either potash or ammonia alum). I place

beneath each closet seat a receptacle containing a small quantity of the above compound, in which the fæces and urine are received and collected, the vessel being removed weekly or more frequently if required, an important feature of my process being the retardation of fermentation of the excreta, so as to prevent it from fouling the atmosphere and from being depreciated in value as a manure, which is effected by frequent removal of the receptacles when charged.

The cinders, ashes, and refuse from the houses are in like manner collected in tubs or receptacles other than the receptacles in which the excreta are received and removed to the same depôt as the excreta, where they are sifted, separating the cinders, refuse vegetable matter, and the fine ash. The vegetable matter is burnt, and its ash and the fine coal ash are used for the purpose of my Invention, while the coarser portions are employed for other purposes. The fine coal and vegetable ash is mixed with the excreta from the prepared receptacles, after which sulphuric acid is added to the mixture, and this is allowed to remain in a heap, say, for seven days, but it must be examined from time to time, and if the heat produced gives any appearance of charring the whole heap should be turned over. When the seven days have expired the whole heap must be turned over and be again examined in, say, three or four days time, and such turning over be repeated if required. The heap is then allowed to stand for about seven days longer, being in the whole 21 days, but 28 days will sometimes be required, after which it may be passed through a screen so as to insure perfect mixing. It is then a damp powdery manure containing all the constituents of the fæces and urine except a large portion of the water, of which it will retain from 20 to 25 per cent.

The proportions of the ingredients which I prefer to employ for producing the manure in a state ready for sale would be about 12 cwts. of fine ash to 24 cwts. of excreta, and 45 lbs. of sulphuric acid SO^3. I do not, however, limit myself either to these proportions nor to the precise mode of mixing the ingredients and turning over of the compound as above described, the peculiarity of my process being, that by the admixture of the sulphuric acid and the fine ashes with the excreta without the use of fire heat and without mechanically separating the urine I avail myself of the condensation and heat produced by the action of the sulphuric acid on the excreta and ashes, by which a considerable portion of the watery particles are evaporated, while another portion is

absorbed in the formation of the sulphates produced by the use of the sulphuric acid; thus whatever lime, ammonia, magnesia, or soda is present each would require its equivalent of water to form the cystallized salt. It would be found advantageous that the fine ash should be as dry as possible before admixture, even though it should have been dried specially for the purpose; also any tendency of the compound to char should be carefully prevented by turning over as above described. With these precautions a valuable manure will be produced, which will allow of the addition of nitrates, phosphates, chlorides, or other materials, but which addition is not a necessary part of my process. I also use for the mixing with the excreta the deposit found in the flues of large furnaces and boiler fires, which is known as "flue dust," and which contains a valuable quantity of sulphuric acid. By the above method of collecting and treating the night soil and refuse of towns there is nothing lost, all is made profitably available, the cinders will be found sufficient to raise steam for any motive power required in the process of preparing the manure and for all drying and evaporating purposes, the surplus cinders being saleable, and all other kinds of refuse, such as glass, iron, &c. can be disposed of for their usual purposes.

The urine from the public urinals and that portion which can be collected from dwelling houses I treat as follows:—I put into the tanks of the urinals a quantity of the same before-described mixture which I put into the receptacles for nightsoil, and I collect the urine at least once a week, and take it to the depôt; it is there evaporated while in a state of freshness before decomposition has set in, and thus the evaporation can be accomplished without causing any offensive smell. When it is reduced to about one-eighth part of its bulk it may be thrown on the before-described prepared manure, and allowed to evaporate naturally, or it may be thrown amongst fine ashes and treated with sulphuric acid in a manner similar to that described above with reference to the excreta from the receptacles, the quantity of acid being however less because of the less quantity of water.

The blood from the slaughterhouses I treat as follows:—When the animal is slain I catch the blood in a vessel containing the common commercial alum in the proportion of $^1/_{20}$th part of alum to the blood; the blood immediately solidifies, and can be conveniently carried, being free from the danger of spilling and from offensiveness; it can also be dried on hot iron plates without giving off offensive smell. After drying it

can be ground up with the nightsoil manure before described; or if required it may be sold as a separate manure. It may be mixed with dry clay; a convenient proportion would be $^1/_6$th part of clay to one part of blood. When it is not convenient to catch the blood in a vessel charged with alum, as above described, the alum can be afterwards mixed with the blood so as to produce solidification.

Having thus described the nature of my Invention, and in what manner the same is to be performed, I would have it understood that I do not claim generally the treatment of excreta, urine, or blood with fine ashes or sulphuric acid, or the drying by artificial heat of mixtures of excreta, urine, or blood with fine ashes, sulphuric acid, or other ingredients; but I do claim,—

First. The use of a mixture of sugar or other saccharine matter, commercial chloride of lime, water and alum in receptacles for being mingled with excreta, substantially as herein described.

Second. The process of mingling the compound of excreta and the above-described mixture with fine ash and sulphuric acid in such manner that the heat produced by the chemical action serves to evaporate a large part of the moisture without the aid of artificial heat, substantially as herein described.

Third. The use of flue dust, with or without fine ash, for mixing with excreta, substantially as herein described.

Fourth. The treatment of urine for manure by mingling it with the above-described mixture and subsequent evaporation, substantially as herein described.

Fifth. The treatment of blood with alum for the purpose of solidifying it and rendering it inodorous and innoxuous, substantially as herein described.

In witness whereof, I, the said Edward Taylor, have hereunto set my hand and seal, this Sixteenth day of January, in the year of our Lord One thousand eight hundred and seventy-two.

EDWARD TAYLOR. (L.S.)

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