

UNITED STATES PATENT OFFICE.

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MANUFACTURE OF CARBONIZED FUEL.

No Drawing. Application filed April 21, 1924, Serial No. 708,013, and in Great Britain May 15, 1923.

This invention relates to the manufacture of solid fuel from non-coking and coking coals, that is to say from mixtures of both kinds of coal selected so that the excess of binding material in the coking coal may be taken up by and form a binder for the non-coking coal, and has for its object to produce from such material, a fuel suitable for blast furnace, foundry, industrial or household purposes.

In order to obtain a satisfactory fuel for the purposes aforesaid and from materials of the nature indicated, it is necessary to have regard not only to the nature of the coal employed, the proportion of different coals in any given mixture and the temperature of carbonization, but it is also essential that the coking coal containing the excess binding material shall be distributed thoroughly evenly throughout the mass of the mixture, the residual products from the heat decomposition of the coking coal forming a permanent binder for the residual products from the heat decomposition of the non-coking coal.

According to this invention the coking coal in a finely divided or pulverized condition is formed into a colloidal suspension with water, soft soap and water, cresote or other liquid and in that condition is mixed with the non-coking coal which has been previously reduced to a suitably fine state of division by any suitable means, the mixture being then consolidated by ramming, stamping or otherwise compressing in a mould or trough preferably of the shape in cross section of the oven or retort, and finally charged into the oven or retort. The liquid in which the finely divided coking coal is dispersed, besides forming a temporary binder for the mass, ensures the even distribution of the finely divided coking coal in the mass in the final mixing.

Suitable proportions for the coal mixture which may be taken as examples are 10 to 20 per cent by weight of coking coal and 80 to 90 per cent by weight of non-coking coal which forms the bulk of the mixture, but in certain cases the percentage of coking coal may be increased up to 50 per cent according as the coking index of the binding coal varies.

The coking coal is ground or pulverized

to pass through a mesh of one sixteenth of an inch and less and the non-coking coal is ground to pass through a mesh of one eighth of an inch and less.

In order to ensure the uniform distribution of the coking coal in the mass the bituminous coking coal after being ground is formed into a colloidal suspension with water or other liquid as aforesaid the object of this being to hold the pulverized coking coal in suspension. The proportion of added water or other liquid will vary according to the condition of the coal before treatment, but we find that good results are obtained by adding the water or other liquid in such proportion that the final mixture of coking and non-coking coal will contain ten to fifteen per cent by weight of the water or other liquid or thereabouts.

The preliminary mixture of coking coal and liquid so produced is added to the previously ground or crushed non-coking coal in the required proportion as aforesaid and evenly distributed throughout the mass by further mixing to coat uniformly the solid particles and bind them together.

The material is then moulded and after being consolidated in the mould by ramming or stamping as aforesaid is pushed into a retort where it is carbonized at a temperature of from 500 to 1,200 degrees centigrade. The resulting fuel is suitable for burning either in domestic grates or stoves, or for metallurgical purposes.

I claim:—

1. A process of manufacture of solid fuel from mixtures of non-coking and coking coals comprising first pulverizing the coking coal, then forming the pulverized coking coal into a colloidal suspension with water, adding this colloidal suspension to pulverized non-coking coal, thoroughly intermixing the whole together, consolidating the mixed mass in a mould and carbonizing the moulded mass in an oven or retort.

2. A process of manufacture of solid fuel comprising pulverizing non-coking coal, thoroughly intermixing the pulverized non-coking coal with a colloidal suspension of pulverized coking coal in water, consolidating the mass in a mould and carbonizing the moulded mass in a retort, the residual products from the heat decomposition of

the coking coal forming a permanent binder for the residual products from the heat decomposition of the non-coking coal.

3. A process of manufacture of solid fuel comprising first forming a colloidal suspension of pulverized coking coal dispersed in a liquid, then intermixing pulverized non-coking coal with said colloidal suspension, the liquid serving to indicate the even distribution of the pulverized coking coal throughout the mass as described, consolidating the mixed mass in a mould and carbonizing the moulded mass in an oven or retort, the residual products from the heat decomposition of the coking coal forming a permanent binder for the residual prod-

ucts from the heat decomposition of the non-coking coal.

4. A process of manufacture of solid fuel comprising first pulverizing coking coal, dispersing said pulverized coking coal in a liquid so as to form a colloidal suspension, then pulverizing non-coking coal, intimately mixing said pulverized non-coking coal with the colloidal suspension of coking coal until the mass is moist throughout, consolidating the mass in a mould and carbonizing the moulded mass in an oven or retort.

In testimony whereof he has affixed his signature.

WALTER WILLIAM STRAFFORD.