

1

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## PROCESS FOR THE MANUFACTURE OF COAL-TAR PITCH

André Agnan Raineau, Verneuil, France, assignor to Charbonnages de France, Paris, France, a public institution of France

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The present invention relates to a high yield process for the manufacture of coal-tar pitch for road surfacing.

One of the objects of the invention is to obtain a high yield of pitch in proportion to the amount of coal treated.

It is known that when coal is distilled in a neutral or reducing atmosphere, a solid product is obtained, on the one hand, known as coke or semi-coke, and on the other hand, volatile products are obtained, some gaseous, others condensable at normal temperatures which are called coal-tars.

When the coal-tars are fractionated, light hydrocarbons and heavy products, known as coal-tar pitches, are obtained. These latter products have several industrial uses and are very much in demand as binding agents and for road construction in view of their binding and plasticizing properties.

There are numerous distillation processes which yield cokes and coal-tars which are specially suitable for specific uses but, usually, coal-tars are considered to be mere by-products of the coking process. The usual yields of coal-tar are, at the most, equal to 5% of the initial charge of coal used when produced in the conventional processes, that is to say, in coke and gas-works furnaces, and are equal to 10% to 12% when the operation is carried out at low temperature, and the corresponding yields of pitch residues are, in general, 3% and from 5% to 6%.

It has been found, and this is another object of the present invention, that the yield of coal-tar is exceptionally high when the coal is distilled in a bed strongly fluidized by a rapidly moving current of gas, such as a neutral gas, or nitrogen, by a low temperature distillation at between 500° C. and 600° C., as a result of which an exceptionally high yield, of the order of about 20%, of heavy coal tar, rich in pitch, is obtained.

It has been found, and this is yet another object of the invention, that the coal-tars thus obtained are rich in products of high molecular weight having binding properties suitable for use either alone, with or without topping or after mixing with other coal-tars or fluid oils which act at the same time as solvent, plasticizer and condensation agent, so that it suffices to add them to said coal-tars, before they are distilled, in order to obtain as a solid residue a coal-tar pitch having good binding properties.

The invention also relates to the pitches obtained by the said process.

The specific features and advantages of the present invention will become apparent from the following description which is merely given by way of example, without being in any way restrictive.

### Example 1

1000 kg. of small coal containing 32–35% of volatile materials, are distilled at a temperature of 550° C., in a current of a neutral gas, or nitrogen, at a speed of 0.3 or 0.4 metre per second relative to the carbonization

2

chamber, in a type of apparatus which is so arranged that the solid materials, in granular form, are continuously fed into a reactor where they form a bed and in which they are put into contact with the gas entering the lower part of the reactor. The gas, when passing over this layer, agitates the same and transforms the mass into a fluidized bed in which the solid particles are vigorously stirred in a whirling movement, but are not carried away except for the finest or lightest particles. The said current of gas also heats this layer, under excellent conditions, the heat being transferred directly, without the help of any intermediary body, from the gas to the solid under conditions of agitation which are highly favorable to exchanges and which ensure the bed being maintained at a uniform temperature. The solid particles are rapidly raised to the required reaction temperature and escape from the apparatus through a discharge device by gravity. The volatile products produced during the operation are carried away by the gases and normally escape by an appropriate outlet.

By treating the charge of coal in this type of apparatus, granulated coke is obtained, on the one hand, and, on the other, 200 kg. of heavy coal-tar having a softening point of about 50° C. K. S. These 200 kg. of coal-tar are thinned down with 200 kg. of anthracene oil at 100° C. The mixture is distilled under a pressure of 18 mm. of mercury until the softening point K. S. of the residue reaches 73° C. About 300 kg. of pitch having binding and plasticizing properties which are perfectly suitable, in particular, for agglomerating purposes and for road surfacing, are thus obtained.

### Example 2

In a distilling process similar to that of Example 1 but which is carried out at 500° C., 210 kg. of coal-tar, having a softening point of about 50° C., are prepared from 1000 kg. of coal, having 32–35% of volatile materials. This coal-tar is then mixed with an equal weight of high temperature coal-tar whose yield in pitch having a softening point K. S. of 75° C., is equal to 55%. This mixture is then distilled under a pressure of 20 mm. of mercury until the softening point K. S. of the residue reaches 75° C. In this way 385 kg. of pitch, whose properties are similar to those of the pitch described in the preceding example, are obtained.

This invention has been described and illustrated by the above examples in an explanatory way, which is by no means restrictive, and alterations of detail may be made therein without departing from the spirit of the said invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. In the process of manufacturing coal-tar pitch for use as agglomerating and road surfacing agents, comprising the steps of establishing a bed of small granular coals in a reactor, passing a stream of nitrogen at a temperature ranging from 500° C. to 600° C. through said bed of coals from below the latter at a rate of flow of 0.3 to 0.4 meter per second, whereby said stream of nitrogen fluidizes said bed of coals and agitates said coals to thereby ensure transfer of sufficient heat to said coals to effect distillation of the latter with a resulting yield of about 20% of heavy coal-tar rich in pitch; the further steps of forming a mixture of a predetermined weight of said coal-tar with an equal weight of an agent selected from the group consisting of high temperature coal-tars having a 55% yield of pitch with softening point K. S. of 75° C. and anthracene oil, and distilling said mixture under a pressure ranging from 18 mm. to 20 mm. of mercury until the residue attains a softening point K. S. ranging from 73° C. to 75° C., whereby a

3

solid pitch having high binding and road-surfacing qualities is obtained.

2. In the process according to claim 1, said stream of nitrogen being at a temperature of 550° C., said mixture consisting of equal weights of said heavy coal-tar and anthracene oil at a temperature of 100° C., and said mixture being distilled under a pressure of 18 mm. of mercury until the softening point K. S. of said residue of said mixture reaches 73° C.

3. In the process according to claim 1, said stream of nitrogen being at a temperature of 500° C., said mixture consisting of equal weights of said heavy coal-tar and high temperature coal-tar having a 55% yield of pitch of softening point K. S. of 75° C., and said mixture being distilled under a pressure of 20 mm. of mercury until the softening K. S. point of said residue of said mixture reaches 75° C.

4. The process of manufacturing coal-tar pitch from a coal-tar obtained by distillation of coal in a fluidized bed; comprising the steps of forming a mixture at a temperature of 100° C. of equal weights of anthracene oil and said coal-tar, and distilling said mixture under a pressure ranging from 18 mm. to 20 mm. of mercury until the residue reaches a K. S. softening point ranging from 73° C. to 75° C., whereby a solid pitch having high binding and road-surfacing qualities is obtained.

5. The process of manufacturing coal-tar pitch from a coal-tar obtained by distillation of coal in a fluidized

4

bed; comprising the steps of forming a mixture at a temperature of 100° C. of equal weights of anthracene oil and said coal-tar, and distilling said mixture under a pressure of 18 mm. of mercury until the residue reaches a K. S. softening point of 73° C., whereby a solid pitch having high binding and road-surfacing qualities is obtained.

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