

[54] FUEL COMPOSITION
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[57] ABSTRACT
An improved combustible fuel product for use in coal-burning heating systems, which fuel has a heat value substantially equivalent to that of coal and exhibits low pollution emissions. The fuel consists essentially of lignite (or brown coal) and cryogenically reclaimed rubber tire fragments. In the preferred range, the fuel consists in weight percent of between 85% and 92% lignite and between 8% and 15% cryogenically reclaimed tire fragments.

3 Claims, No Drawings

FUEL COMPOSITION

BACKGROUND OF THE INVENTION

This invention relates to improved fuel products for use in coal-burning heating systems.

At one time coal, both anthracite and bituminous, was the most common fuel for heating and energy conversion systems. For reasons of economy and convenience, oil and natural gas have replaced coal in many fuel applications.

At the present time there still exist many coal-burning systems. One problem faced by the operators of these systems is that coal is considered to be a dirty fuel in that it can produce dense smoke, particulate matter and other environmentally undesirable emissions. For these reasons, substitute fuels are being sought which have the same heat value as coal and which are environmentally desirable.

Recently there has been much publicity about the "energy crisis" where the cost of natural gas and oil has been rising and the reserves thereof have been diminishing. The reserves of coal are quite large and, in view of the rising gas and oil prices, coal is once again being reviewed as a possible fuel.

It is therefore an object of this invention to provide an inexpensive coal-base fuel which can be used in present coal-burning installations, which fuel has a heat value comparable to that of the coal originally intended for use in the system.

Another object of this invention is to provide an environmentally desirable fuel which will meet the current strict air-pollution emission requirements.

Yet another object is to provide a fuel which can be used in existing systems without conversion thereof.

These and other objects will become apparent from the following description and appended claims.

SUMMARY OF THE INVENTION

There is provided by virtue of this invention a fuel product: (1) which can be used in existing coal-burning installations without conversion thereof, (2) which, when burned, has low-pollution emission characteristics, and (3) which has a heat value substantially equivalent to that of coal. This fuel consists essentially of lignite and cryogenically reclaimed rubber tire fragments. Lignite is a naturally occurring material, which can be characterized as a brownish-black coal intermediate between peat and bituminous coal. This combination of lignite and cryogenically reclaimed rubber tire fragments produces a fuel product having a heat value substantially equivalent to that of coal and which has low emission characteristics.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The fuel is an admixture of a coal-like material, lignite, and cryogenically reclaimed rubber tire fragments.

Lignite, sometimes referred to as brown coal, is a material which is said to be intermediate peat and bituminous coal and has the texture of the original wood distinct on its surface. It has a heat value lower than that of anthracite or bituminous coal and is believed to have lower pollution emissions. Moreover, it is believed that there are extensive reserves of lignite.

In order to raise the heat value of the fuel product above that of the lignite itself, cryogenically reclaimed

rubber tire fragments are mixed with the lignite. The fragments, being in large part carbon, have a higher heat value than the lignite and therefore may be added in amounts effective to raise the heat value of the mixture to that approximately equivalent to the anthracite or bituminous coal.

Cryogenically reclaimed rubber tire fragments are produced by a process in which rubber tire scraps, (i.e. complete tires or parts thereof) are exposed to a cryogenic temperature for a time sufficient to lower the temperature of the scrap to a point at which the rubber in the scraps exhibits brittle fracture characteristics which is less than about -80°F . The embrittled scraps are then transferred to a mill in which the scraps are struck with a force sufficient to shatter them into small fragments. Normally, the tire scraps are exposed to temperatures approximately equivalent to that of liquid nitrogen (i.e. -320°F .) and then transferred to a rotary hammer mill for fragmentation. About 95% of the fragments produced by this process are less than one quarter inch square and are substantially pure rubber from the tread of the tire or from the tire carcass. The tire cords (fabric, metal or glass) from the carcass can be separated from the rubber fragments.

As indicated above, the rubber fragments are added to the lignite in amounts sufficient to raise the heat value of the mixture to a level substantially equivalent to the anthracite or bituminous coal. In the preferred embodiments, the fuel product consists essentially, in weight percent, of 85% to 92% lignite and 8% to 15% cryogenically reclaimed rubber fragments. A specific fuel product composition which is suitable for use in most coal-burning installations consists, in weight percent, of 90% lignite and 10% rubber fragments.

This fuel may be used in large coal-burning installations, such as electricity generating plants, which use enormous quantities of coal and which have been characterized as extreme polluters.

It will be appreciated that numerous changes and modifications can be made to the embodiment described herein without departing from the spirit and scope of this invention.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. An improved combustible fuel product, for use in coal-burning heating systems, characterized by a heat value substantially equivalent to coal so as to permit substitution thereof in said heating systems, which burns with low emissions so as to reduce polluting discharges, and consists essentially of lignite and cryogenically reclaimed rubber tire fragments in an amount effective to adjust the heat value of the fuel to substantially the heat value of the substituted for coal, said fragments being obtained by exposing rubber tire scraps to cryogenic temperatures so as to embrittle the rubber therein and striking said embrittled tire so as to shatter said tire into fragments of a size sufficiently small for use as a fuel.

2. A fuel as in claim 1 which consists essentially, in weight percent, of: between about 85% and 92% lignite and 8% and 15% cryogenically reclaimed rubber tire fragments.

3. A fuel as in claim 1 wherein said cryogenically reclaimed fragments is present in an amount approximately equal to 10%.

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