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(54) **Firelighter**

(57) A firelighter comprises a fibre component and a natural wax component, wherein the wax component comprises a long chain fatty ester of length C42 to C60

at an inclusion level of between 20% and 80% by weight of the total firelighter.

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Description

[0001] This invention relates to solid firelighters of the type which may be used, predominantly, to initiate combustion of i) barbecues (BBQ), irrespective of whether the barbecue fuel is in the form of charcoal lump wood or briquettes, ii) natural wood in outdoor wood fires or iii) any domestic or commercial fires.

[0002] So called 'natural' firelighters are already known and are supplied in the form of a scored softboard or fibreboard which has subsequently been impregnated with a high energy fuel additive, usually a wax. The fibreboard used is categorized as 'Low-density fibreboard' and has a density of between 0.35g/cm³ and 0.5g/cm³ with voids to enable it to be impregnated with sufficient wax to perform adequately as a firelighter. The board is made on specialist board-making equipment by board manufacturers in generally 4 feet by 8 feet sheets, which is then shipped to other companies to be made into firelighters by the subsequent cutting to the desired size followed by addition of fuel additives such as slack wax by dipping or spraying the softboard with heated wax in the liquefied state.

[0003] In use, the firelighters are designed to be applied either below or dispersed amongst pieces of BBQ or domestic fireplace fuel. However, whilst these products do possess some natural credentials, the board fibre used is derived from trees with a growth cycle of at least 8 to 12 years. Furthermore; the wax used to impregnate the softboard is quite often a petroleum based wax which is contrary to the term "Natural" in the name.

[0004] Over the years, there have been several attempts to use other materials and techniques including a variety of agricultural and industrial waste products as the fibrous or carrier material as described in GB2213829 and GB2310670, both of which deal with combustible material bound with a wax material.

[0005] GB2213829 discloses the use of both cellulosic and non-cellulosic combustible fillers in combination with specifically a non-natural petroleum derived wax in a method of formation of a solid fuel material by compression, either ram compaction or extrusion.

[0006] Taking the example as given in GB2213829 and substituting the exemplary wax (Kerapress 2086), a paraffinic wax, with natural waxes, it has been found through experiment that characteristics common to most natural-derived waxes result in poor demoulding from the press tooling due to the stickiness of the natural waxes. The same can also be argued for GB2310670.

[0007] GB2310670 also discloses combustible fillers in combination with natural derived waxes. Manufacture is carried out using compression, in order to provide a product of the required density. From test work performed, however, it has also been found that the waxes cited alone or in combination will not compress and bind adequately when using ram compaction as the chosen technique. Also, some stickiness of the wax in the pressed units prevents mould release from the press tool-

ing, resulting in incomplete ejection of the compressed units from the press tooling.

[0008] The need remains for a firelighter which is more natural and environmentally friendly than previously available but which exhibits excellent performance and is easy to make.

[0009] According to a first aspect, the present invention provides a firelighter comprising a fibre component and a natural wax component, wherein the wax component comprises a long chain fatty ester of length C42 to C60 at an inclusion level of between 20% and 80% by weight of the total firelighter.

[0010] According to a second aspect, the present invention provides a method of manufacturing a firelighter according to the first aspect, the method comprising the steps of:

i) pre-mixing a fibre component and the natural wax component into a homogeneous premix and

ii) subjecting the premix to compression to form the firelighter, wherein steps i) and ii) are performed sequentially in the same apparatus.

[0011] Firelighters according to the present invention are made substantially entirely from naturally-occurring ingredients and possess the following attributes:

(a) they incorporate a wax component that is both naturally derived and sustainable and has inherent good mould release characteristics;

(b) they incorporate a natural fibre component that is derived preferably from agricultural fibre, for example annually renewable linseed, flax or hemp fibres, waste wood, coppice willow or Miscanthus;

(c) they are processed in a single step; and

(d) they are inherently more environmentally acceptable and in keeping with 'Natural' marketing claims.

[0012] In the present invention, the fibre component can be any combustible material containing fibres but is preferably an agricultural by-product, preferably selected from linseed, flax or hemp fibres and waste wood or combinations thereof, coppice willow or Miscanthus. The fibre is preferably comminuted to particulate form for example by grinding and may be similar to sawdust in particle size and appearance.

[0013] However, some coarser particles, up to 3mm diameter, may be present and it is preferred, in order to achieve a good packing density under pressure, to have a range of particle sizes between a minimum of 0.0125, preferably 0.05mm, up to 3mm, preferably 2.5 mm, with a preponderant amount in the range 0.5 to 1.5 mm.

[0014] In the present invention, the wax component is a natural wax component. By this we mean that the wax is a wax from a renewable source such as a plant, insect or animal, as opposed to a wax derived from fossil fuels, such as paraffinic or microcrystalline wax or a "polymer

wax" such as polyethylene or polypropylene wax. The wax from an animal would be from the exterior of a living animal such as lanolin (wool grease). It has been found that, by the use of long chain fatty esters of carbon chain length between C42 and C60 at inclusion levels in the wax blends of between 20% to 80% by weight, sticking is overcome entirely and product binding is excellent.

[0015] Natural waxes for use in the present invention may include minor amounts of fatty acids or alcohols such as stearic acid and/or palmitic acid or the corresponding alcohols. Preferably, the natural wax component of firelighters according to the invention is from 20 to 40% by weight, more preferably 25 to 30% by weight, depending on cost and performance considerations such as intended burn time and the properties of the fibre component. Suitable waxes may readily be derived from for example oilseed rape, soy bean oils or sunflower oils and may also be obtained from beeswax, Candelilla, lanolin or carnauba wax or derivatives thereof.

[0016] In the method of the invention, the premix is subject to cold pressing at pressures under which the wax is capable of plastic flow at ambient or room temperatures of less than say 30°C, more likely less than 25°C but in most cases not less than 15°C. Under such conditions, the wax forms a substantially continuous pathway between the particles of fibrous material and binds them together substantially without absorption of wax and, on ignition in use, the inter-particle wax pathway provides a wicking effect to promote combustion. Pressures which may be used are typically from 5tons/in² upwards.

[0017] In the method according to the present invention, through a simple one-step forming process, for example finely ground linseed, flax or hemp fibres or waste wood is taken and a fuel preferably in the form of a finely ground, grated or powdered natural wax is added. This wax can be for example triacylglycerols or derivatives thereof, preferably fully hydrogenated, and is added prior to the compression stage to form the finished product in a single process. The resulting board may contain 'snap-off' firelighters or individually formed firelighters of varying sizes and shapes.

[0018] It has been found that firelighters according to the invention are safe to use and, when ignited, they burn steadily without flaring, sudden deflagration, spitting, dripping or explosion. It has also been found that any flare resulting from the firelighter being applied directly to hot charcoal is much reduced and inherently less dangerous than with other firelighters, especially those based on alcohol gels and liquids.

[0019] Throughout this specification, the term 'firelighter' is interchangeable with 'firestarter', both being internationally recognised terms for products initiating and aiding combustion.

[0020] The invention will now be described by way of example.

Example 1

[0021] Pre-formed chips of coppice willow were ground to particulate form and mixed with palm wax (75% by weight) and sunflower wax (25% by weight), the proportion of wood to wax being 50:50 by weight. Mixing of the components was continued until the mixture was homogenous and the cold mix was then compressed in a suitably-sized and shaped die and punch assembly at a pressure of 6.0 tons/in², whereby the mixture formed a solid material which did not adhere to the press tooling. The die was shaped to form a "chocolate bar" style product from which individual firelighter pieces could readily be broken away for use but, in an alternative embodiment, the die formed individual firelighter units. In either case, the resulting product was wrapped to prevent losses by evaporation, for transportation and storage before use.

[0022] The resulting firelighter was used as a lighting medium for a barbecue in which the fuel was briquette charcoal, notably more difficult and slower to light than lump wood varieties. Charcoal was satisfactorily ignited to a condition suitable for grill cooking to commence after 20-30 minutes, this being comparable with currently commercially-available firelighters and liquids.

Example 2

[0023] The process of Example 1 was repeated using comminuted hemp fibres in place of the coppice willow, again reduced to particulate form by milling. The wax component was palm wax (40% by weight) and sunflower wax (60% by weight), mixed 50:50 by weight with the fibre. The resulting product was suitable for use as a firelighter, as with the product of Example 1.

Claims

1. A firelighter comprising a fibre component and a natural wax component, wherein the wax component comprises a long chain fatty ester of length C42 to C60 at an inclusion level of between 20% and 80% by weight of the total firelighter.
2. A firelighter according to claim 1, in which the fibre component comprises an agricultural by-product.
3. A firelighter according to claim 2, in which the agricultural by-product is selected from linseed, flax or hemp fibres and waste wood or combinations thereof, coppice willow or Miscanthus.
4. A firelighter according to any preceding claim, in which the fibre component is comminuted to particulate form.
5. A firelighter according to any preceding claim, in

which the wax component is from a renewable source having a plant, insect or animal origin.

6. A firelighter according to any preceding claim, in which the natural wax component includes minor amounts of fatty acids or alcohols. 5
7. A firelighter according to any preceding claim, in which the natural wax component is from 20 to 40% by weight, more preferably 25 to 30% by weight, of the composition. 10
8. A firelighter according to any preceding claim, in which the wax component is derived from oilseed rape, soy bean oils, sunflower oils, beeswax, Candelilla, lanolin or carnauba wax or derivatives thereof. 15
9. A firelighter according to any preceding claim, in which the wax component forms a substantially continuous pathway between the particles of fibrous material and binds them together substantially without absorption of wax. 20
10. A method of manufacturing a firelighter according to any preceding claim, the method comprising the steps of: 25
 - i) pre-mixing a fibre component and the natural wax component into a homogenous premix and 30
 - ii) subjecting the premix to compression to form a firelighter, wherein steps i) and ii) are performed sequentially in the same apparatus.
11. A method according to claim 9, in which the premix is subject to cold pressing at pressures under which the wax is capable of plastic flow at ambient or room temperatures of less than 30°C. 35
12. A method according to claim 11, in which the compression pressure is not less than 5ton/in². 40

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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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