Nov. 28, 1950 L. G. SCHULTZ 2,531,828

COATED FUEL IMPREGNATED BLOCK

Filed Feb. 20, 1945

Fig. 1.

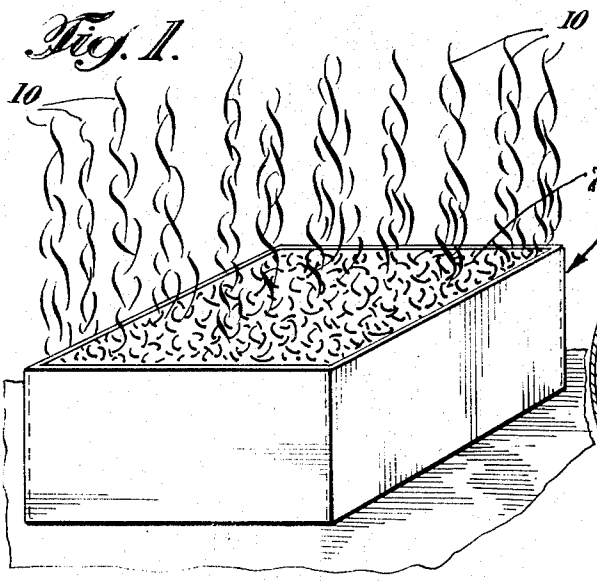


Fig. 4.

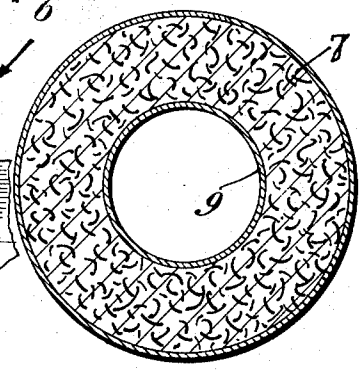


Fig. 2.

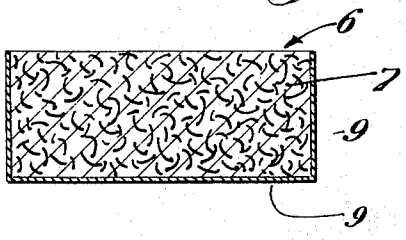
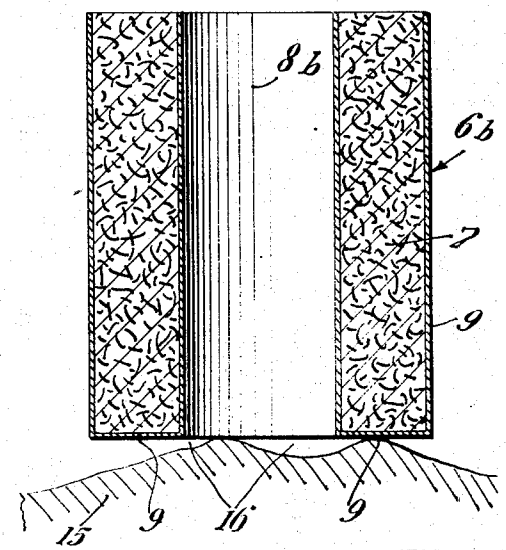


Fig. 5.



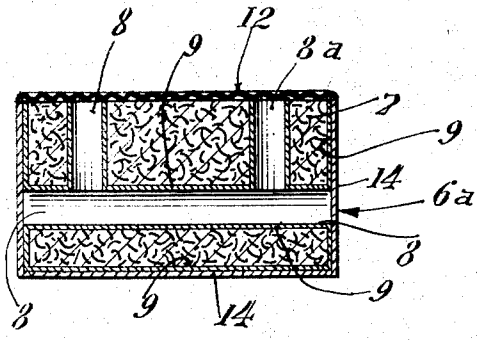


Fig. 3.

INVENTOR.

Lloyd G. Schultz

BY

Wm. Kilpatrick

ATTORNEY

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COATED FUEL IMPREGNATED BLOCK

Lloyd G. Schultz, New York, N. Y.

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26 Claims. (Cl. 158—96)

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This invention relates to fuel and to fuel briquettes and blocks and methods for making the same and more particularly to improvement in smudge creating fuels for use in frost protection in orchards and is especially useful for use in citrus orchards or groves and for other purposes.

Objects of the invention are to provide an improved fuel of this kind which will limit the burning to the top of the block, give better and more even ventilation and produce a more nearly perfect combustion and more economical than heretofore, and will lengthen the life of the fuel and give a fuel which is more reliable and definite in length of time of burning.

Other objects of the invention are to provide an improved fuel block of this kind which is durable for shipping and which will long retain its fuel against evaporation.

An important advantage is that the smudge creating fuel is in the form of a fibrous briquette, and is preferably made of compressed, absorbent fibrous material, preferably of mineral or vegetable origin, and which is impregnated with a suitable liquid oil or alcohol or with a hydrocarbon, residual waste distillate, which not only creates a heated smudge creating vapor during the burning thereof, but also simultaneously acts as a bactericide and insecticide during use.

Another object is to provide a fuel briquette suitable for use with the combustion control means of my United States Patent No. 2,280,267, issued April 21, 1942.

Additional objects of the invention are to effect simplicity and efficiency in such fuel blocks and methods and to provide an extremely simple fuel block of this kind which is economical and reliable in operation, and economical to manufacture, transport, handle and operate.

Still other objects of the invention will appear as the description proceeds; and while herein details of the invention are described in the specification and some of the claims, the invention as described in some of the broader claims is not limited to these, and many and various changes may be made without departing from the scope of the invention as claimed in the broader claims.

The inventive features for the accomplishment of these and other objects are shown herein in connection with several forms of the invention each of which briefly stated, includes a block or briquette of compressed absorbent fibrous material impregnated with a liquid fuel and having an air-impervious coating on the bottom and

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sides of the block for limiting the flame to the top.

In two forms of the invention one or more ventilating openings are provided to direct air to the inner part of the flame; and in one form additional coverings of paper and cardboard are shown to prevent breakage and fuel evaporation.

Suitable fuels and absorbent materials, coatings and coverings are mentioned hereinafter, but it is understood other suitable fuels and suitable fibrous and non-fibrous materials may be used and that one or both of the coverings may be omitted or used with any of the blocks described, and that other shapes of blocks may be used.

In the accompanying drawing showing, by way of example, several of many possible embodiments of the invention,

Fig. 1 is a perspective view showing one form of the invention;

Fig. 2 is a transverse vertical sectional view of the fuel block of Fig. 1;

Fig. 3 is a transverse vertical sectional view of another form of the invention;

Figs. 4 and 5 are respectively horizontal and axial sections showing another form of the invention.

In the form of invention of Fig. 1, the fuel comprises a simple briquette or block 6 of liquid-fuel-absorbent material which may be compressed absorbent material 7 and impregnated with a liquid fuel. The block is provided with a suitable air-impervious coating 9 on the bottom and/or sides of the block, thus limiting the flame 10 to the top of the block, as in Fig. 1. While the necessity of illustration requires that the coating be shown in section, it is understood that the coating may be so thin that the thickness cannot be accurately illustrated.

The form of invention of Fig. 3 comprises a fuel block or briquette 6*a* of compressed absorbent fibrous material 7 impregnated with a liquid fuel and having ventilating openings 8*a*, 8 passing therethrough from the lower part of side faces thereof to an intramarginal part of the top face. The block has an air-impervious coating 9 on the bottom and sides of the block and walls of the openings 8.

If the block is to be shipped or stored, it may be desirable to additionally provide an air-impervious strengthening and protecting corrugated cardboard 12 adhered on the top face of the block and an air-impervious paper 14 adhered on the bottom and sides of the block, said coating paper and board protecting the block from breakage and the fuel from evaporation and leakage. The

board 12 and paper 14 are adapted to be stripped off before igniting the block, leaving said coating 9 thereon to limit the burning to the top of the block.

In the form of invention of Figs. 4 and 5 the fuel comprises a tubular block or briquette 6b of compressed absorbent fibrous material 7 impregnated with a liquid fuel and having a large ventilating axial opening 8b passing therethrough from the bottom face thereof to an intramarginal part of the top face; and an air-impervious coating 9 is applied on the bottom and sides of the block and walls of said opening.

The coverings 12 and 14 and openings 8 may be used with the devices of Figs. 1, 2, 4 and 5; and the opening 8b could be used with a rectangular block. Other shapes of blocks and openings could be used within the scope of the claims.

The fuel block may be prepared in any suitable manner. Or, broadly stated, the method of making the fuel may comprise first forming a block of compressed absorbent fibrous or other material with or without the ventilating openings 8 or 8a passing therethrough, then soaking said block in a liquid fuel either under pressure or not, until sufficient fuel is therein. Then the impregnated block is immersed in one or more solutions adapted when dried to form an air-impervious coating on the bottom and sides of the block and on the walls of the openings.

Then if desired an air-impervious strengthening and protecting sheet or board may be adhered on the top face of the block; and if further desired an additional air-impervious sheet or layer of paraffin paper may be adhered on the sides and bottom of the block. Said coating, paper and boards protect the block from breakage and the fuel from evaporation and leakage, and the paper and board are adapted to be stripped off before igniting the block, leaving said coating thereon to limit the burning to the top of the block.

A suitable fuel for impregnating the block may be alcohol, or any cheap oil or other liquid material.

A suitable material for the block, may be asbestos fiber, or other absorbent material, or on account of cheapness and its natural burning qualities, may be made up of vegetable fibers, compressed into bales or briquettes, as in Figs. 1 to 5, to economize in space, and to render them slow burning. Such vegetable fibers may be of dried leaves, hay, straw, sawdust, the residual bagasse of sugar cane, and the like.

It has been found that the fuel forming briquettes when made of vegetable matter are porous and highly absorbent, and may be advantageously impregnated with a liquid hydrocarbon, or the like, thus to increase the fuel and smudging capacity of the briquette during protective combustion.

A suitable hydrocarbon fuel for the herein disclosed use is a waste distillate which is the result of refining natural petroleum and other oils, and a suitable distillate for the purpose is that made from the crude oils obtained from the States of Texas and Louisiana, amongst others, because the waste distillate obtained from refining the crude oils of these States contains a very large amount of sulphur, which when burned, gives off a sufficient volume of sulphurous acid with the smudge to act upon the plant pests and bacteria to destroy them, during the smudging operation.

There are various methods of impregnating the material of the briquette. The loose fibrous material may be first immersed in the liquid distillate, and then formed into briquettes or it may be formed by molding or compressing the fibrous material into briquette form, and then placing the briquette material in a closed container in which is provided a liquid waste distillate and then applying pressure to the liquid.

For forming the coating 9, the block may be dipped into the coating-forming solution or mixture, as far as the top edge of the sides, but so as not to reach the top face. Then the block is removed and the coating allowed to dry. Or if preferred the solution could be brushed or sprayed on the bottom and sides and then allowed to dry.

A suitable solution is sodium silicate or calcium chloride alone or mixed or successively applied, the sodium silicate or calcium chloride providing an element of fire-proofness to the sides. Also albumen or a slurry of Portland cement or fire-resistant creosote asphalt emulsion could be used. Various other materials could be used.

For protecting orchards the briquettes may be placed on the ground at suitably spaced locations and ignited.

For the briquette of Fig. 5, a slightly rough place on the ground 15 may be found leaving a ventilating space 16 to feed the ventilating opening 8b. The briquette may be used with or without the control means as described in my said patent. Or something could be used to hold the block up, or otherwise to provide for an air inlet.

Any of the described briquettes or blocks may be used for camp fires or in suitable heating or cooking stoves, orchard heaters, tobacco curers or other purposes too numerous to mention.

Various coverings of various materials other than corrugated paper 12 or the paper 14 could be used.

The coating 9 may be omitted at the bottom of the blocks, if desired.

In any case, as the liquid fuel burns, it is drawn to the top of the block by capillary action, and continues to burn until all of the liquid is consumed, leaving the absorbent material intact. The block of exhausted absorbent material is usually merely replaced by a new impregnated block, but can be reimpregnated and reused if desired.

The invention claimed is:

1. An article of the character described comprising a piece of absorbent material having mixed therewith a liquid fuel and having a fire resisting easily frangible coating adhered on the sides for resisting the passage of air.

2. A fuel as in claim 1, said coating consisting of sodium silicate.

3. A fuel as in claim 1, said coating consisting of calcium chloride.

4. A fuel as in claim 1, said coating consisting of Portland cement.

5. A fuel as in claim 1, including an additional covering on the top.

6. A fuel as in claim 1, including an additional covering on the sides.

7. A fuel as in claim 1, said block having ventilating openings passing through the top face and open at the lower part, the walls of the openings having said coating adhered thereon.

8. An article of the character described comprising a block of compressed absorbent fibrous material having mixed therewith a liquid fuel; a fire resisting air-impervious easily frangible coating adhered on the bottom and sides of the block.

9. A fuel as in claim 8, said material being vegetable fibers.

10. A fuel as in claim 8, said material being asbestos fibers.

11. An article of the character described comprising a block coated with fire resisting material and impregnated with a liquid fuel; and air impervious paper sheet covering secured on faces of the block.

12. A fuel as in claim 11, said covering including a corrugated cardboard adhered to the top of the block.

13. A fuel as in claim 11, said covering including sheets of paraffin paper adhered to the bottom and sides of the block.

14. An article of the character described comprising a block or briquette of compressed absorbent fibrous material impregnated with a liquid fuel and having ventilating openings passing therethrough from the lower part of side faces thereof to an intramarginal part of the top face; an air-impervious coating on the bottom and sides of the block and walls of the openings; an air-impervious strengthening and protecting corrugated cardboard adhered on the top face of the block; an air-impervious paper adhered on the bottom and sides of the block; said coating, paper and board protecting the block from breakage and the fuel from evaporation and leakage; the paper and board being adapted to be stripped off before igniting the block, leaving said coating thereon to limit the burning to the top of the block.

15. An article of the character described comprising a tubular block of compressed absorbent fibrous material impregnated with a liquid fuel and having a large ventilating axial opening passing therethrough from the face thereof to an intramarginal part of the top face; an air-impervious fire resisting coating on the bottom and sides of the block and walls of said opening.

16. An article of the character described comprising a block of compacted absorbent fibrous vegetable material impregnated with a liquid fuel; and a substantially fireproof air-impervious coating adhered on and supported by the bottom and sides of the block, leaving the top face of the block exposed, whereby when the liquid fuel at the top face of the block is ignited, air is held by said coating from the fibrous material except at said top face and the liquid fuel is fed to the combustion on said top face by capillary attraction in the fibrous material as a wick, to replace the consumed oil, until substantially all the oil is removed from the block; whereupon the block may be reimpregnated with oil and used again.

17. An article of the character described comprising a block of compacted absorbent fibrous material impregnated with a liquid fuel; and a substantially fireproof air-impervious coating of dried hardenable liquid on and supported by only the bottom and sides of the block, leaving the top face of the block exposed.

18. An article of the character described comprising a block of divided material impregnated with a vaporizable fuel; and substantially fireproof air-impervious coating of sodium silicate on the bottom and sides of the block, leaving the top face of the block exposed.

19. An article of the character described comprising a body of compacted absorbent fibrous material impregnated with a liquid fuel and having a ventilating opening passing therethrough from a lower part of the body to an intramarginal part of the top face; and substantially air-impervious coating on the bottom and sides of the body and all walls of the opening leaving the top face of the body exposed; whereby when the liquid fuel on the top face of the body is ignited, air is held by said coating from entering through the opening of the fibrous material except at said top face and liquid fuel is fed to the combustion on said top face by capillary attraction in the fibrous material as a wick, to replace the consumed oil.

20. An article of the character described comprising a compressed block of absorbent fibrous material having a dry substantially fireproof air-impervious coating deposited from a solution of sodium silicate applied to only the bottom and sides of the block and dried thereon; said block being impregnated with a hydrocarbon oil, whereby the oil is adapted for igniting at the top face of the block, whereby when the oil is burned, air is held by said coating from the fibrous material except at said top face and oil is fed to the combustion on said top face by capillary attraction in the fibrous material as a wick, to replace the consumed oil; whereby continuing the burning removes substantially all the oil from the block adapting the block for again reimpregnating it with oil and repeating the burning.

21. An article of the character described comprising a block of compressed absorbent vegetable fibrous material impregnated with petroleum oil and having ventilating openings passing therethrough from a lower part of the block to an intramarginal part of the top face; and a substantially fireproof air-impervious easily frangible coating of alkaline sodium silicate adhered on and supported by the bottom and sides of the block and walls of the opening leaving the top face of the block exposed.

22. An article of the character described comprising a body of absorbent material impregnated with a petroleum oil; and a substantially fireproof air-impervious easily frangible coating of an alkaline material adhered on and supported by the bottom and sides of the body leaving the top face of the block exposed.

23. An article of the character described comprising a body of material impregnated with liquid fuel; and an easily frangible coating on the bottom and sides of the body leaving the top face of the body exposed.

24. An article as in claim 23 having an easily removable paper covering adhered on the bottom, top and sides of the body to protect said coating and body.

25. An article of the character described comprising a block of compressed absorbent vegetable fibrous material impregnated with a hydrocarbon petroleum oil; and a substantially fireproof air-impervious easily frangible, non-corrosive coating of alkaline sodium silicate adhered on and supported by the bottom and sides of the block leaving the top face exposed; said coating being non-corrosive by petroleum oil, and being of low cost and fragile and adapted when left in the field to disintegrate and not injure agricultural machines and to counteract acidity in the soil.

26. An article of the character described comprising a block of absorbent material impregnated with a fuel; and a substantially fireproof air-impervious water-soluble easily frangible coating adhered on and supported by the bottom and sides of the block leaving the top face

of the block exposed; said coating remaining closely fitting on the block during contraction of the block, thus maintaining capillary withdrawal of the fuel during burning and preventing access of air to the sides of the block and the consuming of the block; said coating being soluble by water and disintegrating under continued weather conditions when no longer needed, preventing the retention of water.

LLOYD G. SCHULTZ.

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