

[54] **SOLID FUEL PACKAGE**

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[57] **ABSTRACT**

A slow and even burning compact package of solid fuel components featuring log slices formed of compressed wood shavings. A centrally arranged igniter piece and two relatively small chips formed of the same material as the larger log slices cause burning to start at the center and bottom of the fuel package and to migrate slowly outwardly until the entire package is consumed. Some of the log slices are chemically treated to produce a color flame. The slices are arranged relative to the igniter and chips to produce a natural chimney effect for the burning fuel package. The fuel components are nested on a pre-formed tray or pallet and the latter is enclosed in a thin transparent plastic wrapper which prevents displacement of the components during handling of the package.

[52] **U.S. Cl.** **44/40**
 [51] **Int. Cl.**..... **C10I 11/00**
 [58] **Field of Search**..... 44/40, 38

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2 Claims, 6 Drawing Figures

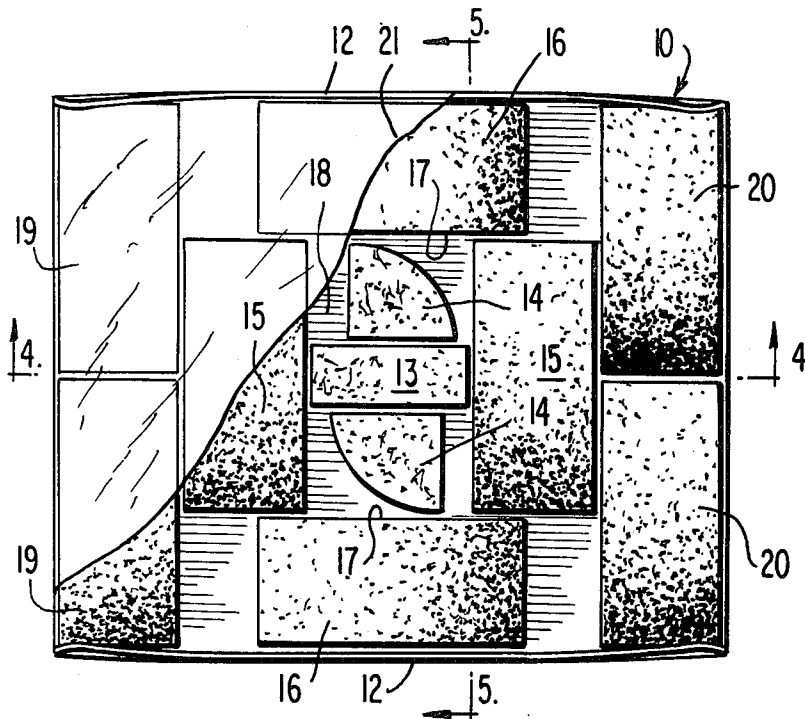


FIG. 1

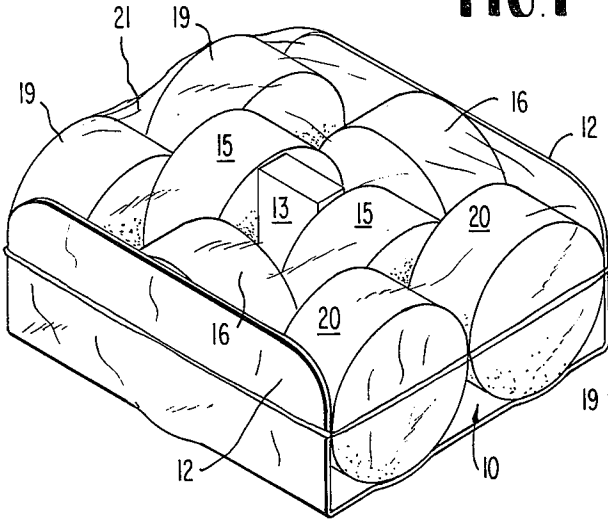


FIG. 4

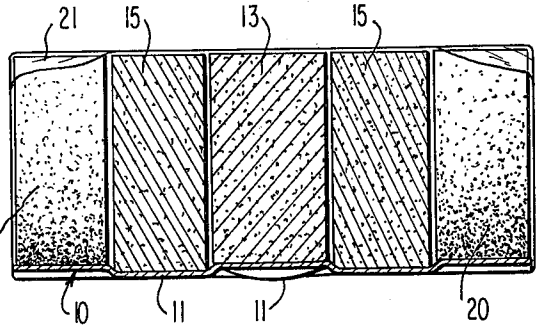


FIG. 2

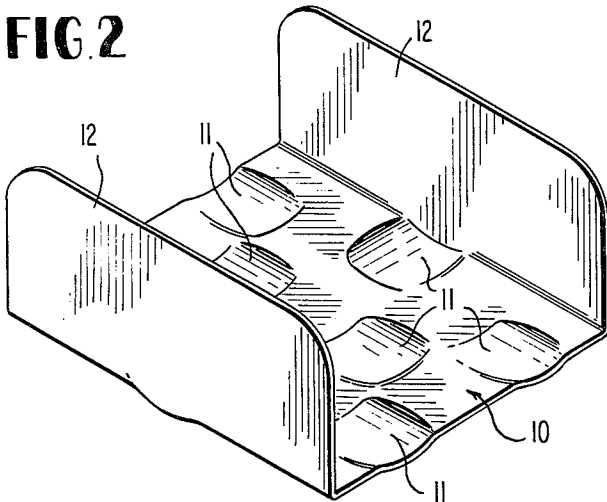


FIG. 5

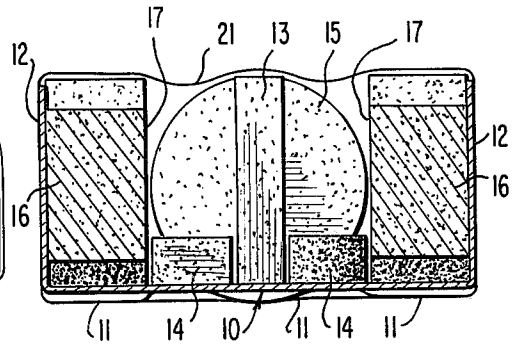


FIG. 3

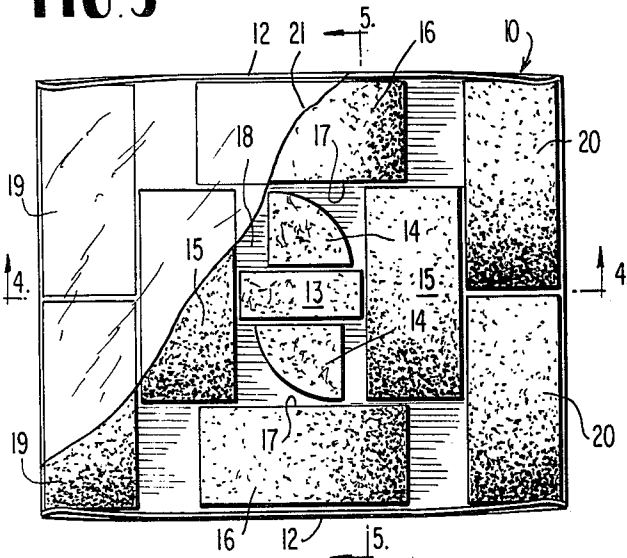
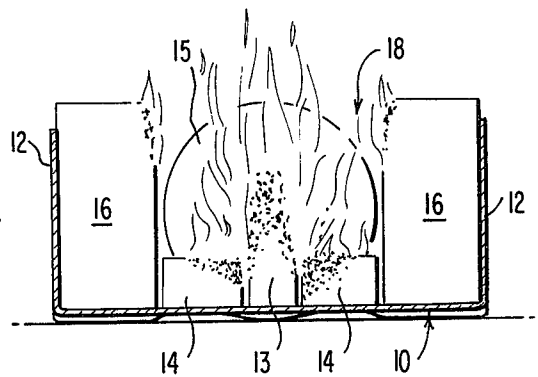


FIG. 6



SOLID FUEL PACKAGE

BACKGROUND OF THE INVENTION

There is a strong need for an inexpensive and efficient solid fuel unit for use in the home fireplace or for making a campfire or as an orchard heater or the like. Natural fireplace logs are not always available and if available, are expensive and have a number of attendant disadvantages. They lack uniformity in size and tend to give off noxious fumes and excessive smoke and usually project hot embers and sparks which are likely to damage rugs and furnishings. Natural logs also have a tendency to burn unevenly and fire kindling with logs can be difficult and there is frequently the necessity for restarting the fire several times due to poor combustion. Coal, coke and like solid bituminous fuels have never been convenient or popular for the home fireplace and are not satisfactory for campfires and the like. These fuels are dirty and give off much smoke and are inconvenient to handle and transport.

In more recent times certain artificial solid fuels have been proposed including fuels formed from paper, sawdust and certain vegetable matter usually compressed into briquettes in the presence of a chemical binder. Such fuels have never been widely adopted mainly because of excessive cost or because the burning characteristics have not been satisfactory in terms of burning time or evenness of burning. More recently, Federal Smoke and Emission Standards for clean air and open burning have further restricted the use of natural and artificial solid fuels and have increased the need for better products in this category.

One of the more popular and successful solid fuels is manufactured and sold by Weyerhaeuser Company under the tradename "PRES-TO-LOG." This product is made essentially from compressed dry wood shavings and is quite efficient in terms of the previously noted requirements and also economical, being made essentially from waste products. However, there is still some difficulty with artificial logs formed from wood shavings in terms of slow and uniform burning and connected with kindling or fire starting.

Accordingly, it is the object of this invention to improve upon the prior art in general and the above mentioned PRES-TO-LOG product in particular, by the provision of a solid fuel unit, assembly or package, which is ideally suited to use in the home fireplace or for making a campfire or for other similar purposes. The fuel unit is a self-contained uniformly sized package which is totally consummable and meets the Ringleman-1 Federal Smoke Emission Standards. Testing of the product by an independent test laboratory has also indicated that the invention is very satisfactory in terms of particulate emission during burning. Additionally, the fuel unit or package is clean and easy to handle and can be produced in various sizes by simply adding to the number of fuel slices while preserving the unique geometric arrangement of slices which causes the efficient, long and slow burning characteristics of the product.

Most importantly, the invention includes its own easily ignitable fire starting element and adjacent small chips of the solid fuel, arranged in relation to the surrounding major fuel slices to produce a chimney effect and to cause burning of the product outwardly from the center and bottom of the package gradually and evenly. Two of the interior fuel slices are chemically treated to

produce a desirable color flame and this is an optional feature of the invention. The individual fuel slices and components are nested on a pre-formed convenient pallet or tray having an outer wrap of preferably transparent plastic film. The arrangement holds the fuel slices in the predetermined array with respect to one another and to the centrally arranged igniter and chips, and prevents unwanted displacement of components during transportation and handling.

Other features and advantages of the invention will be apparent during the course of the following detailed description.

BRIEF DESCRIPTION OF DRAWING FIGURES

FIG. 1 is a perspective view of a solid fuel package or unit embodying the invention;

FIG. 2 is a similar view of a pre-formed pallet or tray for support of solid fuel slices;

FIG. 3 is a plan view of the fuel package showing the array of slices in relation to a central starter element and kindling chips;

FIG. 4 is a vertical section taken on line 4—4 of FIG. 3;

FIG. 5 is a vertical section taken on line 5—5 of FIG. 3; and

FIG. 6 is a partly diagrammatic view similar to FIG. 5 illustrating the unique burning process embodied in the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to the drawings in detail wherein like numerals designate like parts, the numeral 10 designates a pallet or tray for supporting the cylindrical solid fuel slices and maintaining them in proper assembled relationship to promote the most efficient burning. This pallet may be conveniently molded from foam plastic or may be formed if preferred from pressed kraft paper or fibreboard. The pellet 10 is rectangular and its bottom wall may be formed to provide shallow arcuate recesses 11 or seats for the several cylindrical fuel slices to be described. The seats tend to prevent movement of the slices which is undesirable during the handling or shipment of the package. Pallet 10 also includes a pair of parallel upstanding sidewalls 12, disposed at right angles to the bottom walls. The opposite ends of the pallet may be open as shown in FIG. 2.

As best shown in FIG. 3, the assemblage of fuel components forming the invention comprises a center located relatively small upstanding rectangular block 13 which serves as an efficient igniter or fire starter. This igniter 13 consists of combustible fibrous material saturated with wax. Such an igniter block is available on the market and one such product is manufactured and sold by Ljutic Industries of Yakima, Washington. As shown in FIG. 5, the igniter 13 is upstanding in the assembly and rests on the bottom wall of the pallet 10 and extends to the top of the package or assembly.

Arranged closely adjacent to the igniter block 13 on the opposite major faces of the same, is a pair of small kindling chips 14 formed of compressed wood shavings, which is the essential material embodied in the major fuel slices yet to be described. The two chips 14 may conveniently comprise arcuate segments taken from one of the fuel slices. Preferably each chip 14 has a flat face arranged in opposed relationship to one of the flat vertical sides of the igniter block 13. As viewed

in FIG. 5, the chips 14 are quite shallow so that the spaces above them on opposite sides of the block 13 are open and unobstructed, for an important purpose to be described.

On opposite sides of the upstanding igniter block 13 and closely adjacent the two relatively narrow vertical faces thereof is a first pair of relatively large cylindrical fuel or log slices 15 formed of the above named compressed wood shavings. In practice, these slices and the others to be described may be taken from the aforementioned PRES-TO-LOGS manufactured and sold by Weyerhaeuser Company of Tacoma, Washington. As shown in the drawings, the slices 15 rest on their sides, and their cylindrical peripheries are seated in two of the arcuate recesses 11 nearest to the center of the pallet 10. The diameters of the slices 15 are sufficiently large that the slices extend even with the top of the igniter block 13 at the top of the package. The interior vertical faces of the two slices 15 form the sidewalls of a combustion chamber or chimney space inside of the package as will be further discussed. Preferably, the two slices 15 are chemically treated to produce a colored flame, such as red or green or blue upon burning, but this is an optional feature which may be omitted if preferred.

An additional pair of cylindrical log slices 16 are arranged in tangential relationship to the two slices 15 and with their axes disposed at right angles to the axes of the slices 15. The two slices 16 are seated in two of the recesses or seats 11 immediately inwardly of the pallet sidewalls 12. The arrangement is such that the interior vertical flat end faces 17 of the two slices 16 form the other sidewalls of the rectangular combustion or chimney space shown at 18 in FIG. 3.

Immediately outwardly of the two slices 15 at each end of the package are two more pairs of cylindrical fuel slices 19 and 20, whose axes are parallel with those of the slices 15. Each pair of slices 19 and 20 is arranged with their cylindrical surfaces substantially in contact and resting in the seats 11 provided near the ends of the pallet or tray 10. It may be observed in FIG. 3 that there is substantial contact between the slices 15 and 16 and between the slices 15, 19 and 20 so that the burning may migrate from the center of the package outwardly toward the sides and ends. The inner end faces of the slices 19 and 20 partly overlap the outer end faces of the slices 15, and the latter have their peripheries overlapped by the slices 16.

In order to secure the components snugly in their assembled relationship, a preferably plastic transparent thin film outer wrap 21 is utilized and snugly encloses the pallet 10 and all of the components resting thereon. This outer wrap makes it possible to handle the fuel package without dislodging the individual components. It is essential that the slices and starting elements remain approximately in the relative positions shown in the drawings for the most efficient operation of the invention.

In the use of the artificial solid fuel package embodied in the invention, it is unnecessary to employ a fireplace grate or basket. The package is simply placed on the fireplace floor with the bottom wall of the pallet 10 lowermost. The entire fuel package is consummable and there is no necessity for opening the package prior to use and in fact this is undesirable because it could result in upsetting the arrangement of the components

which is carefully created to produce the most efficient slow and even burning.

The igniter block 13 can be lit with a match or cigarette lighter at the top and will burn readily due to its high wax content. As the igniter block is consumed, the flame will spread to the small fuel chips 14 on opposite sides thereof which are at the bottom of the package and arranged centrally with respect to the slices 15 and 16 which define the combustion or chimney space 18. Combustion will be maintained in this chimney space 18 for approximately 45 minutes before the fire begins to migrate outwardly by igniting the interior sides of the opposed pairs of cylindrical slices 15 and 16 as shown approximately in FIG. 6. Since the chips 14 are small, combustion will begin near the bottom of the package and migrate outwardly and upwardly. Eventually the flame will spread to the outermost slices 19 and 20 and the entire package will be consumed. In practice, it can be expected to consistently get a fire of 2 hours or more with burning at an even rate. In addition to fireplace useage, the fuel unit is ideally suited to campfires, orchard heating, and similar applications.

It should be understood that when complete logs of the PRES-TO-LOG type are utilized in the conventional manner, they are extremely difficult to ignite and to keep burning by conventional methods. For this reason, a major advantage of this invention resides in the easy ignition means and the method of slow and even burning outwardly in all directions from the center of the package. Ignition is greatly enhanced by the built-in chimney effect as a result of the particular placement of the pairs of slices 14 and 16 relative to the igniter block 13 and chips 14 to define the combustion or chimney rectangular space 18 which is open at the top and closed at the bottom and on opposite sides.

It is to be understood that the form of the invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the sub-joined claims.

I claim:

1. A substantially totally consumable solid fuel package for home fireplaces, orchard heating and the like comprising a burnable tray-like holder for solid fuel having a generally flat bottom adapted to rest on a fireplace floor or the like and having upstanding fuel-confining side wall portions, an array of compressed wood particle fuel log slices of substantially equal size disposed in said holder and having their peripheral faces resting on the bottom wall of the holder and their end faces disposed vertically, said array of fuel log slices including a first spaced opposing pair of slices located centrally in the holder and a second spaced opposing pair of slices located immediately on opposite sides of the first pair, the interior end faces of said pairs of slices being substantially at right angles and the interior end faces of said second pair being close to the peripheral faces of the first pair, whereby the interior end faces of both said pairs of slices define a top opening substantially rectangular chimney passage extending upwardly from the bottom wall of said holder, a solid igniter element disposed centrally in said chimney passage and extending substantially between said first pair of log slices and resting on the bottom wall of said holder and extending substantially to the top of said package, said top being defined by the tops of said

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equal size log slices, a pair of relatively small and shallow solid fuel kindling elements disposed in the bottom of the chimney passage on opposite sides of the igniter element and being in close proximity to the interior end faces of said first and second pairs of log slices to enable initial burning to migrate outwardly from the center of the fuel package near the bottom thereof, additional fuel log slices arranged on opposite sides of the first and second pairs in said array of log slices and having exterior vertical end faces terminating at the opposite ends of said package, the interior end faces of the last-named slices substantially abutting the exterior end

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faces of said first pair of slices, and a snug wrapping of burnable film enclosing the entire package including said holder.

2. A fuel package as defined by claim 1, and said additional fuel log slices consisting of two pairs of side-by-side slices immediately outwardly of the slices in the first pair and spanning substantially the width of the holder and having end face portions opposing and spaced from opposite sides of the slices in the second pair.

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