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2,212,157

ORCHARD HEATER AND METHOD OF OPERATING THE SAME

Filed April 8, 1939

Fig. 1.

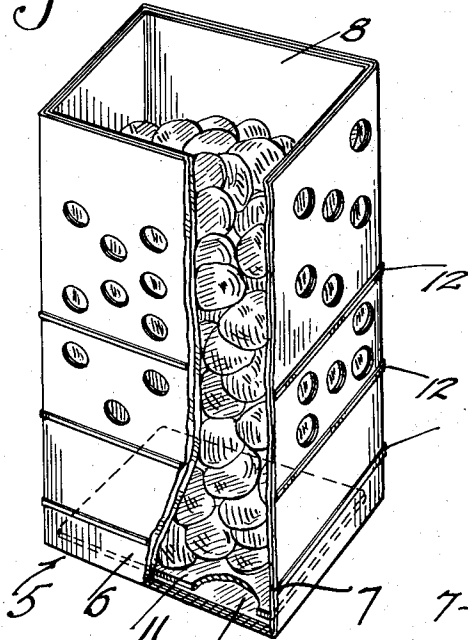


Fig. 2.

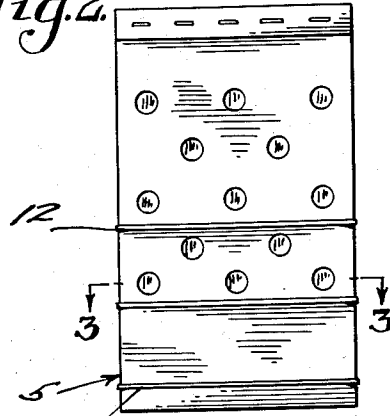


Fig. 3.

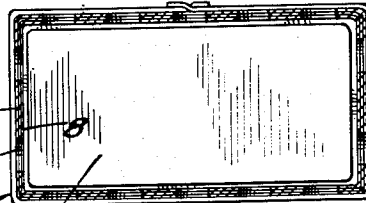


Fig. 4.

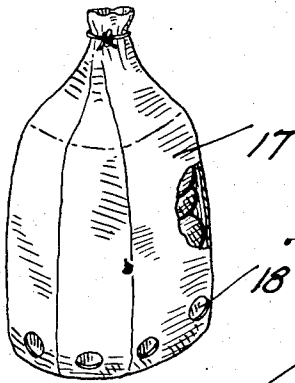


Fig. 5.

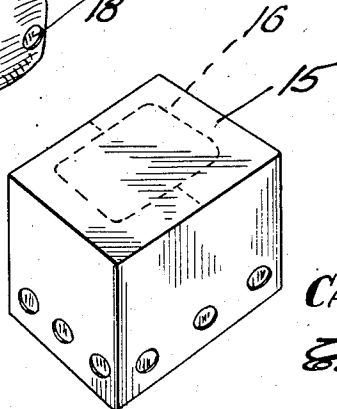
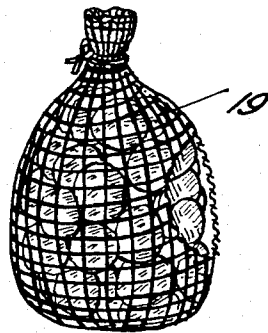


Fig. 6.



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ORCHARD HEATER AND METHOD OF OPERATING THE SAME

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4 Claims. (Cl. 44-38)

This invention relates to an orchard heater for preventing damage by frost to fruit in citrus groves, and a main object is to provide a heater construction for burning a solid fuel, in which the fuel container is formed of a combustible material treated with a fire retardant agent in order that the container and the fuel therein will burn evenly.

Another equally important object is to provide a heater that is of economical construction, and which will eliminate the employment of all expensive equipment now usually required by heaters using liquid or other fuels.

Still another object is to provide an orchard heater in which the heat generated from the burning fuel will be diffused adjacent the surface of the ground where the greatest frost danger usually occurs.

A still further object is to provide an orchard heater construction in which the heater is utilized for transporting the fuel.

Other objects and advantages will be apparent from the following specification, reference being had to the appended drawing forming a part thereof, in which:

Fig. 1 is a perspective view of my heater filled with fuel, and partly broken away.

Fig. 2 is an elevation of the heater prepared for shipment.

Fig. 3 is a cross section of the heater taken on line 3-3 of Fig. 2.

Figs. 4, 5 and 6 are perspective views of modified forms of heaters.

It is now customary in the growing of citrus or other sub-tropical fruits to apply heat in the groves to increase the temperature when the same falls to about the freezing point in order that the growing fruit and trees will not be endangered.

The heaters now generally employed are of metal formation adapted for the burning of a liquid fuel, such as a low grade oil distillate, and as expensive equipment is required, such as large embedded fuel tanks, portable tanks for supplying additional fuel to the heaters during their operation, to say nothing about expensive labor costs, the costs of operating becomes excessive.

In the heater herein described substantially all such expensive additional equipment of liquid burning heaters as well as metal heaters for solid fuel is eliminated, as my heater consists of a single container provided with apertures for the admission of air to the fuel, the container being formed of a flexible combustible material treated with a fire retardant chemical that will burn

evenly along with the solid fuel carried thereby. Further the grower may provide himself with a large number of heaters, each containing the heating fuel and store the same in convenient out-houses adjacent the groves at small expense.

Referring now more specifically to the drawing the heater or fuel container 5 is preferable formed of a flexible material such as paper treated with suitable chemicals or fire retardant material to prevent rapid combustion, or it may be formed from a paper pulp in which a fire retardant chemical has been added thereto.

As an example of a fire retardant for treatment of the heater containers, I have successfully employed a chemical produced under a secret process known to the trade as "Graselli Fire Retardant 3 W. G." manufactured by E. I. Du Pont De Nemours of Wilmington, Delaware, but other equally satisfactory results may be attained by the use of other or similar fire retardant solutions. Further the containers may be dipped in a fire retardant, or sprayed with various materials such as copper or cementitious solutions that will retard their combustion prior to the consumption of the fuel contained therein.

In the drawing I have shown the container 5 as consisting of a plurality of members 6, 7 and 8 to secure rigidity of the walls, all being treated with a fire retardant composition, but it will be understood that only a container formed of a single member may be used provided the same can be formed stable enough to withstand rough usage in transportation. Each container is of substantially rectangular formation, approximately two (2) feet in height, and one (1) foot in depth and width. The walls of the fuel container 5 are provided with a number of perforations 9 of a size to prevent spillage of the fuel therefrom and for the admission air to the fuel to support combustion.

In the bottom 10 of the container is placed a shoe 11 formed of cardboard or sheet metal to form an even supporting base for the filled containers or heaters when placed in the fruit groves. The lower portion of the containers also may be provided, if found necessary, with a plurality of metal straps or wires 12 for strengthening the construction to prevent collapse of the heaters when in operation.

In preparing the heaters for the market, the containers are opened from a flat form and then filled with a fuel, such as briquettes formed from coal, coke, lignite or other desired solid fuel, the top 13 is then closed by sewing or stapling. When the fruit grower wishes to use the heaters

they are transported to the groves and placed adjacent the trees, the operator cutting the tops off to expose the fuel therein, and at the same time spraying a small quantity of gasoline or oil on the fuel and lighting the same by ordinary ignition torches.

As the heaters are quite low in height the heat therefrom will be diffused to that portion of the atmosphere surrounding the trees to effectually combat any frost which usually settles adjacent the ground surface.

As the fuel is consumed the containers will also be consumed, but as they are chemically treated with a fire retardant chemical they will not be consumed prior to the consumption of the fuel.

In Fig. 5 I have illustrated another form of container which is of box like construction, its walls being provided with air apertures as in my main form, and the top wall 15 may be cut out as indicated at 16 so as to expose the fuel contained therein. This heater is also chemically treated for fire retardant purposes as in the form first described.

In Figs. 4 and 6 I have illustrated modified forms of heaters in which 17 (Fig. 4) designates a multi-wall bag formed of paper of substantially rectangular formation with a flat bottom in order that it may stand without support, and provided with air inlets 18.

In Fig. 6, the heater 19 is shown as formed of a coarse meshed fabric, such as jute and after filling with fuel is tied at its upper end as in form illustrated in Fig. 4. Both of these heaters are treated with a fire retardant chemical such as sodium silicate or other satisfactory solution, as in the form first described.

One of the many economic advantages of my construction is that the heaters are filled at the place of fuel production and then transported to their respective places of use without entailing an additional expense of separate fuel transportation, or expense and trouble in filling the heaters with fuel at their place of use.

As heretofore noted the treatment of the heat-

ers of fuel containers with a fire retardant material or chemical forms one of the important features of my invention for unless they are so treated they would be consumed prior to the combustion of the fuel carried thereby, and thus render the heaters of little or no value.

I claim:

1. In the art of heating orchards, a method of producing heat comprising the provision of a thin-walled, flexible, combustible, fuel container impregnated with a fire retardant chemical and filled with a combustible fuel adapted to burn at the same rate of combustion as the impregnated container, igniting the fuel in said container to cause combustion of the fuel and container, and continuing the combustion of the container and fuel so that they will be consumed evenly together.

2. In the art of heating orchards, a method of producing heat comprising the provision of a thin-walled, flexible, combustible fuel container impregnated with sodium silicate to retard combustion thereof and filled with a combustible fuel adapted to burn at the same rate of combustion as the impregnated container, igniting the fuel in said container to cause combustion of the fuel and container, and continuing the combustion of the container and fuel so that they will be consumed evenly together.

3. An orchard heater comprising a thin-walled, flexible, combustible fuel container having an air inlet in its wall, and a slow burning fuel filling the container, said container being so treated with a fire retardant chemical that it will be consumed evenly with the fuel therein.

4. An orchard heater comprising a thin-walled, flexible, combustible fuel container having an air inlet in its wall, and a slow burning fuel filling the container, said container being so treated with sodium silicate to retard combustion thereof that it will be consumed evenly with the fuel therein.

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