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PAPER CONTAINER FOR SMUDGE OIL

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Fig. 1

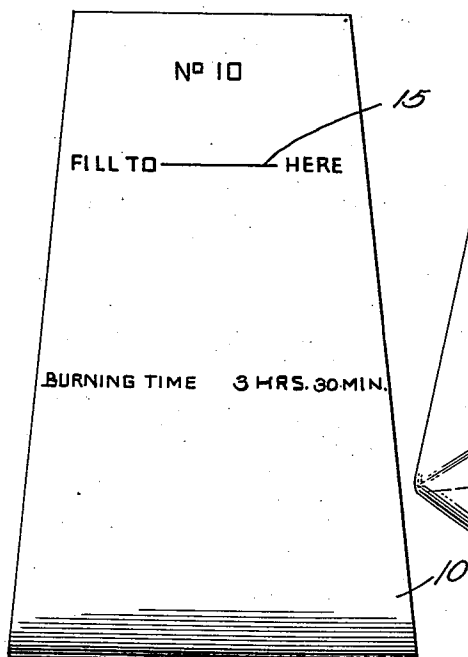


Fig. 2

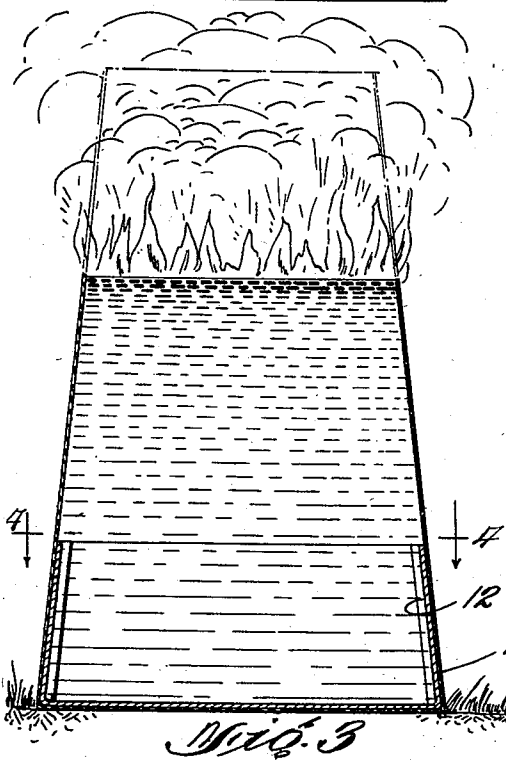
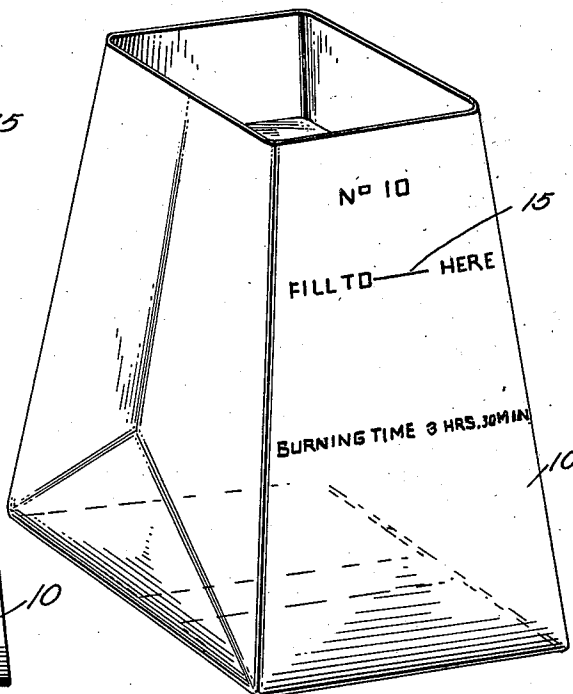
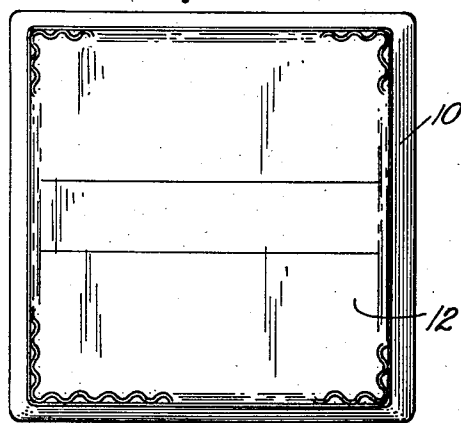


Fig. 4



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PAPER CONTAINER FOR SMUDGE OIL

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6 Claims. (Cl. 44-40)

This invention relates to means for protecting perishable crops from cold or frost damage and in its more specific aspects to containers for fluid fuels commonly designated "smudge oils" employed in the firing orchards, groves, and truck farms during periods of cold weather.

The heating of orchards, groves and truck farms by the smudge pot method to protect perishable crops against cold or frost damage is widely practiced and, while feasible, is nevertheless expensive in that it has heretofore required a substantial investment on the part of the grower in metal smudge pots. To the small truck grower, farmer, florist and citrus grower, such an investment is in many cases out of proportion to his return and cannot be undertaken, with the result that many crops have been lost or seriously damaged during cold spells.

During the course of extensive experimentation to develop a method of crop protection that would be within the reach of the small as well as the large grower, and which is fast and practical in its operation, I have discovered that bags of relatively heavy paper can be employed as containers for relatively heavy oils such as the so-called smudge oil during firing thereof and the handling preliminary thereto without loss of oil through seepage or bag bursting.

While bags fabricated from heavy kraft paper are preferred because of their low cost, and because a heavy grade of kraft paper, while normally more readily combustible than the heavy fuel oils, is nevertheless sufficiently impervious to smudge oils of low specific gravity for a substantial length of time as to make feasible its use, and because, further, kraft paper will burn down with the oil being fired, other kinds of paper of a burnable nature and possessing the desired degree of imperviousness to smudge oil may be employed in the fabrication of a container as aforesaid.

It is also within the purview of the present invention to employ as smudge oil containers bags made from paper specially treated to make it impervious to smudge oil, or bags made of paper material itself pervious but interiorly lined with a lining which is impervious to smudge oil.

I have also found that the practicability of bag-type paper containers in orchard and grove firing is augmented if the bag is fashioned larger at its bottom portion than at its top portion whereby, when filled with oil and placed on the ground for firing, the danger of tipping is overcome and whereby, also, the burning surface of the oil is increased as the level of the oil lowers,

thus to create more smudge as the oil burns down in the bag.

Paper bags to be used as aforesaid may be made up in various sizes to meet the demands of the individual grower. Preferably the bags will be numbered according to size beginning with a No. 1 bag having a capacity to hold a standard quart of smudge oil, and running to No. 12, for example, the latter having a capacity to hold 12 standard quarts of smudge oil.

The invention further contemplates that each bag will be provided with a filling line, preferably made during manufacture thereof, to indicate to the user the level to which the bag is to be filled. Accordingly, the user is enabled to fill the bag to the proper level corresponding to its intended capacity. To further assist the grower in the proper use of the bag, the latter preferably carries suitable indicia to indicate the approximate burning time, in hours and minutes, of the oil therein contained as established by field tests. With this information on each bag, the grower is enabled to ascertain definitely the size of bag required under existing weather conditions and how long he can expect to protect his crop with a certain size bag.

Other objects will be in part obvious and in part hereinafter pointed out in connection with the following analysis of this invention wherein is illustrated an embodiment of the invention in detail.

Referring to the drawing—

Fig. 1 is a side elevation of a bag-type container for smudge oils in accordance with the present invention;

Fig. 2 is a perspective view of a fuel package in accordance with the present invention, as constituted by a bag as illustrated in Fig. 1 filled to its proper level with smudge oil;

Fig. 3 is a view of a bag during firing of the oil therein contained, illustrating the manner in which the bag burns down with the oil; and

Fig. 4 is a section along line 4-4 of Fig. 3 illustrating one form of reinforcement employed with bags of large capacity.

Referring to the drawing, the reference character 10 designates a fold-type paper bag of generally rectangular section having side and end walls, a closed bottom, and an open top. Preferably, the bag is of one-piece construction, its bottom being closed and sealed by a flap construction (Fig. 2) corresponding generally to the flap construction employed in nail bags used by hardware stores in the packaging of nails sold in the bulk. It will be understood, however, that

types of bottom flap construction other than those employed with paper nail bags may be used.

Preferably, the bag is fashioned from heavy kraft paper which has been found to be substantially impervious to heavy or low specific gravity fuel oils. Kraft paper is also desirable in that it burns as a wick when oil contained therein is fired. It will be understood, however, that other kinds or grades of paper may be employed, so long as they possess the desired degree of imperviousness to smudge oil and are capable of burning with the oil. Also, paper from which the bag is fashioned may be specially treated to render it impervious to smudge oil, or the finished bag when made of paper of itself pervious may be provided with an interior lining impervious to smudge oil.

While the bottom flap and general construction of the bag as illustrated is more or less conventional, the bag may be said to differ from the paper nail bags in that its bottom portion has a greater area than the top portion of the bag. For symmetrical construction, a bag tapering from its large area bottom to its relatively smaller area top portion is desirable. When filled with smudge oil and placed on the ground, a paper bag as aforesaid is stable and the danger of its being tipped is substantially overcome. Further, with a bag larger at its bottom than at its top, the burning surface of the oil increases as its level lowers, with the result that more smudge is created as the bag burns towards the bottom.

In order to suit the demands of individual growers, and also to provide to the grower bags capable of meeting diverse weather conditions, the bags are made up in different sizes, numbered from 1 to 12, such numbering denoting the liquid capacity of each bag, preferably in standard quarts. Thus a No. 1 bag is designed to have a capacity to hold one standard quart of smudge oil whereas the No. 12 bag has a capacity to hold 12 standard quarts of smudge oil. With the larger size bags, particularly those numbered from 9 to 12, and holding from 9 to 12 quarts of fuel oil, respectively, the bottom and side walls for about two inches from the bottom can be reinforced by inserting suitable reinforcement within the bag preferably in the nature of a tray or secondary bottom 12 of corrugated reinforcement material, thus to strengthen the bags and to prevent bursting of filled bags during their transport from the place of filling to the place where they are to be burned. In the smaller bags, for example, those numbered from 1 to 8, reinforcement of the bag bottom and sides is not believed to be necessary, although such may be desirable under certain conditions.

The vertical height of each bag, regardless of its size, is preferably about 2 inches greater than need be to comply with the liquid capacity of the bag, thus to permit the bag being filled to its intended capacity without spilling. The extra length of the bag, that is, its portion above the liquid level therein prior to firing, is also employed to insure proper ignition of the oil as it ignites with the smudge oil and assists ignition of the latter. It is also intended that the portion of the bag above the liquid level will act as a windbreak while the torch or match is being applied to the fuel.

Each bag is provided with a filling line 15 which is preferably a heavy black line made during manufacture of the bag and preferably viewable from both the inside and outside of the bag. Such a filling line indicates to the user

the level to which the bag should be filled for its designated capacity. It is also advantageous to provide the bag with suitable indicia denoting its approximate burning time in hours or minutes as established by field tests. With such information, the grower is advised quite accurately of the length of time he can expect protection from a bag of a certain size being fired. Such burning time data also enables the grower to set the time for firing of the bags, in conjunction with weather reports advising when the coldest hours of a cold spell are to be expected.

In one suggested use of the invention, the bags which as shown are of the folded type can be sold to the grower in flat or folded form, thus to enable easy transportation from the seller to the consumer and at the same time permitting the consumer or grower to have on hand a substantial supply of the bags in anticipation of a cold spell as might result in cold or frost damage to his crops. Depending on weather conditions, the grower can fill the bags as required at the location of an immediate oil company handling the smudge oil in question or he can have on his grove an accessible supply of smudge oil to be used with the bags if and when conditions demand.

Upon filling of the bags of selected size to their proper filling level, the filled bags can be distributed to their points of use and ignited at the proper time as determined by weather forecasts.

Various grades or blends of fuel oil can be employed for firing, mention being made herein of one blend which has been found eminently satisfactory for the intended use, such being a blend of heavy asphaltic oil known as "Bunker C" and a #2 grade of fuel oil. The advantages of such a blend are readily apparent when paper bags in accordance with the foregoing are filled with the same as the asphaltic oil is sufficiently heavy that it does not seep through the paper of which the bags are fashioned, with the high flash point, #2 grade of fuel oil permitting ready ignition and assuring burning without forced draft. Speaking generally, the specific gravity of the oil found suitable for use with paper containers as aforesaid is 18 to 22. However, I do not desire to be limited in this respect as the blend of oil to be used is generally within the discretion of the fuel oil seller or blender.

If difficulty is encountered in igniting the filled bags, such may be readily overcome by adding a few drops of gasoline to the top of the oil contained inside the paper bag. Upon application of a torch or match, the oil will ignite immediately, burning off the part of the paper bag above the oil level therein. As the level of the oil lowers upon continued burning, the paper of the bag burns down with the oil and in so doing acts as a wick, thus to insure consumption of all of the oil within the container.

While in the foregoing a foldable bag of rectangular section has been illustrated and referred to, other types of bags such as bags of cylindrical shape, may be employed, if and when circumstances or demand warrants the same.

It is to be understood also that filled bags may be merchandized as a fuel package by an oil distributor serving a particular locality or section. By this proposed manner of merchandizing the grower is able to purchase a desired number of fuel packages of required size, which he can transport as needed from the distributor to his grove for firing under the requisite weather conditions. Under such form or merchandizing the

open top of the filled bag may, under conditions requiring the same, be closed by any suitable means so as to prevent spilling of the oil from the filled bags during their transport from the point of distribution to the point of firing.

By the above invention, the small grower, truck farmer and florist, as well as others engaged in raising perishable crops for early market, who heretofore have had little or no available protection from late frosts or late severe cold spells, are given effective and fast protection against adverse weather conditions at minimum cost, in that the only expenditure entailed in the practice of the invention is the negligible cost of the bags and of the cheap and readily available oil required for filling the same.

By the terms "kraft" and "kraft-type" paper, as employed in the foregoing description and in the appended claims, is meant paper of a weight making it more or less impervious to the relatively heavy smudge and orchard heating fuel oils whereby a bag or container made therefrom will retain the oil within the bag for a substantial period of time without bursting, and of a porosity such that it absorbs some of the oil and is thereby consumable therewith.

As many changes could be made in carrying out the above constructions, without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A fuel package comprising a "kraft-type" paper container and a quantity of relatively heavy oil contained therein, said paper being more readily combustible than the oil yet having the property of retaining and burning down with the oil as the latter is consumed.

2. A fuel package comprising a bag fashioned

from "kraft-type paper" and a quantity of relatively heavy oil contained therein, the paper forming said bag being more readily combustible than the oil yet having the property of retaining and burning down with the oil as the latter is consumed.

3. A fuel package as set forth in claim 2, wherein the bag is formed larger in its bottom portion than in its top portion, whereby the bag is self-reinforced against bursting and is substantially stable against forces that would normally tip the same.

4. A fuel package as set forth in claim 2, in which the bag is provided with a reinforced bottom.

5. A fuel package as set forth in claim 2, wherein the bag has the capacity to hold a predetermined quantity of oil which corresponds to the selected burning time of the package, and wherein the exterior surface thereof carries an indication of the selected burning time.

6. For use as a container for relatively heavy oils which is capable of retaining and burning down with the oil during its combustion for the purpose of providing heat for the protection of perishables from cold and frost damage, a fold-type bag made from flexible paper material of the order of kraft paper, said bag having a flat bottom, side walls which taper upwardly, and an open top whereby when set up and filled to its filling level with oil the bag is self-reinforced against bursting and is substantially stable, and being provided with a filling level indication disposed well below its open top and which corresponds to a predetermined quantity of oil with which the bag is to be filled and with other indicia representative of the approximate burning time thereof, the extra height of the bag above the filling level indication being provided to assist in ignition of the oil.

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