April 23, 1940. J. K. KAHN 2,197,866

STARTING WICK FOR OILSTOVE BURNERS

Filed July 28, 1938

Fig. 1.

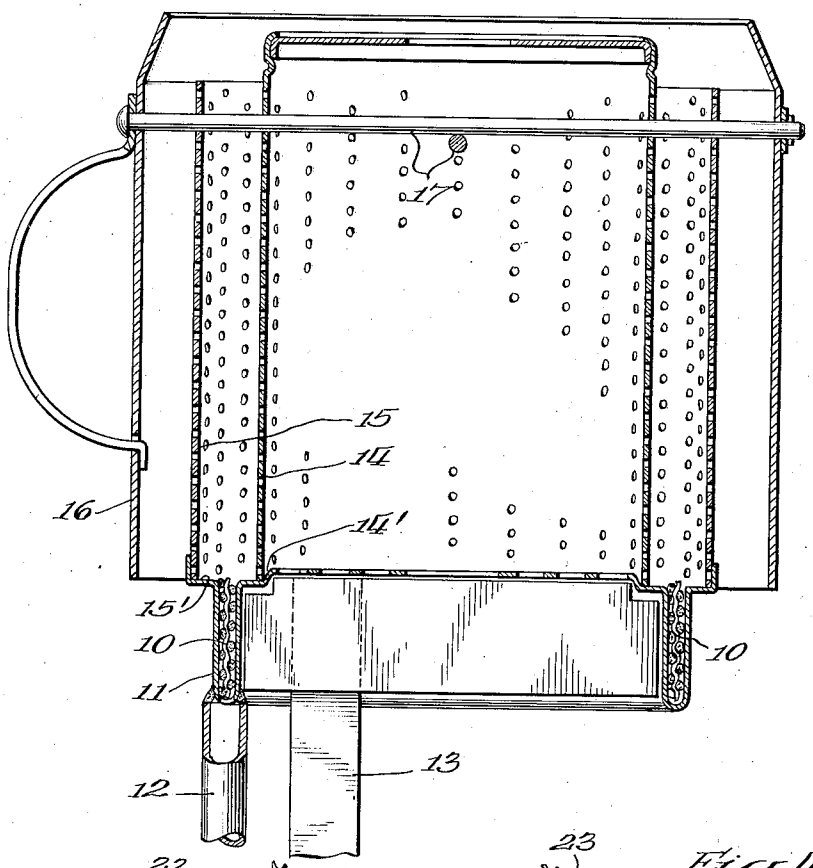


Fig. 2.

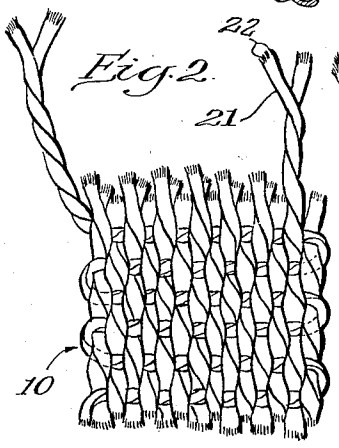


Fig. 3.

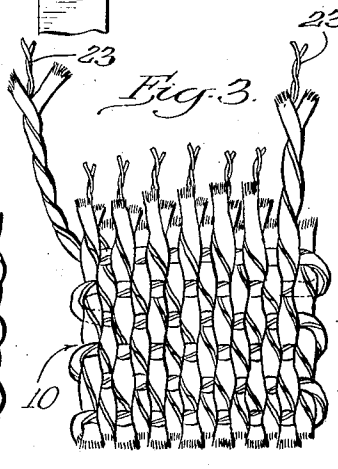
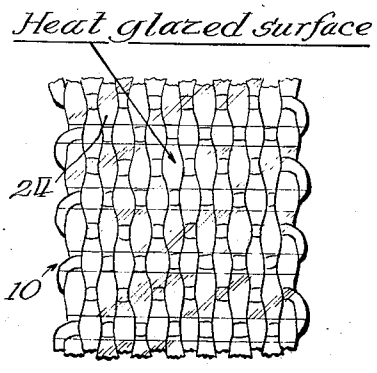


Fig. 4.



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STARTING WICK FOR OILSTOVE BURNERS

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Application July 28, 1938, Serial No. 221,673

9 Claims. (Cl. 67—69)

My invention relates to starting wicks for oilstove burners.

The chief object of my invention is the provision of a starting wick which will give more satisfactory service and service for a longer period before requiring attention than will the asbestos starting wicks now in general use, and also a wick which will have a much longer total life.

Another advantage of my wick is that the carbon and gum deposits which accumulate upon it are more readily removed than from the conventional asbestos wick, and the wick will better stand handling and abrasion in cleaning the wick after it has finally accumulated excessive gum and carbon deposits, because my wick, unlike the asbestos wicks, does not become brittle with use and exposure to heat in the burner.

I find on tests that my glass wick lights considerably faster than the usual asbestos wick, and this is probably due to the increased capillarity. Also, the flame will more quickly propagate about the full circle of the wick. That is probably attributable in part to the increased capillarity and in part to the more uniform surface of the glass wick whereby the flame in propagating does not have to travel over ridges and other barriers, as in the rough asbestos. Further, I find that less carbon and other deposits collect on my glass wick. This is apparently because the glass wick presents a smoother exposed surface to which foreign material is less likely to adhere.

The foregoing together with further objects, features and advantages of my invention are set forth in the following description of specific embodiments thereof, wherein:

Fig. 1 is an axial vertical section through an oilstove burner equipped with the wick of my invention;

Fig. 2 is a fragmentary side view of the wick of my invention with certain yarn ends extended and frayed better to reveal their structure.

Fig. 3 is a view similar to Fig. 2 of a modified form of the wick in which reinforcing wires are interwoven along with the yarns; and

Fig. 4 is a view similar to Fig. 2, but showing another modification where the surface is glazed by fusion to stiffen the wick.

Referring to Fig. 1, the wick 10 is seated within the annular trough 11 of a conventional oilstove.

The fuel oil, such as kerosene, is fed into the trough 11 at the bottom thereof by a feed tube 12. It will be understood that the fuel feed through the feed tube 12 is varied either by a feed valve, not shown, or by provisions for raising or lowering the feed trough in relation to a fixed fuel supply level. The feed trough is mounted by a support 13, the details of which may be in accordance with various known expedients.

The assembly generally termed the burner head rests upon the feed trough and consists of the cylindrical inner and outer perforates 14 and 15 and a surrounding jacket 16. The lower ends of the perforates 14 and 15 rest in seats 14' and 15' provided in the oppositely flanged upper ends of the sides of the trough 11.

When the burner is started the fuel is fed into the lower part of the trough 11, whence it is carried by the capillarity of the wick to the upper edge of the wick. The burner head is lifted from its seat on the trough to permit a match to be inserted between the bottom of the perforates and the upper end of the wick to ignite fuel fed by the wick. Combustion initially takes place in the annular space above the trough and between the perforates. After the perforates and the trough reach sufficient temperature by this preliminary heating satisfactorily to vaporize the oil, the burner assembly is re-seated and the combustion may then take place without the annular space between the perforates, by virtue of the vaporized oil passing through the perforations, as the normal operation of the burner. This is in accordance with the usual practice.

The wick 10 itself is of the usual size and shape, initially being a flat tape cut to a length which when inserted in the annular trough 11 will constitute a ring-shaped wick with its ends substantially abutting.

Except for the optional inclusion of reinforcing wires woven into it, the wick is preferably all glass. The wick is woven tape-wise from yarns and in the form here shown both the warp yarns and the filler yarn are double yarns. Preferably each yarn is of a normal diameter between $\frac{1}{32}$ and $\frac{1}{16}$ of an inch and consists of literally thousands—15,000, for example—individual glass filaments of diameter less than .00025 inch. Such a filament or fibre will weigh about 1.67×10^{-8} pounds per yard and the yarn will run about 500 yards per pound. Glass filaments of larger diameter, such as .0005 or .00075 or even larger, may be substituted, but are not preferred, because the smaller the filament the greater will be the capillary action of the wick.

The glass is preferably a hard glass low in alkali with a softening point of about 1500° F.,

which will satisfactorily prevent objectionable sintering at the temperature to which the wick is subjected in the burner.

Even though the filaments in an individual yarn be twisted together to make a somewhat twisted yarn, or a pair of yarns are twisted together for weaving, the filaments in each yarn are still parallel in the sense that they are substantially parallel with each other within any given section along the yarn even though each filament together with other filaments in the yarn may describe a helix. The point is that the yarn is composed of thousands of filaments which are bundled together directionally, so that there are thousands of interstices all extending longitudinally of the yarn, as distinguished from a clumping or matting together of filaments which may have the general direction of the thread but where the interstices are not directionally uniform and the capillary capacity very much less.

When the wick is positioned for use, the filler yarns extend vertically and serve as the primary capillary means for raising the fuel from the bottom of the trough. But also the warp yarns, which lie horizontally, have similar capillary capacity and they are intimately concatenated with the vertical yarns. This is of advantage especially when the fuel feed is cut down to a minimum for low burning. When the fuel feed is low, the vertical yarns would take up all of the fuel before it had traveled circumferentially in the trough very far from the point of admission, but the fuel feed pipe **12** and the flame would be concentrated at one side,—were it not for the fact that the horizontal yarns carry the fuel horizontally and will distribute it about the angular wick, thereby insuring a uniformly distributed flame when the flame is low as well as when it is high.

My glass wick is less susceptible to adhering a layer of carbon or other residual deposits, and its capillarity is less subject to impairment by such deposits, than is the conventional asbestos wick, and apparently for this reason: The bundle of thousands of very fine glass filaments which constitutes each yarn exposes less interstices at its surface whereby foreign deposits may adhere. Also deposits cannot so well work themselves into the interior of the bundle of filaments, and so long as the interior of the filaments is kept free from clogging the capillarity of the yarn will not be substantially impaired.

I find on off-and-on tests that under conditions where the conventional asbestos wick will not perform satisfactorily for more than fifty or sixty hours before it requires cleaning, my glass wick will perform satisfactorily without attention for some twelve hundred hours, or about twenty times as long.

The glass fibres do not become stiffened or brittle by continued exposure to the heat of the burner, nor does the wick contain any binder material which will become brittle under continued exposure to heat. As a result my wick still retains its original flexibility or freedom from brittleness even after long exposure in use. My glass wick is not attacked by kerosene or higher distillates in which it may be washed to free accumulated deposits. For these reasons it is easier to remove accumulated deposits when that finally does become necessary and, because of the unimpaired flexibility of the wick, the wick is not damaged in the handling incident to the removal of deposits.

Because my glass wick requires cleaning very infrequently and is not substantially impaired by the cleaning, its total life is almost indefinite and can be expected to be comparable with the life of the stove.

I find that a wick of reasonably tight weave from glass yarns of the weight and character described as preferable will satisfactorily retain its shape in an installation such as illustrated. If lighter yarns are used, if the web is woven more loosely, or if the wick must protrude for some distance above the trough without support, it may be advisable to incorporate some expedient for further stiffening the wick to render it more self-supporting. For example, as shown in Fig. 3, some or all of the yarns may have light brass wires **23** intertwisted therewith and woven along with the yarns into the web. The incorporation of the wire in the filler yarns which are the vertical yarns when the wick is in use, are the more effective in rendering the wick more self-supporting.

Alternatively, the wick may be stiffened to give it more self-support by glazing or fusing the surface by fusing heat as by a blow torch. This need not be a continuous glaze; a spotty or sectionalized non-continuous glaze will serve the purpose. As indicated in Fig. 4, this surface glazing may be sectionalized into transversely extending areas **24** separated by unglazed areas. This serves to stiffen the wick against transverse collapsing while permitting it to flex easily longitudinally.

I claim:

1. As a starting wick to be disposed in the annular oil feed trough at the bottom of the space between inner and outer cylindrical perforates of an oilstove burner, a tape woven from yarns each of which is a capillary bundle of thousands of substantially parallel glass filaments with filament diameters considerably less than .001 inch, substantially the entire surfaces of the wick being exposed portions of the glass yarns.

2. A starting wick according to claim 1 reinforced by metal wires extending along some of the yarn and woven as a unit therewith into the tape.

3. As a starting wick to be disposed in an annular feed trough at the bottom of a space between inner and outer cylindrical perforates of an oilstove burner, a tape formed from interwoven and intimately concatenated horizontal and vertical yarns, each of which is a capillary bundle of thousands of substantially parallel glass filaments with filament diameters less than .00075 inch, substantially the entire surfaces of the wick being exposed portions of the glass yarns.

4. A starting wick to be disposed in the annular oil feed trough of an oilstove burner and formed substantially wholly of horizontal and vertical yarns interwoven into a tape, each of the yarns being a capillary bundle of thousands of substantially parallel glass filaments with filament diameters in the order of .00025 inch of a hard glass relatively low in alkali with a softening point in the order of 1500° F.

5. A starting wick for oilstove burners comprising a tape of length, height and thickness suitable for operatively fitting the oil feed trough of a standard oilstove burner, the tape being substantially all glass and formed of interwoven horizontal and vertical yarns, each of which is a capillary bundle of thousands of substantially parallel filaments, with filament diameters in the order of .00025 inch, of hard glass relatively low

in alkali with a softening point in the order of 1500° F. or higher.

6. A starting wick for an oilstove burner, consisting of a tape woven from yarns, each of which is a capillary bundle of thousands of substantially parallel glass filaments with filament diameters considerably less than .001 inch, the surface of the wick being glazed by fusing substantially to stiffen the tape without substantially impairing the capillarity of the yarn.

7. A starting wick for an oilstove burner, consisting of a tape formed from interwoven and intimately concatenated horizontal and vertical yarns, each of which is a capillary bundle of thousands of substantially parallel glass filaments with filament diameters of less than .00075 inch, the tape being surfaced glazed or fused on areas extending vertically across the wick and horizontally spaced apart by unglazed areas, whereby the wick is stiffened horizontally without substantially impairing its longitudinal flexibility.

8. A starting wick to be disposed in the annular feed trough at the bottom of a space between inner and outer cylindrical perforates of an oilstove burner, consisting of an all glass-and-metal woven tape arranged as a ring with the width of the tape upstanding, the horizontal warp being at least in part of wire and the vertical weft being yarn which is a capillary bundle of thousands of substantially parallel glass filaments with filament diameters in the order of .00025 inch.

9. A starting wick to be disposed in the feed trough of an oilstove burner, consisting of vertical yarns formed of capillary bundles of thousands of substantially parallel glass filaments with filament diameters in the order of .00025 inch, which vertical yarns are interwoven with horizontal strands of non-combustible material to hold each bundle of filaments together as a yarn upon exposure to heat from the flame.

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