March 6, 1945. J. M. WEAVER 2,371,006

OIL BURNER WICK

Filed March 8, 1943

Fig. 1.

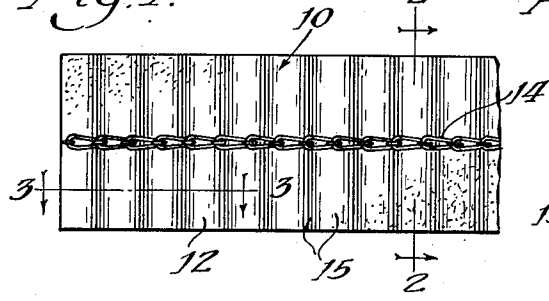


Fig. 2.

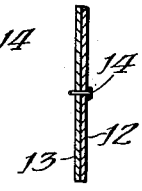


Fig. 3.



Fig. 4.

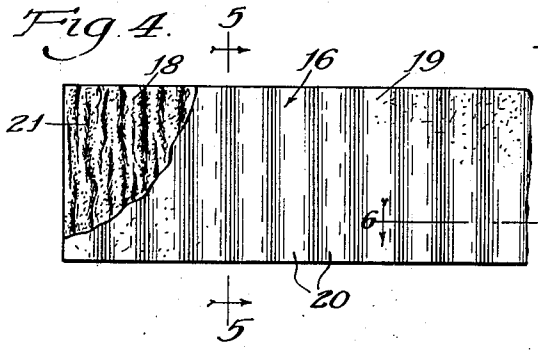


Fig. 5.

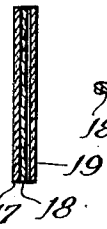


Fig. 6.

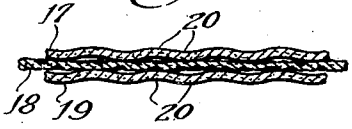


Fig. 7.

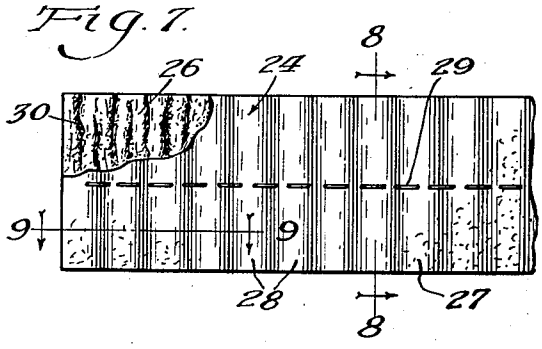


Fig. 8.

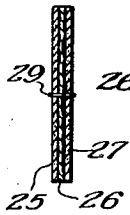


Fig. 9.



11

Fig. 10.

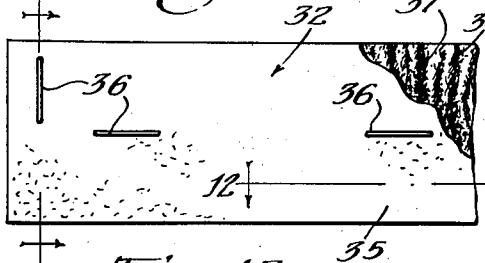


Fig. 11.

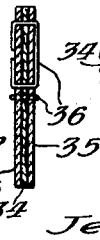
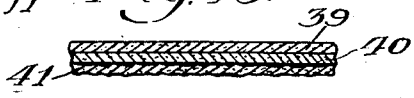


Fig. 12.



Fig. 13.



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UNITED STATES PATENT OFFICE

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OIL BURNER WICK

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Application March 8, 1943, Serial No. 478,486

13 Claims. (Cl. 67—69)

This invention relates to improvements in wicks of the type adapted for use in oil burners, and more particularly to wicks formed entirely of asbestos material. Such wicks have been extensively used and one of the important reasons for the wide acceptance of such wick constructions is due primarily to the non-combustible nature of asbestos by virtue of which the wicks do not char, and thus eliminate the necessity of trimming for purposes of maintaining an even flame.

More specifically my improved asbestos wick construction is of the type comprising a plurality of laminations of asbestos paper secured together as a unit. Wicks of this general type have heretofore been proposed but have not been found entirely satisfactory because of the short term of good performance and because they become "cemented" in the channel of the oil burner base or receptacle, by salts, starches, etc., that boil over in the process of cooking.

One of the objects of this invention is to provide an improved wick formed of a plurality of laminations of hard and dense asbestos paper stock and soft, porous asbestos felt, and wherein said wick is constructed in a manner to provide high capillary action for feeding of the oil to the area of vaporization and combustion.

Another object is to provide an improved wick formed of a plurality of laminations of asbestos and wherein one lamination has higher and more rapid capillary action than the other or others for quickly feeding fuel oil to the upper edge of the wick in proper quantity to effect quick and thorough vaporization with minimum carbon formation and coking.

A further object is to provide an improved, laminated asbestos paper wick which may be readily bent, without danger of rupturing or breaking, for fitting into the annular channel of the burner base or wick receptacle.

A still further object is to provide an improved laminated asbestos paper wick which is preformed as a flat strip, so as to lend itself to convenient packaging and shipment, in strip form or when coiled into a roll, and which may be readily bent to fit the wick receptacle without danger of rupturing or breaking.

And still another object is to provide an improved laminated asbestos paper wick having one or more laminations of felted asbestos having crimped or rippled surfaces for obtaining a high degree of capillary action for rapidly feeding an adequate quantity of oil to the area of vaporization and combustion.

Still another object is to provide an improved laminated asbestos paper wick wherein one or more of said laminations is crimped, rippled, fluted or corrugated, and which permits ready bending of the wick to fit a burner base or wick receptacle without danger of rupturing or breaking.

Other objects and advantages of this invention will be apparent from the following description taken in connection with the accompanying drawing in which:

Fig. 1 is a face view of an improved asbestos paper wick construction embodying the present invention.

Figs. 2 and 3 are vertical and transverse sections through the wick, taken substantially as indicated at lines 2—2 and 3—3 respectively on Fig. 1.

Fig. 4 is a face view of a modified form of asbestos paper wick.

Figs. 5 and 6 are vertical and transverse sections, taken substantially as indicated at lines 5—5 and 6—6 respectively on Fig. 4.

Fig. 7 is a face view of another modified form of my improved asbestos paper wick.

Figs. 8 and 9 are sectional views, taken substantially as indicated at lines 8—8 and 9—9 respectively on Fig. 7.

Fig. 10 is a face view of a further modification of my improved asbestos paper wick.

Figs. 11 and 12 are sectional views, taken as substantially indicated at lines 11—11 and 12—12 respectively on Fig. 10.

Fig. 13 is a sectional view of a still further modification of my improved asbestos paper wick.

In oil burners of the hydrocarbon blue flame type designed especially for consumption of kerosene, the kerosene in liquid form is consumed for only a few minutes after ignition each time the burner is operated. During this initial period the kerosene is consumed on the edge of the wick and the fire burns as a yellow flame, and serves to heat the sheet metal "shells" which form the combustion chamber. The heat from the combustion chamber is conducted to the wick and the metal burner base or wick receptacle, causing heat to radiate to the face of the wick, which results in vaporizing the kerosene. The vaporized kerosene rises and admixes with the air drawn into the combustion chamber through the perforations in the walls thereof and the admixture then burns as a blue flame.

Such burners are so constructed as to control the fuel for maintaining a relatively uniform or constant level. The wick and its retaining re-

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ceptacle are lowered so that kerosene will flow into the receptacle and effect saturation of the wick, and then the receptacle is raised to dispose the wick to a desired height at which the flame is to be held. The flame is controlled by the amount of vapor produced and this is determined by the quantity of kerosene admitted to the wick base or receptacle. When the wick receptacle is lowered fuel flows into the channel thereof to a depth of about ⅛ of an inch or less, and the capillary action of the wick feeds the fuel to the top edge of the wick. This action may be fast or slow depending upon the characteristics of the wick material employed.

In its broad aspect this invention is directed to a novel wick construction composed of two or more laminations of asbestos paper stock which may be secured together in any one of a number of different satisfactory conventional manners, and wherein at least one of the laminations is provided with ridged surfaces.

The term "ridged" as used herein and in the claims in the absence of a more appropriate, generic term, is to be understood as defining elevations and depressions in the surfaces of the asbestos paper, whether they be in the nature of corrugations, fluting, rippling or crimping. The term "fluting" as used herein is to be understood as being synonymous in meaning with the term "corrugations" and defines relatively shallow depth alternate elevations and valleys. The term "felt" as used herein is to be understood as defining a relatively soft, porous, asbestos paper as distinguished from dense, or hard asbestos paper.

The purpose of utilizing one or more laminations having ridged surfaces is three-fold—the first purpose is to insure obtaining sufficient capillary action for feeding of the oil quickly to the upper edge of the wick for lighting and later for enhancing vaporization. The second purpose is to insure adequate flexibility of the laminated wick to permit it to be conveniently bent for fitting in a burner base or wick receptacle of an oil burner, without danger of rupturing or breaking, or excessive buckling of certain of the laminations. The third purpose is to permit the wick material to be initially made in relatively long strips and coiled in rolls for convenient shipment.

In the construction illustrated in Figs. 1 to 3 of the drawing, the wick indicated at **10** is composed of two laminations or plies, **11** and **12**, of standard asbestos paper stock, stitched together as indicated at **14** at its longitudinal center for firmly securing the laminations or plies together as a unit. The laminated wick thus formed is preferably fluted or corrugated as indicated at **15** after the laminations thereof are secured together.

In the construction illustrated in Figs. 4 to 6 of the drawing, the wick indicated at **16** is composed of three laminations of asbestos paper stock, designated as **17**, **18** and **19**. The two outer laminations or plies **17** and **19** are fluted or corrugated as indicated at **20**, and the inner surfaces thereof are adhesively secured to the intermediate lamination or ply **18** which, as may be clearly seen in Fig. 4 of the drawing, has the surfaces thereof crimped or rippled or fluted or corrugated as indicated at **21**. The inner lamination **18** is of thin, soft, porous asbestos felt, which due to its surface formation provided multiplicity of elevations and depressions or valleys which form open spaces with the adjoining laminations **17** and **19**, which with the soft nature of the felt provides adequate capillary action for supplying the necessary quantity of fuel to the upper edge of the wick. It may be understood that the laminations **17** and **19** may be corrugated prior to assembly with the intermediate lamination or may be corrugated after assembly with said intermediate lamination **18**.

In the construction illustrated in Figs. 7 to 9 of the drawing, the wick indicated at **24** represents my preferred construction and is composed of three plies or laminations of asbestos paper stock, designated as **25**, **26** and **27**. The ply **25** is preferably formed of a relatively dense, hard asbestos paper which possesses a high degree of resistance to impairment of its surface, due to its rigid construction and firmness, and insures greater stability than other types of asbestos paper under the disintegrating effects of a flame, and also serves to transmit heat to the lamination **26**.

The lamination **27** is formed of standard asbestos paper stock while the intermediate lamination **26** is of thin, soft, asbestos felt having crimped or rippled surfaces to form open spaces and valleys with the adjacent surfaces of the other laminations which, with the soft nature of the felt, provide adequate capillary action for supplying the necessary quantity of fuel to the upper edge of the wick. Said laminations **25**, **26** and **27** are secured together along the longitudinal center thereof by stitching as indicated at **29**, and are fluted or corrugated as a unit as indicated at **28**.

In the construction illustrated in Figs. 10 to 12, the wick is composed of three laminations or plies of asbestos paper stock, designated as **33**, **34** and **35**, connected together as a unit by means of staples **36**. The outer plies **33** and **35** are formed of standard asbestos paper stock while the intermediate ply **34** is of thin, soft asbestos felt and has its surfaces, as indicated at **37** rippled.

As a modification of the construction shown in Figs. 10 to 12, the two outer plies **33** and **35** may be formed of relatively hard, dense paper stock, while the intermediate ply is preferably of soft asbestos felt provided with ridged surfaces.

In the construction shown in Fig. 13, one of the outer plies, designated at **39** and the intermediate ply **40**, are formed of relatively hard, dense paper stock, while the other outer ply **41**, is preferably formed of soft asbestos felt, provided with ridged surfaces.

It has been found from actual experience that a wick formed of a plurality of plies or laminations of asbestos paper stock whether secured together by stitching, adhesive or by stapling will easily buckle, rupture and break when bent from a flat form into an arc for accommodating it to the burner base or wick receptacle of an oil burner, unless one or more of the laminations has the surfaces thereof formed with ridges, that is, either in the form of a fluted surface, corrugated surface, a rippled surface or a crimped surface.

It has likewise been found that the use of a lamination having ridged surfaces greatly increases the capillary action for feeding of the oil to the area of vaporization and combustion, and to even further increase the capillary action I prefer that the intermediate lamination, which in the construction herein shown and described, is shown as rippled, be formed of especially soft asbestos paper.

When thin, soft, felt paper is used it affords

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rapid absorption of oil, permitting quick lighting, quick development of the flame and better control of the flame, and efficient and thorough vaporization of the fuel with minimum coking effect. If too great a quantity of fuel is supplied a smoky operation will result, hence I prefer to use a thin, soft, intermediate lamination. While a heavy, soft asbestos felt may be used it has been found that thin felt affords better flame control.

By virtue of my novel construction it is possible to form the wicks in flat strip formation for convenience in packaging and shipment, or for coiling in rolls, and the wicks may readily be bent and formed to fiat a burner base of an oil burner without possibility of rupturing or breaking of the laminations thereof, irrespective of whether the laminations are secured together by means of stitching, adhesive or by staples.

It will be apparent that where it is desired that one or more laminations of the wick be corrugated, such laminations may be initially corrugated prior to connection with the other laminations, or the total assembly of the laminations may be corrugated or crimped together by passing the laminated strip through suitable crimping or corrugating wheels.

While not absolutely essential, I prefer to utilize a wick construction composed of a plurality of laminations wherein one of the intermediate laminations has the surfaces thereof rippled, and wherein said intermediate lamination is formed from a relatively soft asbestos paper stock which possesses a higher degree of capillarity than the other laminations.

The illustrations in the drawing are to be understood as diagrammatic representations, shown on an enlarged and somewhat exaggerated scale.

While I have herein shown and described certain preferred embodiments of my invention, manifestly it is capable of further modification without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise forms herein disclosed, except as I may be so limited in the appended claims.

I claim as my invention:

1. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, and having an intermediate lamination formed with rippled surfaces, and one of the other laminations being corrugated.

2. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the inner and outer laminations being corrugated and an intermediate lamination being formed with rippled surfaces.

3. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the inner lamination being corrugated and an intermediate lamination being formed with rippled surfaces.

4. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the outer lamination as compared to the other laminations being formed of relatively harder and more, dense paper stock, and one of the other laminations being formed with ridged surfaces.

5. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the outer lamination as compared to the other laminations being formed of relatively harder and more, dense paper stock, and one of the other laminations being formed with rippled surfaces.

6. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the outer lamination as compared to the other laminations being formed of relatively harder and more, dense paper stock, and an intermediate lamination formed with rippled surfaces.

7. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, the outer lamination being formed of relatively hard, dense paper stock, the inner lamination being corrugated and an intermediate lamination as compared to the outer laminations being formed of relatively soft paper stock and formed with rippled surfaces.

8. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, one of the laminations being formed of relatively soft paper stock, and the outer lamination as compared to said one lamination being formed of relatively harder and more, dense paper stock.

9. An oil burner wick comprising three superimposed laminations of asbestos paper connected together as a unit, each of said laminations being corrugated, and the intermediate lamination being formed with rippled surfaces.

10. An oil burner wick comprising a plurality of superimposed laminations of asbestos paper connected together as a unit, at least two of said laminations as compared to the remaining lamination or laminations being formed of relatively harder and more, dense paper stock, and another lamination being formed with ridged surfaces.

11. An oil burner wick comprising three superimposed laminations of asbestos paper connected together as a unit, the outer lamination being formed of relatively hard, dense paper stock, the inner lamination as compared to the outer lamination being formed of relatively soft paper stock, and the intermediate lamination being formed with ridged surfaces.

12. An oil burner wick comprising three superimposed laminations of asbestos paper connected together as a unit, the outer and inner laminations as compared to the intermediate lamination being formed of relatively harder and more, dense paper stock, and the intermediate lamination being formed with ridged surfaces.

13. An oil burner wick comprising three superimposed laminations of asbestos paper connected together as a unit, the intermediate lamination and one of the other laminations being formed of relatively hard, dense paper stock, and the remaining lamination being formed with ridged sudfaces.

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