April 14, 1942. G. WALTERS 2,279,354

WOVEN WICK

Filed Aug. 3, 1940 2 Sheets-Sheet 1

Fig. 1.

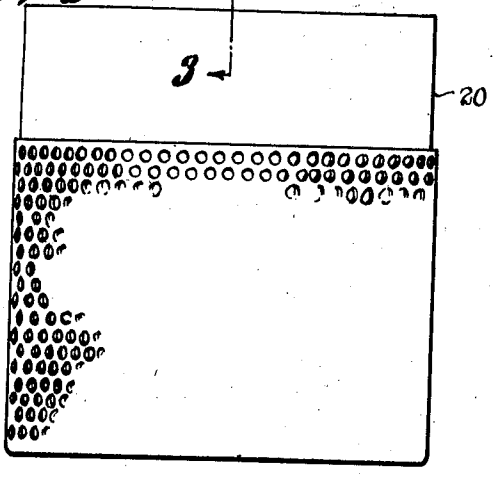


Fig. 2.

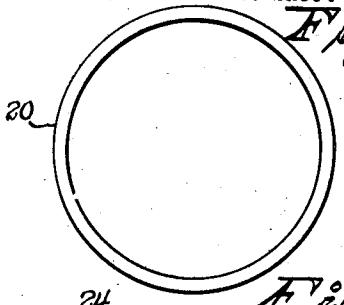


Fig. 5.

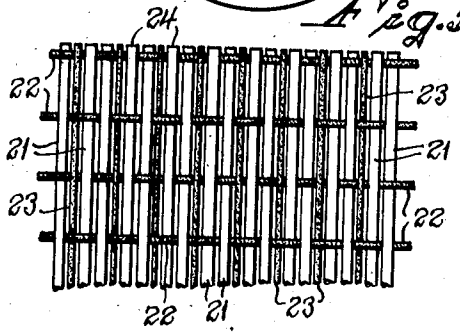


Fig. 3.

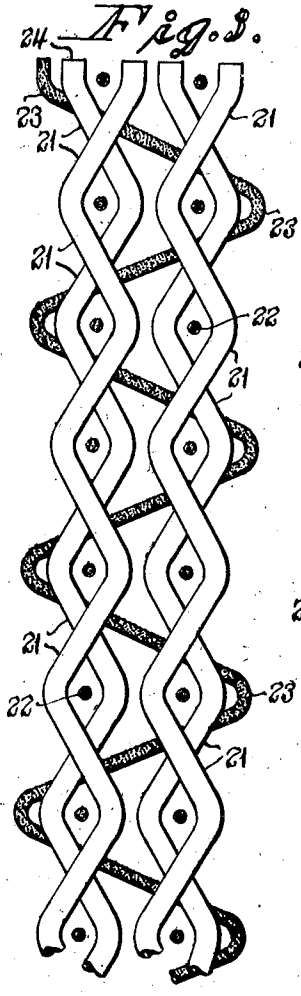


Fig. 4.

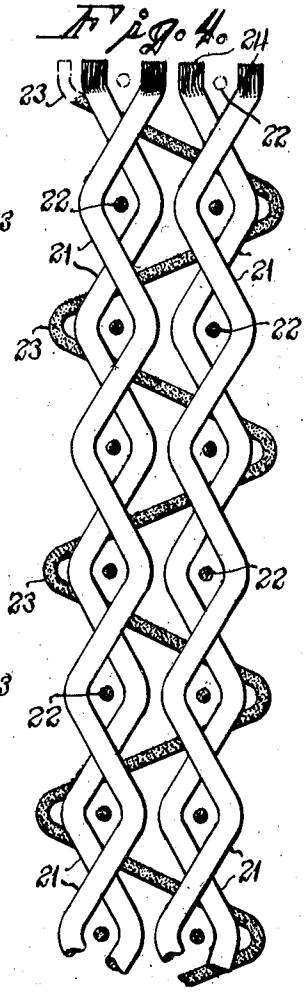
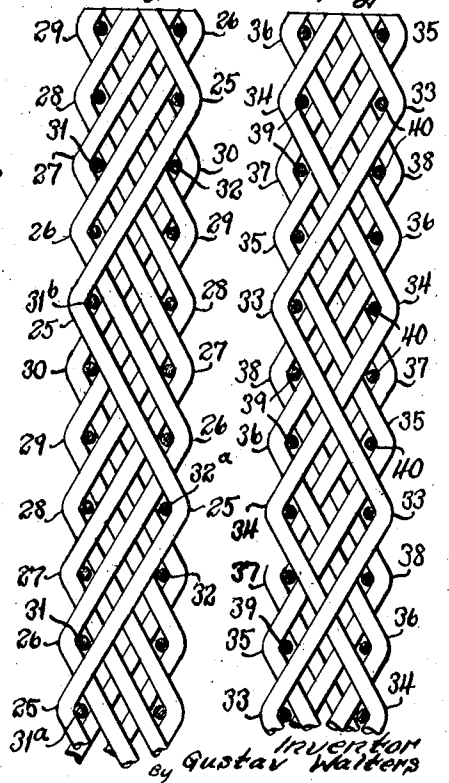


Fig. 6. Fig. 7.



Inventor
Gustav Walters
By Lagmore, Sale & Nichols
Attorneys

April 14, 1942. G. WALTERS 2,279,354

WOVEN WICK

Filed Aug. 3, 1940 2 Sheets-Sheet 2

Fig. 8.

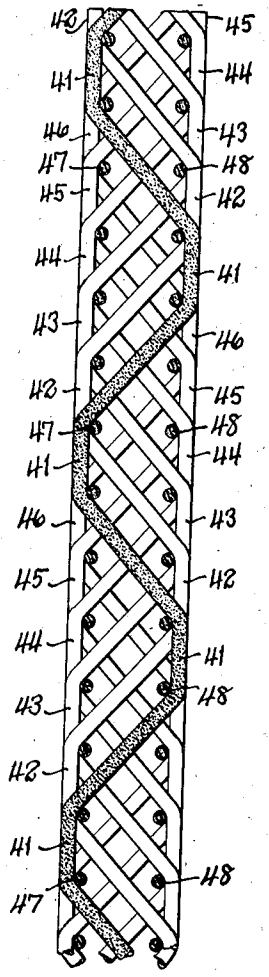


Fig. 9.

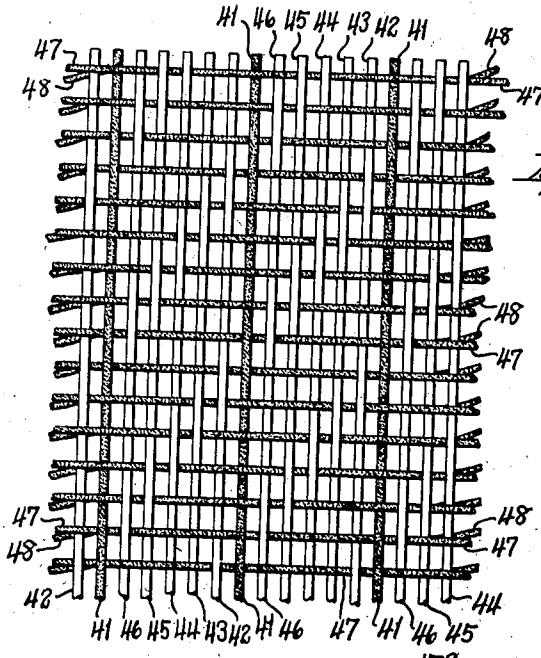


Fig. 19.

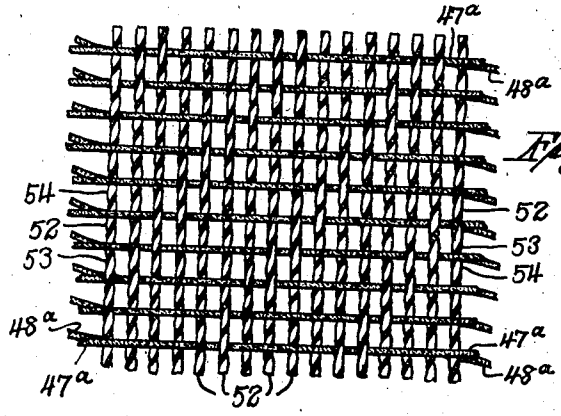


Fig. 11.

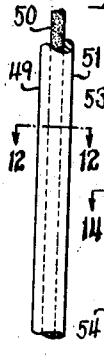


Fig. 13.

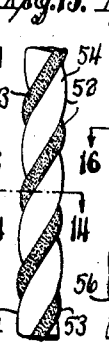


Fig. 15.



Fig. 17.



Fig. 10.

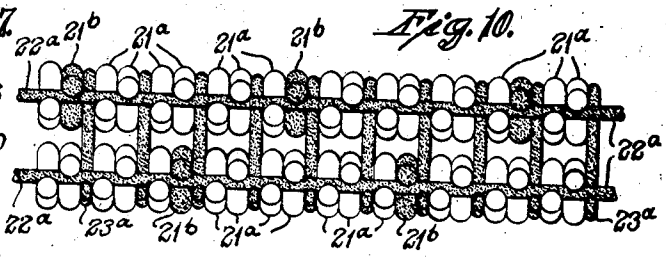


Fig. 12.

Fig. 14.

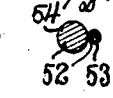


Fig. 16.

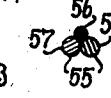
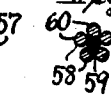


Fig. 18.



Inventor
Gustav Walters
by
Seymour, Cooley & Watson
Attorneys

Patented Apr. 14, 1942

2,279,354

UNITED STATES PATENT OFFICE

2,279,354

WOVEN WICK

Gustav Walters, Middletown, Conn., assignor to The Russell Manufacturing Company, Middletown, Conn., a corporation of Connecticut

Application August 3, 1940, Serial No. 350,583

13 Claims. (Cl. 67—69)

This invention relates to improvements in woven wicks, and more particularly to woven wicks for use in oil-stoves and the like.

This application is a continuation-in-part of my application Ser. No. 227,705 filed August 31, 1938.

One object of this invention is to provide an improved woven wick for oil-stoves and the like which will have a long life and which will retain a proper burning edge with a minimum of attention.

Another object of this invention is to provide an improved woven wick for oil-stoves and the like which will have a long life and at the same time will have good capillary action to supply an adequate amount of fuel for a satisfactory flame.

Other objects of this invention will appear from the present disclosure.

In the accompanying drawings, in which certain ways of carrying out the invention are shown for illustrative purposes:

Fig. 1 is a front elevation illustrating one embodiment of the invention in the form of a tubular wick mounted in a tubular carrier of usual form;

Fig. 2 is a top plan view on a reduced scale, of the wick shown in Fig. 1, the carrier being omitted;

Fig. 3 is an enlarged vertical diagrammatic fragmental section on line 3—3 of Fig. 1, showing one form of weave-construction;

Fig. 4 is a view similar to Fig. 3 but with the top portion of the wick after having been burned;

Fig. 5 is a reduced scale left-side elevation of the upper portion of Fig. 3;

Fig. 6 is a view similar to Fig. 3 of a modified form of weave-construction;

Fig. 7 is a view similar to Fig. 6 of another modified form of weave-construction;

Fig. 8 is a view similar to Fig. 6 of still another modified form of weave-construction;

Fig. 9 is a reduced scale left-side elevation of Fig. 8;

Fig. 10 is a top plan view of Fig. 3 in a right-angle-rotated position with certain of the warp-strands shown as flame-destroyable;

Fig. 11 is a side elevation of a modified form of warp strand;

Fig. 12 is a sectional view on line 12—12 of Fig. 11;

Fig. 13 is a side elevation of another modified form of warp strand;

Fig. 14 is a sectional view on line 14—14 of Fig. 13;

Fig. 15 is a side elevation of another modified form of warp strand;

Fig. 16 is a sectional view on line 16—16 of Fig. 15;

Fig. 17 is a side elevation of still another modified form of warp strand;

Fig. 18 is a sectional view on line 18—18 of Fig. 17; and

Fig. 19 is a view similar to Fig. 9 of a fragmental portion of a wick employing the form of warp strand illustrated in Figs. 13 and 14.

In the description and claims, the various parts are identified by specific names for convenience, but they are intended to be as generic in their application as the prior art will permit.

The particular form of the invention chosen for illustration is a tubular wick **20** preferably, though not necessarily, woven in seamless form. In the form of weave illustrated in Figs. 3, 4 and 5, the wick is of two-ply construction, including longitudinal or warp strands **21**, transverse or weft- or filler-strands or picks **22**, and binder strands **23**. The warp strands are each made of flame-destroyable fibres of superior oil-feeding capacity, and flame-resistant fibres intermingled in suitable proportions to produce a flame-resistant strand, that is, a strand which when subjected to a flame will not promptly burn up or disintegrate so as to lose its strand form, but will retain its strand form and functioning as part of the upper surface of a wick. The weft strands **22** and binder strands **23** are preferably made of flame-destroyable fibres, so as to produce a flame-destroyable strand, that is, a strand which is either completely consumed by flame or which is so substantially completely destroyed by flame as to result in the ready disintegration or falling apart of the portion of such a strand which has been subjected to flame. Therefore, when the top or flame edge **24** of the wick is burned for some time, and particularly when the oil of the stove has been permitted to burn dry, the top ends of the binder strands **23** and such of the weft strands **22** as are located adjacent the top of the wick will be burned away or so thoroughly disintegrated as to no longer form part of the upper end of the wick, and the upper ends of the warp strands **21** will have their flame-destroyable fibres burned out or disintegrated so as to leave only the flame-resistant fibres remaining at their upper or flame ends as indicated at the upper end of Fig. 4. When in use in oil stoves and the like, repeated burning dry of wicks made in accordance with the present invention actually clean and improve the flame-edge of the wick,

and does not harm the wick at all. By having the weft-strands **22** and the portions of the binder-strands **23** which are adjacent the upper edge of the wick burned out, or disintegrated, risk is avoided of having portions of such warp or binder-strands stick up and cause uneven-burning places in the wick.

The flame-destroyable fibres of superior oil capillarity or oil-feeding capacity are preferably vegetable fibres of cotton or sulphite pulp or the like, or mixtures thereof, and the flame-resistant fibres are of asbestos, glass, rock wool or the like, or mixtures thereof. Where the flame-destroyable and flame-resistant fibres are intermingled in a given warp-strand to make it flame-resistant, they are intermingled to produce a substantially uniform distribution of the two kinds of fibres.

Throughout the drawings of the present application, all flame-destroyable strands and threads, are indicated by stippling, in order to readily distinguish these flame-destroyable strands and threads from the flame-resistant strands and threads.

The particular form of weave illustrated in Fig. 6 is of two-ply construction and includes a plurality of sets or groups of warp-strands which, in the present instance, comprise six warp-strands, each respectively designated **25, 26, 27, 28, 29** and **30**. The said warp-strands extend diagonally back and forth through the fabric and alternately pass over or around weft-strands or picks **31** in one face of the fabric and over or around weft-strands or picks **32** in the opposite face of the fabric.

By way of example, the warp-strands **25**, after passing over and around the first weft-pick **31***a*, extends diagonally and misses engagement with several weft-picks **31** and **32** before appearing on the opposite face of the fabric for extension around the weft-pick **32***a*. The warp-strand **25** then extends diagonally to the opposite face of the fabric and again misses several weft-picks before looping over or around the weft-pick **31***b*. The remaining warp-strands **26, 27, 28, 29** and **30** are all staggered with respect to the warp-strand **25** and each other in the order named and each thereof similarly misses several picks between its appearance on the respective opposite faces of the fabric, as clearly shown in Fig. 6.

It will be understood, of course, that other sets of warp-strands corresponding to the warp-strands **25** to **30** inclusive exist in the fabric in the background of the strands shown in Fig. 6. By way of example, the next warp-strand back of the warp-strand **30** would be a warp-strand corresponding in position and inclination to the warp-strand **25**.

The particular form of weave illustrated in Fig. 7 is of two-ply construction and includes a plurality of sets or groups of warp-strands which comprise six strands each respectively designated **33, 34, 35, 36, 37** and **38** arranged from the foreground to the background in the order named. In one face of the fabric is a series of weft-strands or picks **39** and in the opposite face is a corresponding series of weft-strands or picks **40**. The said weft-strands or picks **39** in one face are tied to the weft-strands or picks **40** in the other face solely by the warp-strands **33** to **38** inclusive before referred to. The said warp-strands all extend diagonally back and forth through the fabric similarly to the weave shown in Fig. 6, each of the said warp-strands missing several weft-picks between its appearance on the respective opposite faces of the fabric. It may be explained in this connection that in the weave of Fig. 7, the next warp-strand in the background beyond the warp-strand **38** would be another warp-strand corresponding in position to the position of the warp-strand **33** and constituting the first strand of another group of similar warp-strands.

The particular form of weave illustrated in Fig. 8 is of two-ply construction similar to the construction illustrated in Fig. 6, and includes a plurality of sets or groups of warp-strands which comprise six strands each respectively designated **41, 42, 43, 44, 45** and **46** arranged from the foreground to the background in the order named. In one face of the fabric is a series of weft-strands or picks **47** and in the opposite face is a corresponding series of weft-strands or picks **48**. The said weft-strands or picks **47** in one face are tied to the weft-strands or picks **48** in the other face solely by the warp-strands **41** to **46** inclusive before referred to. The said warp-strands all extend diagonally back and forth from one face of the fabric to the other, and, like the weaves shown in Figs. 6 and 7, each of the said warp-strands **41** to **46** inclusive misses a number of weft-picks between its appearance upon the respective opposite faces of the fabric. The form of weave of Fig. 8 differs primarily from the form of weave of Fig. 6 by the fact that each warp-strand engages over or loops around two successively-arranged weft-picks, instead of around one as in Fig. 6. It will be evident that instead of having each warp-strand loop around one or around two weft-picks, the form of weave could be such that each warp-strand is looped over more than two weft-picks at a time.

It will be noted that the forms of weaves shown in Figs. 6, 7, 8 and 9 contain no binder-strands, but only warp-strands and weft-strands. All the warp-strands in Figs. 6 and 7 are each made of flame-destroyable fibers and flame-resistant fibers intermingled to produce flame-resistant warp-strands. In the construction of Figs. 8 and 9, each warp-strand **41** is flame-destroyable and of superior oil-feeding capacity, while each of the five warp-strands **42, 43, 44, 45** and **46** is a flame-resistant warp-strand. It will be seen that by having the flame-destroyable warp-strands less in number than the flame-resistant warp-strands and well distributed or scattered among them, that an objectionable uneven flame-edge of the wick is avoided. Instead of having one in six of each group of warp-strands flame-destroyable, a lesser or greater proportion of flame-destroyable warp-strands could be employed. The filler or weft-strands of the constructions of Figs. 6, 7, 8 and 9, are preferably made of all flame-destroyable fibers so as to produce flame-destroyable weft-strands.

In the form of the invention shown in Fig. 10, which illustrates a top plan view of the edge of the wick shown in Fig. 3 modified to the extent that a certain minor number of the warp-strands are flame-destroyable and of superior oil-feeding capacity in order to feed a larger amount of oil to the flame-edge of the wick than would be fed by a wick of this type in which all of the warp-strands were made of intermingled flame-resistant and flame-destroyable fibers. Thus, referring to Fig. 10, the warp-strands **21***a* are flame-resistant warp-strands, and the warp-strands **21***b* are flame-destroyable warp-strands to thus give

greater oil-feeding capacity to the wick. The binder-strands **23***a* are flame-destroyable and of superior oil-feeding capacity and therefore aid in supplying an adequate amount of oil to the flame-edge of the wick. The weft-strands **22***a* are also flame-destroyable.

Instead of having a warp-strand either all flame-resistant or all flame-destroyable, it can have a longitudinally-continuous flame-resistant portion and a longitudinally-continuous flame-destroyable portion which is superior in oil-feeding capacity to the flame-resistant portion. Thus the warp-strand **49** shown in Figs. 11 and 12, has a flame-destroyable center-thread or strand-portion **50** of superior oil-feeding capacity and surrounded by a flame-resistant portion **51**.

The warp-strand **52** illustrated in Figs. 13 and 14, has a flame-destroyable thread **53** twisted with the flame-resistant thread **54** to form the warp-strand.

The warp-strand **55** shown in Figs. 15 and 16, is formed by the flame-destroyable thread **56** twisted with two flame-resistant threads **57**. And the warp-strand **58** illustrated in Figs. 17 and 18 has a central flame-destroyable thread **59** twisted together with five flame-resistant threads **60**. Similarly, it will be evident that any other desired combination of flame-destroyable and flame-resistant threads may be used, twisted together or untwisted or lying side by side. to form a warp-strand.

Any of the flame-resistant warp-strands **49**, **52**, **55** or **58** or any combinations thereof with or without flame-destroyable warp-strands and/or other forms of flame-resistant warp-strands can be used to make any wicks in accordance with this invention. Thus, for example, in making a wick having a weave-construction as shown in Figs. 8 and 9 and employing the type of warp-strand **52** having a flame-destroyable portion **53** and a flame-resistant portion **54**, all of the warp-strands can be made of such warp-strands **52**, as illustrated in Fig. 19, and with the weft-strands **47***a* and **48***a* flame-destroyable. By suitably proportioning the diameters of the flame-destroyable portion **53** and the flame-resistant portion **54**, any desired oil-feeding characteristics can be given to the wick.

Where a wick is woven in seamless form, the longitudinal strands whose ends form the flame-edge of the wick, are the warp-strands, and the transverse strands are the weft or filler strands or picks. But where a wick is woven as a strip to be formed up in tubular shape to provide a seamed tubular wick, the longitudinal strands whose ends form the flame-edge of the wick, may either be the warp or weft strands, depending on how the wick-forming strip is cut from the woven fabric.

I have found it to be important that the warp or longitudinal strands of the wick be composed of between 30% and 70% flame-resistant fibres, and the remainder of flame-destroyable fibres superior in oil-feeding capacity to the flame-resistant fibres. It will be evident from the variety of forms of the invention herein set forth, that this does not mean that each warp-strand has to be composed of between 30% and 70% by weight of flame-resistant fibres, but that all the longitudinal or warp-strands, considered as a group, whether some be of all flame-destroyable fibres or all flame-resistant fibres or partly of flame-destroyable fibres and partly of flame-resistant fibres, that the total average composition of all the longitudinal strands should range between 30% and 70% of flame-resistant fibres with the balance of flame-destroyable fibres which are superior in oil-feeding capacity to the flame-resistant fibres. The most effective percentage of composition will vary depending upon the form of weave and the form of warp-strands or combinations of warp-strands which are used in a given wick.

Where a longitudinal or warp-strand is to be formed of flame-resistant fibres intermingled with flame-destroyable fibres of superior oil-feeding capacity, it is more preferable to have from 40% to 60% of flame-resistant fibres with the balance of flame-destroyable fibres in order to produce a strand which will have good flame-resistance and lasting quality in service, and which will also have good oil-feeding capacity.

Wicks made in accordance with the present invention may be used in various oil-stoves or the like which employ wicks. Thus, for example, a tubular form of wick may be mounted in a usual form of carrier as shown in Fig. 1, or a tubular wick of short height may be used as a top or attachment-wick.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A woven wick having longitudinal strands and transverse strands woven together; at least a majority of the longitudinal strands being flame-resistant; and substantially all the transverse strands being flame-destroyable.

2. A woven wick having longitudinal strands and transverse strands woven together; at least a majority of the longitudinal strands being flame-resistant; and at least some of said longitudinal flame-resistant strands each having a longitudinally-continuous flame-resistant portion, and a longitudinally-continuous flame-destroyable portion superior in oil-feeding capacity to said flame-resistant portion.

3. A woven wick having longitudinal strands and transverse strands woven together; at least a majority of the longitudinal strands being flame-resistant; at least some of said longitudinal flame-resistant strands each having a longitudinally-continuous flame-resistant portion, and a longitudinally-continuous flame-destroyable portion superior in oil-feeding capacity to said flame-resistant portion; and substantially all the transverse strands being flame-destroyable.

4. A woven wick having longitudinal strands and transverse strands woven together; a majority of the longitudinal strands being flame-resistant; and a minority of the longitudinal strands being flame-destroyable and superior in oil-feeding capacity to said flame-resistant strands.

5. A woven wick having longitudinal strands and transverse strands woven together; a majority of the longitudinal strands being flame-resistant; a minority of the longitudinal strands being flame-destroyable and superior in oil-feeding capacity to said flame-resistant strands; and substantially all the transverse strands being flame-destroyable.

6. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; a majority of the longitudinal strands being flame-resistant; and a minority of the longitudinal strands being flame-destroyable and superior in oil-feeding capacity to said flame-resistant strands.

7. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; a majority of the longitudinal strands being flame-resistant; a minority of the longitudinal strands being flame-destroyable and superior in oil-feeding capacity to said flame-resistant strands; and substantially all the transverse strands being flame-destroyable.

8. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; a majority of the longitudinal strands being flame-resistant; a minority of the longitudinal strands being flame-destroyable and superior in oil-feeding capacity to said flame-resistant strands; binder-strands connecting the plies together; and substantially all of the transverse strands and binder-strands being flame-destroyable.

9. A woven wick having longitudinal strands and transverse strands woven together; the longitudinal strands being composed of between thirty per cent and seventy per cent flame-resistant fibres and the remainder of flame-destroyable fibres superior in oil-feeding capacity to said flame-resistant fibres; and substantially all the transverse strands being flame-destroyable.

10. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; the longitudinal strands being composed of between thirty per cent and seventy per cent flame-resistant fibres and the remainder of flame-destroyable fibres superior in oil-feeding capacity to said flame-resistant fibres.

11. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; the longitudinal strands being composed of between thirty per cent and seventy per cent flame-resistant fibres and the remainder of flame-destroyable fibres superior in oil-feeding capacity to said flame-resistant fibres; and substantially all the transverse strands being flame-destroyable.

12. A woven wick having a plurality of plies each formed by longitudinal strands and transverse strands woven together; the longitudinal strands being composed of between thirty per cent and seventy per cent flame-resistant fibres and the remainder of flame-destroyable fibres superior in oil-feeding capacity to said flame-resistant fibres; binder-strands connecting the plies together; and substantially all of the transverse strands and binder-strands being flame-destroyable.

13. A woven wick having longitudinal strands and transverse strands woven together; the longitudinal strands being composed of between thirty per cent and seventy per cent flame-resistant fibres and the remainder of flame-destroyable fibres superior in oil-feeding capacity to said flame-resistant fibres.

GUSTAV WALTERS.