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P. S. RAMOS
COMPOSITE WICK

2,504,584

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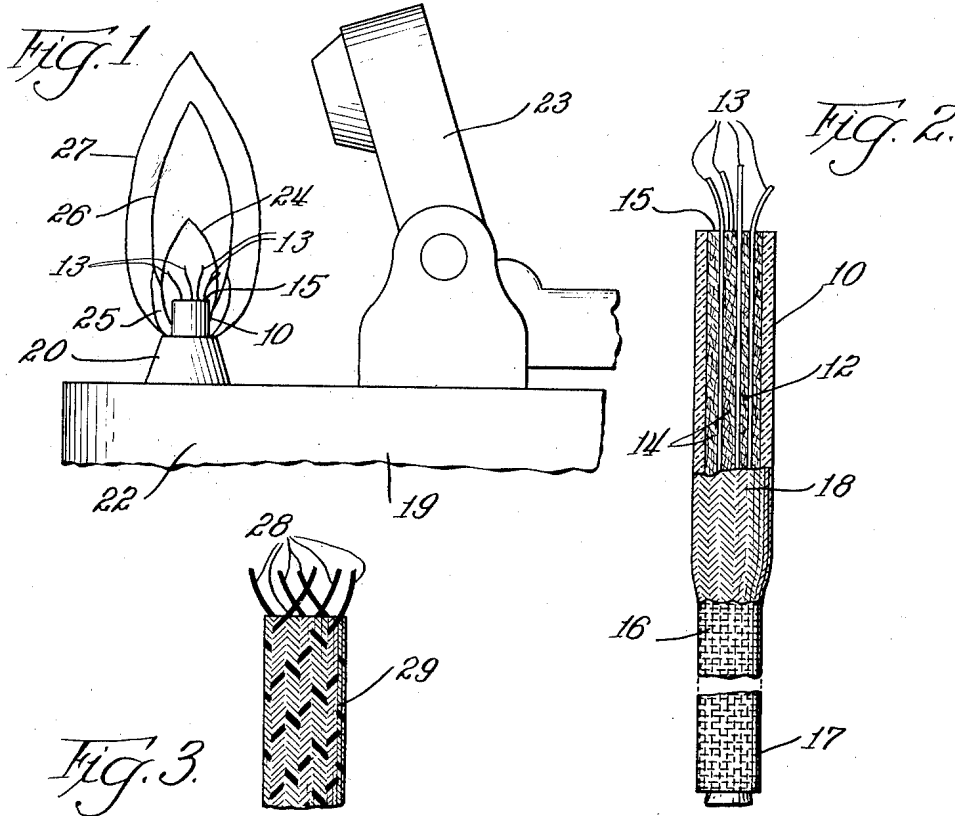


Fig. 3.

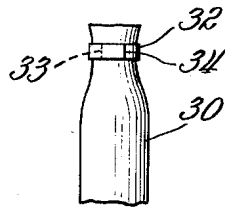
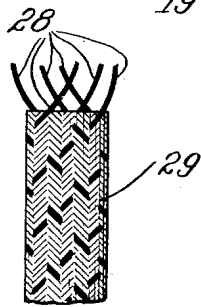


Fig. 4.



Fig. 6.

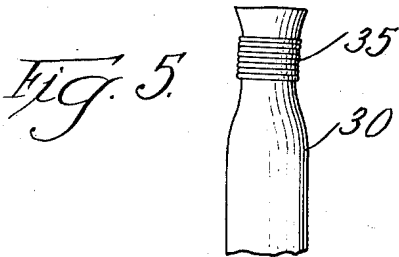


Fig. 5.

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UNITED STATES PATENT OFFICE

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COMPOSITE WICK

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4 Claims. (Cl. 67—69)

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This invention relates to composite wicks of a type adapted to use in combustible liquids for carrying such liquid from a supply chamber to a place of combustion.

One of the general objects of my invention is to provide an efficient composite wick for combustible materials which is adapted to long service life.

Another object of my invention is to provide a flame supporting wick structure embodying a heat-retaining element which tends to maintain combustion so as to prevent the flame from being blown out in the wind, or the like.

My invention has for a further object the provision of a composite wick structure incorporating a filler of a burnable material having good properties of capillarity and an outer cover of material which is non-combustible at ordinary flame temperatures, which cover is pervious to combustible liquid and constructed to minimize deterioration of the portion of the wick which is exposed to the flame.

As another object, the invention comprehends the provision in a wick of an end portion carrying a stiffening coating adapted to facilitate the threading of the wick into a receiving opening of a holder, container, or the like.

The invention further contemplates the use, in the manufacture of composite wicks composed of a filler possessing properties of capillarity and a normally flexible and liquid pervious covering for the filler, of a cementitious substance applied to the covering as a stiffening medium to facilitate the insertion of the filler, at least the major portion of which cementitious substance may be later removed from the covering to restore its normal liquid perviousness.

It is another object of my present invention to provide means for holding together the end portion of a composite wick structure to minimize the disintegration of that portion of the wick which would normally accompanying fraying.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings in which similar characters of reference indicate similar parts throughout the several views.

In the one sheet of drawing:

Fig. 1 is a fragmentary side elevational view depicting the adaptation of a preferred form of my composite wick to a cigar lighter;

Fig. 2 is a side view partially in section and partially in elevation and drawn to an enlarged scale for illustrating the structure of a preferred embodiment of my composite wick;

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Fig. 3 is a fragmentary side elevational view of a wick embodying a modification of the invention; and

Figs. 4, 5 and 6 are each fragmentary side elevational views of wicks constructed in accordance with my invention and illustrating means by which fraying of the end of the wick may be limited.

Considered generally, and as disclosed in the exemplary embodiment of my wick depicted for illustrative purposes in Fig. 2, it comprises a tubular outer cover 10 of flexible refractory material which is desirably woven and is pervious to liquid, a filler 12 of a material which preferably possesses a high degree of capillarity, and, by preference, although not necessarily, includes a plurality of relatively fine metallic filaments 13 which are carried thereby and project from the end of the wick which is to be lighted in use.

In the preferred embodiment of my composite wick, the tubular outer cover 10 is woven of a flexible refractory material, such as spun glass, which material is resistant to and non-carbonizable at the ordinary flame temperatures encountered in use in the burning of the usual and ordinary types of liquid fuels. Being woven and in the nature of a glass cloth, the tubular cover is normally pervious to liquid fuels and possesses a degree of capillarity. Although other refractory materials, such as asbestos and the like, may be used in making the tubular cover, the glass has advantages, such as the presentation of a smooth outer surface which facilitates the ease of installation of the wick, in addition to its refractory qualities.

For the filler 12, I prefer to utilize a material having a high degree of capillarity, such as cotton yarn, having strands 14 extending longitudinally through the tubular outer cover. It is by preference that the ends of the filler strands terminate in substantially flush relationship with the end of the tubular outer cover at an end 15 which is adapted to use as the flame-supporting end of the wick. At the other end, the filler strands may terminate in substantially flush relationship with the end of the tubular filler or may project somewhat therefrom, as shown in Fig. 2.

Since refractory tubing of the kind utilized in my disclosed wick structure is made for other purposes and is obtained as a separate item, the use of such prefabricated tubing necessitates the insertion of the filler into the tubing. To facilitate the insertion of filler into such prefabricated refractory tubing, I have found it desirable to coat the tubular outer cover 10 with a layer 16 of a ce-

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mentitious material to stiffen the tubing and enable it better to hold its tubular shape while the filler is drawn or threaded therethrough. Among the cementitious materials suitable to provide the desired stiffness are varnish, shellac, lacquer, paint or the like, all of which may be applied as liquids and are solidified by exposure to the air.

In addition to being desirable for facilitating the insertion of the filler into the tubular outer cover, the provision of the stiffening material at the end of the wick opposite the flame-supporting end, and which is to be inserted into the opening of a holder, such as a cigar lighter, is also desirable to prevent the end portion from fraying and to ease the starting of the wick into such holder opening. On the other hand, the desirable liquid perviousness of the major portion of the tubular outer cover makes the removal of the cementitious material from that major portion desirable. Such removal of the cementitious material from the wicks after the filler is inserted may be accomplished chemically or, when varnish, shellac, lacquer or the like is used as a cementitious material, it may be removed from the desired portion by being burned off in a flame. As shown in Fig. 2, an end portion 17 of the outer cover has the coating of the cementitious material thereon to facilitate the insertion of that end into a holder while a major portion 18 of the cover surface has had the cementitious material removed therefrom to improve the porosity and perviousness of the cover.

In the form of my invention which is disclosed in Fig. 2, a plurality of metallic filaments 13 are threaded through the cover with the filler so as to be held therein with the filler. It is my preference that these metallic filaments which project from the flame-supporting end of the wick and beyond both the filler and cover, shall be relatively fine, as well as stable at flame temperatures, and shall project to positions within the flame heated area. The metallic filaments are heated to incandescence during the initial burning of the flame so as to have a tendency to maintain continuous combustion in spite of wind which would normally blow out the flame. Because of its characteristics, relatively fine German silver wire has been found to be very satisfactory for the purpose. Other metallic filaments, such as iron or copper, are suitable for the purpose.

In Fig. 1, my wick is shown in its application to a cigar lighter 19 wherein the end 15 of the wick projects from a wick-supporting collar 20 on a fuel-containing housing 22 of the lighter. As is usual, the lighter 19 is depicted as having a movably mounted flame-snuffing and wick-protecting cap 23 which normally covers the exposed end of the wick.

Although it is not desired to be limited by or to any particular theory of wick operation, it is my belief that a space 24, somewhat conical in shape, surrounds the end portion of the wick, including the exposed end of the filler, in which space no combustion takes place. Combustion does, however, occur in the spaces designated as 25, 26 and 27 outside of the tubular outer cover 10. With a flame of this type, it is readily apparent that the refractory outer cover provides effective protection for the carbonizable filler material. Although the exposed and projecting filament ends are normally heated, the shifting of the flame in a breeze or wind also has a tendency to bring those filament ends into the hotter portions of the flame space.

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In the modification of the invention which is disclosed in Fig. 3, a plurality of metallic filaments 28 are woven or threaded into the refractory material of a tubular outer cover 29. The structure and nature of the filaments 28 are similar to those of the filaments 13, except that they are carried by and project from the end of the tubular outer cover, rather than the filler, as shown in the form in Fig. 2. The cover 29, except for having the filaments 28 woven or threaded therein, is similar in structure and characteristics to those of the cover 10.

With reference to Fig. 4, a wick 30, which may be of substantially the structure disclosed in either Figs. 2 or 3, has a malleable metal band 32 encircling the outer cover near the flame-supporting end thereof with its ends 33 and 34 overlapped. This band limits the fraying and thus prolongs the life of the flame-supporting end of the wick.

Another manner of limiting the fraying of the flame-supporting end of the wick 30 is shown in Fig. 5. In this instance, a fine metallic wire 35 or the like is wrapped around the end portion of the wick near the flame-supporting end. The ends of such wire may be twisted together to secure the turns in place.

As depicted in Fig. 6, a simple knot 36 may be tied in the end portion of the wick 30 to prevent it from fraying beyond a predetermined limit.

From the foregoing description and reference to the accompanying drawings, it may be readily appreciated that the disclosed composite wick structure is both efficient and capable of long service life.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A composite wick comprising, in combination, a tubular outer cover of woven refractory material, a filler within and extending from end to end of the outer cover, said filler being composed of material possessing the property of capillarity and having a plurality of longitudinally extending metallic filaments of relatively fine cross section therein and projecting in whisker-like manner from one end thereof, the end portion of said cover opposite said one end of the filler having a coating of cementitious material thereon for stiffening purposes, and means for limiting fraying of the wick at said one end.

2. A composite wick comprising, in combination, a tubular outer cover of woven refractory material, a filler within and extending from end to end of the outer cover, said filler being composed of material possessing the property of capillarity and having a plurality of separated and longitudinally extending metallic filaments of fine cross section therein and projecting randomly from one end thereof, and the end portion of said cover opposite said one end of the filler having a coating of cementitious material thereon for stiffening purposes.

3. A composite wick adapted to extend into a supply of liquid fuel at one end and to support a flame at the other end and comprising, in combination, a tubular outer cover of woven refractory material, a filler within and extending

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from end to end of the outer cover, and said filler being composed of material possessing the property of capillarity and having longitudinally extending randomly and in whisker-like manner metallic filaments therein and projecting from the flame supporting end thereof so as to be heated to incandescence by a flame for maintaining combustion.

4. In a composite wick of substantially circular interior cross section, the combination comprising a tubular and normally liquid pervious outer cover of woven refractory material, a filler within and extending from end to end of the outer cover, said filler fitting with relative snugness within the circular interior of the cover and being of a material possessing a relatively high degree of capillarity, said outer cover only being coated with a cementitious material for stiffening purposes during the insertion of the filler, and said cementitious material being removed from all but one end portion of the cover after

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the filler is in place and prior to the installation of the wick for use to restore the perviousness of all but said one end portion of the cover.

PEDRO S. RAMOS.

REFERENCES CITED

The following references are of record in the file of this patent:

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13,546	Great Britain	of 1889

Certificate of Correction

Patent No. 2,504,584

April 18, 1950

PEDRO S. RAMOS

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 2, line 50, for the word "obtained" read *obtainable*; column 5, line 4, strike out "randomly and in whisker-like manner" and insert the same after "projecting", in line 5, same column;

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of July, A. D. 1950.

[SEAL]

JOE E. DANIELS,
Assistant Commissioner of Patents.