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FIBER GLASS WICKING

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Fig. 1

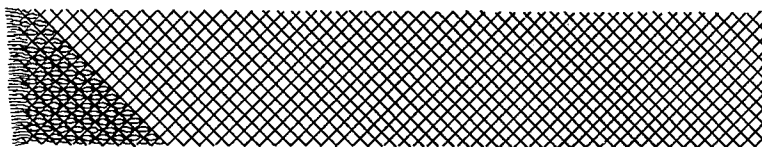
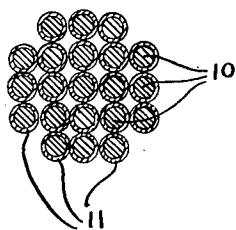


Fig. 2



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FIBER GLASS WICKING

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8 Claims. (Cl. 67—69)

This invention relates to wicking material for use with combustible fluids and more particularly to wicking formed primarily of fine glass filaments.

5 The object of this invention is an improved wick for use in lamps, lanterns, stoves and the like which will have superior qualities of stiffness, capillarity and durability.

10 This invention features a textile fabric made wholly or in part of fine filaments of glass, each of which is coated with a thin layer of organic material, this material serving to stiffen the fabric, improve its capillarity and protect the individual filaments in the zone of combustion.

15 While it has been proposed heretofore that fabrics woven from fine glass filaments be used as wicking in oil lamps and the like, such materials have been found to have certain inherent disadvantages which have prevented their use in this manner. It has now been definitely estab-
20 lished that the drawing of glass into filaments materially changes the physical characteristics of any particular glass from which they are formed, resulting in a lowering of the softening temperature often by from 200° C. to 300° C. Thus, when cloth woven from these filaments has been used as wicking in lamps and the like, that portion adjacent the flame has been found to fuse, thereby reducing the capillarity of the wick
30 and resulting in high spots and an uneven flame. Furthermore, it has been found that fabrics of the usual dimensions made from glass filaments do not have sufficient stiffness to stand unsupported, as required in some installations, and require additional stiffening as by the inclusion of fine metal wires and the like in the fabric.

35 The present invention consists in coating each of the filaments of glass, in a fibrous glass fabric, with a thin layer of organic stiffening material which is not soluble in the oil or other fluid with which the wick is to be used, which material will form a tightly adherent film of carbon about each filament in the combustion zone. This coating and stiffening material must be applicable in a
40 sufficiently dilute form as not to fill the interstices of the fabric and obstruct the capillary movement of fluid through the fabric. Preferably, this material may be one of the thermo setting synthetic resins which may be applied to the fabric in dilute solution and subsequently polymerized to
45 form a stiff insoluble coating on each fibre.

50 Fig. 1 of the accompanying drawing illustrates diagrammatically a fiber glass wick embodying the present invention, while Fig. 2 is an enlarged diagrammatic cross-section through a single

thread from the wick of Fig. 1. This thread is composed of a plurality of fine filaments of glass 10, each having a diameter on the order of .0003 of an inch. Each of these filaments is largely covered with an extremely thin layer of organic material 11. While a somewhat greater degree of covering may be found on the outer filaments, the coating is applied as uniformly throughout the thread as can be done as a practical matter.

5 As a preferred example of the invention, a 10 heavy fibre glass tape may be immersed in a 5% solution of a water dispersible phenolic resin and subsequently dried and heat treated to polymerize the resin to give the desired degree of stiffness to the tape. It has been found that this treatment
15 has no ill effects on the capillarity of the tape but in some instances, as with kerosene oil, somewhat increases the capillarity of the tape. The reason for this phenomenon is not known, but is believed to be due to the smooth surface and
20 impervious character of the filaments in their original condition, a rougher surface being provided by the treatment which is more easily wet. While immersion of the finished tape is inexpensive and produces satisfactory results, the indi-
25 vidual threads of the fabric may be sized with the material before weaving. The desired stiffness may be obtained by heating after the weaving operation.

30 In addition to providing the desired degree of stiffness in the glass wicking and, if anything, improving its capillarity, the thin coating of organic material protects the individual filaments from the extreme heat of the flame in the zone of combustion and prevents the melting and
35 fusing together of the filaments. This is believed due to the fact that the organic coating on the fibres carbonizes in the heat of the flame forming a thin layer of carbon on each filament which acts as an immobile barrier preventing the melting to-
40 gether of the adjacent filaments. Whether this is the true function of the carbon or whether it merely acts as a buffer or insulating material between the glass and the flame is uncertain, but the fact remains that filaments which otherwise
45 grow brittle and fuse together are maintained in substantially their original condition when provided with a carbonizable coating and the ability of the wick to feed oil to the flame is unimpaired and, in some cases, actually improved.

50 While the invention has been described with respect to certain specific fabrics and resinous coatings, it is obvious that the invention extends to all fabrics composed, at least in part, of glass filaments and to all coating materials which will
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form a stiff carbonizable coating on each glass filament. Within these limits, the scope of the invention is to be determined by the wording of the appended claims.

5 I claim:

1. As a new article of manufacture, a wicking material for use with combustible fluids comprising a fabricated mass of glass filaments, each of said filaments being coated with a stiff adherent layer of organic material.

2. As a new article of manufacture, a wicking material for use with combustible fluids comprising glass filaments woven into a textile fabric, each of said filaments being coated with an adherent layer of organic material.

3. As a new article of manufacture, a wicking material for use with combustible fluids comprising glass filaments woven into a textile fabric, each of said filaments being coated with an adherent layer of carbonizable material.

4. As a new article of manufacture, a wicking material for use with combustible fluids and having a high capillarity comprising woven glass filaments, said wicking having a small amount

of organic material uniformly distributed therein and coating the individual glass filaments.

5. As a new article of manufacture, a wicking material for use with combustible fluids which comprises a woven glass fabric mechanically stiffened with an amorphous organic material extending throughout the fabric, said stiffened fabric having a high capillarity.

6. As a new article of manufacture, a wicking material for use with combustible fluids which consists of a woven fabric comprising fine glass filaments and a coating material uniformly distributed on said filaments to stiffen said fabric and prevent the fusing together of said filaments.

7. As a new article of manufacture, a wicking material for use with combustible fluids which consists of a woven fabric comprising fine glass filaments each of which is coated with a stiffening and carbonizable layer of organic material.

8. As a new article of manufacture, a wicking material for use with combustible fluids which consists of a woven fabric comprising fine glass filaments each of which is coated with a stiffening layer of phenolic resin.

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