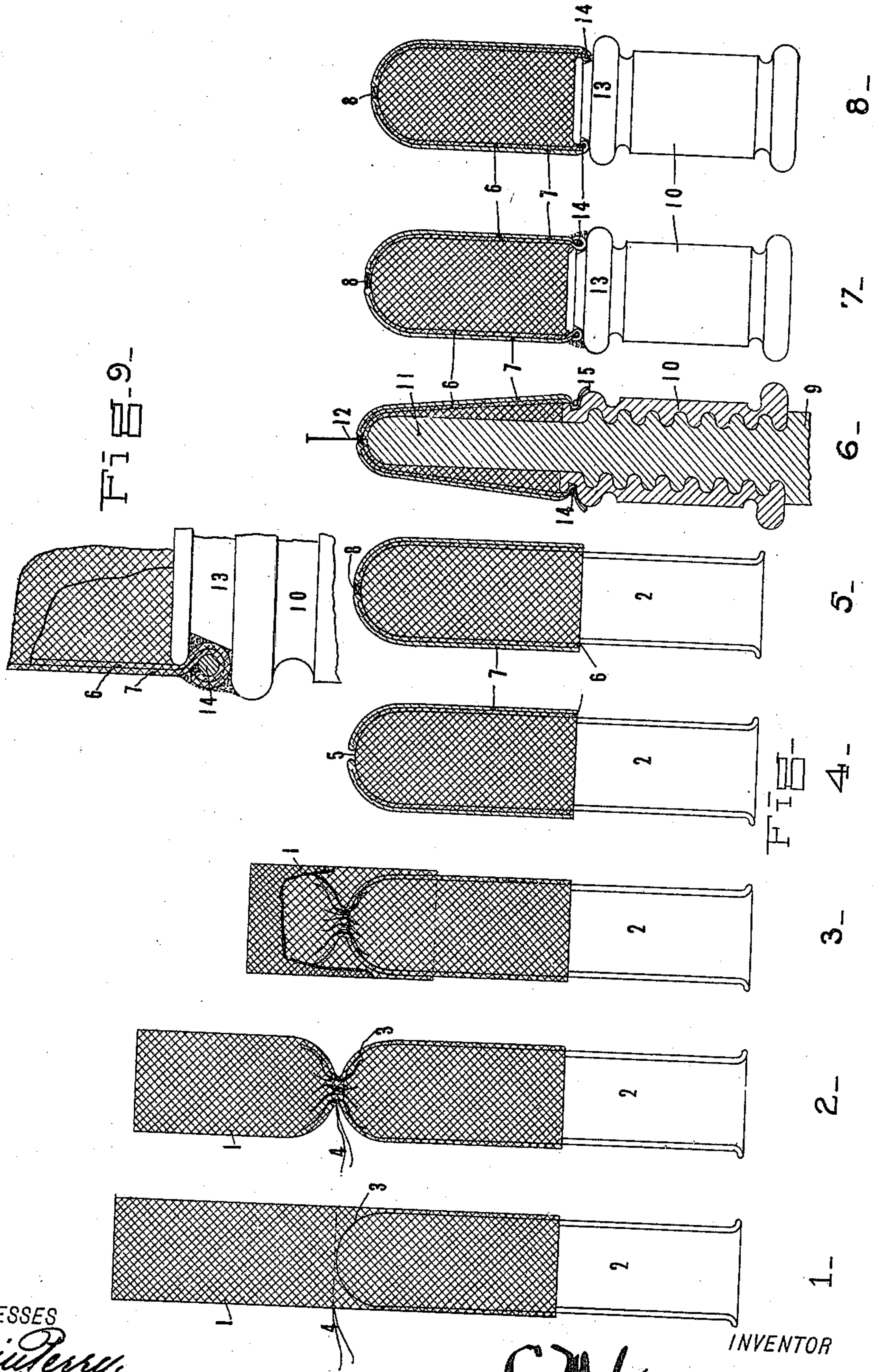


964,036.

C. M. LUNGREN.  
MANTLE MAKING PROCESS.  
APPLICATION FILED APR. 27, 1907.

Patented July 12, 1910.



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# UNITED STATES PATENT OFFICE.

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## MANTLE-MAKING PROCESS.

964,036.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed April 27, 1907. Serial No. 370,617.

*To all whom it may concern:*

Be it known that I, CHARLES M. LUNGREN, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Mantle-Making Processes, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a process of making devices of that class commonly known as "incandescent mantles", and more particularly to unitary devices of this nature which are provided with means adapting them for being readily attached to and detached from a gas burner. Since, however, certain advantages characteristic of this invention prominently appear when it is carried out for the purpose of producing an improved type of what is known as an "inverted" mantle unit, it will be conducive to clearness to disclose the process through such embodiment thereof.

One object of this invention is to formulate a simple and inexpensive method of making a mantle unit characterized by an unusual degree of strength and durability.

Another object is to devise a method of making a mantle unit especially adapted for use in an inverted burner, and in which the lower edge of the mantle will be free from interrupted or broken fibers, thus eliminating the objectionable ragged edge which has hitherto caused so much difficulty in the making of mantles from a tubular blank.

Another object is to devise a method of making a mantle unit of the inverted type from a tubular blank having a closed lower end free from a ragged edge and which will provide a plurality of adherent superposed walls.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of my invention, like characters of reference denote corresponding parts.

Figure 1 is an elevation showing a pre-

liminary step in this method, in which a mandrel has been inserted midway into a tubular blank and a draw-string has been positioned preparatory to strangulating the blank adjacent the end of the mandrel. Fig. 2 illustrates another step, showing the blank after it has been strangulated and thereby formed into a shape similar to that of an hour-glass. Fig. 3 illustrates a subsequent step, showing the free end of the blank partially telescoped over the portion supported by the mandrel. Fig. 4 illustrates the completion of the telescoping, with a residual small open aperture at the end of the blank. Fig. 5 illustrates the blank, showing the small opening at the end thereof closed by darning or weaving strands across the same. Fig. 6 illustrates a convenient step for evenly and properly positioning the blank with relation to a mantle support preparatory to securing the latter two together. Fig. 7 illustrates the blank mounted on the mantle support and having its edges countersunk into a groove on the end of said support and cemented thereto. Fig. 8 is a view showing a modification in which the edges of the blank are intumed in the groove. Fig. 9 is an enlarged view showing more clearly the union of Fig. 7 between the blank and the mantle support.

As conducive to a better understanding of this invention, it may here be noted that hitherto mantles have been so fragile and structurally so weak as to prohibit their use for many purposes to which they would otherwise be well adapted so far as their light-affording properties are concerned. For example, it may be pointed out that mantles have hitherto been constructed by impregnating and burning a fabric blank which usually resembles a capsule in shape and is formed of a single layer of fabric. The completed mantle has likewise comprised a single layer or wall and it has depended for its strength solely upon this single wall which is naturally very fragile. These and other objectionable features, this invention proposes to cure by producing a mantle unit in which the mantle itself will be characterized by a plurality of closely adhering walls which will mutually support and reinforce one another and form a composite structure of great strength and durability. As will be perceived, a weak point in one wall of this new mantle will be



strengthened by a stronger portion of the superposed wall. This plural wall mantle will be further strengthened and made wear-resisting by being permanently mounted upon an asbestos spool provided with threads or other means enabling it to be secured to the burner. Thus, what may be termed a mantle unit is formed as distinguished from unmounted mantle. It is toward the production of such a mantle unit that this invention is more particularly directed.

Referring now to the accompanying drawings, Fig. 1 illustrates one of the preliminary steps in the production of a mantle in accordance with this method. A tubular blank 1 of a woven fabric is first obtained, and such blank is gathered together or strangulated at a point intermediate its ends. This may most conveniently be done by inserting midway into the blank a mandrel 2 having a rounded end 3. An ordinary test tube of suitable size is well adapted to serve as a mandrel for this purpose, being inexpensive and readily obtainable and having a smooth surface adapting it for being freely inserted into and withdrawn from the blank. A draw-string 4 is preferably threaded around the circumference of the blank at a point adjacent the rounded end of the mandrel, and tion supported by the mandrel, as shown by Fig. 2, thus bringing the tubular blank into approximately the shape of an hour-glass. The outer or free portion of the blank may now be reversed or telescoped over the portion supported by the mandrel, as shown by Fig. 3, and the two portions of the blank may then be drawn tightly over the mandrel, as shown by Fig. 4, so as to cause the blank to closely conform in shape to said mandrel. In practice it will be observed that the blank thus drawn over the mandrel has a small aperture 5 at its end.

Having thus obtained the blank in the form shown by Fig. 4, the small aperture 5 may be closed by darnings of a suitable thread, as illustrated by 8 in Fig. 6. The capsule-shaped blank having a double wall thickness is now ready for cleansing, saturation and mounting upon the tubular support. After being cleansed and freed from oils and other impurities, the capsule-shaped blank is dried and then saturated with a suitable illuminant solution and then drawn tightly over a form while wet and allowed to dry to the desired extent either in the air or by gentle oven heat. In this operation the two thicknesses of fabric forming the wall of the blank are pressed tightly together and adhere so as to form substantially a single layer. The saturated fabric is preferably allowed to dry until it is slightly moist, instead of until quite dry, inasmuch as it is much easier to handle in this slightly moist condition in the subsequent operations. The

impregnated blank will now be mounted upon a suitable tubular support or spool, thoroughly dried and incinerated, and shaped and hardened by heat, when it is ready for use.

A preliminary step in the preferred manner of mounting the blank on the tubular support is illustrated by Fig. 6, which shows a post 9 extending through the mantle support or spool 10 and terminating a suitable distance from the end of such spool, depending upon the length of blank which is to be mounted on said spool. This instrumentality enables the blank to be symmetrically mounted on the support or tube 10 by slipping the blank over the protruding end 11 of the post and positioning such blank centrally on such post by means of a removable pin 12. The blank is then drawn down over the end of the spool, which preferably provides an annular recess 13, and the overlapping portion of the blank may then be forced into such recess by means of an asbestos or other suitable thread 14, which is tied around it, thus pressing it into the recess of the spool. The extending portion or skirt 15 of the blank may then be cut short and saturated with a suitable heat-resisting paste, which paste may also be applied to the thread and underlying portions of the blank. This skirt 15 is then turned over the thread, as illustrated by Fig. 7, and pressed into the recess of the spool, and a slight amount of paste may be then applied over the inturned skirt. It may also be observed that the paste may be applied to the groove and allowed to dry before tying the fabric in place, so as to insure a more thorough and intimate cementing of the blank to the support. Having thus mounted the blank on the support, it may be subjected to sufficient heat to bake the paste, and the saturated blank may then be incinerated and shaped in a burner and thus brought into condition for final use. It will of course be understood that the novel 2-ply blank may be otherwise mounted on the support, as for example in the manner described by my U. S. Patent No. 845,185, but the above shown method is deemed preferable in dealing with the peculiar 2-ply mantle herein disclosed.

It will thus be seen that the above disclosed method is one well adapted to achieve the ends and objects aforesaid. The simplicity of the method is obvious, and the resulting product is well adapted for withstanding uses which would destroy mantles as have been hitherto constructed. This largely arises from the fact that the inner and outer plies of the mantle which has been made from the telescoped blank are caused to adhere to one another during the formative steps of this process and thus produce a composite structure of superior strength. Moreover, the end of the mantle is free from



loose or ragged edges, which has been a source of weakness in mantles as have been hitherto constructed.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of making a combined mantle and support, consisting in obtaining a short length of a tubular blank of woven fabric of uniform weave, inserting approximately midway into said blank a mandrel having a rounded end, strangulating with a cord the portion of said blank immediately adjacent the rounded end of said mandrel, whereby the contracted portion of said blank will be made to closely conform in shape to said rounded end, telescoping the free portion of said blank over the portion supported by said mandrel and drawing said portion into closely interfitted relation, with its end tightly overriding the rounded end of said mandrel, then darning the aperture in the strangulated end by means of weavings extending from edge to edge of said opening through the double thickness of said blank, impregnating the said blank, and permanently cementing the raw edges of the open end thereof to the grooved periphery of a non-combustible mantle support.

2. The method of making a combined mantle and support constituting a unitary article of manufacture adapted to be readily handled and mounted as a unit in pendent relation on the delivery end of a burner-tube, consisting in obtaining a tubular blank of woven fabric, inserting approximately midway into said blank a mandrel having a rounded end, strangulating the portion of said blank immediately adjacent the rounded end of said mandrel by means of a draw-string, then telescoping the portion of said blank at one side of said point of strangulation over the portion on the opposite side so that the doubled blank conforms to the shape

of said mandrel, then stitching together the edges of the opening at the point of strangulation, then drawing the circumferential edges of the open end of the double-walled blank into close relation to the grooved periphery of a tubular non-combustible mantle support and cementing said edges thereto.

3. The method of making a mantle unit adapted to be secured to a burner, consisting in preparing a capsule of woven fabric, obtaining a tubular mantle support, mounting said mantle support upon a post whereby said post projects a distance beyond the end of said mantle support, and then drawing said capsule over said post and securing its end to said mantle support.

4. The method of making a mantle unit adapted to be secured to a burner, consisting in obtaining a tubular mantle support having a threaded bore, screwing into said bore a post until its end projects a distance from the end of said mantle support, stretching a capsule-shaped blank of woven fabric over said post, and securing the edges of said blank to said support.

5. The method of making a mantle unit adapted to be secured to a burner, consisting in preparing a woven blank having approximately the shape of an hour-glass, telescoping one portion of said blank over the other, obtaining a mantle support, mounting said mantle support upon a post projecting beyond the end thereof, and then drawing said blank over said post and securing its ragged end to said mantle support.

6. The method of making a mantle unit adapted to be secured to a burner, consisting in obtaining a tubular blank of woven fabric, strangulating said blank intermediate its ends by means of a draw-string, telescoping the portion of said blank at one side of said point of strangulation over the portion on the opposite side, obtaining a suitable mantle support, mounting said support on a post projecting therefrom, drawing said blank over said post, and securing its free end to said mantle support.

In testimony whereof I affix my signature, in the presence of two witnesses.

CHARLES M. LUNGREN.

Witnesses:

G. R. JEWETT,  
E. E. ALLBEE.

It is hereby certified that in Letters Patent No. 964,036, granted July 12, 1910, upon the application of Charles M. Lungren, of Bayonne, New Jersey, for an improvement in "Mantle-Making Processes," errors appear in the printed specification requiring correction, as follows: Page 2, line 9, after the word "from" the article *an* should be inserted, and same page, line 31, the syllable and words "tion supported by the mandrel" should be stricken out and the words *this string is then tightened* inserted instead; 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 30th day of August, A. D., 1910.

[SEAL.]

F. A. TENNANT,  
*Acting Commissioner of Patents.*