

Oct. 22, 1940.

A. CERETTI ET AL
SYSTEM FOR OBTAINING THREAD BY DRAWING, IN PARTICULAR
FOR GLASS THREADS WITH LONG FIBERS
Filed March 22, 1938

2,219,066

Fig. 1.

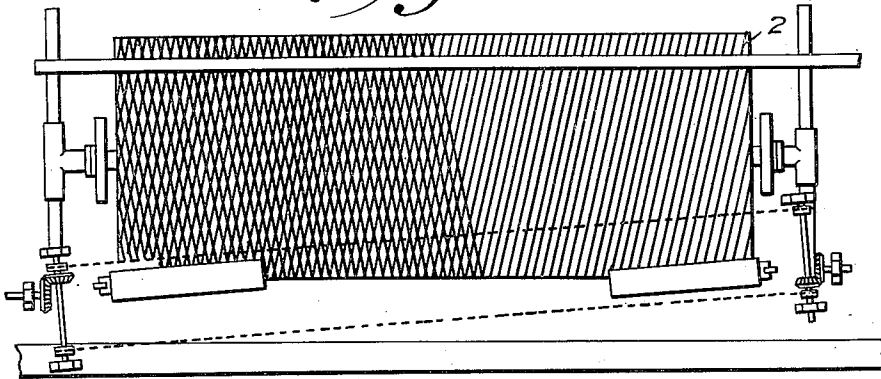


Fig. 2.

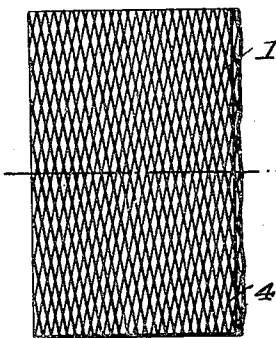


Fig. 3.

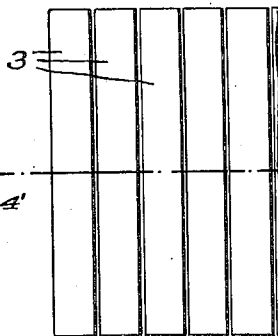


Fig. 4.



Fig. 5.

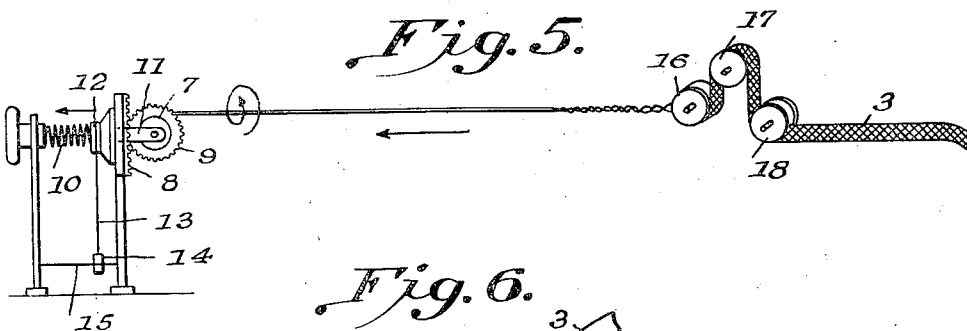
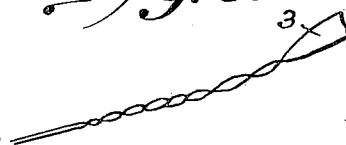


Fig. 6.



Inventors

ALDO CERETTI and
PIERO MODIGLIANI

By *Dwight Cole & Garner*

Attorneys

UNITED STATES PATENT OFFICE

2,219,066

SYSTEM FOR OBTAINING THREAD BY
DRAWING, IN PARTICULAR FOR GLASS
THREADS WITH LONG FIBERS

Aldo Ceretti and Piero Modigliani, Livorno, Italy,
assignors, by mesne assignments, to Owens-
Corning Fiberglas Corporation, Toledo, Ohio, a
corporation of Delaware

Application March 22, 1938, Serial No. 197,493
In Luxemburg March 30, 1937

12 Claims. (Cl. 57—156)

The present invention refers to a system for reducing a web by drawing, into a large thread, in particular for glass threads with long fibers.

The invention refers to a method for forming a web in glass threads by means of a rotating drum which draws the glass threads, coming from two wire drawing appliances connected to two glass furnaces and which move alternately in opposite directions and parallel to the axis of rotation of the drum, the fibers or filaments of the web crossing each other by this process and forming always the same angles to each other.

The present invention has for its object to obtain the large thread in glass, in the form of a ribbon extending along a line parallel to and bisecting the acute angle formed by the filaments or meshes composing the web or bat which is formed by mechanical means.

The ribbons cut in the said direction may be gradually drawn out, in a direction parallel to the said cut, that is to say, in a direction parallel to the edges of the ribbons, which are of a length equal to the winding circumference of the drum, or of a length of only a portion of this circumference.

The fibers finally composing the thread will have first a direction slightly inclined with respect to the edges of the ribbon and to this end the length of the latter will approximately represent their length, as the drawing continues they will become parallel and are entirely so at the phase of winding on to the drawing bobbin or other equivalent member.

This process of spinning, starting from the web of glass threads produced by mechanical means, may also be utilised for other fibers than those in glass.

The regularity of the angle of crossing of the elementary threads formed alternately in one direction and the other is produced by one or more drawing-out appliances carried on the corresponding furnace and which move along the axial direction of a rotating drum which collects and arranges the elementary threads.

The drawing-out of the above-mentioned initial ribbon cut of more or less width according to the type of yarn which it is desired to obtain, may also not be accompanied by torsion.

The drawing-out appliances may be of the type used for the spinning of hemp.

In the case of elementary threads obtained by wire drawing such as the elementary threads of glass utilised for the said formation of the web of crossed elementary threads, this crossing being of strictly uniform direction, there may be

obtained large threads or yarns composed of a small number of elementary threads of large diameter, as well as a larger number of elementary threads of smaller diameter. Thus, without varying the type of the yarn obtained, the qualities on the contrary, may vary.

The drawing-out of the ribbons may be accompanied or preceded by humidifying by means of a jet of dressing liquid.

The invention will be well understood by means of the following detailed description which refers to the annexed drawing of an embodiment given simply by way of example:

Figure 1 represents a winding drum for the elementary threads coming from the two furnaces moving in opposite directions parallel to the axis of rotation of the drum;

Figure 2 is a plan view of the jacket, entirely developed, in glass fibers, of a length equal to the circumference of the drum shown in dotted lines.

Figure 3 shows the cutting lines of the ribbons of fibers, these being parallel and bisecting the acute angles formed by the crossing of the filaments;

Figure 4 shows diagrammatically the direction of drawing with respect to the fibers;

Figure 5 shows diagrammatically a system of simultaneous drawing and twisting of the ribbons of long fibers;

Figure 6 shows the process of formation of long fibered yarn.

Referring particularly to the figures of the drawing:

1 is the web of glass thread forming the jacket mounted on the drum 2 and obtained by means of a cut parallel to the axis of the drum. 3 are ribbons obtained by cutting the web in the direction parallel to its length, that is to say, over a length corresponding to the circumference 4' of the winding drum (Fig. 2.)

According to the invention, the ribbons 3 are drawn in the direction of the arrow *y* bisecting the acute angle formed between any two crossed fibers such as 5 and 6. The result is that the fibers forming the yarn or thread have a length equal to the circumference 4' and this corresponds to a spinning of long fibers carried out in a similar manner to the spinning of hemp fibers.

The drawing-out may take place by ordinary systems. It should be accompanied naturally by twisting such as shown diagrammatically by Figure 5, where the bobbin 7 is subjected both to a movement of rotation about its axis and also to a movement of rotation about an axis at right angles, by means of the fixed circular rim 8

which engages the gearing 9 integral with the bobbin. The axis 10 of the fork 11 which supports the bobbin 7 is adapted to rotate by means of the pulleys 12 and 14 set in motion by belts 13 driven by the spindle 15. The system of three rollers 16, 17 and 18 give rise to the preliminary drawing-out of the long fibers and to the simultaneous placing in parallel of the said fibers.

The formation of the yarn or thread takes place as shown diagrammatically by Figure 6.

The said system of spinning may, however, be replaced by any other system whatever appropriate to the spinning of long fibers.

We claim:

1. The method of producing artificial fibers which comprises forming a web of filaments, cutting the web into ribbons extending substantially in the direction of said filaments, and drawing the ribbons to arrange the cut filaments substantially parallel.

2. The method of producing artificial fibers which comprises forming a web of filaments, cutting the web into ribbons extending substantially in the direction of said filaments, drawing the ribbons to arrange the cut filaments substantially parallel, and twisting the drawn filaments.

3. The method of producing artificial fibers which comprises laying artificial filaments upon a carrier drum, cutting the web formed by the filaments into ribbons extending substantially in the direction of the filaments, and drawing the ribbons into fibers.

4. The method of producing artificial fibers which comprises laying artificial filaments upon a carrier drum, cutting the cylindrical web formed by the filaments along the length of the drum to derive a plane web of filaments, cutting the plane web of filaments into ribbons extending substantially in the direction of the filaments, and drawing the ribbons into fibers.

5. The step in the method of producing artificial fibers which consists in laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle and having substantially uniform spacings and direction.

6. The method of producing artificial fibers which comprises laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle, cutting the web formed by the filaments into ribbons extending substantially parallel to the bisector of the acute angle, and drawing the ribbons to arrange the cut filaments substantially parallel.

7. The method of producing artificial fibers which comprises laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle, cutting the cylindrical web formed by the filaments

longitudinally of the drum to derive a plane web of filaments, cutting the plane web of filaments into threads extending in directions medially of the angle of crossing of the filaments with said threads having a length corresponding to the circumference of the rotary drum, and drawing the threads into long fibers.

8. The method of producing artificial fibers which comprises laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle, cutting the cylindrical web formed by the filaments longitudinally of the drum to derive a plane web of filaments, cutting the plane web of filaments into ribbons having parallel edges in parallel to the bisector of the angle of crossing of the series of filaments, and drawing the threads to arrange the filaments in substantial parallelism.

9. The method of producing artificial fibers which comprises laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle, cutting the cylindrical web formed by the filaments longitudinally of the drum to derive a plane web of filaments, cutting the plane web of filaments into ribbons extending in directions medially of the angle of crossing of the filaments, drawing the threads to arrange the filaments in substantial parallelism, and twisting the drawn filaments.

10. The steps in the method of producing artificial fibers which consists in laying upon a rotary drum two series of artificial filaments crossing each other substantially uniformly at an acute angle and having substantially uniform spacings and direction, and cutting the web of filaments so formed transversely of the fibers and subsequently into ribbon strips along lines in parallel to the bisector of the angle of crossing of the filaments.

11. The method of producing a yarn of glass fibers which comprises winding said fibers upon a drum to form a web having the fibers arranged at angles approaching a right angle to the axial direction of said drum, cutting said web in a direction at right angles to the axis of the drum, and drawing the cut web in a longitudinal direction.

12. The method of producing a yarn of glass fibers which comprises winding long glass fibers upon a drum to form a web having at least a portion of said fibers crossing one another, cutting said web at substantially right angles to the axis of the drum, and drawing the fibers so cut in a direction substantially parallel to said cut to orient said fibers in a predominantly parallel relationship and form a yarn thereof.

ALDO CERETTI.
PIERO MODIGLIANI.