Nov. 1, 1938. A. L. FORSTER 2,135,072

APPARATUS FOR MAKING GLASS FIBER MATS

Filed Oct. 20, 1937 2 Sheets-Sheet 1

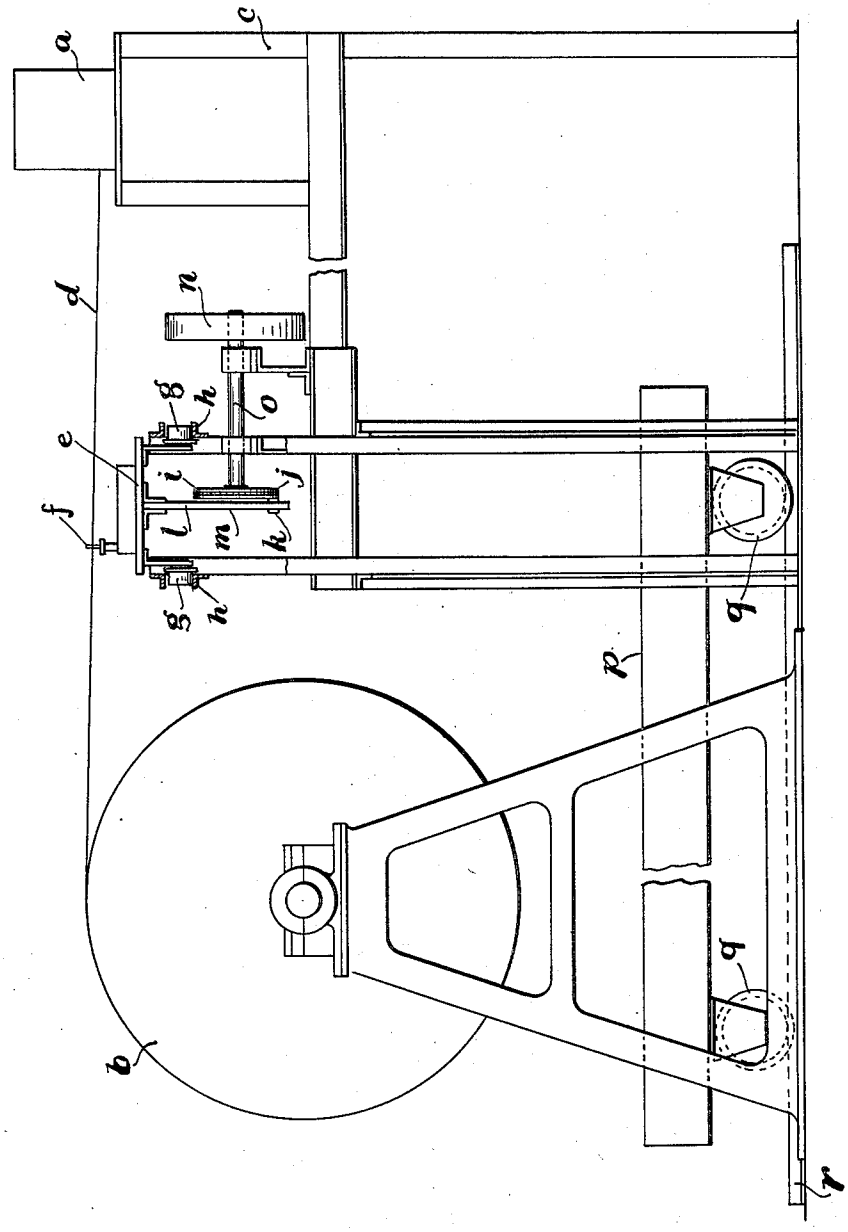


Fig. 1.

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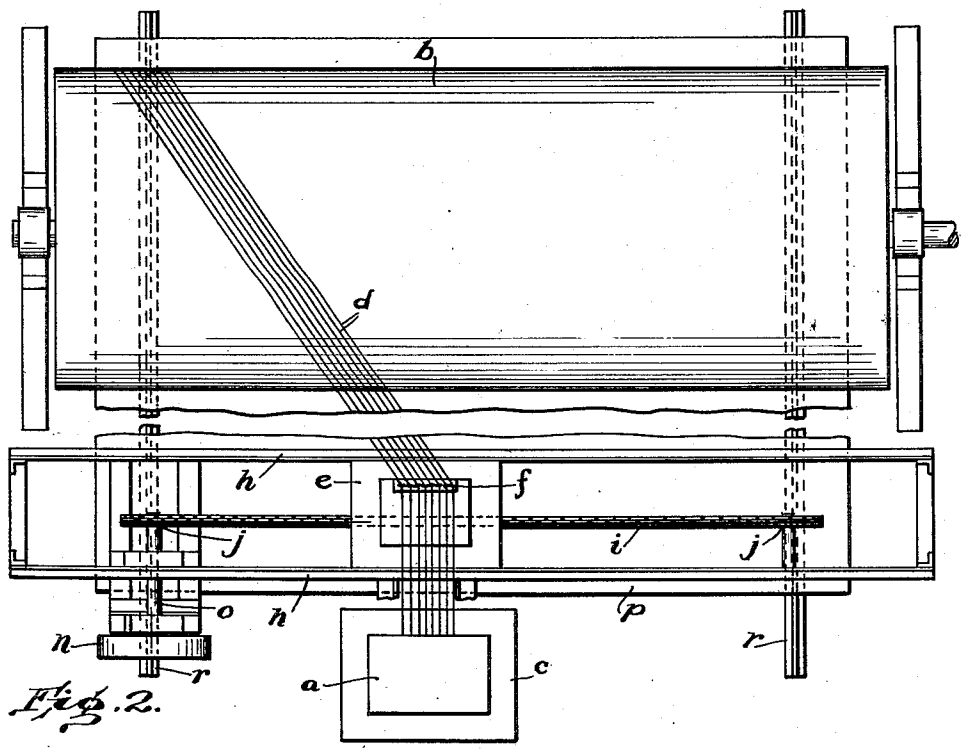
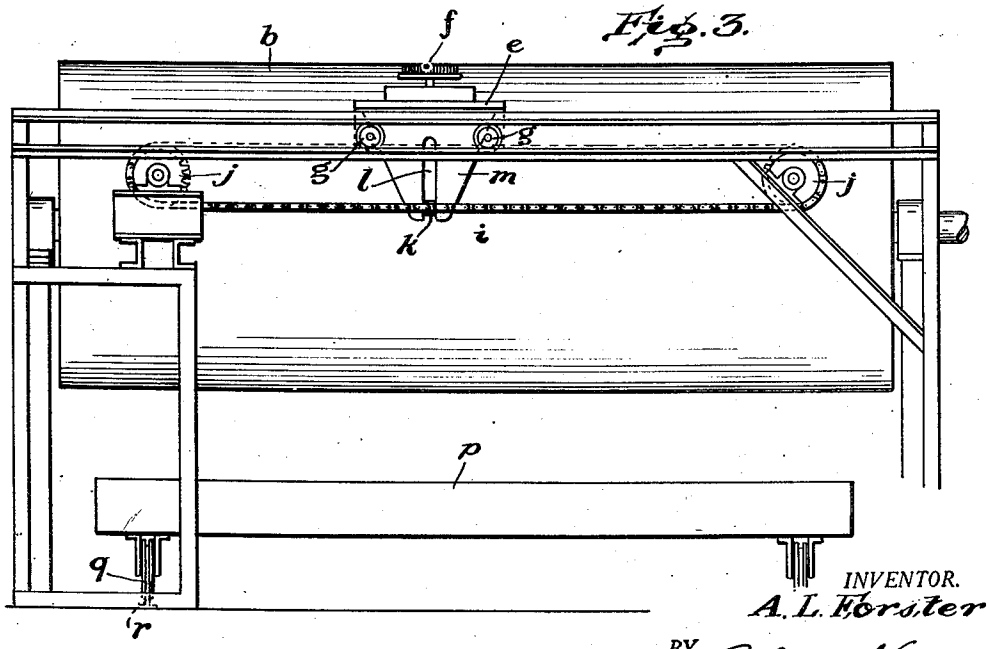


Fig. 2.

Fig. 3.



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Patented Nov. 1, 1938 2,135,072

UNITED STATES PATENT OFFICE

2,135,072

APPARATUS FOR MAKING GLASS FIBER MATS

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Application October 20, 1937, Serial No. 170,076
In Great Britain August 8, 1936

3 Claims. (Cl. 49—17)

The present invention relates to a means for forming mats of glass fibers which have been mechanically drawn from a molten supply body.

One of the objects of the invention is to produce a mat of fibrous glass in which the fibers are built up in individual layers of fibers which are parallel, or approximately parallel, the fibers of each layer, however, running at an angle to the fibers of adjacent layers.

Another object of the invention is to provide a simple apparatus to produce such a mat, which avoids the inconveniences and disadvantages of reciprocating the furnace.

Still another object of the invention is the provision of means for forming a mat capable of easy removal from the attenuating drum.

The invention comprises the combination of a rotary drum, a stationary furnace situated at one side of and at a convenient distance from the drum, the furnace being provided with nozzles through which the glass threads can be drawn, and a reciprocatory guide adapted to move parallel with the axis of the drum for effecting the desired disposition of the threads on the drum.

The invention also comprises the combination with the drum, of a movable table on to which the completed mat can be transferred.

In the accompanying drawings:

Figure 1 is a side elevation, Figure 2 a plan, and Figure 3 a rear view showing diagrammatically apparatus constructed in accordance with the invention.

In carrying my invention into effect, I mount a stationary glass furnace *a* at a convenient distance from one side of a rotary drum *b*, and in a position opposite about the center of the length of the drum. The furnace is mounted on a stand *c* and is provided with a row of small spinning nozzles (not shown) from each of which a length of thread *d* is drawn and attached to the drum *b*. Between the drum *b* and furnace *a*, and in a position near to the drum, is arranged a reciprocatory carriage *e* on which is mounted a thread guide *f* in the form of a comb, the purpose of this guide being to engage and move the threads *d* relatively to the drum for the purpose of effecting an oblique and overlapping disposition of the layers of threads on the drum while the latter is rotating. The carriage *e* is provided with rollers *g* which engage tracks *h* arranged parallel with the axis of the drum. Any convenient means may be employed for reciprocating the carriage along the tracks relatively to the drum. In the example shown a transversely arranged endless chain *i* is carried by sprockets *j* and is provided with a lateral projection *k* which engages a vertical slot *l* in a member *m* depending from the carriage, motion being imparted to one of the sprockets *j* by a belt driven pulley *n* on the spindle *o* of this sprocket. With this arrangement the rate of movement of the carriage is decelerated and accelerated at each end of its travel so that reversal is obtained without shock, but over the greater part of the travel the rate of movement is uniform. If desired the means for reciprocating the carriage may be adapted in any convenient manner to operate at a non-uniform rate so as to produce an irregular oblique disposition of the threads on the drum. Alternatively for the same purpose the drum may be rotated at a non-uniform rate, or both of these methods may be employed.

After the mat of threads has been formed on the drum *b* it is desirable to transfer it to a flat table. According to another part of my invention, I arrange a table *p* to be movable beneath the drum. In the example shown the table is provided with supporting rollers *q* which run on horizontal rails *r*. After a longitudinal incision has been made in the mat, one end is secured to the front end of the table *p*, and the latter is then moved beneath the drum *b*. The drum and table may be interconnected by any convenient means such as a rope (not shown) wrapped around the drum and secured to the table, or a rack and pinion mechanism (also not shown), so that the drum moves with a peripheral speed equal to the linear speed of the table, thus enabling the mat to be deposited on the table without disturbance of the threads.

By this invention I am able to avoid the inconvenience and disadvantages of reciprocating the furnace. Also I am able to effect the removal of the mat from the drum in a simple and convenient manner.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. Apparatus for forming mats of glass fibers which comprises a stationary furnace having a plurality of outlet orifices adapted to emit streams of glass for attenuation into fibers, a stationary rotary drum spaced away from said orifices upon which said fibers are individually and simultaneously wound in spaced apart relationship, means between said outlet orifices and said drum for guiding said individual fibers in paths spaced apart and maintaining the fibers out of contact with each other throughout their travel from the furnace to the drum, and means

for reciprocating said guiding means and causing said fibers while held in spaced relation and substantial parallelism, to traverse back and forth over said drum during the winding operation.

2. The apparatus as claimed in claim 1, in which said guiding means is in the form of a comb having a plurality of teeth interspaced between said fibers.

3. Apparatus for forming into mats glass threads drawn from a furnace, comprising the combination of a stationary drum, a stationary furnace positioned at one side of and at a convenient distance from the drum, the furnace being provided with outlets spaced apart and arranged in a row extending parallel with the axis of the drum, through which outlets the glass threads can be drawn, means for rotating the drum and winding the threads thereon, a guide through which the threads are directed in their passage from the furnace to the drum, said guide comprising a comb by which the threads are guided and held in spaced relation during their passage from the furnace to the drum, and means for reciprocating said guide in directions parallel with the axis of the drum for effecting the desired disposition of the threads on the drum.

ALFRED LINDSAY FORSTER.