

Feb. 24, 1942.

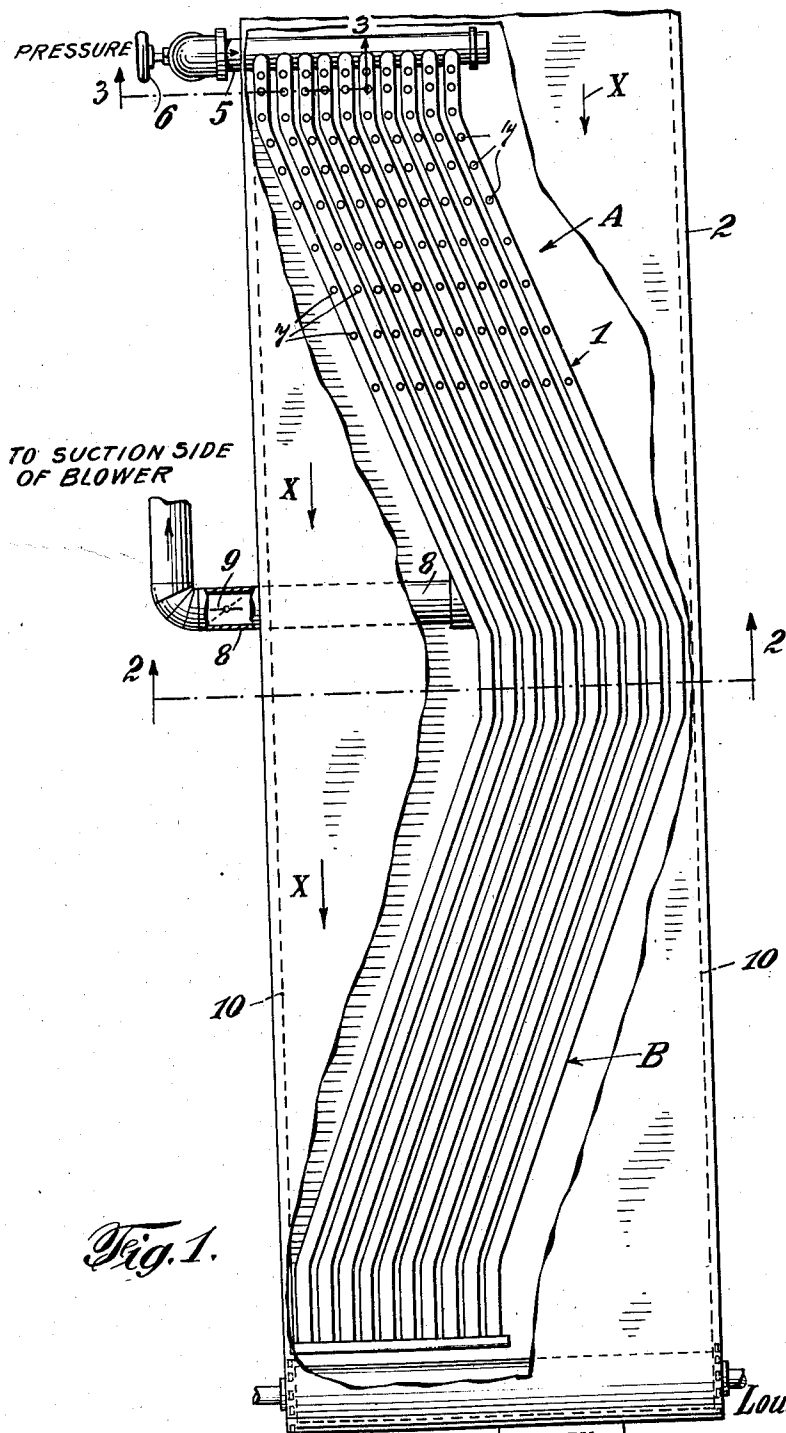
L. P. MILLER

2,274,424

SLIVER MAKING MACHINE

Original Filed June 12, 1940

2 Sheets-Sheet 1



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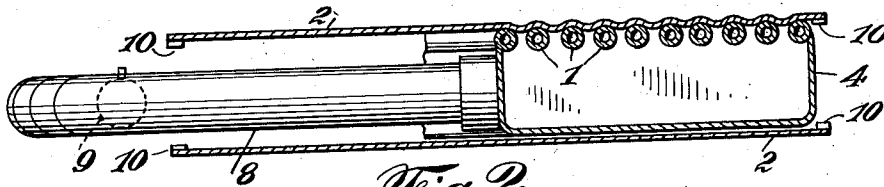


Fig. 2.

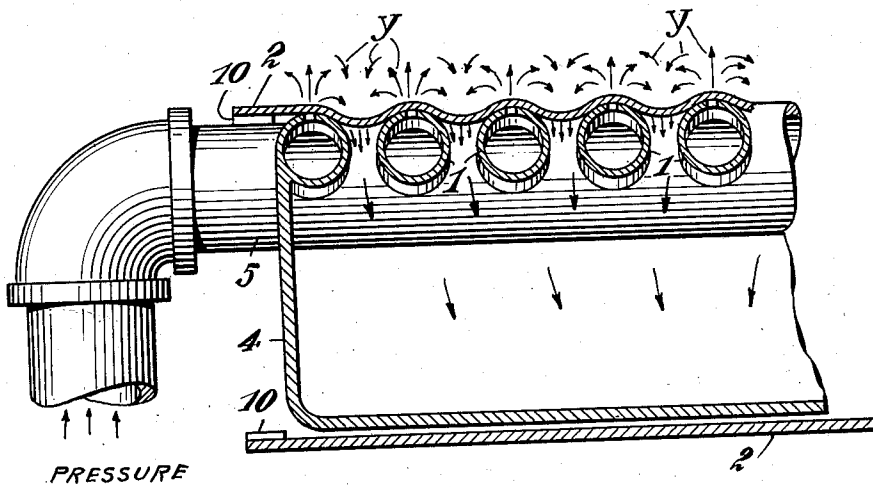


Fig. 3.

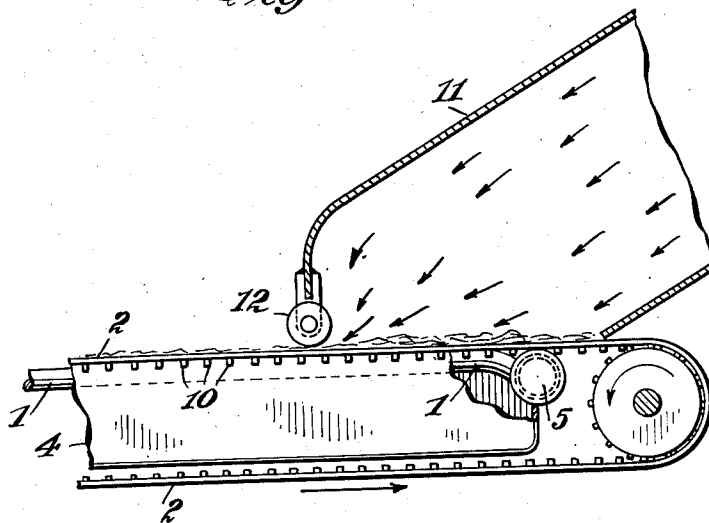


Fig. 4.

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UNITED STATES PATENT OFFICE

2,274,424

SLIVER MAKING MACHINE

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Original application June 12, 1940, Serial No. 340,049. Divided and this application May 21, 1941, Serial No. 394,396

10 Claims. (Cl. 19—150)

The present invention relates broadly to textiles and more especially to an apparatus for making slivers.

The present invention may be embodied in structures other than that specifically disclosed herewith but the preferred structure comprises a porous belt supported upon a bed having therein a plurality of angularly disposed slots connected with a suction box in such manner that the porous belt is pulled down against the slots by suction due to air currents which pass through the belt and into the slots as the belt is moved longitudinally over the slots. The textile material to be made into a sliver may comprise rabbit fur in the form of a loose elongated mass which rests upon the upper surface of the traveling belt.

The slots may be made of means of a grate or grid of tubes over which the conveyor belt is moved so as to slide on the upper portions of the tubes. These tubes may extend angularly in one direction and then in the other beneath the upper travel of the belt. The angular direction of the slots relative to the movement of the belt causes a rolling action to the material. It is also desirable in some cases to provide the forward portion of the tops of the tubes with small openings and to supply the tubes with compressed air so that there is a small blast of air blowing upwardly through the porous belt as it passes over the top portion of the tubes at the forward ends thereof and there is a downward current of air of greater volume passing through the porous belt as to that portion which extends over the spaces between the tubes. Flat bars may be used as a grid table, or round tubes may be used to form the suction grid table. Where tubes are used, the tubes being round in form cause the belt to assume a corrugated appearance which produces troughs in which the longitudinally extending loose masses of textile material collect. The suction beneath the belt and the sloping sides of the valleys formed in the belt further facilitate the rolling action produced on the loosely formed material by the angularity of the valleys to the travel of the belt.

As the belt progresses over the angularly disposed slots, there is a tendency of the upper travel of the belt to carry the material against the high side of the corrugation toward which the belt is moving. This tends to free the pores of the belt from the mass of material on the other low side of the corrugation, and thus the suction on the low side becomes more effective than that on the high side of the corrugation and

this action tends to promote a sidewise rolling or turning motion to narrow strips of the loose mass of material as the belt progresses lengthwise of the machine. Where the belt has travelled a distance of a few feet over the angularly disposed grid of pipes, as previously described, the suction beneath the pipes and the compression within the pipes resulting in upward blasts of air through the openings in the pipes, causes the material to be sufficiently compacted to leave the machine in the form of distinct, definite slivers located in the valleys of the upper travel of the belt.

It is to be understood that the degree of suction, or negative pressure, maintained beneath the belt shall be such as not to interfere with the relatively free movement of the fiber in the several valleys of the corrugations formed in the belt but shall be sufficient to cause the fibers to remain in the valleys and to rotate or roll as described. This amount of suction is dependent somewhat on the character of the fiber used and the size of the sliver being made. The degree of suction desired may easily be determined by observing the action of the fibers as the machine is operated.

More specific description of an apparatus for carrying out the present invention will now be set forth in the following specific specification by reference to the accompanying drawings throughout which like parts are indicated by like characters.

The drawings are diagrammatic in view of the fact that the details will be apparent to one skilled in the art and while the drawings illustrate the preferred form of apparatus, it is to be understood that the disclosure is not to be considered in the limiting sense.

Fig. 1 is a plan view of the top of the suction table showing the conveyor belt broken away over the table.

Fig. 2 is a cross-section on line 2—2 of Fig. 1.

Fig. 3 is an enlarged cross-section on line 3—3 of Fig. 1.

Fig. 4 is a diagrammatic illustration showing a hood as one method of feeding material to the apparatus.

Referring now to the drawings and more especially to Fig. 1, a grid or bed of pipes 1 is arranged beneath a porous conveyor belt 2 which is driven by suitable mechanism, not shown, in such manner that the upper run of the belt is in the direction of the arrows X. The pipes 1 are spaced apart in order to provide slots through which air may be drawn downwardly by suction

through the porous belt 2. A casing 4 is secured to the outside pipes as indicated in Figs. 2 and 3 in such manner as to form a suction box, the top of which is the pipes 1. Preferably, the pipes 1 are angularly disposed first in one direction and then in the other direction. It is to be understood, however, that the mechanism is fully operative even when the pipes are extended diagonally in one direction only beneath the conveyor belt 2. Preferably, the pipes 1 are closed at one end and are connected at the other end with a header pipe 5, which header is connected with a source of air pressure by a pipe containing a control valve 6. The upper or top portions of the forward part of the pipes are preferably provided with small openings 7 through which compressed air within the pipes may blow upward through the porous conveyor belt 2 which slides on the upper surface of the pipes. The connecting pipe 8 connected to the casing 4 leads to some air handling mechanism capable of producing suction or negative pressure so as to maintain a partial vacuum within the suction box 4, and may be provided with a damper, or air valve 9 to regulate the degree of negative pressure in the suction box 4.

The edges of the porous conveyor belt 2 preferably are provided with drive chains 10 which may cooperate with suitable drive sprockets in order that the belt 2 may be properly driven over the grid of pipes 1.

The material to be treated may be fed upon the belt 2 either as a lap or batt, or it may be in the form of loose fibers which are floated through the air by means of a picker cylinder or other suitable mechanism tending to disperse the fibers in the air and permit the fibers to settle gently, as a very loose mass, on the conveyor belt 2 as indicated in Fig. 4. In this construction, preferably, the forward end of the belt 1 is covered by a hood 11 and the forward edge may terminate in a roller 12 which is located closely adjacent to the upper run of the conveyor belt 2.

In the operation of the device, the air currents are generally in accordance with the arrows Y as indicated in Fig. 3. It will be observed that as the material is carried forward over the angular zone A of the pipe grid that there is a tendency to rotate the material clockwise and that as the material is carried over the angular zone B, there is a tendency to rotate the material counter-clockwise as the construction is illustrated in Fig. 1.

The rolling or turning action produced on the material is not so much to produce a twist in the finished product as it is to orient and compact the fibers together. The term "orient" is used to mean that the majority of the fibers have their axes extending in the direction of the length of the sliver. The reverse movement through the zone B is not so much for the purpose of untwisting the fibers that have passed the zone A as it is to continue the orientation of the fibers and the compacting of the loose fibers into a sufficiently compact mass to comprise a sliver which may be handled as such for further treatment in the textile art. If a more compact sliver is desired than that which issues from this machine, the sliver may be fed to suitable compacters where the mass is further compacted.

Since the machine for carrying out the present invention is illustrated diagrammatically, the various drives for the movable parts have been omitted in order not to complicate the showing

in view of the fact that such drives will be obvious to those skilled in the art.

This application for patent is a division of my application Serial No. 340,049, filed June 12, 1940, and the present application is limited to the apparatus or machine which may be used as one form of device to carry out the method which is covered by my application Serial No. 340,049.

What I claim is:

1. An apparatus for producing slivers from loose textile fibers comprising a porous continuous belt, a grid over which one run of said belt travels, means to cause loose textile fibers to be deposited upon said belt means to cause air to flow through the portion of said porous belt over the openings in said grid to form elongated masses of textile fibers on said belt over the openings in said grid, the openings in said grid extending substantially longitudinally of said belt to cause said elongated masses of textile fibers to extend substantially longitudinally of said belt and to be subjected to fluid pressure while lying freely on said belt.
2. A device for forming slivers from textile fibers comprising a suction box, the upper portion of said suction box comprising a grid, a travelling continuous belt having one run of said belt travelling over said grid whereby when a partial vacuum is produced in said suction box said run of said belt is drawn against said grid to permit air to flow through said belt over the open spaces in said grid of said suction box, means to discharge loose textile fibers upon said traveling continuous belt, the openings in said grid extending substantially longitudinally of said belt to cause the air flow through said belt and said loose textile fibers to form longitudinally elongated masses of said textile fibers on said belt over the openings in said grid.
3. A sliver forming device comprising a suction box having one side thereof formed of a grid, a porous continuous belt having one run thereof moving over a grid of the suction box in such manner that the spaces in the grid are diagonally disposed relatively to the said run of the said porous belt, means to feed loose textile fibers to said belt, the spaces in the grid of said suction box extending substantially longitudinally of said belt whereby said longitudinal and diagonal relation of said spaces to the run of said belt causes the air current through the textile fibers and the belt because of the suction in said suction box to produce longitudinally extending masses of textile fibers over the spaces in the grid.
4. An apparatus for forming slivers comprising a continuous porous belt, a suction box having a grid adjacent a run of said belt whereby said run of said belt is held against said grid when said belt is moved over said suction box while a partial vacuum is maintained therein, said grid being formed of substantially cylindrical members whereby the partial vacuum formed in the suction box causes the portion of said porous belt in contact with said grid to assume a corrugated condition with air flowing through the valley portions of said corrugations in said belt, said corrugations being angularly disposed relatively to the direction of movement of said belt.
5. A device for forming slivers from textile fur fibers comprising a travelling porous endless belt, a suction box having a grid on one side thereof formed of substantially cylindrical pipes, said pipes being provided with small openings, means

to supply compressed air to said pipes, means to withdraw air from said suction box to form a partial vacuum within said box, said pipes being angularly disposed relative to the travel of one run of said belt, said belt being in contact with said grid to assume a corrugated condition over said grid whereby compressed air from within said pipes flows through said corrugations and atmospheric air flows through said belt in the valley portions of said corrugations, thereby causing a rolling and compacting action to fur fibers supported by said travelling belt as the belt moves over the said grid of the suction box.

6. A machine for making slivers comprising supporting means to support an uncompressed mass of sliver material, means comprising fluid pressure to cause the sliver material to be separated into a plurality of continuous elongated masses, and means to cause each of said elongated masses to be rotated around its longitudinal axis while being supported upon one side only by said supporting means.

7. A machine for making slivers comprising supporting means to support a lap-like mass of loose textile material, fluid pressure means to cause said loose lap-like mass to be divided into a plurality of continuous elongated masses, and means to cause said continuous elongated masses while being freely supported on one side only by

said supporting means to be rolled to compact the textile material thereof into slivers.

8. A machine for making slivers comprising a travelling support for a loose mass of textile material, means to cause said loose mass of textile material to be divided into a plurality of elongated continuous masses while being carried upon said travelling support, and means operative upon said elongated continuous masses while being carried on said travelling support to roll said elongated continuous masses under pressure to compact the same into slivers.

9. A machine for making slivers from fur fibers or the like comprising a travelling support to support said fibers as a loose fiber lap, dividing means to divide said lap into a plurality of loose fiber elongated masses supported by said travelling support, and means to cause said elongated masses to roll on said travelling support while said elongated masses are being subjected to pressure.

10. A machine for making slivers from fur fibers or the like comprising a travelling belt comprising the support for a loose lap of said fur fibers, means to divide said loose lap of said fur fibers into a plurality of elongated individual masses while said fibers are being carried by said travelling belt, and means to subject said elongated masses to fluid pressure while rolling said masses upon said travelling belt.

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