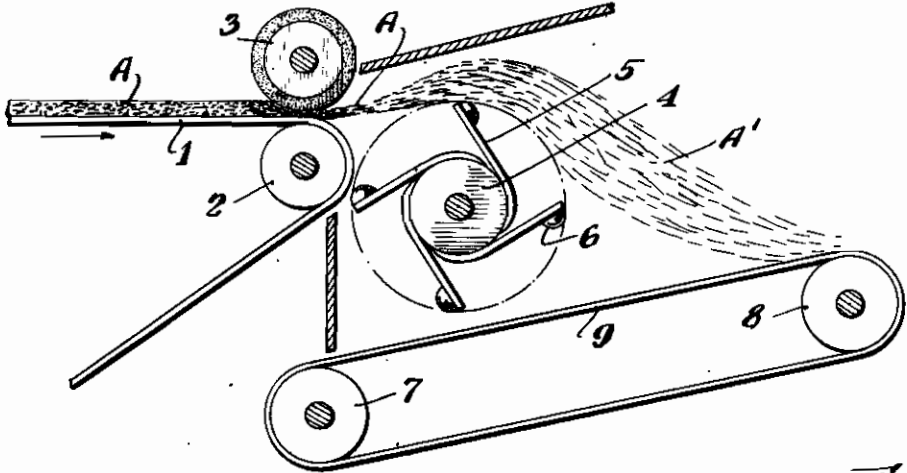


PUBLISHED  
APRIL 27, 1943.  
BY A. P. C.

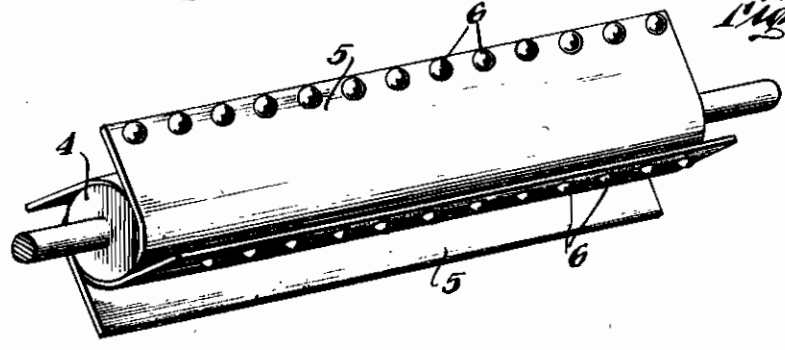
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METHOD AND APPARATUS FOR THE LOOSENING  
OF MATTED FIBROUS MATERIALS  
Filed Aug. 5, 1940

Serial No.  
351,493

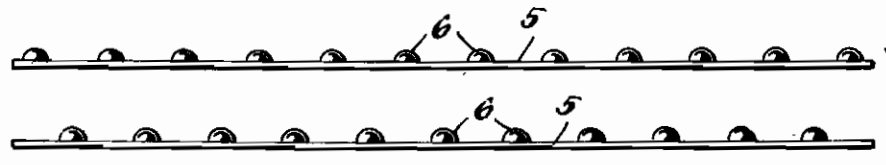
*Fig. 1*



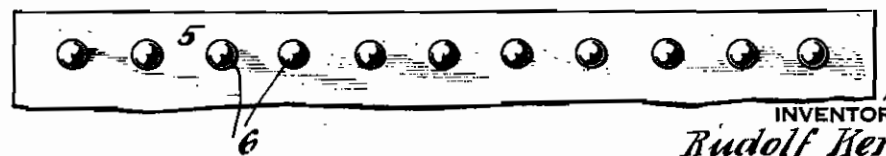
*Fig. 2*



*Fig. 3*



*Fig. 4*



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# ALIEN PROPERTY CUSTODIAN

## METHOD AND APPARATUS FOR THE LOOSENING OF MATTED FIBROUS MA- TERIALS

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Application filed August 5, 1940

This invention relates to improvements in method and apparatus for the loosening of matted fibrous materials and has for an object to provide such a method and apparatus which serves to loosen or fluff matted fibrous materials without subjecting the fibers to undue tearing, rubbing, or erosion.

In the manufacture of staple fiber the wringing of the material to partially free it of moisture causes the fibers to be matted together so that it is desirable to have the fibers loosened or fluffed before the material is transferred to the drying chamber. This is necessary in order to dry the material quickly and therefore secure the maximum effectiveness from the drying chamber. It is also necessary in order to permit uniform drying so that the moisture content of the material will be as nearly constant as possible throughout the mass. The latter is particularly important for commercial reasons.

It is an object of this invention to provide a method and apparatus whereby a web of more or less matted moist fibrous material is subjected to relatively high frequency vibrations particularly in a direction transverse to the web whereby the material will be shaken or beaten apart and loosening or fluffing thereof is effected without subjecting the material to a combing or other pulling treatment, which would cause injury to the fibers due to the fact that the wet strength of such fibers is generally relatively low.

It is another object to provide such a method and apparatus in which in addition to the beating action a current of air is applied to the web or mat to assist the loosening action.

A more specific object is to accomplish these results by passing the web of matted material over a cylinder revolving at high speed in the direction of movement of the mat, which cylinder is provided with vanes to impart vibrations to the web as the web passes thereover, which vanes are preferably so arranged that at least the ends thereof are tangential.

A further object is to provide the vanes of said cylinder with a plurality of knobs near the edges thereof whereby supplemental vibrations of a transverse wave-like nature are imparted to the web.

Another object is to so arrange said knobs that the knobs on successive vanes will strike the web at different points so as to impart further wave motion thereto and to assure that all parts of the web are properly beaten and loosened.

Other objects will become apparent from the following description taken in connection with the attached drawings showing illustrative embodiments of the invention and wherein:

Fig. 1 is a side view illustrating one form of apparatus for carrying out the invention;

Fig. 2 is a perspective view of the rotor;

Fig. 3 is an edge view of two adjacent vanes showing the staggered relationship of the knobs;

Fig. 4 is a corresponding view of two adjacent vanes as viewed at right angles thereto.

Referring to said drawings, the numeral 1 designates a belt of foraminous material serving to convey a layer A of fibrous material. The belt 1 passes around roller 2 and 3 designates a pressing roller. The numeral 4 designates a roller carrying a series of vanes 5, say four in number, which vanes are shown as being tangentially arranged. Near the edge of the vanes 5 and on the effective side thereof are arranged a number of knobs 6 preferably of generally hemi-spherical form and as shown in the drawings preferably so arranged that the knobs of one vane are staggered with respect to the knobs of the next following vane.

7 and 8 designate rollers supporting and advancing a conveying belt 9 for transporting away the loosened or fluffed material A'.

The material A, due to previous treatment and/or to the squeezing or wringing action imparted thereto by roller 3, leaves said roller in a more or less compacted and matted condition, making drying thereof difficult. It thereupon passes above and over the roller 4 and vanes 5 which are rotating at a high speed, say two hundred fifty or more revolutions per minute. During this passage, the material A is given a large number of blows by the vanes 5 with the result that vigorous vibrations are imparted thereto, both in the direction transversely of the web and also longitudinally thereof. This causes the web to be loosened and fluffed without the application of substantial tearing action. Furthermore, if the knobs 6 are employed vibrations or waves in the direction of the breadth of the web are imparted thereto, serving to assist further in the loosening of the material. This action is increased if the knobs 6 of successive vanes are staggered with relation to each other.

Due to the tangential arrangement of the vanes any tendency for the material to be wrapped around the rotor is effectively avoided. Furthermore, the action of the vanes is such that a current of air is blown against the web of fibrous material, passing therethrough and serving further to loosen and fluff the material.

Due to the impact of these air currents and the beating applied to the web of material, the web is caused to float over the rotor and thereafter passes forwardly onto the conveyor belt 9 in a loose fluffed condition.

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