J. SAUS.

CARDING.

APPLICATION FILED APR. 24, 1916.

1,303,833.

Patented May 13, 1919.

2 SHEETS—SHEET 1.

FIG. 1

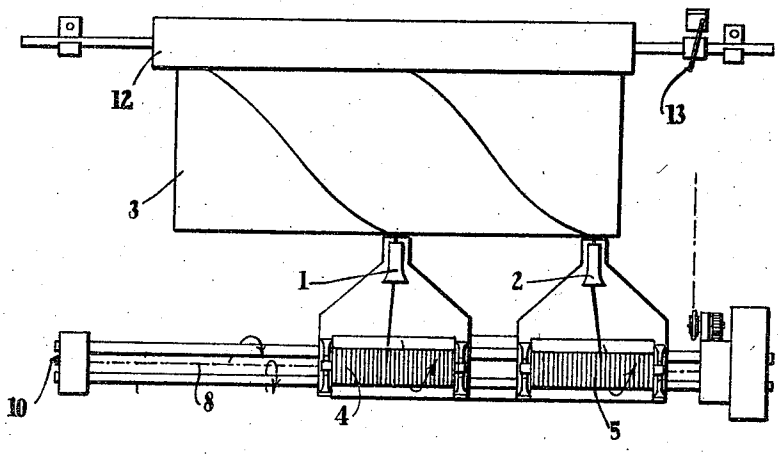
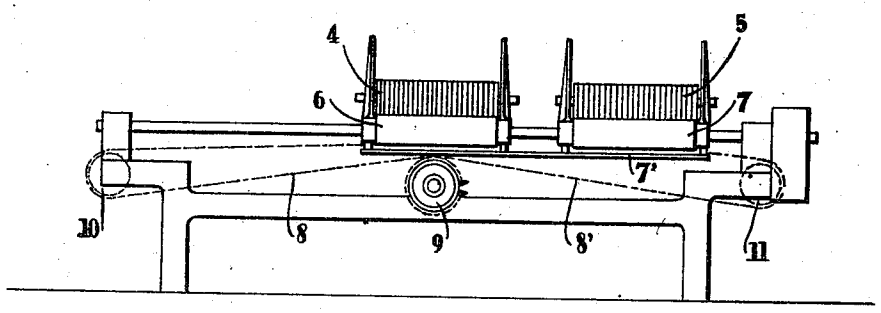


FIG. 2



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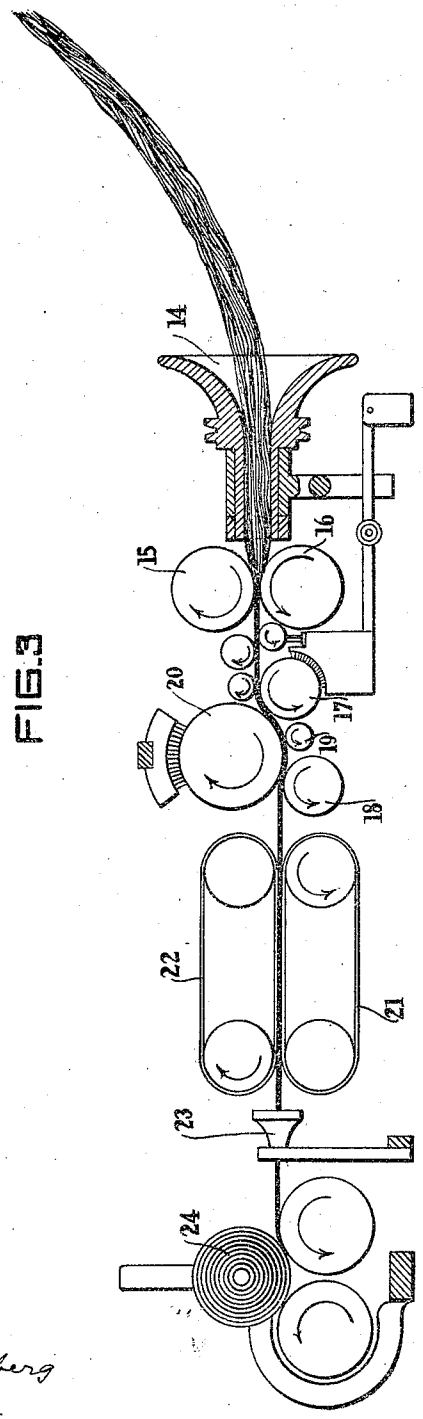


FIG. 3

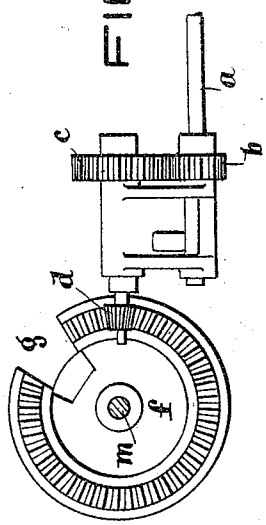


FIG. 4

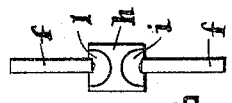


FIG. 5

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CARDING.

1,303,833. Specification of Letters Patent. Patented May 13, 1919.

Application filed April 24, 1916. Serial No. 93,294.

To all whom it may concern:

Be it known that I, JUAN SAUS, a subject of the King of Spain, residing at 141 Rambla, Sabadell, Barcelona, Spain, have invented certain new and useful Improvements Relating to Carding, of which the following is a specification.

There are two existing methods of wool spinning, namely (1) in which the material is prepared by carding, applied to short fibers which cannot be rendered parallel and as a consequence the threads obtained are soft to the touch but they cannot be spun to a very low number, and (2) in which the material is prepared by combing applied to the fibers for rendering them parallel in which the short fibers, that is the noils, are separated, the threads obtained being fine but hard to the touch by reason of the short fibers having been eliminated.

It will be understood that it is a matter of industrial importance to obtain wool fibers which while having the supple feel of threads of short fiber have a degree of fineness such as given to threads formed only of long fibers because with the threads thus obtained one is able to produce as fine products on weaving looms as those actually produced with threads of wool having long fibers and without presenting to the touch the hardness of these latter. To obtain this new result it is necessary to have a method and machine permitting of spinning together two sorts of fiber long and short.

According to the invention this result is secured by a carding operation. The method of carding is applicable particularly to the treatment of wools because of its utility with respect to fibers of mixed lengths without it being necessary to separate the fibers according to length. Accordingly the invention consists in spinning previously or naturally mixed long wool and short wool by which is obtained the suppleness, regularity and fineness of thread and that at a reduced cost since according to the invention the wool can be treated by the parallelization of the fibers without it being necessary to separate the short fibers, that is the noils.

Accordingly a machine such as that employed for carding short fibers is combined with a means for drawing or stretching ribbons or sections resulting from the division of the lap and the combing of the same ribbons for completing the parallelization of the fibers before they are passed between condensing rubbers or aprons. This operation is produced by mechanism represented in Fig. 3 of the accompanying drawings but in order to secure the desired effect it is necessary to obtain, in the passage of the fibers into and through the carding machine, a perfect distribution of the fibers and this effect is realized by the mechanism represented in Fig. 1.

In the accompanying drawing,

Figure 1 is a diagrammatic plan view of a machine comprising the necessary modifications to the present invention.

Fig. 2 is a front view of a feeding arrangement for the machine, while

Fig. 3 is a side view in section on a larger scale of mechanism for perfecting the ribbons and rendering them uniform. The mechanism illustrated in Fig. 3 replaces on the machine the mechanism ordinarily employed for the formation and withdrawal of the slivers.

Fig. 4 is a side elevation and Fig. 5 a detail end elevation illustrating the known mechanism for imparting a reciprocating movement to the drum 9.

The feeding arrangement of the carding machine consists of two ribbon guides or funnels 1 and 2 which are given a reciprocating rectilinear movement in a direction parallel to that of the axis of the main cylinder 3 of the carding machine, the movement being reciprocating with strokes such that the guide or funnel 1 passes over one part of the front of the cylinder 3, while the guide or funnel 2 passes over the remainder of the front of the cylinder.

The slivers of fiber which are of mixed lengths, say of wool, to separate the fibers of which, according to length, no attempt has been made, passing through the guides and funnels 1 and 2 come respectively from bobbins 4 and 5 which follow the movements of the guides or funnels, for which purpose they are mounted on carriages 6 and 7 connected one with the other by the plate 7′ (see the front elevation Fig. 2) actuated by traction chains 8 and 8′. These chains are fixed by one of their extremities to the carriages 6 and 7 and pass on to the drum 9, guided by the pulleys 10 and 11 respectively.

The known mechanism for imparting a reciprocating movement to the drum 9 consists of the driving shaft *a* which imparts movement to the pinion *d* by means of the wheels *b* and *c*; the support *e* of the pinion

d and of the wheel c rock upon the spindle of this same shaft a. The pinion d meshes with the plate f which is provided with teeth upon its two faces and these sets of teeth are interrupted by a slot g. A part h upon which two guides i and l are formed is provided at the place corresponding with the slot g. As a result of this arrangement, when the pinion d has traversed the teeth of one of the faces of the plate f, it passes through the slot g, the gudgeon of the pinion sliding over one of the guides i or l and then passes over the teeth on the other face of the plate. The shaft m on which the drum 9 is keyed is thus given a reciprocating movement of rotation.

It will be understood that the ribbons on leaving the bobbins 4 and 5 pass through feed rollers to the "licker-in" roller, the carding machine being the same as is usual except for the addition of the mechanism illustrated in Figs. 1 and 3.

In this manner the ribbons are uniformly distributed over the main cylinder 3 each over its own end, and this uniformity is increased and perfected in the known manner by the action of a cylinder 12 covered with card points in the same manner as the cylinder 3, the cylinder 12 having a movement of rotation and at the same time a reciprocating movement, produced by the cam 13.

By the means described a perfectly uniform lap is produced with the fibers lying parallel throughout its length. In the same carding machine the lap is divided in a known manner into sections or parts each of which is subjected to the action of the device represented in vertical section in Fig. 3. Each card comprises a number of these devices equal to the number of sections into which the lap is divided. These sections are formed into ribbons by their passage through the guides or funnels 14 and are subjected to the action of pressure rollers 15, 16. They are then drawn or stretched between these rollers and other rollers rotating at a higher surface velocity. Of these rollers, the roller 17 is provided with comb points while the rollers 18 and 19 are fluted longitudinally. At 20 is mounted a roller covered with leather so that it may fit snugly against the fluted rollers 18 and 19.

In order to impart a certain consistency to the ribbons they are passed through rubbers 21, 22 after which they pass through guides 23 and are rewound upon rollers 24.

In practice, carding by the method described is effected conjointly or in combination with the rest of the operations necessary in spinning. Although it has been referred to as applied to the treatment of wools, obviously it is applicable to the treatment of other textile fibers but nevertheless its principal application is to wool.

The devices described may be constituted by mechanisms whose constructional details vary, but these modifications do not in any way affect the principle of the invention.

I claim:—

1. In a machine for carding fibers of different lengths, in combination, a main carding cylinder, a pair of longitudinally reciprocating feed guides, means for reciprocating each guide substantially a distance equal to half the length of the cylinder, a point-covered cylinder, means for longitudinally reciprocating said point-covered cylinder, a lap of uniform quality being produced by this dual reciprocation, means whereby said lap is formed into ribbons, pressure rollers whereby each such ribbon is stretched, and rubbers whereby each ribbon is rubbed or twisted before winding.

2. In a carding machine for producing a product of uniform quality from fibers of different lengths, in combination, a cylinder, a pair of feeding guides, means for reciprocating said guides lengthwise of the cylinder, a point-covered cylinder, and means for giving said point-covered cylinder a longitudinal reciprocation, whereby the fibers are distributed well mixed upon the cylinder, and further distributed by the reciprocation of the point-covered cylinder to form a bat of uniform quality, distribution, and parallelization of fibers.

3. The process of preparing for spinning, wool of mixed long and short fiber quality, which process consists in feeding said wool into a carding machine in sidewise reciprocating ribbons whereby the wool is distributed nearly uniformly upon the carding drum, in removing the bat so formed from the drum while subjecting the removing means to reciprocating movement whereby even distribution and parallelization of all fibers practically is effected, in conducting said bat from the carding machine in a series of ribbons, and in compressing, stretching and rubbing said ribbons individually as they are conducted from the machine, prior to winding.

4. The process of preparing for spinning, fibers of mixed and varying lengths, which consists in feeding said fibers in the form of ribbons in a reciprocative motion parallel to the axis of the main cylinder, and together extending throughout the length of the cylinder, whereby the fibers become substantially parallelized and removing the cylinder-formed bat upon a rotating and reciprocating surface covered with card points, whereby owing to the double reciprocation a bat of uniform quality and parallelization and distribution of fibers is produced.

5. In a machine for effecting the parallelization and uniform distribution for spinning, of textile fibers of varying lengths, a carriage, sliver spools mounted on said car-

riage, funnels or guides mounted on said carriage, a carding cylinder rotating in one plane, means whereby said carriage is made to travel back and forth along the carding cylinder to distribute the fiber containing sliver thereover, a point-covered cylinder on the opposite side of said carding cylinder for taking off the formed bat, and means for imparting a longitudinal vibration to said point-covered cylinder as it takes off the bat, whereby the fibers are given first a transverse and progressive motion, second a progressive motion and then a transverse and progressive motion whereby a bat having fibers of unequal lengths uniformly distributed and arranged is produced.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."