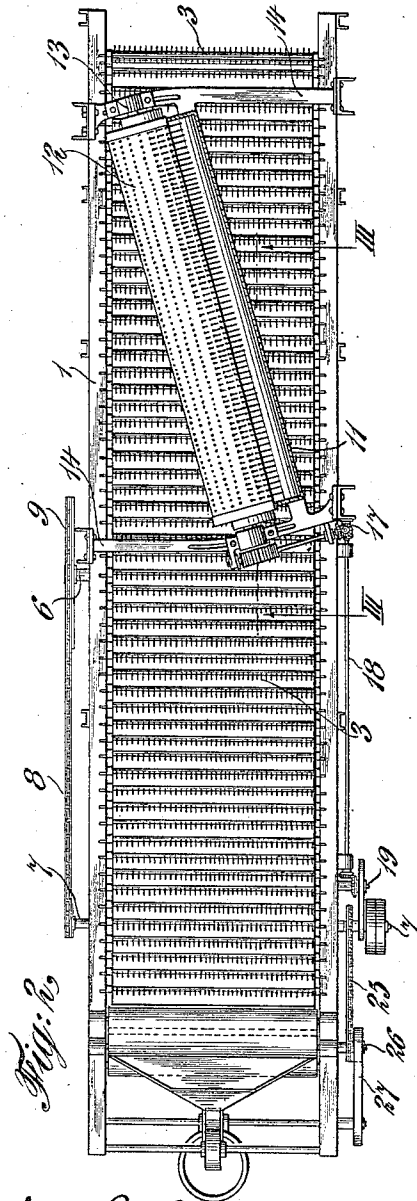
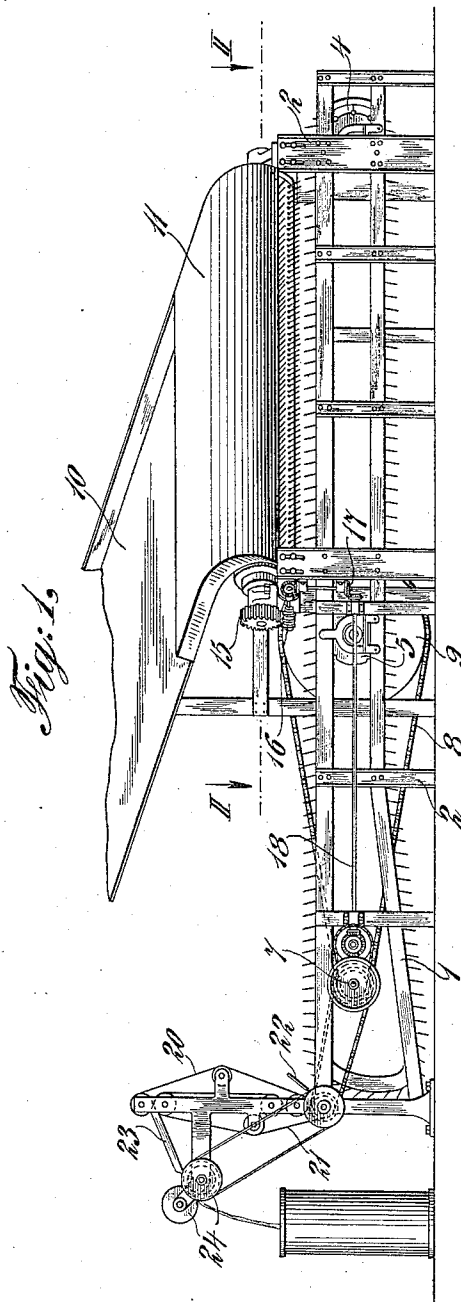


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COMBING MACHINE.
APPLICATION FILED JUNE 10, 1910.

1,059,726.

Patented Apr. 22, 1913.

3 SHEETS—SHEET 1.



Witnesses:
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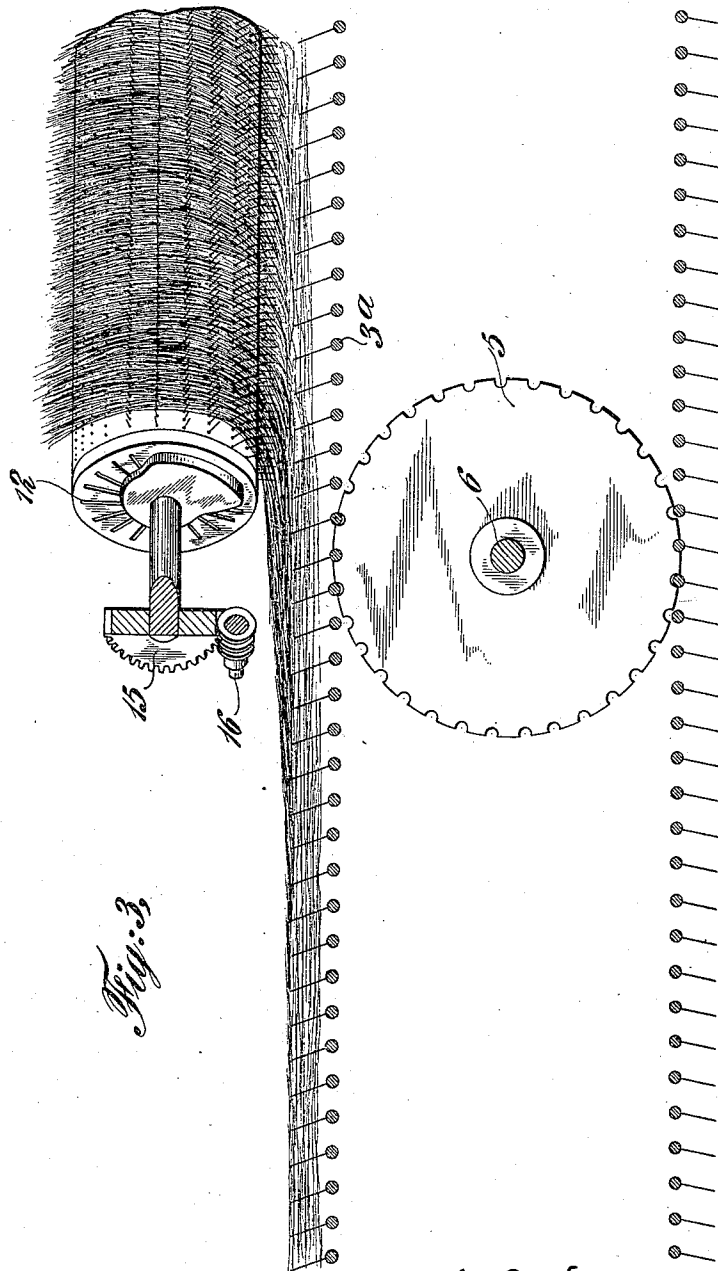


Fig. 3.

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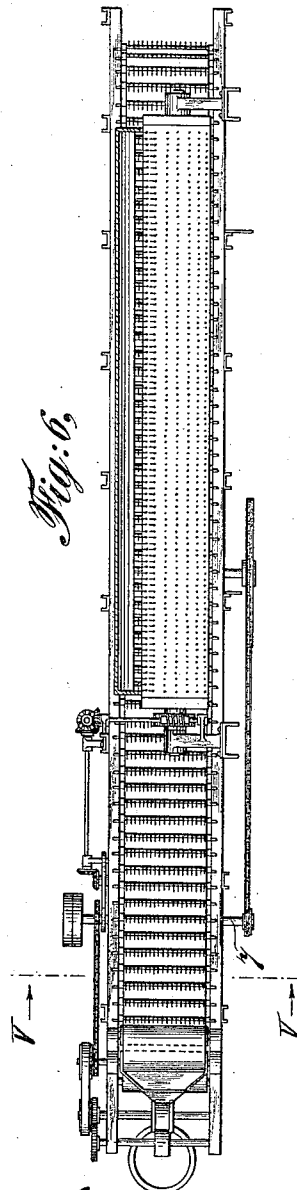
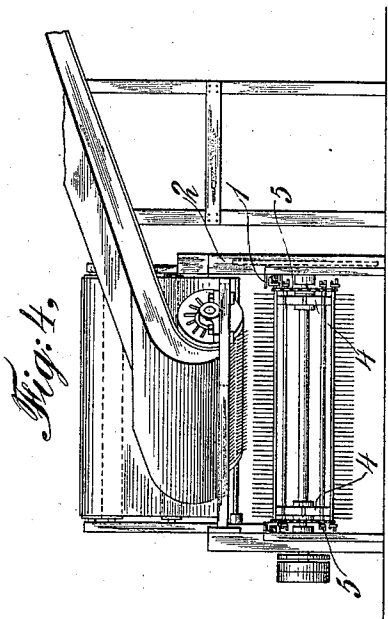
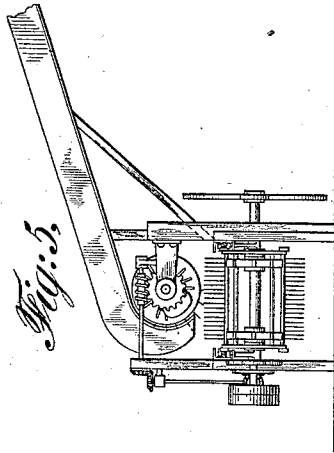
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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COMBING-MACHINE.

1,059,726.

Specification of Letters Patent.

Patented Apr. 22, 1913.

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To all whom it may concern;

Be it known that we, JOHN GOOD and HARRY G. KIMBALL, both citizens of the United States, and residing, respectively, at Brooklyn, county of Kings, New York, and Lawrence Park, Bronxville, Westchester county, New York, have invented certain new and useful Improvements in Combing-Machines, of which the following is a full, true, and concise specification.

This invention is an improvement in combing or hackling machines for operation on hemp and like fiber, and consists in the arrangement of the parts, hereinafter described and claimed, for distributing the load on such machines to thereby enable them to run with improved efficiency and higher draft upon the fiber, the special object of the invention being the attainment of a maximum combing effect in a single and continuous operation upon a fiber-lap.

To this end the invention comprises a fiber-feeding means organized with the combing pin train in such a manner as to present the lap of fiber to the action thereof in an oblique or edgewise position, so that the line of its engagement with the train of combing pins, extends lengthwise of the path of movement of said train and over several of the gill bars upon which the combing pins are carried, as will be fully explained in the following detailed description.

In the accompanying drawings forming a part hereof, Figure 1 is a side elevation of a combing machine embodying the principle of the present invention; Fig. 2 is a horizontal section of Fig. 1 on line II—II thereof; Fig. 3 is an enlarged illustrative view showing a portion of the same machine on line III—III of Fig. 2; Fig. 4 is an end elevation of Fig. 1; Fig. 5 is a transverse vertical section of a modified form, taken on line V—V of Fig. 6; and Fig. 6 is a top plan of Fig. 5 with the feed-board removed and the feed-chute in section.

It should be noted that the foregoing drawings are merely illustrative of the principle of the invention and are not intended to indicate the mechanical proportions or the structural details of the mechanism except in the usual general way. The operating parts of the machine shown in the drawings are all instruments that are well known and familiar to builders of this kind of machinery.

Referring first to Figs. 1 to 4, the machine therein shown comprises a frame conveniently made up of sides girders 1, posts 2 and suitable transverse members arranged in any suitable way to support the feeding apparatus and provide a track or mounting upon which the combing pin train, marked 3, may run. The combing pin train may have any suitable construction and mode of operation according to the choice of the builder of the machine, and it may be driven in any suitable way so long as thereby a series or succession of suitable combing pins will be caused to travel with the proper degree of rake through a path adjacent to the fiber feeding means, to be later described. The form of combing pin train taken for illustration in the present case, is an ordinary link-formed combing-chain such as is at present in common use in hemp and flax working machinery. For this reason detailed description of its construction will not be necessary to those skilled in this art; suffice it to explain, however, that the chain is made up of a series of parallel gill bars 3^a which are appropriately linked together with their linked ends mounted to run upon tracks supported on the inside of the side girders 1, as appears in Fig. 4. The tracks are arranged in upper and lower stretches and provide a path or circuit through which the chain may continuously revolve. Each gill-bar 3^a extending transversely of the chain carries a row of combing pins, and is controlled by the dogs with which it is provided so that the said pins are maintained in a forwardly raked position as they move through the upper and operative stretch of track, while in the return or lower stretch, in which they do no work, they may hang indifferently. As they approach the delivery head, in their upper stretch, their forward inclination is gradually diminished and finally reversed as they pass downwardly into the return stretch. On leaving the lower stretch of track they are returned again to the upper stretch by means of the notched idler wheels 4, and thereupon their previous forward rake is again resumed. The automatic control of the rake of the combing pins as just described is a well known quality of the common combing-pin chain herein referred to, and the specific arrangement of the tracks and dogs whereby such control is effected, will therefore be fully understood by those skilled in this art.

In the present case, the chain is driven by the notched drive wheels 5 of the transverse shaft 6 which receives motion from the power shaft 7 through its large sprocket wheel 9 and a sprocket chain 8; and such drive wheels 5 are arranged to simultaneously engage and drive both the upper and lower stretches of the chain, preferably at an intermediate point between the ends of the stretches, so that the chain will thus be simultaneously pushed and pulled at both points, thereby diminishing any tendency for it to bind in passing from one stretch to the other. The hemp streams forwardly from the feeding apparatus, as shown in Fig. 3, so that the location of the drive wheels is thus coincident with the region where the greatest load falls on the chain, and the operation of the latter at high speeds is correspondingly facilitated.

The fiber to be combed or hackled is placed upon the feed-board 10 in the form of bunches of raw fiber, or in such other form as it may happen to come, forming thereon a single, broad and substantially flat fiber-lap which is introduced into the curved and somewhat tapered chute 11 by which it is directed and guided into engagement with the lap-feeding means. The present invention contemplates any suitable form of lap feeding means which will properly conduct the lap from the end of the feed-board into the action of the combing pin train, and prefers a train of feeding pins for this purpose, in order that the uncombed fiber may be held more or less loosely while being subjected to the combing train and so that individual fibers may be drawn off therefrom, successively and as rapidly as they become free and disentangled. The means taken for illustration of the present case consists of an ordinary gill-pin cylinder 12, the pins of which form a feeding train which engages the lap while it is still within the curved chute 11 and conducts it therefrom into the combing chain. Its construction involves a plurality of gill-pins suitably controlled by the cam plates 10, so that, as the cylinder revolves, they are projected radially outward from the wall thereof on the sides which are proximate to the fiber lap, and withdrawn or housed within the cylinder at its opposite sides. The construction of gill-pin cylinders having this mode of operation is also well known. The cylinder is journaled on the transverse supports 14, the journal seats 13 thereof being horizontally adjustable on the supports and the latter are vertically adjustable on the frame posts 2, as shown in the drawings. Rotary motion is imparted to the cylinder through a worm gear 15 and a worm 16 which is driven by appropriate shafting and beveled gearing, indicated at 17, from a longitudinal shaft 18,

the latter receiving its motion through a change speed gearing 19 from the main power shaft 7. In Figs. 1 to 4 the feeding cylinder and preferably the entire feed-head of the machine is arranged obliquely to the path of the combing train and is set as closely to the points of the combing pins thereof as may be required for the particular fiber to be treated. The lap passing from the feed-board and conducted by the feeding train into the action of the moving combing pins will engage the same along an oblique line corresponding more or less closely to the angle at which the feeding cylinder has been placed, and will hence be distributed over a considerable portion of the operative stretch of the combing train, as partially indicated in Fig. 3. The single lap will thus be simultaneously acted upon by a number of the transverse rows of combing pins of which the combing train is formed, and the duty or strain which falls on each gill-bar 3^a of the train will thus be but a fraction of the total load on the whole train. It is obvious that the width of the lap may be greater than the width of the combing chain so that when diagonally or obliquely placed it will occupy the full width of the chain and all of the pins of the latter will work upon some part of the lap. The rate at which fiber in the form of this relatively broad lap may thus be safely supplied without overloading the gill-bars of the combing pin chain, is sufficient to compensate for the excessive attenuation due to the higher combing draft at which the present machine is designed to run and the combed fibers drawn off from the obliquely placed lap, by the combing pin train are so closely assembled thereon that they can be continuously removed at the delivery end in the form of a single, combed sliver. The oblique position of the lap, moreover, tends to facilitate the breaking up of square ends in the raw fiber and distribute the fibers thereof longitudinally producing uniform imbrication of the product sliver.

Collection and delivery of the fibers drawn off and superposed on the combing chain, is accomplished, in the present instance, by a well known form of apron delivery head, located at the end of the operative stretch of the train, but any suitable means may be employed for this purpose. As shown herein, the head comprises two leather apron-belts marked 20 and 21 respectively, and carried upon a system of rollers so that they may run in mutual contact with each other from a point at about the level of the combing pin train upwardly to a point near the top of the frame of the delivery head. The fiber from the chain is caught in the nip of the two leather belts, at the lower point, being assisted thereto by the guide-

board 22, and is thence carried by the belts upwardly, and deposited upon a short conductor 23 over which it moves to the calender rolls 24 and thence to the sliver can.

5 The apron belts of the delivery-head are driven from the power shaft 7 by a sprocket-chain 25 geared to the axle 26 of one of the rollers of the apron-head system, and the calender rolls are driven by a belt 27 from
10 the same axle. Other ways of driving the delivery head and the calender rolls, may of course be used with equal effect, the object being merely to provide a suitable means for collecting the combed fibers from the comb-
15 ing train and combining and condensing them into the form of a single sliver, as will be well understood by those skilled in this art.

In Figs. 5 and 6 the construction is substantially identical with the construction above described, except for the fact that the train of feeding pins is disposed in parallelism with the path of the combing pin train. The broad single lap in this instance being
25 presented to the action of the said train along a line which is perpendicular to the gill-bars of the latter so that the combing action takes place for a distance along the chain, equal to the full width of the lap.
30 The single lap fed is thus distributed over the greatest extent of the length of the chain, the engagement therewith being still in a line or region which is transverse to the gill-bars or transverse rows of pins of the
35 combing train and also at an angle of less than 90 degrees to the path of movement thereof.

Claims:

1. In a combing machine a moving comb-
40 ing pin train and means for feeding a single lap thereto in a plane of feed extending longitudinally of said train.
2. In a combing machine, the combination

of a moving combing train composed of transverse rows of combing pins, means for 45 feeding a single lap simultaneously to a plurality of such transverse rows and a delivery head.

3. A combing machine comprising a train of combing pins and a train of feeding pins 50 disposed to feed a continuous lap thereto, said trains being mutually so disposed that the line of engagement of the lap with the combing train assumes an angle of less than 90 degrees to the direction of the combing 55 movement.

4. A combing machine, having a combing pin chain and lap feeding means disposed at an angle to the gill-bars of said chain.

5. The combination in a combing machine, 60 of a moving train of forwardly inclined combing pins and means for feeding a continuous lap downwardly thereto from above, the introduction of the lap to said train taking place along a line disposed at an angle 65 of less than 90° to the path of movement of the train.

6. In a combing machine, a feed-head comprising a train of lap-feeding pins adapted for moving a wide flat lap, a comb- 70 ing pin train of less width than said feeding train and engaging the lap therefrom in an oblique direction.

7. In a combing machine, the combination with a combing pin train comprising trans- 75 verse rows of combing pins, of a feed head obliquely disposed with reference thereto.

In testimony whereof, we have signed this specification in the presence of two witnesses.

JOHN GOOD.
HARRY G. KIMBALL.

Witnesses:

T. H. PROSSER,
CLIFFORD H. KLOS.