Oct. 20, 1953 J. GRESSEL 2,655,696

COMBING MACHINE OF THE RECTILINEAR TYPE

Filed Sept. 23, 1946 3 Sheets-Sheet 1

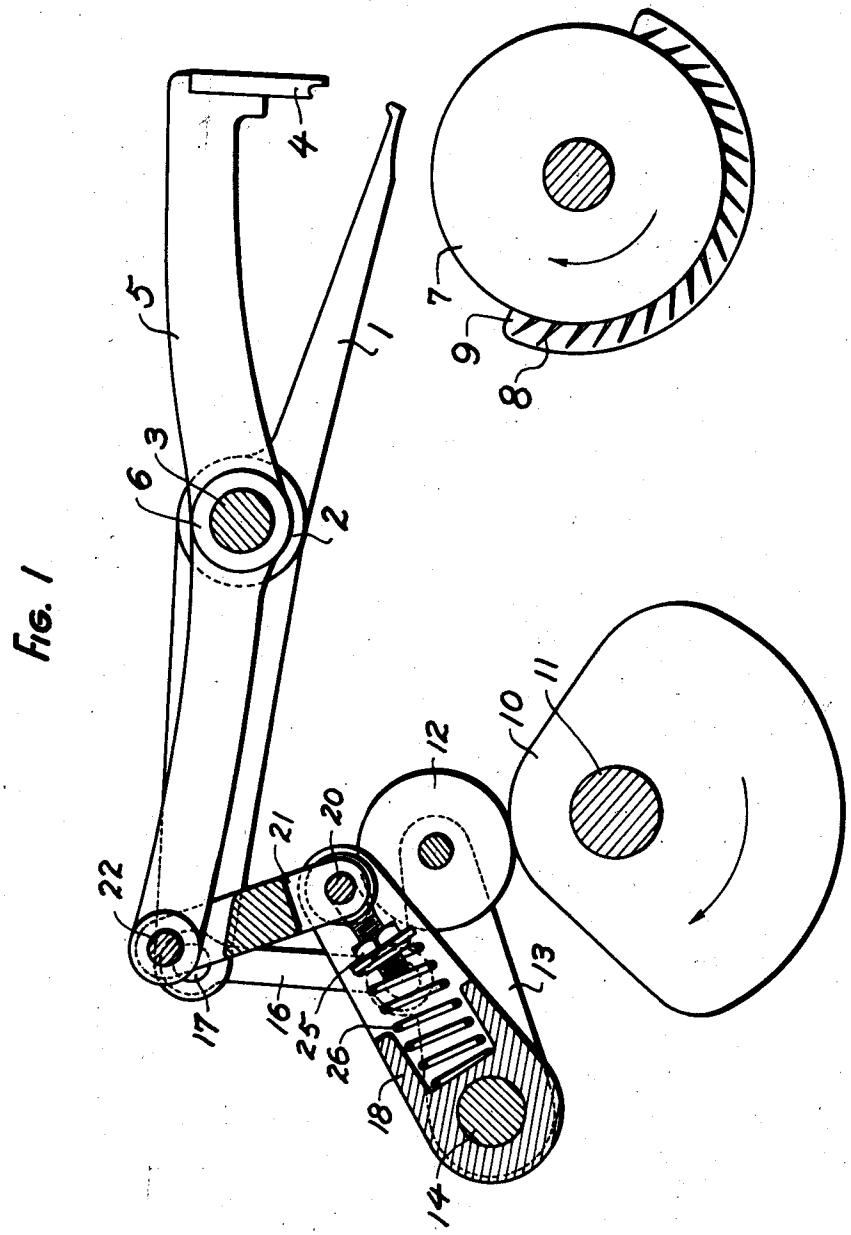


FIG. 1

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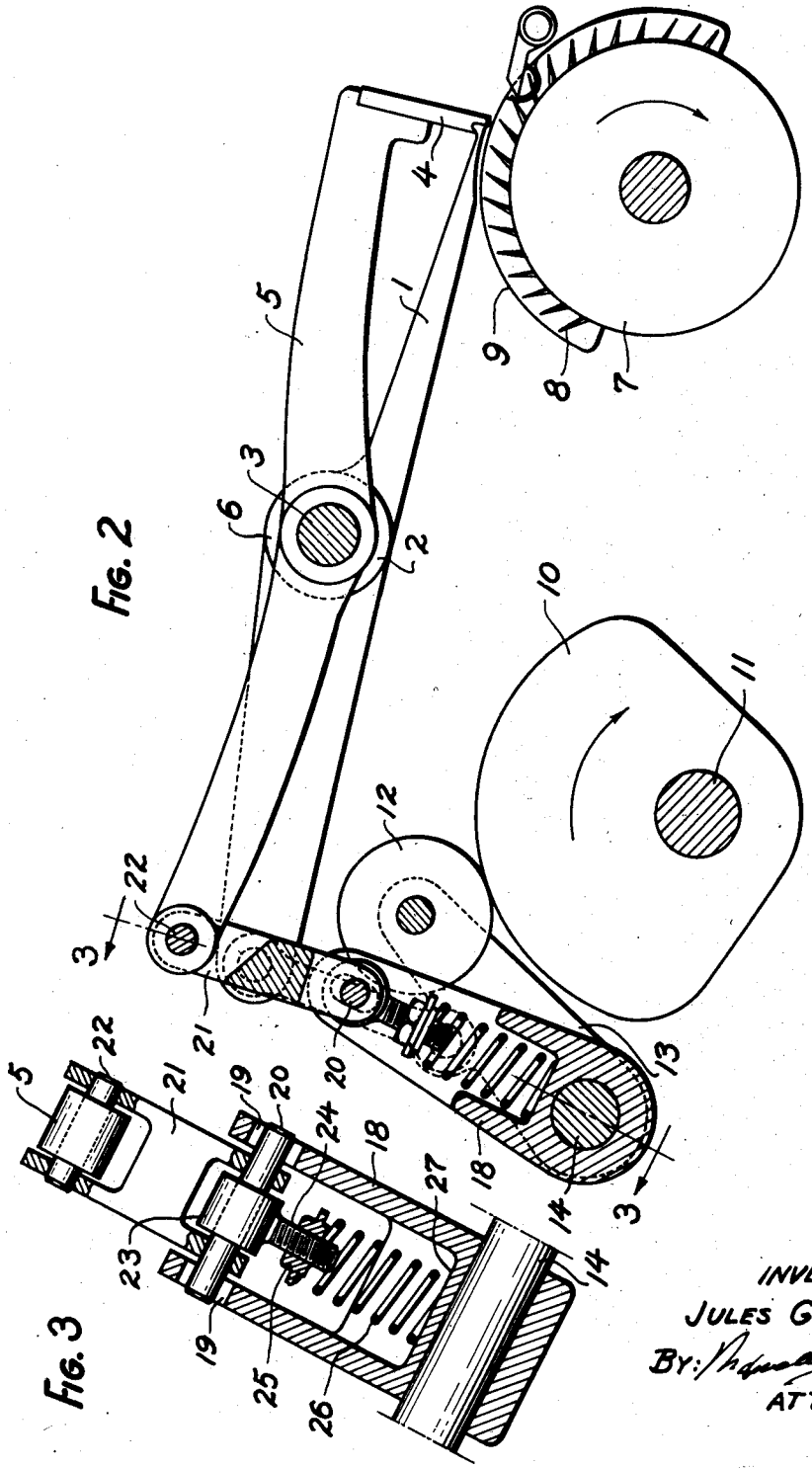


FIG. 2

FIG. 3

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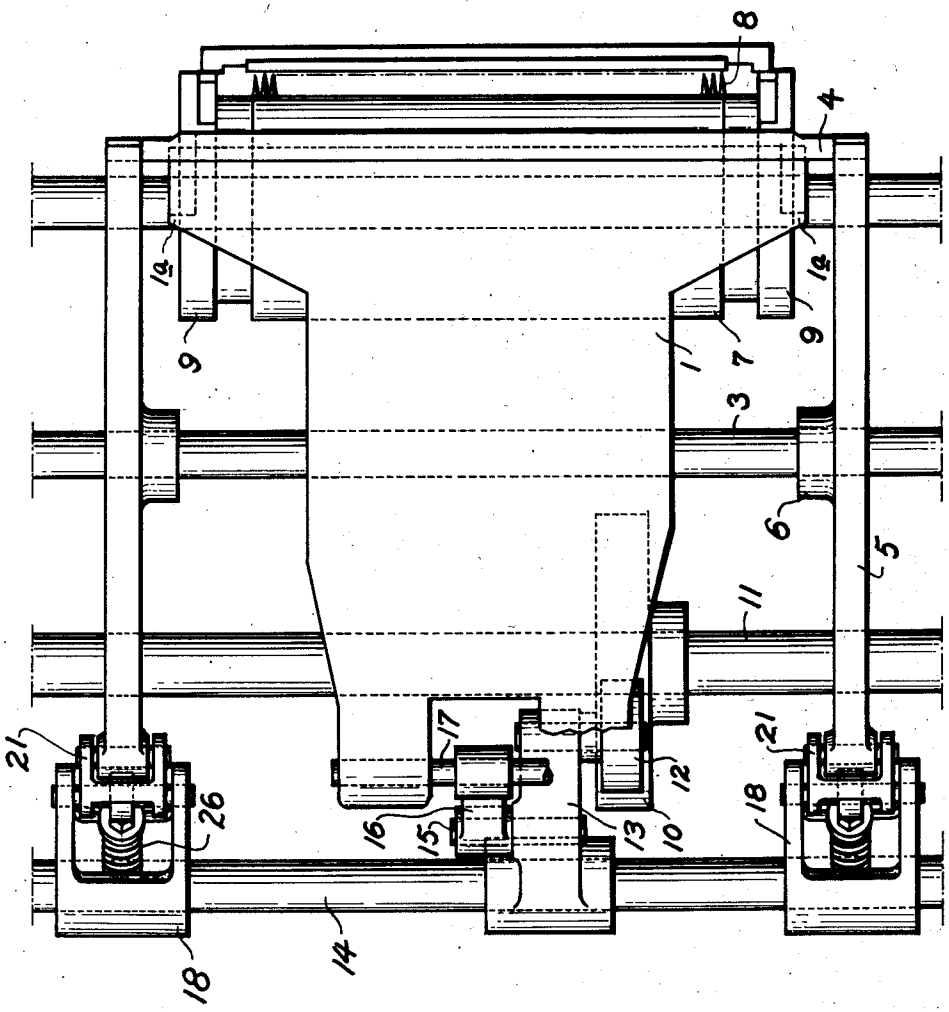


FIG. 4

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COMBING MACHINE OF THE RECTILINEAR TYPE

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4 Claims. (Cl. 19—116)

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The invention relates to combing machines of the rectilinear type proceeding from the basic Heilmann's system, for the combing of textile fibres, such as, for example and more particularly, wool and tows.

It is well known that the feed lap is liable to present substantial overthicknesses due either to overlapping areas caused by folds, or to inclusion of foreign bodies, and further that, in order to meet this danger, the lower nipper jaw has been mounted resiliently in such a manner that it may eventually yield under the action of an abnormal pressure, and against the action of a compressed spring, whereas the upper nipper jaw is rigidly or positively driven. It has been found that when this constructive principle is used, should overthicknesses present themselves in the lap, it may happen that, in spite of all the safety devices which have hitherto been proposed, the lower jaw comes into engagement with the needles of the circular comb carried by the rotary combing drum or cylinder, which causes damaging of said circular comb and makes it necessary to take out said comb in order to have it repaired by straightening its needles. This accident, which, however, may as well occur if the lower jaw spring happens to break, results, moreover, in said lower jaw and, in some cases, the dabbing blade, i. e. the blade which dabs the tuft in the needles, being at the same time damaged by the traversing motion of the circular comb needles.

The object of the present invention is to eliminate these drawbacks and, in view thereof, said invention provides improvements in rectilinear combers which are characterized in that:

1. The upper jaw is resiliently mounted so as to be able to yield to the pressure and to move away from the circular comb should the lap present overthicknesses, whereas the lower jaw is rigidly or positively driven.

2. The lower jaw is widened and shaped, at least in the bill portion thereof, in such a manner that, in case of a breaking of the rigid mechanism serving to drive said lower jaw, it may come to bear upon sectors provided on either side of the circular comb, said sectors being integrally connected with the combing cylinder, or the shaft thereof, and having a radius slightly greater than that of the circle of the needle tips.

3. As stop sectors for the lower jaw, one may may use the sectors with which, in some constructions, the combing cylinder is provided for guiding the dabbing blade.

Owing to these improvements, a greater safety in operation is secured, this permitting even the reduction of the spacing between the bill of the nipper and the tips of the circular comb needles, due to the fact that the lower jaw can never come

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into engagement with the circular comb needles either as a result of overthicknesses being present in the feed lap, or of breaking of the rigid mechanism which drives the lower jaw. The production losses and repair expenses incurred through accidents in the known constructions are thus eliminated. Moreover, the adjustment is considerably facilitated due to the fact that every other anti-flexing device is done away with and that the adjusting members are more easily accessible, more particularly with regard to pressure adjustment.

In order to provide a full understanding of the invention, an embodiment of a combing machine provided with the present improvements will now be described with reference to the accompanying drawings in which:

Fig. 1 is a side elevational view, partly broken away and in section, showing the nipper in the opened position;

Fig. 2 is a similar view showing the nipper in the closed position;

Fig. 3 is a transverse, sectional view taken along the line 3—3 of Fig. 2; and

Fig. 4 is a plan view of the illustrated device, but on a reduced scale.

Referring to the drawings in detail, the lower jaw is indicated at 1. The lower jaw 1 is rockably mounted, as at 2, on a stationary shaft 3. The numeral 4 indicates the upper jaw having arms 5 extending from the opposite ends thereof and rockably mounted intermediate their ends, as at 6, on the shaft 3. The lower and upper jaws 1 and 4 cooperate in the usual manner with a combing cylinder 7 having a circular series of combing needles 8 extending therefrom. The cylinder 7 is provided with sectors 9 at the opposite ends thereof, such sectors extending radially beyond the tips of the combing needles, as seen in Figs. 1 and 2.

The lower jaw 1 is positively driven by a mechanism which includes a cam 10 mounted on a rotated shaft 11, a follower roller 12 engaging the periphery of the cam and rotatably mounted on the end of an arm 13 which is secured to a rockably mounted jack shaft 14. A pin 15 (Fig. 4) is carried by the arm 13 intermediate the ends of the latter, and a link 16 (Figs. 1 and 4) is pivotally connected at one end to the pin 15 and at its other end to a pin 17 mounted on the lower jaw structure 1 at the end of the latter remote from the combing cylinder 7. Thus, as the cam 10 is rotated, the arm 13 rocks and this rocking motion is communicated to the lower jaw 1 by the link 16, so that the lower jaw moves toward and away from the combing cylinder, as shown in Figs. 1 and 2.

The upper jaw 4 is also actuated by the cam 10 which effects rocking of the shaft 14 through the follower roller 12 and the arm 13. In order

to translate the rocking of shaft 14 into movement of the jaw 4, a lever or arm 18 is secured on the shaft 14 in alignment with each of the support arms 5 of the upper jaw. Each lever 18 is bifurcated, as seen in Fig. 3, and the separated legs thereof are formed with elongated slots or openings 19 adjacent their free ends to receive the end portions of a connector pin 20 having its axis parallel to the axis of shaft 14. A link 21 is pivotally mounted at one end on the connector pin 20 and at its other end is pivotally connected to the end of the related support arm 5 which is remote from the jaw 4, for example, by a pivot pin 22. A member 23 is mounted on the connector pin 20, or formed integral with the latter, between the bifurcated legs of lever 18, and has a threaded extension or bolt 24 extending radially therefrom in the direction toward the shaft 14. An abutment or nut 25 is threaded on the bolt 24, and a compression spring 26 is disposed between the nut 25 and a seat 27 formed between the bifurcated legs of lever 18 at the end of the latter mounted on the shaft 14. Thus, the spring 26 yieldably urges the connector pin 20 toward the outer ends of the slots 19, and the force exerted by the spring may be varied by adjusting the nut 25 along the bolt 24.

When the cam 10 is positioned so that the follower 12 rides on the small radius portion of the cam, as in Fig. 1, each lever 18 is inclined sharply from the vertical in the direction toward the combing cylinder, and spring 26 moves the connector pin 20 to the outer ends of the slots 19. The links 21 pull downwardly on the ends of arms 5 to which they are connected and thereby raise the upper jaw 4 away from the lower jaw 1. The lower jaw 1 is also raised away from the combing cylinder 7 when the small radius portion of the cam is active (Fig. 1), by reason of the connection between the lower jaw structure and arm 13 provided by the link 16. However, since the pin 15 connecting link 16 to arm 13 is disposed radially inward relative to the connector pin 20, the raising movement of the lower jaw is less than the raising movement of the upper jaw 4 so that the upper and lower jaws are separated to open the nipper.

As the cam 10 is rotated in the direction of the arrow on Fig. 1, the follower 12 engages cam portions of progressively increasing radii so that the arm 13, shaft 14 and levers 18 are rocked in the counter-clockwise direction, as viewed on Figs. 1 and 2, so that the levers 18 approach a position in which a single straight line passes through the axes of shaft 14, pin 20 and pin 22, as in Fig. 2. At some intermediate point during such movement of levers 18, the upper jaw 4 bears upon the lower jaw 1, and, as the levers 18 continue to rock, the springs 26 are compressed so that the jaws 1 and 4 are held together by the pressure of such springs. The movement together of the jaws 1 and 4 during their displacement toward the combing cylinder results again from the fact that the pin 15 is disposed radially inward relative to the connector pin 20.

If the feed lap on the combing cylinder becomes overly thick with the nipper in its closed condition (Fig. 2), the lower jaw 1, which is positively driven from the cam by a rigid or non-deformable transmission, cannot yield upwardly by reason of that non-deformable transmission and cannot yield downwardly to possibly injure the teeth 8 by reason of the sectors 9, while the upper jaw 4 will yield upwardly to further compress the springs 26 between the abutments 25 and the seats 27.

The lower jaw 1 is preferably widened at its bill portion 1a (Fig. 4) to overlie the sectors 9 on the combing cylinder so that, in the event of a failure in the non-deformable mechanism driving the lower jaw, the widened bill portion 1a of the lower jaw will bear upon the sectors 9 to prevent damage to the needles or teeth 8. The sectors 9, in certain embodiments of the invention, may be the same sectors which are provided in existing machines for guiding the dabbing blade.

While a specific embodiment of the invention has been illustrated and described in detail, it is to be understood that the invention is not limited to that precise construction, and that various changes and modifications may be effected therein without departing from the spirit or scope of the invention as defined in the appended claims.

I claim:

1. In a combing machine of the rectilinear type for the combing of textile fibers, in combination, a stationary pivot and upper jaw rockably mounted on said pivot, a lower jaw rockably mounted on said pivot, a circular comb positioned underneath said lower jaw adjacent an extremity thereof, first mechanism adapted to impart rocking motion to said upper jaw, second mechanism adapted to impart rocking motion to said lower jaw, said first mechanism including resilient means for yieldably guiding said upper jaw, said second mechanism being arranged for positive guidance of said lower jaw, and synchronous driving means for both of said mechanisms.

2. The combination according to claim 1 wherein said driving means comprises a cam and a cam follower cooperating with said cam, said cam and cam follower being common to both of said mechanisms.

3. The combination according to claim 1 wherein said circular comb is provided with a plurality of arcuate sectors rotatable therewith, said sectors having a radius greater than the periphery of the teeth of said comb, said extremity of said lower jaw extending into registry with said sectors whereby any depression of said lower jaw sufficient to damage said comb will be prevented.

4. In a combing machine of the rectilinear type for the combing of textile fibers, in combination, an upper jaw, a lower jaw, a common pivot for both of said jaws, a cam, a lever, a cam follower secured to said lever and cooperating with said cam, a circular comb positioned underneath said lower jaw adjacent an extremity thereof, means including a compression spring connecting said lever with said upper jaw whereby the latter will be resiliently guided through rocking motions, and positive guiding means connecting said lever with said lower jaw whereby rocking motion will be imparted to both of said jaws in synchronism.

JULES GRESSEL.

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