Feb. 27, 1923. 1,446,750.

J. JOLLY.

COMBING MACHINE.

FILED DEC. 31, 1920. 4 SHEETS—SHEET 1.

Fig. 1.

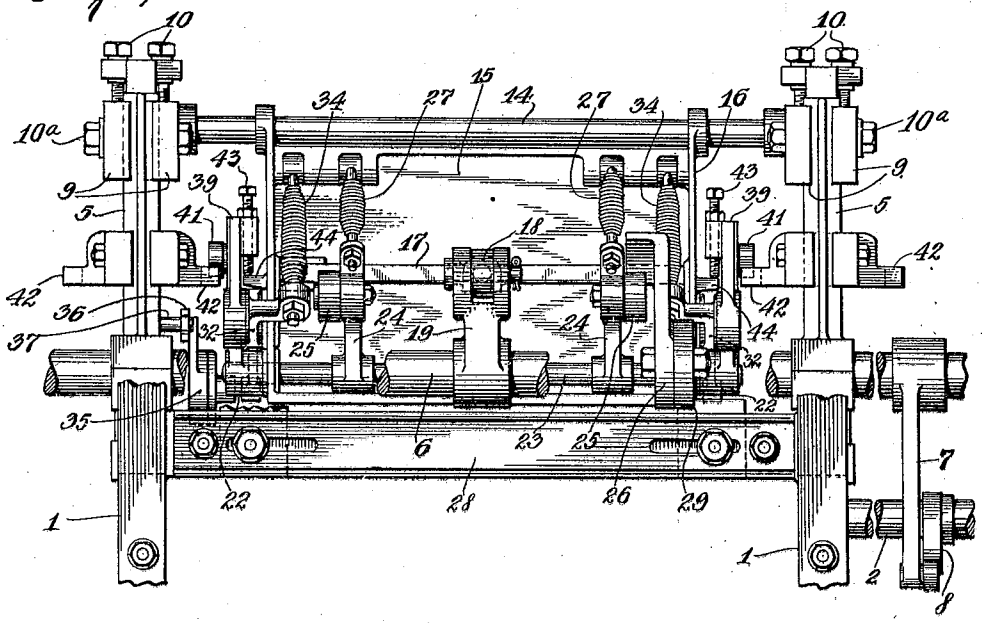
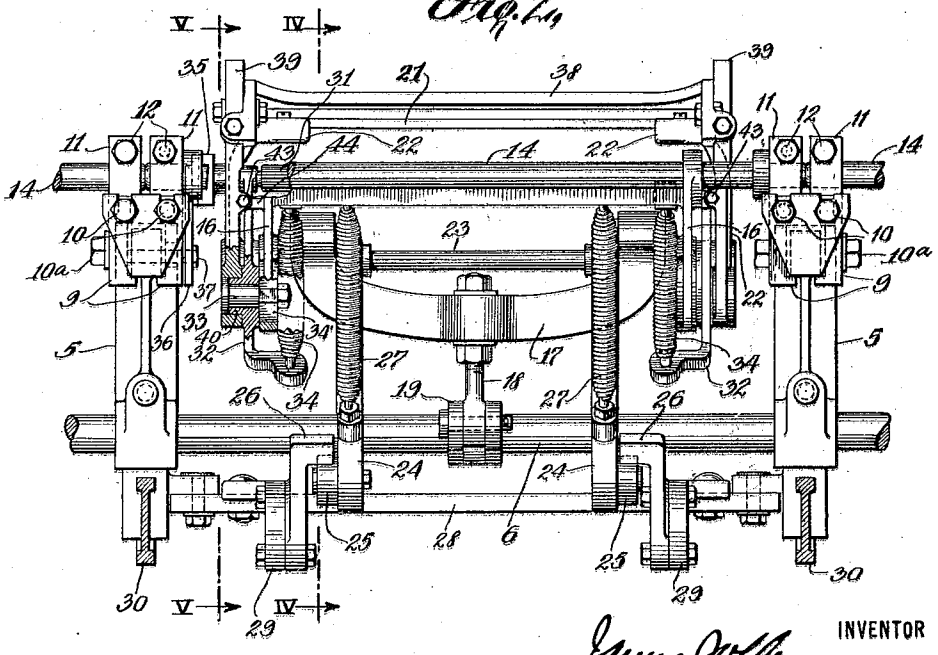


Fig. 2.



INVENTOR

James Jolly

BY

Jeffrey Kinnear & Clarke

ATTORNEYS

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Fig. 3,

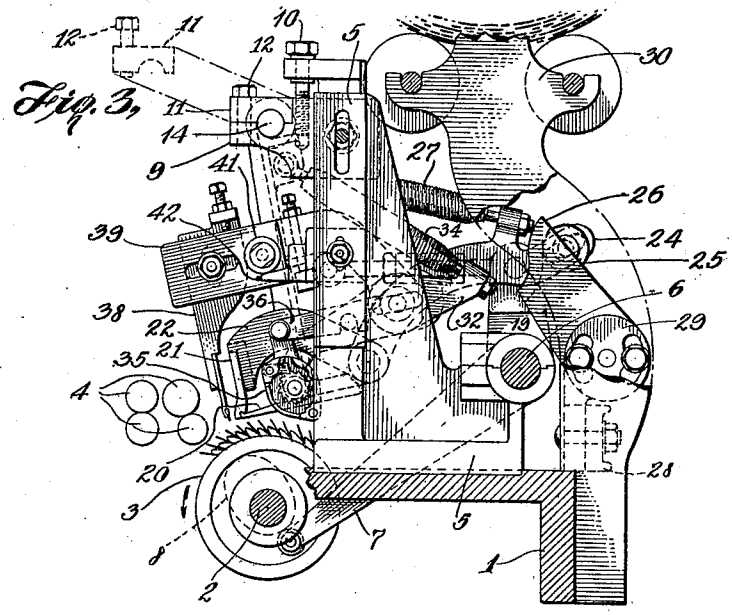


Fig. 4,

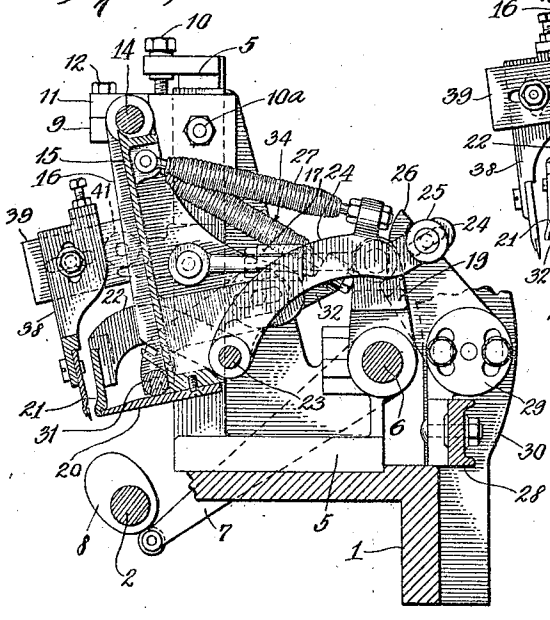
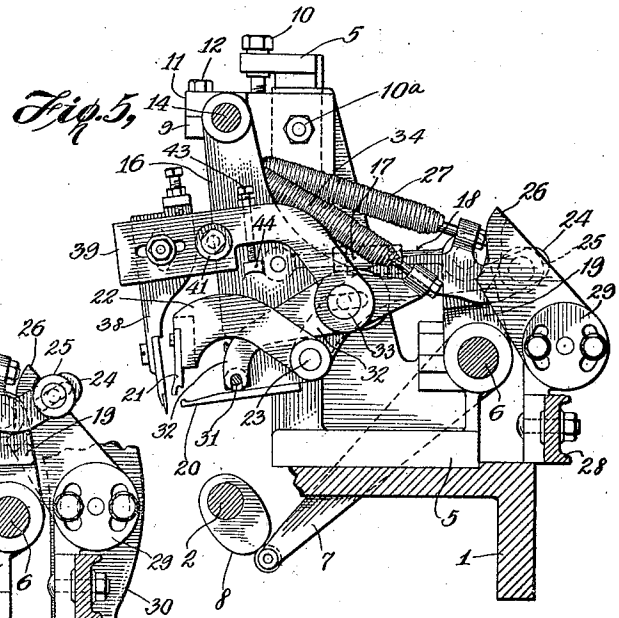


Fig. 5,



James Jolly INVENTOR

BY

Jeffrey Kimbrace & Sylvester

ATTORNEYS

Feb. 27, 1923. 1,446,750.

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Fig. 6.

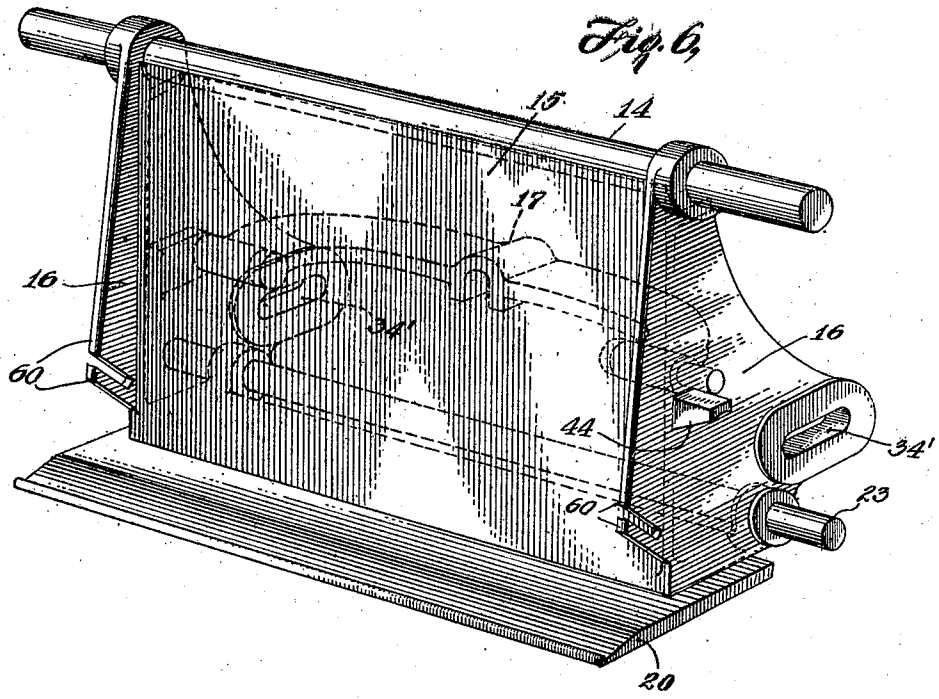
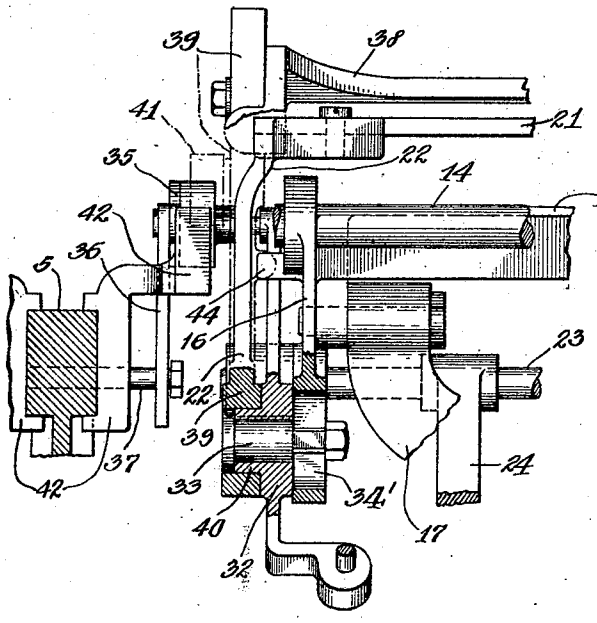


Fig. 7.



James Jolly INVENTOR

BY

Jeffery Kinnear & Eggleston

ATTORNEYS

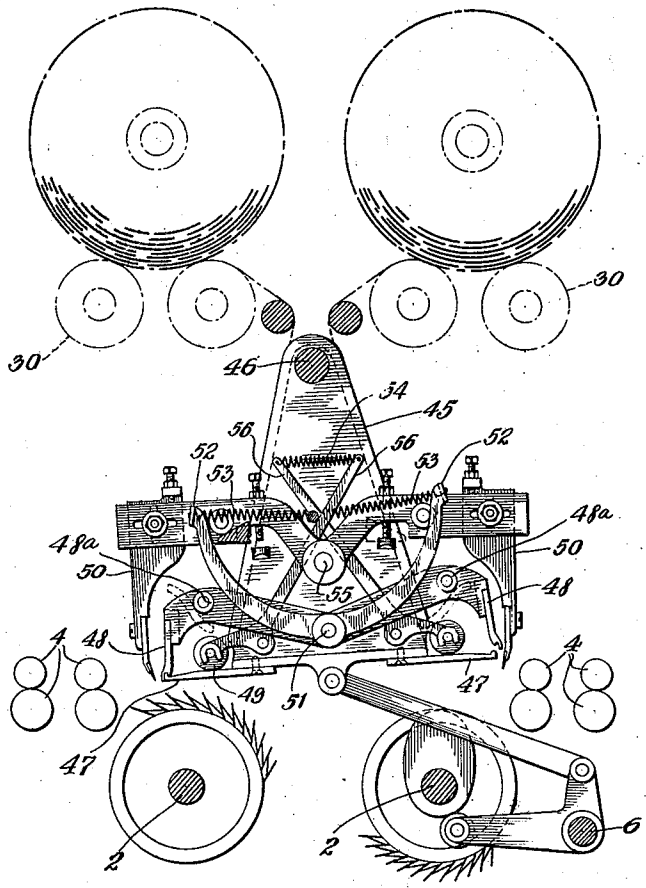
Feb. 27, 1923. 1,446,750.

J. JOLLY.

COMBING MACHINE.

FILED DEC. 31, 1920. 4 SHEETS—SHEET 4.

Fig. 8,



James Jolly INVENTOR

BY

Jeffrey Kimball & Eggleston

ATTORNEYS

Patented Feb. 27, 1923. 1,446,750

UNITED STATES PATENT OFFICE.

JAMES JOLLY, OF BOLTON, ENGLAND, ASSIGNOR TO WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COMBING MACHINE.

Application filed December 31, 1920. Serial No. 434,210.

To all whom it may concern:

Be it known that I, JAMES JOLLY, a subject of the King of Great Britain, residing in Bolton, England, have invented the following described Improvements in Combing Machines.

The invention is an improved organization of the combing head structure of Heilmann-type combing machines, being characterized by simplicity of structure and manufacture, and by various collateral advantages, a principal advantage being the easy removability, as a unit, from the combing head, of the sliver-feed means, the nipper means and the top-comb together with their several adjustable mountings, all of which are so assembled and related that they can be quickly and bodily removed for repair, or for substitution by another similar assembly, or merely to expose the parts beneath. The separate organization of these parts affords the further advantage that the mechanism of the combing head units can be assembled and fitted together apart from the rest of the machine with a corresponding saving of labor, and the manner of the assembly is such as to accommodate a wide lap and at the same time provide ample space for brush-cleaning the head. Various other advantages are also attained by the principles herein disclosed and if not herein pointed out will be quickly perceived by those skilled in this art.

In the accompanying drawings:—

Fig. 1, is a rear elevation of a combing head incorporating the principle of this invention.

Fig. 2, is a top plan view thereof with parts removed or in horizontal section.

Fig. 3, is a side elevation of Fig. 1, part of the creel support being broken out.

Fig. 4, is a section on line IV—IV of Fig. 2.

Fig. 5, a section on line V—V.

Fig. 6, a perspective of the frame of the removable unit and

Fig. 7, an enlarged plan and section of the fulcrum supports of the top comb and feed roll means.

Fig. 8 is a side elevation of a double-sided machine incorporating the principles of this invention.

These drawings show only one of the heads of the machine which will be understood to comprise six or more similar heads as customary in multiple-head machines. It will be understood also that all the heads are mounted on a common base and separated by the frame uprights 1 which carry the operating parts and that they are driven from a suitable drive-head at one end of the machine. The drive-head may be variously constructed for this purpose, as well known to the art, and is therefore not herein described. It drives the combing heads, in part through the comb cylinder shaft 2, which shaft extends through all the heads carrying a comb cylinder 3 in each head, located therein directly in rear of the detaching and piecing rolls 4. The latter are diagrammatically indicated because the detail of the mounting and the specific means of imparting to them the usual, intermittent or forward and backward piecing motion, are not important to this invention, and can be supplied by any person skilled in this art. It will be understood that their particular function is to receive and detach the combed tuft and overlap it on the preceding tuft so as to produce a continuous fleece.

Each of the frame uprights 1 carries on its upper surface, and horizontally adjustable thereon, a standard 5. The rear parts of these standards form the journal seats for a rock shaft 6 also common to all of the heads and operated from the comb shaft 2 by its arm 7 engaging a cam, or cam-groove 8 on that shaft. The rock shaft 6 is the main operating means for the nipper mechanism and its associated parts in each combing head, and while it is preferably constituted of a single shaft running the length of the machine and driven from the drive-head, it can also be otherwise organized without essentially effecting the operations it performs. The upper ends of the standards 5 carry the means of support of the removable unitary assembly above referred to, that is to say of the lap plate, and the lap-feed mechanism, the nipper mechanism and the top-comb. According to the particular design, this supporting means consists of two journal bearings one on each standard 5 and each comprising a pillow block 9 clamped to the side face of its standard and capable of vertical adjustment thereon by means of the adjusting screw 10. As herein shown one such screw, 10^a, serves to clamp in place the proximate pillow

blocks of adjacent heads, this being a detail obviously subject to variation. The journal cap 11 is held in place by a cap screw 12 one being sufficient for each cap and the pillow projects forwardly over the detaching rolls so that the cap screw is accessible, and the cap can be removed with facility. As will later appear the primary purpose of this supporting means is to carry and permit the unitary removal of the nippers and associated members as above stated and for this principal purpose its detail design is obviously subject to great variation. It is preferably a two-part bearing, i. e., comprises a base and cap and it is also in the present case a pivotal, or the support for a pivotal, bearing, since the nipper-mechanism supported thereby is arranged to oscillate in the process of piecing and detaching. The organization of the nipper and associated members which are supported in or from this pivotal mounting is assembled in a main frame, which may be termed the nipper frame and is shown by itself in Fig. 6. It comprises a shaft or shaft-like part 14, the ends of which are adapted to rest in the two-part journal bearings above referred to, and a single casting permanently fixed to the shaft part and comprising an upright cross member or lap-plate 15 joining two vertical side members in the form of thin plates 16. This frame, when mounted as described, is adapted to be moved back and forth or oscillated by its yoke connection 17 which is detachably connected to an eye-bolt 18 pinned to a short crank arm 19 carried on the rock shaft above referred to. The operating connection is readily detachable from the rock shaft by backing off one of the nuts on the eye-bolt and allowing the latter to drop out of the inverted U-shaped socket (Fig. 6) in which it is normally clamped. The cushion plate 20 or lower nipper jaw is adjustably secured to the lower thickened edge of the lap plate 15 and the nipper knife 21, which co-acts therewith, is carried by a pair of nipper arms 22 each fixed to the ends of a rock shaft 23 which is journaled in the side plates 16. The upper arms 22 are located outside of the side plates of the swinging frame. The rock shaft 23 carries fixed on it, in rear of the lap-plate two rearwardly and upwardly extending arms 24 provided with friction rollers 25 adapted to engage the rear faces of the cam tracks 26 when the rock shaft 6 swings the frame forwardly on its pivotal axis 14. This causes the nipper knife to open against the tension of the nipper springs 27 which latter are connected between the ends of the arms 24 and a point on the upper rear side of the lap-plate, as shown in Fig. 1. The nipper-closing springs thus move bodily with the oscillating frame. The nipper cam tracks 26 are supported on the frame bar 28 by an adjustable joint 29, the purpose and construction of which will be plain without explanation, and the friction rollers 25 are also adjustable on their arms 27 so that both ends of the nipper knife may be set for simultaneous and equal engagement with the cushion plate. It will be apparent that the rollers and cam tracks constitute an operating connection between the nipper and a fixed frame part whereby the nippers are opened by the effect of, and at a predetermined point in, the forward swing of the frame. This function of said operating connection can be performed by other means which will likewise be readily separable when the frame assembly is to be removed. The lap to be combed is taken from a lap roll carried on the usual creel rollers 30 being conducted thence over the shaft part 14 of the nipper frame and thence downwardly over or in front of the lap plate 15, and thence forwardly under the feed roll 31 which is corrugated. This roll is supported by its gudgeons at each end in the open notches in the ends of the two feed roll levers 32, which levers are fulcrumed on studs 33 projecting outwardly from the side plates 16 of the nipper frame and connected at their rear ends with the feed roll springs 34. The other ends of the feed roll springs are connected to the rear side of the lap plate like and adjacent to, the nipper springs so that both sets of springs are carried by the removable unit. The studs 33 are adjustably secured in slots 34′ in the side plates 16, as shown more clearly in Fig. 7, so that the position of the feed roll with respect to the bite line of the nippers may be adjusted forward and back as desired. One end of the feed roll 31 is projected beyond the journal notch in its holding arm 32 where it carries a ratchet wheel, shown in Fig. 3, the latter being enclosed in a box lever 35 journaled on the feed roll gudgeon and carrying a pawl by which the ratchet and feed roll are rotated. For this purpose the box lever 35 is provided with a hook 36 adapted to hook over a stationary stud 37 projecting from the adjacent standard 5, and when so engaged the oscillation of the nipper frame on its axis 14, will oscillate the box lever on its axis and thereby rotate the feed roll and advance the lap accordingly. This feed roll hook can be swung out of engagement with its stud 37 whenever desired, and when so disengaged the feed roll can be manually rotated by the thumb wheel at its opposite end.

The top comb 38 is fastened to the usual head piece and is adjustably secured to and unites the two top comb arms 39 which latter are journaled concentrically to the feed roll arms 32 preferably on the bosses 40 thereof, and around the heads of the studs

33, see Figs. 2 and 7. As shown more clearly in Fig. 1 each top comb arm 39 is provided with a friction roller 41 projecting laterally therefrom and adapted to engage a cam track 42 adjustably fixed to the inside face of the adjacent standard 5. When the nipper frame is oscillated to its rearward position the top comb rollers roll up the cam tracks 42 thereby causing the top comb to be lifted relatively to the nipper frame, or at least to follow a path not likely to collide with the comb cylinder. In the forward oscillation the rollers 41 roll off of the cam tracks 42 and in that event the top comb arms are supported by the set screw 43 with which each is equipped, said screws being adapted to seat upon the lugs 44 projecting from the outer faces of the side plate 16 of the nipper frame. The adjustment of these screws determines the depth of penetration of the top comb teeth into the tuft. as will be apparent.

By the arrangement above described, the feed roll levers, nipper arms and top comb arms occupy substantially the same plane, all outside of and close to the adjacent side plate 16 and such disposition permits the width of the combing head to be relatively narrow with respect to the width of the lap while providing ample space between said arms and the adjacent standard to insert the hand or brush for cleaning the parts—a matter of much importance to the quality of the combed product. And in addition to this facility of access, the whole head structure above the comb cylinder can be removed when desired and as above described by simply removing the journal caps 11 and dropping the eye-bolt 18 out of the yoke. The removal thus permitted, uncovers the comb cylinder and its doffing brush or other scavenging means (not shown) so that they can be closely inspected, or removed, upwardly, if desired, thereby avoiding the need of providing special access to these parts in rear of the machine as well as affording other conveniences. These several considerations adapt the head structures to be assembled in a single frame, back to back, thereby producing a duplex or double-sided machine as shown diagrammatically in Fig. 8 and wherein a double-sided nipper frame 45, is removably hung on an axis 46 being oscillated by a rod from the shaft 6, over two adjacent comb cylinders. This frame carries lap plates and cushion plates 47, nipper knives 48, feed rolls 49 and top combs 50, all arranged in the relation above described, except that the nipper arms are fulcrumed on a common shaft or axis 51 and their free ends (52) cross and extend to the opposite sides respectively and are connected by a single spring 53 for closing them against the cushion plates. The nippers are opened by the engagement of their roller 48^a, placed in front of their axis 51, engaging fixed cam tracks properly placed for the purpose as indicated. A single spring 54 connects the feed roll levers 56 and provides the feed roll pressure, such feed rolls being otherwise operated as above described. The top comb arms are similarly mounted on a single axis 55, but are otherwise the same as the top comb first described. By disconnecting the frame 45 and its shaft 46 from its support (not shown) and from its oscillating means, the entire duplex nipper mechanism can be removed as will now be apparent.

As shown more clearly in Fig. 6 the nipper frame is formed with two projecting flanges 60, constituting guard rails for the selvage of the lap and these rails are obliquely notched at their lower ends to hold a clearer cover in position on top of the feed roll.

I claim:—

1. In a multiple head combing machine, the combination with a comb cylinder, of its associated lap-feed means, nipper means and top comb assembled in a frame and therewith constituting a unitary structure, and supporting means for said structure forming the sole support thereof and from which said structure may be bodily removed.

2. In a multiple head combing machine, the combination with a comb cylinder, of its assembled lap-feed means, nipper means and top comb, assembled in an oscillating frame and therewith constituting a unitary structure, and supporting means for said structure located above the comb cylinder, and from which said structure may be bodily removed and means for oscillating said structure.

3. In a combing machine, the combination with a comb cylinder, of its associated lap-feed, nipper means and top comb assembled in a frame and therewith constituting a unitary structure, and supporting means for said structure on which it is adapted to be moved back and forth with respect to said cylinder, and from which said structure is adapted to be bodily removed.

4. In a combing machine, the combination with a comb cyliner, of its associated lap-feed, nipper means and top comb assembled to form a unitary structure, supporting means for said structure from which it may be bodily removed, means for moving said structure back and forth with respect to said cylinder and means whereby said movement operates the members of said structure.

5. In a combing machine, the combination with a comb cylinder and upright supporting means, of lap-feed means, nipper means and top comb, all organized in a suitable frame adapted to be moved about an axis and to be removed from the ma-

chine as a unitary structure, a two-part bearing, or bearings, for said frame adapted to be opened to permit the bodily removal of said structure.

6. In a combing machine, a comb cylinder, an upright standard at each end of a combing head thereof, a pillow block for each standard above the comb cylinder, a swinging frame removably supported by and journaled in said blocks and carrying a cushion plate, lap-feed means, nipper means and a top comb, and means for swinging the frame.

7. In a combing machine, an oscillating frame carrying the lap-feed means, nipper means and top comb all organized into a unitary structure and means for oscillating said frame, in combination with the framework of the machine provided with a pivotal mounting for said oscillating frame, located above the comb cylinder, and constituting the support for said oscillating structure and provided with relatively fixed members having operating connections with and for causing the operation of, said feed means, nipper means and top comb when the frame oscillates.

8. In a combing machine, a frame structure comprising lap-feed means, nipper means and top comb in a unitary organization, means for moving said structure back and forth, and operating connections between said organization and fixed parts of the machine frame adapted to cause the operation of one of the members of said organization in each direction of movement.

9. In a combing machine, a combing head, a frame, carrying the cushion plate, lap-feed means, nipper knife and top comb, an upright standard at each side of the combing head, a block on said standard supporting said frame above said comb cylinder, and means for adjusting the blocks toward the cylinder.

10. In a combing machine, a combing head, an upright standard at each end thereof, a block or part on each standard projecting forwardly therefrom, a frame carrying the lap feed means, nipper means and top comb, and means for detachably supporting said frame on said projecting parts.

11. In a combing machine, a comb cylinder, an organization of lap-feed means, nipper knife arms and top comb, movably supported above the cylinder and means for imparting back and forth movement to said organization, in combination with a nipper-closing spring having its opposite ends connected to parts of said organization and an operating connection between said nipper arms and a relatively fixed part adapted to open the said knife against the pressure of said spring.

12. In a combing machine, a frame mounted above the comb cylinder and comprising side plates with feed roll arms, top comb arms and nipper knife arms all journaled in said frame and occupying positions alongside the outer faces of said side plates.

13. In a combing machine, an oscillating frame pivotally supported above the comb cylinder and composed of two united side plates, feed-roll arms, nipper arms and top comb arms all journaled on said frame alongside the outer faces of said side plates, means for oscillating said frame and operating connections whereby the oscillation causes operation of said arms.

14. In a combing machine, an oscillating frame comprising two united side plates and a cushion plate mounted at the lower end thereof, feed-roll arms, nipper arms and top comb arms journaled on said side plates, and a nipper spring having its ends connected to a nipper arm and to said oscillating frame.

15. In a combing machine, a moving frame carrying feed roll arms, nipper arms and top comb arms, and provided with springs for both the feed roll arms and nipper arms connected between said arms and said frame.

16. In a combing machine, a frame comprising a lap-plate structurally uniting two vertical side plates, and feed roll arms and nipper arms supported on said side plates.

17. In a combing machine, a lap-plate structurally uniting two vertical side plates, a cushion plate secured to the lower edge of the lap plate, a nipper knife and arms for said knife located outside of said side plates.

18. In a combing machine, a removable combing head unit comprising a one-piece frame consisting of a lap-plate and two side plates, and cross feeding and nipper means mounted thereon.

19. In a combing machine, an oscillating frame comprising an upright cross plate structurally uniting two side plates, a cushion plate fixed to said frame, a nipper journaled thereon and means for oscillating said frame and nipper.

20. In a combing machine, a frame supporting a feed roll and comprising an upright cross plate having forwardly projecting lap-guiding flanges along its margins, said flanges being provided with notches or seats for removably supporting a clearer cover for the feed roll.

21. In a combing machine, an oscillating frame comprising side plates having feed roll arms, nipper arms and top comb arms supported on the outer sides of said plates, two of said arms being concentrically journaled thereon.

22. In a combing machine, an oscillating frame carrying feed roll arms and top comb arms both concentrically journaled thereon.

23. In a combing machine, a one-piece

nipper frame comprising a lap-plate, side plates and forwardly extending lap-guide flanges, and a cushion plate removably secured to the lower part of said lap-plate.

24. In a combing machine, a nipper frame movably and detachably mounted on the machine frame and adapted to be bodily removed therefrom and comprising feed roll arms, top comb arms and nipper arms all journaled in said nipper frame and a cushion plate on said frame.

25. In a combing machine, a nipper frame detachably mounted on the machine frame whereby it and its associated members may be bodily removed from the machine, feed roll arms, top comb arms and nipper arms all carried by said nipper frame, two of said arms being concentrically journaled thereon.

26. In a combing machine, a nipper frame movably and removably mounted on the machine frame, and having feed roll arms, top comb arms and nipper arms journaled thereon, and means for adjusting the axis of the top comb arms with relation to the axis of the nipper arms.

27. In a combing machine, a movable and removable nipper frame, a lap-feed means, a top comb and a nipper knife all mounted on said frame and removable as a unit therewith, means for adjusting the position of the lap-feed means with reference to said knife, and means whereby the movement of said frame operates said feed means and knife.

28. A combing machine having all of the elements in one head that are directly engaged with the lap to be combed, arranged to be simultaneously removed from the machine.

In testimony whereof, I have signed this specification.

JAMES JOLLY.