Oct. 6, 1931. D. BARKER 1,826,494

COTTON COMBER

Filed Aug. 24, 1929

Fig. 1

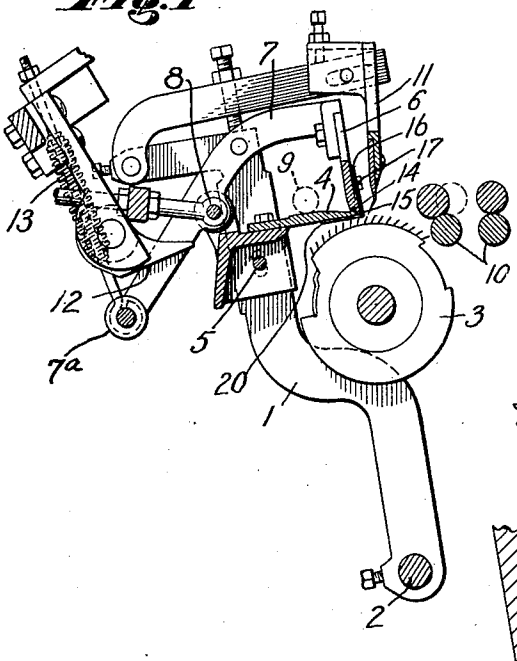


Fig. 2

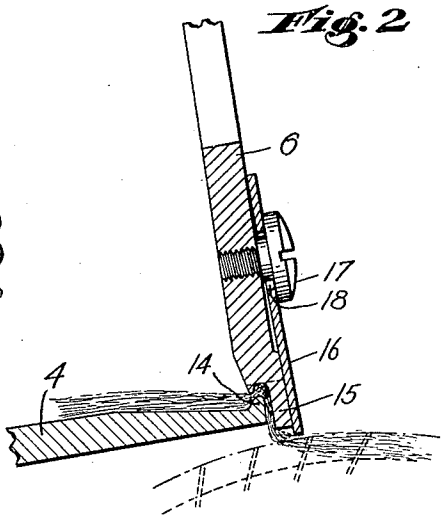


Fig. 3

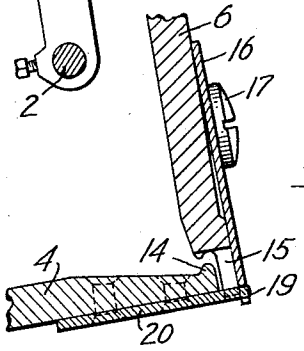
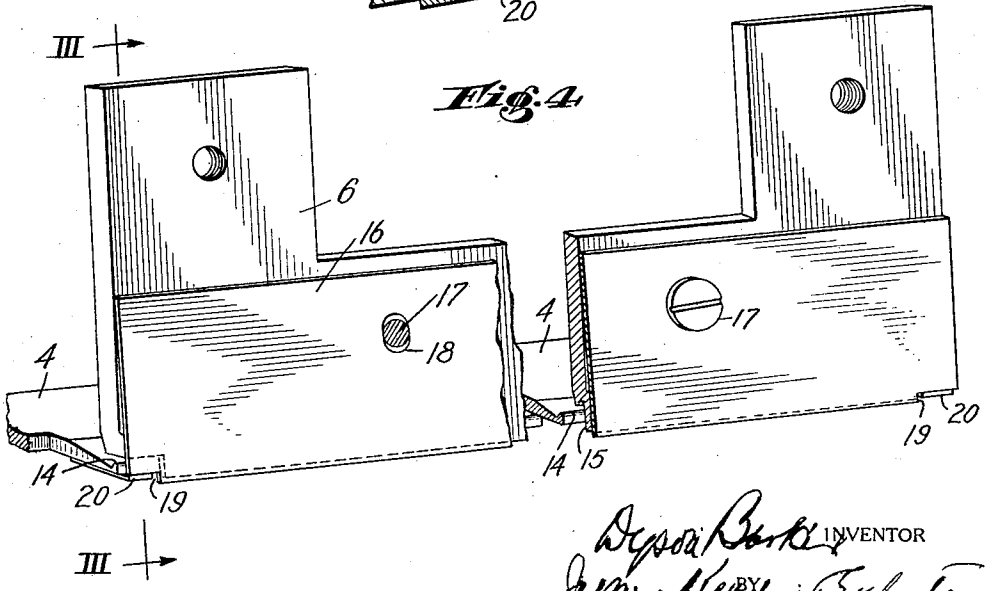


Fig. 4



Dyson Barker INVENTOR

BY Jeffrey Kelbaugh & Eyles Inc.

ATTORNEY

Patented Oct. 6, 1931

1,826,494

UNITED STATES PATENT OFFICE

DYSON BARKER, OF WHITINSVILLE, MASSACHUSETTS, ASSIGNOR TO WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

COTTON COMBER

Application filed August 24, 1929. Serial No. 388,076.

The invention is an improvement in Heilman-type cotton combers and consists of improved means for causing the nippers to carry the tuft into deep engagement with the revolving half-lap thereby permitting heavier laps to be handled without loss of combing efficiency. The invention is exemplified in the accompanying drawings by its form at present preferred but without limitation thereto.

In such drawings, Fig. 1 is a vertical transverse section partly in diagram of an ordinary Nasmith-Heilman cotton comber having the invention applied; Fig. 2 a larger scale vertical section through the nipper mechanism; Fig. 3 a section thereof on line III—III of Fig. 4; and Fig. 4 a front elevation of Figs. 2 and 3.

The general organization of the comber shown by Fig. 1, which is well understood is as follows: The nipper frame or carriage 1 swings on a fixed axis 2 located below the fixed axis of the comb cylinder 3 and carries the lower nipper jaw or cushion plate 4 which is adjustably mounted upon it by means of bolts 5. The upper jaw 6 of the nipper mechanism, termed the nipper knife, is carried on lever arms 7 fulcrumed on an axis 8 also carried by the nipper frame. The cotton lap to be combed is supplied from the creel, not shown, and fed by the lap-feed roll 9 along the top face of the cushion plate 4 and beyond the edge thereof upon which it is nipped by the closing of the knife blade 6 thereagainst. The rearward movement of the swinging nippers carries the projecting end of the lap, or tuft, into the action of the needles on the revolving comb cylinder, whereupon the nippers swing forward and present the combed tuft to the detaching rolls 10 in overlapping relation to the tail end of the last previously combed tuft. The lower detaching roll 10 rotates on a fixed axis with an intermittent forward and backward motion, the upper traversing roll being driven by it. The nippers open as they approach these rolls and at the same time the rolls rotate forwardly grasping the tuft and detaching it from the body of the lap held by the feed roll 9, drawing the tail ends of the fibres through the depending teeth of the top comb 11, lowered for the purpose; after which the rolls rotate reversely to back the tail of the combed tuft into position to receive the next succeeding tuft and so on, all according to the usual action of this type of comber.

The nipper knife closes against the cushion plate by the action of the nipper springs 13 and is opened, against the tension of such springs, by the engagement of the cam bowl 7*a* on the rear ends of the nipper arms 7 with the fixed cam 12, as the nipper frame swings forward. These are strong springs acting through favorable leverage and exert a powerful compression on the lap, necessary to keep the fibres from being snatched away by the revolving needles, but, being spring-produced, the nipping pressure is constant, whether the lap be thick or thin and according to the spring tension. Under these circumstances, the closed position of the knife is somewhat closer to the cushion plate with a thin lap than with a thicker lap and is not a constant position; it may also vary with a given lap according as the latter varies in thickness along its length. The bottom or nipping edge of the knife is longitudinally grooved with a round-bottomed groove or crease, conforming to the rounded bead 14 at the edge of the cushion plate and with which it co-operates to put a crimp in the lap, further promoting the security with which the tuft fibres are held. The front wall 15 of this crimping groove on the knife blade 6 forms a lip which not only makes the crimp, but also directs the tuft downwards toward the needle path, and has heretofore been solely depended upon for that purpose.

Efficient cylinder combing requires that the tuft be brought as fully as possible into the action of the needles, the cushion plate being set close to the cylinder, and that the lip 15 should come as close as possible to the path of the needle points because the closer it comes, the more fully will the tuft be held to the half-lap action. But because of variation of lap thickness it is not possible to make the lip 15 take this closest possible position, which would produce the best combing, because a thinner lap, or the absence of

it under the nipping edge, as on the occasion of a break, would let the springs close it too far in which case the lip would be struck by the needles. In consequence of this limitation and necessarily, the lip as heretofore provided has been made short enough to just escape the needles when the nippers are empty, that is to say when no lap is present and therefore when it is at its normal work it is more or less distant from that position and more inefficient for its intended purpose in proportion to the thickness of the lap, which is to say, that in the combers referred to the combing efficiency falls off rapidly as the weight of lap is sought to be increased.

The invention remedies this objection and produces efficient and substantially equal combing of all weights of lap by means of a special tuft-deflecting extensible lip which always occupies the position of closest proximity to the needle path, during the combing period, regardless of the presence or absence of a lap on the cushion plate or whether it happens to be thick or thin, bending every tuft into the needle path to the same and a maximum extent on every nip.

This lip is formed of a flat plate 16, loosely mounted on the front face of the blade 6 with freedom for limited vertical movement thereon, parallel to the plane of the blade, and held thereto by two large-headed screws 17, screwed into the blade through oblong slots 18 in the plate, the slots being long enough to give the plate a range of vertical movement of, say about $\frac{3}{32}$ inch, which is all that is required. Other forms of mounting could obviously be substituted. When the nippers are open the plate 16 hangs loosely and by its own gravity on the screws 17, its lower edge being then lower than the lower edge of the blade, but not low enough to interfere with the forward feed of the lap which occurs when the nippers are open. When the knife closes, the notched corners 19 of the plate 16 encounter and come to rest on two stop fingers 20 which are secured, riveted, to the bottom side of the cushion plate, at its extreme ends, projecting forwardly just enough for this purpose.

The stop fingers are always at a fixed distance from the needle path because they are carried by the cushion plate and the latter is rigid on the nipper legs 1 and always occupies exactly the same position with reference to the needle path during the cylinder combing. When the plate comes to rest on these fingers, its lower edge is then in its working position which is the closest possible, or closest desired, to the needle path, and it takes this position on every nip regardless of the extent to which the nipping edge of the blade proper may be closed upon the bead 14. Such nipping edge continues its closing movement after the plate has come to rest on its stop means, but in any case the tuft is pushed down by the gravity of the loosely mounted lip and thereby deflected sharply and uniformly into the needle path so that the thickness of the lap is substantially without effect on the thoroughness of the combing up to the limit which the nippers are capable of handling. This will be recognized as representing increased production. The nipping or integral lip 15 is no longer relied on for any tuft-deflecting function except as incidental to the production of the crimp-grip, but such lip now serves the important function of relieving the deflector lip (16) of any pressure or rubbing contact with the cotton such as would interfere with its reliable action. For this function its length is obviously not important and need be no longer than will suffice to keep the deflector lip clear of the cotton so that it may settle freely on its stop means on each closure, and preferably solely by gravity, having only to depress the tuft and not to grip it. The plate 16 thus affords a deflecting but non-nipping lip and can therefore be loosely mounted and gravity operated without need of lubrication, which of course would be undesirable so close to the cotton, while the fixed lip can be reduced in width, even more than indicated in the drawings and need be no wider and also no longer than will suffice to keep the deflector lip unobstructed for its described action. It is obvious that a lip such as 16 can be readily applied to existing combers, to increase their capacity, since the attachment means and necessary changes are easily made. Ordinarily the existing nipping or fixed lip is filed off to reduce its thickness, and as indicated in the drawings, but this may be as preferred within the principle of the invention above described. The function of the stop fingers 20 can obviously be performed by other parts capable of supporting the deflector lip accurately in its correct position, but it has been found that fingers on the cushion plate are practical and most easily applied to existing machines. When used the corners of the knife are notched away to clear them as indicated in Fig. 4, and with such arrangement the adjustment of the cushion plate by the known means constitutes the adjustment of the lip to its optimum position.

As will be understood, the nipper knife closes to the position indicated in Fig. 2 just before the arrival beneath it of the first row of needles on the rotary comb, so that by virtue of the presence and action of the movable lip, the needles penetrate the heel of the tuft at a point which is uniformly close to the grip line of the nippers, and pass through the tuft from its heel to its free end or tip, after which the knife and lip are jointly lifted away from the tuft, prior to the drawing off and remain lifted until the tuft has been detached and the next feed has taken

place whereupon the same action is repeated.

I claim:

1. In a cotton comber, the combination with the comb cylinder and detaching roll both rotating on fixed axes and swinging nippers to carry the tuft from one to the other comprising a cushion plate and nipper knife, the latter having a nipping edge and a tuft-deflecting lip, movable relatively to each other and coincidently moving toward and from the cushion plate, means to close said edge against the cushion plate and means to stop the movement of said lip and hold the same at a constant distance from the needle path regardless of lap thickness.

2. In a cotton comber, the combination with the comb cylinder and detaching roll both rotating on fixed axes and swinging nippers to carry the tuft from one to the other comprising a cushion plate and nipper knife, the latter having a nipping edge and a non-nipping tuft-deflecting lip movable relatively to said edge without friction on the cotton and stop means for said lip to establish a constant working distance thereof from the needle path.

3. In a cotton comber, the combination with detaching rolls and comb cylinder of nipper mechanism moving from one to the other and comprising a cushion plate, and nipper knife, the knife having a nipping edge and a deflecting lip, the one being movable relatively to the other, and an abutment carried by the nipper mechanism adapted to establish a position for said lip during the combing period which position is in fixed relation to the needle path and unaffected by lap thickness.

4. In a cotton comber, the combination of the comb cylinder and detaching roll, a nipper frame movable from one to the other and including a cushion plate adjustably carried on said frame and a nipper knife having a nipping edge and a deflector lip relatively movable with respect to said edge, means for closing said edge against the cushion plate and means on the cushion plate forming a stop for said lip and adapted to establish a constant working distance for said lip with respect to the needle path.

5. In a cotton comber, nipper mechanism comprising a cushion plate and nipper knife having a grooved nipping edge adapted to produce a crimp grip of the lap on the cushion plate, a deflector lip movably carried on said knife and stop means supporting said lip independently of said knife during the cylinder-combing period.

6. In a cotton comber, a comb cylinder, a cushion plate, a nipper knife coacting therewith, a spring to close the knife, a deflecting lip on said knife, and stop means determining a fixed position for said lip with relation to said cylinder independently of the lap thickness and during the combing period.

7. In a cotton comber, the combination with detaching rolls and comb cylinder, of a nipper frame moving from one to the other and comprising a cushion plate and nipper knife fulcrumed on said frame, the knife having a nipping edge and a relatively movable and self-adjusting deflector lip and an abutment carried by the nipper mechanism establishing the lip position during the combing period.

8. In a cotton comber, nipper mechanism comprising a cushion plate and a nipper knife, a lip fixed on said knife and a deflector lip movable thereon and stop means determining a fixed working position of the latter lip independently of the position of the other.

9. In a cotton comber, nipper mechanism comprising a cushion plate and a nipper knife having a grooved nipping edge and a lip in fixed relation to said edge, a deflector lip movable in relation to said fixed lip and means to establish a constant working position for said deflector lip during the cylinder-combing period.

10. A comber for cotton having a comb cylinder rotating on a fixed axis, and bearing a needle-half-lap, a swinging cushion plate having its working position at a close and substantially constant distance from the path of the needle points thereof, a nipper knife, a deflector lip movably associated therewith and means for establishing a constant position for said lip with respect to said cushion plate during the whole of the combing period.

11. A comber for cotton having a comb cylinder rotating on a fixed axis and bearing a needle half-lap, a swinging nipper frame including a cushion plate and coacting nipper knife, a deflector plate mounted loosely on the forward face of said knife and means carried by the nipper frame for establishing a constant position for said lip with reference thereto during the whole combing period.

12. A comber for cotton having a comb cylinder rotating on a fixed axis and bearing a needle half lap, a swinging nipper frame including a cushion plate and coacting nipper knife, a deflector lip movably associated with said knife, means carried by the nipper frame for establishing a constant working position for said lip in relation to the needle path and means for adjusting said nipper frame to adjust thereby the relation of said working position to the needle path.

13. A comber for cotton comprising in combination, a combing cylinder and a detaching roll both rotating on fixed axes, a nipper frame moving from one to the other and including a nipper knife, a top comb between said roll and nipper knife, a flat plate movably associated with the front face of said nipper knife and resting by its lower edge on the tuft held by said knife to deflect it into the needle path and means for estab-

lishing a constant working position for said plate with reference to said nipper frame.

14. In a comber, the combination of a comb cylinder rotating on a fixed axis, moving nipper mechanism having the functions of holding the tuft for action by the comb cylinder and of transferring it after combing to the detaching mechanism and including a nipper knife and cushion plate, a tuft-deflecting lip operative directly in front of said nipper knife, and being movable with reference to said knife, and actuating means for said knife and lip operating to raise the lip clear of the cushion plate and tuft prior to tuft detachment, and means to lower said knife and lip following detachment, the comb cylinder needles having initial penetration into the heel part of the tuft close to the cushion plate and moving through the tuft toward its tip.

15. In a comber, the combination of a rotary comb rotating on a fixed axis, a cushion plate and coacting nipper knife, a tuft-deflecting lip movably associated with the front face of said knife, means whereby the lifting and lowering of said knife causes the lifting and lowering of said movable lip, said knife and lip both being lifted prior to and during tuft-detachment and both being lowered prior to the cylinder-combing of the tuft, and an abutment for said movable lip engaged thereby when the knife is lowered, said abutment determining a position of said lip which is uniformly close to the needle-path on successive nips and depresses the heel part of the tuft for initial penetration by the needles of the rotary comb.

16. In a comber, the combination of a comb cylinder rotating on a fixed axis, a cushion plate and coacting nipper knife, a tuft-deflecting lip movably associated with said knife, means confining the tuft-engaging edge of said lip to operation only in a plane parallel with said knife and preventing any movement thereof in the direction in which the tufts are detached and abutment means supporting said lip in its lower position which is uniformly close to the needle path and presents the heel part of the tuft for initial penetration by the needles.

In testimony whereof, I have signed this specification.

DYSON BARKER.