E. V. BATES.

GARNET WORKER BREAST FOR WOOL CARDS.

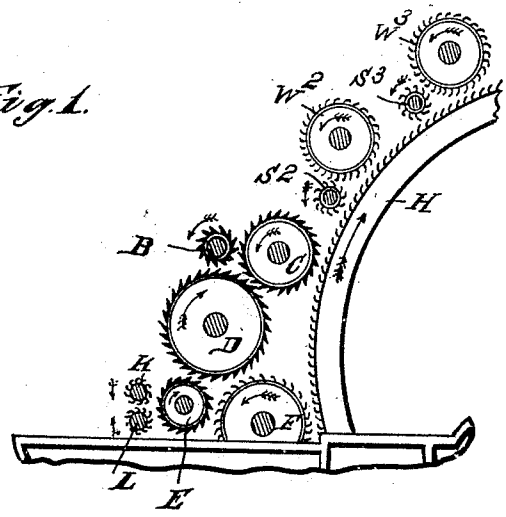
APPLICATION FILED OCT. 9, 1918.

1,368,319.

Patented Feb. 15, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



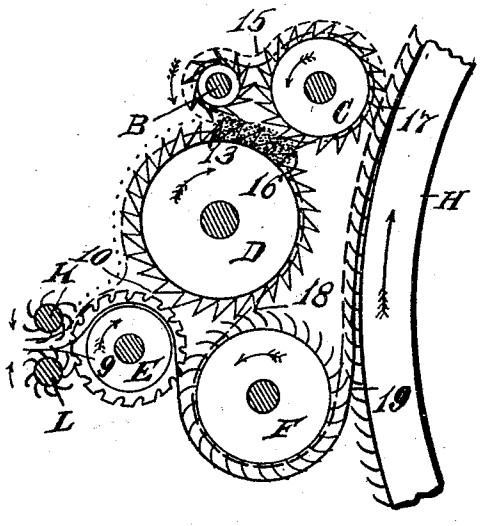


Fig. 2.

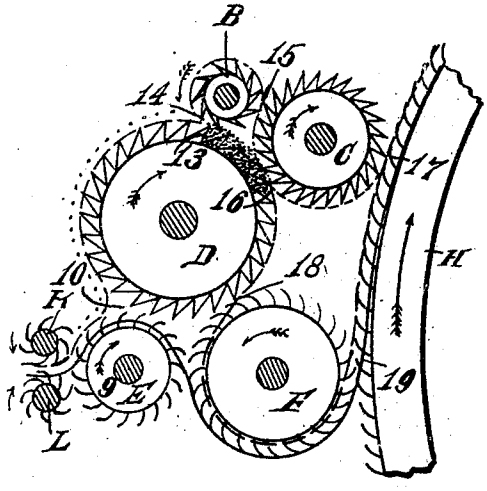


Fig. 3.

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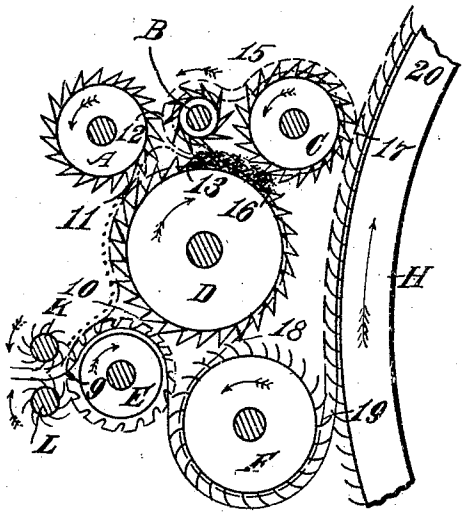


Fig. 4.

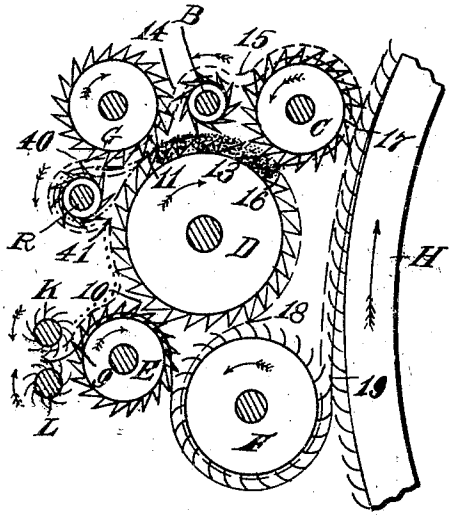


Fig. 5.

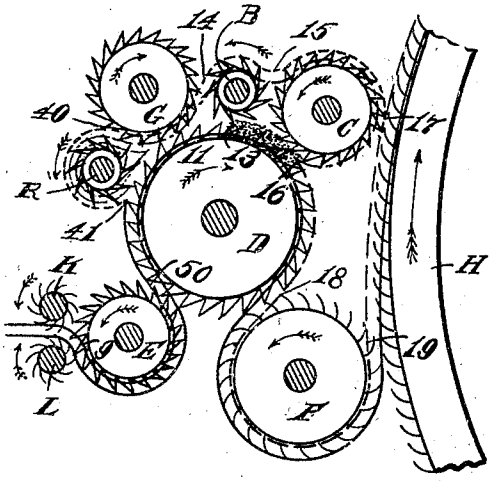


Fig. 6.

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3 SHEETS—SHEET 3.

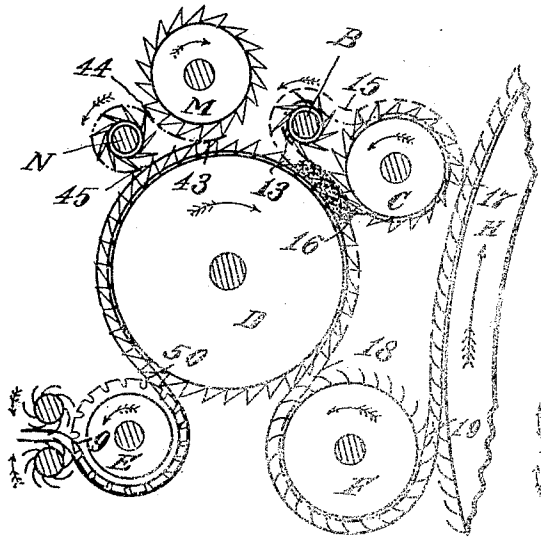


Fig. 7.

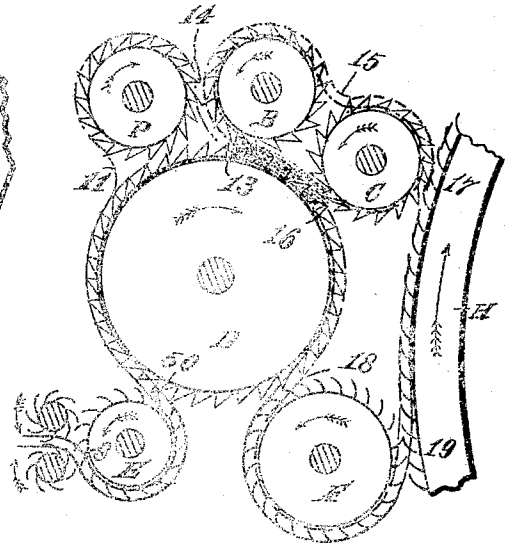


Fig. 8.

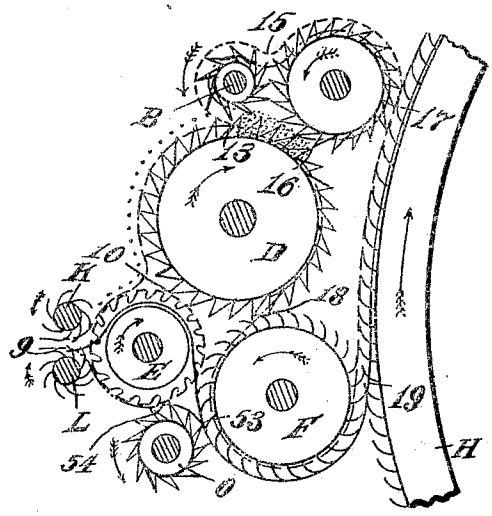
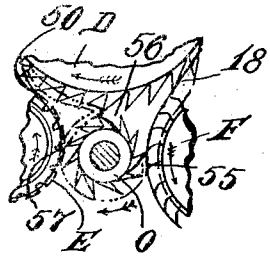


Fig. 9.

Fig. 10.



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EDDO V. BATES, OF LOWELL, MASSACHUSETTS.

GARNETT WORKER-BREAST FOR WOOL-CARDS.

1,368,319. Specification of Letters Patent. **Patented Feb. 15, 1921.**

Application filed October 9, 1918. Serial No. 257,467.

To all whom it may concern:

Be it known that I, EDDO V. BATES, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Garnett Worker-Breasts for Wool-Cards, of which the following is a specification.

This invention relates to what are known as breasts for woolen cards. It is of a type similar to those shown in patents to E. V. Bates on breast for carding machines, Nos. 1,103,649, July 14, 1914, and 1,162,846, December 7, 1915, wherein a breast cylinder and other rolls coöperating therewith are located at the feed end of a card with little, if any, change in the arrangement of the main cylinder, workers, strippers, lickerin, tumbler, etc.

My device is particularly useful on the first breaker card, as the stock fed to such first breaker is generally made up of matted locks and, especially with low grade stock, contains pieces of cloth, which must be torn up, together with buttons, seeds and other impurities which should be removed. My device may, however, be used as described herein or, with the slight modifications familiar to every carder, on the intermediate or finisher cards.

Especially when used on the first breaker, I prefer that all my rolls shall be covered with flat wire or garnett wire instead of with card clothing, as cylinders covered with such wire are stronger and the teeth thereof are not so readily bent or injured.

The particular feature of this invention is the use of a worker covered with garnett wire in carding contact with the main cylinder and also preferably with the breast cylinder. I believe that I am the first to use such a garnett wire worker in carding contact with a main cylinder covered with card clothing, and particularly such a worker also arranged to card with the breast cylinder and to return any lumps, locks or other pieces of material from the main cylinder to the breast cylinder before they have passed on to the other workers and strippers of the card covered with the ordinary card clothing.

As the stock is placed lightly on the main cylinder by the tumbler and any locks or bunches stand up on the teeth thereof, such locks and bunches are easily removed by such worker especially if, as I prefer, its teeth have considerable pitch or rake.

My device is substantially a re-working breast with flat wire tooth rolls including especially a worker which not only cards with the main cylinder but serves as a guard to prevent rough stock from being carried along by the main cylinder to the injury of the card clothing thereon and to that on the workers and strippers.

In my preferred construction, I use a lickerin, preferably of the bur roll type covered with flat wire teeth, which takes stock from the feed rolls and carries it upward, its teeth being arranged point to point with those on the breast cylinder whereby something in the nature of carding occurs to the extent that the parts of such locks, pieces of cloth, etc., as stick up on the teeth of the bur roll lickerin are pulled away and picked off by the breast cylinder, leaving small parts and finer pieces in the teeth of the bur roll. By running my lickerin forward, I can watch the stock as it runs thereon. My tumbler is preferably so arranged as to clear the teeth of the breast cylinder and of the bur roll, and to transfer the stock from both to the main cylinder.

My breast is easily attached to an old card, and is very simple, easy to clean and does not interfere with the operation or cleaning of other parts nor with the view of them.

By card clothing, I mean clothing with an elastic or yielding foundation and round wire teeth.

Under flat wire teeth, I include convex wire toothed card clothing, garnett wire with saw teeth, and bur cylinder wire with flat-topped teeth, both known to the trade as metallic tooth wire.

Such metallic tooth wire will not bend nor give, and convex wire teeth will bend or give very little, while the round teeth of card clothing will yield and are permanently bent out of shape with little difficulty.

Any flat wire tooth is rigid and, if rigidly held, may separate or even break the stock but will not yield.

By forward running, applied to rolls and cylinders, I refer to the direction in which the top moves from the feed end of the card toward the delivery end, or from left to

right in the drawings, and by backward running I refer to the opposite direction. By forward pitching, applied to teeth, I refer to the rake, from base to point when at the top of a roll, being toward the delivery end of the card, and by backward pitch I refer to the opposite pitch.

It is believed that the stock is acted upon as indicated graphically by the broken and whole lines used in all the figures except Figure 1, but this cannot be positively determined.

In the drawings, Fig. 1 is a diagrammatic side elevation of the feed end of a card showing one preferred form of my device, with no stock in the teeth. Fig. 2 is a similar view, on a somewhat larger scale, showing graphically what is believed to be the course of the stock. Fig. 3 shows a slight modification of the arrangement of rolls shown in Fig. 2. Fig. 4 shows another preferred form of my device, and Figs. 5, 6, 7, 8, 9 and 10 show other arrangements which can be used to advantage in some cases.

In the drawings, H represents the main cylinder of a card which runs forward and has card clothing teeth which pitch forward. F is a tumbler which runs backward and is covered with card clothing having teeth which pitch backward. Both have round wire teeth.

C represents a worker which preferably takes the place of the first worker on the card or is located in front thereof, that is, in position so that the stock will reach it before it reaches the first card clothing covered worker. This worker C is covered with flat wire tooth card clothing, preferably of the saw tooth garnett, rigid type, the teeth of which have considerable pitch and rake forward. I prefer that this should run backward but, as shown in Fig. 3, it may run forward.

D is a breast cylinder in position to be stripped by tumbler F and to card with worker C. It is preferably covered with flat wire tooth clothing which, I prefer, should be of the garnett wire tooth type. It runs forward and its teeth pitch forward.

K and L are the feed rolls of any usual construction, and E represents a lickerin which takes the stock therefrom in a well known manner. This lickerin is preferably of the bur roll type and preferably runs forward so as to carry the stock upward, but it may be provided with any other kind of teeth and may run downward, as shown in Figs. 6, 7 and 8.

B represents a stripper shown as of the flat garnett wire type with teeth which pitch backward and which run backward in position to strip worker C and to be cleared by breast cylinder D. In all the views, the main cylinder H is supposed to run with a surface speed of about 900 feet per minute, the tumbler F at from 400 to 500 feet per minute, say 440, the lickerin E, when running forward, about 200 feet per minute, the breast cylinder D from 200 to 300 feet per minute, say 220, the worker C at about 30 feet per minute, and stripper B at about 100 feet per minute. It is believed that such relative speeds give best results.

Referring to Fig. 2, the stock is delivered at 9 by feeding in rolls K and L and is carried upward to the point 10 by bur cylinder lickerin E. A part of the stock is pulled well into the teeth of E and remains there, as shown by the full line, and passes over E, under F and on to H. This stock is relatively small and fine and is stripped from E by F, from which it is cleared by main cylinder H.

The locks, knots, pieces of cloth, etc., which stand up above the teeth on lickerin E, as indicated by the line of long dashes and dots, is picked off at the point 10 by breast cylinder D and carried along up to the point 13 where it is mixed with other stock taken from stripper B.

When the stock reaches the point of carding contact 16 with the worker C it is divided, the locks, knots, etc., which stick up being pulled into the teetah of worker C, as shown by the line of dot, dash, dot, dash, while the smaller pieces and the stock which is better mixed and carded remains on breast D, as shown by the line of long dashes, and is stripped therefrom at the point 18 by tumbler F, from which it is stripped at the point 19 by main cylinder H.

The stock taken from tumbler F by main cylinder H is carried along to the point of carding contact 17 with worker C, where any knots, locks, etc., which stick up above the teeth of the main cylinder are pulled into the rigid or semi-rigid teeth of the worker, while the finer parts remain in the round wire teeth of the main cylinder and continue on to be further carded by the regular card clothing workers W^2 and W^3 and to be acted on by the regular strippers S^2 and S^3, as shown in Fig. 1.

The stock picked up by the teeth of worker C at the point 16 and at the point 17 is carried upward and back, and at the point 15 is stripped therefrom by stripper B, from which, at its point of stripping contact 13 with breast cylinder D, it is stripped and mixed with the other stock shown roughly between the points 13 and 16. The stock which is carried over by worker C is shown by a line of dashes and dots and by another line of short dashes.

In Fig. 3, all parts are the same except worker C, whose teeth pitch the same forward way but which travels forward. The result of this movement is that the stock,

shown by the short dashes, taken from the main cylinder H at 17 is carried downward and backward and is re-carded at the point 16. At this point 16 it is mixed and carded with other stock which comes from the point 13. The stock which is least mixed and stands on the points of the teeth at 16 will generally be pulled into the teeth of worker C and, as shown by the line of dash, dot, dash, dot, will be carried up and back and will be stripped at the point 15 by worker B and carried back again until cleared from the stripper at 13 by breast cylinder D.

In Fig. 4, I show the same construction as Fig. 2 except that I add another worker A provided with flat wire teeth which rake forward, while this worker preferably travels backward. The operation is substantially the same as that shown in Fig. 2 except that I gain an additional carding point between worker A and breast cylinder D at 11, whereby the rough stock which sticks up on the points of the teeth D is pulled apart, and what remains on worker A is stripped therefrom at the point 12 by stripper B and returned to breast cylinder D at the point 13. This worker A may travel at about 30 surface feet per minute.

In Fig. 5, lickerin E is shown as covered with saw tooth garnett wire, and I show an additional worker G which travels forward and has teeth which pitch forward and a stripper R therefor having teeth which pitch backward and which runs backward. In this view, worker C is supposed to travel about 30 feet per minute, stripper B about 30 feet per minute, worker G about 60 feet per minute, and stripper R about 100 feet per minute.

The action of the stock on lickerin E, tumbler F, worker C and the main cylinder is the same as before, but stripper B serves as a transfer roll which carries the stock, shown in the line of short dashes and dash, dot, dash, dot, over from worker C to the point 14 where it is stripped by worker G and carried down to the point 11 where recarding takes place, some being carried back to the point 40, where all is stripped by stripper R, and carried around to the point 41 whence it is stripped by breast cylinder D.

In Fig. 6, the lickerin E is shown as separated from tumbler F and as traveling backward, with garnett teeth which pitch backward, the construction being otherwise the same as in Fig. 5. The stock taken from the feeding in rolls at 9 travels down instead of up, as shown by the double full lines, and is all removed at the point 50 by the breast cylinder. With some classes of stock, this downward movement permits foreign matters, like buttons, etc., to drop to the floor.

The action of the workers C and G and strippers B and R is substantially the same, the stock being carded and re-carded until stripped from the breast cylinder D by tumbler F and delivered to the main cylinder at 19 whence it is carried along to the point 17 as in the other constructions. At the point 17, any unmixed or unseparated material which sticks up on the teeth of H is picked off by the rigid or semi-rigid teeth of worker C, as before described.

In Fig. 7, the lickerin E is shown as a bur roll running backward, with teeth which pitch backward and out of contact with tumbler F.

In addition to worker C and stripper B, I show another independent worker M which runs forward, with teeth which pitch forward, and a stripper N therefor which runs backward, with teeth which pitch backward, both of garnett wire.

The stock received by bur roll E at 9 travels down, as shown by the double full lines, and is picked off at 50 by the breast cylinder D and is first carded at the point 43 by worker M from which, at 44, it is stripped by stripper N and returned at 45 to the breast cylinder. From this point it travels along to the points 13 and 16 where it is treated in substantially the same way as shown and described in Fig. 2. Worker M may travel at about 30 feet.

In Fig. 8, lickerin E is shown as running backward and is covered with card clothing and is out of contact with tumbler F. Worker C and stripper B are the same as shown in the other views, but I show an additional worker P which travels forward and has teeth which pitch forward and is in carding contact with breast cylinder D and in stripping contact with stripper B.

In this construction, stripper B travels 100 surface feet per minute, and worker P, 30 surface feet per minute so that it will be stripped by B.

Where the lickerin runs down or backward, as shown in Figs. 6, 7 and 8, either the breast cylinder D should run faster or the lickerin slower in order to be kept clear. For the speeds indicated heretofore, a surface speed of the lickerin of about 100 feet per minute would be suitable.

In Fig. 9, I show a roll O, which might be called a lumper, covered preferably with flat wire, shown as garnett wire, with teeth which pitch backward and running backward at a slow surface speed, of perhaps 30 feet per minute, in carding contact with tumbler F and in stripping contact with lickerin E.

The effect of this roll is to pick off any rough stock which stands up on the teeth of tumbler F and to carry it, as shown by the line of three dots and a dash, from point 53 on the tumbler to the point 54 on the lickerin, by which it is carried back to the

point of contact 9 with the feed rolls, from which it goes through the breast again. Roll O thus serves as a guard to keep rough stock from the main cylinder, but also prevents the stock being thrown off by centrifugal force as it pulls the stock into the teeth of the tumbler, thus causing it to hang on better.

This roll O thus serves as an additional protection to the teeth of the main cylinder and regular workers.

Whatever rough stock, such as rags, gets onto the main cylinder H, on account of its high speed, is thrown outward by centrifugal force and, as there is no stripper between worker C and H, it is caught and pulled into the teeth of C by which it is carried back to the breast cylinder D and re-worked.

Another reason why I prefer to run my lickerin E forward is that the stock is pulled apart at the point 9 and again at the point 10 so that, as it is carried up by breast cylinder D, any buttons, pieces of metal, and other substances which would injure the teeth are thrown off and gradually work along between 9 and 10 until they fall off the end of roll E on to the floor. This occurs before they are crowded between the teeth of any two rolls and at the time when the stock is enough separated so that they will fall out of it.

In Fig. 10, I show the roll O as it can be used where the lickerin and tumbler are not in engagement, as shown in Figs. 6 and 8. In this case, the flat wire covered lumper roll O is inserted between cylinder D, lickerin E and tumbler F, with its teeth pitching backward and running forward at a slow speed.

The result of this arrangement is that, at its nearest point 57 to lickerin E, it pulls apart the stock, taking some which sticks up on the teeth and, as shown by the line of two dots and two dashes, carries it around to the nearest point 56 on cylinder D, and at 55 it catches any coarse stock which stands up on the teeth of the tumbler and carries this also, as shown by the line of three dots and dashes, back until it is stripped at the point 56 by breast cylinder D, all such stock being carried back to the point 50. It will be observed that something in the nature of carding occurs at the points 57 and 55.

It will also be understood that, with some classes of stock, it may be advisable to move this lumper roll far enough away either from the lickerin or the tumbler so that no action takes place, but in every case it should run at a speed sufficiently slow, as from 30 to 100 surface feet per minute, so that it will be stripped either by the lickerin or the breast cylinder. It is preferably covered with flat wire, as this keeps clean better than round wire card clothing.

My breast properly includes a breast cylinder, a flat wire worker in carding contact with it and with the main cylinder, and a stripper between the worker and the breast cylinder. In my preferred construction, I prefer to use a forward running lickerin with a tumbler in stripping contact therewith.

Except for the added difficulty of locating and the difficulty of watching its operation, keeping it clear, etc., I prefer also to use the lumper roll O as shown in Figs. 9 and 10.

In attaching my preferred form of breast to the ordinary card, my flat wire tooth worker takes the place of the first card clothing covered worker and no change is required in the location of the lickerin and tumbler.

The construction shown in Figs. 1, 2 and 3, with a single worker C, is very satisfactory, but in many cases I can conveniently and economically use an extra worker, such as A, Fig. 4, or P, Fig. 8, stripped by the same stripper, thus giving an extra carding point. Except for the expense and the fact that the work cannot as readily be seen, I find the combination of two workers, as shown in Figs. 4 and 8, with a lumper roll, as shown in Fig. 10, is very satisfactory.

I claim:

1. In a carding machine having a main cylinder, feeding in rolls and a forward running bur roll lickerin, the combination of a garnett wire breast cylinder in carding relation with the bur roll lickerin, a garnett wire worker in carding relation with the main cylinder and with the breast cylinder, a stripper between such worker and the breast cylinder, and a tumbler in stripping relation with the breast cylinder and the lickerin and in such relation therewith as to be stripped by the main cylinder.

2. In a carding machine having a main cylinder, feeding in rolls and a forward running bur roll lickerin, the combination of a garnett wire breast cylinder which takes part of the stock directly from the bur roll lickerin, a garnett wire worker in carding relation with the main cylinder and with the breast cylinder, a stripper between such worker and the breast cylinder, and a tumbler in stripping relation with the breast cylinder and the lickerin and in such relation therewith as to be stripped by the main cylinder.

3. In a carding machine having a main cylinder, feeding in rolls and a flat wire tooth lickerin, the combination of a flat wire tooth breast cylinder which takes part of the stock directly from the lickerin, a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, a stripper between such worker and the breast cylinder, and a tumbler in stripping relation with the breast cylinder and

in such relation therewith as to be stripped by the main cylinder.

4. In a carding machine having a main cylinder, feeding in rolls and a lickerin, the combination of a breast cylinder which takes part of the stock directly from the said lickerin, a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, a stripper between such worker and the breast cylinder, and a tumbler in stripping relation with the breast cylinder and in such relation therewith as to be stripped by the main cylinder

5. In a carding machine having a main cylinder, feeding in rolls and a lickerin, the combination of a flat wire tooth breast cylinder which takes part of the stock directly from the said lickerin, one or more workers in operative relation with the breast cylinder, one of such workers being a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, means for stripping each worker, and a tumbler in stripping relation with the breast cylinder and in such relation therewith as to be stripped by the main cylinder.

6. In a carding machine having a main cylinder, feeding in rolls and a lickerin, the combination of a breast cylinder which takes part of the stock directly from the lickerin, one or more workers in operative relation with the breast cylinder, one of such workers being a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, means for stripping each worker, and a tumbler in stripping relation with the breast cylinder and in such relation therewith as to be stripped by the main cylinder.

7. The combination with a wool carding machine having a main cylinder covered with round wire card clothing, feeding in rolls, a tumbler, and a lickerin which runs forward and has teeth which pitch forward, of a breast comprising a breast cylinder which runs forward and has teeth which pitch forward so placed as to take part of the stock directly from the lickerin, a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, and a stripper for such worker between it and the breast cylinder, the tumbler being in stripping relation with the breast cylinder and in such relation therewith as to be stripped by the main cylinder.

8. The combination with a wool carding machine having a main cylinder covered with round wire card clothing, feeding in rolls, a tumbler, and a lickerin which runs forward and has teeth which pitch forward, of a breast comprising a breast cylinder which runs forward and has teeth which pitch forward so placed as to take part of the stock directly from the lickerin, a flat wire tooth worker in carding relation with the main cylinder and with the breast cylinder, and a stripper for such worker between it and the breast cylinder, the tumbler being in stripping relation with the breast cylinder and in such relation therewith as to be stripped by the main cylinder, together with a lumper roll having teeth which run point to point with those on the tumbler so located as to return to the breast such part of the stock as sticks up on the teeth of the tumbler.

9. The combination with a wool carding machine having a main cylinder covered with round wire card clothing, feeding in rolls, a tumbler, and a lickerin which runs forward and has teeth which pitch forward, of a breast comprising a breast cylinder which runs forward and has teeth which pitch forward so placed as to take part of the stock directly from the lickerin, a flat wire tooth worker having teeth which pitch forward and which runs backward and which is in carding relation with the main cylinder and with the breast cylinder, an additional worker which has teeth which pitch forward in carding relation with the breast cylinder, and a stripper for both workers between them and the breast cylinder, the tumbler being in stripping relation with the breast cylinder and with the lickerin and in such relation therewith as to be stripped by the main cylinder, together with a lumper roll having teeth which run point to point with those on the tumbler so located as to return to the breast such part of the stock as sticks up on the teeth of the tumbler.

10. The combination with a wool carding machine having a main cylinder covered with round wire card clothing, feeding in rolls, a tumbler, and a lickerin which runs forward and has teeth which pitch forward, of a breast comprising a breast cylinder which runs forward and has teeth which pitch forward so placed as to take part of the stock directly from the lickerin, a flat wire tooth worker having teeth which pitch forward and which runs backward and which is in carding relation with the main cylinder and with the breast cylinder, an additional worker which has teeth which pitch forward in carding relation with the breast cylinder, and a stripper for both workers between them and the breast cylinder, the tumbler being in stripping relation with the breast cylinder and with the lickerin and in such relation therewith as to be stripped by the main cylinder.

In testimony whereof I have affixed my signature.

EDDO V. BATES.