

T. E. HOWORTH.
 PICKER WASTE SEPARATING MACHINE.
 APPLICATION FILED MAR. 6, 1917.

1,299,185.

Patented Apr. 1, 1919.
 2 SHEETS—SHEET 1.

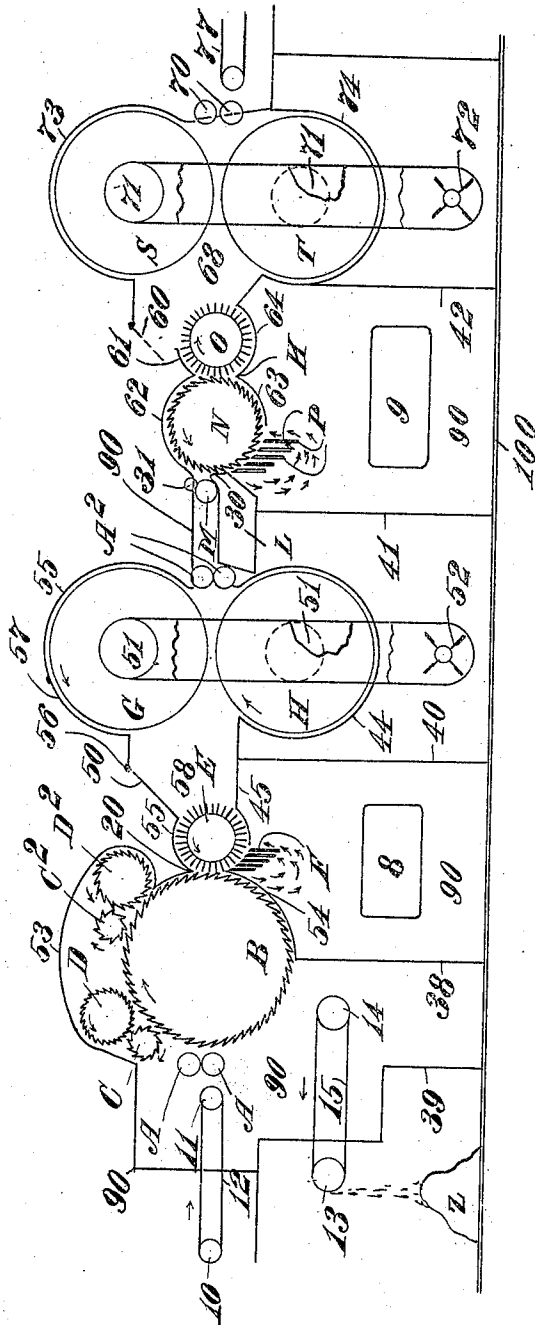


Fig. 1.

WITNESSES:

Switzer A. Nicol.

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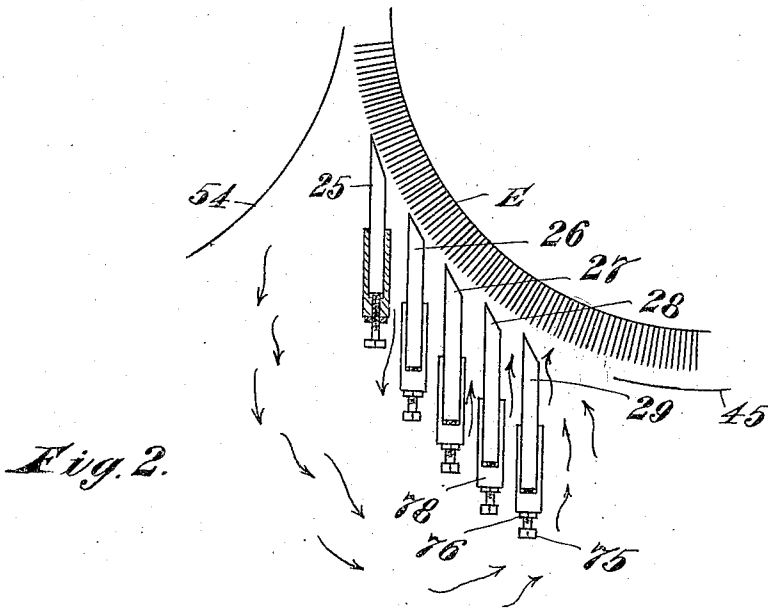


Fig. 2.

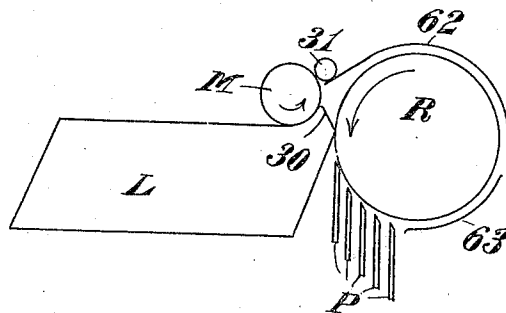


Fig. 3.

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THOMAS E. HOWORTH, OF NASHUA, NEW HAMPSHIRE.

PICKER-WASTE-SEPARATING MACHINE.

1,299,185.

Specification of Letters Patent.

Patented Apr. 1, 1919.

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To all whom it may concern:

Be it known that I, THOMAS E. HOWORTH, a citizen of the United States, residing at Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Picker-Waste-Separating Machines, of which the following is a specification.

This invention relates to machines and processes especially adapted for separating the cotton fiber from the seed and other impurities in what is known as picker waste or picker seed. This is the waste which cannot be separated by the pickers ordinarily in use and is usually disposed of for filling as it cannot be put in condition to be spun into yarn.

My machine and process may be used for other similar material, but is especially adapted for utilizing cotton picker waste or picker seed.

It is necessary first to open up or tear apart the bunches of fiber which are matted together and cling closely around the seeds. Such seeds may be perfect or defective. This opening out should be accomplished with as little injury to the fiber as possible, and the seed and other waste should also be so loosened that when the material is agitated or shaken the larger pieces of seed and other waste can be separated from the fiber. I prefer then to remove a substantial part of the remaining dust and to form the material into a bat so that it can be acted upon by other mechanisms which further open it out and comb the fiber. Such finishing means remove the remaining impurities, and I finally pass the material through devices which remove the rest of the dust and form the material into a suitable bat which can be handled in a carding machine of ordinary type, so that it can thereafter be spun into yarn.

My machine and process may be divided into two parts, first the preparing, and second the finishing. While I can handle the raw stock with my finishing means, it must be fed with great care, and there is danger that bunches will get in and break the knives, brackets or other parts, and I therefore prefer to prepare the stock by opening it out, getting rid of the heavy impurities and spreading it into a fairly even bat.

In both, I use the combination of feed devices with a main Garnett roll and a continuous wire brush roll which brushes it, together with especially arranged knives closely set to either one or the other roll in the opening of an otherwise closed compartment. I prefer in connection with the preparing means, to set these knives in operative relation with and under the wire brush roll for the reason that the heavy impurities at this stage are still in the stock and the wires of the wire brush roll have sufficient give so that when a bunch passes it will not break the knives, their brackets nor the brushes.

As the stock is fed in the rough to the preparing means, I set the main roll so that it carries the stock upward and I associate with the main roll and above it one or more sets of opening and evening rolls. These need not rework the stock, but are intended simply to open it. They include a first roll of Garnett wire with teeth set point to point with those on the main roll and traveling in the same direction, and a second roll, in operative relation therewith and with the main roll, having teeth set in the opposite direction and revolving in the opposite direction, preferably at a speed greater than the first roll, but less than the main roll. The first opening roll should be set far from or near to the main roll according to the nature of the stock.

I prefer to use a second set of opening and evening rolls set a little farther away than the first set to allow for the opening out and expansion of the stock.

Beyond the main roll, I locate a brush roll having straight wires. This is closely set to the main roll and travels faster in a direction to clear the material from the teeth thereof. This brush roll carries the material along at a high speed first in a downward direction, and while so traveling downward it engages a series of especially constructed and located knives. These knives are set preferably in brackets, and slightly loose, and are so arranged that the first knife on the receiving end is set very close, while the following knives toward the delivery end are set at a greater distance from the roll to allow for the opening out or expansion of the stock which occurs as it is operated on.

These knives are set in the opening of an otherwise closed compartment, with the result that the revolving roll causes a current of air to travel into and out of such compartment through and around the knives. The result of this is that while most of the fiber clings to the roll, most of the heavy waste is either thrown off by centrifugal force through the knives or scraped off by them, and drops to the bottom of the compartment, while the lighter fiber which may be carried along by the current of air through the knives is picked up by the returning current of air and delivered by the roll with what has clung thereto.

The fiber, which is now fairly clean from the heavy impurities, is rapidly carried along by the brush roll and the current of air created thereby since all the parts are inclosed, and is picked up by and between slowly revolving cages from which the air and dust is being constantly drawn. It is formed by them into a bat which is also delivered by them to the finishing means.

These finishing means include feed devices, a main Garnett roll, and beyond that a brush roll together with knives in the opening of an otherwise closed compartment which in this case, I prefer to associate with and underneath the Garnett roll.

As shown in Fig. 3, the finishing main Garnett roll may be replaced by a brush roll if desired; but I prefer to use the Garnett roll if the stock has previously been properly prepared by opening, spreading, and forming into an even bat without bunches.

Substantially all parts are incased, and for my brush rolls, I use those with elastic straight radial wires which will give and let go of such bunches as should not be carried along.

These wires should be set continuously around the roll and not in bunches nor in separate rows, as such bunches or rows allow the stock to roll up and get in between, forming rolls or bunches which clog the machines, break the knives, and do other damage.

My finishing means alone will handle the stock, but I prefer to deliver it by suitable preparing means so that the action is first a harsh opening action such as between close-set Garnett rolls, then a relatively soft scraping and further opening such as between a brush and close-set knives then a mixing by air currents in a closed compartment, from which the lighter stock comes out between knives and is formed into a bat, which bat is then subjected to a harsh scraping action as between a Garnett roll and close-set knives. It is then preferably combed, brushed and straightened by another brush.

I claim, however, to be the first to provide

means suitable for preparing picker seed stock and associating such means with a Garnett roll running proximate to closely set knives.

In the drawings, Figure 1 is a diagrammatic side elevation showing my complete machine with one side casing removed.

Fig. 2 is a detail of one set of knives.

Fig. 3 is a detail of the feed table and knives associated with either a Garnett or brush roll.

10 and 11 are carrier rolls carrying feed apron 12 of any suitable construction, and A, A are feed rollers, preferably fluted all comprising the feed devices for the raw stock.

B is a main roll traveling from left to right with reference to its top in a direction which I will call, with reference to it and other rolls, forward running. It is covered with Garnett wire and may travel at perhaps 1250 ft. per minute.

C is a first opening roll covered with Garnett wire and traveling forward in the same direction with B at a surface speed of perhaps 800 ft., or less, per minute.

D is a second preparing roll covered with Garnett wire and traveling backward in a direction opposite to B and C at a speed intermediate between them at perhaps 1000 ft. per minute.

C and D should be carried by any well known adjustable bearing devices by which they can be set far or near to main roll B.

The Garnett wire on B is medium coarse, while that on C is finer, and that on D is preferably coarser.

C² and D² are similar to C and D and may be used, if desired, and if used, are preferably set a little farther away from B than are C and D. The wire on these rolls is preferably coarser than that on C and D.

I prefer to box in underneath the feed devices and roll B by casing indicated at 39, and to locate a second apron 15 carried by rolls 13 and 14 under the feed devices and between them and roll B so that sand or other similar impurities can be carried out and deposited in a pile such as Z.

All the parts are cased on the sides as shown at 90 and over rolls B, C, D, C² and D² is located a casing 53. This casing preferably runs in close at the point 20, and a similar casing 38 runs up close at the point 54 so that stock can not fly off but must come in contact with brush roll E.

This brush roll E is covered with preferably straight wire perhaps one inch long traveling backward or in a direction opposite to roll B at a surface speed of perhaps 3600 ft. per minute. Over it is a casing 55, while underneath it is formed a substantially closed in compartment, formed by the floor 100, partitions 38, 54, 45 and 40, with an opening through which project the

knives indicated collectively by F and shown in detail in Fig. 2, as 25, 26, 27, 28, 29.

These knives are carried in brackets 78 and are adjustable toward and from roll E by means of set screws such as 75 and lock nuts 76. They extend the length of the roll and between them are substantial air spaces, the knives being perhaps one half inch thick and the spaces between them substantially one half inch.

These knives are set preferably so that the sharp edge of each will receive the stock as it is carried along by roll E. The edge of the first knife on the receiving side is about 10/1000 inch distant from the brush wires, the next 15/1000 inch, the next 25/1000 inch, the next 39/1000 inch and the next about 39/1000. This is to allow for the expansion of the stock as it is cleaned and straightened, and also to assist in causing a return current of air down through and between the first knives and up through and between the last knives as indicated by the arrows.

G and H are cylindrical cages revolving in the direction of the arrows at a slow surface speed. The upper side of G is cased at 55, and the lower side of H at 44, while through the suction pipes 51 the air and dust are drawn from them by means of a fan 52 of well known construction.

The partition 45 extends from the brush roll E on the lower side toward H, while at the upper side I prefer to provide a glass door 50 hinged at 56 to another hinged section 57 of the top casing. This door can be used for examining the condition of the stock, for cleaning and for admitting air, if necessary.

Cages G and H are covered with any suitable woven wire of appropriate mesh and collect the stock, which is driven along by brush E, into a bat. This bat is delivered to carrier rolls A² which are similar to A and are preferably fluted.

Rolls A² deliver the bat to a table L, along which it is carried, under fluted feed roll M which revolves in a snugly fitting recess in table L, and pushes the stock over a nose or lip 30 from which Garnett roll N combs and removes it.

This main roll N is similar to B. It is covered with Garnett wire and travels backward at a surface speed of about 2150 feet per minute.

Associated with and underneath main roll N, on the receiving side, are especially devised knives P, which are similar in all respects to F.

These knives are located in the opening of an otherwise closed compartment formed by the floor 100, vertical partitions 41 and 42, together with table L and casings 63 and 64 which extend up closely between main roll N and brush roll O at the point K.

Over roll N and brush roll O which is similar to E, but which travels in the opposite direction, are the top casings 62 and 61. These extend well down between rolls N and O.

Roll O travels at a rate of speed sufficient to clear the teeth of main roll N and to brush the stock which has been combed out by the action of the teeth of main roll N on the stock as it is delivered over lip 30. Its surface speed may be about 3600 feet per minute.

On the delivery side beyond roll O, I prefer to locate cages S and T which are similar to G and H and from which the air is drawn through pipes 71 by means of fan 72.

At the top of S is casing 73, and at the bottom of T is casing 74 similar to 55 and 44, and hinged to 73 is an adjustable door 60, which is preferably of glass, and so arranged that it can be opened or closed to admit more or less air.

These cages S and T form the material into a finished bat which is passed along through delivery rolls 70 which are preferably fluted, on to an apron 77 of any usual form.

The cleanout doors for the closed compartments are represented by 8 and 9.

I prefer to extend casing 55 well down and close to roll E at 58 and casing 64 well up and close to roll O at 68 to prevent the stock from clinging to the rolls.

As shown in Fig. 3, roll M delivers the stock over the top edge of lip 30 and lip 30 so slants that the stock is combed and cleaned before it is picked off and carried along to the knives by the finishing roll such as R.

The roll R may be covered with Garnett wire as is N or with brush wire as O. In either case, it combs out and cleans the stock as it comes over the feed lip 30 from feed table L forced by feed roll M.

31 is a clearer roll which stops the gap between casing 62 and roll M and keeps the latter clean.

Rolls such as E, N, or R are cleaning and straightening rolls, and associating such a roll with knives set in the opening of an otherwise closed compartment, I regard as new, especially if such knives are close set and the distance of the setting increases from the receiving toward the delivery end of the machine.

I claim:

1. The combination in a cotton picker waste separating machine, of a Garnett roll, and a continuous wire brush roll running faster than the Garnett roll in such manner as to clear the stock therefrom, with a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of one of said rolls in such manner as to cause a current

of air into and out of such compartment through and around such knives.

2. The combination in a cotton picker waste separating machine of a Garnett roll, and a continuous wire brush roll running faster than the Garnett roll in such manner as to brush and clear the stock therefrom, with a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of one of said rolls so that the distance of the setting increases from the receiving toward the delivery end of the machine.

3. The combination in a cotton picker waste separating machine of a Garnett roll, and a continuous wire brush roll running faster than the Garnett roll in such manner as to clear the stock therefrom, with a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of one of said rolls, said rolls being so incased and said knives being so set as to cause a current of air into and out of such compartment, through and around such knives.

4. The combination in a cotton picker waste separating machine of a Garnett roll, and a continuous wire brush roll running faster than the Garnett roll in such manner as to clear the stock therefrom, with a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of one of said rolls, said rolls being so incased and said knives being so set as to cause a current of air into and out of such compartment, through and around such knives, together with feed mechanism at the receiving end and revoluble cages, and means for drawing the air out of such cages.

5. The combination in a cotton picker waste separating machine of preparing means which include feed mechanism, a forward running Garnett roll, Garnett opening rolls above and in operative relation therewith, a wire brush roll running backward and faster than the Garnett roll in such manner as to brush the stock therefrom, and a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of the brush roll, and cages adapted to receive stock from the brush roll, together with finishing mechanism which includes feed rolls, a backward running Garnett roll, a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the Garnett roll, a forward running brush roll in engagement with such Garnett roll and revoluble cages from which the air is adapted to be drawn, all parts being suitably cased.

6. The combination in a cotton picker waste separating machine of a cleaning and straightening roll which travels backward,

with a series of knives in the opening of an otherwise closed compartment closely set to and under the receiving side of said roll, such roll being so incased and such knives being so set as to cause a current of air into and out of such compartment, through and around such knives.

7. The combination in a cotton picker waste separating machine of a continuous brush roll, with a series of knives in the opening of an otherwise closed compartment closely set to and under the receiving side of said roll, said roll being so incased and said knives being so set as to cause a current of air into and out of said compartment, through and around said knives.

8. The combination in a cotton picker waste separating machine of an elastic straight radial continuous wire brush roll which travels backward, with a series of knives in the opening of an otherwise closed compartment closely set to and under the receiving side of said roll, such roll being so incased and such knives being so set as to cause a current of air into and out of such compartment, through and around such knives.

9. The combination in a cotton picker waste separating machine of an elastic straight radial continuous wire brush roll, with a series of knives in the opening of an otherwise closed compartment closely set to and under the receiving side of said roll, said roll being so incased and said knives being so set as to cause a current of air into and out of said compartment, through and around said knives.

10. The combination in a cotton picker waste separating machine of preparing means which include feed mechanism, a forward running Garnett roll, Garnett opening rolls in operative relation therewith, a wire brush roll adapted to take the stock from the Garnett roll, and means of forming the stock into a bat, with finishing mechanism which includes feed rolls, a backward running Garnett roll, a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the Garnett roll, and a forward running continuous wire brush roll in engagement with such Garnett roll.

11. The combination in a cotton picker waste separating machine of preparing means which include feed mechanism and means for opening the stock and forming it into an even, continuous bat, with means to feed such bat to the finishing means, together with such finishing means including a backward running Garnett roll, a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the Garnett roll, and a forward running brush roll in engagement with such Garnett roll.

12. The combination in a cotton picker waste separating machine of preparing means which include feed mechanism, a forward running Garnett roll, Garnett opening rolls above and in operative relation therewith, a wire brush roll running backward and faster than the Garnett roll in such manner as to brush the stock therefrom, and a series of knives in the opening of an otherwise closed compartment closely set proximate to and under the receiving side of the brush roll, and cages adapted to receive stock from the brush roll.
13. The combination in a cotton picker waste separating machine of harsh opening means, relatively soft scraping means, bat
- forming means, and harsh scraping means as described.
14. The combination in a cotton picker waste separating machine of harsh opening means including Garnett rolls, soft scraping means including a continuous brush and close-set knives, bat forming means, and finishing means including a Garnett roll and knives set closely thereto.

In testimony whereof I affix my signature.

THOMAS E. HOWORTH.

Witnesses:

ROBERT H. CLOUGH,
ANNE E. TEMPLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."