April 11, 1967 O. U. MOON 3,313,005

LAP GUIDE FOR PICKING MACHINES

Filed Oct. 28, 1963 2 Sheets-Sheet 1

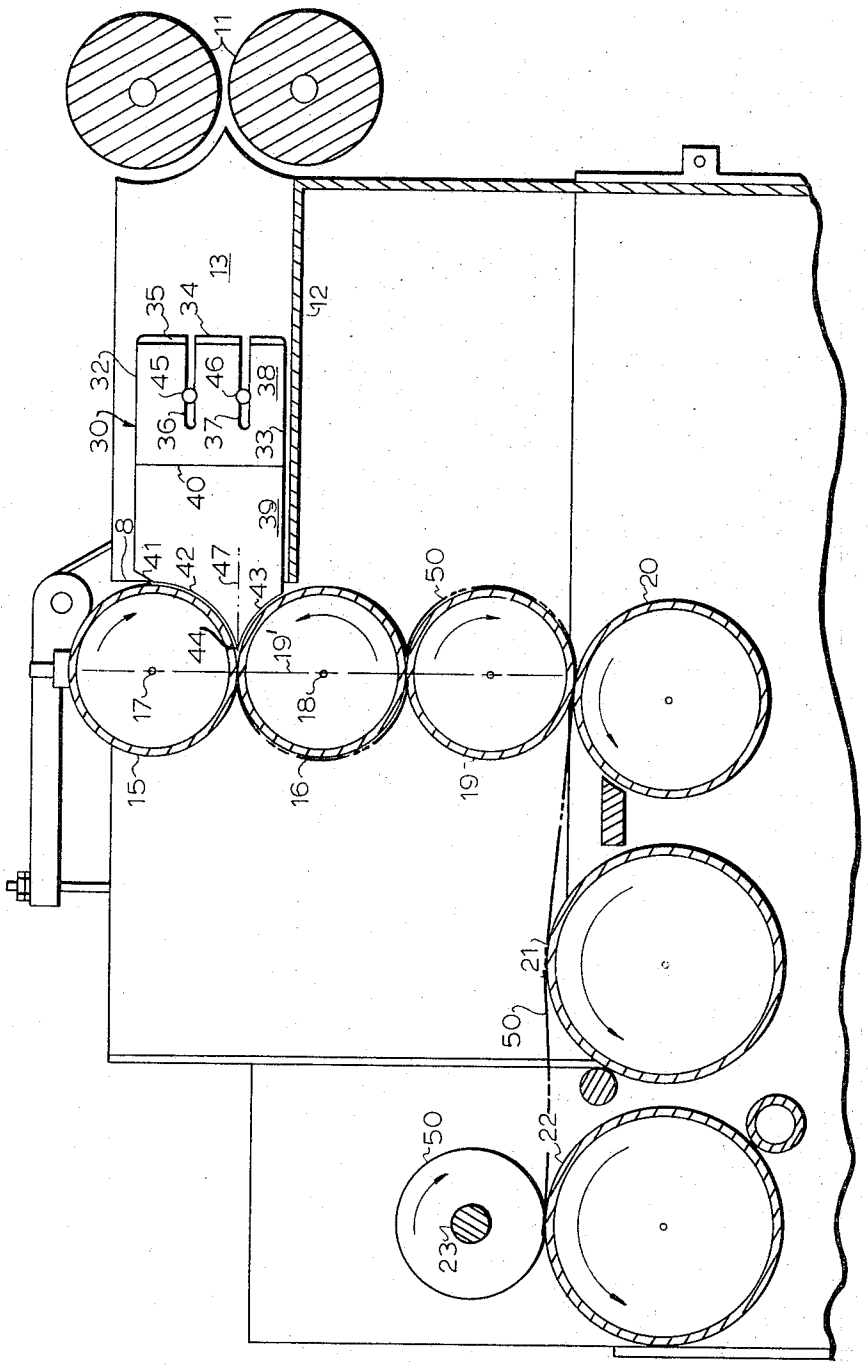

FIG. 1

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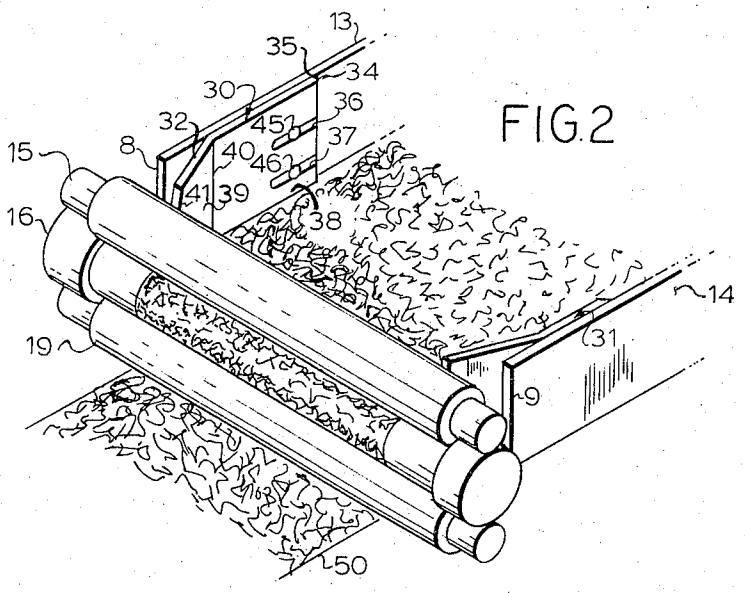

FIG.2

FIG.3

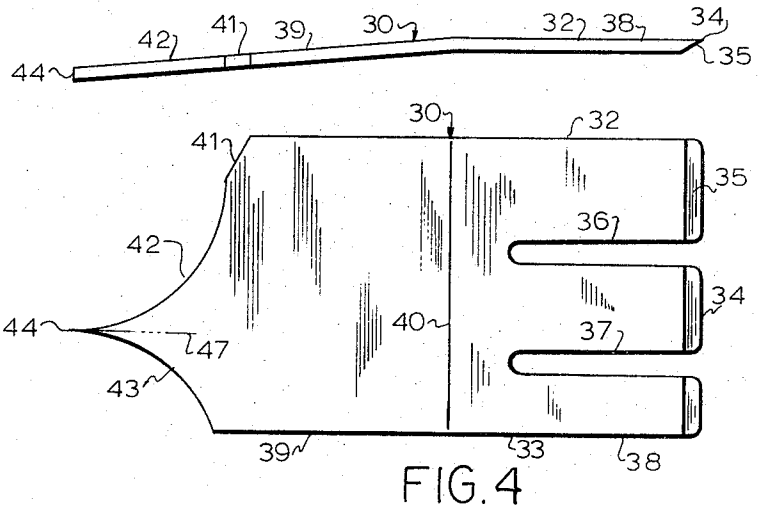

FIG.4

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3,313,005

LAP GUIDE FOR PICKING MACHINES

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This inventon relates to fiber processing equipment, and is more particularly concerned with a guide for the lap as formed by a picking machine.

In the processing of cotton or other textile fibers, the fibers are cleaned and formed into a mat, or lap, by a picker. This lap is then run through a carding machine for further cleaning and for combing the fibers.

The lap formed by conventional pickers has very loose and ragged edges. In transporting the lap from the picker to the card, fibers from the edges of the lap fall off, thus becoming waste. Further, the lap is normally made the same width as the carding machine. When run through a carding machine, the lap spreads out due to the carding action, thus extending outside the machine. The fibers that go past the drum of the machine are blown out to become waste. This is known as "blow out."

Previous attempts to reduce the waste in this process have included the use of means to fold over the edge of the lap. Though this narrows the lap, the edges of the lap are so thick that they immediately spread out and give about the same amount of blow out as if the lap were the usual width.

The device of the present invention is used on the picker to narrow the lap before the lap goes into the calender rolls. The device gives firm edges to the lap and makes the lap somewhat narrower than usual. The firm edges prevent fibers from dropping off the lap during storage and transporting; and, the narrow lap provides sufficient spreading room to reduce blow out in the carding machine.

In general terms, the device of the present invention comprises a pair of plates mounted on the usual walls of the platform which carries the lap to the calender rolls. The plates act as extensions of the existing walls, and have their ends formed to match the curvature of the calender rolls. This configuration allows the plates to be very close to the rolls so that fibers are held until they are between the calender rolls. The plates converge in the direction of flow of the material to narrow the passageway as the lap enters the calender rolls.

It is accordingly an object of the present invention to provide a lap which is formed narrower than the conventional lap and is of uniform thickness and density throughout its width.

Another object of the invention is to provide guides for a picker which will guide the lap as it enters the calender rolls, and prevent spreading of the fibers.

A further object of the present invention is to provide guides for a picker which are inexpensive to manufacture, quick and simple to install, and very efficient in operation.

These and other features and advantages of the present invention will become apparent from consideration of the following specification when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a partial, longitudinal cross sectional view of a cotton picker having the guides of the present invention installed thereon.

FIG. 2 is a perspective view of the front portion of a cotton picker having the guides of the present invention installed thereon.

FIG. 3 is a top plan view of one of the guides of the present invention.

FIG. 4 is a front elevational view of the guide shown in FIG. 3.

Referring now in detail to the embodiment chosen for the purpose of illustrating the present invention, it being understood that in its broader aspects the present invention is not limited to the exact details herein depicted, FIG. 1 shows a conventional cotton picker. The collector drum (not shown) of the cotton picker collects the fibers, as is well known, and feeds these fibers to a pair of opposed feed rollers **11**. The opposed rollers **11** are mounted one above the other and are provided with horizontal parallel axes. The rollers **11**, in turn, feed the fibers, as a lap **50** along a predetermined, relatively horizontal path defined by a trough having a base plate **12** and a pair of opposed, upstanding parallel, side walls **13** and **14**, the side walls **13** and **14** extending upwardly from the opposite parallel edges of base plate **12**. The inner ends **8** and **9** respectively of sidewalls **13** and **14** terminate in spaced relationship to a pair of calender rolls **15** and **16**.

In the conventional cotton picker of FIG. 1, the calender rolls **15** and **16** are disposed one above the other with their peripheries axially abutting along a vertical plane **19'** including the axes **17** and **18** of the rolls **15** and **16**. The axis **17** of roll **15** is parallel to the axes **18**. In like manner the calender roll **19** is disposed below the roll **16** while a calender roll **20** is disposed below the roll **19**. In addition, there are rolls **21** and **22** disposed in side by side relationship with the roll **20**.

It will be understood by those skilled in the art that the roll **15** is rotated in a clockwise direction while the roll **16** is rotated counter-clockwise, as indicated by the arrows in FIG. 1. Furthermore, the roll **19** is rotated in a clockwise direction while the roll **20** is rotated in a counter-clockwise direction. Rolls **21** and **22** are rotated in a counter-clockwise direction and roll **23** is rotated clockwise, all as indicated by arrows in FIG. 1. The incoming lap **50** passes between the calender rolls **15** and **16** and across the periphery of roll **16**, passing downwardly and then between the rolls **16** and **19**. Thence, the lap **50** passes around the outer portion of roll **19** and between the rolls **19** and **20**. The lap thus formed then goes across the roll **21**, passing around the roll **22** and is wound up on the pin or rod **23**.

The intent and purpose of the plate **12** and side walls **13** and **14** is to provide a passageway for the incoming lap **50** so that the lap **50** is fed between the abutting peripheries of the rolls **15** and **16**, the side walls **13** and **14** holding the loose fibers sufficiently to direct them through the calender rolls **15** and **16**. After the lap **50** has passed between the rolls **15** and **16**, the fibers are packed tightly enough together so that the lap can complete its path as hereinbefore described.

The above is well known in the art and should be understood without further description.

It will be noticed in FIGS. 1 and 2 that the side walls **13** and **14** terminate before reaching the calender rolls **15** and **16**. Since the fibers at this point are quite loosely packed, even in the relatively short distance between the ends **8** and **9** and the calender rolls **15** and **16**, the edge fibers can spread out, giving very rough and ragged edges to the lap **50**. When these ragged edges are passed through the calender rolls **15** and **16**, they provide edge portions that are only slightly held to the lap **50**. In the prior art devices, these edge portions would be lost at the picker, in transportation, or in the carding machine.

According to the present invention, the ragged edges of the lap **50** are eliminated by providing a pair of guides **30** and **31**, respectively, on the end portions of the side walls **13** and **14**. The guides **30** and **31** thus close the gap between the side walls **13** and **14** and the rolls **15** and **16** and function to progressively narrow the lap **50** as it enters between the rolls **15** and **16**, thereby urging the

loose edge fibers of the lap **50** into the lap itself, to retard the likelihood that these loose fibers will be lost.

Since guide **30** is complementary with respect to the guide **31**, I shall describe in detail only the guide **30**.

In FIGS. 3 and 4 it is seen that the guide **30** is a generally rectangular member having straight, parallel upper and lower edges **32** and **33** and a straight back edge **34** generally perpendicular to the edges **32** and **33**. Along the inner surface of guide **30**, the rear edge portion, adjacent edge **34**, is beveled to provide a rear lap directing surface **35** which converges the edge of lap **50** inwardly from the inner surface of side wall **13** to the inner surface of the guide **30**.

Intermediate the upper edge **32** and lower edge **33** are a pair of parallel vertically spaced, open ended slots **36** and **37** which extend inwardly from rear edge **34**, parallel to the edges **32** and **33** and terminate in rounded ends.

At its central portion, the guide **30** is bent to separate the guide **30** into a flat mounting plate **38** and a flap lap directing flange **39** joined together along the bent portion which defines a common edge **40** generally parallel to the rear edge **34** and perpendicular to the edges **32** and **33**. The common edge **40** constitutes the front edge of the mount plate **38** and the rear edge of the flange **39**.

The front edges of the guide **30**, i.e., of the lap directing flange **39**, is irregularly shaped to conform generally to the shape of the rolls **15** and **16**, respectively. In more detail, from the end of the upper edge **32**, the front edge extends generally in an outwardly and downwardly direction to define a straight intermediate edge portion **41** disposed at an obtuse angle with respect to edge **32**. At the lower end of edge **41**, the front edge extends downwardly and outwardly in an arcuate path to define an upper concave arcuate edge **42** for abutting roll **15**. The lower end portion of edge **42** meets a lower concave arcuate edge **43** to define forwardly projecting finger or cusp **44**. The lower end of lower arcuate edge **43** terminates at the inner end of lower edge **33**.

The guide **30** is of slightly less height, i.e., distance from lower edge **33** to upper edge **32** than the height, i.e., distance from the upper surface of plate **12** to the upper edge of side wall **13** and is mounted on the inner surface of side wall **13** by bolts **45** and **46** which project respectively through the slots **36** and **37** and are threadably received by side wall **13**. By loosening bolts **45** and **46** the guide **30** may be moved forwardly or rearwardly, as desired.

With the guide **30** positioned properly, the bolts **45** and **46** are tightened so that the outer surface of the mounting plate **38** is flat against, or contiguous with, the inner surface of the side wall **13** while the lap directing flange **39** diverges inwardly and forwardly from the plane of the inner surface of side wall **13**, as seen in FIG. 2.

The arrangement is such that the cusp **44** of the lap directing flange **39** is disposed between the rolls **15** and **16**, the edges **42** and **43** converging to a tangent at the cusp **44** so as to conform to the curvature of rolls **15** and **16**, respectively. The common tangent line **47** of edges **42** and **43**, which essentially bisects the cusp **44**, is disposed perpendicular to the vertical plane **19'**. It will be understood that the plane of side wall **13** is perpendicular to the axes **17** and **18** and that the lap directing flange **30** and the plane of the side wall **13** subtend an angle of from approximately 1° to approximately 6°, preferably about 3°; therefore, the curvatures of the edges **42** and **43** should be, theoretically, elliptical so as to be essentially concentric with the peripheries of rolls **15** and **16**, however, since the angle subtended is very small, the elliptical surfaces of edges **42** and **43** are in reality essentially circular.

It will be understood that guide **31** is mounted in identical fashion to provide a forwardly and inwardly protruding lap directing flange, similar to flange **39**. The cusps of guide **31**, such as cusp **44**, converges forwardly to reduce the effective width of the troughlike channel or passageway (i.e., the distance between side walls **13** and **14** which is normally approximately 40 inches) to approximately 39 inches, each flange, such as flange **39**, being offset with respect to its associated side wall **13** or **14** by approximately ½ inch. This, in turn, causes the width of the resulting lap **50**, as it enters between the rolls **15** and **16**, to be reduced to approximately 39 inches.

Between approximately ½ inch and approximately two inches reduction in width of the lap **50**, immediately prior to its entry between rolls **15** and **16** is sufficient to direct substantailly all the ragged edge portions, or loose fibers along the edge positions of lap **50**, inwardly into the remaining portion of the lap **50** and thereby avoid loss of the fibers. Hence, the forwardmost end of the cusp **44** of the lap directing flange should be offset from the plane of the outer surface of the mount plate **38** by approximately one-fourth inch to one inch and preferably by one-half inch.

The purpose of the particular shape of the guides **30** and **31** is to allow them to be mounted as close as possible to the calender rolls **15** and **16**. The ideal would be to have the guides touching the rolls; however, the consequent scraping would be undesirable. I have found that for best results edges **42** and **43** of the guides **30** and **31** should be placed in close proximity to the rolls **15** and **16**, about .003" from the calender rolls **14** and **15** for efficent use of the guides **30** and **31**. Any smaller dimension would permit the guides **30** and **31** to operate at least as well; but, closer tolerances would be required, which would increase the cost of making and installing the guides **30** and **31**. On the other hand, .003" is close enough to the calender rolls **15** and **16** for the guides **30** and **31** to give good results, and is relatively easy to accomplish without undue hardship.

In operation, the guides **30** and **31** are attached to the inner surfaces of walls **13** and **14**, respectively, by bolts **45**, **46** or the like. The lap directing flange **39** of each guide is placed close to the calender rolls **15** and **16**, with the cusps **44** thereof projecting between the two rolls. The calender rolls **14** and **15** are normally touching each other, being spring urged together so the cusps **44** cannot be at the tangent point, but it should be quite close, the object being to guide the fibers as far into the calender rolls **15** and **16** as is possible.

The opposed lap directing flanges **39** of the guides **30** and **31** are offset inwardly of the machine so that the passageway for the fibers is narrowed, making a slightly narrowed lap, as shown in FIG. 2.

The cusps **44** project far enough between the calender rolls **15** and **16** that the fibers cannot spread out before being compressed by the rolls, thus giving relatively smooth, firm edges to the lap.

The guides **30** and **31** of course compress the outside edges of the lap in axial directions with respect to rolls **15** and **16** and toward the axis of the trough as it enters the calender rolls **15** and **16**; however, after the edges are compressed, the lap passes normally, three times between calender rolls. With this amount of calendering, the extra thickness which is formed on the edges of the lap is spread throughout the width of the lap.

It will thus be seen that the lap formed by the picker is narrower than the conventional lap, and has firm edges. In transporting the lap, there are no loose edges to fall off; and, in the carding machine, there is sufficient space at the edges of the lap for some spreading without spreading beyond the edges of the drum of the carding machine. This narrow width will prevent approximately 90% of the blow out in the card, in addition to the saving due to almost no loss in transporting the lap.

It will be understood that the device here presented is by way of illustration only, and is meant to be in no way restrictive; therefore, numerous changes and modifications may be made, and the full use of equivalents resorted to without departing from the spirit or scope of the invention as outlined in the appended claims.

I claim:

1. In a picking machine of the class having a lap trough

along which a lap is fed to a pair of opposed calender rolls, a pair of opposed complementary lap guides secured to the opposite side walls of said trough, each lap guide including a flat mounting plate and a flat lap directing flange integrally joined together along a common edge defining the front edge of said mounting plate and the rear edge of said lap directing flange, said lap directing flange being angled slightly with respect to said mounting plate, said mounting plate being provided with means for adjustably securing said mounting plate to the inside surface of a side wall of said trough, said means permitting said mounting plate to be adjustably positioned in various positions along said side wall, said mounting plate being provided with a rear edge approximately parallel to said common edge, the inner surface of said mounting plate adjacent said rear edge being beveled for directing the edge of said lap inwardly of said trough and toward the inner surface of said mounting plate when the edge of said lap passes thereby, said lap directing flange being constructed and arranged to project beyond the end of said side wall of said trough and being adapted to direct said edge of said lap inwardly axially of said calender rolls as said lap approaches said calender rolls, said lap directing flange having a pair of arcuate concave front edges one above the other which approach each other toward the forwardmost portion of said lap directing flange, said front edges becoming approximately tangential at the forwardmost end of said lap directing flange, one of said front edges having a curvature to abut the periphery of one of said calender rolls, the other of said front edges having a curvature to abut the periphery of the other of said calender rolls.

2. A lap guide for a picking machine of the class having a lap trough along which a lap is fed to a pair of opposed calendar rolls, said lap guide comprising flat mounting plates adjacent the edges of said lap, each mounting plate having a flat lap directing flange integrally joined thereto along a common edge defining the front edge of said mounting plate and the rear edge of said lap directing flange, said lap directing flanges being angled slightly with respect to said mounting plates, said mounting plates being provided with means for adjustably securing said mounting plates to the inside surface of the side walls of said trough, said means permitting said mounting plates to be adjustably positioned into various positions along said side walls, said lap directing flanges being constructed and arranged to project along the end of said walls of said trough and being adapted to direct said edges of said lap laterally inwardly of the axis of said trough when said lap passes thereby while maintaining a single layer of said lap, each of said lap directing flanges having a pair of arcuate concave front edges, one above the other, which approach each other toward the forwardmost portion of said lap directing flange and form a cusp, one of said front edges having a curvature corresponding to the periphery of one of said calender rolls and lying closely adjacent thereto, the other front edge having a curvature corresponding to the periphery of the other of said calender rolls and lying closely adjacent thereto.

3. A lap guide for a picking machine of the class having a lap trough along which a lap is fed to a pair of opposed calender rolls, said lap guide comprising flat mounting plates adjacent each edge of said lap, each mounting plate having a flat lap directing flange integrally joined thereto along a common edge defining the front edge of said mounting plate and the rear edge of said lap directing flange, said lap directing flanges being angled slightly with respect to said mounting plates, said mounting plates being provided with means for adjustably securing said mounting plates to the inside surface of the side walls of said trough, said means permitting said mounting plates to be adjustably positioned in various positions along said side walls, said mounting plates being provided with a rear edge approximately parallel to said common edge, the inner surface of said mounting plates adjacent said rear edges being beveled for directing the edges of said lap inwardly of said trough and toward the inner surface of said mounting plates when the edges of said lap pass thereby, said lap directing flanges being constructed and arranged to project along the ends of said side walls of said trough and being adapted to direct said edges of said lap inwardly of the axis of said trough when said lap passes thereby, said lap directing flanges having a pair of arcuate concave front edges one above the other which approach each other toward the forwardmost portion of said lap directing flanges, said front edges becoming approximately tangential at the forwardmost end of said lap directing flanges, one of said front edges having a curvature to abut the periphery of one of said calender rolls, the other of said front edges having a curvature to abut the periphery of the other of said calender rolls, the forwardmost ends of said lap directing flanges being offset from the plane of the outer surface of said mounting plates by between one-fourth inch to approximately one inch.

References Cited by the Examiner

UNITED STATES PATENTS

7,533	7/1850	Rider	19—161
512,443	1/1894	Kershaw	19—163
1,118,305	11/1914	O'Connell	242—55.1 X
1,551,865	9/1925	Brandwood et al.	28—1
2,206,297	7/1940	Curley et al.	19—89
2,544,965	3/1951	Rogers	19—89 X

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