Nov. 3, 1942. J. F. LEHMAN 2,301,058

LICKER GRINDER

Filed July 23, 1940 2 Sheets-Sheet 1

Fig. 1

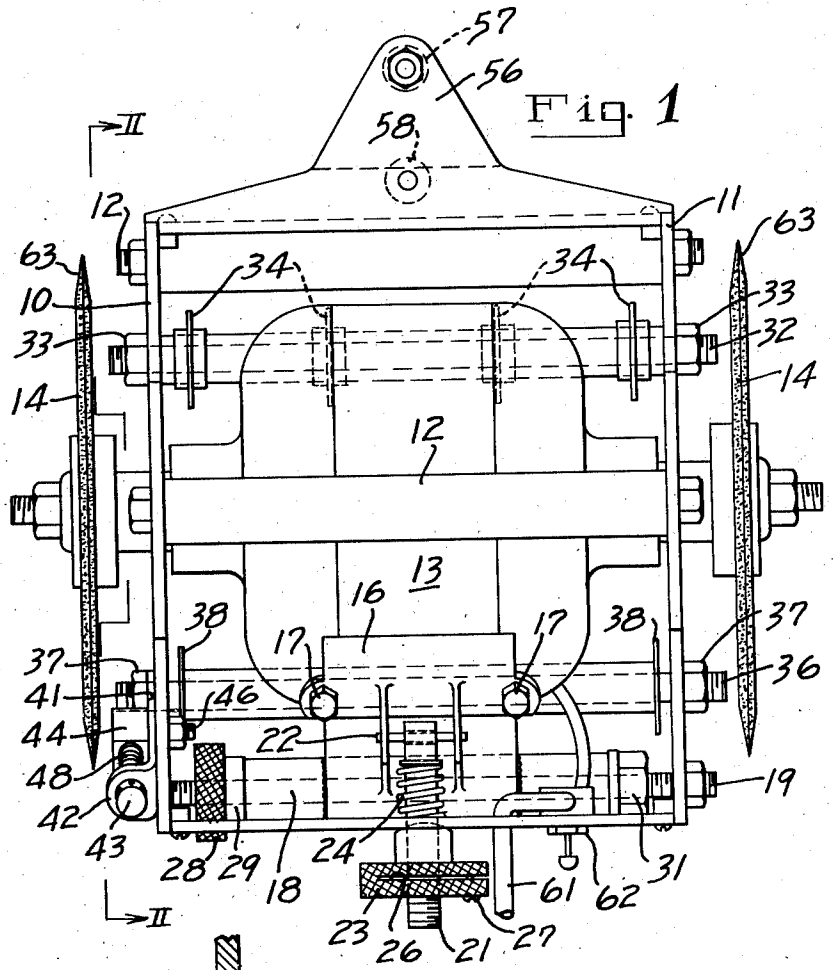
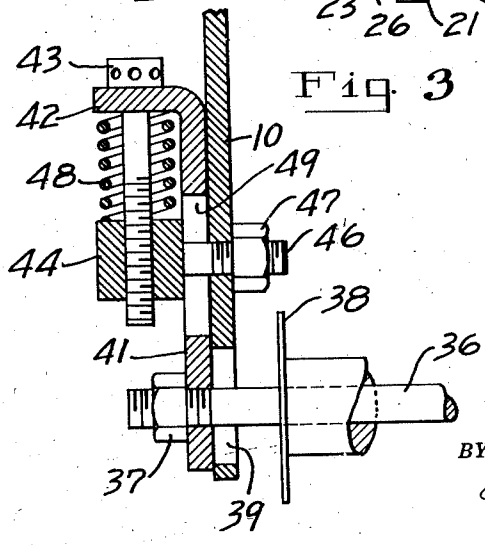


Fig. 3



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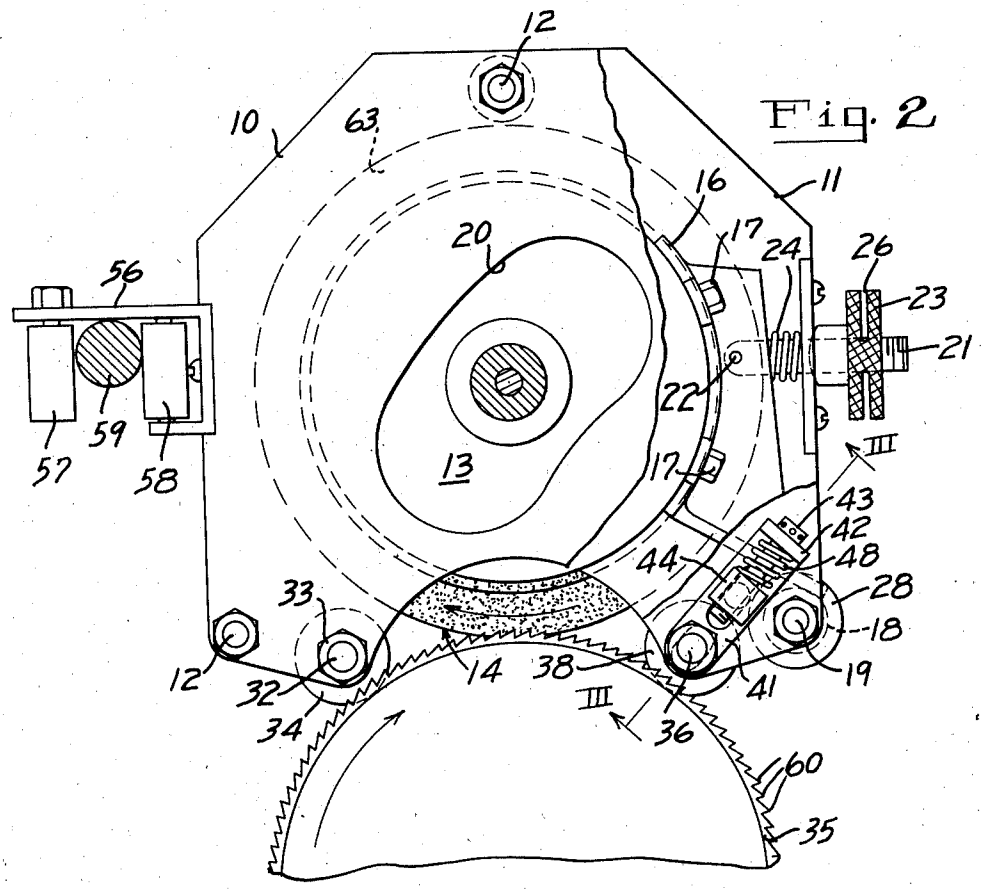


Fig. 2

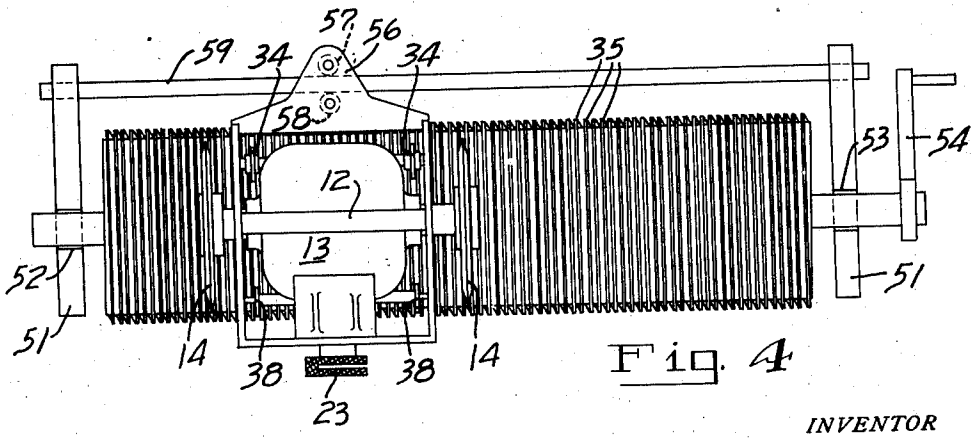


Fig. 4

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UNITED STATES PATENT OFFICE

2,301,058

LICKER GRINDER

John F. Lehman, Birmingham, Ala., assignor to Felton Wimberly, Jr., Birmingham, Ala.

Application July 23, 1940, Serial No. 347,114

3 Claims. (Cl. 51—56)

This invention relates to a licker grinder and has for an object the provision of an apparatus capable of accurately and speedily grinding the teeth of a licker without the necessity of removing the wire therefrom.

A further object of my invention is to provide a licker grinder including means to guide and hold the grinding wheels to proper position to contact the teeth while the licker is being turned beneath the grinder.

A still further object of my invention is to provide a licker grinder embodying motor driven grinding wheels mounted in a suitable frame, and embodying guiding means supporting the frame and motor on the licker and adapted to hold the grinding wheels to proper grinding position.

A still further object of my invention is to provide a licker grinder comprising a unitary machine supported on the licker cylinder and embodying a motor, grinding wheels driven by the motor, means to adjust the position of the grinding wheels with respect to the licker teeth both laterally and with respect to depth, and means to guide the apparatus to hold the grinding wheels to their proper grinding position.

Heretofore in the operation of carding machinery, so far as I am aware, the licker has been run until the teeth were so dull it was no longer capable of doing effective work, when it was removed and equipped with new wire. By the use of my invention the teeth of the wire when dulled may be ground and the licker maintained in good condition indefinitely.

Briefly, my invention comprises a motor having a grinding wheel mounted on its shaft on each end, the grinding wheels being of a width to extend downwardly between adjacent rows of teeth on the licker and beveled to the proper pitch to grind the licker teeth on each side of the grinding wheel. The motor is pivotally mounted in a frame adapted to be supported on the licker cylinder whereby the depth of grinding wheels with respect to the licker surface may be adjusted. It is also adjustable with its grinding wheels laterally of the frame. The frame is supported by adjustable guide wheels which follow the spiral wire on the licker and guide and hold the grinding wheels to their work.

These and other features of my invention are illustrated in the accompanying drawings forming a part of this application, in which

Fig. 1 is a plan view of my improved grinder;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1, and showing the grinder in operation;

Fig. 3 is a detail sectional view taken on line III—III of Fig. 2, showing one of the adjusting means for the guide rollers; and

Fig. 4 is a plan view partly diagrammatic, showing the apparatus in operation grinding the licker teeth.

Referring to the drawings for a better understanding of my invention, I show a rectangular frame comprising side members 10 and 11 held together by a plurality of through bolts 12. Mounted between the frame members 10 and 11 is a motor 13 having a grinding wheel 14 mounted on each end of its shaft. The motor is supported in the frame by means of a bracket 16 secured to the motor by means of tap screws 17, and which is connected at its opposite end, preferably by welding, to a sleeve 18 mounted on a bolt 19 extending from side to side of the frame. An adjusting bolt 21 is pivotally connected to the bracket 16 at 22, and is provided with an adjusting nut 23 manually operable to raise and lower the motor 13 in its frame by a pivotal movement about the bolt 19. As will be seen in Fig. 2, the pivot pin 22 is capable of limited lateral sliding movement on the bolt 21. A spring 24 on the bolt 21 holds the motor steady in the frame in its adjusted position. The nut 23 is split, as shown at 26, and a set screw 27 serves to compress the split portions and prevent loosening of the nut from its set position. Openings 20 in the end frame members 10 and 11 permit the pivotal movement of the motor described.

The sleeve 18 with bracket 16 and motor 13 is adjustable laterally in the frame by means of an adjusting nut 28 slidingly connected to the sleeve 18 at 29, and which is locked in adjusted position by means of a lock nut 31. As the motor is thus laterally adjusted the pivot pin 22 slides through the opening in the adjusting bolt 21, as already explained.

Extending across the frame near the bottom is an axle 32 held in position by nuts 33, and which has mounted thereon a plurality of guide wheels 34. These guide wheels are so spaced as to bear against the sides of the wire 35 of a licker as the licker is being rotated with the apparatus resting on the upper surface, and are effective to hold the grinding wheels 14 to their proper position to grind the licker teeth, as seen in Fig. 2. On the opposite side of the frame is another axle 36 held in place by nuts 37 and having mounted thereon supporting wheels 38 which bear against the surface of the cylinder and assist in holding the frame up off the wire as the licker is being rotated.

In order that the supporting wheels 38 may bear evenly on the surface of the licker, I provide a means, shown particularly in Fig. 3, to adjust the position of one end of the shaft 36 with respect to the frame 10. As shown in Fig. 3, the axle 36 extends through a slotted opening 39 in the frame member 10 and through a hole in a plate 41 mounted on the side of the frame member 10. The upper end of the plate 41 is

bent over to form a head 42 through which extends an adjusting screw 43. The adjusting screw 43 extends downwardly through the head 42 and is screwed into the threaded head 44 of a bolt 46 rigidly secured to the frame member 10 by means of a nut 47. A spring 48 is interposed between the head 42 and the nut 44. The bolt 46 passes through a slotted opening 49 in the plate 41, so that when the nut 47 is loosened and the screw 43 is turned, the plate 41, with the adjacent end of the axle 36, moves up or down, depending on the direction of turning of the screw 43, and its height is thereby regulated with respect to the surface of the licker cylinder. When the proper adjustment has been secured, the nut 47 is tightened up, which tightens the plate 41 against the frame member 10 and holds the axle 36 firmly in place.

Referring to Figs. 2 and 4, whenever it is desired to grind the teeth of a licker, the licker is removed from its frame and placed in a cradle 51 with its shaft resting in suitable openings 52 and 53 in the cradle. The licker cylinder may then be rotated by means of a crank 54, or by any other suitable means. The grinder frame is then set down on the cylinder, as shown in Fig. 4. It is prevented from turning with respect to the cylinder by means of a guide bracket 56 secured to the side of the frame, as shown in Fig. 2, and having rollers 57 and 58 mounted therein between which a rod 59 extends, and which has its ends inserted in suitable openings in the cradle 51. Electric current for operating the motor 13 may be supplied through a wire 61, and the operation of the motor is controlled by switch 62.

As is well known, the wire 35 of a licker is comprised of several separate toothed spirals laid side by side in grooves formed in the licker shell, the distance between two rounds of any one spiral being one inch, and there being from five to ten spirals, side by side, according to the class of work for which the card, in which the licker is incorporated, is intended. This results in the distance between the centers of two consecutive spirals being either one-fifth, one-sixth, one-seventh, one-eighth, one-ninth, or one-tenth inch apart, while the points of the teeth are usually one-fourth inch apart lengthwise of the wire.

In designing my improved grinding machine, therefore, I space the grinding wheels 14 to fit accurately between two parallel rows of wire, and the grinding wheels are of such thickness and are formed with beveled peripheries 63, so as to grind the teeth 60 successively on each side of the wheel as the licker is turned, as shown in Fig. 2 of the drawings. The guide wheels 34 must also be spaced on the axle 32 to bear against the wire 35 and to hold the grinding wheels 14 to their proper position for grinding. The grinding wheels may be properly positioned with respect to each other, if some slight adjustment is required, by means of shims on the motor shaft, as is well understood.

As the teeth are being ground, the licker is turned in one direction until the outermost grinding wheel in the direction of travel completes the grinding of the teeth to that end of the cylinder. As clearly shown in Figs. 2 and 4, the guide wheels 34 rest on the cylinder between the spirally wound rows of licker wire, so that upon rotation of the cylinder the grinder is caused to traverse the same. Then the direction of rotation of the licker is reversed and the machine is fed back in the opposite direction until the opposite grinding wheel completes its grinding of the teeth to the opposite end of the cylinder. Then the machine is moved and the guide wheels placed between the next adjacent parallel rows of wire and the operation just described is repeated, followed by a similar operation, until all the rows of the licker teeth have been ground.

From the foregoing it will be apparent that I have devised an improved licker grinder which is simple of construction and operation, and which is adapted to grind the teeth of a licker or other spirally arranged teeth with a maximum of efficiency and a minimum of time.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. A licker grinder comprising a motor, a frame supporting the motor, a pair of grinding wheels mounted on opposite ends of the motor shaft and spaced to fit between parallel spiral rows of licker wire and adapted to grind the sides of adjacent rows of teeth, means to rotate the licker cylinder with respect to the grinder, rollers carried by the frame for supporting the grinder on the licker cylinder and cooperating with the spiral rows of wire to guide and hold the grinding wheels to their work and cause the grinder to traverse the licker, means to adjust the position of the guide means vertically with respect to the frame, a guide bar extending along one side of and parallel to the licker cylinder, and a bracket carried by the motor frame engaging the guide bar and free to swing thereabout for holding the grinder against turning with the licker cylinder.

2. A licker grinder comprising a supporting frame, guide wheels carried by the frame and adapted to bear against the spirally wound licker wire, a motor pivotally mounted on one side of the frame, means to adjust the motor laterally and about its pivot in the frame, a pair of grinding wheels mounted on the opposite ends of the motor shaft and spaced to enter between the rows of teeth of the licker, and having bevelled faces to grind the adjacent sides of the licker teeth, means to rotate the licker as the grinding wheels are being driven by the motor, and means to hold the grinder frame against turning with the licker cylinder.

3. A licker grinder comprising a grinding wheel adapted to grind the sides of adjacent spiral rows of licker teeth, a frame upon which the grinding wheel is mounted, rollers carried by the frame for supporting the grinder from the licker cylinder and laterally engaging the rows of licker wire to hold the grinding wheel to proper cutting position, means to drive the grinding wheel, means to rotate the licker to cause the grinder to traverse the same, a guide bar extending along one side of and parallel to the licker cylinder, and a bracket carried by the motor frame engaging the guide bar and free to swing thereabout for holding the grinder against turning with the licker cylinder.

JOHN F. LEHMAN.