

March 17, 1936.

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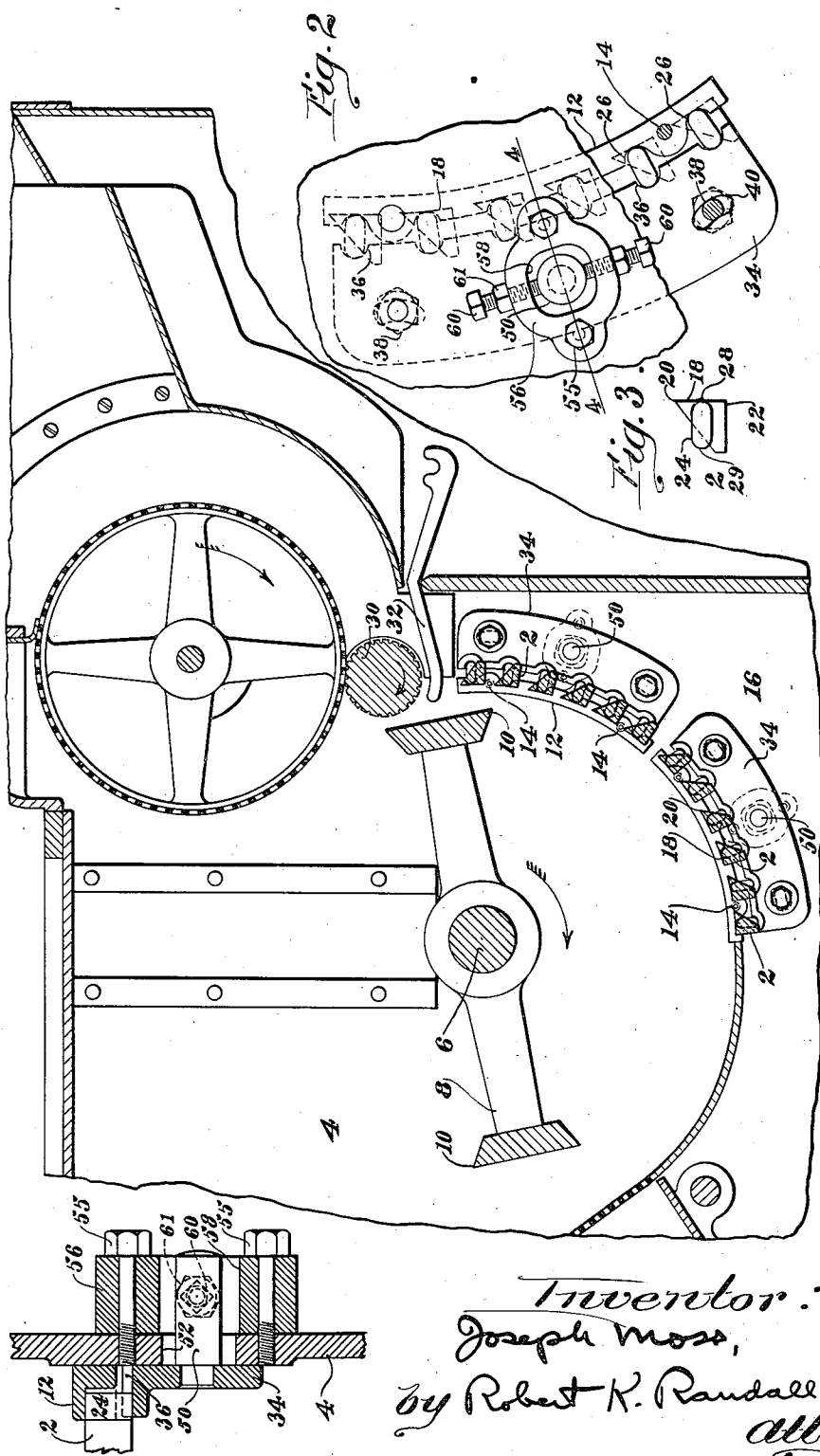
2,034,664

GRID BAR FOR COTTON OPENING MACHINERY

Original Filed March 25, 1929

Fig. 1.

Fig. 4.



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UNITED STATES PATENT OFFICE

2,034,664

GRID BAR FOR COTTON OPENING
MACHINERY

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Original application March 25, 1929, Serial No.
349,697. Divided and this application October
23, 1931, Serial No. 570,579

13 Claims. (Cl. 19—95)

The present application is a divisional one, forming a part of the invention disclosed in my previous application for patent on Cotton openers or pickers, filed Mar. 25, 1929, Serial No. 349,697.

The invention has relation to the grids which are commonly employed in connection with the beaters of cotton openers, pickers, and other machines for cleaning cotton and similar fibers. The object of the present invention is to provide a novel and improved construction of beater-grid which shall be inexpensive, compact, substantial, and effective, and shall have advantages over prior devices through affording improved and simplified means, free from likelihood of fouling by the droppings, for mounting the grid-bars and adjusting their action in loosening dirt, trash, dust and other undesired matter from the cotton, and for discharging the dirt from the beater-chamber. These and other objects of the invention, and the manner in which they are attained, will be apparent from the accompanying description, taken in connection with the drawing.

An illustrative embodiment of the invention is shown in the accompanying drawing in which,—

Fig. 1 is a fragmentary showing in vertical longitudinal section of portions of a cotton picker or opener, including the beater-chamber, the beater, and other parts associated therewith, together with the improved grid-construction of the invention.

Fig. 2 is a side elevation of a portion of the casing forming one end of the beater-chamber of Fig. 1, viewed from the back, partly broken away to reveal the grid-construction, and also showing the means for adjusting the settings of the grid-bars.

Fig. 3 is an end elevation of one of the improved grid-bars of the invention.

Fig. 4 is a section on line 4—4 of Fig. 2.

Having reference to the drawing,—

In Fig. 1 the grid-bars 2 are arranged as heretofore in many instances in parallel relation extending across the machine from the casing 4 at one end of the beater-chamber to the corresponding casing at the other end, and are disposed horizontally and parallel to the axis of the shaft 6 of the beater 8 with all the bars substantially equidistant from the axis of such shaft 6 and consequently from the path of rotation of the beater-blades 10.

As hitherto in certain instances the grid-bars 2 are installed between the beater-chamber and the dead-air chamber 16, supported in proper working relation to the path of the beater-blades

by means of fixed segments or "circles" 12 applied in suitable manner to the casing 4 defining the lateral ends of the beater-chamber, as by means of screws 14 put through the walls of the casing and threaded into the segments 12. Each grid-bar as hitherto is substantially triangular in cross-section throughout the extent of its working length, this shape providing a flat fiber-supporting face 18 for presentation toward the beater, a sharp working edge 20 at the advance side of said face for presentation in opposition to the direction of travel of the beater-blades 10 and the cotton or other fiber propelled across the faces 18 of the grids thereby, and a square heel 22 at the other side of the face 18.

In accordance with the invention, the ends of each of the grid-bars are provided with integrally formed fins 24 having their direction of greatest length disposed at right angles to the face 18 of each grid-bar which is presented toward the path of the beater. The extremities 28, 29, of these elongated portions or fins 24 are convex or pointed, and the extremities 28, of which the highest point lies in the plane of the flat face 18, are received in concavities 26 provided in spaced relation along the convex sides of the segments 12 facing away from the beater 8, these concavities 26 constituting seats or bearings in which the ends 28 ride back and forth to adjust the angle of the flat faces 18 to the path of the beater-blades 10 and the inward extent or rake of the working edges 20, to modify the cleaning action. Thus the contact-point of the end 28 of each fin with the surface of the seat constitutes the axis on which each grid-bar is turned in adjusting, and this axis lies substantially in the plane of the inward face of said grid-bar. The said seats are in series that are substantially concentric with the axis of revolution of the beater, and the seats 26 may be spaced equidistant from each other around the beater, or may be spaced more widely apart at one end of the series than at the other.

The grid-bars 2 are held in place in their seats 26 in the fixed segments 12 by movable segments 34 having concavities 36 corresponding to those of the fixed segments, and in these concavities or seats 36 are engaged the ends 29 of the fins 24 which are away from the beater and opposite to the ends 28. These movable plates 34 are slidably secured to the side-walls or casings 4 by means of shouldered bolts 38 which pass through elongated slots 40 in the segments which are curved counter to the curvature of segments 12 on a radius about equal to the distance of each

slot from the arc in which are located the bottoms of the series of seats 26 in the fixed segment 12. Thus the segments are capable of movement back and forth in the direction of their length while the distance between each concavity 36 and its associated seat 26 remains unchanged. The grid-bars are arranged in a plurality of groups or banks, each with its respective fixed and movable adjusting segments, as shown, so that by adjusting each group different settings may be achieved at different points in the passage of the cotton through the beater-chamber, as may be dictated by the nature of the cotton being cleaned.

The arrangement of the grid-bars with fins engaged respectively with the fixed and the movable segments provides for a rocking or angular adjustment of the grid-bars around pivotal axes located as stated at the seats 26 in the fixed segments, such axes lying substantially in the plane of the working faces 18 of the grid-bars because of the termination of the fin at 28, flush with the working surface 18 of the grid-bars. Because the length of the fins is disposed at right angles to the working face 18, the greatest possible inward and outward movement of the sharp working edges 20 and of the heels 22 compatible with the desired ease and accuracy of adjustment and compactness of the parts involved is attained with a minimum angular movement of the grid-bars about their axis of rotation which lies in the plane of their surface 18. Thus, a relatively great change of the angles of the faces and of the apertures between adjacent bars is obtained in return for a very small adjustment of the movable segments 34. When the axis is located at midwidth of the faces 18, as shown, the opening action upon the fiber may be varied throughout a relatively great range without bringing the grid-bars into dangerous proximity to the path of rotation of the beater-blades, i. e., without bringing the grid-bars so near the blade in the attempt to increase the rake that there will be danger of the beater-blades striking the grid-bars as a result of vibration of the latter in the case of grid-bars of considerable length, with obvious severe damage and danger of fire. Where a wide range of adjustment of the working edges 20 toward and from the path of the beater-blades is desired, as in some instances, it is only necessary in forming the grid-bars to put the fins and consequently the axis of rotation of the grid-bars as close as possible to the heel 22, while still maintaining the axis in the plane of the working face 18, so as to get the maximum possible change of rake with a minimum angular rotation of the grid-bar about its axis. A further feature of both these arrangements is that owing to the advantageous rectangular relation existing between the effective length of the fin and the plane of the working face, which latter coincides with the end of the fin, the necessary angular movement of the outward end 29 of the fin around its axis in accomplishing the full range of adjustment of the grid-bars is so small that the fin does not appreciably lie over on its side at either end of its maximum adjustment, and therefore does not fail to fill the space between the opposing paired seats in the stationary and movable segments respectively even at the extremes of the adjustment, and hence the grid-bar is not allowed any substantial amount of play even in its extreme positions which would otherwise permit the grid-bar to vibrate in its seat under the action of the beater-blade when

travelling at high speed, and therefore the wear on the adjusting device is reduced to a minimum. The aforesaid curving of the slots 40 which guide the movable segments so that the opposing seats of a pair do not appreciably change their spaced relation assists in keeping the bars tight.

As a means of enabling the adjustment of the action of the grid-bars to be made conveniently with the requisite fineness of setting, and to maintain the adjustment after it has been made, a stud 50 is provided and fixed rigidly in each segmental plate 34. This stud extends transversely of the machine out through a hole 52 formed in the side-frame 4 upon which the segmental plate is mounted, the hole being of proper size and shape to permit change of position of the stud. To the outward side of the side-frame 4 is attached by screws 55 a block 56 having a central opening 58 within which stands the outwardly-extending portion of stud 50, and within threaded holes in opposite side-portions of such block are fitted adjusting screws 60 with lock-nuts 61. The inner ends of these screws bear against the opposite sides of the stud 50, and thus by obvious manipulation serve to push the stud in one direction or the other to adjust very accurately, the position of the movable segment 34 and hence the angular relation of the grid-bars to each other and to the path of the beater-blades, and to hold the parts in adjusted relation.

The described improved grid-bars and the arrangements for mounting and adjusting them afford little or no opportunity for the dirt or trash struck out from the cotton to lodge in bearings or other places, and therefore are free from the serious drawbacks of prior devices in that they cannot be fouled and put out of adjustment or rendered incapable of adjustment by reason of such accumulations; while the adjusting means is powerful enough, and has such advantageous leverage, as to make possible easy and accurate adjustment in the face of the greatest possible fouling which can conceivably occur from such source.

A decided advantage which results from the novel provision of adjusting means for the grid-bars which are accessible from outside the dead-air chamber 16 is that corrective changes or adjustments of the setting and action of the grid-bars may be made at any time during the operation of the machine. Need frequently arises to change the setting of the grid-bars, owing to the varying content of moisture or dirt or trash in cotton from succeeding lots or bales being run through the machine, or to observed improper action as noted from the condition of the output. Hitherto, it has been necessary to stop the whole machine to prevent the dirt and trash collected in the dead-air chamber or other dirt-chamber or enclosure from being blown out into the room, or sucked up through the grid-bars to reenter and foul the clean fibers, according to the peculiarities of the individual machine, when the door of this chamber was opened to allow the operator to get in and make the necessary changes in the grid-bar settings. Since the beaters themselves have had to be brought to rest from their very high speed of rotation, before the necessary adjustments could be made, and again accelerated up to their full working speed before the operation of the machine could be resumed, these adjustments have represented no small amount of loss of the machine's time and consequently of production. Through the provisions of the invention, as is obvious, this

loss is eliminated, and the necessary adjustments of the grid-bars may be made at any time without pause in the working of the machine.

What is claimed as the invention is:—

1. Beater-grid construction having in combination grid-bars each mounted for angular adjustment about an axis lying in the plane of the fiber-supporting face of the bar, and through which axial adjustment the working edges of the bars are adjusted toward and from the path of the beater-blades, seats engaged by the grid-bars along the axes of their rotation, and a movable segment engaging the grid-bars to rotate them into the desired angular position about their axes aforesaid.

2. Beater-grid construction having in combination grid-bars each mounted for angular adjustment about an axis lying in the plane of the fiber-supporting face of the bar, and through which axial adjustment the working edges of the bars are adjusted toward and from the path of the beater-blades, a fixed segment engaged by the grid-bars along the axes of their rotation, and a movable segment engaging the grid-bars to rotate them into the desired angular position about their axes aforesaid, and positioning means for the movable segment including screw-means exerting pressure thereagainst in the direction of movement of the movable segment.

3. Beater-grid construction having in combination a casing, grid-bars, fixed seats for the grid-bars, members engaging the grid-bars to hold them against the seats and movable to impart rocking movement to the grid-bars, and having portions extending to the exterior of the casing, and screw means at the exterior of the casing engaging such portions to change and fix the position of the movable members.

4. Beater-grid construction having in combination a casing, grid-bars, fixed seats for the grid-bars, segments holding the grid-bars in the seats and movable to impart rocking movement to the grid-bars, and having portions extending to the exterior of the casing, and screw-means upon the exterior of the casing engaging opposite surfaces upon such portions to move such portions and their connected segments in either direction to effect such rocking movement of the grid-bars, such screw-means serving to fix the movable segments and grid-bars, in adjusted position.

5. Beater-grid construction having in combination grid-bars mounted for angular adjustment about axes lying in the planes of their faces that are presented toward the beater, and through which angular adjustment the working edges of the bars are adjusted toward and from the path of the beater-blades, seats engaged by the grid-bars along the axes of their rotation, and movable segments engaging the grid-bars to position their working edges at different distances from the path of the beater-blades at different points in the circuit of the beater.

6. A grid-bar for fiber-cleaning machines having in combination a fiber-supporting face, a working edge, means defining an axis of rotation in the plane of such face and apart from the

working edge, and means for rotating the bar about such axis.

7. A grid-bar for fiber-cleaning machines having in combination a fiber-supporting face, a working edge, means defining an axis of rotation in the plane of such face and apart from the working edge, and means eccentric to such axis for rotating the bar about such axis.

8. A grid-bar for fiber-cleaning machines having in combination a fiber-supporting surface and a working edge in connection with such surface, means defining an axis of rotation in the plane of such surface and apart from the working edge, and means for supporting the bar, for imparting angular movement thereto about the axis, and for maintaining the angular position of the bar about its axis.

9. A grid-bar for fiber-cleaning machines having in combination a fiber-supporting face and a working edge, and a two-point bearing, one of such points lying in the plane of the face and out of line with the working edge, and the other point in spaced relation to the first whereby the bar may be turned about the first point as an axis.

10. A grid-bar for fiber-cleaning machines having in combination a fiber-contacting face, and a fin on the end of the bar adapted to serve as a two-point bearing, one end of such fin lying in the plane of the face and defining an axis of rotation in such plane, and the other end adapted to be moved with respect to the first end to impart angular movement to the bar about such axis.

11. Beater-grid construction having in combination grid-bars each having a fiber-supporting face, a two-point bearing-member on the end of each grid-bar, one of such points lying in the plane of the said face, seats engaged by the points thus lying in the said planes, and a movable segment engaging with the other points not lying in said planes, with the effective length of the bearing-member as defined by the line joining its said two points disposed at right angles to the said face.

12. A cotton cleaner having in combination a rotor, grid-bars having fiber-supporting faces and working edges, and each having an axis of rotation in the plane of its fiber-supporting face, and a single adjusting means adapted to adjust the opening between adjacent bars, the angle of the said faces with respect to the rotor, and the spaced relation of the working edges with respect to the rotor.

13. A cotton cleaner having in combination a frame, a rotor, a plurality of grid-bars each having a fiber-supporting face and a reduced terminal portion or fins substantially normal to the plane of such face, opposed guides having sockets to receive the opposite extremities of a fin of each bar, means for mounting one of the guides to permit swinging movements thereof, and means connected with the guide and mounted externally of the frame to swing the guide and thereby to rock the grid-bars.

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