GRID FOR CLEANING MACHINES

Fig. 1

Fig. 2

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ABSTRACT OF THE DISCLOSURE

The grid is made up of a number of equi-spaced grid bars each of which is provided with an adjustable fin on the downstream side. The fins are closely spaced to the beating circle substantially tangentially of the beating circle. The adjustability of the fins from the beating circle allows the grid bars to be retained at the optimum angle of incidence to the beating to eliminate the maximum of contaminants.

This invention relates to a grid for cleaning machines. More particularly, this invention relates to a grid for cotton fiber cleaning machines and, still more particularly, to a grid for removing short fibers, husk particles, etc.

Therefore, cleaning machines for cleaning cotton have utilized beatsers and closely spaced grids for removing waste material such as dust, husk particles and the like from the cotton. Generally, the grids have been formed by a number of grid bars or rakes of triangular shape which have been set so as to project one edge in close relation to the beating circle of the beater. Where an increase in the rate of elimination of the waste material has been desired, the angle of incidence of this leading edge of the grid bars relative to the beating circle has been increased. However, such increases in the angle of incidence has also inevitably resulted in an increase in the undesirable elimination of good fibers.

Accordingly, it is an object of the invention to remove a minimum of good fibers during a fiber cleaning process.

It is another object of the invention to position a grid bar at an optimum angle of incidence relative to a beating circle to remove a maximum of waste material while eliminating a minimum of good fibers.

Briefly, the invention provides a grid for a cleaning machine wherein the grid is formed by a plurality of grid bars or rakes which are each provided with a fin on the downstream side relative to the direction of travel of a beating mass. Each fin is arranged to be substantially tangential to the beating circle while being closely spaced to the beating circle. In addition, each fin is mounted on a grid bar in an adjustable manner relative to the beating circle so as to allow an adjustment to be made to obtain better stripping effects of the fibers sticking to the beater and to augment the stripping effect of consecutive grid bars.

The grid bars are mounted in spaced manner on a frame which is pivotally mounted below a beater so as to facilitate replacement of the beater.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 illustrates a diagrammatic section through a cleaning machine incorporating a grid according to the invention; and

FIG. 2 illustrates a view of a pair of grid bars of the grid of FIG. 1.

Referring to the drawings, the cleaning machine which is of known construction in general has a housing in which a beater 2 having saw tooth fittings 3 is mounted. A duct 4 is connected to the casing 1 to deliver roughly opened fiber materials through a pair of compactor rolls 5 and a pair of feed rolls 6 is a known manner.

A grid which is made up of equi-spaced grid bars or rakes 7 secured to a frame 12 is pivotally mounted on a hinge 11 below the beating circle 8 of the beater 2. The grid bars or rakes 7 are disposed about the beating circle 8 for about half the circumference while being closely spaced to the beating circle 8. Each grid bar or rake 7 has an edge 9 (FIG. 2) one surface of which forms an angle of incidence a to the radius R of the beater 2 of approximately 60° plus or minus 10°, that is, an angle from 50° to 70° while the other surface 10 of which forms an angle β to the tangent to the beating circle of from 0° to 2°.

A fin 14 of generally angled shape is adjustably mounted on each grid bar 7 and includes a control surface 15 which extends in a tangential direction close to the beating circle 8 while covering the beater 2 approximately one-half the distance between adjacent grid bars 7. A slot 16 is provided in one leg of the fins 14 to permit the fins 14 to be adjusted relative to the beating circle 8 in directions indicated by arrow 17 (FIG. 2), for example, into the position as shown in dotted line in FIG. 2.

By shifting the fins 14 into the dotted line position to increase the distance between the control surface 14 and the beating circle 8 of the beater 2, the fiber material is lifted from the covering of the beater 2 more strongly through more effective centrifugal forces and is beat against the next succeeding edge 9 more strongly. Thus, since the striking of the fiber material against the edges 9 of the grid bars 7 is directly affected by the distance of the fins 14 from the beating circle and, consequently, the degree of elimination of contaminants, the optimum found angle of incidence of the grid bars 7 with respect to the beating circle need not be changed.

The pivotal mounting of the grid allows tilting into the dotted line position shown in FIG. 1 so as to permit radial removal, for example, horizontally to the left as viewed, of the beater 2 through a suitable opening in the casing wall 13 in order to replace the beater 2 with another beater with, for example, new or different fittings.

A conduit plate 19 is positioned downstream of the last grid bar 18 in a course off the beater 2 to allow the fiber material on the beater 2 to peel off and be picked up by a tangential air flow in a channel 20 positioned substantially tangentially of the beater 2. The fiber material can then be conveyed to the following process step.

Having thus described the invention, it is not intended that it be so limited as changes may be readily made therein without departing from the scope of the invention. Accordingly, it is intended that the subject matter described above and shown in the drawings be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In combination with a beater of a cleaning machine defining a rotating beating circle; a grid including a plurality of grid bars disposed along said beating circle, each grid bar having an edge defined by two surfaces, one surface of which forms an angle of incidence to the radius of said beater and the other surface of which forms an angle to the tangent of said beating circle, and a plurality of fins, each of said fins being mounted on a respective grid bar on the downstream side thereof relative to the rotating beater and having a control surface thereon extending from said respective grid bar for controlling the lifting out of fiber material radially of said beating circle and extending across said grid bar and being disposed tangentially of said beating circle in close relation to said beating circle.
2. The combination as set forth in claim 1 wherein each said control surface extends over one-half the distance between adjacent grid bars.

3. The combination as set forth in claim 1 wherein said grid is pivotally mounted at one end below said beater for pivoting away from said beater whereby said beater can be removed past said grid in a radial direction from the cleaning machine.

4. In combination with a beater of a cleaning machine defining a rotating beating circle; a grid including a plurality of grid bars disposed along said beating circle, a plurality of fins, each of said fins being mounted on a respective grid bar on the downstream side thereof relative to the rotating beater and having a control surface thereon extending across said grid bar and being disposed tangentially of said beating circle in close relation to said beating circle, and means for adjustably mounting said fins on said grid bars to adjust the space between said control surface and said beating circle.

5. In combination with a beater of a cleaning machine defining a rotating beating circle; a grid including a plurality of grid bars disposed along said beating circle, each said grid bar having an edge adjacent said beating circle, said edge being formed by a first grid bar surface extending outwardly of said beating circle and in the direction of rotation of said beater at an angle of incidence with a radius of said beater of from 50° to 70°, the apex of said angle being approximately on said beating circle, and a second grid bar surface extending from said edge in the direction of rotation of said beater and disposed substantially tangentially of said beating circle, and a plurality of fins, each of said fins being mounted on a respective grid bar on the downstream side thereof relative to the rotating beater and having a control surface thereon extending across said grid bar and being disposed tangentially of said beating circle in close relation to said beating circle.

6. The combination as set forth in claim 5 wherein said angle of incidence is 60° and said second surface forms an angle with a tangent to said beating circle between 0° and 2°.

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