APPARATUS FOR REMOVING TRASH FROM CARDED FIBERS

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ABSTRACT

Apparatus for removing trash from carded fibers includes a plate portion conforming generally to card clothing on the main cylinder, means for positioning the plate portion in superposed spaced relation to the card clothing on the main cylinder between the means feeding fiber to the main cylinder and the doffer, and a passageway defined at least in part by the plate portion permitting removal of trash therethrough responsive to centrifugal force imparted to the trash by the main cylinder but retaining fibers for delivery to the doffer.

2 Claims, 3 Drawing Figures
APPARATUS FOR REMOVING TRASH FROM CARDED FIBERS

BACKGROUND OF THE INVENTION

Carding machines normally have a pair of plates positioned between the flats or other carding means and the doffer, such as a front top plate and a front door plate, both of which are fastened across the arches which support the main cylinder. The purpose of these plates is to confine the fibers acted upon by the main cylinder prior to delivery of the fibers to the doffer. The front door plate has pivoted means permitting removal thereof for ready access for inspection of the clothing on the main cylinder. Thus, the tendency has been to retain this front area of the main cylinder as closed as possible in order to confine the fibers and air currents occurring at that area adjacent the main cylinder. A tendency has been observed for short fibers and trash to accumulate and build up between the cylinder and the arches causing "choking." Use of the apparatus illustrated herein has been found to reduce any tendency toward choking, as well as "blow out" of fibers.

BRIEF DESCRIPTION OF THE INVENTION

It has been found that, by spacing the top front plate slightly below the carding means, a negative pressure may be created as may be overcome by the heavier trash particles permitting their removal therethrough by centrifugal force while the fibers are retained under the control of the main cylinder. Preferably, the leading edge of the plate adjacent the carding means is tapered or beveled to form a sharpened lower edge so as to provide an unobstructed path for ready removal of the trash. Also, preferably the top front plate is set closer to the main cylinder than is the carding means further accentuating the opening thus formed between the plate and the carding means for trash removal. Such a structure has particular utility when employed in conjunction with a stationary carding device, such as illustrated in U.S. Pat. Nos. 3,604,062 and 3,604,475. It has been further found that the front door plate may be spaced slightly beneath the top front plate creating an additional passageway for the removal of trash. Trash, as defined herein, is any undesirable material which is advantageously removed from the carded fibers and includes the coarse pepperlike material, such as leaf and hull particles, which occurs in cotton laps and webs, as well as fly and short fibers and the like. It has been found that the coarse particulate matter is largely removed by the first-mentioned opening between the top front plate and the carding means, while short dirty fibers, fly, some particulate matters and the like, are removed at the last-mentioned opening between the top front plate and the front door plate. Thus, it has been found desirable to remove the trash from the fibers after maximum opening thereof, as occurs after they have been subjected to a carding action as has occurred when the fibers are fed onto the main cylinder for further carding action between the main cylinder and carding means, and prior to transfer of the fibers to the doffing means. It is thought that the aforementioned passageway advantageously affects the air currents occurring during carding adjacent the main cylinder to assist in trash removal.

BRIEF DESCRIPTION OF THE DRAWING

The construction designed to carry out the invention will be hereinafter described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing forming a part thereof, wherein an example of the invention is shown and wherein

FIG. 1 is a perspective view illustrating a carding machine having apparatus for removing trash constructed in accordance with the present invention.

FIG. 2 is an enlarged longitudinal sectional elevation illustrating apparatus for removing trash constructed in accordance with the present invention, and

FIG. 3 is a longitudinal sectional elevation illustrating a modified form of the invention.

The drawing illustrates a carding machine having a main cylinder and carding means along a substantial portion of the main cylinder provided with card clothing in carding relation to card clothing on said main cylinder. Apparatus for removing trash from the carded fibers after being subjected to a carding action by the clothing of the main cylinder and the carding means prior to delivery of the carded fibers to a doffer includes a plate A having a portion conforming generally to the card clothing on the main cylinder. Means B position the plate in superposed spaced relation to the card clothing on the main cylinder between the carding means and the doffer. The plate defines a passageway C permitting removal of trash therethrough at least partially responsive to centrifugal force imparted to the trash by the main cylinder but retaining the fibers for delivery to the doffer. Thus, a substantial portion of the trash is removed while the cleansed fibers are retained for delivery by the main cylinder to the doffer.

DESCRIPTION OF A PREFERRED EMBODIMENT

The main cylinder 10 is illustrated as being carried between the usual arches 11. The main cylinder 10 has card clothing 12 thereon with teeth 13 pointing in the direction of rotation of the main cylinder, as illustrated by the arrow in FIG. 1. The fibers (not shown) being carded pass between the carding means broadly designated at 14 and the main cylinder from whence they are delivered to the doffer 15 which turns in the direction of the arrow illustrated in FIG. 1. The doffer 15 is provided with a cover 16 and a triangular shaped bar 17 is placed between the front door plate and the doffer cover for the purpose of sealing this area of the card against removal of fibers and confining air currents adjacent the main cylinder.

The front top plate A conforms generally to the card clothing on the main cylinder and is illustrated as being spaced beneath the carding means in the form of stationary carding plates broadly designated at 14. It has been found that a spacing of approximately one-eighth inch will produce satisfactory results. The plate A is beveled as at 18, and is preferably also tapered rearwardly as at 19 to join a thickened portion 20. It is thought to be significant that the plate is beveled adjacent a lower edge rearwardly to enlarge the effectiveness of the passageway adjacent thereto. It is, also, believe significant that the passageway be thus positioned adjacent the carding means, but it also appears that a passageway or a plurality of passageways may be advantageously positioned in the plate other than at a marginal edge or otherwise along the main cylinder be-
between the means feeding fibers to the main cylinder and the doffer.

It will be noted that the teeth 13 of the cylinder clothing are pointed in a direction opposed to the teeth 21 of the clothing 22 of the stationary plate 14. The stationary plate 14 may include clamping means 23 for fastening the clothing 22 upon the plate portion 24 as set forth in the aforesaid patents. The setting between the clothing of the stationary plate 14 and the clothing of the main cylinder is preferably about 0.050 inch, whereas, the portion of the plate A adjacent thereto is preferably set from about 0.017 to about 0.022 inch from the clothing of the main cylinder. The opposite edge of the plate 20 illustrated at 20a is set at about 0.050 inch.

Suitable means B positions the plate A in superposed spaced relation to the card clothing 12 on the main cylinder between the carding means 14 and the doffer 15. Such means includes the bolts illustrated at B which pass through the plate A and into respective arches 11. If desired, shims (not shown) may be utilized to vary the settings or additional bolts threaded into the plate and bearing against the arches, and the like, may be employed to achieve the desired settings.

It will be observed that the plate in part defines a passageway C permitting removal of trash therethrough at least partially responsive to centrifugal force imparted to the trash by the main cylinder but retaining the fibers for delivery to the doffer. It has been found that a negative pressure is created producing suction at the passageway. In other words, long fibers outside the plate A, if placed close to the passageway C, will be drawn in and become subject to the action of the main cylinder. This action explains, at least in part, the fact that a large amount of particulate trash is removed through such passageway as illustrated in FIG. 2, while the long fibers are retained subject to the action of the main cylinder.

In FIGS. 1 and 2 the front door plate is illustrated as assuming its customary configuration. The front door plate is carried by a bracket or forearm 25 which has pivotal connection as at 26 with a bracket 27 fixed with respect to the arches 11. It has been found that undesirable short fibers and additional particulate trash may be removed by providing an additional passageway 28, as illustrated in FIG. 3, between the leading edge of the front door plate and the trailing edge 20a of the top front plate. The passageway 28 is formed in part by a bevelled portion 29. A rearward tapered portion 30 extends to the full plate thickness as illustrated at 31. It has been found that a space of one-thirty-second to one-sixteenth inch between the leading edge of the front door plate and the trailing edge of the top front plate produce satisfactory results. A setting of 0.017 inch at the leading edge has proved satisfactory with 0.027 inch in the medial portion of the plate.

If desired the trash thus removed may be collected by suitable suction nozzle (not shown). Special nozzles may be constructed for this purpose or existing removal devices may be adapted to serve the purpose.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. In a carding machine having a main cylinder, means feeding fibers to said main cylinder, and stationary plate means carried in superposed fixed spaced relation to the card clothing on the main cylinder having card clothing in carding relation to card clothing on the main cylinder, apparatus for removing trash from carded fibers prior to delivery of the carded fibers to a doffer comprising:

A. a plate portion conforming generally to the card clothing on the main cylinder;

B. means positioning said plate portion in superposed fixed spaced relation to the card clothing on the main cylinder;

C. an edge of the plate portion beveled rearwardly and upwardly forming a sharpened lower edge facing in a direction opposite to the direction of rotation of the main cylinder;

D. said stationary plate means having an edge opposite said sharpened lower edge;

E. means positioning said sharpened lower edge below said opposite edge and in spaced relation thereto; and

F. said sharpened lower edge and said opposite edge defining a passageway permitting removal of trash therethrough at least partially responsive to centrifugal force imparted to the trash by the main cylinder but retaining the fibers for delivery to the doffer;

whereby a substantial portion of the trash is removed while fibers are retained for delivery by the main cylinder to the doffer.

2. The structure set forth in claim 1 wherein a plurality of plate portions having sharpened edges are carried in superposed spaced relation to the card clothing on the main cylinder each sharpened edge defining together with an opposite edge of a plate portion a passageway for removal of trash.

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