CLEARERBOARD FOR DRAWING ROLLERS OF TEXTILE MACHINES

Fig. 1

Fig. 2

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Fig. 3

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The present invention relates to clearerboards for drawing rollers of textile machines and more particularly to pivotally oscillating underclearerboards having curved front and back edges for use on drawing frames having metallic fluted rollers.

In the operation of certain textile machinery such as drawing frames, roving frames, spinning frames and the like, the sliver, roving or yarn passes between rollers which incidentally pick up and accumulate lint, loose fiber and waste from the sliver or flax or from other sources. This accumulation forms laps on the rollers, a portion of which eventually passes back into the sliver, roving or yarn causing slubs or other undesirable irregularities in the finished yarn. This is especially true when slivers, which are relatively close and contain a large amount of lint, fiber and waste, pass over the metallic fluted bottom rollers of conventional drawing frames.

Clearerboards have been devised to operate in contact with the rollers of drawing frames in order to remove the lint and fibers and thereby lessen the accumulation on the rollers and prevent return of slubs or masses of lint and fiber into the sliver. There are several types of clearerboards presently in commercial use. Probably the most common of these is a felt covered flat rectangular board which is reciprocated back and forth in line with the advancing sliver and with the felt or other lint gathering material in contact with the rollers. This clearerboard has not proven completely satisfactory in that rows of lint and loose fibers called “eyebrows” form on the clearerboards and occasionally are picked up by the rollers and passed back into the sliver.

The present invention provides an improved clearerboard which not only clears lint and loose fiber from the rollers but does so with a reduction in the return of accumulated lint and fiber to the rollers. The present invention contemplates the use of a flat clearerboard mounted on a central pivot post with its top surface in contact with the rollers and it pivotally oscillates in a plane parallel to the plane of the rollers by a linkage driven from an oscillating shaft such as the knock-off shaft of a conventional drawing frame. The board has a concave back edge and a convex front edge which reduce overlap of the board beyond the adjacent rollers and therefore reduce the formation of rows of lint and fiber commonly called “eyebrows.” The pivotally oscillatable underclearerboard also is characterized by a reduction of the formation of masses of lint and fiber commonly called “rat tails” or “rat nests” which are prevalent on stationary underclearerboards.

Thus the present invention provides an improved underclearerboard mechanism which evenly gathers lint and fiber from the rollers and greatly reduces the formation of “eyebrows,” “rat nests” and “rat tails” on the clearerboard, thereby reducing the occurrence of pick-up and return of lint and fiber by the rollers to the sliver. The pivot oscillation not only provides more effective clearing, but results in a simple and inexpensive construction, since a single pivot post may be used to mount the underclearerboard and no complex sliding mechanism must be provided as is required in the back and forth reciprocation of conventional underclearerboards.

Further, the construction is simply and inexpensively attached to an existing drawing frame or other textile machinery.

Other and further features and advantages of the present invention will be apparent from the following description and drawings, in which:

FIG. 1 is a vertical sectional view of a drawing frame including a clearerboard construction illustrating the preferred embodiment of the present invention;

FIG. 2 is a top plan view of only the clearerboard and driving mechanism of FIG. 1 with the rollers shown in dotted lines; and

FIG. 3 is a bottom plan view of the elements of FIG. 2 illustrating the position of farthest movement of the clearerboard in one direction in solid lines and the position of farthest movement in the opposite direction in dash-dot lines.

Referring now to the drawings, the preferred embodiment of the present invention will be described in detail.

The drawing frame itself is generally indicated and includes a beam member 12 extending across the frame and a pair of spaced roller stands 14 extending upwardly from the beam member 12 for support of rollers 16. The stands 14 include bearings and gearing for the mounting and driving of the rollers 16. The bearings and gearing may be of any conventional construction and, therefore, are not illustrated in the present drawings. The rollers 16 include a series of fixed bottom rollers 18, 20, 22 and 24 which are driven by the gearing at progressively greater speeds from the slower back roller 24, to the faster front roller 18. These rollers 18, 20, 22 and 24 are metallic and are formed with longitudinal flutes 26 therein to facilitate the grasping and moving forward of a sliver. Top rollers 28 are mounted in bearings in the stands 14 in vertical alignment with their respective bottom rollers and vertically movable to accommodate passage of a sliver between the top and bottom rollers. The top rollers 28 are free rollers, being rotated by the rotation of the bottom rollers and the movement of the sliver.

Also extending from the frame is a shaft mounting 30 for mounting a small drive shaft 32 which in conventional drawing frames is the knock-off shaft oscillating in conjunction with a drawing mechanism or other machinery so that when the other machinery stops, the knock-off shaft, through proper linkage, will stop operation of the drawing frame 10. Fixedly mounted on the shaft 32 is a sleeve 34 which oscillates with the shaft. A connecting arm 36 has one end 38 pivotally attached to the sleeve 34 and has its other end 40 pivotally secured to a top clearerboard 42 which rests on the top rollers 28 and reciprocates back and forth to clear lint and loose fiber from the top rollers.

The construction which has been explained above is conventional in the textile machinery field and has been included herein to exemplify the type of machinery to which the apparatus of the present invention is adaptable. The scope of the present invention is directed to the underclearerboard and its driving mechanism, which will presently be described.

An underclearerboard 44 of flat construction with a lint gathering top surface 46 such as felt or napped wool, is mounted subjacent the bottom rollers 18, 20, 22 and 24 on a pivot post 48. This post 48 is secured to the frame beam 12 and extends vertically into a centrally located hole 50 in the underclearerboard 44. The lower end 52 of the pivot post 48 extends through a hole 54 in the frame beam 12 and is threaded so that it can be adjustably secured thereto by lock nuts 56 and 58 on either side of the beam 12. In order to mount the top surface 46 of the clearerboard 44 in contact with the bottom rollers 18, 20, 22 and 24 and to apply pressure to the clearerboard for proper clearing of the bottom rollers, a coil spring
is mounted concentric with the pivot post 48 and is biased between the lock nut 56 adjacent the top of the beam 12 and a washer 62 adjacent the clearerboard 44. Thus, the spring 60 normally urges the clearerboard 44 upwardly so that the top surface 46 thereof is in clearing contact with the fluted bottom rollers 18, 20, 22 and 24. The mounting of the clearerboard 44 on the central pivot post 48 permits pivotal movement of the clearerboard.

In order to impart pivotal oscillation to the clearerboard 44, a driving mechanism 64 is provided which drivingly links the clearerboard 44 to the knock-off shaft 32. This mechanism 64 consists of a bracket 66 secured as by bolts 68 to one corner of the clearerboard 44. This bracket 68 is L-shaped and is attached to the side 70 and bottom 72 of the clearerboard. A mounting lug 74 extends to the side of the bracket 66 and forms a mounting for one end 76 of the connecting arm 78. The other end 80 of the connecting arm 78 is pivoted on a mounting lug 82 extending from an arm 84 of a sleeve 86 fixed on the knock-off shaft 32 for oscillation there-with. Thus, the oscillation of the shaft 32 is transferred by the driving mechanism 64 into pivotal oscillation of the underclearerboard 44 in a plane parallel to the axes of the rollers 18, 20, 22 and 24.

As is apparent from the drawing, the back edge 88 of the underclearerboard 44 is convexly curved and is positioned adjacent the rear bottom roller 24. This convexity is such that when the underclearerboard is oscillated, the back edge 88 will at no point extend a substantial distance beyond the back roller 24. Thus the build up of lint and fiber in rows or "eyebrows" on the overlapping portion of the underclearerboard is prevented. Conversely, the front edge 90 is positioned adjacent the front bottom roller 18 and is concavely curved with straight end portions to similarly reduce build up of lint and fiber. It has been found by experiment that when an underclearer approximately 10" wide using a 22 ounce napped wool top surface is attached to a conventional drawing frame having 13/4" diameter bottom rollers, optimum results are obtained by reciprocating the underclearer approximately 70 strokes per minute with a 3/4 inch to one inch reciprocating stroke. The optimum curvature for both front and back edges has been found to be a concave curve which is offset 3/4" at the center.

While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and has herein been described in detail one specific embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

We claim:

1. A clearerboard for use on drawing frames having top and bottom rollers comprising a board supporting member on said drawing frame, a clearerboard pivotally supported on said board supporting member below the bottom rollers of the drawing frame, said clearerboard having a top surface adjacent said bottom rollers, resilient means urging said clearerboard upward into engagement with the rollers, and oscillating means for oscillating said clearerboard for pivotal movement about an axis substantially perpendicular to the plane of the axes of said bottom rollers.

2. A clearerboard for use on drawing frames having top and bottom rollers comprising a board supporting member on said drawing frame, a clearerboard pivotally supported on said board supporting member below the bottom rollers of the drawing frame, said clearerboard having a top surface adjacent said bottom rollers and a convex back edge, resilient means urging said clearerboard upward into engagement with the bottom rollers, and oscillating means for oscillating said clearerboard for pivotal movement about an axis substantially perpendicular to the plane of the axes of said bottom rollers.

3. A clearerboard for use on drawing frame rollers comprising a pivot post on said drawing frame below said rollers and extending substantially perpendicular to the plane of the axes of the rollers, a clearerboard pivotally mounted on said pivot post said clearerboard having a top surface adjacent said rollers with a convex back edge and a concave front edge, resilient means urging said clearerboard upward into engagement with the rollers, and oscillating means for oscillating said clearerboard about said post in a plane substantially parallel with the axes of said rollers.

4. A clearerboard for use on drawing frame rollers comprising a pivot post on said drawing frame below said rollers and extending substantially perpendicular to the plane of the axes of the rollers, a clearerboard pivotally mounted on said pivot post, said clearerboard having a top surface adjacent said rollers with a convex back edge and a concave front edge, resilient means urging said clearerboard upward into engagement with the rollers, and oscillating means for oscillating said clearerboard about said post in a plane substantially parallel with the axes of said rollers.

5. A clearerboard for use on drawing frame rollers comprising a pivot post on said drawing frame below said rollers and extending substantially perpendicular to the plane of the axes of the rollers, a clearerboard pivotally mounted on said pivot post, said clearerboard having a top surface adjacent said rollers with a convex back edge and a concave front edge, resilient means urging said clearerboard upward into engagement with the rollers, and oscillating means for oscillating said clearerboard about said post in a plane substantially parallel with the axes of said rollers.

6. A clearerboard for use on drawing frame rollers comprising a pivot post on said drawing frame below said rollers and extending substantially perpendicular to the plane of the axes of the rollers, a clearerboard pivotally mounted on said pivot post, said clearerboard having a top surface adjacent said rollers, resilient means urging said clearerboard upward into engagement with the rollers, an oscillating shaft mounted on said drawing frame and drive linkage interconnecting said clearerboard and said shaft to transmit oscillation of said shaft into oscillation of said clearerboard in a plane substantially parallel with the axes of said rollers.

7. A clearerboard for use on drawing frame rollers comprising a pivot post on said drawing frame below said rollers and extending substantially perpendicular to the plane of the axes of the rollers, a clearerboard pivotally mounted on said pivot post, said clearerboard having a top surface adjacent said rollers with a convex back edge and a concave front edge, resilient means urging said clearerboard upward into engagement with the rollers, an oscillating shaft mounted on said drawing frame, and drive linkage interconnecting said clearerboard and said shaft to transmit oscillation of said shaft into oscillation of said clearerboard in a plane substantially parallel with the axes of said rollers.

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