

Oct. 24, 1967

R. B. JENKINS, SR

3,348,268

SCREEN FOR CARDING MACHINES

Filed Sept. 6, 1966

6 Sheets-Sheet 1

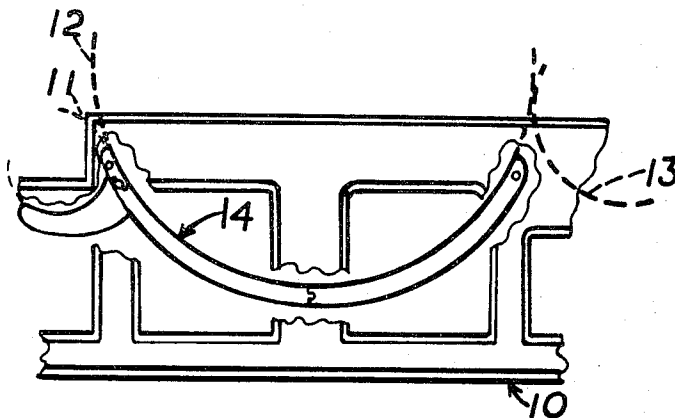


Fig-1

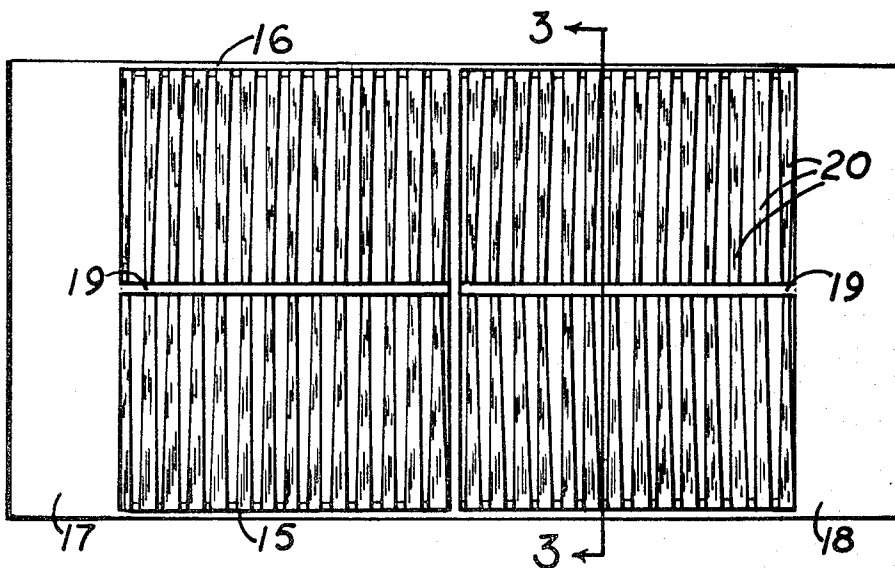


Fig-2

INVENTOR
ROBERT B. JENKINS, Sr.

BY *Clifton T. Hunt, Jr.*

ATTORNEY

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R. B. JENKINS, SR

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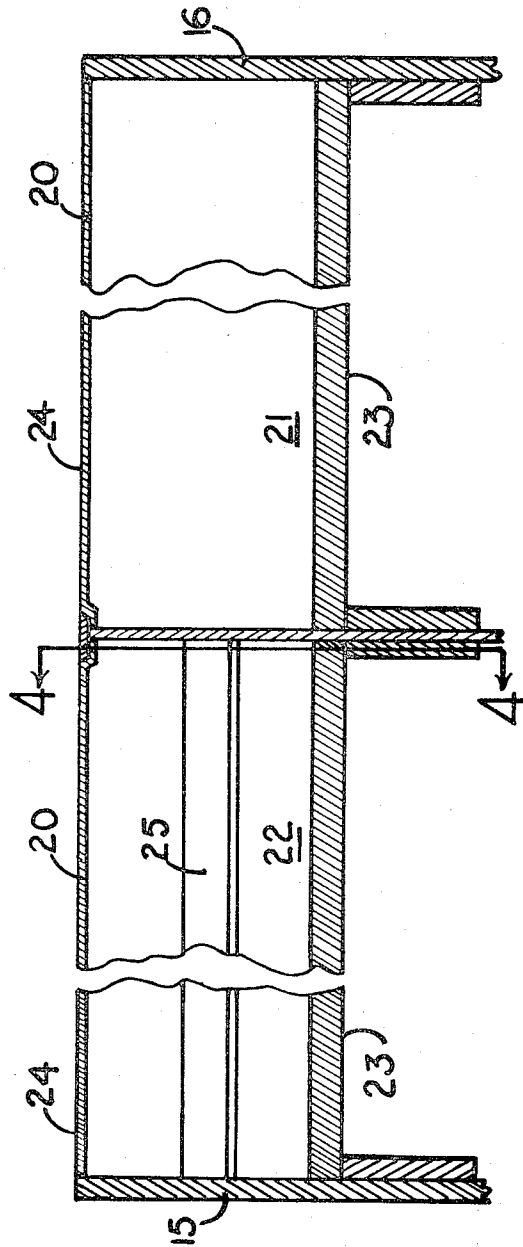


FIG - 3

INVENTOR
ROBERT B. JENKINS, Sr.

BY *Clifton T. Hunt, Jr.*

ATTORNEY

Oct. 24, 1967

R. B. JENKINS, SR

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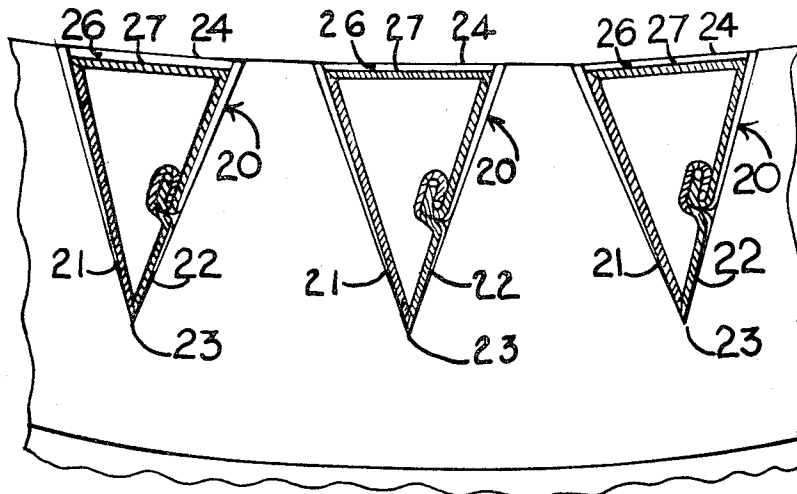


Fig-4

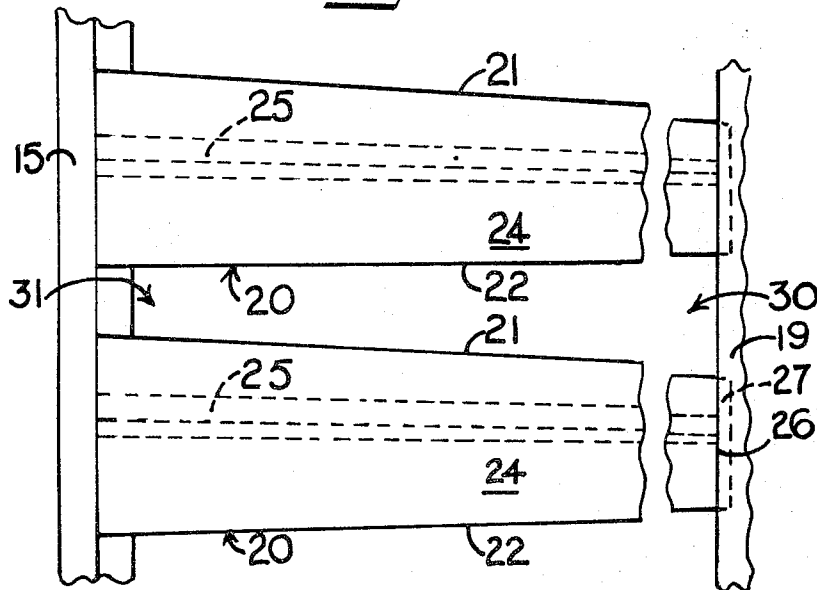


Fig-5

INVENTOR
ROBERT B. JENKINS, Sr.

BY *Clifton T. Hunt, Jr.*

ATTORNEY

Oct. 24, 1967

R. B. JENKINS, SR

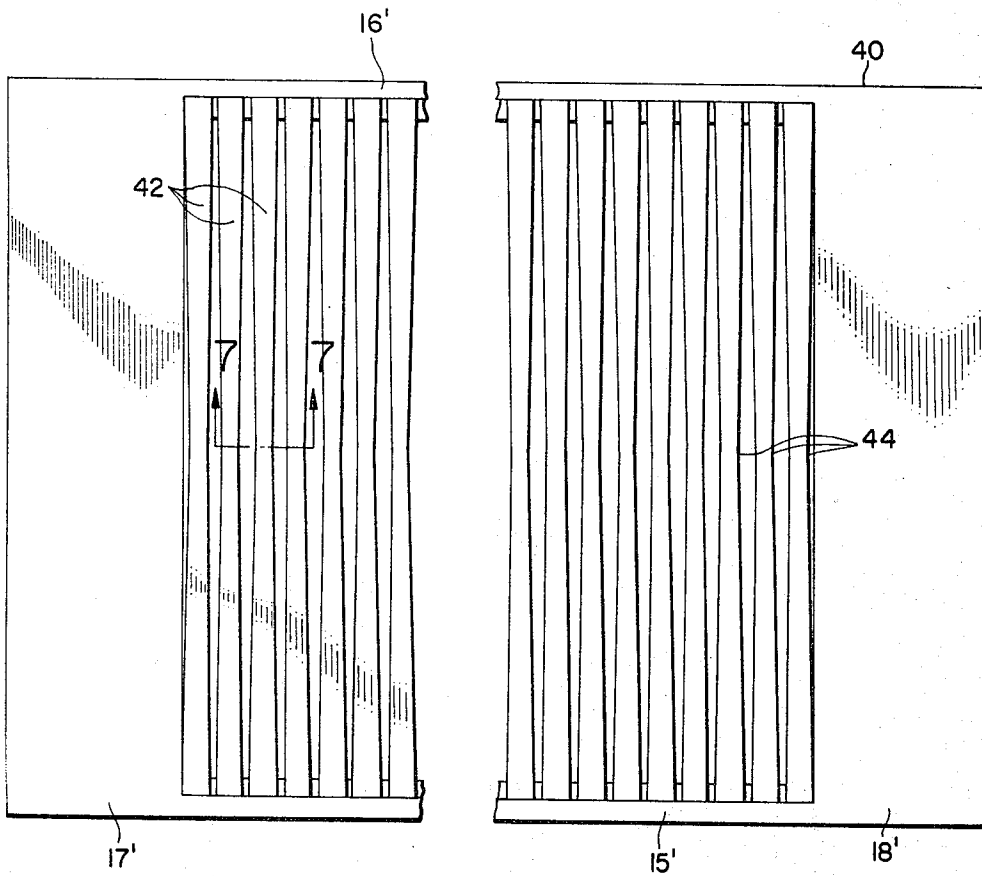
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FIG. 6



INVENTOR
ROBERT B. JENKINS, Sr

BY *Clifton T. Hunt, Jr.*

ATTORNEY

Oct. 24, 1967

R. B. JENKINS, SR

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FIG. 7

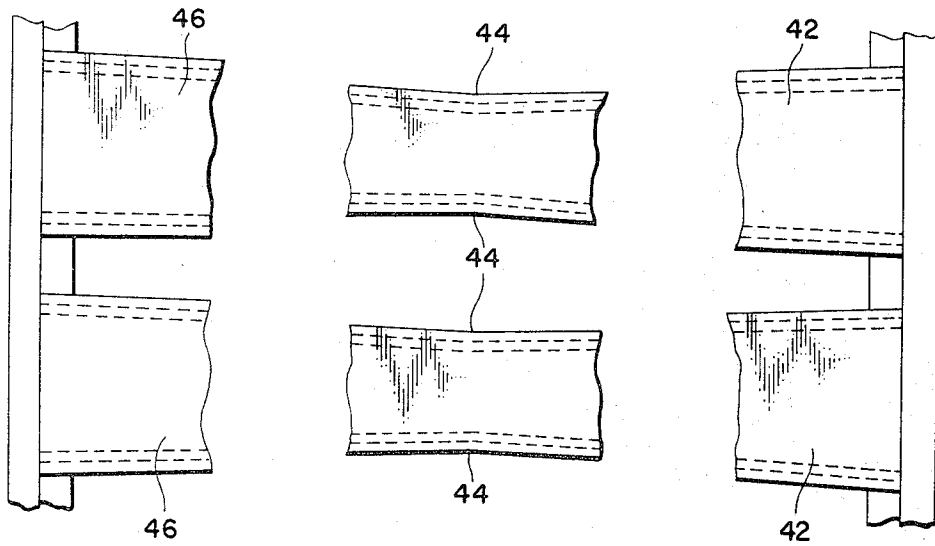
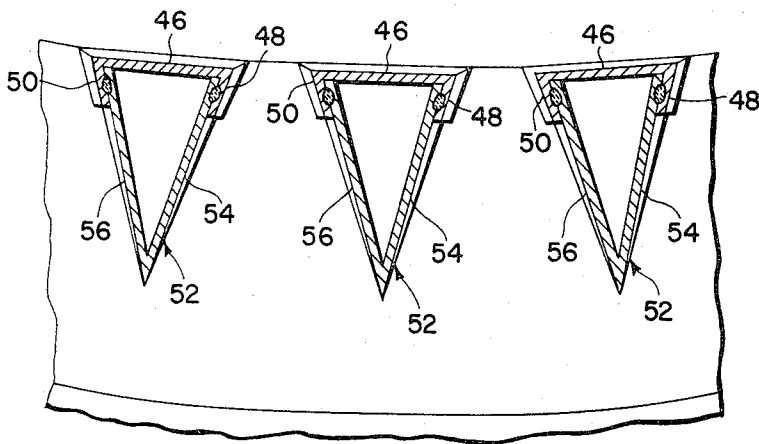


FIG. 8

INVENTOR
ROBERT B. JENKINS, SR

BY *Clifton T. Hunt, Jr.*

ATTORNEY

Oct. 24, 1967

R. B. JENKINS, SR

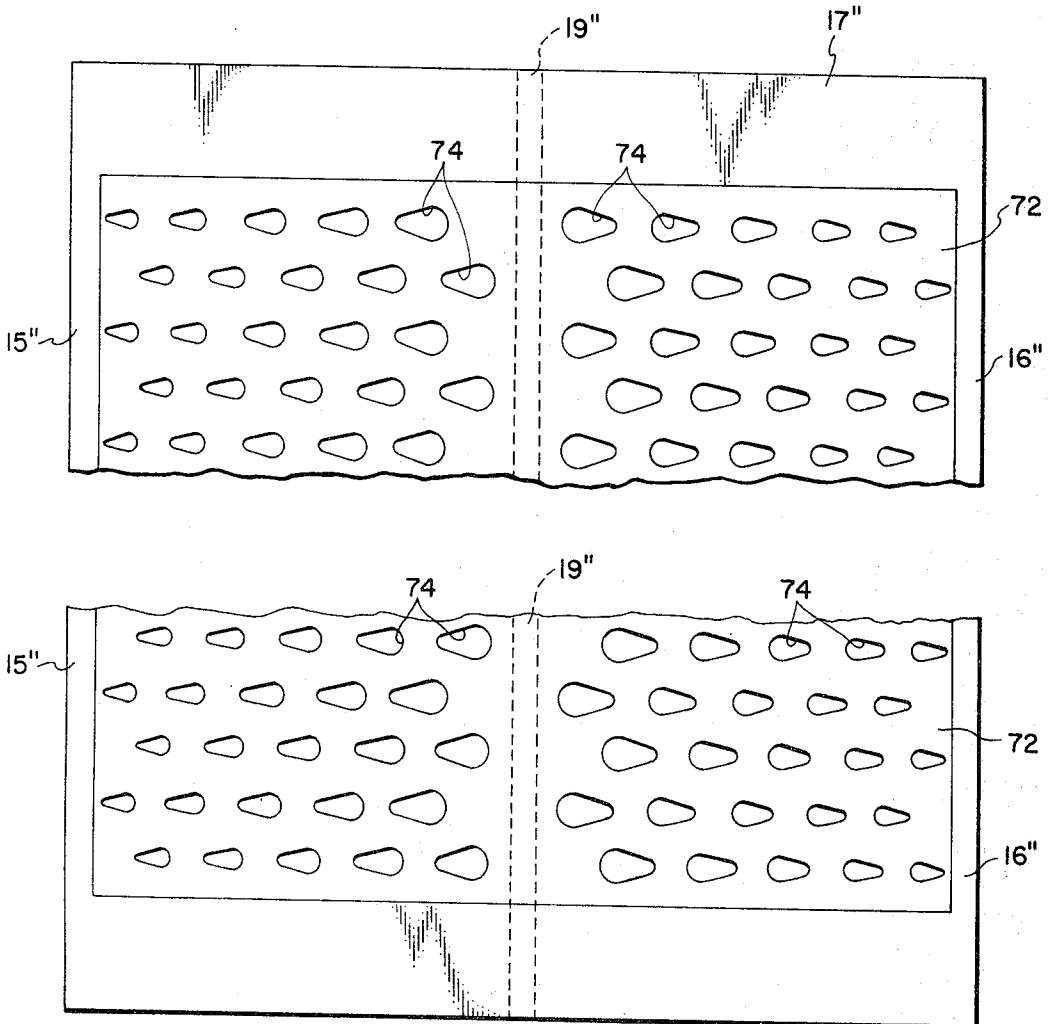
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FIG. 9



INVENTOR
ROBERT B. JENKINS, Sr.

BY *Clifford T. Hunt, Jr.*

ATTORNEY

1

3,348,268

SCREEN FOR CARDING MACHINES

Robert B. Jenkins, Sr., Gastonia, N.C., assignor to R. B. Jenkins & Co., Inc., Gastonia, N.C., a corporation of North Carolina

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8 Claims. (Cl. 19—95)

ABSTRACT OF THE DISCLOSURE

This invention relates to carding machines and more particularly to an improved screen for such machines which includes a channeling means for directing more of the air currents carrying dust and lint through the central area of the screen than through the edges of said screen.

This is a continuation-in-part of application Ser. No. 403,468 filed Oct. 13, 1964, now abandoned.

Conventional screens for carding machines comprise a plurality of transversely extending bars arranged in parallel relation to one another about the lower periphery of the main cylinder of the carding machine. The spacing of the screen from the main cylinder varies depending upon the type and quality of fiber being processed. During the carding operation, some of the fibers, lint and foreign matter from the web are carried by the main cylinder across the proximal surface of the screen, and air currents created through rotation of the main cylinder cause at least a portion of such lint and foreign matter to pass between the bars defining the screen. Such lint and foreign matter accumulate beneath and about the frame of the carding machine from whence it is subsequently collected.

In recent times the speed at which the cylinders of the carding machine are driven have increased to such an extent that the air currents created through rotation of the main cylinder tend to move transversely of the conventional screen or along the length of the bars, carrying lint and foreign matter laterally or transversely of the card from whence it is dispersed throughout the room rather than permitting it to fall through the screen and accumulate beneath the card as in the past. The lateral displacement of the lint causes it to settle on the frame of the card and on surrounding machinery creating a safety and fire hazard and also endangering the quality of the material being processed on the carding machine.

It is an object of this invention to provide a card screen that induces the air currents created through rotation of the main cylinder in high-speed carding to pass through the screen beneath the main cylinder carrying the lint and foreign matter beneath the card from whence it may be easily collected, rather than dissipating such lint laterally of the card as has heretofore been experienced in high-speed carding with conventional screens.

It is a more specific object of this invention to so configure the screen that a larger space is provided adjacent the midpoint of the main cylinder than is provided at the ends of the cylinder. According to the disclosed embodiments of the invention, this may be accomplished by tapering the bars of the screen inwardly toward their midpoints from their outer ends, or by providing a perforated screen having larger perforations adjacent the midpoint of the cylinder, as will be more fully described in connection with the accompanying drawings, in which:

FIGURE 1 is a fragmentary side view of a carding machine with parts broken away and showing the relation of the screen to the main cylinder;

FIGURE 2 is a top plan view of the screen removed from the carding machine;

FIGURE 3 is a transverse sectional view through the

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screen taken substantially along the line 3—3 in FIGURE 2 and showing a pair of axially aligned bars, with parts broken away, extending between the ends of the main cylinder;

5 FIGURE 4 is an enlarged sectional view looking from the center of the screen toward one side and taken substantially along the line 4—4 in FIGURE 3;

10 FIGURE 5 is an enlarged fragmentary top plan view of the screen, with parts broken away, showing adjacent bars tapering inwardly toward the center rib and defining a larger air space between the bars at the center rib than at the side of the screen;

15 FIGURE 6 is a top plan view, with parts broken away, of a first modified form of screen removed from a carding machine;

FIGURE 7 is an enlarged sectional view taken substantially along line 7—7 in FIGURE 6;

20 FIGURE 8 is an enlarged fragmentary top plan view of the screen of FIGURE 6, with parts broken away, showing adjacent bars tapering inwardly toward a point between the ends of the bars; and

FIGURE 9 is a fragmentary top plan view of a second modified form of screen removed from a carding machine.

25 Referring more specifically to the drawings, as best shown in FIGURE 1, the numeral 10 broadly indicates a side frame of a carding machine, so much only of the framework of the carding machine being shown as will be necessary to illustrate the essential features of the invention. The lickering, main cylinder and doffer are indicated at 11, 12 and 13, respectively. The main cylinder screen is broadly indicated at 14. The screen, as best shown in FIGURE 2, includes side frame members 15 and 16 and transverse end frame members 17 and 18 between which extends a longitudinal central rib 19.

30 A plurality of longitudinally spaced bars 20 extend transversely from the side frame members 15 and 16 to the central rib 19. The bars 20 may be of any desired cross-sectional configuration but in the embodiment illustrated, they are triangular in cross-section as best shown in FIGURE 4 and include opposed sides 21 and 22 which merge to define a pointed edge 23. The third side or face 24 of each bar 20 is opposite the pointed edge 23 and is desirably spaced from the main cylinder to separate foreign matter, lint, and the like from the fibers remaining on the cylinders during the carding operation. As illustrated in FIGURE 3, the side 22 of each bar 20 may include a seam 25 by means of which opposed ends of the blank from which the bar is formed are secured together. In FIGURE 5, the inner end of the side 24 of each bar 20 is shaped to define a shoulder as at 26 from which a flange or lip 27 extends for engagement with the longitudinal center rib 19 at the center of the screen.

35 In conventional screens, the bars 20 are of uniform dimension throughout their length and extend in uniformly spaced parallel relation to each other transversely of the screen to define a space of approximately three-sixteenths of an inch between adjacent bars. This distance may be varied as desired.

40 The structure of the frame member thus far described is conventional and it is with a structure of this type that the invention is adapted to be used. The frame of the screen may be like that shown, for example, in U.S. Patent No. 488,684 to Whittle, and any desired number of sections may be used in the screen. The bars or plates 45 may be welded or otherwise fastened to the frame.

40 The invention resides in providing means for decreasing the amount of air obstructing material at the center of the screen relative to the amount present at the sides of the screen. One means of accomplishing this is shown in FIGURES 2—5, where each of the bars 20 is tapered from its outer end portion inwardly toward its respective

lip or flange 27 which engages the center rib 19 as shown in FIGURE 5 and defining air obstructing elements. Each bar is thus of greater cross-sectional dimension at its outer end portion than at its juncture with the center rib 19. More specifically, in the illustrated embodiment, the face defined by the side 24 of each bar is tapered so that it is wider adjacent its outer end than adjacent the lip 27 at its inner end. Thus, the sides 21 and 22 converge toward the lip 27 in each of the bars 20.

The bars are equally spaced from each other when assembled in the frame of the screen and each bar is uniformly tapered in the manner described. Consequently, the bars in the assembled screen define relatively large spaces 30 adjacent the center rib 19 as compared with a relatively small space 31 between adjacent bars at the sides of the screen.

By way of example and not as a limitation, the outer ends of the bars 20 may be spaced apart a distance of approximately three-sixteenths of an inch and the face 24 of each bar may be uniformly tapered inwardly from a width of one-half inch at its outer end to a width of seven-sixteenths of an inch at its inner end, thereby defining a space of five-sixteenths of an inch between the inner ends of adjacent bars at their juncture with the center rib 19. As will be apparent to those skilled in the art, the foregoing dimensions are illustrative only and may be varied as desired within the spirit of the invention.

An alternative embodiment is shown in FIGURES 6-8. There is shown a screen 40 having a frame with sides and end portions like those in the form of invention illustrated in FIGURES 2-5 and bearing the same reference characters with the prime notation added, no further description of the frame being deemed necessary. However, in the embodiment shown in FIGURES 6-8, the center rib member 19 of the first form of the invention is eliminated and the bars 42 are continuous and extend the full distance between the side members 15' and 16'. The bars 42 are tapered inwardly from their outer end portions toward a point 44 intermediate the ends of the bars and approximately midway between the side frame members 15', 16'.

The bars 42 themselves may be of any desired configuration, a specific illustration being shown in FIGURE 7. There, the bars 42 are shown as triangular in cross-section and formed from two separate blanks of sheet material. The upper member 46 is formed in an inverted U-shaped configuration having depending and slightly converging legs 48 and 50. The lower member 52 is V-shaped and comprises upwardly diverging legs 54 and 56 engaged between the converging legs 48, 50 of the upper U-shaped member 46. The seam may be suitably fastened as by tack welding or spot welding.

As shown in FIGURE 8 the upper U-shaped member 46 forms the face of the bar and is tapered inwardly from each end toward the intermediate point 44, thereby providing a wider air space between the intermediate portions 44 of adjacent bars 42 than between the ends of the bars. The specific distances and dimensions described in connection with the first form of the invention are equally applicable here.

Turning now to the form of invention shown in FIGURE 9, the screen includes a frame like that described in connection with the first form of the invention and like parts bear like reference characters with a double prime notation added. A perforated plate 72 is positioned in the area defined by the sides 15'' and 16'' and ends 17'', 18''. Plate 72 has rows of tear-shaped perforations 74 so arranged that the perforations 74 in each row are staggered relative to the perforations in adjacent rows. As shown in FIGURE 9, the larger rounded end portion of each perforation extends toward the longitudinal axis of the frame. Also, the area of the slots is greater adjacent the longitudinal axis of the screen than at the sides, the slots gradually diminishing in size as they approach the sides of the screen.

When properly positioned beneath the main cylinder of a carding machine in a conventional and well known manner, any desired embodiment of the improved screen of this invention induces the air currents created by rotation of the main cylinder during the carding operation to be channeled through the enlarged central open areas of the screen. Consequently, lint and other foreign matter is carried through the enlarged openings at the center of the screen and is deposited beneath the frame of the card in a central location where it may be easily removed rather than being dispersed throughout the room by the lateral displacement of the air as has heretofore been experienced in high-speed carding operations.

There is thus provided an improved card screen by means of which lint and foreign matter is more efficiently removed and is more readily accumulated in a central location beneath the card for easy removal than has heretofore been possible.

In the drawings and specification there have been set forth preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A carding machine screen comprising:

(a) a frame including opposed side and end members and a center rib extending between the end members in parallel relation to the side members,

(b) a plurality of bars each having a face and extending along spaced axes parallel to each other and to the end members between the center rib and each side member, and

(c) the face on each bar being narrower at the center rib than at its respective side member to define outwardly converging air spaces between adjacent bars.

2. A structure according to claim 1 wherein the face on each bar is about one-sixteenth of an inch narrower at the center rib than at its side member.

3. A structure according to claim 1 wherein the faces of adjacent bars are spaced apart at their respective side members about three-sixteenths of an inch and about five-sixteenths of an inch at the center rib.

4. A screen for carding machines having a main cylinder, said screen comprising:

(a) a frame having a pair of parallel side members spaced axially from each other,

(b) a plurality of bars extending inwardly from each side member toward the other side member,

(c) means extending between the end members and parallel to the side members supporting the bars extending from each side member, and

(d) at least some adjacent bars tapering inwardly from one of the side members toward the other side member to a point between said side members.

5. A screen for carding machines having a main cylinder, said screen comprising:

(a) a frame having a pair of parallel side members spaced axially from each other,

(b) a plurality of bars each having a face and extending along spaced axes parallel to each other from each side member toward the other side member,

(c) means extending between the end members and parallel to the side members supporting the bars extending from each side member, and

(d) the faces on at least some adjacent bars being narrower between the side members than at their respective side members.

6. A screen for carding machines having a main rotating cylinder which creates air currents that strike said screen, said screen comprising:

(a) a frame having a longitudinal axis and including a pair of longitudinally extending parallel side members spaced from each other and on opposite sides of said longitudinal axis; and

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- (b) channeling means extending between said side members channeling more of said air currents through said screen intermediate said side members than at said side members, said channeling means comprising a plurality of air obstructing elements, each element having a face, the faces of said air obstructing elements being narrower adjacent said longitudinal axis than adjacent said side members. 5
7. A screen according to claim 6 in which said channeling means comprises: 10
- (a) a plurality of bars extending transversely of said frame between said side members,
- (b) at least some adjacent bars tapering inwardly from the extremities of said bars to a point intermediate the extremities of said bars, so that the distance between adjacent bars at the intermediate position is greater than at the extremities of the bars. 15
8. A screen according to claim 7 in which:

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- (a) said bars are tubular and triangular in cross-section,
- (b) said tubular and triangular bars being formed of an upper inverted U-shaped member and a lower V-shaped member,
- (c) the upper portions of the legs on the V-shaped member fitting between the downwardly directed legs of the upper inverted U-shaped member in overlapping relation, and
- (d) means securing the overlapping legs together.

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DORSEY NEWTON, *Primary Examiner.*