Oct. 30, 1956 R. C. FERGASON 2,768,494

COTTON PICKER SLAT

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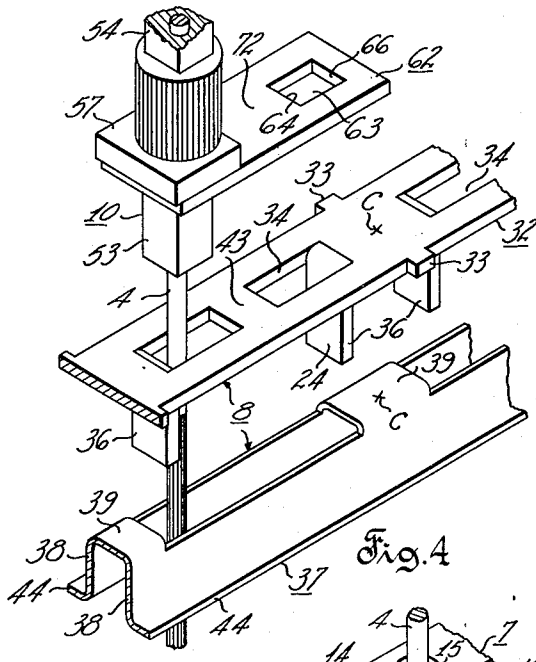


Fig. 4

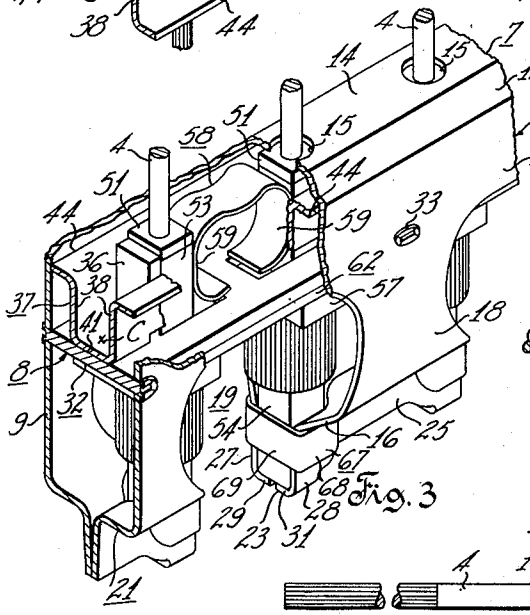


Fig. 3

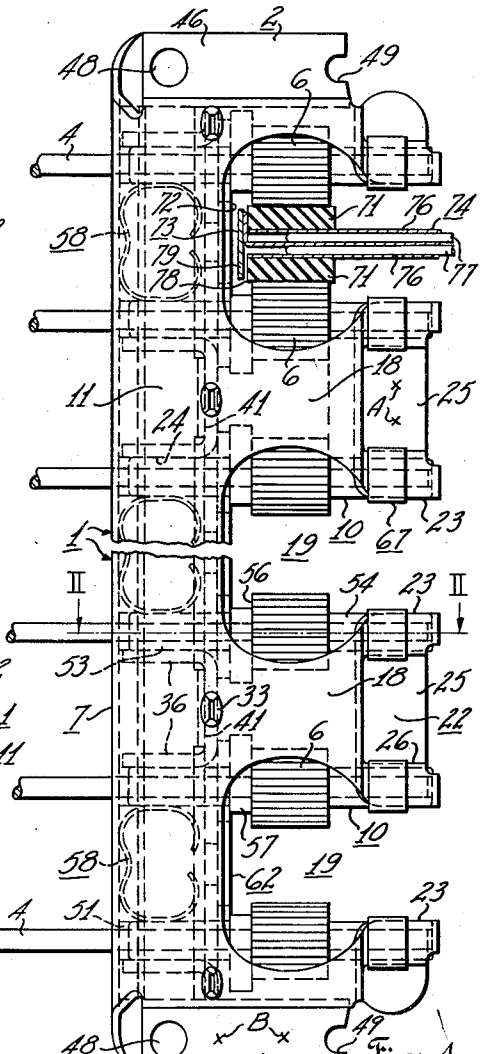


Fig. 1

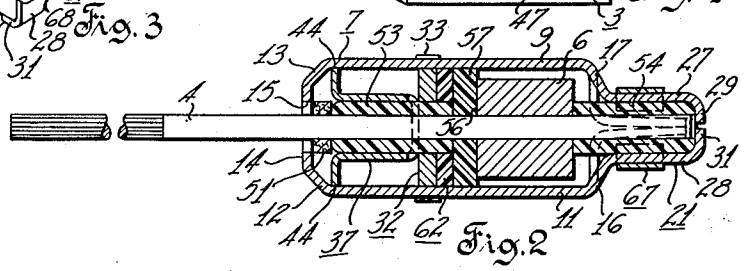


Fig. 2

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COTTON PICKER SLAT

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13 Claims. (Cl. 56—42)

This invention relates to cotton harvesting machines, and it is concerned more particularly with a picking mechanism of the type wherein a series of vertical slats are moved in endless succession about a horizontal oblong path and wherein each of such slats carries a vertical row of horizontally extending rotary picking spindles.

My U. S. Patent No. 2,671,298, dated March 9, 1954, discloses a cotton picking machine of the hereinabove outlined character, and it should be understood that in a machine of that type the slats, the spindles and the bearings by means of which the spindles are mounted on the slats are normally subjected to varying stress and wear conditions. Such conditions may be caused, for example, by the type of cotton being picked, and by the presence of dust and by other injurious foreign material such as stones and the like which sometimes enter the picking mechanism. When picking in areas of heavy yield cotton a large number of bolls are gathered on the spindles of each slat and severe bending stress is encountered by the slats when they pass through the stationary stripper assembly. The stripper removes the cotton by a push-off action longitudinally of the spindle, and an axial pull on each spindle of more than a hundred pounds is not uncommon. It will be appreciated that under such load conditions a slat having sixteen spindles, for example, will be subject to an extremely heavy bending stress. It is desirable then that the slat structure which is supported at its opposite ends must be adequately reinforced to resist bending or warpage induced by these forces.

Another load condition which is caused by the stripping operation and which must be taken care of properly is the transfer of axial pull from the spindle to the slat structure. Should the axial spindle load be concentrated for example, on the spindle mounting bearings, severe and abnormal wear of the bearing and slat structure at the point of mounting will take place due to the hammering action resulting from the axial pull exerted by the stripper. The slat structure, in order to function properly, should therefore be relieved from objectionable concentrations of the axial spindle loads.

At times during the picking operation foreign objects such as stones and the like enter between the picking spindles and, as a result, the spindles may become damaged by bending or breakage. In order to overcome this difficulty it is desirable to provide some floating in the spindle mounting which will lessen the shock of impact loading transversely of the spindles and let the spindles yield slightly under radial loads, particularly in a vertical direction.

In operation the picking unit frequently encounters sand, grit or other abrasive substances which reduce the wearing life of the spindle bearings. Another desirable feature to be incorporated in the slat, therefore, is that the slat should afford protection to the spindle bearings against the adverse effects of these foreign materials.

The spindles and bearings in the slats are active elements during the picking operation, and they are the

parts of the machine most likely to be damaged or worn. It is further desirable, therefore, that in addition to above described desirable features the slat be constructed so as to afford easy and individual removal and replacement of the worn spindles and bearings.

Therefore, the present invention has for its principal object the provision of a slat structure in which reinforcing and spindle bearing mounting provisions are combined to satisfy the hereinabove outlined requirements.

More specifically, it is an object of the invention to provide an improved spindle and bearing mounting which will be effective to transmit stripper induced axial pull uniformly to the slat structure.

A further object of the invention is to provide an improved bearing mounting and slat reinforcing asembly by means of which slat warpage is reduced to a minimum and which provides a bearing mounting which positively mounts the bearings to limit displacement laterally of the slat structure and which is adaptable to provide for floating mounting of the bearings in a vertical direction.

A still further object of the present invention is to provide an improved slat reinforcing assembly of the hereinabove outlined character which will effectively coact with other elements of the slat assembly to afford individual insertion or removal of spindles and/or bearings in a simple, convenient manner.

The foregoing and other objects and advantages are attained by the present invention, various novel features of which will become apparent from the description herein and accompanying drawings disclosing a preferred embodiment of the invention, and will be set forth in the appended claims.

Referring to the drawings:

Fig. 1 is a fragmentary side elevation of a spindle carrying slat structure in association with parts of a spindle drive track assembly broken away and shown in section;

Fig. 2 is an enlarged sectional view along the line II—II of Fig. 1;

Fig. 3 is a perspective view of a segment of the slat structure shown in Fig. 1, with some parts broken away and shown in section; and

Fig. 4 is a perspective, exploded view of some of the parts shown in Fig. 3, the parts shown in Fig. 4 being inverted relative to the corresponding parts shown in Fig. 3.

Referring to Fig. 1, the reference character 1 designates generally a slat and spindle assembly which may be equipped at its upper and lower ends 2 and 3 with hinges (not shown) for pivotal connection to vertically spaced upper and lower slat carrying chains (not shown) in a conventional manner. In accordance with well known principles, these chains are drivingly mounted in a cotton picking unit for travel in a horizontal, oblong path and carry the associated slat and spindle assemblies 1 through a picking zone or tunnel (not shown). While passing through the tunnel the picking spindle rods 4 are caused to rotate by the frictional engagement of their enlarged drive portions 6 with spindle drive tracks 71 (Fig. 1) of conventional construction. Further details of construction and operation of a cotton picking unit of the type above described may be obtained by reference to my hereinbefore mentioned U. S. Patent No. 2,671,298.

The slat and spindle assembly 1 comprises a shell structure 7, a reinforcing member or subassembly 8 comprising a spindle bearing guide structure 37 and a stiffening member 32 (Fig. 4) and a series of spindle and bearing assemblies 10.

Referring to Figs. 1 and 2, the slat shell 7 has a body portion of rectangular cross section formed by a pair of elongated coextensive side wall members 9 and 11, an outer wall 14 and an inner wall structure 21. The side

walls 9 and 11 have outer edge portions 12 and 13 formed integral with outer wall 14. Outer wall 14, as shown in Fig. 3, has a longitudinally spaced series of spindle receiving openings 15 therethrough. It will be understood that the term outer as applied to various structure derives its significance from the orientation of the slat structure in an operative position in which the spindles 4 and outer wall 14 face toward the outside of the picking unit. The side walls 9 and 11 have a transversely aligned longitudinally spaced series of peninsular portions 18 which define a series of embrasures 19, the inner edge portions 16 and 17 of side walls 9 and 11 being thereby segmented.

Inner wall structure 21 completes the slat shell 7 by connecting inner edge portions 16 and 17 and includes a spaced series of wall segments 22 fixedly uniting the inner edge portions 16 and 17 of each peninsular portion 18. Each segment 22 comprises a web 25 which is formed by portions of side walls 9 and 11 which are bent toward each other and thereby placed in face to face engagement. The relatively abutting walls of web 25 are secured together as by spot welding at points A. Each segment 22 further comprises a pair of inner spindle bearing mounting pockets 23 formed by bending of laterally opposite end portions of web 25 to form side walls 27 and 28 of the pocket 23. Referring to Figs. 1 and 3, it will be apparent that the pockets 23 at longitudinally opposite sides of the embrasure 19, have open sides facing toward each other. The closed side of each pocket 23 opposite to its open side is formed by portions of web 25 bent at right angles to side walls 9 and 11 and forms a bearing seat or wall 26. The innermost end of the bearing pocket 23 is formed by two bent over tab projections 29 and 31 of pocket walls 27 and 28.

The upper and lower ends 2 and 3 of slat shell 7 (Fig. 1) present hinge mounting flanges 46 and 47 which are formed by bending side wall 11 at a right angle toward side wall 9 and again bending wall 11 at a right angle so that both side walls are placed in face to face engagement. The side walls are fixedly secured together as by spot welding at points B. Flanges 46 and 47 are provided with a mounting stud 48 and an open ended slot 49 which cooperate with hinge elements (not shown) pivotally mounted on the slat carrying chains (not shown).

The slat reinforcing member or subassembly 8 (Figs. 3 and 4) includes an elongated stiffening member or reinforcing strip 32 which is fixedly mounted between side walls 9 and 11 interjacent outer wall 14 and inner wall 21. Strip 32 presents rivet elements 33 which pass through corresponding apertures in side walls 9 and 11 and which are secured as by peening to insure a permanent fit. Strip 32 is provided with a longitudinally extending series of spaced rectangular bearing slots 34 (Fig. 4) therethrough which are formed by striking out and bending over a tab or abutment means 36 at right angles to the plane of strip 32. It will be noted (Fig. 4) that the slots 34 are formed in pairs, with abutment surfaces of pairs of struck out tabs 36 spaced from each other and interjacent successive pairs of bearing slots 34.

The subassembly 8 further includes a bearing guide or mounting structure 37, best shown in Fig. 4, which is formed by a pair of relatively spaced guide rails 38 fixedly united by spaced bridge members 39. As indicated in Fig. 4, the bearing guide structure 37 and strip 32 are placed into cooperative engagement with each other with bridge members 39 positioned between abutment means 36 and bearing in face to face engagement upon surface 41 (Fig. 3) of reinforcing strip 32. The bearing guide structure 37 and the strip 32 are fixedly secured together as by a spot weld at point C between each bridge member 39 and adjacent surface 41 to form the completed subassembly 8. In its installed position in the slat shell as seen in Figs. 2 and 4, the bearing guide structure 37 is mounted between the side walls 9 and 11 and interjacent the outer wall 14 and reinforcing strip 32.

The guide rails 38 (Fig. 4) are of identical L-shape in cross sectional configuration, and present edges 44 (Fig. 2), respectively, in abutting relation to the inner surfaces of side walls 9 and 11. The transverse spacing of the guide rails from each other affords a bearing receiving space between successive bridge members 39 and accommodates abutment means 36 (Fig. 4) which extend therebetween. It will be apparent that the subassembly 8 serves to reinforce the slat shell 7 not only against bending but also against twisting, and that the abutment means 36 aid in this function by snugly contacting the inner surfaces of rails 38 thereby preventing them from flexing inward due to bending or twisting loads applied to the slat.

The slat reinforcing subassembly, when fixedly mounted in the slat structure extends longitudinally from upper end 2 (Fig. 1) to lower end 3. The pairs of bearing slots 34 open into the embrasures 19 and are in transverse alignment with the spindle openings 15 (Fig. 3) in outer wall 14 and with the inner bearing pockets 23. The abutment tabs 36, extending at right angles to strip 32, are mounted interjacent successive pairs of bearings slots 34 and present a surface 24 (Figs. 1 and 4) in transverse alignment with bearing seat or wall 26.

The spindle and bearing assemblies 10, which may be individually inserted into or removed from the assembled shell and reinforcing structure, are best shown in Fig. 4. The assembly 10 includes a spindle rod 4; an enlarged drive portion 6 positioned intermediate the ends of rod 4, and having an axial end face 56 (Figs. 2 and 4); a thrust transmitting element in the form of a rectangular washer 57 encircling rod 4 and abutting end face 56; outer and inner bearing bushings 53 and 54, respectively, slidable over opposite ends of rod 4, with bearing 53 abutting thrust transmitting element 57; and a dust seal in the form of a square felt washer 51 (Fig. 3) slidable over spindle rod 4 and positioned in overlying relation to spindle admitting opening 15 and abutting outer bearing bushing 53. The outer and inner bearing bushings 53 and 54 are identical in construction, each being square in cross section and having a cylindrical opening through the length thereof substantially equal to the diameter of the spindle rod 4. The cross sectional width of each bearing is substantially equal to the width of the inner bearing pockets 23, the width of the bearing space defined by guide rails 38, and to the width of bearing slots 34 in reinforcing strip 32.

The spindle and bearing assembly further includes a rub strip or member 62 best shown in Fig. 4. Rub strip 62 is generally rectangular in shape and has a width substantially equal to that of the reinforcing or stiffening strip 32. The rub strip 62 slidably engages the reinforcing strip 32 between peninsular portions 18, and the length of the strip 62 is such that it overlaps the pair of bearing slots 34 which are provided next to each other in strip 32 at each embrasure 19. Each member 62 has a pair of elongated bearing hatches 63 therethrough, the hatches 63 being shorter in length than the bearing slots 34, but longer than the cross sectional widths of the bearing bushings 53. Each hatch 63 has an internal edge 64 and a terminal edge 66, and the span from the terminal edge 66 of one hatch to the terminal edge 66 of the other hatch in the same rub strip 62 is substantially equal to the distance between the abutment tabs 36 of the associated pair of bearing slots 34. It will be understood that the sliding relation between rub strip 62 and reinforcing strip 32 affords only back and forth longitudinal movement of the reinforcing strip 32 as the side walls 9 and 11 limit any lateral displacement.

Before inserting the spindle assembly into the slat, resilient means in the form of a C-shaped spring clip 58 is inserted through one of a pair of relatively adjacent bearing slots 34 and positioned as shown in Fig. 3, between opposed abutment tabs 36. Spring clip 58 has identical spring leg portions 59 which face opposed abut-

jacent said outer wall and stiffening member; spaced abutment means mounted on one of said members and positioned between said bearing guides and interjacent successive pairs of said slots; resilient means positioned between said abutment means; and spindle bearing bushings mounted between said resilient and abutment means, said bushings being engaged by said resilient means and urged by the latter into engagement with said abutment means.

3. A spindle slat for cotton pickers comprising, in combination, a shell structure having spaced side wall members connected by an inner wall and an outer wall having longitudinally spaced spindle admitting openings therethrough; an elongated stiffening member extending longitudinally of and fixedly positioned between said side walls and having a series of longitudinally spaced slots therethrough in opposed relation to said spindle admitting openings in said outer wall; bearing guides fixedly mounted between said side walls and interjacent said outer wall and stiffening member so as to define bearing receiving spaces between said guides in communication with said slots; spaced abutment means mounted on one of said members and positioned between said bearing guides interjacent successive pairs of said slots; spring clips positioned, respectively, in said bearing receiving spaces; and spindle bearing bushings mounted between said resilient and abutment means, said bushings engaged by said spring clips and urged by the latter into engagement with said abutment means.

4. In a spindle carrying slat for cotton pickers, the combination of a shell structure having spaced side walls connected by an outer wall and an inner wall; stiffening means extending longitudinally of said slat between said side walls; a plurality of picking spindle rods; a bearing bushing on each of said spindle rods; means individually mounting said bearing bushings between said side walls and interjacent said outer wall and stiffening means; and enlarged drive portions fixedly mounted on said spindle rods and having axial end surfaces, respectively, operatively disposed in thrust transmitting relation to said stiffening means, so that thrust induced axially of said spindle rod is transmitted through said drive portion to said stiffening means independently of said bearing bushing.

5. In a spindle carrying slat for cotton pickers, the combination of a shell structure having an outer wall, a segmented inner wall and spaced side walls, said side walls having aligned embrasures therethrough between segments of said inner wall; stiffening means extending longitudinally of said slat between said side walls and interjacent said outer and inner walls; individual inner and outer spindle bearing bushings; means mounting said outer bearing bushings between said side walls interjacent said outer wall and stiffening means; means mounting said inner bearing bushings in said inner wall segments in alignment with said outer bearing bushings; picking spindle rods rotatably mounted, respectively, in aligned pairs of said outer and inner bearing bushings; enlarged drive portions fixedly mounted, respectively, on said spindle rods intermediate said inner bearing bushings and stiffening means; and a thrust transmitting element positioned in abutting relation between said stiffening means and each of said drive portions, so that thrust forces induced axially of said spindle rods are transmitted to said stiffening means independently of said outer bearing bushings.

6. In a spindle carrying slat for cotton pickers, the combination of a shell structure having spaced side wall members connected by an inner wall and an outer wall having longitudinally spaced spindle admitting openings; a stiffening member extending longitudinally of said slat between said side walls and having slots therethrough in opposed relation to said spindle admitting openings in said outer wall; spaced abutment means mounted on one of said members and positioned between said side wall members interjacent successive pairs of said slots; resilient means positioned between said abutment means; individual spindle bearing bushings mounted between said resilient and abutment means, said bushings being engaged by said resilient means and urged by the latter into engagement with said abutment means; picking spindle rods rotatably mounted, respectively, in said bearing bushings; and enlarged drive portions fixedly mounted, respectively, on said spindle rods and each having an axial end face disposed in thrust transmitting relation to said stiffening means, so that thrust forces induced axially of said spindle rods are transmitted through said drive portions to said stiffening means independently of said bearing bushings.

7. In a spindle carrying slat for cotton pickers, the combination of a shell structure including an outer wall having spaced spindle admitting openings, a segmented inner wall, and spaced side walls having aligned embrasures therethrough between segments of said inner walls; a stiffening member fixedly positioned between said side walls interjacent said outer and inner walls and having a series of longitudinally spaced slots therethrough in opposed relation to said spindle admitting openings; bearing guides fixedly mounted between said side walls interjacent said outer wall and stiffening means so as to define bearing receiving spaces in communication with said slots; abutment means mounted on said stiffening member and extending into said spaces between said bearing guides interjacent successive pairs of said slots; resilient means having arms within said spaces; individual spindle bearing bushings positioned, respectively, in said bearing receiving spaces and engaged by said arms so as to be urged by said resilient means into engagement with said abutment means; spindle rods rotatably mounted, respectively, in said bearing bushings; and an enlarged drive portion fixedly mounted on each of said spindle rods and having an axial end face disposed in thrust transmitting relation to said stiffening means so that thrust forces induced axially of said spindle rods are transmitted through said drive portion to said stiffening means independently of said bearing bushings.

8. In a spindle carrying slat for cotton pickers, the combination of a shell structure comprising an outer wall having spaced spindle admitting openings, a segmented inner wall, and spaced side walls having aligned embrasures therethrough between segments of said inner wall; a stiffening member fixedly positioned between said side walls interjacent said outer and inner walls and having a series of longitudinally spaced slots therethrough in opposed relation to said spindle admitting openings; bearing guides fixedly mounted between said side walls interjacent said outer wall and said stiffening means so as to define bearing receiving spaces in communication, respectively, with said slots; abutment means mounted on said stiffening member and extending into said spaces between said bearing guides interjacent successive pairs of said slots; resilient means having spaced arms within said spaces; pairs of outer and inner spindle bearing bushings, said outer bearing bushings being positioned in said bearing receiving spaces, respectively, and engaged by said arms so as to be urged by said resilient means into engagement with said abutment means; means mounting said inner bearing bushings in said inner wall segments in alignment with said outer bearing bushings; picking spindle rods rotatably mounted, respectively, in aligned pairs of outer and inner bearing bushings; enlarged drive portions fixedly mounted, respectively, on said rods intermediate said inner bearing bushings and stiffening member; and a thrust transmitting element positioned in abutting relation between said stiffening member and said drive portions so that thrust forces induced axially of said spindle rods are transmitted through said drive portion to said stiffening means independently of said outer bearing bushings.

9. In a spindle carrying slat for cotton pickers, the

ment tab 36. The width of the spring clip 58 is such that when installed, working clearance exists between it and the relatively spaced guide rails 38. After spring clip 58 is in place the rub strip 62 is placed on the reinforcing strip 32 with the hatches 63 in general registry with the bearing slots 34.

As best shown in Fig. 1, each embrasure 19 affords clearance for the insertion of a pair of spindle assemblies 10. The assembly takes place in the following manner after spring clip 58 and rub strip 62 are positioned as described above. The first spindle assembly is positioned at an angle and spindle rod 4 is passed through hatch 63 in rub strip 62, bearing slot 34, past spring leg 59 and through spindle opening 15. Axial movement of the inclined spindle rod through opening 15 is continued until outer bearing bushing 53 enters into hatch 63 of rub strip 62. Subsequent entry of bushing 53 into slot 34 places hatch 63 in installing alignment with slot 34 and causes bushing 53 to engage one leg 59 of spring clip 58 which tends to urge bearing bushing 53 into engagement with abutment means 36. The spindle and bearing assembly, aided by spring clip 58 is then manipulated to swing inner bearing 54 into inner bearing pocket 23. This places outer bearing 53 in face to face engagement with abutment tab 36 and places rub strip member 62 in condition to adjust itself longitudinally until internal edge 64 of hatch 63 contacts a side of outer bearing bushing 53. The companion spindle and bearing assembly is inserted into the slat structure in a manner similar to the insertion of the first assembly. As bearing bushing 53 of the companion assembly encounters rub strip 62 it shifts the same toward the adjacent installed assembly thus placing the second bearing hatch 63 in installing alignment with slot 34. The companion spindle and outer bearing bushing are moved into place and then swung as described in respect to the first assembly until inner bearing 54 is seated in its respective bearing pocket 23.

As the companion assembly is swung into place the outer bearing bushing thereof contacts terminal edge 66 of hatch 63 and slides rub strip 62 into operative position, (Fig. 1) wherein strip 62 is maintained against further back and forth longitudinal movement by the contact of each terminal edge 66 with sides of outer bearing bushings 53. That is, as the spindle assemblies of each pair are successively inserted into the slat structure between peninsular portions 18 the rub strip 62 shifts longitudinally to place first one hatch 63 and then the other in installing alignment; thereby causing the outer bearing bushings to contact terminal edges 66 and to lock strip 62 in operative position. When the assemblies are in operative position the thrust transmitting element 57 abuts the axial end face 56 of the drive portion 6 and also the rub strip 62. It is readily apparent from Fig. 1, that any pull axially of spindle rod 4 will be distributed through drive portion 6, thrust transmitting element 57, and rub strip 62 to the reinforcing strip 32 and shell structure 7. Thus, no objectionable axial load is placed on the outer bearing bushing 53.

Upon the insertion of a spindle and bearing assembly in the described manner a spring clip 67 (Fig. 3) of C-shape is slipped over the inner bearing pocket 23. Clip 67 is provided with leg portions 68 which project from a base part 69 and pass along the sides 27 and 28 of bearing pocket 23 to hook around the seat or wall 26. The base part 69 bridges the open side of pocket 23 and insures that the spindle assembly will not pivot bearing 54 out of its operative position.

In operation, the spindle drive rollers 6 are rotated by engagement with spindle drive assemblies 74 one of which is shown in operative position in Fig. 1. The drive assembly includes a pair of backing plates 76, a pair of drive tracks 71 mounted hereon, a pair of spring arms 77 positioned between the backing plates, and a T-strip 73. In operation, the head 79 of T-strip 73 frequently engages the midportion or wear surface 72 of rub strip 62. The T-strip 73 prevents the slats from contacting the outer edge 78 of drive tracks 71, and the contact between head 79 and strip 62 aids in maintaining the slat at right angles to the picking tunnel as the slat passes therethrough.

From the above it is readily apparent that the contact area between the head 79 and the rub strip 62 should be as large as possible. The midportion 43 (Fig. 4) of the reinforcing strip is of a width that is considerably less than that of the head 79 due to the need for clearance in inserting the spindle assemblies. However, it will be noted that the midportion 72 of strip 62 is considerably wider than the head 79 of T-strip 73 thereby presenting an adequate wear surface. This enlarged wear surface 72 is made possible by the sliding relation between rub strip 62 and reinforcing strip 32 which provides the necessary installing clearance without making the hatches 63 as long as the bearing slots 34. Thus the configuration of rub strip 62 permits individual replacement of spindle and bearing assemblies and also provides the maximum wear surface for contact with head 79. Should the rub strip 62 wear out it can readily be replaced by removal and reinstallation of the associated pair of spindle and bearing assemblies.

The spring clip 58, best shown in Fig. 3, permits each spindle rod 4 and outer bearing 53 to float in one vertical direction within the limit defined by the spindle opening 15 through which the rod 4 passes. This arrangement not only serves to minimize bending and breakage of spindles from impact loads, but it also permits the outer bearing bushing 53 to align with the spindle rod when it flexes from a straight line position. This results in reduced wear of the outer bearing bushing and spindle for the flexing stress is not concentrated at the outer edge of the bearing bushing 53 as would be the case if the bearing were rigidly mounted. The dust seal 51, which surrounds the spindle rod at a point just inside the outer wall 14, serves to close spindle opening 15 so as to protect the outer bearing bushing 53 from the ingress of dust and dirt. As this seal is made of oiled felt or similar material it does not interfere with the flexing of the spindle rod in response to load conditions.

It is to be understood that it is not desired to limit the invention to the particular features and details described hereinabove, and that the invention is to be considered as including such other forms and modifications as are fairly embraced by the scope of the appended claims.

It is claimed and desired to secure by Letters Patent:

1. A spindle slat for cotton pickers comprising, in combination, a shell structure having spaced side wall members connected by an inner wall and an outer wall having longitudinally spaced spindle admitting openings therethrough; a reinforcing member extending longitudinally of said slat between said side walls and having slots therethrough in opposed relation to said spindle admitting openings in said outer wall; spaced abutment means mounted on one of said members and positioned between said side wall members interjacent successive pairs of said slots; resilient means positioned between said abutment means; and spindle bearing bushings mounted between said resilient and abutment means, said bushings being engaged by said resilient means and urged by the latter into engagement with said abutment means.

2. A spindle slat for cotton pickers comprising, in combination, a shell structure having spaced side wall members connected by an inner wall and an outer wall having longitudinally spaced spindle admitting openings therethrough; a stiffening member extending longitudinally of said slat between said side walls and having slots therethrough in opposed relation to said spindle admitting openings in said outer wall; relatively spaced bearing guides mounted between said side walls and inter-

combination of a shell structure comprising an outer wall having spaced spindle admitting openings, a segmented inner wall, and spaced side walls having aligned embrasures therethrough between segments of said inner wall; a stiffening member extending longitudinally of said slat between said side walls and having slots therethrough in opposed relation to said spindle admitting openings; spaced abutment means mounted on said stiffening member between said side walls interjacent successive pairs of said slots; resilient means positioned between said abutment means; pairs of individual outer and inner spindle bearing bushings, said outer bushings being positioned between said side walls and engaged by said resilient means so as to be urged by said resilient means into engagement with said abutment means; means mounting said inner bearing bushings in said inner wall segments in alignment with said outer bearing bushings; picking spindle rods rotatably mounted, respectively, in aligned pairs of said outer and inner bearing bushings; enlarged drive portions fixedly mounted, respectively, on said rods between said inner and outer bearing bushings and each having an axial end face opposite to said stiffening member; and thrust transmitting means operatively interposed between said end faces of said drive portions and said stiffening member, so that thrust forces induced axially of said spindle rods are transmitted through said drive portions to said stiffening member independently of said outer bearing bushings and resilient means.

10. In a spindle carrying slat for cotton pickers, the combination of a shell structure having at least two peninsular portions defining an embrasure; a reinforcing member extending longitudinally of and within said shell structure and having a pair of elongated slots therethrough between said peninsular portions; inner spindle bearing bushings mounted in said peninsular portions of said shell structure in alignment with said slots; a pair of picking spindle rods journaled, respectively, in said inner bushings and having enlarged drive portions fixedly mounted thereon between said inner bearing bushings and said reinforcing member; outer bearing bushings rotatably operatively associated, respectively, with said rods at the side of said drive portions next to said reinforcing member; and a strip member disposed between said drive portions and said reinforcing member in face to face engagement with the latter to extend longitudinally thereof between said peninsular portions and having a pair of elongated hatches therethrough of a length less than the length of said slots.

11. In a spindle carrying slat for cotton pickers, the combination of a hollow shell structure having at least two peninsular portions defining an embrasure; a reinforcing member extending longitudinally of and within said shell structure and having a pair of elongated slots therethrough between said peninsular portions; a pair of fixed abutments within said shell structure adjacent to said peninsula portions, respectively; resilient means positioned within said shell structure between said abutments; a pair of picking spindles each comprising a spindle rod and an enlarged drive portion fixedly mounted thereon; means including a pair of bearing bushings engaging said abutments, respectively, and urged into operative position against the latter by said resilient means, for operatively mounting said picking spindles on said shell structure, and a wear strip member disposed between said drive portions and said reinforcing member in face to face engagement with the latter to extend longitudinally thereof between said peninsular portions, said wear strip having a pair of elongated hatches therethrough of a length less than the length of said slots, said bearing bushings extending through said slots and into said hatches, respectively, to lock said wear strip against back and forth longitudinal movement when said spindles are in operative position.

12. In a spindle carrying slat for cotton pickers the combination of a shell structure having at least two peninsular portions defining an embrasure; a reinforcing member extending longitudinally of and within said slat and having a pair of elongated slots therethrough between said peninsular portions; a pair of fixed abutments within said shell structure adjacent to said peninsular portions, respectively; a spring clip having spaced leg portions in the space between said abutments; a pair of picking spindle rods each having an enlarged drive portion presenting an axial end face in confronting relation to said reinforcing member; thrust transmitting elements abutting said axial end faces, respectively; means including said abutments, spring clip and a pair of outer bearing bushings operatively associated with said spindle rods in axially abutting relation to said thrust transmitting elements, for operatively mounting said spindle rods on said shell structure; and a wear strip member disposed between said thrust transmitting elements and said reinforcing member to extend longitudinally of the latter between said peninsular portions, said wear strip having a pair of elongated hatches therethrough of a length less than the length of said slots, said bearing bushings extending through said slots and into said hatches, respectively, to lock said wear strip against back and forth longitudinal movement when said spindles are in operative position.

13. A spindle mounting slat for cotton pickers, comprising: a shell structure having a pair of elongated side wall members extending in spaced parallel relation to each other and each having outer and inner edge portions, said side wall members having transversely aligned embrasures therein along said inner edge portions; an outer wall forming part of said shell structure and integrally uniting said outer edge portions and having a series of longitudinally spaced spindle admitting openings therethrough; inner wall means forming part of said shell structure and integrally uniting said inner edge portions between said embrasures, said inner wall means including a series of longitudinally spaced wall segments each having inner bearing bushing mounting pockets in alignment with said spindle receiving openings; a stiffening member rigidly mounted between said side wall members intermediate said inner and outer walls and having spaced pairs of slots therethrough in opposed relation to said spindle admitting openings; relatively spaced spindle bearing guides rigidly mounted between said side wall members interjacent said stiffening means and outer wall; and a series of longitudinally spaced abutments mounted on one of said members and positioned between said spindle bearing guides interjacent said pairs of slots.

References Cited in the file of this patent

UNITED STATES PATENTS

2,058,514	Rust et al.	Oct. 27, 1936
2,668,409	Branblett	Feb. 9, 1954
2,671,298	Fergason	Mar. 9, 1954
2,705,860	Fergason	Apr. 12, 1955