Aug. 11, 1959 J. J. SCHROTH 2,899,059

VIBRATING SCREENS

Filed Feb. 27, 1958 5 Sheets-Sheet 1

Fig. 1.

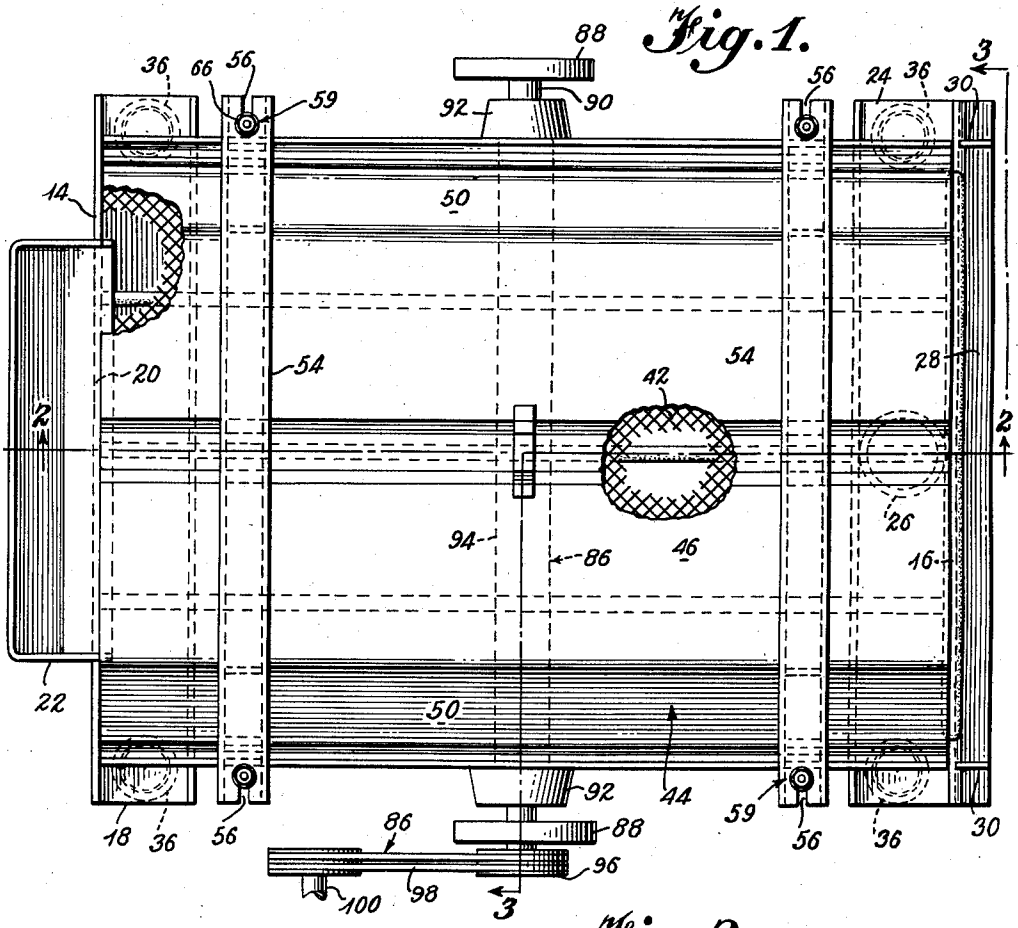

Fig. 2.

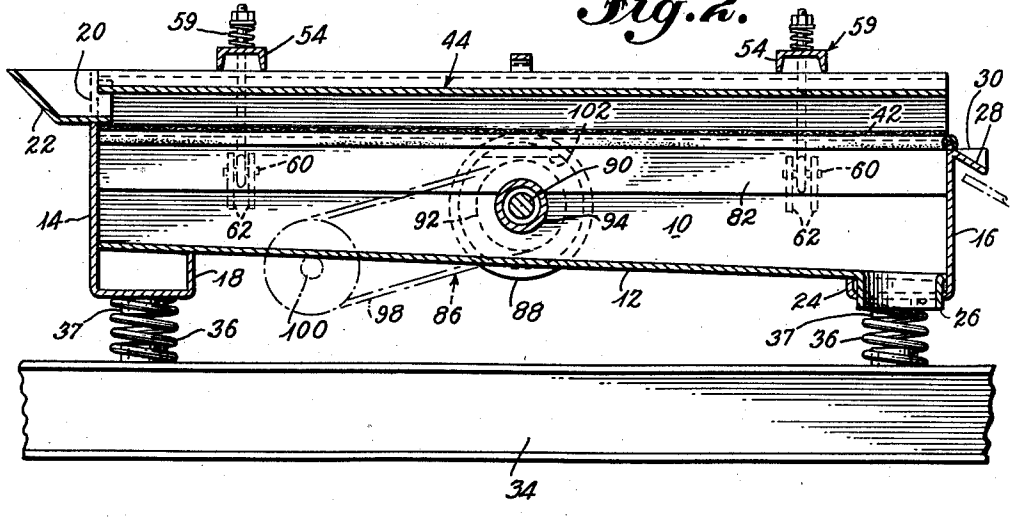

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Fig. 3.

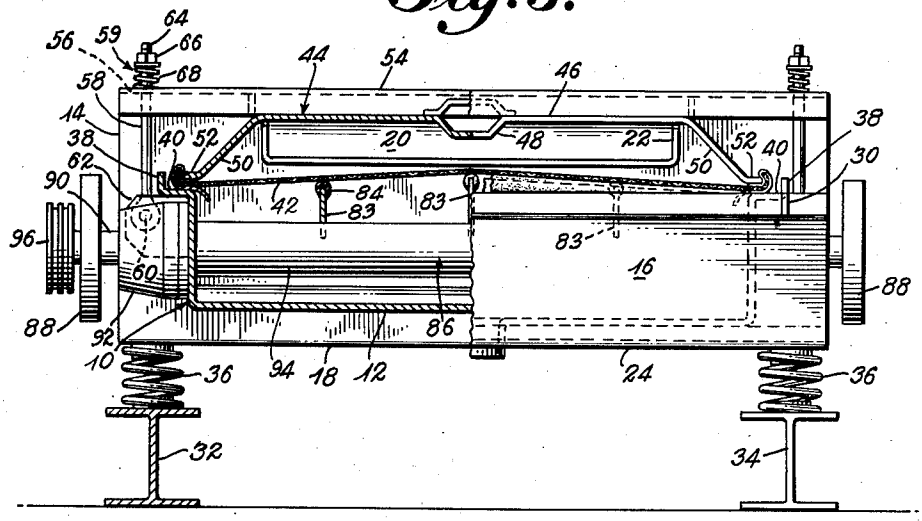
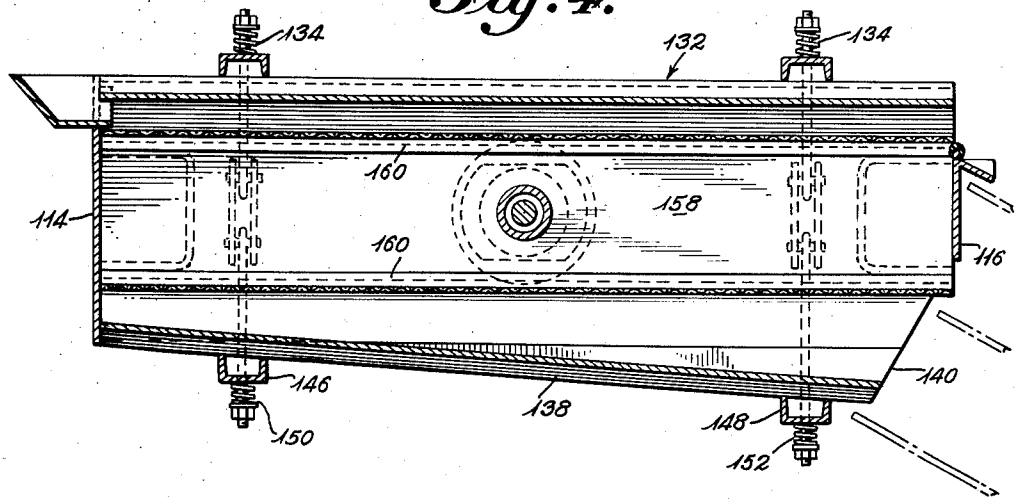


Fig. 4.



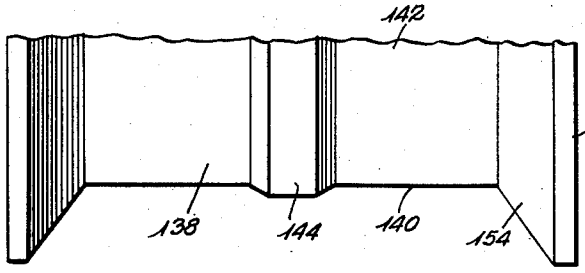


Fig. 5.

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Fig. 6.

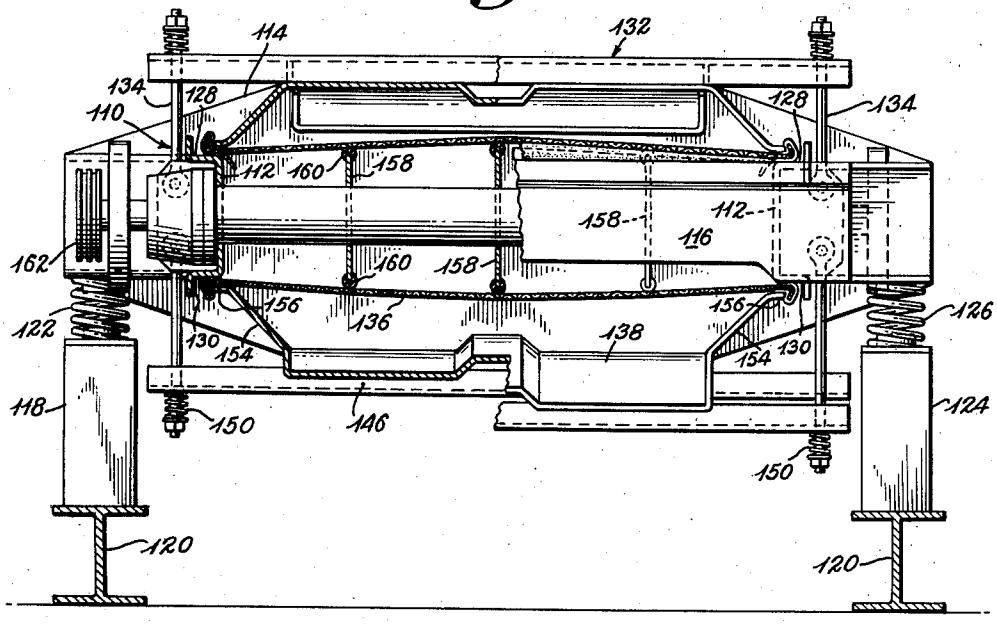

Fig. 9.

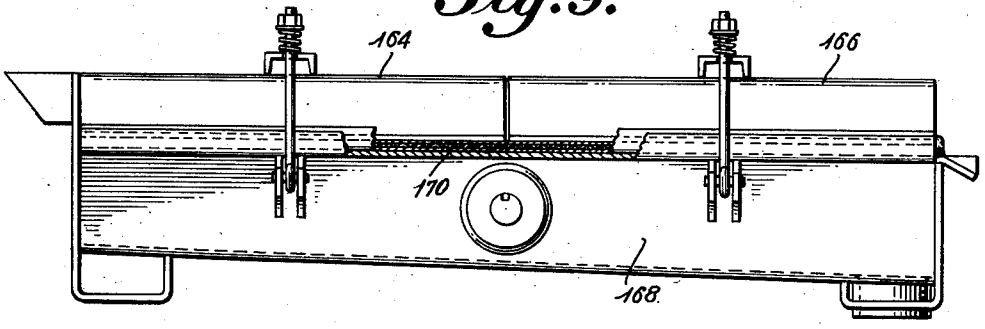

Fig. 8.

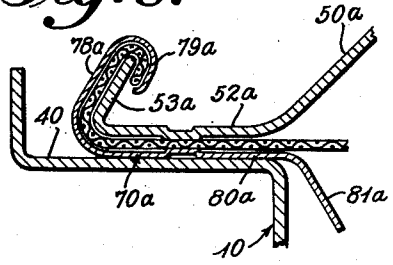

Fig. 7.

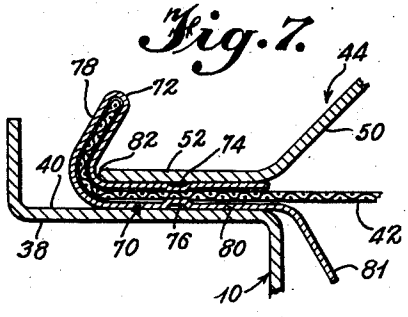

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Fig. 10.

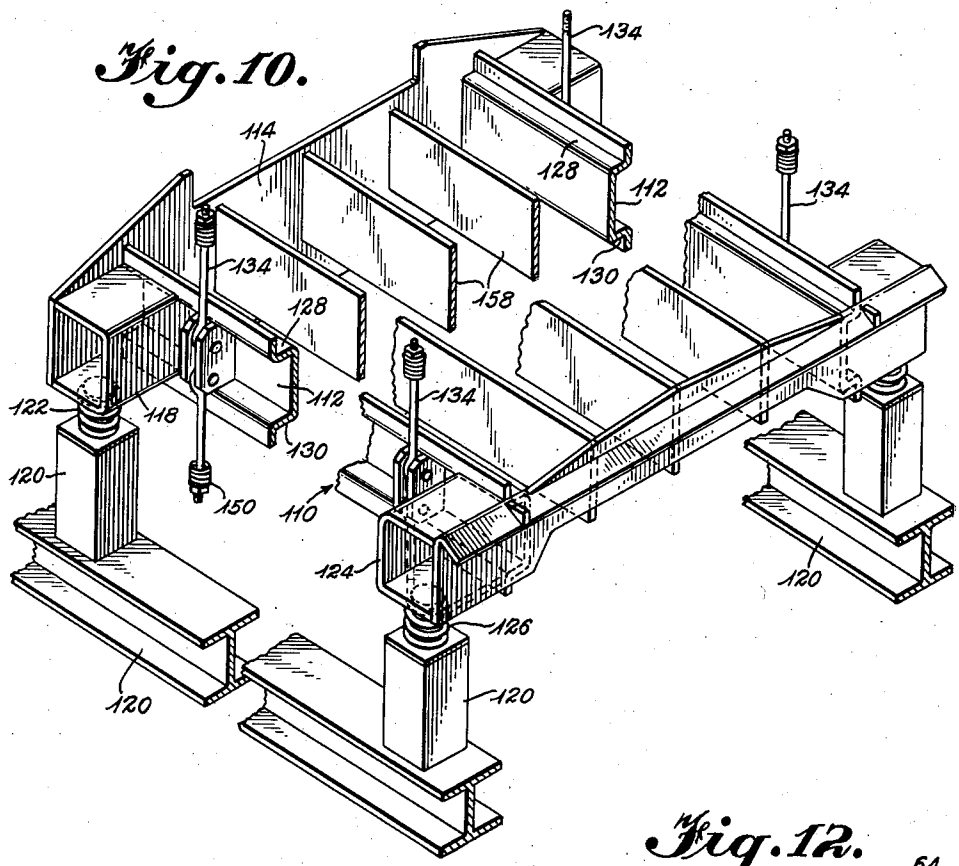


Fig. 11.

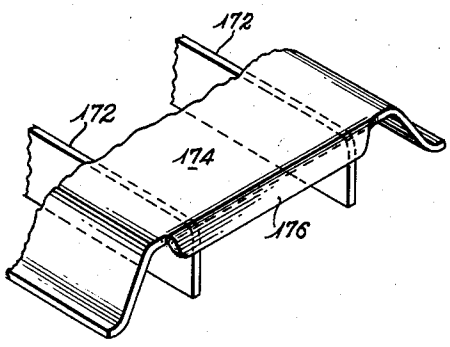
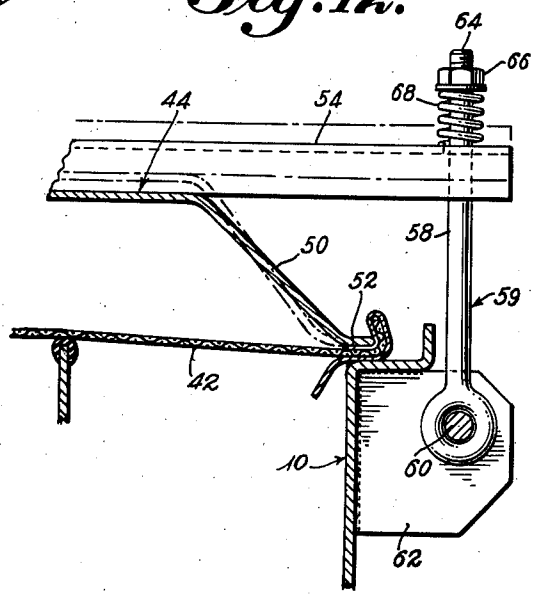


Fig. 12.



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VIBRATING SCREENS

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Fig. 13.

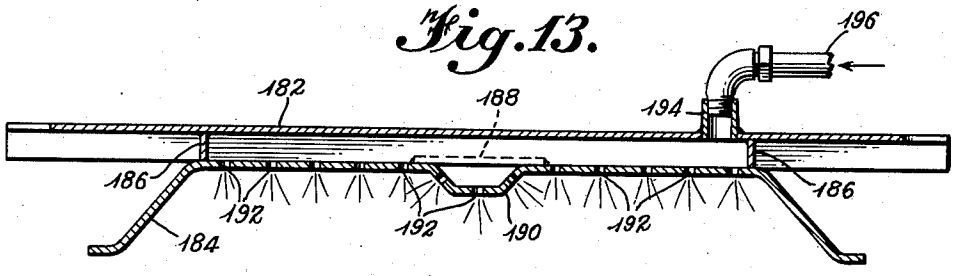


Fig. 14.

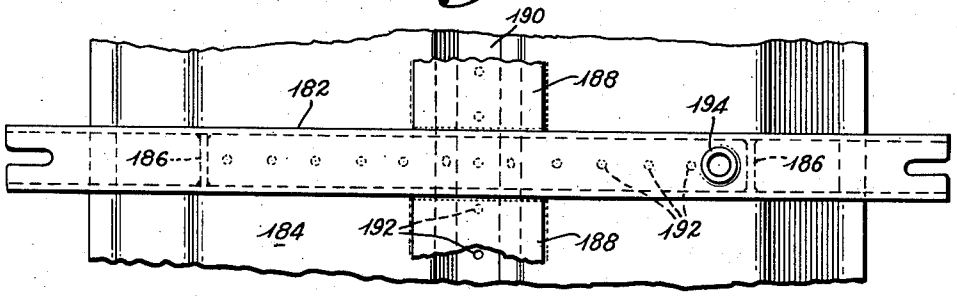


Fig. 15.

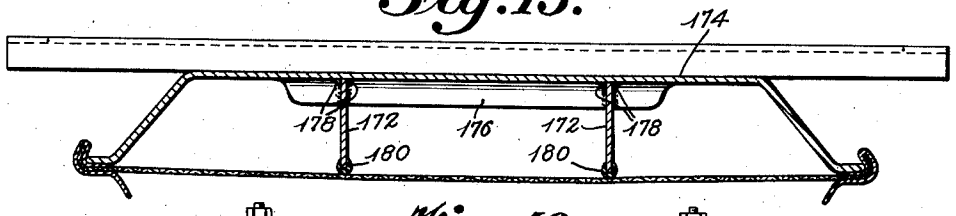


Fig. 16.

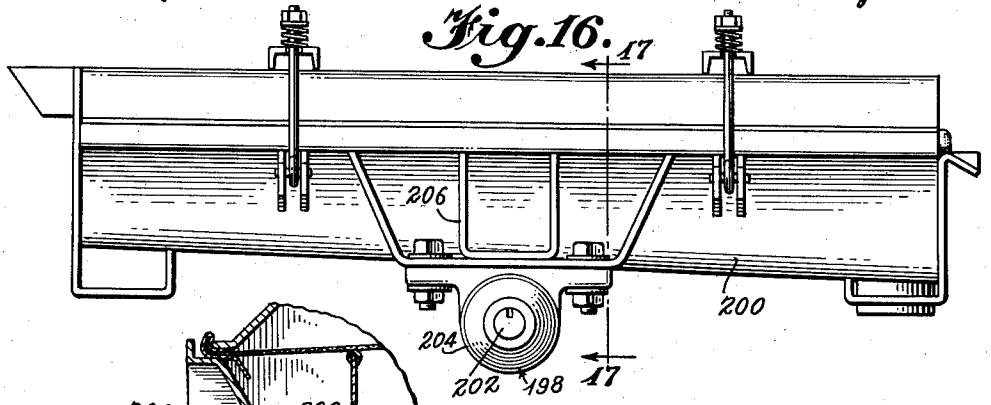
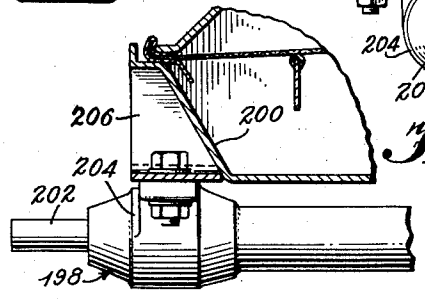


Fig. 17.



United States Patent Office 2,899,059 Patented Aug. 11, 1959

2,899,059

VIBRATING SCREENS

John J. Schroth, Doyleston, Pa., assignor to Link-Belt Company, a corporation of Illinois

Application February 27, 1958, Serial No. 717,913

18 Claims. (Cl. 209—403)

This invention relates to vibrating screen assemblies, and more particularly to vibrating screen assemblies adapted for use in applications where sanitation is of especial concern.

For certain applications of vibrating screens, and particularly in the food processing industry, a demand has arisen for a vibrating screen assembly which may be satisfactorily operated while requiring only a minimum total amount of time for necessary cleaning operations. Attempts to reduce the total amount of non-productive time spent in cleaning the screen assemblies are usually directed either toward extending the length of operating time between successive cleanings or toward reducing the time required to perform a cleaning operation. Structural characteristics of an assembly tending to improve the properties of the assembly in one of the foregoing respects often impair its properties in the other respect. For example, assemblies having relatively simple exposed surfaces may be cleaned easily, yet the exposed surfaces tend to become contaminated sooner by dust, dirt, etc. and thus require more frequent celaning. Enclosing the assembly reduces the risk of contamination from external sources but often renders disassembly of the screen for cleaning purposes more difficult and time consuming.

It is a primary object of the invention to provide a vibrating screen assembly which may be operated for extended periods of time between successive cleaning operations and yet may be easily and efficiently cleaned in a minimum amount of time.

It is another object of the invention to provide an enclosed vibrating screen assembly having simple internal exposed surfaces which are readily accessible for cleaning and present a minimum number of crevices where bacteria may build up.

It is another object of the invention to provide an enclosed vibrating screen assembly wherein a removable closure member is cooperatively related to the screen cloth in a manner such that both elements may be mounted and demounted simultaneously.

Still another object of the invention is to provide an enclosed vibrating screen assembly which may be efficiently purged without being disassembled.

Still another object of the invention is to provide an enclosed vibrating screen assembly which may be swiftly and efficiently disassembled for cleaning operations.

Other objects and advantages of the invention will become readily apparent by reference to the following specification taken in conjunction with the accompanying drawings.

In the drawings:

Figure 1 is a plan view of one form of vibrating screen assembly embodying the present invention;

Figure 2 is a vertical sectional view of the screen assembly taken on the line 2—2 of Fig. 1;

Figure 3 is a vertical sectional view of the screen assembly taken on the line 3—3 of Fig. 1;

Figure 4 is a vertical sectional view of another form of vibrating screen assembly embodying the present invention;

Figure 5 is a partial detail plan view of a portion of the assembly of Fig. 4;

Figure 6 is a vertical sectional view similar to Fig. 3, but showing the screen assembly of Fig. 4;

Figure 7 is a detail sectional view showing one form of engagement between the longitudinal edge of a screen cloth and a cooperating longitudinal side edge of a cover or closure member;

Figure 8 is a view similar to Fig. 7 showing another form of structure;

Figure 9 is a side elevational view, partially broken away, of still another form of a vibrating screen assembly;

Figure 10 is a detail isometric view, partially broken away, of certain parts of the screen assembly of Figure 4;

Figure 11 is a detail perspective view of another form of mounting of the tensioning plates for the screen cloth;

Figure 12 is a vertical sectional view of a portion of a screen cloth assembly showing the manner in which a transverse tensioning force is applied to the screen cloth;

Figure 13 is a vertical sectional view through another form of cover or closure member which may be employed with any of the screen cloth assemblies disclosed in the preceding figures;

Figure 14 is a partial plan view of the closure member of Fig. 13;

Figure 15 is a vertical sectional view through the form of closure member shown in Fig. 11;

Figure 16 is a side elevational view of another form of screen cloth assembly showing a different form of vibrating mechanism; and,

Figure 17 is a detail, vertical sectional view taken approximately on line 17—17 of Fig. 16.

Referring now to Figs. 1 through 3, the form of vibrating screen assembly disclosed includes a trough-like screen box 10 having a bottom plate 12 which is inclined downwardly toward the right hand or discharge end of the assembly as best seen in Fig. 2.

The opposite ends of the box 10 are closed by a feed end plate 14 and a discharge end plate 16. Each of the plates 14 and 16 is secured by suitable means, such as welding, to the respective ends of the box 10. As best seen in Fig. 2, the lower portion of the feed end plate 14 is bent inwardly and upwardly to define a transversely extending channel 18 which supports the feed end of the box 10. A materials receiving cut-out 20 is formed in the upper portion of the plate 14 through which material is fed into the interior of the screen assembly. A receiving hopper 22 of any suitable construction may be mounted upon the plate 14, as by welding. Material may also be fed into the interior of the screen assembly through a cut-back along the feed end portion of the cover or alternatively through a feed spout mounted in the center of the cover at the feed end.

The discharge end plate 16 is likewise formed with an inwardly and upwardly bent portion which defines a supporting channel 24 for the discharge end of the box 10. As best seen in Fig. 2, the channel 24 is interrupted in its central portion to provide an opening through which a discharge spout 26 may depend from the interior of the box 10. A transverse discharge lip 28 extends across the upper edge of the plate 16 and has a pair of spaced deflector elements 30 located to confine material flowing from the screen surface.

The screen box 10 is resiliently supported upon a pair of fixed frame elements 32 and 34 by coil springs 36 which are mounted at each end of the respective chan-

nels 18 and 24. The springs 36 may be maintained in position by piloting tubes 37 secured to the associated frame members and channels.

In a manner best seen in Fig. 3, the upper edges of the side walls of the screen box 10 are formed with outwardly and upwardly projecting flanges 38 each having an upwardly facing, generally horizontal bearing surface 40 extending the entire length of the screen box 10 longitudinally of the assembly. The bearing surfaces 40 are adapted to support the longitudinal side edge portions of a screen cloth 42 which extends transversely between the respective bearing surfaces 40 and longitudinally from end to end of the screen box 10.

The screen cloth 42 is maintained in position upon the bearing surfaces 40 by a cover member designated generally 44. In the Figs. 1 through 3 embodiment, the cover member 44 completely overlies the screen cloth to define, with the screen box 10, the receiving end plate 14 and the discharge end plate 16, a substantially enclosed vibrating screen assembly.

The cover member 44 is constructed from sheet material and includes a centrally located upper portion 46 which is formed with a longitudinally extending stiffening rib 48. The side wall portions 50 are inclined downwardly and outwardly from the central portion 46 to form the horizontal, longitudinally extending side edge flanges 52 which engage with the associated side edge elements of the screen cloth 42. The sheet material from which the cover member is constructed is selected to possess a sufficient degree of resiliency to permit the side wall portions 50 to be flexed relative to the upper portion 46. A pair of transversely extending channel shaped stiffeners 54 are secured to the central portion 46 by suitable means, such as welding, and are extended transversely beyond the side edges 52 of the cover member 44 in the manner best seen in Fig. 3. At each outer end of each bar 54, a longitudinally extending slot 56 is formed to receive the shank 58 of a swing bolt or clamp assembly 59. The shank 58 is pivotally mounted upon the side of the screen box 10 by means of a pivot pin 60 which is supported in ears 62 which may be welded directly to the side walls of screen box 10. The upper end of each shank 58 is threaded as at 64 to receive a clamp nut 66. A compression spring 68 is mounted upon the shank 58 below the nut 66 in a position where it may be engaged between the nut and the upper surface of the channel 54.

It is apparent that by threading the nut 66 downwardly of the shank 58, the spring 68 will be compressed between the nut and the upper surface of the channel 54 to thus resiliently force the cover member 44 downwardly to clamp the cover member 44 and the screen cloth 42 to the bearing surfaces 40 of the screen box 10. The function of spring 68 is to apply proper and uniform pressure to the assembly and to maintain proper screen cloth tension. By loosening the nuts 66, the shank 58 of each swing bolt may be pivoted outwardly of the screen box about its pivot 60 to thus disengage the swing bolt from the associated end of the bar 54 to permit the cover member 44 and the screen cloth 42 to be removed from the screen box for cleaning.

Since one of the important features of the invention resides in the cooperating and interengaging structure of the edge elements of the screen cloth 42 and the longitudinal side edges of the cover element 44, this portion of the assembly structure is illustrated in some detail in Fig. 7. As best seen in this figure, a longitudinally extending sheathing strip designated generally 70 of metallic sheet material is mounted along each longitudinal side edge of the screen cloth 42. In the form shown in Fig. 7, the sheathing strip 70 is folded at 72 to surround the longitudinal edge of the screen cloth and overlies both the upper and lower surfaces of the screen cloth for some distance inwardly of the side edge of the latter. The sheathing strip is secured to the screen by bending of the sheathing and screen under mechanical pressure and additionally, spot welding at 74 and 76. The outermost portion of the sheathing strip 70 is bent upwardly and inwardly of the screen to form a tensioning portion 78 extending the entire length of the sheathing strip. The innermost portion of the sheathing strip remains in a substantially horizontal plane in order that it may rest upon the bearing surface 40 in face-to-face engagement in the manner shown in Fig. 7. This innermost portion of the sheathing strip may be most aptly referred to as a bearing portion 80. A downwardly and inwardly projecting baffle 81 extends along the entire length of the inner edge of the bearing portion 80. The baffles 81 prevent the entry of material particles into the crevices between the bearing portions 80 and the bearing surfaces 40.

As best seen in Fig. 7, the part of the bearing portion 80 lying above the screen cloth 42 has a transverse width equal to that of the side flange 52 of the cover member 44. The longitudinal side edge 82 of the flange 52 thus is in a position to abut the inner surface of the inclined tensioning portion 78 of the sheathing strip 70.

Referring now to Fig. 12, the relative positions of the various parts of the assembly are shown in full lines to indicate when the assemblies 59 have been actuated to clamp the cover member 44 and the screen cloth 42 to the bearing surface 40 and is indicated in broken lines to show the relative positions when the clamp assemblies are released. By a comparison between the broken line showing of the side wall portion 50 of the cover element 44 and its full line position in Fig. 12, it is apparent that upon actuation of the clamp assemblies, the side wall portions 50 are flexed or sprung outwardly at their lower portions by the clamping action to thus force the side flanges 52 outwardly against the inner surfaces of the inclined tensioning portions 78 of the screen cloth 42.

Thus, as the cover member 50 is forced downwardly by the clamp assemblies 59 toward the bearing surfaces 40, the side flanges 52 on opposite sides of the cover element are forced outwardly of the screen cloth to apply a transverse tensioning force to the cloth concurrently with a clamping action forcing the cloth downwardly against the bearing surfaces 40. Release of the clamping assemblies 59 simultaneously unclamps the cover member and the screen cloth from the bearing surfaces 40 and releases the tension applied to the opposite longitudinal edges of the screen cloth to permit swift and efficient disassembly of these elements from the box 10.

A modified form of interengaging edge structure is shown in Fig. 8. In this embodiment, the sheathing strip 70*a* is engaged with only the lower surface of the screen cloth. The side flange 52*a* of the cover member is extended and its outer portion is bent upwardly and inwardly as at 53*a* to define the inner surface of the tensioning portion 78*a*. The sheathing strip 70*a* and the screen cloth are bent downwardly at 79*a* to overlap the upper edge of the portion 53*a* of the cover. A baffle 81*a* is provided along the inner edge of the bearing portion 80*a*.

Aside from the fact that the screen cloth and cover member are permanently secured to each other, the function and operation of the Fig. 8 embodiment is the same as that disclosed in Fig. 7.

In addition to being supported along its longitudinal edges, the screen cloth 42 is also supported by a number of longitudinally extending slats 83 which, in the Figs. 1 through 3 embodiment, are welded at either end to the feed end plate 14 and the discharge end plate 16. The upper edges of the slats 83 are covered by tubular cushioning strips of resilient material 84. The number of supporting slats 83 employed may vary between different screen assemblies depending primarily upon the width of the box 10. One or more of the support slats 83 may be extended downward and joined to the bottom plate 12 to stiffen the latter in the case of greater width units.

In the Figs. 1 through 3 construction, the screen assembly is vibrated upon the resilient support provided

by the springs 36 by a conventional vibrating unit of the unbalanced weight type. The vibrating unit is designated generally by the numeral 86 and includes a pair of unbalanced flywheels 88 mounted for rotation with a shaft 90. The shaft 90 is rotatably supported within bearing assemblies 92, one bearing assembly being located at either side of the screen box 10. The shaft 90 extends through the interior of the screen box within a fixed tubular shield 94 which is sealed to the opposed inner side walls of the screen box 10 to protect the rotating shaft 94 from the material being screened in the box. The shaft 90 is driven in rotation by means of a pulley 96 which in turn is driven by means of a belt or belts 98 from a drive shaft 100 driven by any suitable means.

Rotation of the shaft 100 drives the shaft 90 together with the associated flywheels 88. Each of the flywheels 88 is provided with an unbalancing counterweight, such as 102 in Fig. 2, so that rotation of the shaft 90 imparts a vibratory motion to the screen box 10.

Operation of the screen assembly shown in Figs. 1 through 3 is similar to more conventional screens insofar as the separatory process is concerned. Material to be separated may be fed in through the feed hopper 22 and the cut-out 20 onto the upper surface of the screen. Vibratory movement of the screen box 10 under the influence of the rotating counterweights 102 conveys the material toward the discharge end of the screen cloth 42, the liquid or finer elements of the incoming material passing through the openings in the screen cloth while the coarser elements remain on top of the screen cloth and are eventually discharged over the lip 28. Material passing through the screen cloth falls onto the bottom plate 12 and is discharged through the spout 26. While the screen assembly of Figs. 1 through 3 is shown as being supported with the screen cloth 42 extending in a generally horizontal direction, such screen assemblies are sometimes mounted in an uphill position when difficult separations are encountered and/or particularly dry oversize products are desired. The oversize material is conveyed uphill by the vibratory action.

In other instances where easy separation and/or higher oversize capacities are encountered the screen assemblies are mounted in a downhill position (the feed end located at an elevation above the discharge end) in order that gravity may assist the vibratory action of the assembly in conveying the coarser material to the discharge end of the screen.

In Figs. 4 through 6 and 10, a double deck screen assembly embodying the present invention is disclosed. In this form, the screen box 110 is formed from a pair of spaced side plates 112 which extend between a feed end plate 114 and a discharge end plate 116. A transversely extending channel 118 projects outwardly from each side plate 112 to support the feed end of the screen assembly from fixed frame members 120 through a resilient spring member 122. The discharge end plates 116 are likewise provided with transverse projecting channels 124 having springs 126 bearing on the underside thereof to resiliently support the discharge end of the screen assembly upon the frame members 120.

In the Figs. 4 through 6 construction, the side plates 112 of the screen body are each formed with an upwardly facing bearing surface 128 similar to the bearing surfaces 40 of the Figs. 1 through 3 embodiment and are also provided with downwardly facing bearing surfaces 130 extending along the lower edges of the plates 112.

A screen cloth assembly and cover member designated generally 132 are supported on the upper bearing surfaces 128 and are detachably secured thereto by means of clamp assemblies 134. Since the screen cloth and cover member assembly 132 and the clamp assemblies 134 are identical in construction with the screen cloth, cover member and clamp assemblies of the Figs. 1 through 3 embodiment, these elements of the Figs. 4 through 6 construction will not be described in detail.

A second screen cloth 136 extends transversely between the lower bearing surfaces 130 and is clamped thereto by a lower cover assembly 138. As best seen in Fig. 4, the bottom surface of the lower cover member 138 is inclined downwardly in a direction toward its discharge end, since the lower cover member 138 defines the bottom plate of a screen assembly. For convenience in discharging material from the lower cover member 138, its discharge end is cut back as at 140, see Figs. 3 and 5.

As is the case with Figs. 1 through 3 embodiment, the cover member 138 includes a generally flat central portion 142 which is formed with a longitudinally extending stiffening rib 144. Transversely extending channels 146 and 148 are secured to the outer surfaces of the central portion 142 and, like the bars 54 of the Figs. 1 through 3 embodiment, are extended beyond the longitudinal side edges of the cover member for engagement with clamping assemblies 150 and 152 of a construction similar to the clamping assemblies 59. The cover member 138 also is provided with outwardly extending side wall portions 154 which terminate at their outer edges in longitudinally extending bearing flanges 156 adapted to engage the longitudinal edge elements of the screen cloth 136 in the manner previously described in connection with the Figs. 1 through 3 embodiment.

As in the previous case, a suitable number of longitudinally extending supporting slats 158 are mounted between the end plates 114 and 116, the supporting slats of the Figs. 4 through 6 embodiment being provided with resilient cushioning strips 160 mounted on both their upper and lower edges.

The Figs. 4 through 6 structure is provided with a vibrating unit 162 of a construction identical to that employed in the Figs. 1 through 3 embodiment and hence this unit will not be described in detail.

Still another form of screen assembly is disclosed in Fig. 9. This embodiment is quite similar to the one disclosed in Figs. 1 through 3 and differs therefrom by having two separated cover assemblies 164 and 166 mounted in end to end relationship on a single screen box 168. The two separate cover assemblies 164 and 166 are employed in combination with a single screen cloth 170 which extends the entire length of the screen box 168. The separable covers 164 and 166 are especially adapted for use in larger sized assemblies and provide a more convenient structure to handle during the assembly, disassembly and cleaning operations.

Further modifications of the cover assembly are shown in Figs. 11 through 15. In Figs. 11 and 15, a construction is provided wherein the longitudinally extending supporting slats 172 are mounted upon a cover assembly 174 instead of being mounted between the end plates of the screen box. In this structure, the central portion of the cover assembly is formed with a downwardly projecting tab 176 at both the feed and discharge ends. The transverse width of the tab may vary to accommodate varying numbers of tension bars as may be required. The supporting slats 172 are welded both to the central portion of the cover member as at 178 and to the inner surfaces of the tabs 176. As in the previous embodiments, the screen cloth engaging edges of the tensioning bars are provided with resilient strips 180 (Fig. 15).

In Figs. 13 and 14, an arrangement for purging the interior of the screen assembly without removing the cover member is disclosed. In this embodiment, the transversely extending clamping channels 182 are modified to define enclosed chambers over the end portions of the cover member 184 by welding end closure plates 186 in the interior of the channel members as best seen in Fig. 13. Longitudinal cover plates 188 are welded to the central portion of the cover member, between the channels 182 to overlie the channel defined by the longitudinal stiffening rib 190 to convert this

channel into an enclosed conduit hydraulically connecting the chambers defined by the respective transverse channels **182**. The cover member and the stiffening rib are drilled at several locations, such as **192**, to place the interior of the chamber within the transverse channels **182** and the conduit defined by the rib **190** in communication with the interior of the cover assembly.

At one end of one of the transverse bars **182**, a coupling **194** is provided for connecting the interior of the various chambers and conduits to a source of purging fluid indicated partially at **196** in Fig. 13. It is believed apparent that when the cover member disclosed in Figs. 13 and 14 is mounted upon a screen assembly such as shown in any of the previously described embodiments, purging fluid may be supplied through the fitting **194** and sprayed through the various holes **192** into the interior of the screen assembly, thereby permitting the assembly to be purged without requiring the removal of the cover member.

In Figs. 16 and 17 a further modification is illustrated. In this modification, the vibrating unit **198** is mounted below the screen box **200**. The shaft **202** is supported for rotation in bearing hangers **204** which in turn are mounted upon a supporting frame designated generally **206** fixedly secured to each side wall of the screen box **200**. The depending bearing hangers allow the shaft **202** to pass beneath the lower surface of the screen box **200**, thus permitting the interior surfaces of the screen box **200** to be completely unobstructed for quicker and more efficient cleaning.

While I have described in detail certain embodiments of my invention, it will be apparent to those skilled in the art that these embodiments are capable of modification. Therefore, the foregoing description is to be considered exemplary rather than limiting and the true scope of my invention is that defined in the following claims.

Having thus described the invention, I claim:

1. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having longitudinal edge portions in engagement with said bearing surfaces, a cover assembly including longitudinal side edge portions in engagement with said edge portions of said screen cloth, said bearing surfaces and cover assembly engaging said edge portions of said screen on opposite sides thereof, clamping means on said box operable to clamp said cover assembly and said screen cloth to said bearing surfaces, and means on said cover assembly operable to force said edge portions of said cover assembly and of said screen cloth outwardly to apply a transverse tensioning force to said screen cloth when said clamping means are operated to clamp said cover assembly and said screen cloth to said bearing surfaces.

2. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having longitudinal edges overlying said bearing surfaces, an edge element secured along each of said longitudinal edges, said edge elements projecting from said screen cloth in a direction away from the associated bearing surface, a cover assembly extending transversely between said edge elements on the side of said screen cloth opposite from said bearing surfaces, clamping means on said box operable to urge said cover assembly toward said bearing surfaces, and means on said cover assembly engageable with each of said edge elements to clamp said screen cloth to the bearing surfaces and to concurrently force said edge elements laterally apart to apply a transverse tensioning force to said screen cloth when said clamping means is operated to urge said cover assembly toward said bearing surfaces.

3. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having opposed longitudinal edges overlying said bearing surfaces, a longitudinally extending sheathing strip secured along each longitudinal edge of said cloth, each sheathing strip having a bearing portion in face-to-face relationship with its associated bearing surface and a tensioning portion projecting from said screen cloth in a direction away from the associated bearing surface, a cover assembly extending transversely between said tensioning portions of said sheathing strips on the side of said screen cloth opposite from said bearing surfaces, clamping means on said box operable to urge said cover assembly toward said bearing surfaces, and means on said cover assembly engageable with said tensioning portions to clamp said screen cloth to the bearing surfaces and to force the respective tensioning portions of said sheathing strips laterally outwardly of said screen cloth to apply a transverse tensioning force to said screen cloth when said clamping means is operated to urge said cover assembly toward said bearing surfaces.

4. A vibrating screen as defined in claim 3 wherein each sheathing strip surrounds each longitudinal edge of said screen cloth in face-to-face relationship with both the upper and lower surfaces thereof.

5. A vibrating screen as defined in claim 3 wherein each sheathing is secured to one surface only of said screen cloth, said cover member engaging the other surface of said screen cloth and having a longitudinally extending vertically inclined flange in face-to-face relationship with said screen cloth in opposition to said tensioning portion of said sheathing strip.

6. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having longitudinal edges in engagement with said bearing surfaces, each of said edges being bent along a longitudinal line away from said bearing surfaces to provide an outer edge portion extending lengthwise of each of said longitudinal edges of said screen cloth and projecting away from said bearing surfaces and inwardly of said screen cloth, a cover member comprising a central portion vertically spaced from said screen cloth on the side thereof opposite from said bearing surfaces, and side wall portions inclined outwardly from said central portion to form longitudinally extending side edges located adjacent said outer edge portions of said screen cloth, clamping means on said box, means mounted on said central portion of said cover member engageable with said clamping means to clamp the longitudinal edges of said cover member and said screen cloth to said bearing surfaces, and means enabling said side edges of said side wall portions to be moved outwardly against said outer edge portions of said screen cloth when said clamping means is operated to apply a transverse tensioning force to said screen cloth.

7. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having opposed longitudinal edges overlying said bearing surfaces, an edge element comprising a longitudinally extending sheathing strip secured along each longitudinal edge of said screen cloth, each sheathing strip having a generally horizontal bearing portion in face-to-face relationship with the associated bearing surface, and a tensioning portion projecting inwardly of said screen cloth in a direction away from the associated bearing surface, a cover member comprising a central portion vertically spaced from said screen cloth on the side thereof opposite from said bearing surfaces, and side wall portions, integral with and inclined outwardly from said central portion, having longitudinally extending side edges located inwardly of said tensioning portions of said sheathing strips, clamping means on said

box, and means mounted on said central portion of said cover member engageable with said clamping means to clamp the longitudinal edges of said cover member and said screen cloth to said bearing surfaces upon operation of said clamping means, said side wall portions of said cover member having sufficient resiliency to permit said side edges to be moved outwardly against said tensioning portions of said sheathing strips when said clamping means is operated to apply a transverse tensioning force to said screen cloth.

8. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having opposed longitudinal edges overlying said bearing surfaces, an edge element extending lengthwise of each of said longitudinal edges and projecting inwardly of said screen cloth in a direction away from the associated bearing surface, a cover member comprising a central portion vertically spaced from said screen cloth on the side thereof opposite from said bearing surfaces, and side wall portions, integral with and inclined outwardly from said central portion, having longitudinally extending side edges located adjacent to and inwardly of said edge elements of said screen cloth, a transversely extending bar mounted upon said central portion of said cover member and extending transversely beyond the longitudinal side edges of said member, and a clamp assembly located on each side wall of said box operable to engage said bar at the respective ends thereof and to apply a force thereto to clamp said cover member and said screen cloth to said bearing surfaces, said side wall portions of said cover member having sufficient resiliency to permit said side edges of said cover member to be moved outwardly against said edge elements when said clamp assemblies are operated to apply a transverse tensioning force to said screen cloth.

9. A vibrating screen as defined in claim 8 wherein said edge elements of said screen cloth each include a sheathing strip surrounding and overlying both the upper and lower surfaces of said cloth along a longitudinal edge thereof, the side edges of said cover member being movable into and out of abutment with the inclined portions of said sheathing strips.

10. A vibrating screen as defined in claim 8 wherein a sheathing strip is secured along each longitudinal edge of said screen cloth against one surface thereof, and the side edges of said cover member engage the other surface of said screen cloth.

11. A vibrating screen comprising a box having spaced longitudinally extending side walls supported between transversely extending end walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having longitudinal edge elements respectively engaged with said bearing surfaces, a cover member having longitudinal side edge portions in engagement with said edge elements and a central section overlying and vertically spaced from said screen cloth on the side thereof opposite from said bearing surfaces, supporting slats extending between said end walls of the box, cushioning strips on said slats disposed in edgewise abutment with said screen cloth, and clamping means on said box operable to clamp said cover member and said screen cloth to said bearing surfaces and concurrently therewith to force said edge elements outwardly of said screen cloth to apply a transverse tensioning force to said screen cloth and to force said screen cloth against said cushioning strips of said tension bars.

12. A vibrating screen as recited in claim 11 wherein said supporting slats are fixedly supported upon said end walls at locations wherein said cushioning strips engage the lower surface of said screen cloth to maintain the engaged portions of said cloth at an elevation above said bearing surfaces.

13. A vibrating screen as recited in claim 11 wherein said supporting slats are fixedly secured to the central section of said cover member for engagement with the surface of said screen cloth facing said cover member to maintain the engaged portions of said cloth at an elevation different from that of said bearing surfaces when said cover member and cloth are clamped to said surfaces.

14. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a bearing surface extending longitudinally along each of said side walls, a screen cloth having longitudinal edge elements respectively engaged with said bearing surfaces, a cover having longitudinal side edge portions in engagement with said elements and a central section vertically spaced from said screen cloth on the side thereof opposite from said screen cloth, a transversely extending member fixedly secured to said central section of said cover and having end portions projecting transversely beyond said central section, means defining a chamber within said member having openings extending through said central section to place said chamber in communication with the space between said central section and said screen cloth, clamping means on said box engageable with the end portions of said member operable to clamp said cover and said screen cloth to said bearing surfaces and concurrently therewith to force outwardly said edge elements of said screen cloth to apply a transverse tensioning force to said screen cloth, and means for supplying purging fluid to said chamber while said cover member is clamped to said bearing surfaces.

15. A vibrating screen as recited in claim 14 wherein said cover includes a longitudinally extending depressed stiffening rib extending beneath said member, a second transversely extending member secured to the central portion of said cover and having a chamber therein, said cover having openings placing said chamber in communication with the space between said cover and said screen cloth, means secured to said cover to enclose said stiffening rib to define a conduit extending between said members, each transverse extending member having an opening placing the chamber within each member in communication with said conduit.

16. A vibrating screen comprising a fixed base, a screen box comprising a pair of longitudinally spaced transversely extending end plates and a pair of longitudinally extending side walls secured to said end plates, means resiliently supporting said box upon said base, means defining a bearing surface extending longitudinally along the upper portion of each of said side walls, a screen cloth having opposed longitudinal edge elements supported upon said bearing surfaces, a cover member overlying said screen cloth on the side thereof opposite from said bearing surfaces, means for clamping said cover member and said screen cloth to said bearing surfaces, means on said cover member for tensioning said screen cloth when said cloth and said cover member are clamped to said bearing surfaces, and means for vibrating said boxe upon said base comprising a shaft rotatably supported from said side walls below said box, unbalancing counterweights mounted upon said shaft for rotation therewith, and means for rotating said shaft.

17. A vibrating screen comprising a frame having a pair of spaced side walls, means defining an upper and a lower bearing surface extending along the upper and lower edges of each of said side walls, upper and lower screen cloths extending transversely between said side walls and having longitudinal side edge elements in respective bearing engagement with the upper and lower bearing surfaces of said side walls, an upper cover assembly overlying said upper screen cloth and a lower cover assembly underlying said lower screen cloth, each of said cover assemblies including resilient side portions inclined vertically inwardly from the longitudinal side edges thereof, and clamp means on said side walls for drawing both of said cover assemblies toward the respective bearing surfaces to clamp the cover assemblies

and screen cloths thereto, said side portions having sufficient resilience to permit movement of the longitudinal side edges thereof outwardly against the associated side edge elements to apply a transverse tensioning force to said screen cloths as said screen cloths are clamped against their respective bearing surfaces.

18. A vibrating screen comprising a box having spaced longitudinally extending side walls, means defining a generally horizontal bearing surface extending longitudinally along the upper edges of each of said side walls, a screen cloth having longitudinal side edge elements supported upon said bearing surfaces, said edge elements each including a bearing portion in face-to-face relationship with the associated bearing surface and a longitudinally extending baffle projecting downwardly and inwardly from said bearing portion, a cover assembly overlying said screen cloth on the side thereof opposite from said bearing surfaces, means for clamping said

cover member and said screen cloth to said bearing surfaces, and means on said cover member for tensioning said screen cloth when said cloth and said cover member are clamped to said bearing surfaces.

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