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J. W. LAMBERT ET AL

3,092,573

VIBRATING SCREEN CLAMP MECHANISM

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2 Sheets-Sheet 1

Fig. 1

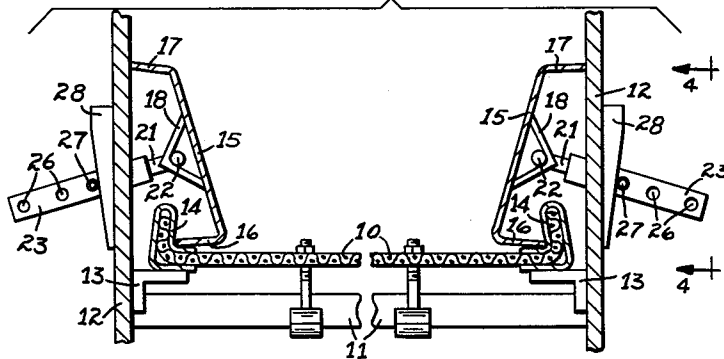
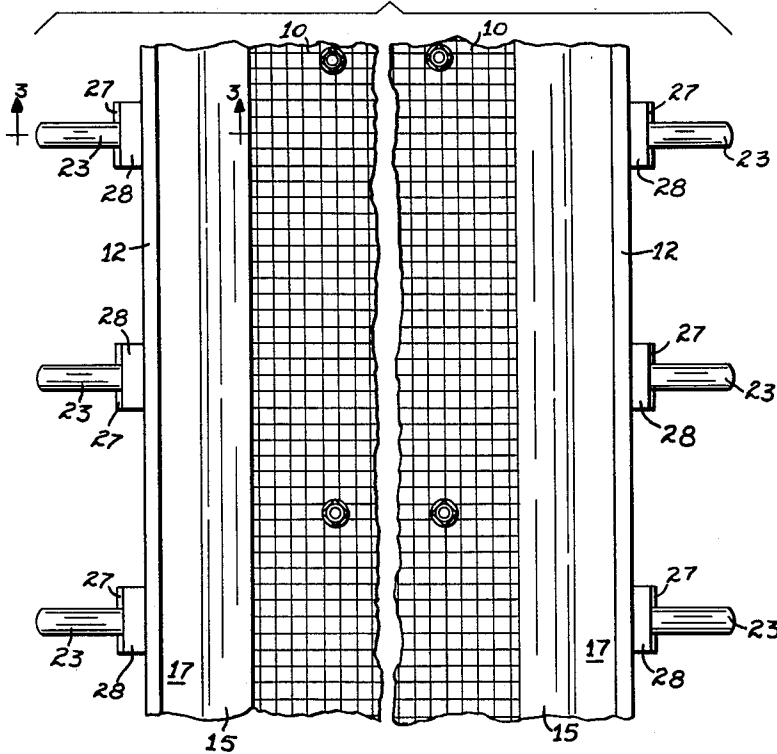


Fig. 2



INVENTORS.
Jordan H. Lambert
Gordon Speers
Harry E. Wilson
BY *Wells & St John*
Attys.

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Fig. 3

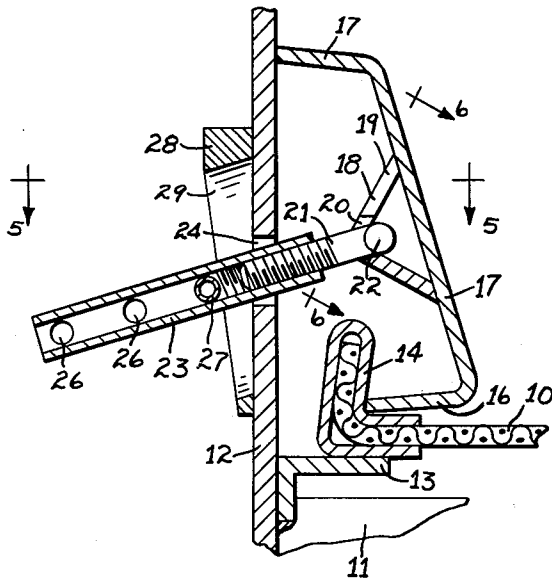


Fig. 4

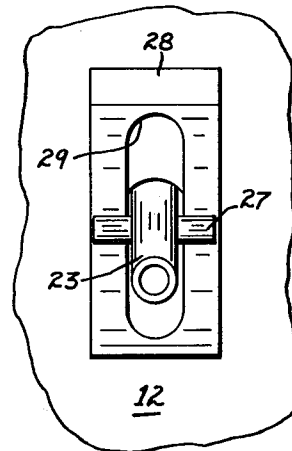


Fig. 5

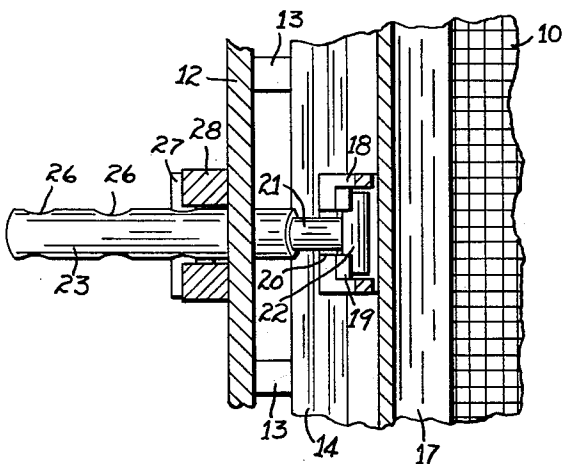
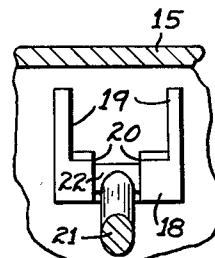


Fig. 6



INVENTORS.
Gordon N. Lambert
Gordon Spens
Harry E. Wilson
 BY *Wells & H. John*
attys.

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3,092,573

VIBRATING SCREEN CLAMP MECHANISM

Jordan W. Lambert, E. 317 14th Ave.; Gordon Spens, E. 803 26th Ave.; and Harry E. Wilson, S. 2704 Manito Blvd., all of Spokane, Wash.

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4 Claims. (Cl. 209-403)

This invention relates to a novel vibrating screen clamping mechanism designed to tie down such screens to their supporting frameworks.

The instant invention is designed to be used on screens utilized for grading and sorting purposes. Such screens are normally mounted on inclined frames which are connected to vibrating supports. As the screens are vibrated granular particles of sand or ore sliding along the screen and the fines fall through the screen where they are recovered. The sides of the screen are reenforced and bent upwardly to receive the lower edges of side rails which complete the mounting of the screen to the frame. These side rails are secured to the frame normally by means of spaced bolts. These rails form the sides of the trough through which the particles are directed, the screen being the bottom wall of the trough.

The problem encountered with this normal mounting procedure is that the heads of the bolts are exposed to the moving abrasive particles. Within a rather short time these heads wear off and require replacement. Such a fixed mounting also makes the recovery or repair of a screen or a rail quite a complicated task.

It is a first object of this invention to provide a mounting apparatus for a vibrating screen which can be quickly assembled or dismantled. The apparatus described herein is relatively simple in structure and utilizes parts common to each mounting bracket, each of which is relatively inexpensive and easily manufactured.

It is a most important object of the present invention to provide a mounting apparatus to clamp the edges of the screens in which the rail itself is a continuous member with no apertures or protrusions along the surfaces thereof which are directed inwardly toward the particle receiving trough. The side rails themselves may be made of material which can withstand abrasive action of the rock. The continuous surfaces of the side rails alleviate the danger of undue wear on any exposed parts.

It is another object of this invention to provide such a clamping mechanism which can be accurately adjusted so as to provide the exact tension required on the screen being supported. In order to accomplish this result the invention provides for both a coarse and a fine adjustment of the supporting elements which determine the clamping tension exerted upon the screen.

These and further objects will be evident from a study of the following disclosure taken in conjunction with the accompanying drawings which illustrate a preferred form of the invention. It is to be understood at the onset that the form of the invention illustrated in the drawings is exemplary and presents a practical example of a workable apparatus utilizing the instant invention. However, this form is not intended to exhaust the possibilities or capabilities of the present invention except as the invention is defined in the claims which follow.

In the drawings:

FIGURE 1 is a sectional view taken laterally across a screen supported by the clamping mechanism constructed according to the present invention, the center area of the screen and supporting framework being broken away;

FIGURE 2 is a top view looking parallel to the screen surface, showing the apparatus in FIGURE 1, the center section also being broken away;

FIGURE 3 is an enlarged sectional view through the

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clamping construction as seen along line 3-3 in FIGURE 2;

FIGURE 4 is a side elevational view of the clamp apparatus as seen along line 4-4 in FIGURE 1;

FIGURE 5 is a sectional view taken along line 5-5 in FIGURE 3, showing one complete clamping assembly; and

FIGURE 6 is a fragmentary sectional view taken along line 6-6 in FIGURE 3.

It is a common practice to utilize vibrating screens to sort and grade ore and rock particles. In such an apparatus the screen itself is normally mounted across an open framework which is vibrated to insure the proper passage of the fines through the screen. The structure of this framework and screen is immaterial to the instant invention which is designed to be utilized with most conventional structures.

The present invention utilizes a screen 10, having apertures of the desired open area, and extending across a framework 11. The framework 11 includes vertical sides 12 which are fixed thereto. The entire framework 11 is adapted to be vibrated by means, not shown in the drawings, so as to move the particles to be sorted along the length of the screen 10. The framework 11 also includes supporting ledges 13 which are fixed to the inner surfaces of the sides 12 and which support the bottom surface of screen 10. The side edges of the screen 10 are reenforced by longitudinal covers 14. The covers 14 serve to stiffen and strengthen the otherwise rough edges of the screen 10. The upturned side edges of the screen 10, which are encased within longitudinal covers 14, are fixed relative to the framework 11 and sides 12 by a pair of longitudinal side rails 15. Each rail 15 is a channel member having a lower flange 16 and an upper flange 17. The lower flange 16 is adapted to abut the inner surface of the upturned edge of screen 10 within cover 14, while the upper flange 17 is adapted to abut the inside surface of the adjacent vertical sides 12. As can be seen in FIGURE 1, it is evident that as the rail 15 is pulled toward its adjacent vertical side 12, the screen 10 will be stretched transversely across the width of the framework 11.

It is the apparatus utilized to position the rail 15 relative to the vertical sides 12 which forms the chief subject matter of this invention. A prime consideration in such a mounting apparatus is that the rails 15 should be formed continuously with no projections or apertures which would weaken its structure and be subject to abrasive wear during use of the screen. In order to fulfill this requirement a series of identical V-shaped mounting brackets 18 are spaced longitudinally along each side rail 15 and are secured in a fixed position on the outside surfaces of the side rails 15 intermediate their flanges 16 and 17. Each mounting bracket 18 is provided with an apex which is spaced outwardly from the central portion of the respective side rail 15. Each bracket 18 is also provided with an enlarged aperture 19 which opens to a restricted aperture 20, located at the apex of the bracket 18.

A shaft apparatus is utilized to connect the framework 11 to the side rails 15. This apparatus consists of two parts which are coaxial and suitably engaged to one another. The first part is a bolt 21 having a T-shaped perpendicular head 22 extending from either side of the inner end of this bolt 21. The head 22 of the bolt 21 is formed so as to be receivable within the enlarged aperture 19. The shank of the bolt 21 is receivable within the restricted aperture 20 but the head 22 is not passable through the aperture 20. Thus the shank of bolt 21 extends outwardly from the rail 15 on which the respective bracket 18 is mounted and the head 22 restricts outward movement of the bolt 21 from the positions shown in FIGURES 1, 3 and 5. The shaft apparatus further includes a tubular shaft 23 which is provided with interior threads adapted

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to engage the threaded end of bolt 21. The tubular shaft 23 is adapted to extend through spaced apertures 24 cut along the vertical sides 12. The outer end of tubular shaft 23 is provided with a series of apertures 26 cut along axes perpendicular to the axis of shaft 23 and bolt 21. These last named apertures 26 receive short cross pins 27. In order to secure the shaft apparatus to the framework 11 a wedge 28 is utilized. Wedge 28 has a longitudinal aperture 29 formed therethrough. The aperture 29 is fully enclosed and is sufficiently wide to freely receive the tubular shaft 23.

The operation of the instant clamping mechanism is quite evident from a study of FIGURE 3. The screen 10 is first mounted on the ledges 13 and the rails 15 are positioned in engagement with the vertical sides 12 and the interior corners of the covers 14. The shaft apparatus, consisting of bolt 21 and tubular shaft 23, then protrudes through the apertures 24. The wedge 28 may then be positioned so as to receive the respective tubular shaft 23 and the cross pin 27 is then positioned through one of the apertures 26. By driving the wedge 28 downwardly, as seen in FIGURE 3, the rail 15 may be pulled toward the side 12 to thereby stretch the screen 10 across the framework 11 under the desired tension. The provision of several cross pin apertures 26 allows for coarse adjustment of the screen tension by initially selecting one or the other of the apertures 26 to receive the cross pin 27. Should a more accurate positioning of the side rails 15 be necessary to provide the proper tension of screen 10 the length of the shaft apparatus may be readily adjusted by turning the tubular shaft 23 relative to the bolt 21, which is held against rotation by the V-shaped mounting bracket 18. Thus by using the proper combination of the cross pin apertures 26 and the threaded connection between bolt 21 and shaft 23, one may achieve any desired tension on the screen 10. This tension can also be adjusted by proper positioning of the wedge 28 relative to the cross pin 27. By driving the wedge 28 into a tight engagement between the side wall 12 and cross pin 27, the necessity for a positive lock is removed. The wedging action itself, coupled with the tension in screen 10, is sufficient under most conditions to insure a fixed clamp structure. However, should it be necessary to provide a more positive locking apparatus to position the cross pin 27, this too may be utilized in addition to the wedging action described.

Thus the instant invention provides a very simple and yet effective clamping mechanism. This mechanism is completely isolated from the interior of the trough by the side rails 15. It can be readily dismantled by loosening the wedge 28 and can be easily adjusted to provide the necessary tension on the screen 10. No protruding elements or apertures are required on the inside surfaces of rails 15. Thus wear and damage to the clamping elements is eliminated under normal conditions.

It is obvious that various mechanical equivalents may be substituted in the instant invention without deviating from the scope of the basic concepts embodied therein. For this reason only the following claims are intended to define the invention.

Having thus described our invention, we claim:

1. A vibrating screen clamp mechanism adapted to secure the upturned edges of a screen to a supporting peripheral framework within which the screen is located, comprising:

continuous side rails positioned along the inside sur-

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faces of opposite sides of said framework, each rail being a channel member including a first flange adapted to abut the adjacent upturned screen edge and a second flange adapted to abut the adjacent inside surface of the framework;

brackets spaced longitudinally along the surface of each of said rails adjacent the framework, each bracket including an enlarged aperture opening to a restricted aperture;

individual shaft means having one end carried by said respective brackets, said one end being radially enlarged so as to be receivable within said enlarged aperture but not be passable through said restricted aperture, said shaft means extending outwardly from the bracket on which it is carried and being adapted to extend through an aperture formed through the adjacent framework;

individual cross pins fixed to said shaft means adapted to be positioned at a spaced distance outwardly located from the outside surface of said framework; and individual wedges having a longitudinal aperture adapted to receive said shaft means intermediate said cross pins and the framework to thereby restrict inward motion of said shaft means.

2. The device as defined in claim 1 wherein said shaft means each comprises:

a coaxial shaft and a bolt threadably engaged with one another for longitudinal adjustment.

3. A vibrating screen clamp mechanism adapted to secure the upturned edges of a screen to a peripheral framework, comprising:

side rails positioned along the inside surfaces of opposite sides of said framework, each rail being a channel member including a central web bounded by a first flange adapted to abut the adjacent upturned screen edge and a second flange adapted to abut the adjacent inside surface of the framework; a plurality of individual brackets longitudinally spaced along the surface of the channel member web adjacent to and facing the framework;

individual shaft means having one end thereof releasably engaged with said respective brackets, said shaft means extending outwardly from the bracket with which it is engaged and being adapted to extend through an aperture formed through the framework;

a radially protruding cross pin secured to each of said shaft means at a location outward from the outside surface of said framework;

and an individual wedge adapted to be mounted on said individual shaft means, each wedge having a longitudinal aperture for reception of said shaft means and opposed tapered surfaces adapted to contact said cross pin and the outside surface of said framework, respectively.

4. The device as defined in claim 3, wherein each of said shaft means comprises two members adjustable longitudinally relative to one another to thereby vary the position of the cross pin mounted thereon relative to the side rails and framework.

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