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SCREEN CLOTH TIGHTENING MEANS

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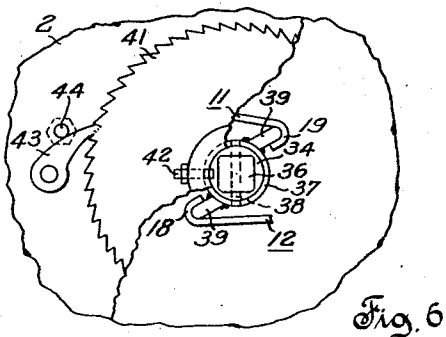
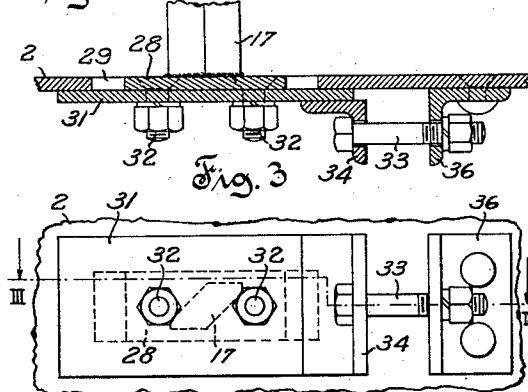
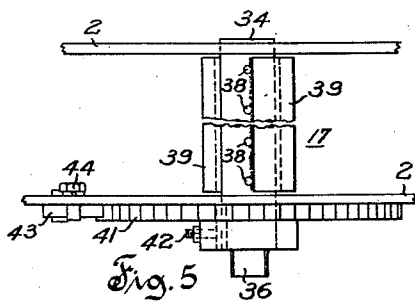
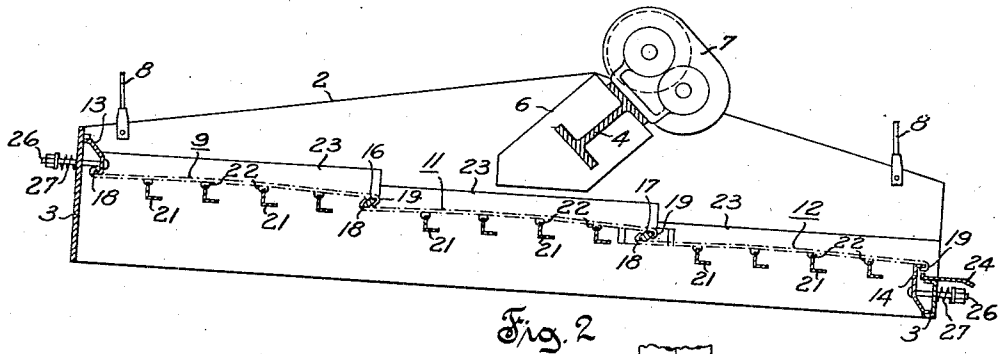
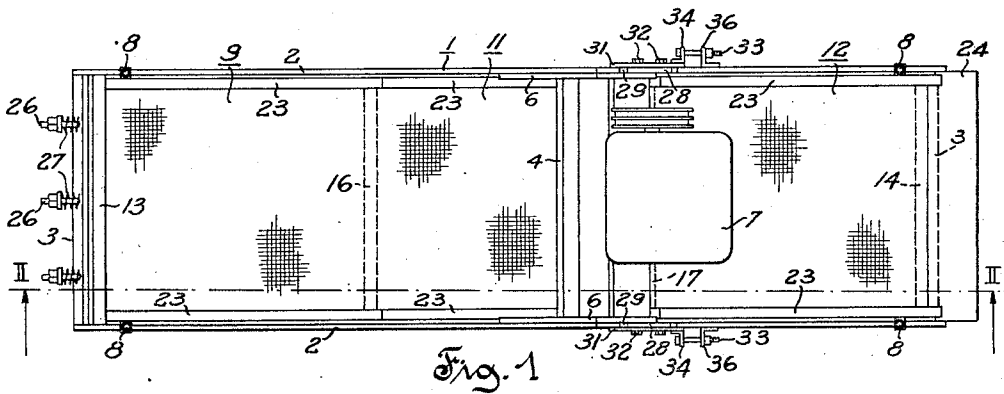


Fig. 6

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SCREEN CLOTH TIGHTENING MEANS

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This invention relates generally to screening apparatus and more particularly to the construction of the screen cloth deck of vibrating screens and the tensioning means therefor.

The vibrating screens heretofore employed generally embody only a single screen cloth section which is secured at the feed and discharge ends of the screen frame by adjustable clamping bars or the like effective to tension and/or stretch the cloth longitudinally of the frame; the screen cloth being supported intermediate its ends by a series of longitudinally spaced transverse cross members arranged in progressively displaced relation to provide in effect a crowned support over which the cloth is stretched. However, the screen cloth supporting and tensioning means heretofore employed are not satisfactory for use on long screens since the wear on the screen cloth is not uniform throughout its length (the wear being greatest at the material receiving end of the screen and progressively dimensioning toward the discharge end thereof as the quantity of undersized material passing through the screen decreases) which results in local stretching and variations in mesh size, thereby necessitating frequent replacement of the entire section in order to obtain a desired and uniform screening action.

It is therefore the object of this invention to provide an improved deck construction for vibrating screens which will effect one or more of the following results and/or advantages: (1) eliminate replacement of the screen forming the entire deck when only a portion of the screen becomes worn; (2) permit rearranging portions of the screen deck to effect a more uniform wear throughout its length; (3) permit variably tensioning different longitudinal sections of the screen deck; and (4) a durable and simplified construction which can be manufactured, installed and serviced with a minimum of time and expense.

In accordance with this invention, one or more of the aforementioned advantages and results may be obtained by forming a deck with a plurality of similar and preferably interchangeable screen sections disposed in end to end relation and providing means intermediate the ends of the deck for simultaneously adjusting the longitudinal tension of two adjacent screen sections.

The invention accordingly consists of the details of construction, combinations of elements and arrangements of parts as more fully set forth in the accompanying claims and in the detailed description, reference being had to the accompanying drawing, in which:

Fig. 1 is a plan view of a screen deck embodying the invention;

Fig. 2 is a vertical section taken on line II—II of Fig. 1;

Fig. 3 is an enlarged partial section illustrating the means for simultaneously adjusting the longitudinal tension of two adjacent sections;

Fig. 4 is a side elevation of the structure shown in Fig. 3;

Fig. 5 is a plan view of a modified screen section adjusting means; and

Fig. 6 is a side elevation of the structure shown in Fig. 5 with parts broken away to better show the construction.

Referring particularly to Figs. 1 and 2, it is seen that a screen deck construction embodying the invention may include a frame 1 comprising spaced opposed longitudinally extending side members 2, longitudinally spaced end members 3 interconnecting said side members, and an intermediate vibrating mechanism support 4 mounted on brackets 6 carried by opposed wall portions of the side members 2. A conventional vibrating mechanism 7 is suitably mounted on the support 4 and the entire structure is suspended from a fixed structure (not shown) by means of four vertically extending rods 8.

A plurality of screen cloth sections, including for purposes of illustration end sections 9 and 12 and an intermediate section 11, are mounted in said frame in longitudinal relation for the passage of material successively thereover by means of the screen cloth clamping plates 13 and 14 adjustably attached to the end members 3 and two intermediate transverse screen hook engaging rod members 16 and 17 which are supported in longitudinally spaced relation by opposed wall portions of the side members 2. Each of said screen cloth sections has its opposite ends or edges provided with oppositely bent hooks 18 and 19 adapted to engage the clamping plates 13 and 14 and the transverse rod members 16 and 17 in the manner shown in Fig. 2. Rod members 16 and 17 are necessarily spaced apart and from said clamping plates distances approximately equal to the length of the screen cloth section which is to be stretched thereacross and each of said sections is additionally supported intermediate its ends by a series of longitudinally spaced cross members 21 which are preferably provided with screen cloth engaging buffer strips 22 formed of rubber or other suitable material and which are arranged in progressively displaced relation to provide in effect a crowned support over which the cloth is stretched. In this connection, the

transverse members 16 and 17 are preferably spaced equal distances from each other and from the clamping plates 13 and 14 in order to reduce manufacturing costs and render the screen cloth sections interchangeable in the event of non-uniform wear thereon. Material passing over the deck is prevented from falling between the side edge of the screen cloth and the side members 2 by means of resilient seal strips 23 which are attached to the side members 2 in any suitable manner (not shown) with their lower edges in engagement with the upper surface of the side margins of the screen cloth sections. The discharge end of the frame 1 is preferably provided with a rearwardly extending apron 24 which shields the clamping plate 14 and the adjusting mechanism therefor and directs the material leaving the screen cloth section 12 away from the screen frame.

Clamping plates 13 and 14 are each mounted to vary the longitudinal tension of the screen sections hooked thereon by means of a plurality of spaced bolts 26 each of which extends through the adjacent end member 3 and has one end attached to the adjacent clamping plate and its other exposed end surrounded by a compression spring 27 interposed between its head and the outside wall surface of said end member. The transverse member 17 is also mounted for simultaneously varying the longitudinal tension of two screen cloth sections 11 and 12 by means of rectangular plates 28 which are secured to the ends of the member 17 and are slidably disposed in rectangular openings 29 formed in opposed wall portions of the side members 2 for longitudinal movement relative thereto. The plates 28 are slidably retained in said openings by means of larger plates 31 which may be removably secured thereto and in sliding engagement with the outside wall surface of the side members by any suitable means such as bolts 32. Longitudinal adjustment of the plates 31 and thereby the plate 28 and member 17 is effected by means of bolts 33 which extend through aligned openings provided in opposed wall portions of the projections 34 and 36 secured to the plates 31 and side members 2, respectively, as is clearly shown in Figs. 1, 3 and 4. It should now be apparent that the tensioning devices hereinbefore described provide means for readily varying the longitudinal tension (a) of end section 9 by adjusting clamping plate 13, (b) of intermediate section 11 and end section 12 by longitudinally adjusting member 17, and (c) of end section 12 by adjusting clamping plate 14. Obviously, a longitudinal adjustment of member 17 in a direction effective to increase the tension of section 11 simultaneously effects a decrease in the tension of section 12 thereby necessitating an adjustment of the clamping plate 14 if the tension of section 12 is to be increased or maintained as it was prior to said adjustment of member 17. The same is true when member 17 is adjusted to effect a decrease in the tension of section 11 and in this connection, it should also be obvious that, if desired, the various sections may be given different degrees of tension.

Referring to Figs. 4 and 5 in which like numerals are used to designate the same or similar parts, it is seen that transverse member 17 is modified for angular adjustment thereby rendering same effective to simultaneously increase or decrease the tension of sections 11 and 12. Said modification consists in employing a round shaft 34 having a squared end 35 for rotating same

and enclosing said shaft in a tube 37 which is removably secured to the shaft for rotation therewith by any suitable means, such as pins 38, and which has welded thereto oppositely extending screen hook receiving projections 39 adapted to be engaged by the hooked ends 19 and 13 of screen sections 11 and 12, respectively. The shaft 34 is supported for angular movement in aligned holes provided in opposed wall portions of the side members 2 and the squared end of the shaft extends beyond the outer wall portion of the adjacent side member a sufficient distance to mount thereon a ratchet wheel 41 having its hub portion secured to said shaft for angular movement therewith by means of a set screw 42. Projections 39 are so arranged that a clockwise movement of shaft 34 and tube 37 (the shaft, tube and ratchet wheel move as a unit) simultaneously increases the longitudinal tension of sections 11 and 12. Movement of the shaft in a counterclockwise direction is prevented by means of a pawl 43 which is prevented from being disengaged from said wheel by means of a removable bolt or pin 44. Tube 37 is approximately equal in length to the distance between the side members 2 and this modified construction permits the tensioning member to be mounted in and removed from an existing frame since if the pins 38 are removed, the shaft can be withdrawn from the tube and the latter can then be placed or removed from between the side member 2, as desired. This procedure should now be obvious and a further description in this connection is deemed unnecessary for a complete understanding of the invention.

The modified construction shown in Figs. 4 and 5 affords all of the advantages inherent in the construction shown in Figs. 1, 2 and 3 and is preferable in installations in which a simultaneous increase or decrease in the tension of the screen sections attached thereto is desired. The invention is applicable to screen deck constructions embodying two or more screen sections regardless of whether or not the screen sections are made interchangeable and it should therefore be understood that, although the invention is disclosed in connection with a deck embodying three screen sections, it is not intended to limit the invention to the exact details of deck and tensioning constructions herein shown and described for purposes of illustration, as various modifications within the scope of the appended claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. A screen deck comprising side walls, a plurality of transverse members including end members and at least two intermediate members connecting said side walls, a plurality of screen cloth sections including end sections and at least one intermediate section disposed in longitudinal relation for the passage of material successively thereover with each section spanning and being supportingly connected with two of said transverse members, each said intermediate member supporting the adjacent ends of two said screen sections and means operably engaging said side walls and at least one said intermediate member to move said intermediate member in a manner effective to change the longitudinal tension of said end and intermediate sections.

2. A screen deck comprising longitudinal side walls, a plurality of transverse members including end members and at least one intermediate

member connecting said side walls a plurality of screen cloth sections disposed in longitudinal relation for the passage of material successively thereover with the proximate ends of two adjacent sections being supportingly connected with said intermediate transverse member, and means operably engaging said side walls and said intermediate member and actuatable to move said intermediate member in a manner effective to simultaneously adjust the longitudinal tension of said two adjacent sections.

3. A screen deck frame for mounting a plurality of screen cloth sections in longitudinal relation for the passage of material successively thereover comprising longitudinal side walls, a plurality of transverse members including end members and at least one intermediate member connecting said side walls, said end members being provided with means for attaching the end of a screen section thereto and said one intermediate member being provided with means for attaching the proximate ends of two adjacent screen sections thereto, and means operative to move said one intermediate member in a manner effective to move said proximate ends of said screen sections in opposite directions to simultaneously increase or decrease the longitudinal tension of the two adjacent screen sections attached thereto.

4. A screen deck frame for mounting a plurality of similar individual screen cloth sections in longitudinal relation for the passage of material successively thereover comprising longitudinal side walls, a plurality of transverse members including end members and at least one intermediate member connecting said side walls and being provided with means for attaching the ends of screen sections thereto, proximate ends of two adjacent said screen sections being attached to each said intermediate member and means for longitudinally adjusting an intermediate one of said transverse members comprising oppositely disposed slots in said side walls, a plate substantially covering each of said slots and being connected with said transverse member for movement therewith, and means mounted on said side

walls for adjusting the longitudinal position of said plates to simultaneously vary the tension of said two adjacent screen sections operatively connected thereto.

5. A screen deck comprising longitudinal side walls, a plurality of similar individual screen cloth sections, a plurality of equally spaced transverse members including end members and at least one intermediate member connecting said side walls and interchangeably mounting said screen cloth section in longitudinal relation for the passage of material successively thereover at least one said intermediate member having mounted thereon proximate ends of two adjacent said screen sections, and adjusting means for rotating said intermediate member in a manner effective to simultaneously tension said two adjacent screen sections.

6. The structure of claim 5 in which said adjusting means comprises means operatively engaging said side walls to retain said adjusting means in adjusted position against the tension of said screen sections.

7. A screen deck comprising side walls, a plurality of transverse members including end members each having a free edge and at least one intermediate member having a pair of oppositely extending free edges, a plurality of separate readily reversible and interchangeable screen cloth sections each provided with a rigid hook strip at each end thereof, said sections being disposed in longitudinal relation for the passage of material successively thereover with each section spanning and being supportingly connected with two of said transverse members by engagement of said hook strips with oppositely extending said free edges, each said intermediate member so supporting adjacent ends of two said screen sections, and means operably engaging said side walls and an intermediate member to adjust the position of said intermediate member for simultaneously changing the longitudinal tension of the two adjacent screen sections supported thereon.

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