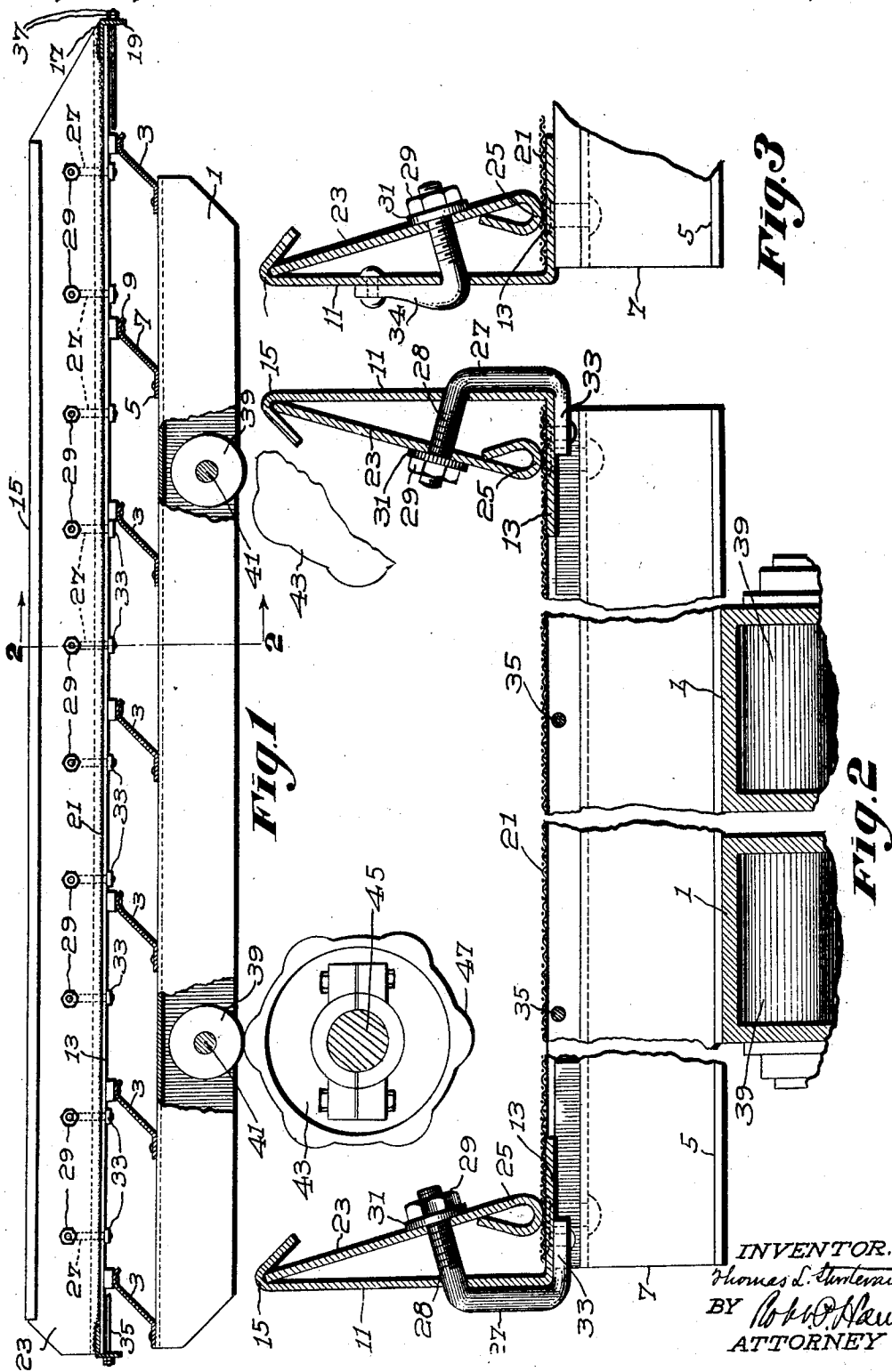


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SCREEN SEPARATOR.  
APPLICATION FILED NOV. 1, 1920.

1,397,343.

Patented Nov. 15, 1921.



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# UNITED STATES PATENT OFFICE.

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## SCREEN-SEPARATOR.

1,397,343.

Specification of Letters Patent.

Patented Nov. 15, 1921.

Application filed November 1, 1920. Serial No. 420,915.

*To all whom it may concern:*

Be it known that I, THOMAS L. STURTEVANT, a citizen of the United States, residing at Quincy, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Screen-Separators, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to screen separators for grading materials, and more particularly to simple and efficient means for supporting the screen clothing for grading the materials.

In use the screen clothing becomes worn so that it is necessary from time to time to remove the clothing from the separator, and to substitute new clothing therefor. It is desirable that the separator shall be out of commission as short a time as possible, and to accomplish this, it is necessary that the construction of the means for holding the screen clothing should be such that the clothing may be quickly and easily removed from its support, and new clothing quickly and easily substituted therefor. The present invention is directed to means for accomplishing these results.

The character of the invention may be best understood by reference to the following description of one good form thereof shown in the accompanying drawing, wherein:—

Figure 1 is a side elevation of the support for the screen clothing, certain parts being broken away to disclose parts beyond the same;

Fig. 2 on an enlarged scale is a transverse section taken on line 2—2 of Fig. 1; and

Fig. 3 is a sectional detail of a slightly modified form of construction.

Referring to the drawing, the construction shown therein as one good form of the invention, comprises a suitable support, in the present instance, including members or channels 1 extending longitudinally of the support, and transverse members or bars 3 mounted on and secured to the backs of the channels at suitable intervals. Each of these members 3 may have a flat portion 5 for con-

nection with the backs of the channels, an upstanding inclined portion 7, and a curved upper end portion 9.

The channels may be of a resilient character such that they may flex longitudinally and transversely, and the transverse members may have a resilient character such that they may flex longitudinally and transversely, and the upper curved end portions thereof may move relatively to the channels. A pair of members or plates 11 may be located at opposite sides of the support, and in the present instance of the invention, each of these plates has an inturned flange 13 which may be riveted or otherwise secured to the curved portions of the transverse members 3 adjacent the ends thereof. The upper edges of the side plates 11 may be bent over to present seats 15.

The ends of the flange plates 11 may be connected to angle bars 17 having depending flanges 19.

Usually in screens of this type it is customary to provide a frame for the screen clothing, and to rivet or otherwise permanently connect the margins of the clothing to its frame. As a consequence, when the clothing becomes worn and it is necessary to substitute new clothing therefor, the frame must be removed together with the clothing. In the present instance, however, it is unnecessary to provide a frame for the clothing.

The clothing 21 may be formed of woven wire of various sizes and mesh, depending on the character of separation desired. This clothing, in the present instance, is cut to proper size, and the edges may remain in the condition they are after being cut, or in some instances, the margins may be bent over, or the edges may be covered by a protecting tape, but this is not indispensable. Suitable means may be provided for gripping opposed margins of the clothing to secure the same to its support. In the present instance of the invention, this means comprises jaws or plates 23 preferably having their lower edges reversely bent to present rounded jaws 25. The upper edges of the jaw plates may rest in the seats 15 or

adjacent thereto. The width of the jaw plates preferably is greater than the width of the plates 11 from their flanges 13 to their seats 15, so that the jaw plates may incline inwardly toward each other and away from the plates 11. The flanges 13 may constitute companion jaws opposed to the jaw plates 23.

Suitable means may be provided for drawing the jaw plates toward their companion jaws 13, in order securely to grip opposed margins of the clothing between them. In the present instance of the invention, this means comprises bolts or members 27 entered through openings in the side plates 11 and the jaw plates 23. The upper ends of these bolts may have threaded portions 28 adapted to receive nuts 29, suitable washers 31 being interposed between said nuts and the jaw plates. Suitable means may be provided for locking the shanks of the bolts against rotation. To accomplish this, in the present instance, the bolts are provided with bent ends 33 which may be riveted or otherwise secured to parts of the side plates. In the form shown in Fig. 2, the end portions 33 extend under the flanges 13 and are riveted thereto, whereas, in the form shown in Fig. 3, the end portions 34 are bent upward and secured to the upstanding portions of the side plates 11.

The construction is such that after the clothing is placed on the flanges 13, the nuts 29 may be tightened, thereby to adjust the jaw plates 23 toward the flanges 13, and securely grip the margins of the clothing between them. Preferably the portions of the bolts extending between the side plates 11 and the jaw plates 23 are inclined with respect to the flanges 13 and extend substantially perpendicularly to the jaw plates 23. As a consequence, when the nuts 29 are tightened, the jaw plates 23 will be slid along the inclined portions of the bolts, and will be positively moved downward and insure pressure of the jaw plates against the clothing. If the reaction of the upper edges of the jaw plates against the seats 15 was relied upon to prevent upward movement of the jaw plates, in the absence of sufficient stiffness or rigidity of the side plates 11, the latter might flex outward and release the clothing, but by the provision of the bolts constructed as described, any possibility of upward releasing movement of the jaw plates is prevented. Also, the bolts desirably reinforce or strengthen the side plates 11, and resist outward flexion thereof. After the clothing has become worn, to remove the same it is merely necessary to release the nuts 29, thereby allowing the jaw plates 23 to release their grip on the margins of the clothing. Thereupon, the clothing may be lifted from the flanges 13. To insert new clothing in place of the old clothing, it is

merely necessary to lay the same on the flanges 13 beneath the jaw plates 23, and then the nuts 29 may be tightened to bring the opposed jaws toward each other so as to securely grip the clothing between them.

The clothing may be secured in stretched or unstretched condition, but preferably it is placed on its support in unstretched condition. As a consequence, distortion of the clothing and enlargement of the meshes thereof from the stretching operation are prevented, and the clothing can be relied upon to grade materials with the degree of separation for which the clothing was intended.

It is desirable to provide means for keeping the meshes of the clothing in open condition for efficient grading effect. To accomplish this, in the present instance, rods 35 may be provided extending between the clothing and the upper edges of the transverse members 3, and having their ends entered through the depending flanges 19 of the end angle bars 17. Adjusting nuts and lock nuts 37 may be provided on the rods, properly to tension the rods.

Any suitable means may be provided for vibrating the clothing. To accomplish this, in the present instance, the clothing and its support are bodily vibrated or shaken. To this end the channels 1 may be provided with followers or rollers 39 mounted on shafts 41 carried by the depending flanges of the channels, and these rollers rest on cams 43 mounted on shafts 45 journaled in suitable bearings. The cams may have projections 47 thereon, so that in the course of the rotation, these humps or projections will engage the rollers and vigorously vibrate the supporting frame. Preferably the cams are disposed on their shafts in a manner such that the humps or projections will engage the followers out of step, thereby to impart a vigorous rocking movement to the frame in a variety of directions. The means for vibrating the frame and the clothing may be similar to that disclosed in my co-pending application Serial No. 408,003, filed Sept. 3, 1920, and therefore, it is unnecessary to show and describe the same in detail herein.

The construction is such that the channels 1 will receive pronounced vibratory movements longitudinally and transversely thereof, and the transverse bars 3 will receive pronounced vibratory movements longitudinally and transversely thereof. These vibratory movements will cause the clothing and the rods 35 vigorously to slap against each other, and cause the rods to slap against and rebound from the upper edges of the transverse members, and thereby maintain the meshes of the clothing in open condition for efficient grading effect.

The screen and its support may be mount-

ed in a casing, or may be carried by a frame of unusual construction, and therefore, it is unnecessary to show and describe the same herein.

5 Preferably one of the cam shafts is mounted in bearings located at a higher level than the bearings for the other cam shaft, so that the screen will occupy an inclined position, such that materials delivered to the upper end of the screen may slide along the same toward the lower end thereof. The finer particles will pass through the meshes of the clothing, while the coarser particles or tailings will flow along the upper surface of the clothing.

10 It will be understood that the invention is not limited to the specific embodiment shown, and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

20 What is claimed is:—

1. In a separator, the combination of a support having side plates provided with inturned flanges and seats, jaw plates having edges in said seats and gripping portions, screen clothing having margins between said inturned flanges and gripping portions, bolts having portions projecting rigidly from the side plates and inclined with respect to said flanges automatically to exert a pulling force upon the jaw plates in an inclined direction toward said flanges to press the gripping portions of the plates against the flanges when the nuts of the bolts are tightened.

2. In a separator, the combination of a support having opposed gripping members at opposite sides thereof, screen clothing having margins between said gripping members, and devices inclined in respect to the plane of the clothing for exerting a pulling force upon one of the cooperating gripping members in a direction inclined to the other gripping member to relatively move the members into secure gripping relation with the margin of the clothing.

3. In a separator, the combination of a support comprising longitudinal members, transverse members mounted on said longitudinal members, side members mounted on said transverse members, gripping members cooperating with said side members, screen clothing having margins between the gripping members and portions of the side members, and bolts connecting the side members and gripping members to adjust them and adapted to exert a force upon the gripping members in an inclined direction toward the side members to cause the members to grip the margins of the clothing between them when the nuts of the bolts are tightened.

4. In a separator, the combination of a support having side plates thereon, gripping plates opposed to the side plates, screen clothing having portions confined between the side plates and gripping plates, the latter

being inclined in respect to the side plates, and bolts connecting the side plates and gripping plates and adapted to exert a force upon the gripping plates in an inclined direction toward the side plates to move the plates into gripping relation with the clothing when the nuts of the bolts are tightened.

5. In a separator, the combination of a support having pairs of opposed jaws mounted at opposed sides of the support, screen clothing in unstretched condition on said support and having margins between the jaws, bolts connecting the jaws of each pair to adjust them and angularly disposed to force one of the jaws of each pair in an inclined direction toward its companion jaw securely to grip the clothing between the jaws.

6. In a separator, the combination of a support, upright side plates mounted on said support, screen clothing on the support, jaw plates fulcrumed to the side plates and extending downwardly therefrom in an inclined direction, cooperating jaws upon the side plates and downwardly extending portion of the jaw plates adapted to engage margins of the screen clothing, bolts connecting said plates to adjust them to move one jaw toward the other and having portions bent to extend along the side plates, and means to secure said portions to the side plates to prevent rotation of said bolts.

7. In a separator, the combination of a support having side plates thereon, gripping plates inclined with respect to said side plates, screen clothing having margins gripped by said gripping plates, bolts entered through the side plates and gripping plates and having portions extending substantially perpendicularly to the gripping plates, and nuts adjustable to slide the gripping plates along the inclined portions of the bolts, thereby to press said plates into gripping relation with the clothing.

8. In a separator, the combination of a support, side plates mounted on said support, screen clothing on the support, jaw plates fulcrumed to the side plates, cooperating jaws upon the side plates and jaw plates adapted to grip margins of the screen clothing, bolts connecting said plates to adjust them, and having portions extending along the side plates to reinforce them.

9. In a separator, the combination of a support, side plates mounted on said support, screen clothing on the support, jaw plates cooperating with the side plates, jaws upon the side plates and jaw plates adapted to engage margins of the screen clothing, and a series of securing means extending between the plates at spaced intervals for exerting a pulling force upon one of the cooperating plates in an inclined direction to

ward the other plate to move the plates into gripping relation with the clothing.

10. In a separator, the combination of a support, side plates mounted on said support and having inturned flanges, screen clothing on the support, jaw plates cooperating with the inturned flanges and adapted to engage margins of the screen clothing between them and the flanges, bolts connect-

ing the side plates and jaw plates to adjust one toward the other and having portions extending along the side plates and other portions bent inwardly to extend along the face of the inturned flanges.

In testimony whereof, I have signed my name to this specification.

THOMAS L. STURTEVANT.