Oct. 21, 1941. R. STROUD 2,259,942

VIBRATORY SCREEN

Filed Feb. 7, 1940

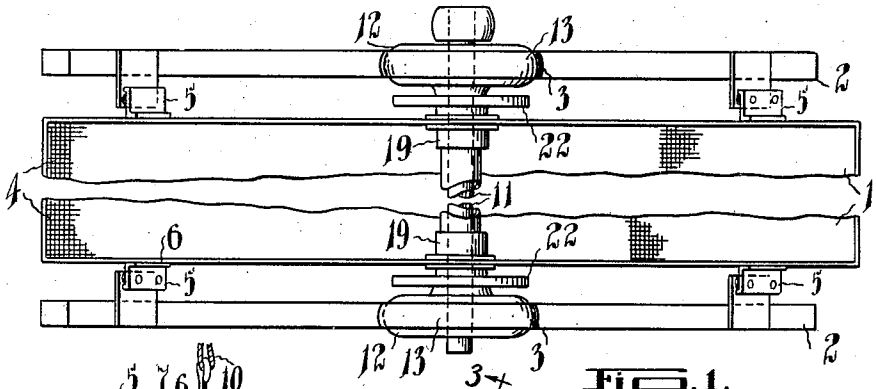


Fig. 1.

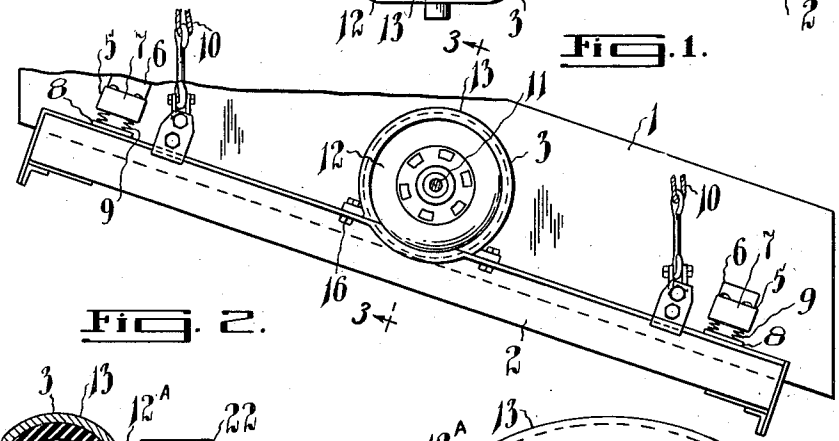


Fig. 2.

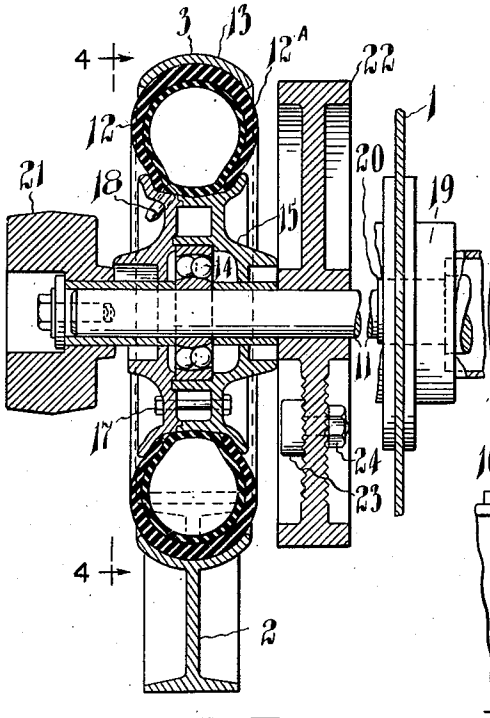


Fig. 3.

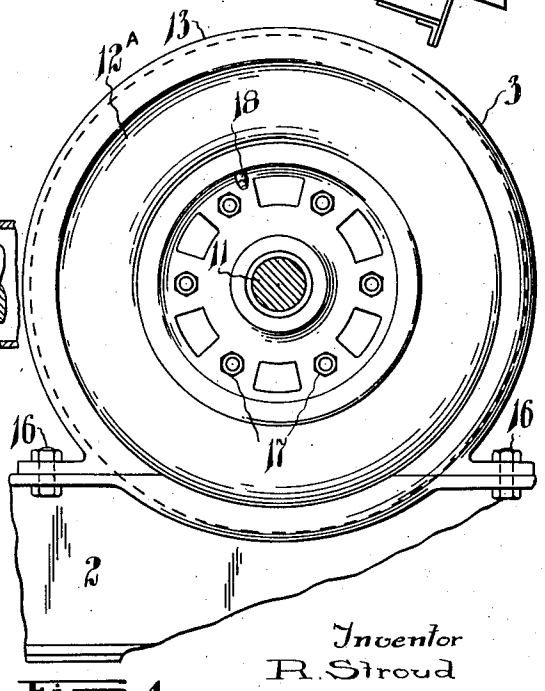


Fig. 4.

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Patented Oct. 21, 1941 2,259,942

UNITED STATES PATENT OFFICE

2,259,942

VIBRATORY SCREEN

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Application February 7, 1940, Serial No. 317,629

2 Claims. (Cl. 209—326)

This invention relates to screening apparatus in which movement is imparted to screens, which are but slightly inclined, to facilitate the flow of discrete material over the screens and a settling out of similar particles.

The object of my invention is to devise a simple, durable construction for the mounting of the device which imparts the movement to the screens which will prevent as far as possible any undue vibration caused by the movement of the screens from being transmitted to members supporting the screen.

The object is attained by means of a construction which may be briefly described as follows. A slightly inclined screen frame is supported by a base at its four corners by any suitable means. Connected to the screen frame and supported by the base is an eccentric gyrating means which gyrates the screen in a plane vertical to the horizontal plane of the screen. To prevent undue vibration of the gyrating means being transmitted to the base of the screen, there is provided a resilient or pneumatic support between the gyrating means and the base of the screen. Means are also provided adapted to increase or decrease the resiliency of this support.

The invention is hereinafter more fully described and illustrated in the accompanying drawing in which:

Figure 1 is a plan view of the apparatus partly broken away,

Figure 2 is a side view partly broken away,

Figure 3 is a sectional view of the gyratory support means taken on line 3—3 in Figure 2, and

Figure 4 is a side view of the supporting means taken on line 4—4 in Figure 3.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

The screen frame 1 is supported by the base 2 and on which is carried the gyrating means 3.

The screen frame 1 which carries the screens 4 is resiliently mounted on the base 2 by means of resilient supports 5 at four corners.

In the resilient mountings 5, rubber could be used as a means to secure the desired resiliency. However, in this case the resilient support is constructed as follows. Secured to the side of the screen frame 1, are outwardly projecting angle brackets 6 having downwardly extending sides 7. Secured to the base 2 are inwardly projecting brackets 8 located directly below the angle brackets 6. Secured to the brackets 8 and springs 9 which project upwardly and are secured to the angle brackets 6 by any suitable means. It may be seen that this type of mounting will allow the screen frame to move freely in any direction to a limited extent.

The base 2 can be supported from below by any suitable means. However, in this case it is shown as being suspended from an overhead support by means of the cables 10.

The shaft 11 of the gyrating means 3 for the screen frame 1 is carried by the base 2 and runs transversely of the screen frame 1. The shaft 11 is journalled at its outer ends in bearings 14 which are carried by the base 2 by means of pneumatic supports 12. The housing 15 of the bearing 14 forms an inner seat for an annular pneumatic bearing support 12. The pneumatic annular support 12 is held in position by means of the outer seat 13 which is secured to the base 2 by means of the bolts 16. To facilitate the removal of the pneumatic support 12 from the inner seat, the inner seat is made in two parts which are secured together by the bolts 17. So that the resiliency of the pneumatic support 12 can be increased or decreased, there is supplied a valve 18 through which the pressure of the air in the pneumatic support 12 can be increased or decreased thereby increasing or decreasing the resiliency of the support

Carried by the screen frame 1 are two bearings 19 one on each side of the scren frame. These bearings may be ball bearings, roller bearings or plain bearings as shown in the drawings. Engaging the bearings 19 is an eccentric 20 which is integral with the shaft 11 and engages the bearings 14.

Secured to one end of the shaft 11 is a driving pulley 21. This pulley may be driven by a motor carried by the base 2 or by any other suitable means.

Carried on the shaft at each side of the screen between the base 2 and the screen frame 1, are fly wheels 22. These fly wheels 22 are secured by any suitable means to portions of the shaft 11 which are concentric to the bearings 14 and the pulley 21. Carried on the web of each fly wheel 22 is a movable weight 23 secured thereto by the bolt 24. By moving this weight 23 in or out, it is possible to increase or decrease the amount of unbalance of the fly wheel 22.

If the fly wheel 22 is properly balanced by the weight 23 so as to offset the inertia of the screen 1, the screen 1 will gyrate in an orbit equal in diameter to twice the throw of the eccentric 20 and the shaft will rotate about its centre. In a case like this, there would be little or no flexing

of the pneumatic support 12. However, if the movable weight 23 is moved inwardly so that the unbalance of the fly wheel is not sufficient to offset the inertia of the screen, the fly wheel and shaft will move in a direction opposite to that of the screen and thereby decreases the effectiveness of the eccentric 20 on the shaft 11 thereby causing the screen to gyrate in an orbit of a diameter of less than twice the throw of the eccentric. If the weight 23 is moved towards the rim of the fly wheel, the fly wheel and shaft will move in the same direction as the screen thereby increasing the effectiveness of the eccentric 20 on the shaft 11 causing the screen to gyrate in an orbit of a diameter of more than twice the throw of the eccentric.

In other words, when the amount of unbalance of the fly wheel is not sufficient to offset the inertia of the screen, the fly wheel and shaft will move in a direction opposite to that of the screen thereby partly neutralizing the effectiveness of the eccentric 20 on the shaft 11.

However, when the weight 23 is moved outwardly towards the rim of the fly wheel, the fly wheel and shaft will move in the same direction as the screen, thereby increasing the effectiveness of the eccentric 20 on the shaft 11.

The effectiveness of each state of unbalance can be increased or decreased by increasing or decreasing the pressure of the air in the pneumatic support 12. The increase of pressure, of course, would offer a much greater resistance to the movement of the shaft 11 and the decrease of pressure would offer less resistance to the movement of the shaft 11 whereby the orbit in which the shaft rotates can be controlled by varying the inflation of the pneumatic support 12.

What I claim as my invention is:

1. A screening apparatus comprising a base; a screen frame resiliently mounted on said base; and means for imparting gyratory movement to said screen frame including a shaft, a bearing for said shaft, a bearing carried by said screen, an eccentric on said shaft journalled in said screen frame bearing to gyrate the screen frame when said shaft is rotated, a counter balancing fly wheel on said shaft, a movable weight on said fly wheel to vary the amount of unbalance of said wheel, an annular pneumatic tube, a valve adapted to permit the inflating and deflating of said tube and thereby regulating the resilience thereof, an outer seat for said tube carried by the base, and an inner seat for said tube carrying the shaft bearing.

2. A screening apparatus comprising a base; a screen frame resiliently mounted on said base; and means for imparting gyratory movement to said screen frame, including a shaft, a bearing for said shaft, a bearing carried by said screen, an eccentric on said shaft journalled in said screen frame bearing to gyrate the screen frame when said shaft is rotated, an annular pneumatic tube, a valve adapted to permit the inflating and deflating of said tube and thereby regulating the resilience thereof, an outer seat for said tube carried by the base, and an inner seat for said tube carrying the shaft bearing.

ROBERT STROUD.