

Oct. 6, 1942.

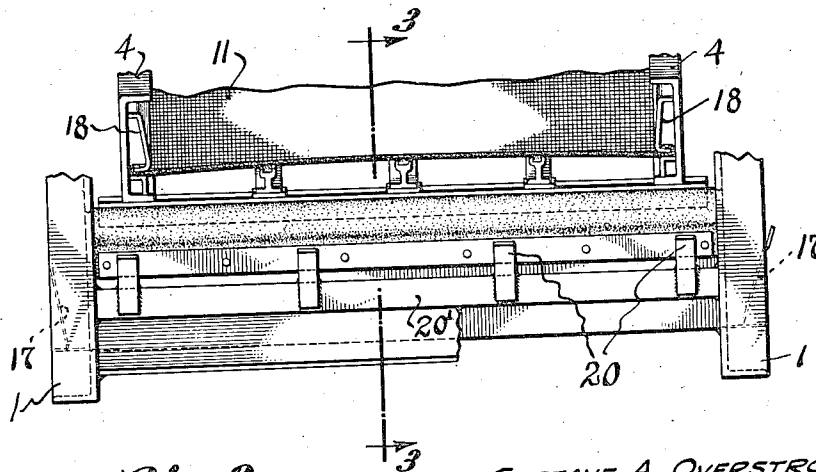
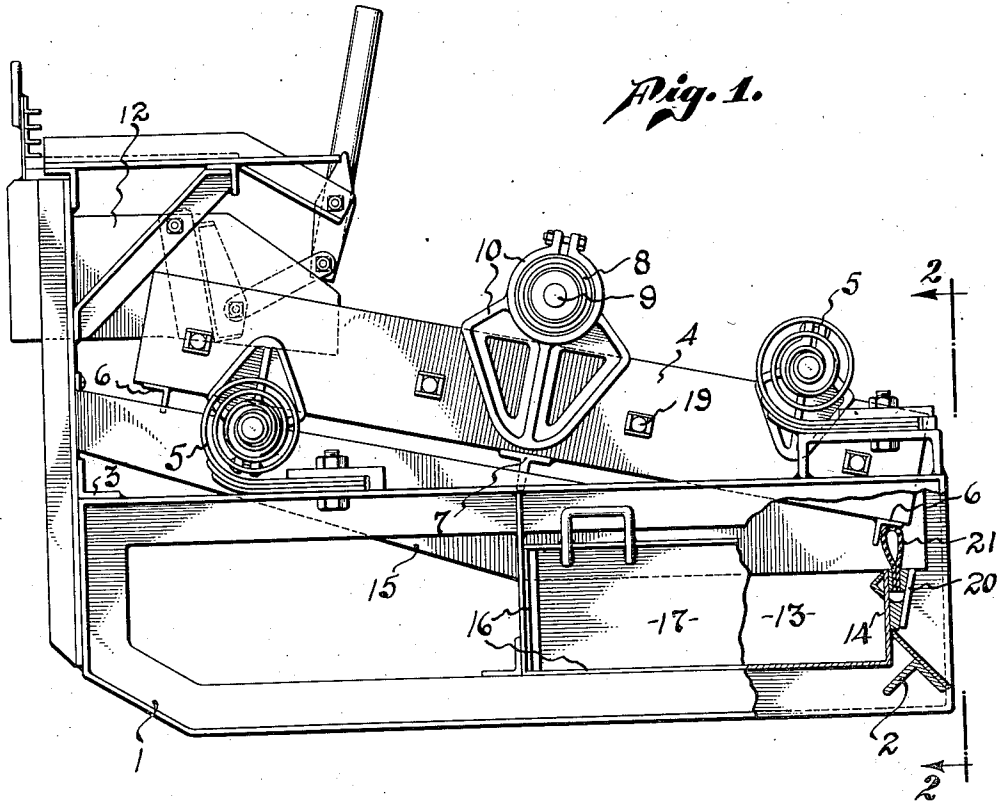
G. A. OVERSTROM ET AL

2,298,153

VIBRATING SCREEN

Filed July 2, 1941

2 Sheets-Sheet 1



GUSTAVE A. OVERSTROM,
GEORGE OVERSTROM,
CONRAD OVERSTROM,
INVENTORS

BY *Daby Daby*
ATTORNEYS

Oct. 6, 1942.

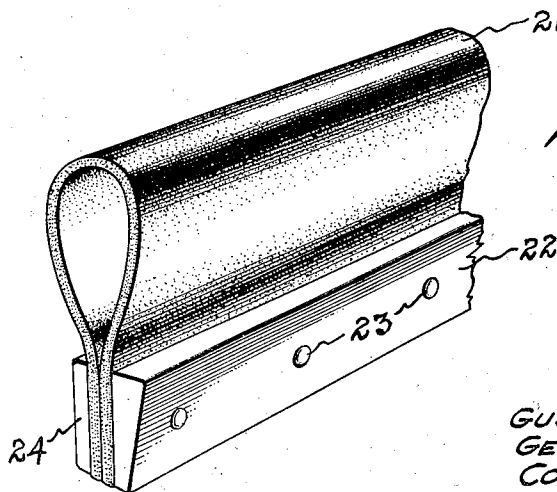
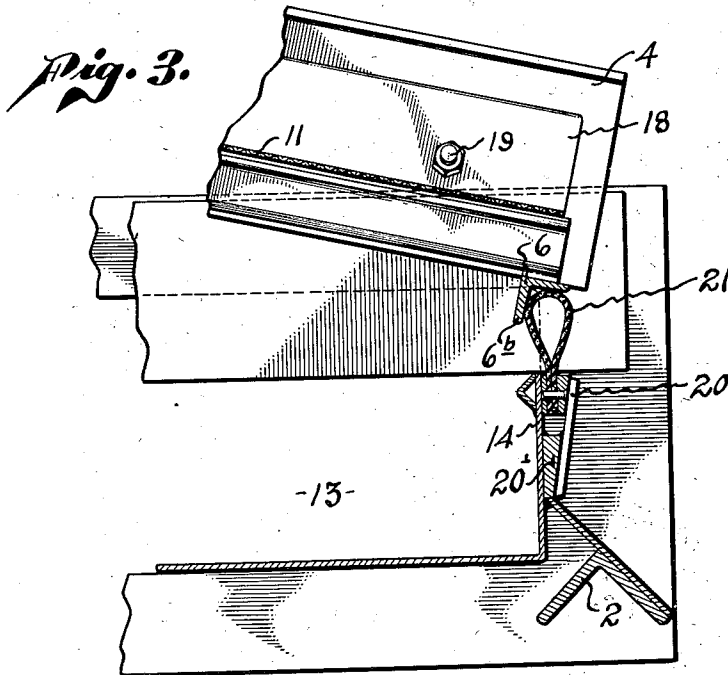
G. A. OVERSTROM ET AL

2,298,153

VIBRATING SCREEN

Filed July 2, 1941

2 Sheets-Sheet 2



GUSTAVE A. OVERSTROM,
GEORGE OVERSTROM,
CONRAD OVERSTROM,
INVENTORS

BY *Darby Darby*

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,298,153

VIBRATING SCREEN

Gustave A. Overstrom and George Overstrom,
Eagle Rock, and Conrad Overstrom, Pasadena,
Calif.

Application July 2, 1941, Serial No. 400,764

7 Claims. (Cl. 209-255)

This invention relates to improvements in vibrating screens, particularly of the type designed for the treatment of rotary mud, pottery clay, and the like, wherein the screen box has movements in a vertical plane so as to have a downward and backward motion at the discharge end during a portion of its cycle.

This invention is particularly concerned with improvements in the manner of mounting and securing a flexible closure member or sealing member interposed between the screen box and an associated trough or tank.

It has been found from practical experience in the screening of sticky materials such as rotary mud used in the drilling of oil wells, and of pottery slip, where for one reason or another it is not possible to employ a stream of water to wash away the waste, that, under these conditions, oversize material which is discharged from the screen cloth at the delivery end of the screen, piles up in front of the screen until it reaches the level of the screen cloth. The discharged or oversize material thus piled up in front of the screen is subject to a backward scraping action caused by the downward and backward travel of the screen box in a portion of its operative cycle. The cross tie member or brace on the underside of the screen box at the discharge end causes a backward scraping movement of the oversize material in under the screen box and cloth so that it becomes mixed with the undersized material and contaminates the same. Particularly is this action true in vibrating screens of the type having a screen box which is resiliently supported for and subject to free vibration in a vertical plane so that the motion thereof varies from circular to oval. In structures of this type, naturally, a space must be left around the screen box to permit such free movements thereof, and it is this very space that provides a place of entry or back travel of the oversize materials by reason of the scraping movement of the cross ties of the screen box at the discharge end when the screen box is on its downward and backward cycle of travel.

In the applicants' copending application, Serial No. 249,548, dated January 6, 1939, it was found that when one end of the flexible closure member was connected directly to the screen box and when, for example, a turbine would run away, the end of the flexible member attached to the screen box would be wrecked due to the intense vibration from overspread. It was likewise found that when one end of the flexible closure member was connected to the cross tie at 55

the discharge end of the screen box by means of bolts that acids in the rotary mud would rust the bolt heads or nuts, making it difficult to quickly change a flexible closure member should one find it necessary to do so. It was also found that the construction of fastening one end of a flexible closure member to a cross tie at the discharge end of the screen box by means of bolts was quite expensive; and this invention is an improvement to accomplish objects impossible to accomplish by the other construction.

The general object of the invention is to provide a construction in vibratory screens of this type which will prevent the cross tie members of the screen box at the discharge end from scraping oversize materials into the screened or undersized material.

Another object of the invention is to provide a flexible seal or closure member that can be quickly detached from the trough without detaching the same from the screen box.

Another object of the invention is to provide a sufficient surface to form a double seal where the ends of the closure member come in contact with the trough.

Another object of the invention is to provide a surface to arrest a backward movement of the flexible closure member.

This invention resides substantially in the construction, arrangement and relative location of parts, all as will be described in full detail below.

In the accompanying drawings, in which the same reference numerals have been used throughout, to indicate the same or similar parts:

Figure 1 is a side elevational view, parts broken away, of a power-driven vibratory screen of the type in which the screen box and cloth are supported for substantially free vibration in a vertical plane in a closed, curved path, to which the invention has been applied;

Figure 2 is a front elevation of Figure 1, parts broken away, looking in the direction of the arrows 2-2;

Figure 3 is an enlarged sectional elevation, parts broken away, of the screen structure taken along lines 3-3 of Figure 2; and

Figure 4 is an enlarged perspective view of an end portion of the flexible closure member.

Referring to the drawings there is shown in Figure 1 and Figure 2 a screen structure which will be described only in general terms in order that the type of a screen to which the invention

is applicable may be understood without going into the details of construction thereof.

Screen structures of this general type usually include some form of supporting frame or base, which in this particular case is illustrated by the pair of side members 1 which may be made of any suitable material, for example, angle irons connected and braced together by cross ties 2 and 3, as well as by the remaining structure as will appear later. The cross ties may be bolted or welded to the frame members 1.

The screen box 4 is shown supported on the top of the frame by means of springs 5 of any suitable form to permit vibration of the screen box in a closed, curved path in a vertical plane. In general, the screen box is made up of side members connected by cross ties or braces 6 and T's 7; the ties in this case being illustrated as angle irons. The screen box is further braced transversely by reason of the fact that the tube 8 in which the unbalanced vibrating member 9 is rotatably mounted, is clamped in clamp brackets 10 in accordance with well-known practice.

The screen cloth is shown at 11 mounted in the box and arranged for being placed under transverse tension as will be explained later.

At 12 is generally indicated the hopper structure by means of which material is fed onto the screen cloth. Located under the screen box is a trough or tank illustrated as comprising a central portion 13 and two extending portions 14 and 15 so that all the material that passes through the screen cloth is collected in the trough. This trough or tank is provided with one or more side exit chutes 16 which may be closed by means of a sliding door 17.

The screen cloth is stretched in the screen box in the manner well-known in practice. The longitudinal edges of the screen cloth are bound in metal binders, and stretcher bar members 18 actuated by stretching bolts 19 move the bars toward the sides of the box in such a manner that the cloth is stretched tight in the box. There are a plurality of stretcher bolts 19 along the length of the box sides so that they may be all evenly tensioned, effecting a uniform tensioning of the cloth in the box.

It will be seen in Figure 3 that there is a space between the bottom of the angle iron 6 and the upper edge of the trough extension 14, which must be provided to permit free vibration of the screen box. This is the space through which, as will be explained later, the discharged oversized material is undesirably worked back into the trough under the screen box.

Spaced across the discharge end of the screen shown in Figure 2 are wedge arms 20 welded to a reinforcing bar 20' which in turn is welded to the outside face of the lip of the tank 14. The flexible closure member illustrated in Figure 4 comprises a flexible strip of rubber 21 whose ends are held together by means of a wedge bar 22 riveted by means of rivets 23 to a rectangular bar 24. This flexible rubber strip is inserted in the space provided, and the wedge strip 22 firmly makes contact with the arm or mating members 20.

It has been observed in practice that the easiest way to insert the strip is to bend the tubular part of the rubber at right angles to the vertical portion shown in Figure 4, and when the flexible tubular member is thus folded over, it is easy to insert the strip, leaving to the operation of the machine itself the manner of causing the

flexible closure member to fit snugly against the vertical leg 6^b of the cross member 6. It has been found that the motion of the machine itself will cause the flexible tube to travel to the left in Figure 3 until the tube is stopped by the flange 6^b.

Likewise, it has been found that to replace the flexible closure member all that is necessary is to bend the tubular part to the right, Figure 3, and then knock the wedge pieces loose from the mating fingers 20. The vertical ends of the tubular flexible closure member shown in Figure 4, left-hand side, fit snugly against the vertical longitudinal side walls of the trough. The curved surface of the tubular flexible closure member, of course, makes contact with both legs of the angle iron 6, the leg 6^b acting as a means to arrest the backward travel imparted to the flexible closure member by means of the screen. Thus it will be seen that this tubular flexible closure member seals the longitudinal vertical sides of the trough with a double seal at its ends, and also makes a double seal with the cross tie member 6 along the horizontal surface of the angle 6, and along the downwardly extending leg 6^b of the same angle.

With the arrangement of this invention, it will be apparent that the objects sought are completely secured without in anyway interfering with the free action of the screen box, and in a manner which permits detachment of the tubular flexible closure member very quickly; for example, all that is necessary to remove this flexible closure member is to loosen the lower edge of wedge member 22 with a hammer, and when wedge 22 is free from its mating arms the strip is immediately detachable without any further labor having to be performed upon it.

It will be noted that it is not necessary to remove bolts of any kind or character to remove the tubular flexible closure member, nor must one attach any bolts of any kind or character to insert the strip. After insertion the strip forms a double seal at its ends and a double seal along its curved surface.

It will be apparent to those skilled in the art that the details of this invention may be readily varied without departing from the true and novel scope thereof. We do not, therefore, desire to be strictly limited to the disclosure as given for purposes of illustration, but rather to the scope of the appended claims.

What is claimed is:

1. The combination with a vibrating screen and a trough mounted under the screen so that the discharge end of the screen is spaced above the forward end of the trough, of a flexible member extending transversely of the screen and closing said opening, and means for firmly holding one edge of the flexible member, the other edge being free and held in line contact with the screen by the resiliency of the member itself.

2. The combination with a vibrating screen and a trough mounted under the screen so that the discharge end of the screen is spaced above the forward end of the trough, of a tubular flexible member for closing said opening, and means for securing the member along one side edge only to the trough so that the free side edge of the member contacts the screen box along its other edge on several lines of contact.

3. In an apparatus of the type described the combination including a resiliently supported screen box having a depending bracing member secured to the bottom thereof near the discharge

end of the screen box, a trough supported under the screen box to receive the material passing through the screen, the discharge end of the screen box being spaced above the forward end of the trough to form an opening, and a flexible member secured at one edge only to the forward end of the trough so as to engage the screen box and close said opening along the unsecured edge of said member.

4. In a mechanism of the type described the combination comprising a resiliently supported screen box, a cross brace secured to the bottom of the screen box near its discharge end, a trough supported under and below said screen box so as to form a space between it and the discharge end of the screen box, a flexible sealing member secured along one edge only to the side of the trough adjacent the discharge end of the screen box so that its free edge engages said brace along at least one line.

5. In a mechanism of the type described the combination comprising a resiliently supported screen box, an angle iron cross brace secured to the bottom of the screen box near its discharge end, a trough supported under and below said screen box so as to form a space between it and the discharge end of the screen box, a flexible sealing member secured to the side of the trough adjacent the discharge end of the screen box

with one edge free so that the free edge engages said angle iron along a plurality of lines.

6. In a mechanism of the type described the combination comprising a resiliently supported screen box, a cross brace secured to the bottom of the screen box near its discharge end, a trough supported under and below said screen box so as to form a space between it and the discharge end of the screen box, an open ended flexible tubular member secured to the side of the trough adjacent the discharge end of the screen box with a free edge which engages said brace along at least one line.

7. In a mechanism of the type described, the combination comprising a resiliently supported screen box, a cross brace secured to the bottom of the screen box near its discharge end, a trough supported under and below said screen box so as to form a space between it and the discharge end of the screen box, an open ended flexible tubular member secured to the side of the trough adjacent the discharge end of the screen box with one edge free so that the free edge engages said cross brace along at least one line, the ends of the tubular member engaging the trough so as to close them.

GUSTAVE A. OVERSTROM.
GEORGE OVERSTROM.
CONRAD OVERSTROM.