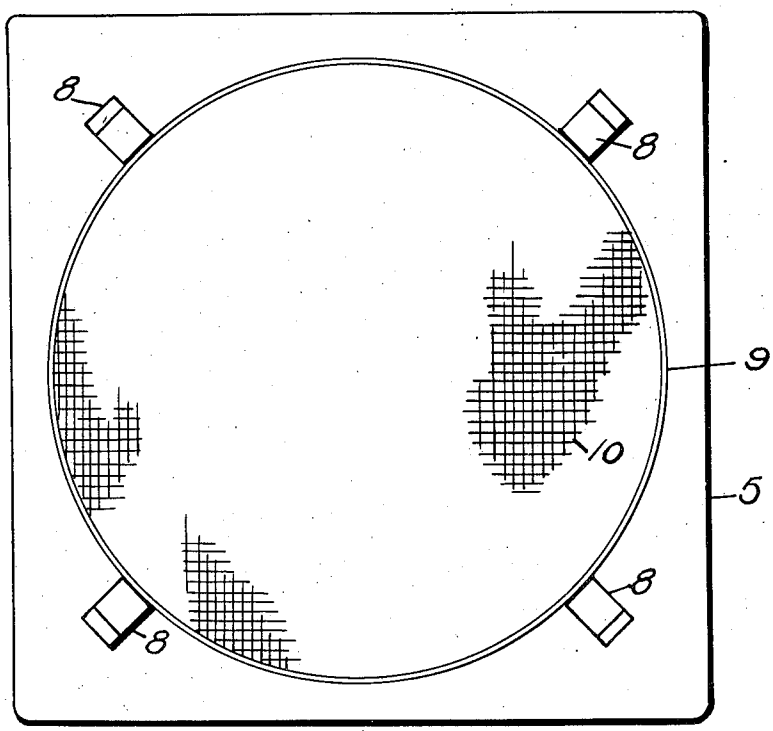
March 2, 1943. M. LINTZ 2,312,343

VIBRATING SCREEN

Filed Feb. 1, 1941

Fig. 1.



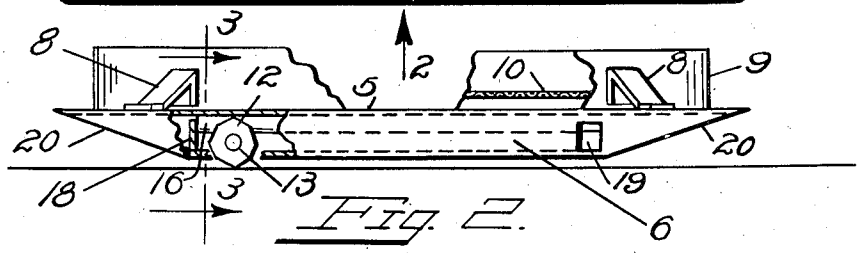


Fig. 2.

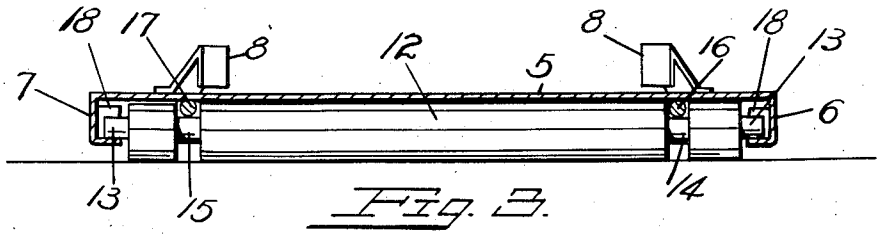


Fig. 3.

INVENTOR.
MARK LINTZ
BY Rolland & McGrew & Campbell
ATTORNEYS.

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VIBRATING SCREEN

Mark Lintz, San Francisco, Calif.

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6 Claims. (Cl. 209—330)

This invention relates to improvements in vibrating screens, particularly the type of screen that is useful for separating divided solids.

A certain amount of vibration greatly facilitates the function of a screen, in that it moves and agitates the material resting upon the screen, thus facilitating the passage of the fines through the meshes of the screen, resulting in more rapid and thorough screening action.

Vibration also serves the useful purpose of breaking up and separating lumps of material that are, in reality, composed entirely or partially of fines.

There is a particular need for such a vibratory screen that readily may be operated by hand where power actuated mechanism is not available, such as in assay and research laboratories or the like.

Therefore, it is a principal object of the present invention to provide a vibratory screen that is particularly effective in rapid screening of material.

Another object is to provide such a screen that readily may be operated by hand without the use of power-driven mechanism.

A further object is to provide a screen having the aforesaid desirable characteristics, that is unusually simple in its component parts and economical to construct.

Still another object is to provide such a screen that is particularly durable.

Other objects and advantages reside in details of design and construction which will be more fully disclosed in the following description and in the drawing wherein like parts have been similarly designated and in which:

Figure 1 is a plan view of a screen made according to the present inventive concept;

Figure 2 is a broken elevation partially in section, of the screen illustrated in Figure 1, looking in the direction of arrow 2; and

Figure 3 is a sectional view taken along the line 3—3 of Figure 2, with the screen element removed.

In order to disclose an operative reduction to practice of the present invention, the accompanying drawing, which is made a part hereof, will be described in some particularity. However, the present disclosure is merely a typical example and it should not be construed to express or to imply any limitation to the invention, the scope of which is, in reality, measured by the appended claims.

While screens made according to the present inventive concept can be made in different sizes for different purposes, the present example is a screen that is well suited for manual operation in a mining research or assay laboratory where divided solids, such as ore, minerals or the like are frequently screened.

In the drawing, reference character 5 denotes a steel plate having downwardly and inwardly turned edges 6 and 7. Mounted upon the upper surface of the plate 5 are a plurality of resilient brackets 8 which are for the purpose of removably receiving and holding a circular screen element 9 which is provided with wire mesh 10 of suitable size.

Carried beneath the plate 5 is an octagonal roller 12 having trunnions 13 that are retained by the downwardly and inwardly turned edges 6 and 7.

Annular grooves 14 and 15 are cut or otherwise produced in the roller 12, the bottom of said grooves being a cylinder somewhat comparable in size and shape to the trunnions 13.

Cylindrical guide rods 16 and 17 are welded or otherwise attached to the bottom of the plate 5 in a position to engage annular grooves 14 and 15 respectively.

Stops indicated by reference character 18 may be provided at opposite ends of the inturned portions of edges 6 and 7 to prevent the trunnions 13 from moving beyond certain limits with reference to the plate 5. These stops 18 may be made by welding or otherwise attaching angle brackets within the inturned edges 6 and 7, or they may be fashioned by partially cutting a portion of the downwardly turned edges 6 and 7 and bending the tongue thus formed inwardly, as indicated at 19.

The extreme opposite ends of the downwardly turned edges 6 and 7 preferably are beveled upwardly as at 20.

In use, the removable screen element 9 is placed upon the plate 5 where it is held by resilient brackets 8, and the material to be screened is placed therein. The operator then grasps either the screen itself or the edges of the plate 5 and rolls the plate from left to right and from right to left upon the octagonal roller 12, which movement obviously transmits sharp vibratory impulses to the plate and to the screen element 9. It will be manifest that the roller 12 is supported upon any convenient flat surface, such as a bench top or the like. To facilitate further the screening action, the entire plate and screen assembly may be rocked about the axis of the roller somewhat from the horizontal position illustrated.

Thus is provided several components of movement and force, in that the material is rocked, shifted from right to left and from left to right, and sharply vibrated with an up and down component which is imparted by the irregular shape of the roller 12.

While an 8-sided or octagonal roller 12 has been found to give excellent results, it will be manifest that rollers of other types may be successfully used, the primary consideration being to provide a roller that has an irregular or non-circular peripheral contour.

It has been found that a roller having less than eight sides is inclined to slide instead of

roll, and a roller having more than eight sides, does not impart so sharp a vibratory movement or force.

As hereinbefore pointed out, the invention is not limited to the instant example, nor is it limited to any particular size, purpose or material of construction. Furthermore, it has been set forth herein that screens made according to the present inventive concept are particularly well adapted for manual operation; however, it might be that, under some circumstances, a screen made according to this disclosure might be actuated by power in order to save labor and take advantage of the excellent screening characteristics of the various components of movement herein provided for.

The relationship of the roller **12** to the plate **5** may be such that the roller **12** is out of contact with the lower surface of the plate **5**, by which arrangement the vibratory impulses would be produced by the bottom of the roller passing over a smooth surface, which vibrations would be transmitted to the plate through cylindrical guide rods **16** and **17** or their equivalents.

On the other hand, the guide rods **16** and **17** may be of such a vertical cross sectional dimension that the vertices of the angular sides of the exterior of roller **12** come into actual contact with the undersurface of the plate **5**, by which arrangement vibratory impulses would be produced both by the roller passing over a supporting surface and also by the roller contacting the under-surface of the plate **5**.

Obviously, the vibratory impulses are generated by the vertices of the angles formed by adjacent sides of the roller **12**. These vertices are radially extending projections which might be provided in numerous different forms such as a roller having flutes, ribs, or lobes, or a roller of star-shaped cross section, or a mere hub having radially projecting arms or spokes, or a roller having the cross section of a polygon of any desired number of sides.

Any of the above-named forms of roller can be made symmetrical or unsymmetrical and there appears to be no geometric term or accepted definition that is generic to so great a variety of these equivalent forms. Therefore, in the following claims, the terms "non-cyclindrical" and "non-circular" are intended to be generic to all types of rollers having a plurality of radially extending projections circumferentially spaced about their perimenters and arranged either symmetrically or unsymmetrically.

What I claim and desire to secure by Letters Patent is:

1. A device of the character disclosed comprising a free-floating non-cylindrical roller having trunnions and having two annular grooves positioned intermediate the trunnions, a plate carried upon the roller and having downwardly and inwardly turned edges positioned to embrace the trunnions, said downwardly and inwardly turned edges forming, together with the bottom of the plate, elongated channels of greater width than the diameter of the trunnions through which the journals of the roller may travel, said edges being beveled upwardly at opposite ends, guide means on the plate positioned to engage the grooves in the roller, a screen element carried upon the plate, and resilient brackets on the plate in a position to hold the screen removably, the surface of the roller projecting downwardly beyond the inwardly turned edges so as to engage a supporting surface.

2. A device of the character described, comprising a body member having means for the support of a screen on its top surface, a non-cylindrical roller loosely journaled on the body for rotary movement lengthwise along the same, and means for communicating vibratory movement of the roller to the screen through the intermediary of the body member, the surface of the roller projecting downwardly beyond the body member so as to engage a supporting surface in its rotary movement lengthwise of the body.

3. A device of the character described, comprising a body member having means for the support of a screen on its top surface, an octagonal roller loosely journaled on the body for rotary movement lengthwise along the same, and means for communicating vibratory movement of the roller to the screen through the intermediary of the body member, the surface of the roller projecting downwardly beyond the body member so as to engage a supporting surface in its rotary movement lengthwise of the body.

4. A device of the character described, comprising a body member having means for the support of a screen on its top surface, guide means on the under surface of the body extending throughout a substantial portion of its length, a non-cylindrical roller supported in the guide means for oscillatory movement therealong and having a surface projecting downwardly beyond the body member so as to engage a supporting surface in its rotation, and means for communicating vibratory movement of the roller to the screen through the intermediary of the body member.

5. A device of the character described, comprising a body member having means for the support of a screen on its top surface, guide means on the under surface of the body extending throughout a substantial portion of its length, a non-cylindrical roller supportedin the guide means for oscillatory movement therealong and having a surface projecting downwardly beyond the body member so as to engage a supporting surface in its rotation, and means associated with the roller for communicating vibratory movement of the roller to the screen throughout the range of its movement in said guide means.

6. A device of the character described, comprising a body member having means for the support of a screen on its top surface, guide means on the under surface of the body extending throughout a substantial portion of its length, a non-cylindrical roller supported in the guide means for oscillatory movement therealong and having a surface projecting downwardly beyond the body member so as to engage a supporting surface in its rotation, and means associated with the roller for communicating vibratory movement of the roller to the screen throughout the range of its movement in said guide means, the body at each end of the guide means having its under surface beveled to facilitate tilting about the axis of rotation of said roller.

MARK LINTZ.