(No Model.)

V. DISTL & A. SUSKY.

SCREENING APPARATUS.

No. 530,261. Patented Dec. 4, 1894.

Fig. 1.

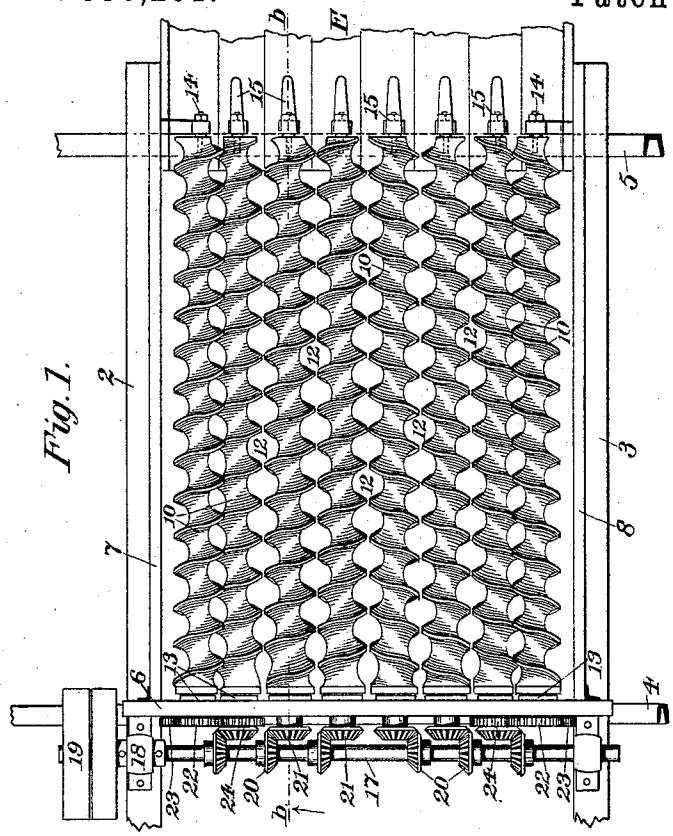


Fig. 3.

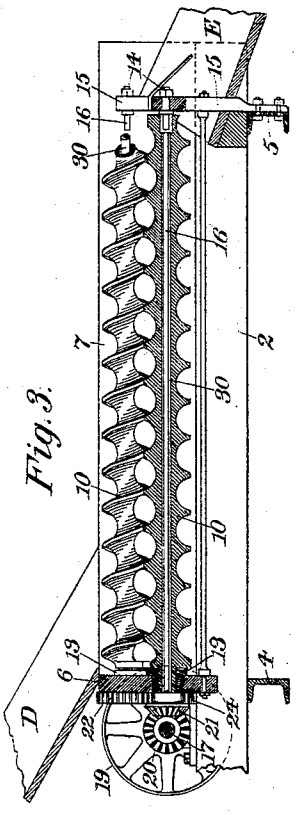


Fig. 4.

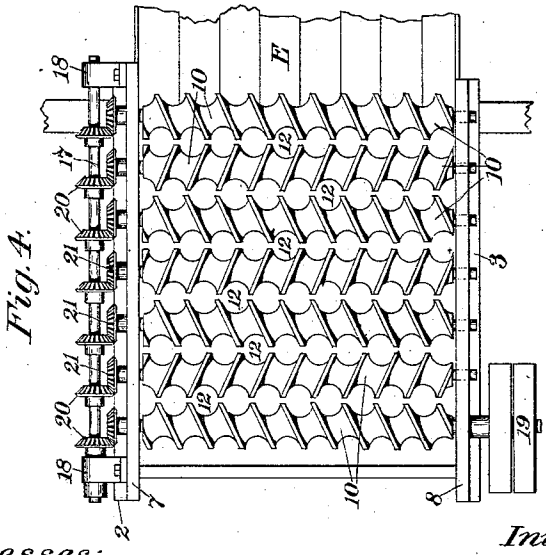
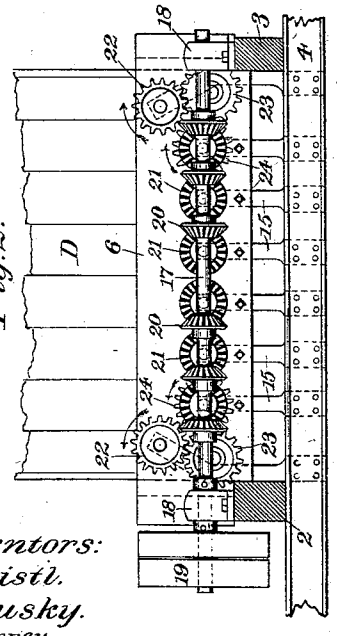


Fig. 2.



Witnesses:
F. L. Edwards Jr.
Fred. J. Dole.

Inventors:
Victor Distl.
Adolf Susky.
By their Attorney,
F. A. Richards

UNITED STATES PATENT OFFICE.

VICTOR DISTL AND ADOLF SUSKY, OF KLADNO, AUSTRIA-HUNGARY.

SCREENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 530,261, dated December 4, 1894.

Application filed June 13, 1894. Serial No. 514,410. (No model.) Patented in Germany November 22, 1891, No. 64,997, and in Austria-Hungary December 28, 1892, No. 14,084 and No. 70,288.

To all whom it may concern:

Be it known that we, VICTOR DISTL and ADOLF SUSKY, subjects of the Emperor of Austria-Hungary, residing at Kladno, in the district of Bohemia, Austria-Hungary, have invented certain new and useful Improvements in Screening Apparatus, of which the following is a specification, which invention has been patented in the following countries: in Germany November 22, 1891, No. 64,997, and in Austria-Hungary December 28, 1892, No. 14,084, at Vienna, Austria, and No. 70,288, at Buda-Pesth, Hungary.

This invention relates to screens adapted for screening coal, ore, and other analogous material, the object of the invention being to provide a screen having a mechanically-operative screen-surface or floor of composite or sectional structure adapted for uniformly distributing the material as it is fed thereon and for carrying the same forward, during the process of screening, in a relatively thin, even layer, with a continuous and uniform speed, and without the liability of crushing or breaking the material being screened.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of a screening-apparatus embodying our invention, a portion of the framework being broken away. Fig. 2 is an end elevation of the same. Fig. 3 is a longitudinal vertical section of the screening apparatus, taken in line *b*—*b*, Fig. 1, looking in the direction of the arrow in said figure. Fig. 4 is a plan view of a portion of a screening-apparatus embodying a slight modification of our invention.

Similar characters designate like parts in all the figures.

In the embodiment of our invention herein shown and described, the screening-apparatus comprises a suitable frame-work for carrying the several operative parts of the apparatus, a composite screen-surface, or floor, consisting of a series of revoluble members, and suitable means, as, for instance, shafts and gearing, for actuating said members, as will be hereinafter more fully described.

The framework for carrying the several operative parts of the screen-mechanism, and which may be of any suitable material, will preferably consist, as herein shown, of the two longitudinal side-rails, 2 and 3, supported at their ends upon transverse beams, 4 and 5, the forward end-rail, 6, and the two guard-rails, 7 and 8, contiguous to the side-rails 2 and 3, all of which constitute a box-like casing for the members of the screen-floor. This casing is provided at the forward end thereof with a hopper, D, whose delivering-end extends over the upper edge of the end-rail 6, as clearly shown in Fig. 3, and the casing is provided at its opposite end with a chute, E, for carrying off the residue or screened material.

The screen-surface or floor comprises a series of revoluble spirally-grooved rollers, 10, set side by side so as to leave screen-spaces, 12, between adjacent rollers. In the form thereof shown in Fig. 1, the screen-floor rollers are longitudinally-disposed and are journaled at their forward ends in suitable bushings, 13, inserted in the end-rail 6, as shown in Fig. 3, and are revolubly supported at their opposite ends upon studs, 14, secured in the upper end of stanchions, 15, which stanchions are bolted at their lower ends to the rear transverse beam 5, and are connected with the end-rail 6 by means of tie-rods, 16.

The spirally-grooved screen-rollers 10 are herein shown as actuated from a shaft, 17, journaled in bearings, 18, upon the frame and provided with a driving-pulley, 19, which may be driven from any suitable power by means of a belt. (Not shown.) Secured to the shaft 17 are a series of bevel-gears, 20, which mesh with and drive bevel-gears, 21, secured to the end of, and rotate, the several screen-rollers.

Referring to Fig. 1, it will be seen that one half of the rollers, or the rollers located at one side of a longitudinal line drawn through the center of the frame, have right-handed spiral grooves, while those located at the opposite side of said line have oppositely-disposed or left-handed spiral grooves, and that the two sets just referred to are rotated in opposite directions, the connecting gears being organized for this purpose, as will be readily understood by reference to said Fig. 1. It is desired to state, however, in this connection, that all of the screen-rollers might be of duplicate construction and be independently ro-

tated in unison and in the same direction, although the arrangement before described is preferable, as a very quick and even distribution of material upon the screen-surface is insured. In practice, the two outside rollers of the series will preferably be supported at a point above the adjacent rollers, and will each be provided at its forward end with a spur-wheel, 22, in meshing engagement with an idle gear-wheel, 23, which, in turn, is in meshing engagement with a gear-wheel, 24, secured to the next adjacent screen-roller, as will be clearly understood by reference to Figs. 1 and 2 of the drawings. These elevated rollers act as guards to prevent the impingement of pieces of material between the extreme side rollers and the guard-rails of the machine, and any large flat pieces that might be moved sidewise against the elevated rollers will be engaged by said rollers and be forced forward toward the chute E.

By the construction and organization just described, the mass of material being carried over the screen-rollers, owing to the variety of sizes and shapes of the constituent parts thereof, is kept in a disseminated and a thoroughly agitated condition most favorable to the thorough screening thereof.

In Fig. 4 we have shown the screen-rollers with their longer axes arranged transversely to the direction in which it is desired to move the mass of material to be screened. In this organization, adjacent rollers have oppositely-disposed grooves located obliquely to the axes of the rollers, the flanges between successive grooves of each roller being of sufficient pitch to force the material located upon said rollers in a direction crosswise of the longitudinal axes thereof. It will be readily understood, by reference to this figure, that the layer of material is moved forward with a zigzag movement, it being first moved forward and toward one end of the series of rollers onto the next adjacent roller which continues to move the mass forward but toward the opposite end of the rollers, the ultimate result being substantially the same as the result produced by the organization of screen-rollers shown in Fig. 1.

To strengthen the rollers and prevent accidental distortion thereof laterally, these are shown cast around cores, 30, which will preferably be tubing of wrought metal.

In consequence of the continuous forward movement imparted to the material by the grooved screen-rollers, we secure the maximum efficiency, and also obviate the jarring or pounding incident to reciprocatory screening-apparatuses of ordinary construction; and owing to the peculiar action of the rollers, the liability of the material becoming wedged or broken is practically obviated.

Our improved apparatus is particularly adapted for the screening of delicate materials which require gentle treatment.

The screen-rollers in their grouping together may form a plane as well as a convex surface, and the screen-surface may be either horizontal or inclined, as desired.

When the organization shown in Fig. 4 is employed, the screen-rollers will usually have obliquely-disposed spool-shaped grooves instead of the spiral grooves shown in Fig. 1, the relative position of the bars to each other being such that the grooves of adjacent bars are contiguous to one another.

To adapt the screening-apparatus to the screening of various kinds of material, it is simply necessary to provide the same with screen-rollers whose grooves are such that the screen-spaces between adjacent rollers will be of greater or lesser diameter.

Having thus described our invention, we claim—

1. The herein-described screening-apparatus, comprising a suitable frame or casing, two sets of obliquely-grooved rollers each set comprising a multiplicity of rollers supported side by side in said frame and adapted for rotation, and means in connection with said rollers and adapted for rotating the rollers of one set collectively in one direction and the rollers of the other set collectively in the opposite direction, whereby the mass of the material is caused to move forward and inward toward a central line from both sides of the screen simultaneously, substantially as described.

2. In a screening-apparatus, a frame or casing, a plurality of longitudinally-disposed rollers formed with non-meshing oblique ribs and grooves and so located with reference to one another as to form intermediate regular screen-spaces, in combination with driving mechanism for rotating said rollers, substantially as described.

3. In a screening-apparatus, a frame or casing, a multiplicity of longitudinally-disposed spirally-grooved rollers arranged in two sets and so located with reference to one another as to form intermediate screen-spaces; and driving-mechanism for said rollers said driving mechanism consisting of a series of gear-wheels secured one to each roller said series being divided into two sets the gear-wheels of one set being rotatable oppositely to those of the other set, and a series of gear-wheels carried upon a driving-shaft and meshing with the gear-wheels of said rollers, substantially as described.

4. In a screening-apparatus, a pair of screening-rollers formed with oppositely-inclined non-meshing spiral ribs and grooves and supported for revoluble movement side by side, in combination with means for simultaneously rotating said rollers in opposite directions, substantially as described and for the purpose set forth.

5. In a screening-apparatus, a screen-floor comprising a series of rollers having obliquely-disposed peripheral screen-space-forming non-meshing ribs and grooves, the grooves of some of the rollers lying in opposing planes to the grooves of others of said rollers, and

means for rotating opposing rollers in opposite directions, substantially as described.

6. In a screening-apparatus, a screen-floor comprising a series of peripherally-grooved rollers set side by side in coinciding planes said grooves forming regular screen-spaces, and two correspondingly-grooved guard-rollers located adjacent to and above the two outside rollers of the series, and means for rotating said rollers, substantially as described and for the purpose set forth.

VICTOR DISTL.
ADOLF SUSKY.

Witnesses:
NORBERT KREISST,
VINCENZ PACHMANN.