

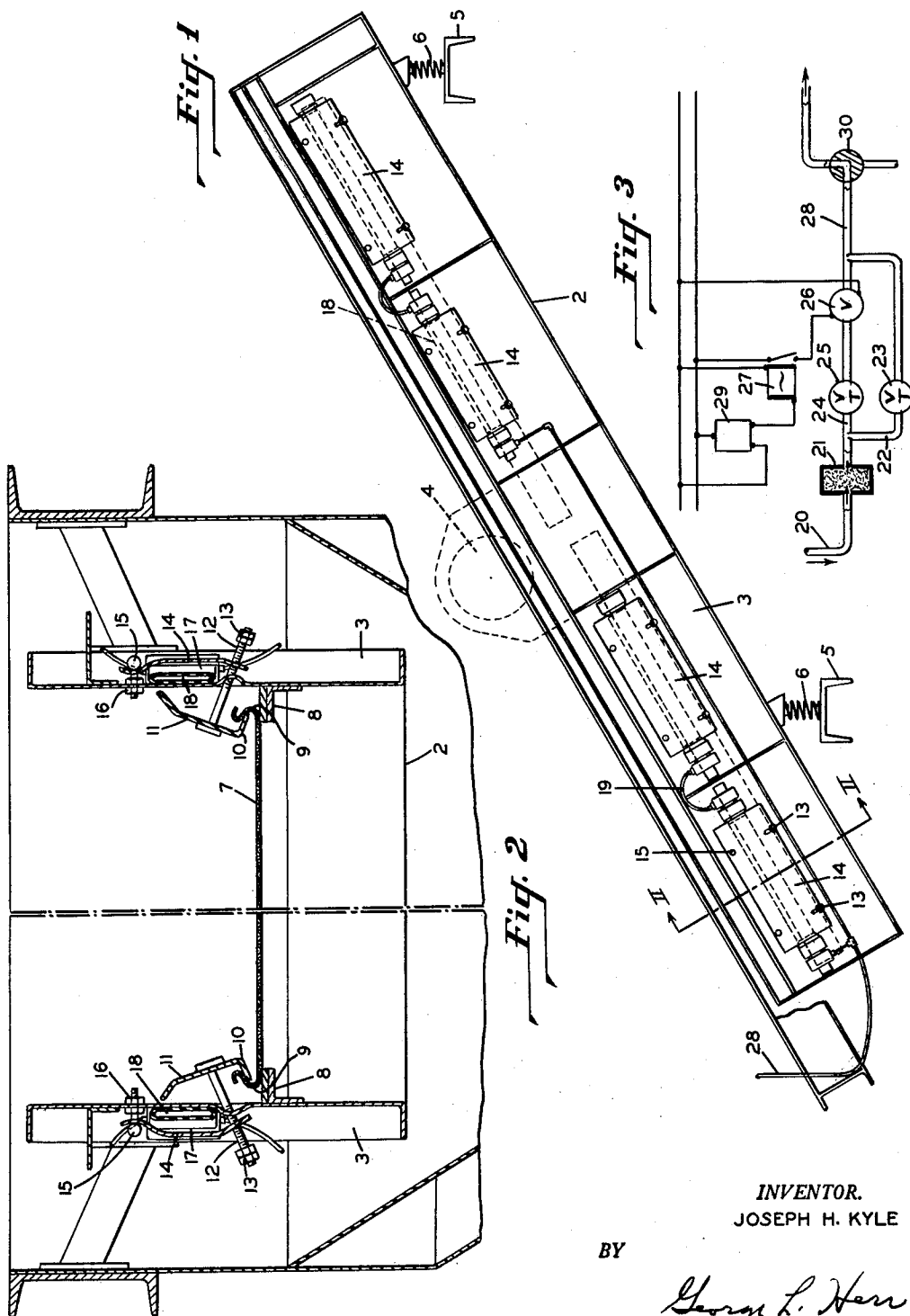
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DEVICE FOR PLACING SCREENS UNDER TENSION

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DEVICE FOR PLACING SCREENS UNDER TENSION

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1 Claim. (Cl. 209-403)

This invention relates to a device for placing vibrating, 10
scalping, or sifting screens under tension, and more particularly to a device in which the tension placed on the screen may be released momentarily while the screen is in operation to relieve blinding of the screen. The invention is also advantageous for releasing and applying 15
tension to screens when changing the size of screens or cleaning them at the end of a color run.

In the equipment used for grading granular materials, such as the color particles used in the manufacture of resilient floor and wall coverings, the screens become coated with the material forming the particles because of its adhesive nature and eventually the screens become blind, greatly diminishing their efficiency. The screening devices currently used in segregating these granular materials are the conventional vibratory screens operated by an unbalanced couple, or other vibrating power source. In order to release the tension on the screens in a conventional device of this type, it is necessary to stop the machine and loosen the bolts along the side plate of the machine to release the clamping mechanism. The material blinding the screen can then be removed as the vibratory motion of the machine whips the loosened screen sufficiently to break the bond between the adhesive particles adhering to the screen and the screen itself. The machine must then be stopped and the bolts tightened before resuming normal operation. This requires a considerable amount of time. The invention herein disclosed also makes it possible to remove the screens more rapidly when it is necessary to clean the screens or change the size of screen in the device.

In the device of this invention the clamping mechanism for the screen is actuated by means of a pneumatic device, and upon a decrease in the pneumatic pressure, the tension on the screen is diminished permitting an increase in vibrational amplitude and the screen is thereby cleared of the material blinding it. This invention is not only useful in releasing the pressure for cleaning purposes, but in changing the tension on the screen, depending on the operation involved.

In order that the invention may be more readily understood, it will be described in connection with the attached drawing, in which

FIG. 1 is a side elevational view of a conventional screening device;

FIG. 2 is a cross-sectional view of the device showing the means for holding the screen under tension; and

FIG. 3 is a diagram of a circuit arrangement to effect the operation of the invention in a timed cycle.

Referring to FIG. 1 there is shown an inclined vibratory screening device 2 of the general conventional type having a side plate 3 serving as one of the main structural members running longitudinally along the device and also serving to retain within the device the granular material being screened. A similar side plate 3 is provided on the opposite side of the device as is shown in FIG. 2. Vibratory motion is imparted to this equipment by means of the eccentric shown generally at 4 driven by a motor not shown. The device is mounted on bases 5 by means of springs 6 so that it vibrates thereon.

Referring to the cross-sectional view shown in FIG. 2, it will be seen that the screen 7 extends across the area between the side plates 3. This screen 7 is supported on

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angle brackets 8 which are in turn secured to the side plates 3 by means of welding or other securing means. The edges of the screen 7 are curved upwardly, forming a hook type edge area 9. This hook-formed edge 9 is engaged by the flange 10 of a clamping member 11 supported by the side plate 3. These clamping members 11 extend along the side plate 3 throughout substantially the entire length of the screen 7. Attached to the clamping members 11 and extending through suitable openings in the side plate 3 are studs 12. These studs have suitable retaining means on their outer extremities such as the nuts 13.

On the opposite side of the side plate 3 from the clamping member 11 there is a bracket 14 secured at a point 15 by means of a bolt 16 passing through suitable aligned holes in the bracket 14 in the side plate 3. This arrangement is such that it forms a hinge joint where the bolt 16 passes through the bracket 14. The lower portion of the bracket 14 is provided with an opening through which the stud 12 passes. The retaining members 13 are affixed to the stud in an area beyond the point where the stud passes through the bracket 14. This prevents the bracket 14 from pivoting beyond the point of the retainers 13 on the stud 12. This bracket 14, side plate 3 and stud 12 relationship is such as to form a longitudinal passage 17 along the outside of the side plate 3 of the screening device. This longitudinal passage 17 is occupied by an inflatable tube 18 which extends the full length of the bracket 14. With this arrangement, when the tube 18 is inflated it fills the entire area of the longitudinal passage 17 and exerts outward force on the bracket 14. This outward force on the bracket 14 hinges it at the point 15 and pushes the lower extremity of the bracket 14 against the retainers 13 on the stud 12. This outward force on the retainers 13 pulls the stud 12 in an outward direction, moving the clamping members 11 toward the side plate 3 at the bottom, pulling the hook member 9 of the screen 7 toward the side plate 3 and placing the screen 7 under tension.

In the embodiment here illustrated, both edges of the screen 7 are provided with the same type of inflatable tube 18 for exerting tension on the screen 7; however, it will be understood that one edge of the screen may be fixed and the opposite edge movable by means of this tension applying arrangement.

Referring again to FIG. 1, it will be observed that the clamping member 11, the bracket 14, and the tube 18 are arranged in parallel arrangement along the side of the screening device 2 in four sections for ease in installation. Between these sections there are pneumatic connections 19 to conduct fluid from one section of the tube to the next adjacent section.

The means for inflating the tube 18 is supplied from any suitable source such as compressed air or a hydraulic fluid. In the preferred embodiment, it is possible to change the pressure on the tube while the equipment is in operation. In order to do this the device is operated normally at a pressure which will place a constant tension on the screen. The pressure can then be diminished so that the stretching force exerted on the screen is not as great and the screen becomes loose so it can vibrate in a vertical direction to free the material which has become adhered to the screen. In continuous operation, it is recommended that the equipment be operated on a time cycle so that periodically pressure on the tube 18 is decreased to permit the screen to clean itself automatically. The arrangement illustrated in FIG. 3 is typical of an automatic arrangement for dislodging material from a screen. The air supply line 20 passes through a filter 21 after which it forks and one line 22 passes through a low pressure regulator 23 and the other line 24 passes through a high pressure regulator 25. The line 24 on which the high

pressure regulator 25 is located is also provided with a three-way venting valve 26 controlled by a solenoid 27. The purpose of this venting valve 26 is to close the high pressure line and vent it to the atmosphere. The two lines 22 and 24 merge beyond the venting valve 26 so that only one line 28 passes to the sifter 2. A timer 29 is connected electrically with the solenoid 27 which is in turn connected to venting valve 26. This timer 29 can be set for a predetermined period of time. Upon receipt of a signal from the timer 29 the solenoid 27 is energized which closes venting valve 26, blocking the line 24 so that only the line 22 remains open. The pressure of the air passing through the line 22 is controlled by the low pressure regulator 23. When operating under this low air pressure the screen can flap during operation so that the material blinding the screen is broken from the screen. If desired, a manual valve 30 may be provided on the line 28 to shut off the air completely when screen changes are being made.

The tube 18 may be made of any material which will retain the conventional inflating fluids. In the embodiment here under consideration these tubes are made of rubber. Both natural and synthetic rubber are suitable for carrying out the invention as well as some of the plastic materials such as vinyl chloride and copolymers thereof, polyethylene and other elastomeric materials.

It will be obvious from this disclosure that I have developed a device by which the screens of a vibrating segregating device may be placed under tension readily and the tension can be altered during continuous operation by merely changing the air pressure in the inflatable element.

I claim:

A device for applying tension to a screen, the elements comprising a side plate extending the length of the screening device, a screen positioned so as to be substantially coextensive with said side plate and projecting at a right angle from said side plate, the edge of said screen being formed into the form of a hook extending parallel to said side plate and placed in close proximity thereto, a clamping member extending along the inside of said side plate having a flanged portion for engagement with the hook on said screen, a bracket hingedly attached to said side plate on the side opposite the one carrying said clamping member, a stud secured to said clamping member and passing through said side plate and said bracket, retaining means carried by said stud to prevent said bracket from passing thereover, an inflatable tube positioned between said side plate and said bracket, means for supplying fluid under pressure to said inflatable tube, means for varying the amount of fluid supplied to vary the tension of said screen, and means for varying the amount of fluid in a predetermined cycle.

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