Aug. 13, 1957 J. L. RAPP ET AL 2,802,570

SCREEN CLEANING STRUCTURE

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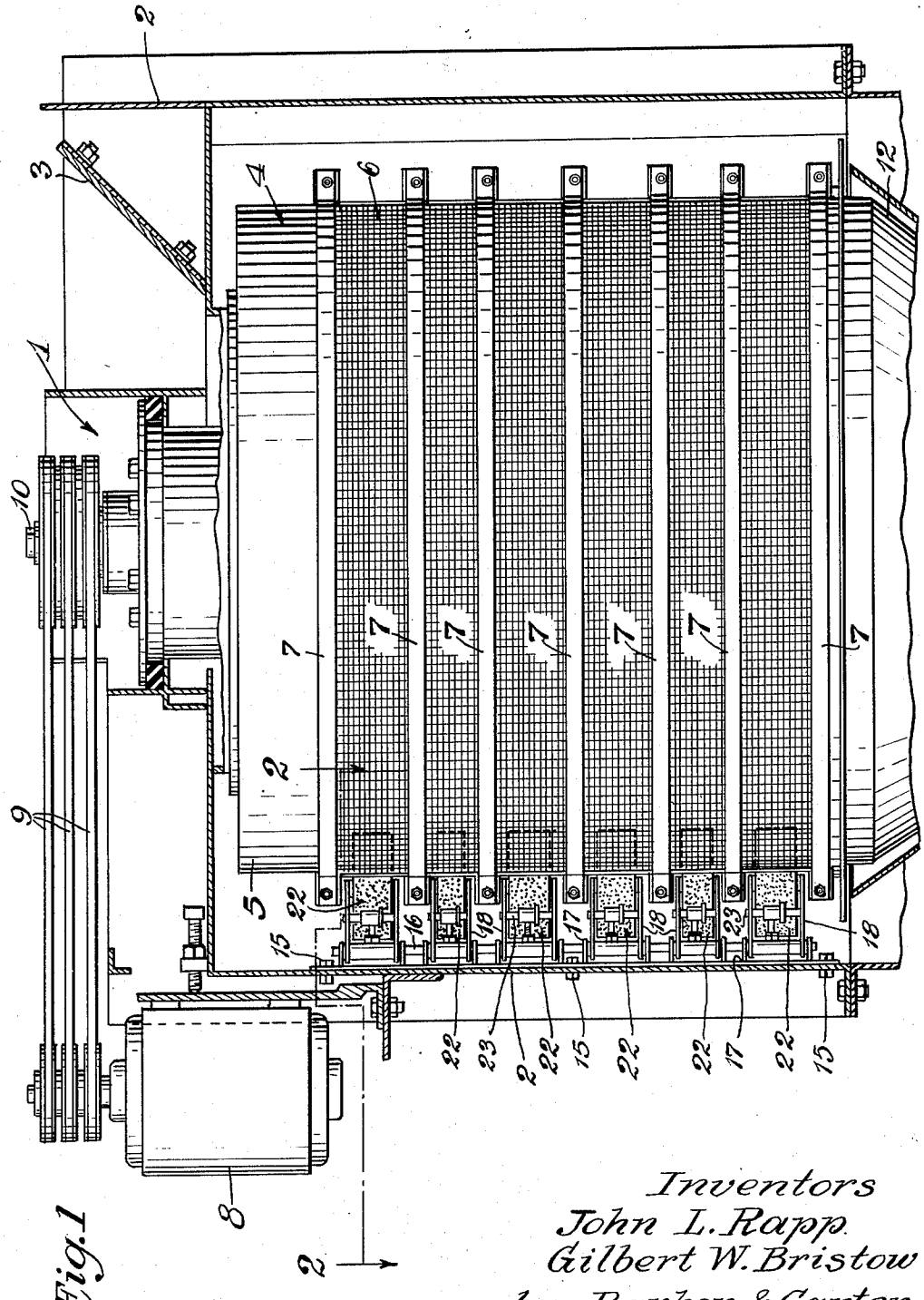


Fig. 1

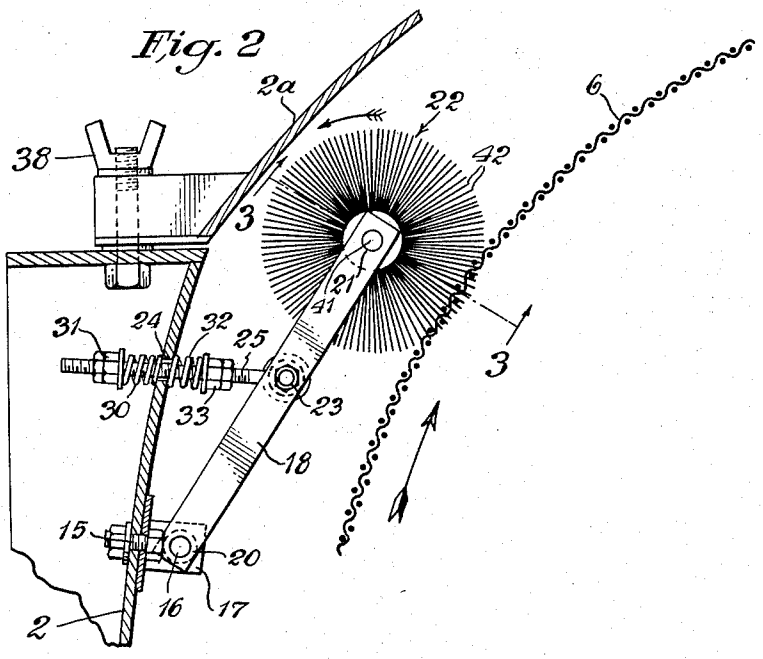
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Fig. 2



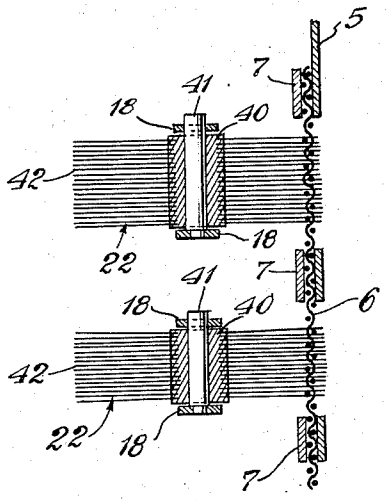


Fig. 3

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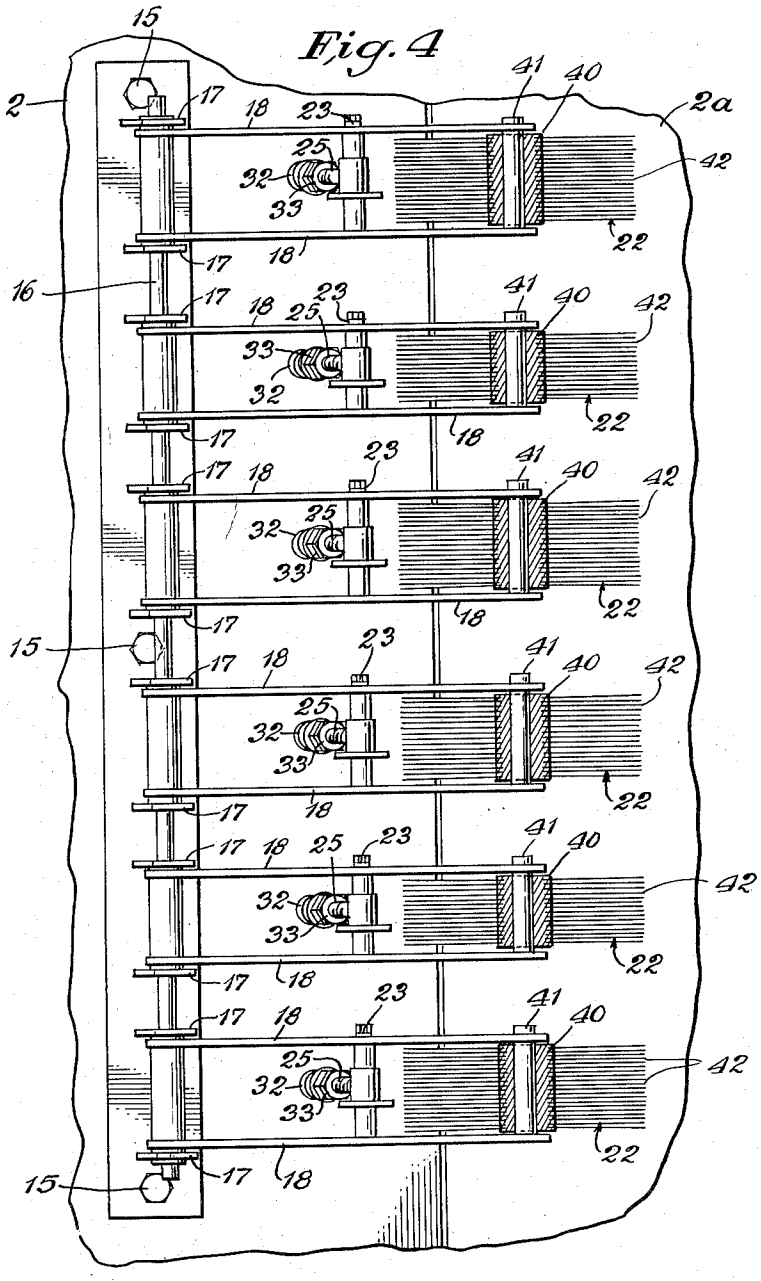
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Fig. 4



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SCREEN CLEANING STRUCTURE

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2 Claims. (Cl. 209—390)

This invention relates to screens usable in screening a variety of materials and particularly to means for cleaning screens.

One purpose is to provide a screen cleaning structure which shall be simple and economical to manufacture.

Another purpose is to provide a screen cleaning structure which shall be automatic and which shall function whenever the screen is in operation.

Another purpose is to provide a screen cleaning structure which shall permit simple and quick replacement of the parts thereof.

Another purpose is to provide a screen cleaning structure which shall be operated by the movement of the screen itself.

Another purpose is to provide a screen cleaning structure which shall be adjustable and provide the desired cleaning of a screen surface.

Another purpose is to provide a screen cleaning structure which shall be operable at all positions of the screen.

Other purposes will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a side elevation in partial cross section;

Figure 2 is a view taken on the line 2—2 of Figure 1;

Figure 3 is a detailed view in partial cross section taken on the line 3—3 of Figure 2; and

Figure 4 is a detailed side elevation of the screen cleaning mechanism.

Like parts are indicated by like numerals throughout the specification and claims.

Referring now to the drawings and particularly to Figure 1, numeral 1 generally indicates a screen. It will be realized that whereas we have illustrated a vertical screen, our invention may be applied to screens of a variety of designs without departing from the nature and scope of our invention.

The screen 1 may comprise a frame 2. A feed chute 3 may be connected to the frame at an upper portion thereof to feed the material to be screened to the area within a cylindrical screen member 4. The screen 4 may comprise a drum or drum frame 5 about which a screening surface, such as the screen cloth 6, may be wrapped. While a screen cloth is illustrated in Figures 2 and 3, it will be realized that the screening surface 6 may take a variety of forms without departing from the nature and scope of our invention. Indicated at 7 is an outer framing structure employed to hold the screen cloth 6 in position on the drum 5. An electric motor 8 may be used to drive, through the continuous belts 9, the screen drum shaft 10. It will be realized that the screen 4 is thereby rotated and may be gyrated simultaneously by means of the drive 8—10 in association with a suitable internal structure. Since such internal structure does not form part of the present invention, it is not illustrated and will not be further described. The material fed downwardly along the chute 3 to the area within the

drum 5 is, as a result of such rotation and gyration, forced outwardly through the screen cloth 6 to pass by gravity between the screen 4 and the frame 2 downwardly to a suitable collection mechanism (not shown). Oversize material which does not pass through the screen wire 6, passes downwardly into the hopper 12 from whence it may be collected for further screening or other use.

Secured to the inner surface of the frame 2, as by the securing means generally indicated at 15, is a vertical shaft 16. A plurality of supporting or positioning brackets 17 may be connected to the inner surface of the frame 2 and the shaft 16 to strengthen and support the shaft 16 in position on the frame 2. Rotatably or pivotally mounted along the shaft 16 is a plurality of brackets or arm members 18. The members 18 are pivoted to the shaft 16 at one end as at 20. Rotatably mounted, as at 21, at the opposite end of each of the members 18 is a cylindrical brush member 22.

An adjustment rod 25 may be pivotally connected to each of the bracket members 18 intermediate the ends thereof, as at 23. The rod 25 may extend from the bracket member 18 toward and through the frame 2 as indicated generally at 24. A spring 30 may be compressed between the outer surface of the frame 2 and a spring-positioning member, such as the nut 31, threadedly engaged with an outer portion of the rod 25. A second spring 32 may, like the spring 30, surround the rod 25 and be clamped between an inner surface of the frame 2 and a second spring-positioning member, such as the nut 33 threadedly engaged with an inner portion of the rod 25. As indicated best in Figure 4, each of the bracket members carries the structure described immediately above. As best seen in Figure 2, the frame 2 may have a removable portion 2*a* positioned generally in alignment with the brush members 22 and the portion 2*a* may be secured to the remaining portion of the frame 2 by any suitable connecting means, such as the bolt and wing nut structure shown generally at 38.

As best seen in Figures 2 and 3, the brush members 22 may be formed of a central hub 40 rotatably mounted on a shaft 41 which is secured to the arm members 18. The hub 40 may carry a plurality of radially extending brush fingers 42. The adjustment structure illustrated best in Figure 2 and comprising the rod 25 and springs 30, 32 in conjunction with the spring tension-controlling members 31, 33, permits the positioning of the brush 22 to cause the brush fingers 42 to extend into the material of the screen cloth 6.

As the screen is rotated in the direction of the arrow shown in Figure 2, the engagement thereof with the outer extremities of the brush fingers 42 causes rotation in the opposite direction, indicated by the arrow in Figure 2, or the brush members 22.

As best seen in Figure 1, the outer screen supporting members 7 are spaced vertically along the screen surface 6 and it will be understood that the members 7 surround the cylindrical screen surface 6 and drum 5. A brush member 22 and the supporting and adjusting structure associated therewith, is provided for the screen surface areas between each pair of spaced framing members 7. It will be realized that, in a particular installation a single brush member 22 could be provided for the entire screen surface 6 in the absence of such horizontal framing members without departing from the nature and scope of our invention. We prefer, however, the structure illustrated, which we find particularly effective in association with gyrating screens, where the surface to be cleaned is moved toward the brushes in varying amounts at varying points from top to bottom of the line of brushes.

It will be realized that whereas we have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number

and disposition of parts without departing from the spirit of our invention. We therefore wish our description and drawings to be taken as, in a broad sense, illustrative or diagrammatic, rather than as limiting us to our precise showing.

The use and operation of our invention are as follows:

When the screen 4 is rotated in a clockwise direction, as the parts are shown in Figure 2, and as it is simultaneously gyrated, the cylindrical brush members 22 are caused to rotate in the opposite direction in response to the engagement of the screen cloth 6 with the outer ends of the brush fingers 42 as shown in Figures 2 and 3. It is important to realize that the brush fingers 42 are caused to penetrate the screen surface 6. The depth of penetration of the fingers 42 is sufficient to remove any material which would otherwise clog the openings in the screen surface and yet such penetration is limited so as not to cause a premature wearing of the brushes 22 or interference with the free rotation or gyration of the screen 4. The depth of penetration is controlled by the adjusting mechanism 25—33. Since the brush member 22 is in effect spring-loaded against the surface 6, it is effective to clean such surface at all positions of the screen 4. As the brushes 22 wear in use, the adjustment mechanism 25—33 may be easily and simply operated to insure penetration of the brush fingers 42 into the screen surface 6. As illustrated herein, the presence of a separate adjusting mechanism for each of a plurality of brush members 22 permits the separate individual adjustment of each of such brush members 22 to insure the proper penetration of the brush fingers threaded into the opposed portion of the screen surface 6. It will be further realized that the centrifugal force generated by the screen surface 6 and brush 22 is normally sufficient to dislodge and discharge the material removed from the screen surface by the brush member 22.

We claim:

1. Automatic screening mechanism for rotatable screens having a frame and a cylindrical screening surface within and spaced inwardly from said frame, said frame and screen defining a substantially annular space therebetween, said mechanism including a bracket member pivotally supported at one end thereof on and for pivotal movement within and transversely of said space, a cylindrical brush member rotatably supported on the opposite end of said bracket, means for maintaining said brush member in interpenetrating relationship with said screen surface including a rod pivotally connected to said bracket intermediate the ends of said bracket and extending through said frame, said last named means including a spring surrounding said rod within said frame and an adjustment member movably engaged with said rod and clamping said spring between said adjustment member and said frame, and means on said rod outside said frame for adjusting the tension of said spring.

2. Automatic screening mechanism for rotatable screens having a frame and a cylindrical screening surface within and spaced inwardly from said frame, said frame and screen defining a substantially annular space therebetween, said mechanism including a bracket member pivotally supported at one end thereof on and for pivotal movement within and transversely of said space, a cylindrical brush member rotatably supported on the opposite end of said bracket, means for maintaining said brush member in interpenetrating relationship with said screen surface including a rod pivotally connected to said bracket intermediate the ends of said bracket and extending through said frame, said last named means including a spring surrounding said rod within said frame and an adjustment member movably engaged with said rod and clamping said spring between said adjustment member and said frame, and means outside said frame for adjusting the tension of said spring, said last named means including a second spring surrounding said rod outside said frame and a second adjustment member movably engaged with said rod outside said frame, said second adjustment member clamping said second spring between said second adjustment member and the outer wall of said frame.

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