July 3, 1934. H. B. RICE 1,965,157

CLEANER FOR SIFTING SCREENS

Filed Jan. 17, 1933

Fig. 1.

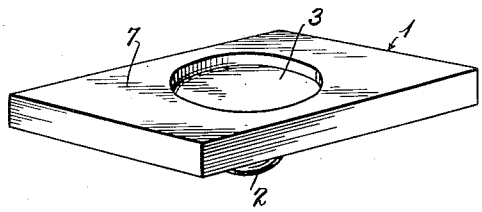


Fig. 2.

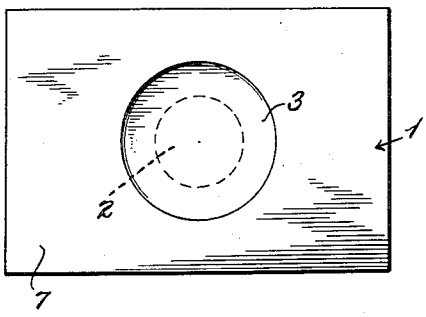


Fig. 3.

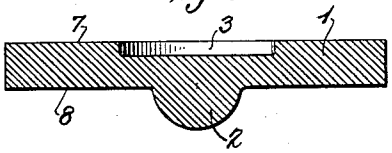


Fig. 4.

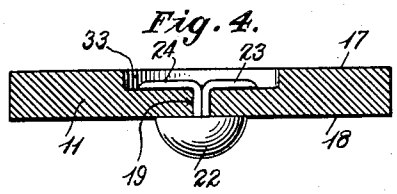


Fig. 5.

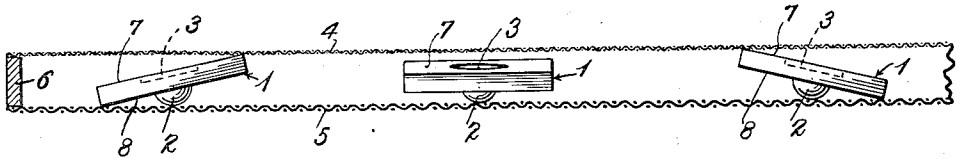
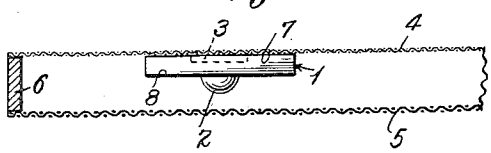


Fig. 6.



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UNITED STATES PATENT OFFICE

1,965,157

CLEANER FOR SIFTING SCREENS

Harry B. Rice, Houston, Tex., assignor, by direct and mesne assignments, to Vacuum Bolting Cloth Cleaner Corporation, Houston, Tex., a corporation of Delaware

Application January 17, 1933, Serial No. 652,215

6 Claims. (Cl. 209—323)

My invention relates to cleaners for sifting screens, and particularly to shaking screens such as are commonly used in flour mills.

The bolting screens so employed, formed of silk or other thin fabric, operate with a vibratory or gyratory motion. In order to obtain a perfect, or even a satisfactory, sifting operation, it is essential that the meshes of the screens be maintained in free and open condition. Without some means for clearing or cleaning the screen cloths, their meshes become clogged with the material being screened or sifted, and are soon incapable of functioning in a proper or adequate manner.

Various devices have been proposed for knocking or jarring sifting screens used in flour mills and elsewhere, for the purpose of loosening the material from the meshes of the screen and throwing the material upwardly from the screen. The result sought to be attained by all such devices is to maintain the mass of material in constant motion, imparting to the material a generally upward dancing motion. This generally vertical motion imparted by the knockers, imposed upon the shaking or gyratory motion of the screens, is designed to effect the automatic cleaning of the screen cloths while in operation.

Many of the devices heretofore employed or proposed for this purpose are unsuited for use in connection with the light and delicate fabrics of the screen cloths employed in flouring mills. Because of their shape or construction, or the roughness of their action, their contacts with the screen cloth in a short time wear and tear the cloth so that it is unfit for use.

In order to avoid this undesirable effect of the usual type of knockers, it has been proposed to arrange balls or other loose pieces of metal upon a reticulated or screen-like support disposed below the screen cloth to be cleaned and so spaced from it that the loose pieces would at frequent intervals strike the screen cloth when the cloth and lower support were vibrated together. Devices of this sort have been found unsatisfactory because of their ineffective action, their short life and their positive injury to the screen cloth when they have become worn and roughened through use.

The object of my invention is to provide a cleaner for sifting screens, and particularly for screen cloths, which will be highly efficient in its jarring and cleaning action without tearing or otherwise injuring the screen cloth fabric, and which will be capable of constant active use for periods so long as to render negligible the factor of wear.

A further object of the invention is the provision of a cleaner for screen cloths and sifting screens generally which will have a gentle yet effective jarring action upon the screen, and a simultaneous or supplemental vacuum or suction action which aids in agitating the screen cloth and cleaning and freeing its meshes.

A still further object is the provision of a screen cloth cleaner which may be easily and economically produced of rubber or other readily moldable material and which will be so formed and shaped as to move upon its support in all directions and to have a free and continuous tilting action in all directions when the support is vibrated.

The invention by which these objects are attained comprises a device formed and constructed as illustrated in the accompanying drawing and more fully described and claimed hereinafter.

In the drawing:

Figure 1 is a perspective view of the preferred form of the device constituting by invention.

Fig. 2 is a top plan view of the device.

Fig. 3 is a central longitudinal vertical sectional view of the device.

Fig. 4 is a view similar to Fig. 3 of a modified form of the device, and

Figs. 5 and 6 are vertical longitudinal sectional views of a sifting screen and cleaner support, showing my device in operative positions relative thereto.

Broadly considered, my invention comprises a body 1 preferably in the form of a generally flat rectangular shape, provided on its under side with a rounded supporting knob or button 2, preferably integral with the body 1. The body is also preferably formed with a recess 3 on its upper side. This recess may be of any desired shape, but for best results should be circular, or substantially circular, and of a diameter and depth sufficient to effect a cupping or vacuum action upon the screen cloth when the upper surface of the body 1 comes into contact with the cloth.

The supporting knob or button is preferably formed integrally with the body 1. The device might be formed of wood, of hard rubber, or of various molded plastic compositions. Certain of these materials are objectionable because they produce devices which are too rigid and unyielding to effect the proper cooperation with the screen cloth, or which are incapable of operating for any great length of time without becoming so worn and rough as to injure the screen cloth.

In order to provide a satisfactory cloth cleaner which will at the same time have a long life and operate efficiently upon and without injury to the screen cloth, the device must be made of relatively soft but firm resilient material capable of use without appreciable rubbing or wearing during long periods of use. To satisfy these requirements I have found that the material best suited is soft rubber of non-blooming stock. This material contains no grit or other abrasive substance, and so far as I am aware, is the only material sufficiently soft, smooth and resilient to operate without tearing or otherwise injuring the screen cloth. In this respect a cloth cleaner of this preferred material is more satisfactory than if the body of the device were built up or otherwise formed of a section or sections of heavy but soft canvas belting or other fabric. In point of length of life my soft rubber cleaner device is so far superior that the only method of comparison is to say that my device is completely and unqualifiedly satisfactory and highly economical, whereas similar devices, if made of fabric, would wear out in so short a time under like conditions as to greatly reduce their efficiency and increase their operating cost.

My cleaner device, while soft and possessed of a certain flexibility, is sufficiently firm and rigid as to exert a jarring action upon the screen cloth when its upper face or one of its upper edges contacts with the cloth. Rubber of this kind is well known in the various arts, being employed for cushioning and shock absorbing purposes on automobiles and furniture and wherever a tough wear-resisting and semi-rigid but resilient pad or plate of rubber of smooth texture is required. When the cleaner embodying my invention is designed for cleaning the screen cloths used in sifting materials such as flour the rubber used should be cured without sulphur.

In its preferred form my cleaner device is made in one piece, preferably by moulding, the recess 3 being formed in one face (top) 7 and the supporting knob 2 being produced on the opposite face (bottom) 8.

However, the device may be made in two parts, if desired. As shown in Fig. 4, the body 11 may be formed in the same manner as in making the preferred form of device, except that the rounded supporting knob is omitted from the bottom 18 and an aperture 19 is provided for the reception of a stud, the ends 23, 24 of which are bent down in the recess 33 in the top face 17 to hold the stud in position so that its head 22 forms a supporting knob or projection similar to the rounded supporting knob 2 of the preferred form. In this alternative construction the ends 23, 24 of the stud must be smooth and must lie flat in the recess 33. In order to insure against these ends of the stud abrading or tearing the screen cloth, the recess 33 may be made somewhat deeper than the recess 3 in the preferred form.

When in use, one or more of my devices are placed upon a support 5 of wire, fabric, or any other suitable material immediately beneath the screen cloth 4 to be cleaned. The screen cloth 4 and support 5 may be secured in fixed relationship in a frame 6, which is vibrated, oscillated, gyrated, or otherwise agitated by any suitable mechanism (not shown) in the performance of the desired screening or sifting operations. Other arrangements for supporting the cleaner devices immediately beneath the screen cloth may be used. The support 5, for example, may vibrate with the screen 4, or independently, or may in certain other arrangements be stationary. The screen cloth 4 may be of any suitable mesh. The support 5 may be of the same character as the screen cloth 4, but is preferably of coarser mesh. In machines so constructed as to permit, the support 5 may be imperforate.

In the operation of the type of screen arrangement illustrated, the screen cloth 4 and support 5 are vibrated or otherwise agitated as a unit. The cloth cleaner devices 1 rest upon their rounded supporting knobs 2 upon the support 5 and have their upper surfaces 7 in contact with the screen cloth or sufficiently close thereto to come into contact therewith during the screening operation. The agitation of the support 5 and cloth 4 gives the cleaner devices a slight bounding or bouncing movement, which instead of being directly up and down, may be transformed into constantly varying tilting movements by reason of the unbalanced condition of the devices upon their rounded knobs 2. In consequence of this movement the cleaner devices strike the cloth 4 at frequent intervals but at varying points and at varying angles. Sometimes the entire top face 7 of the device strikes flatly against the under side of the cloth (as shown in Fig. 6), on which occasions the recess 3 exerts an action similar to that of a vacuum cup; the device attaches itself momentarily to the cloth, and produces an increased cleaning result in the area opposite the recess when released by the continued vibration of the cloth and support. At other times first one edge of the cleaner and then another is tilted up against the screen cloth. This tilting and bouncing action is continuous and the contacts with the screen cloth 4 are of sufficient violence to accomplish a thoroughly efficient cleaning action, maintaining the mesh of the screen cloth 4, and of the support 5, free and open at all times.

It is to be understood that my cleaner device may be made of different shapes and proportions and may be used in different relations and with sifting or shaking screens of different kinds for various materials as well as flour. In other words, my invention is not limited to the dimensions of the cleaner shown in the drawing, which merely illustrates the preferred form of embodiment of the invention.

I claim:

1. A screen cloth cleaner comprising a moulded rubber body in the form of a substantially flat plate having one face substantially flat and provided with a recess therein and a single rounded knob projecting from the central portion of its opposite face.

2. A sifting apparatus comprising a frame, a screen cloth secured upon said frame, a supporting screen secured upon said frame beneath said screen cloth and adjacent thereto, and a screen cloth cleaner on said supporting screen adjacent said screen cloth, said cleaner comprising a substantially flat plate-like body having a single rounded knob upon its bottom, said knob resting upon said supporting screen and said cleaner being freely movable upon said supporting screen with tilting and vertical motions into contact with said screen cloth.

3. A sifting apparatus comprising a frame, a screen cloth secured upon said frame, a supporting screen secured upon said frame beneath said screen cloth and adjacent thereto, and a screen cloth cleaner disposed on said suporting screen and freely movable thereupon with vertical and tilting motions, said cleaner comprising a soft rubber body in the form of a substan-

tially flat upper surface and an integrally formed rounded knob upon its lower surface.

4. A cleaner for screen cloths comprising a generaly flat plate-like resilient body having a flat screen cloth engaging surface and a substantially flat opposite surface with a single relatively short supporting knob on the central portion thereof.

5. A sifting apparatus comprising a frame, a screen cloth secured upon said frame, a supporting screen secured upon said frame beneath said screen cloth and adjacent thereto, and a screen cloth cleaner disposed on said supporting screen and freely movable thereupon with vertical and tilting motions, said cleaner comprising a resilient body having a substantially flat upper surface with a vacuum cup recess in said surface and a rounded knob upon the lower surface of said body, said cleaner being tiltingly supported by said knob upon said supporting screen.

6. A sifting apparatus comprising a frame, a screen cloth secured upon said frame, a support secured to said frame beneath said screen cloth and adjacent thereto, and a screen cloth cleaner upon said support, said cleaner comprising a flat plate-like body having a substantially flat upper surface with a vacuum cup recess in said surface, and a projection on its bottom portion to engage said support and said cleaner being freely movable horizontally upon said support and vertically to contact its recessed surface with said screen cloth.

HARRY B. RICE.