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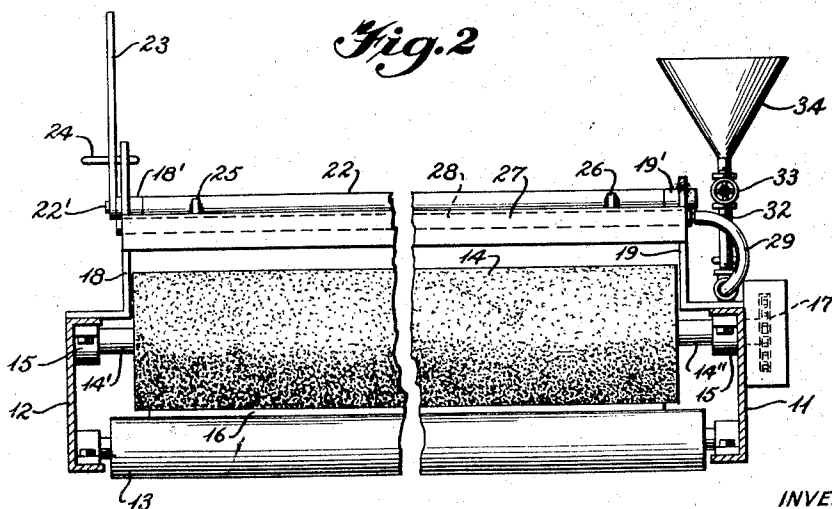
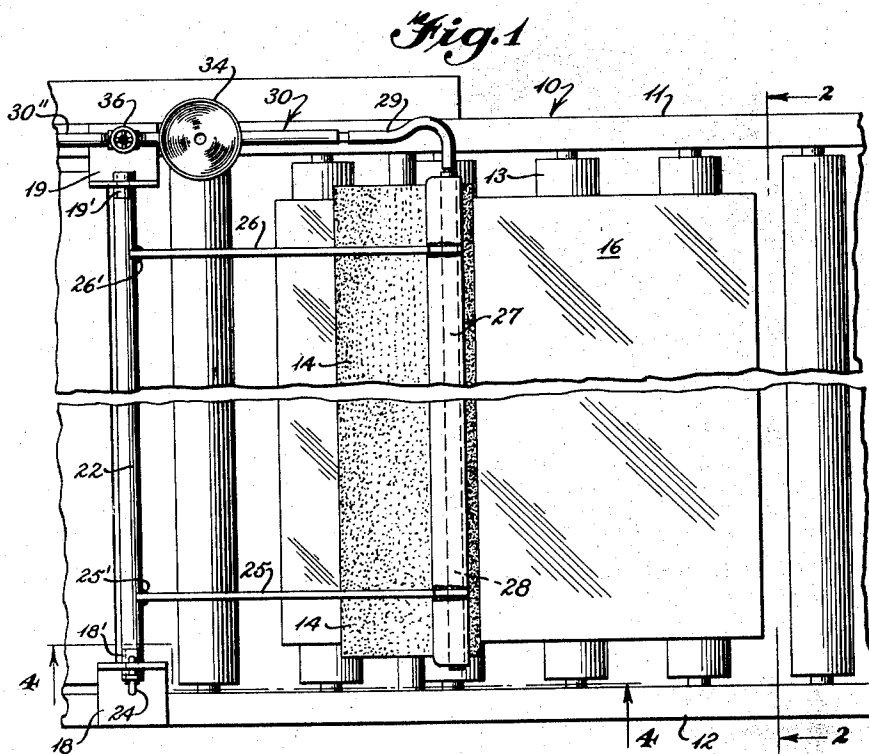
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ROTARY BRUSH CLEANING APPARATUS

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2 Sheets-Sheet 1



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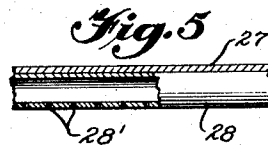
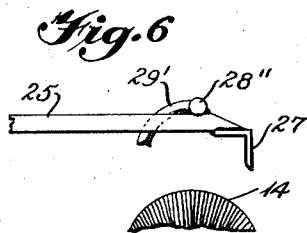
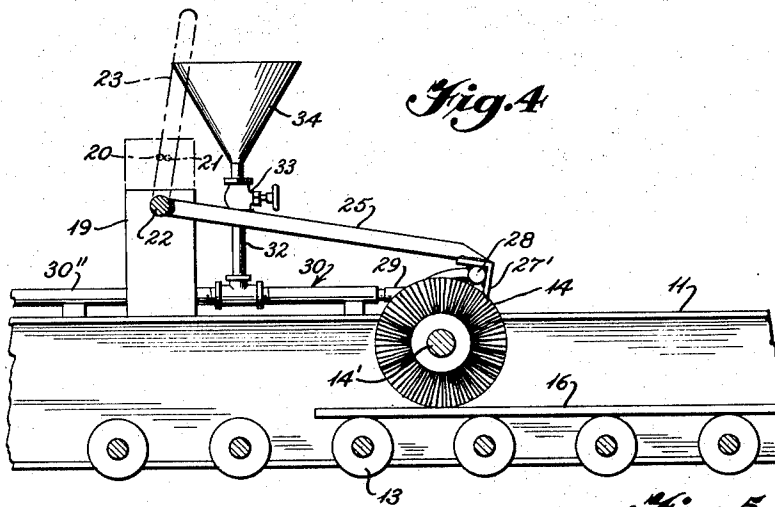
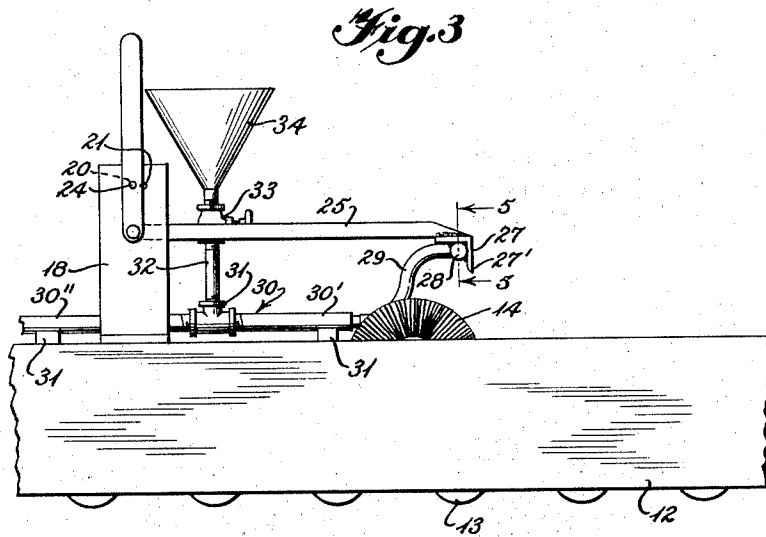
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ROTARY BRUSH CLEANING APPARATUS

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ROTARY BRUSH CLEANING APPARATUS

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7 Claims. (Cl. 15—77)

This invention is directed to a combined cleaning fluid applicator and scraper for cleaning the bristles of an elongated rotating brush.

In cleaning plate-like articles such as glass plates rotary brushes are positioned over the plates which are passed thereunder while the bristles of the brush sweep against the surface of the plate in contact therewith. The bristles of the brush collect deposits of grease and other foreign materials which periodically must be removed to ensure efficient operation of the brush. These rotary brushes are used in a continuous operation and it is highly desirable to be able to clean the brushes while rotating and without interrupting the continuous operation of cleaning the plates. The brushes used have relatively long bristles set in a hub. In the case of grease and sticky foreign substances collecting on and between the bristles, the bristles adjacent each other are drawn toward each other and become stuck together. In order to restore the brush to its most efficient working state, the grease and foreign material must be loosened and finally removed from the individual bristles.

It is an object of my invention to provide a combined fluid-applying apparatus and scraper whereby fluid is applied to the brush in a uniform manner and the scraper is brought into contact with the bristles of the brush to further remove the foreign material which has been loosened by the applied cleaning fluid.

Another object of my invention is to provide for a distribution of cleaning fluid to the bristles of a brush in a uniform manner throughout the length of the brush.

A still further object of my invention is to provide for a uniform distribution of fluid to the bristles of a brush wherein the fluid is under a head of pressure so that it penetrates into the brush and reaches the whole length of the bristles of the brush.

Another object of my invention is to provide in an elongated rotary brush cleaner a combined fluid-applying apparatus by which a detergent is uniformly distributed throughout the length of the brush and along the radial length of the bristles of the brush to loosen foreign material and a scraper which is brought into contact with the bristles to free them of the loosened foreign material followed by introduction of a rising fluid through the fluid-applying apparatus and onto the bristles of the brush.

A still further object of my invention is to provide a pivotal mounting for an elongated scraper and an elongated fluid-dispensing apparatus whereby fluid may be dispensed onto the brush and the scraper may be brought into pivotal contact with the bristles of the brush.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter. It should be understood, however, that the detailed description and specific examples are given by way of illustration only, and while indicating preferred embodiments of the invention, are not given by way of limitation, since various changes and modifications within the spirit and scope of the in-

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vention will become apparent to those skilled in the art from this description.

For a more complete understanding of the nature and scope of the invention reference can be had to the following detailed description taken in connection with the accompanying drawings in which:

Fig. 1 is a plan view of a glass-cleaning machine having an elongated rotary brush associated therewith and the combined scraper and fluid-dispensing apparatus pivotally associated therewith;

Fig. 2 is a side elevation sectional view along line 2—2 of Fig. 1;

Fig. 3 is a side elevational view of the apparatus shown in Fig. 1;

Fig. 4 is a sectional side view along line 4—4 of Fig. 1 showing the scraper of the brush cleaning apparatus in operation;

Fig. 5 is a fragmentary enlarged sectional view along line 5—5 of Fig. 3; and

Fig. 6 is a fragmentary side elevation of a modified form of mounting the fluid-dispensing apparatus over the brush.

Throughout the description and various figures of the drawings like reference characters refer to similar parts.

A typical glass-treating apparatus for glass sheets is generally indicated at 10 and comprises spaced apart side frames 11 and 12 between which is mounted typical conveyor rollers 13 which may be power-driven. An elongated rotary brush 14 having a diameter of about 6 inches having trunnions 14' and 14'' at the axle ends is mounted in suitable pillow blocks 15 attached to the upper portion of frames 11 and 12 over rollers 13 such that a sheet of glass 16 conveyed on rollers 13 is moved under rotary brush 14 for wiping engagement therewith. Rotary brush 14 is power-driven as shown in Figure 2 by sprocket and chain generally indicated at 17.

According to the invention suitable upstanding brackets 18 and 19 are attached to the upper portions of side frames 11 and 12. Upstanding bracket 18 extends upward beyond bracket 19 and has formed therein suitable apertures 20 and 21, the purpose of which will be explained hereinafter.

Pivotaly supported between brackets 18 and 19 in bearings 18' and 19' is an elongated shaft 22 having an extension 22' shown in Fig. 2 at the lefthand end thereof. Rigidly connected with the shaft extension 22' is a vertically extending handle 23 which has an aperture there-through that is brought into alignment with apertures 20 and 21' in upstanding bracket 18 to receive a securing pin 24 such as shown in Fig. 2. By this handle 23 and the pin 24, shaft 22 may be rotated and held in a selected position. Rigidly attached toward the outer ends of shaft 22 are arms 25 and 26 as by welding as indicated at 25' and 26' for each arm respectively. On the outer end of the arms 25 and 26 and on the lower edge thereof is welded an elongated angle member generally indicated at 27 having a depending wiper flange 27'. This elongated angle or wiper member 27 is preferably of stainless steel material and a size of angle 2 inches x 2 inches x 3/16 inches is desirable. Thus by removing pin 24, see Figures 1 and 2, handle 23 may be rotated to the right as shown in Fig. 4 and the arms 25 and 26 are lowered so that the scraper element 27' is brought into wiping engagement with the bristles of brush 14. Pin 24 may be inserted in the aperture in handle 23 which is in alignment with aperture 21 to hold the scraper in wiping contact with the bristles of the brush 14. If necessary the scraper 27' may be lowered further than is illustrated into the bristles of the brush 14. In a typical glass-cleaning line depicted, the glass moves from right to left as shown in Fig. 4 and the rotary brush 14 is

rotated in a counter-clockwise direction or against the direction of movement of glass 16 which is being cleaned.

Associated with the scraper blade 27' which extends throughout the full length of the rotary brush 14 is an elongated fluid-distributing pipe 28 which is welded in position underneath the elongated angle member 27 as shown best in Figures 3 and 4. In Figure 5 the distributing pipe 28 is shown as having a diameter of approximately $\frac{1}{2}$ inch and preferably of copper tubing material with $\frac{1}{16}$ inch apertures 28' in the bottom thereof spaced every three quarters of an inch throughout the length of pipe 28. Fluid-dispensing tube 28 is connected by a flexible connection 29 to a fluid supply pipe generally indicated at 30 attached by brackets 31 to the top of frame member 11. Fluid supply pipe 30 is made in two sections 30' and 30'' having a T-fitting 31 therebetween and to which T-fitting 31' is connected an upstanding pipe 32 having a stop valve 33 attached thereto on which is supported a funnel 34 for receiving the cleaning fluid which is a detergent such as ammonia. All of the fluid conveying apparatus is preferably of copper or an anti-corrosive material so that it will not be attacked by the detergent. The flexible tubing 29 is also of a suitable flexible material which is not attacked by the ammonia or detergent fluid. Section 30'' of fluid supply pipes 30 has imposed therein a shutoff valve 36, see Fig. 1, and the supply pipe section 30'' is attached to a hot distilled water supply which is under a head of pressure.

It is important that the fluid-distributing conduits 28 extend entirely across the length of the elongated brush 14 so that the fluid-cleaning material may be uniformly distributed through the evenly spaced apertures 28', see Fig. 5, onto the bristles of rotary brush 14 and along the radial length of the bristles. A detergent, such as ammonia, is placed in the funnel or reservoir 34 and thus a head of pressure is available for the fluid distribution pipe 28. Valve 36 being closed, valve 33 is opened and the detergent flows through the pipe section 30', flexible connection 29 and throughout the length of the perforated distributor pipe 28 extending throughout the length of brush 14. Brush 14 is rotating as the cleaning process of the glass plates 16 is in continuous operation. The detergent is sprayed under pressure through the small dispensing orifices 28' in pipe 28 and onto the bristles of brush 14 which is rotating counter-clockwise. The detergent is thereby forced onto the bristles of brush 14 which have become stuck together in adjacent areas of the brush by foreign material such as grease. The detergent passes down the whole radial length of the bristles of brush 14 which bristles are set into the customary hub of the rotary brush. The foreign material is loosened and softened by the detergent and while some may freely fall off the bristles a residual amount still is carried by the bristles. The scraper blade 27' impinges into the brush and scrapes off the loosened foreign particles on the bristles thereby freeing the individual bristles.

After the detergent has been applied the valve 33 is closed and the piping and brush are rinsed. This rinsing is carried out by opening valve 36 and allowing hot distilled water to enter the piping and distributor pipe 28. It likewise is applied to the brush bristles under a pressure head and rinses the brush.

In Fig. 6 there is shown an alternative mounting for the spray pipe. The spray pipe 28'' similar to pipe 28 is mounted on top of the pivot arms 25 and 26 and in spaced relation just to the left or rear of the scraper 27.

In carrying out the invention a combined fluid-applying spray head 28 and scraper 27 are provided which work together to effectively apply detergent under a head of pressure in a uniform manner so that the detergent penetrates the brush and flows along the radially disposed bristles and the scraper scrapes the loosened material from the bristles as they whip against the scraper. This combined cleaning operation is carried out while the

rotary cleaning brush is rotating and the continuous operation of cleaning plates, such as glass plates, is not interrupted.

I claim as my invention:

1. A brush cleaner for an elongated rotary brush adapted to rotate against the direction of movement of a plate moved under the brush comprising, in combination, a support frame, mounting means pivotally attached to said frame, a plurality of spaced apart arms extending transversely to and adjacent said elongated brush and each having one end thereof attached to said pivotal mounting means, an operating member attached to said mounting means for pivoting the same, an elongated rigid scraper blade for said brush attached to the other ends of said arms and extending at an obtuse angle with the radially extending bristles of the brush when in scraping engagement therewith on pivoting of said mounting means and arms attached thereto, said scraper when pivoted into engagement with the bristles of the brush being positioned to the side of the axis of the brush so that material removed from the brush falls upon portions of the plate before they move under the brush, an elongated spray pipe extending coextensive with said scraper blade throughout the length of said elongated brush and fixed to said blade, said spray pipe having a plurality of spaced apart fluid-dispensing orifices throughout its length and coextensive with said elongated brush, and extending radially through the wall of said pipe so that they are directed generally toward and in alignment with the adjacent bristles of the rotary brush, fluid pressure supply means connected with said spray pipe, said spray pipe dispensing fluid uniformly onto said brush and along the bristles thereof under pressure to loosen foreign particles adhering to the bristles of said brush, said operating member causing said mounting means and arms connected thereto to simultaneously pivot said elongated scraper blade into and out of wiping engagement with said brush bristles and said spray pipe toward and away from said brush, said scraper blade when in wiping engagement with the brush further loosening from the bristles of the brush the foreign material loosened by said fluid applied thereto.

2. A brush cleaner for an elongated rotary brush adapted to rotate against the direction of movement of a plate moved under the brush comprising, in combination, a support frame, mounting means pivotally attached to said frame, a plurality of spaced apart arms extending transversely to and adjacent said elongated brush and each having one end thereof attached to said pivotal mounting means, an operating member attached to said mounting means for pivoting the same, an elongated rigid scraper blade for said brush attached to the other ends of said arms and extending at an obtuse angle with the radially extending bristles of the brush when in scraping engagement therewith on pivoting of said mounting means and arms attached thereto, said scraper when pivoted into engagement with the bristles of the brush being positioned to the side of the axis of the brush so that material removed from the brush falls upon portions of the plate before they move under the brush, an elongated spray pipe extending coextensive with said elongated brush and supported by said arms in spaced relation to said scraper blade and over said elongated brush, said spray pipe having a plurality of spaced apart fluid-dispensing orifices throughout its length coextensive with said elongated brush, and directed toward said brush, fluid pressure supply means connected with said spray pipe, said spray pipe dispensing fluid uniformly onto said brush and along the bristles thereof under pressure to loosen foreign particles adhering to the bristles of said brush, said operating member causing said mounting means and arms connected thereto to simultaneously pivot said elongated scraper blade into and out of wiping engagement with said brush bristles and said spray pipe toward and away from said brush, said scraper blade when in wiping en-

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gement with the brush scraping from the bristles of the brush the foreign material loosened by said fluid applied thereto.

3. In combination with a horizontal conveyor for moving sheets of rigid material such as glass and including a rotary brush rotatably mounted on said conveyor, means for rotating said brush about an axis of rotation transversely of the path of movement provided by the conveyor to clean the surface of moving sheets of rigid material, said brush being adapted to rotate against the direction of movement of the sheets of rigid material, and a cleaner for said brush, said cleaner comprising an elongated rigid scraper member, and an apertured pipe fixed to the scraper member with the apertures thereof directed toward said brush, the scraper member and apertured pipe extending transversely of said path of movement for the entire length of said brush, a mounting frame fixed in position relative to said conveyor, means pivotally attaching the scraper member and the pipe to the mounting frame, said scraper when pivoted into engagement with the bristles of the brush being positioned to the side of the axis of the brush so that material removed from the brush falls upon portions of the sheets of rigid material before they move under the brush, operating means to pivot said scraper member into and out of engagement with said brush, and means to supply fluid under pressure to said apertured pipe, whereby when the scraper member contacts the rotating brush, fluid is dispensed through the apertured pipe to loosen foreign material in the brush and the scraper member causes removal of loosened material from the bristles by a combined scraping and distortion of the bristles.

4. The apparatus according to claim 3 wherein said apertured pipe has uniform aperture spacing therein and said apertured pipe is positioned adjacent said scraper so as to lie adjacent the scraper but intermediate the scraper and the axis of said rotary brush.

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5. Apparatus according to claim 3 wherein said means to supply fluid under pressure to said apertured pipe comprises a reservoir positioned in elevated relation above said apertured pipe, conduit means connecting said reservoir with said apertured pipe and valve means in said conduit for regulating the flow of fluid from said reservoir to said apertured pipe.

6. Apparatus according to claim 3 wherein said means pivotally attaching the scraper member and the pipe to the mounting frame and said operating means to pivot said scraper member into and out of engagement with said brush comprise a shaft member pivotally mounted on said mounting frame and extending transversely across said conveyor, a plurality of spaced apart arms extending transversely to and adjacent said elongated brush and each having one end thereof attached to said shaft and an operating lever rigidly attached to said shaft adjacent one end thereof and extending to be manipulated to pivot said shaft and arms attached thereto.

7. Apparatus according to claim 6 including stop means connected to said mounting frame for holding the operating lever in an attitude to position said scraper in spaced relation above said brush in one position and in firm engagement with the bristles of the brush in another position.

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