July 19, 1927. 1,636,002

W. J. KENT

CLEANING DEVICE

Filed Oct. 11, 1923 2 Sheets-Sheet 1

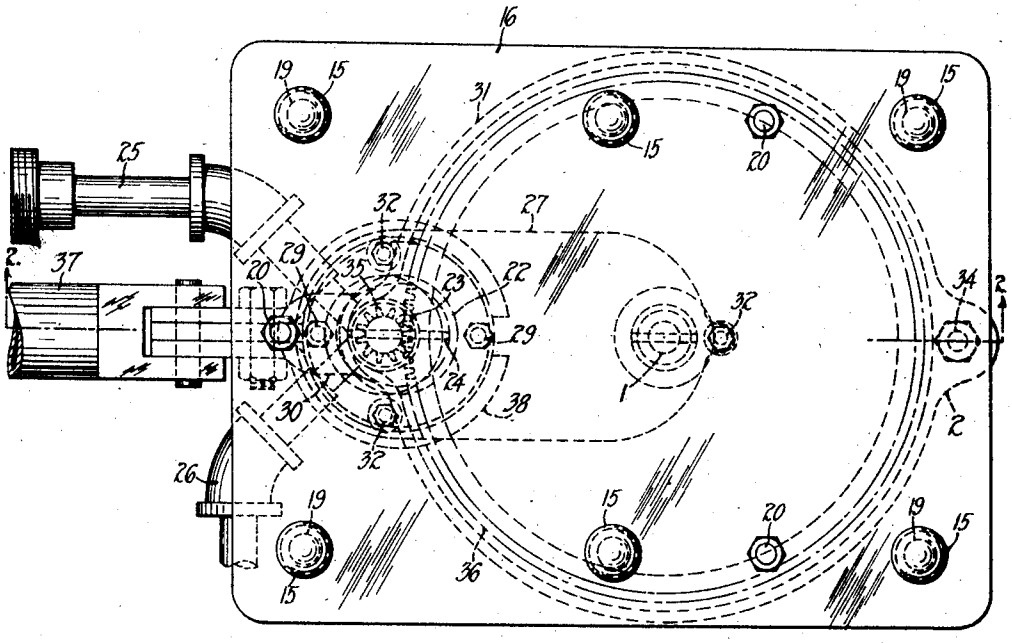


Fig. 1.

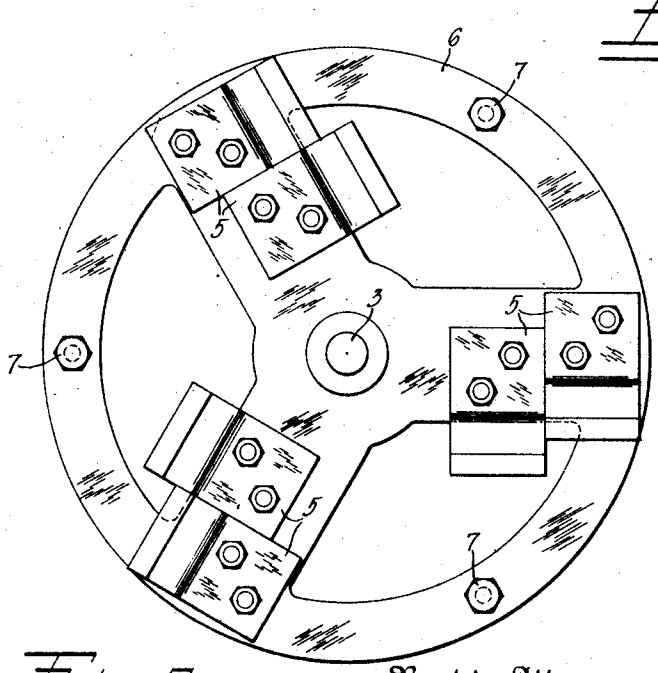


Fig. 3.

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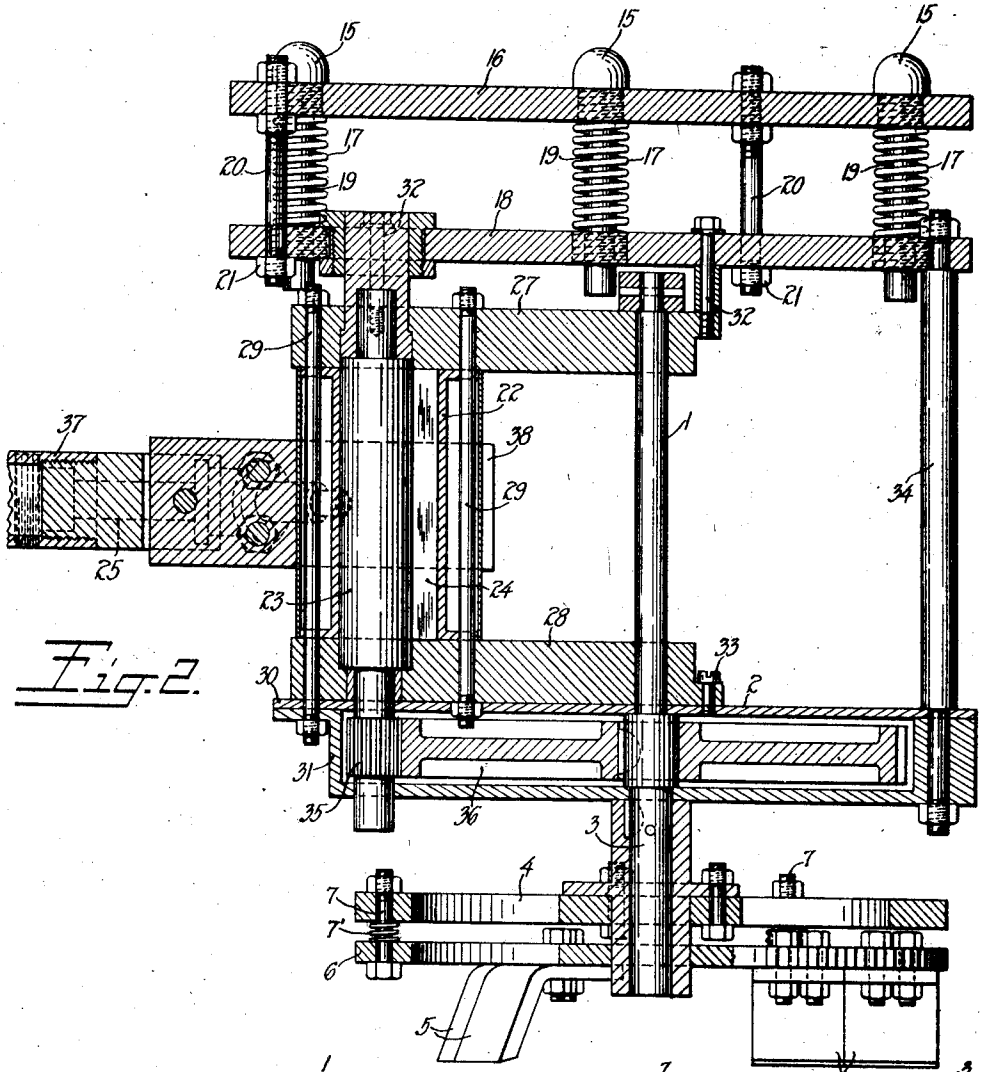


Fig. 2.

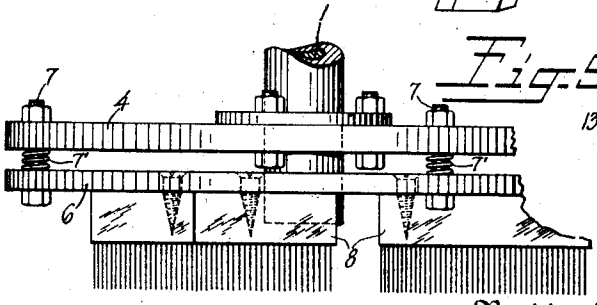


Fig. 4.

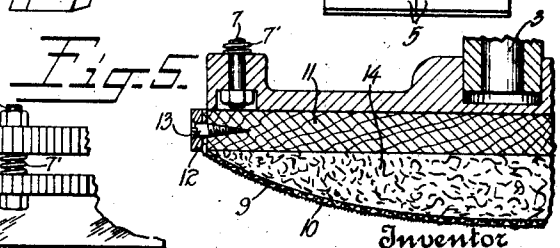


Fig. 5.

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Patented July 19, 1927. 1,636,002

UNITED STATES PATENT OFFICE.

WILLIAM J. KENT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE MECHANICAL RUBBER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

CLEANING DEVICE.

Application filed October 11, 1923. Serial No. 668,032.

This invention relates to cleaning devices and more particularly to a device for cleaning the platens of vulcanizing presses and similar objects.

Referring to the drawings forming a part of this specification,

Fig. 1 is a plan view of the device;

Fig. 2 is a central sectional elevation taken through the plane 2—2 of Fig. 1;

Fig. 3 is a bottom plan view of one type of cleaner;

Fig. 4 is a fragmental elevation showing another type of cleaner; and

Fig. 5 is a fragmental sectional elevation showing still another type of cleaner.

While the cleaning device may be found useful in cleaning various objects it is primarily intended for cleaning the platens of presses used in vulcanizing rubber goods of various kinds as for instance belting, hose and packing. A very hard scale produced by the articles being vulcanized, forms on the surfaces of both platens of the press which is very difficult to remove. These platens are in some cases as large as 30 feet by 5 feet and as it is essential that the surfaces of the platens be kept clean in order to produce high grade rubber products much time is required and expense incurred in removing this scale. Heretofore it has been necessary to allow the press to cool after a vulcanizing heat or cure. The platens are opened sufficiently far apart to permit workingmen to enter after the press has cooled and with knives and scrapers to remove the scale that has formed upon the platens. This difficult task has been done heretofore entirely by hand in this way and the greatest difficulty is experienced in the cleaning of the upper platen, for here the workingmen must lie upon their backs upon the lower platen and in this uncomfortable position scrape the entire surface of the upper platen until it is clean and smooth, the scale and dust falling down upon them and entering their eyes and mouths. It requires about twelve hours for the large size presses to sufficiently cool to permit them to be cleaned by the old method and after they have sufficiently cooled it requires two men about one day to satisfactorily clean the platens. After the press has been cleaned it requires about an hour to reheat it to the correct temperature for the next vulcanizing operation.

With the use of my cleaning device the vulcanizing press may be cleaned while at the vulcanizing temperature and two men can clean the press in about two hours, after which the press is ready for further use without the necessity of waiting to reheat it. It will therefore be seen that when using my cleaning device a very material saving in time will be effected thereby insuring a much greater output from the press. My cleaning device at the same time produces a much cleaner and more smoothly polished surface upon the platens than is possible with the old method of cleaning and there is a further economy in the saving of heat for the press does not have to be first cooled and then reheated.

The cleaning device in its preferred embodiment comprises a cleaner which is adapted for engagement with the surface to be cleaned, a backing which is adapted for engagement with the press or other object being cleaned opposite the part being cleaned to provide pressure between the said part and cleaner, means for operating the cleaner, and means for moving the cleaning device bodily during the cleaning operation. In the present instance a revoluble cleaner is employed and to this end a shaft 1 is mounted in bearings of frame 2 of the device. One end of this shaft as the end 3 is extended beyond the frame and has secured thereon a disc 4 serving as a support for the cleaner. In the present instance three types of cleaners are shown which may be used interchangeably as occasion requires. The type shown on the device (Fig. 2) comprises a set of knives 5 secured to a plate 6 which is yieldingly secured to the supporting plate 4 by means of bolts 7 and springs 7'. Instead of the knives 5, brushes 8 as shown in Fig. 4, or an emery disc 9 as shown in Fig. 5, may be substituted. All that is necessary to make the substitution is to detach the nuts from bolts 7 thereby permitting the plate 6 carrying the particular type of cleaner to be removed from the device and another plate carrying another type of cleaner substituted therefor. I have found that the emery cleaner 9 gives very satisfactory results and may be used for the greater part of the cleaning, although the knives and brushes may be found advantageous at times. I have obtained good results from an emery cleaner constructed as shown in Fig. 5 of a sheet of cloth 10 coated with emery, secured to a disc

11 which may conveniently be of wood, by means of a band 12 fastened to the disc by screws 13.

The sheet of emery cloth is stretched over a pad 14 made of sponge rubber or other suitable material and having a convex outer surface. The backing for the cleaner in the present instance comprises a series of dome-shaped knobs or bearings 15 secured to a plate 16 which is resiliently secured to the frame 2 by means of a series of springs 17 interposed between the plate 16 and a plate 18 forming part of the frame 2. The springs are conveniently mounted on posts 19 which extend from the domes 15 and which have their free ends passing freely through orifices in the plate 18 so that the posts may move with the plate 16 as the springs expand and contract. The plates 16 and 18 are secured together by means of a series of bolts 20 secured to the upper plate 16 and projecting through the lower plate 18 in a manner to slide relatively thereto, nuts 21 being provided on these bolts to hold the two plates together at a maximum distance apart while permitting relative movement thereof.

The shaft 1 may be driven by any desired power such for instance as an electric motor, but I have obtained satisfactory results by employing a fluid driven motor, and in the present instance I have shown a type of pneumatic rotary motor which is a standard motor on the market and comprises briefly a cylinder 22, a shaft 23 within the cylinder and eccentric therewith, and a single blade 24 exactly fitting across the bore of the cylinder in all positions and operating in the usual and well-known manner, an inlet 25 and outlet 26 being provided for the admission and exit of the compressed air that drives the motor. The cylinder heads 27 and 28 are secured together and to the cylinder 22 by means of the tie bolts 29 one of which extends through a plate 30 of the frame 2 and a housing 31 below the plate thereby firmly securing the plate, housing and motor together. The heads 27 and 28 are extended to provide adequate bearings for the shaft 1, the upper head being secured to the plate 18 by means of the bolts 32 and the lower head being further secured to the plate 30 by means of one or more screw bolts 33 while the plate 30 and housing 31 are further secured to the plate 18 by the tie bolts 34 thereby forming a compact and rigid structure of the framework and the various parts forming the cleaning device.

The motor is connected to the cleaner by means of a pinion 35 secured to the extending end of the shaft 23 and an intermeshing gear 36 secured on the shaft 1, the pinion and gear being mounted within the housing 31 to protect them from the scale being removed from the platen.

To move the device bodily throughout the entire area of the platen while the cleaner is revolving in its cleaning operation a comparatively long handle 37 is provided which is pivotally secured to the ends of a band 38 which embraces the outer wall of the cylinder 22.

In cleaning a press for example the platens are opened a sufficient amount apart to permit the cleaning device to be placed therebetween with the cleaner in contact with the surface of the platen to be cleaned and the backing in contact with the surface of the opposite platen and with sufficient compression in the springs 17 to produce the required pressure between the cleaner and part being cleaned. The platens are jacked or blocked up in this spaced relation and the cleaning device inserted. The motor is set into operation by admitting the compressed air thereto in the usual manner and the cleaner thereby caused to revolve at high speed. The handle is sufficiently long so that the operators may draw the device back and forth over the entire surface of the platen as the cleaner is revolving, which operation is continued until the surface is entirely cleaned. The device is so balanced that the domes 15 distribute a uniform pressure over the cleaner, and it is of such a construction that there is no tendency of the device becoming bound or locked between the platens. The springs 17 and 7′ always provide a uniform yielding pressure permitting the operators to freely draw the device back and forth at will.

The cleaner preferably covers a width in its revolving path substantially equal to the width of the device as clearly shown in Fig. 1. This is desirable for, in the case of presses, the hydraulic rams that are employed to open and close the platens obstruct the surfaces to be cleaned and if the cleaner were not made to cover an area at least equal to the width of the device the device would strike these obstructions and the cleaner would not be able to reach and clean the surfaces entirely to these obstructions.

A most important feature of my invention resides in the fact that the device may be employed for the cleaning of either of the platens at will, for after one platen has been cleaned all that is necessary is to withdraw the device and to reinsert it between the platens in an inverted positions whereupon it is in readiness to clean the opposite surface.

As many apparently widely different embodiments of this invention may be made without departing from the spirit thereof, it is to be understood that I do not intend to limit myself to the specific form of the invention as set forth except as indicated in the appended claims.

Having thus described my invention what I claim and desire to protect by Letters Patent is:—

1. In a device for cleaning between opposed surfaces, a frame, opposed bearing means and cleaning means carried thereby, and resilient means carried by the frame adapted to project said bearing means and cleaning means outwardly of the frame.

2. In a device for cleaning between opposed surfaces, a frame, bearing means carried thereby, frictional cleaning means carried by said frame in opposition to the bearing means, and resilient means supported by the frame operative for continuously projecting said bearing means and cleaning means outwardly of the frame.

3. In a device for cleaning between opposed surfaces, a frame, bearing means carried thereby, rotatable frictional cleaning means carried by the frame in opposition to said bearing means, and resilient means supported by the frame operative for continuously projecting said bearing means and cleaning means outwardly of the frame.

4. In a device for cleaning between opposed surfaces, a frame, bearing means at one side thereof, cleaning means at the opposite side thereof, said cleaning means being operative for the full width of the frame and resilient means carried by the frame for projecting said bearing means and cleaning means outwardly of the frame.

5. In a device for cleaning between opposed surfaces, a frame, bearing means resiliently carried at one side thereof, a frictional cleaner resiliently carried by the opposite side of the frame, and mechanically operated means attached to the frame for actuating the cleaner.

6. In a device for cleaning between opposed surfaces, a frame, a series of abutments resiliently supported at one side of the frame, a frictional cleaner rotatable with respect to the frame resiliently supported at the opposite side of the frame, and means for rotating said cleaner.

Signed at Chicago, county of Cook and State of Illinois, this 2nd day of October, 1923.

WILLIAM J. KENT.