

UNITED STATES PATENT OFFICE

JOSEPH S. PORTER, OF PORTLAND, CONNECTICUT, ASSIGNOR TO D. & H. SCOVIL INCORPORATED, OF HIGGANUM, CONNECTICUT, A CORPORATION OF CONNECTICUT

APPARATUS FOR APPLYING ABRASIVE TO POLISHING WHEELS

Application filed July 16, 1928. Serial No. 293,244.

This invention relates to apparatus for applying granular abrasive, such as alundum, corundum, carborundum and emery, to the peripheries of polishing wheels which have bodies that are more or less flexible and are made up of compacted cloth, felt, leather, pulp, fibre, wood or metal.

The object of the invention is to provide an apparatus for this purpose which is relatively inexpensive to build, simple to operate, and by means of which the abrasive can be rapidly applied in a manner that will ensure a coating of uniform density, even thickness and flat surface on the peripheries and parallel with the axes of the wheels that are treated thereby.

This apparatus has an endless belt that is moved beneath a hopper from which granular abrasive is in the desired quantity allowed to escape to the upper surface of the belt, the hopper being desirably electrically heated to keep the abrasive warm. There is a receptacle, preferably electrically heated, containing adhesive, for instance animal glue. The wheel to be coated is held by a clamp that is rotatably mounted at the end of an arm so pivoted that the wheel may be swung over to a position adjacent to the adhesive receptacle in order that the operative may apply the adhesive to the peripheral surface of the wheel and then swing back and pressed upon and allowed to roll on the traveling belt carrying the abrasive until the desired amount of abrasive is gathered by the adhesive. The wheel is then removed and placed in an oven and dried, these steps being repeated until the abrasive coating on the periphery of the wheel has reached the required thickness and density.

In the accompanying drawings Fig. 1 shows a side elevation of the apparatus. Fig. 2 is a view looking down on the apparatus with parts in section. Fig. 3 shows a section of the abrasive holding hopper.

Supported in suitable bearings at one end of the apparatus is a shaft 1 attached to which is a driving pulley 2. At the other end is a shaft 3 loose on which is a driven pulley 4. An endless belt 5, which may be leather or steel, passes around these pulleys.

The shaft 3 is mounted in the upper ends of angle arms 6 which are pivoted in supports 7 and are engaged by springs 8 in such manner as to keep the belt under proper tension.

Fixed on the shaft 1 is a gear 9 that is engaged by a pinion 10 on an arbor 11 carrying a worm wheel 12 which is engaged by a worm 13 driven by a motor 14. When the motor is in action the worm, worm wheel, pinion and gear rotate the driving pulley which gives the belt a slow travel.

Supported over the belt near the driving end of the apparatus is a hopper 15 for receiving the granular abrasive. The hopper shown is divided vertically into two compartments by a casing 16 which may contain water and which is provided with electrical heating units 17 for the purpose of warming the abrasive. Near the bottom of the hopper is a horizontal partition 18 with openings 19 through which the abrasive may flow from the upper compartments into spaces 20 at the bottom of the hopper. Through the bottom of the hopper are slots 21 which permit the escape of abrasive from the spaces 20 onto the belt.

Rods 22 are provided for closing the openings 19 and stopping the downward flow of abrasive. These rods are loosely supported and at their upper ends are pins 23. If a rod is lifted and is turned so that its pin will rest upon the top of the water jacket an opening 19 is left free for the escape of abrasive. When a rod is turned so that its pin is disengaged from the top of the water jacket it will drop into an opening 19 and stop the flow of abrasive. By separating the hopper into two compartments abrasive material of one fineness may be kept in one, and abrasive material of a different degree of fineness or character may be kept in the other, allowing the apparatus to be readily used for feeding adhesive having grains of the desired quality and size to the belt.

On a support 24 at the other end of the apparatus is a receptacle 25 for containing the adhesive. This receptacle is desirably set in a casing 26 that may contain water and which may be heated by an electrical heating

unit 27 for the purpose of keeping the adhesive warm.

Fastened to the front end of the shaft 3 on which the driven belt pulley turns freely is a crank arm 28 with a forwardly extending handle 29. Fastened to the back end of the shaft 3 is an arm 30 which at its free end has a pin 31 that extends forwardly over the belt. Loose on this pin is a sleeve 32. Fastened to the rear end of this sleeve is a clamp disk 33 and adjustable on the front end of the sleeve is a clamp disk 34 that is held in position by a nut 35 which is turned upon the threaded front end of the sleeve. The wheel to be treated is slipped upon the sleeve and then clamped between the disks by the nut. By means of the crank handle the arm may be swung so as to carry the wheel from above the belt, the position illustrated in full line in Fig. 1, to a position adjacent to the adhesive receptacle, as indicated by the dotted lines in that figure.

Below the belt and beneath the operative position of the wheel is a platform 36 and pivoted to the crank handle is a foot 37 that may be turned down so as to rest on the top of the platform when it is desired to hold the wheel above and out of contact with the belt. Adjacent to and below the driven pulley is a receptacle 38 for receiving such abrasive as is not picked up from the belt by the adhesive on the wheel, and extending from the adhesive casing to a position above the belt is a shield 39 which is designed to catch any drip of adhesive from the wheel when the adhesive is applied to the periphery thereof.

In use a wheel clamped on the arm is first swung adjacent to the adhesive receptacle and in this position the operative with a brush or other suitable means coats its periphery with adhesive. The wheel is then swung back onto the traveling belt and the adhesive allowed to collect abrasive therefrom, the wheel being rotated by the movement of the belt so that its whole periphery is coated. The operative by means of the crank handle may press the wheel down into the abrasive if desired to ensure the necessary density of the abrasive picked up by the adhesive on the periphery of the wheel. When a sufficient quantity of abrasive has been collected by the adhesive on the periphery of the wheel the nut is unscrewed, the outer clamp plate taken off and the wheel removed and placed in an oven for drying.

After the coating has been sufficiently baked the wheel may again be located on the arm and coated with adhesive and then allowed to pick up an additional layer of abrasive. These steps may be repeated as often as desired until the coating of abrasive on the periphery of the wheel has reached the desired thickness and density. When one wheel is being dried another wheel may be treated by the apparatus so that there is no lost time.

With this apparatus a coating of abrasive of uniform thickness is quickly applied to the periphery of the wheel and its density well regulated, depending upon the force with which the wheel is pressed down onto the belt when it is collecting abrasive therefrom. As the wheel rotates with the movement of the belt the peripheral surface is evenly coated, and as the axis of the wheel is parallel with the plane of the belt and the platform beneath the belt, the face of the abrasive coating that is formed on the periphery of the wheel is smooth and flat and at all points equally distant from the axis, thus ensuring accurate grinding or polishing of the article which is subjected to the action of the wheel thus produced.

The invention claimed is:

1. An apparatus of the character described comprising an endless belt, mechanism for imparting movement to the belt, a hopper with a plurality of compartments for depositing abrasive on the upper surface of the belt, a rotatable wheel holding clamp adapted to be moved toward and from the upper surface of the belt, and a platform below the belt and beneath the wheel clamp.
2. An apparatus of the character described comprising an endless belt, mechanism for imparting movement to the belt, means for depositing abrasive on the upper surface of the belt, an oscillatory arm, means for oscillating said arm, a pin extending from said arm over and parallel with the upper surface of the belt, a sleeve rotatable on said pin, a clamp disk fixed to said sleeve, a clamp disk detachably mounted on said sleeve, means for securing said detachable disk on said wheel, and a platform below the belt and beneath said clamp disks.
3. An apparatus of the character described comprising an endless belt, mechanism for imparting movement to the belt, means for depositing abrasive on the upper surface of the belt, an adhesive receptacle, an oscillatory arm, a wheel holding clamp rotatably mounted on said arm, means for oscillating said arm and swinging said clamp between the adhesive receptacle and the upper surface of the belt, and a platform below the belt and beneath said clamp.
4. An apparatus of the character described comprising an endless belt, mechanism for imparting movement to the belt, a hopper adjacent one end of the belt for depositing abrasive on the upper surface of the belt, electrical means for heating said hopper, an adhesive receptacle adjacent the other end of the belt, electrical means for heating said receptacle, an oscillatory arm, a wheel holding clamp rotatably mounted on said arm, means for oscillating said arm and swinging a wheel held by said clamp between the adhesive receptacle and into engagement with the upper surface of the belt and caus-

ing the wheel to rotate by frictional engagement with the belt, and a platform below the belt and beneath said clamp.

5 5. Apparatus for applying abrasive to the peripheral surface of a grinding or polishing wheel comprising a frame, pulleys adjacent
10 the ends of the frame, an endless belt running over said pulleys, means for depositing abrasive on the belt, oscillatory means for clamping the wheel to be treated with its
15 axis extending across and parallel with the upper surface of the belt, means for swinging said clamping means and causing the peripheral surface of the wheel to engage with
and be rotated by frictional contact with the belt, and a stationary table beneath the
locality of contact of the wheel with the belt.

6. Apparatus for applying abrasive to the peripheral surface of a grinding or polishing
20 wheel comprising a frame, pulleys adjacent the ends of the frame, an endless belt running over said pulleys, means for depositing abrasive on the belt, freely rotatable means
25 for clamping the wheel to be treated with its axis extending across and parallel with the upper surface of the belt, means for swinging said clamping means and causing
the peripheral surface of the wheel to engage with and be rotated by frictional contact
30 with the belt, and a stationary table beneath the locality of contact of the wheel with the belt.

7. Apparatus for applying abrasive to the peripheral surface of a grinding or polishing
35 wheel comprising a frame, pulleys adjacent the ends of the frame, an endless belt running over said pulleys, a hopper for depositing abrasive on the belt, electrical means for heating said hopper, freely rotatable means
40 for clamping the wheel to be treated with its axis extending across and parallel with the upper surface of the belt, means for swinging said clamping means and causing the peripheral surface of the wheel to engage with
45 and be rotated by frictional contact with the belt and a stationary table beneath the locality of contact of the wheel with the belt.

8. Apparatus for applying abrasive to the peripheral surface of a grinding or polishing
50 wheel comprising a frame, pulleys adjacent the ends of the frame, an endless belt running over said pulleys, means for depositing abrasive on the belt, a clamp for gripping the wheel to be treated, said clamp being
55 rotatably mounted on an oscillatory axle that extends across and parallel with the plane of travel of the upper surface of the belt, means for swinging said axle and clamp toward
and from the belt, and a stationary
30 table extending beneath the upper length of the belt.

JOSEPH S. PORTER.