Patented Aug. 6, 1940 2,210,728

UNITED STATES PATENT OFFICE

2,210,728

METHOD OF CLEANING ABRASIVE SHEET MATERIAL

George H. Orfald, Minneapolis, Minn.

No Drawing. Application August 16, 1937, Serial No. 159,321

3 Claims. (Cl. 141—1)

This invention relates to a method and product for cleaning and renewing abrasive material particularly sheet abrasive material. Such abrasive material is now widely used in various arts. Abrasive sheet material is used in sanders and various forms of wood finishing machines including floor finishing or renovating machines. Said abrasive material is also used for smoothing or rendering uniform leather, hides, etc.

Sheet abrasive material now commonly comprises a sheet of cloth or tough paper having secured to one surface thereof by a suitable binder particles of very hard substances. These substances include emery and carborundum. These particles, of course, vary in size. When the abrasive material is used on certain materials, such as soft woods, certain leathers and other material, the abraded material fills the abrasive material, or in other words, becomes lodged between the particles of the abrasive sheet material, thus destroying its abrasive affect. The abraded material often completely covers and obscures the particles of the abrasive and a hard surface is formed on the filled material by the rotation of the member carrying the abrasive sheet material or by the abrading movement of the sheet material. It is now the common practice in wood-working shops and with floor finishing and sanding machines to discard or throw away the sheet of the abrasive material after it has become so filled.

It is an object of this invention to provide a method and product for cleaning the abrasive material of the filled material so that the abrasive material is renewed and may be again used.

It is a further object of the invention to provide a method and product by the use of which the filled material may be easily and quickly removed from the abrasive sheet material so that said abrasive sheet material is capable of again being put to its regular use. The cleaned abrasive sheet is often as good as new.

It is still another object of the invention to provide a method and product by the use of which the abrasive material when carried on a rotating roll may be cleaned and renewed without being taken from said roll.

These and other objects and advantages of the invention will be fully set forth in the following description:—

The abrasive material when used on wood fills much more readily with the soft woods such as basswood, pine, fir, spruce, cyprus, redwood and magnolia than with hard woods. Very hard woods do not fill the abrasive material so objectionably as do the soft woods. After the abrasive material has become well filled with the wood so that its abrasive quality is much impaired or destroyed, in accordance with the present invention, a certain liquid is placed on the sheet material and filled material therein. In some cases where the filled material has become packed or pressed into a hard mass with a hard smooth surface, it is desirable to score this surface with a stiff brush such as a wire brush. This is quite easily done and if the abrasive material is secured to a rotating roll the brush need only be held against the roll. The liquid is then placed on the abrasive material by being poured on or by means of a sponge or saturated cloth. The liquid then permeates downward into the filled material and sufficient time should be given for such permeation. In the case of abrasive material which is badly filled with wood this time will vary from 5 or 10 minutes to overnight. In fact, it is recommended that where possible the removal of the filling material be started just at the end of the day and the liquid be allowed to remain on or in the abrasive material until the next morning. This is not necessary, but merely constitutes a convenient plant practice. It is the resinous matters or the gummy substance in the wood, which substances are really binders for the wood particles which forms the filling of the abrasive sheet which are acted on by the liquid affixed. The liquid used in accordance with the present invention acts as a softener or solvent for this binder and practically nullifies or destroys the effect thereof. When floors are cleaned considerable varnish is contained in the filling material and some paint is often present. After the liquid has been in contact with the binder for sufficient time to thoroughly act thereon, the filling is reduced to a disintegrated form or in other words, the fibre is released and forms more or less of a powder which can be very easily mechanically removed from the abrasive sheet. While the filler could be removed in other ways, in practice it has been found easy and suitable to remove the filler by means of a brush. When the liquid is applied to a roller containing the abrasive sheet and allowed to remain overnight or for a suitable period the filler can be easily and quickly brushed out the next morning by merely holding a fairly stiff brush against the roller. The paper is effectively cleaned and as above stated, in most cases is just about as good as new.

While other softeners or solvents might possibly be used, applicant after a long period of experimentation, has found that in cleaning wood

filler from paper a very suitable mixture comprises a liquid having approximately 35% of grain alcohol, 30% methyl salicylate and approximately 35% of a refined oil such as a petroleum oil. The mixture is basically an organic decomposition as the alcohol makes rancid the refined oil. The mixture is a viscous liquid with a specific gravity at ordinary temperatures of about 0.85. The boiling point is approximately 365 degrees F. and the flash point is approximately 157 degrees F. The freezing point of the mixture is approximately minus 40 degrees F. While different petroleum oils might be used, in practice tolluene which is a coal tar product has been found suitable. It is important that the liquid have a high flash point or combustion point to eliminate the fire hazard in its use on a rapidly revolving roll or cylinder and in wood-working establishments. The end point flash of the liquid is approximately 494 degrees F.

When leather is buffed or abraded by an abrasive sheet material the abraded material often badly fills the abrasive sheet. This is largely due to the pigment in the leather. When a sheet which is filled with leather particles is to be cleaned and renewed the liquid used is varied somewhat and contains approximately 35% grain alcohol, approximately 25% benzene, approximately 5% methyl salicylate, and approximately 35% refined oil. The liquid is used in the same manner for cleaning an abrasive sheet filled with leather as with an abrasive sheet filled with wood except that the liquid does not have to remain so long in contact with the abrasive sheet. The filler can be easily brushed out of the abrasive sheet as soon as the liquid has penetrated the filler.

The liquid has no softening or other effect upon the binder which holds the abrasive material to the paper or fabric. The parts of the abrasive sheet are thus in no way affected.

In some cases a small quantity of oil of mirbane is added to the liquid as a deodorant for the methyl salicylate. The liquids described also have a high utility for cleaning the pressure rolls of wood-working machines. These rolls accumulate certain gummy or resinous substances. The rolls are sometimes cleaned by the workmen with benzene which is highly inflammable and the use of which is really prohibited by the insurance rules. The liquid above described having a high flash point is quite safe for such use.

From the above description it is seen that applicant has provided a very effective method and product for cleaning and renewing abrasive sheet material. With the method and product an immense amount of this material which would otherwise be thrown away, can be saved for use. The abrasive sheet material is often discarded because of the filling before the abrasive thereon is noticeably worn. The sheet material is rendered useless by the solid filling of the abraded material adhering thereto. As above described, with the present method this filling material can be easily and effectively removed and the abrasive sheet renewed for a long further use. Furthermore, the method can be practiced without taking the abrasive sheet from the roll or cylinder in which it is used in the various machines. While the method can be readily and efficiently used on the sheet not in a machine, it is often more convenient to clean the abrasive sheet without taking it from the rotative roll. The method and product have been amply demonstrated in actual practice and found to be very successful and efficient.

It will of course be understood that various changes may be made in the steps and sequence of steps of the method as well as in the constituents and the proportions thereof without departing from the scope of applicant's invention, which generally stated, consists in a method and product capable of carrying out the objects above set forth, such as disclosed and defined in the appended claims.

What is claimed is:

1. The method of cleaning abrasive sheet material comprising a fibrous sheet and particles of very hard substance secured thereto by an adhesive, which sheet material has been filled with particles of abraded material including fibers and a binder insoluble in water which consists in applying to said sheet material a mixture of grain alcohol, methyl salicylate and a hydrocarbon oil, said mixture having a boiling point of approximately 365 degrees F. and a freezing point of approximately minus 40 degrees F., a specific gravity at ordinary temperatures of about 0.85 and a flash point of at least 157 degrees F. to dissolve said binder without affecting said adhesive and then mechanically removing said filling material.

2. The method of cleaning abrasive sheet material comprising a fibrous sheet and particles of very hard substance secured thereto by an adhesive, which sheet material has been filled with particles of abraded material including fibers and a binder insoluble in water which consists in applying to said sheet material a mixture comprising approximately 35% grain alcohol, 30% methyl salicylate and 35% of toluene, permitting said mixture to permeate said filling material to dissolve said binder and loosen said fibers without affecting said adhesive and then removing said filling material mechanically.

3. The method of cleaning abrasive sheet material comprising a fibrous sheet and particles of very hard substance secured thereto by an adhesive, which sheet material has been filled with particles of abraded material including fibers and a binder insoluble in water which consists in applying to said sheet material a mixture comprising approximately 35% grain alcohol, 25% benzene, 5% methyl salicylate and 35% toluene, to dissolve said binder and loosen said fibers without dissolving said adhesive and then removing said filling material mechanically.

GEORGE H. ORFALD.