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METHOD OF GRINDING PROFILES

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METHOD OF GRINDING PROFILES

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9 Claims

ABSTRACT OF THE DISCLOSURE

A method of grinding a profile in which a workpiece, especially of wood or synthetic material, according to which a pattern profiled precisely in conformity with the eventual profiles to be ground in a workpiece is covered by a layer of abrasive material by means of which a raw tool in the form of a disc is shaped into a grinding disc which thereupon is covered by an abrasive layer and then is used for grinding the workpiece.

The present invention relates to a method of grinding profiles, especially profile strips of wood, synthetic material, and the like, according to which a raw grinding tool is provided with a counter-profile which corresponds to the profile to be ground whereupon by means of the thus made grinding tool the profile to be ground is produced.

Various attempts have been made mechanically to produce profiles by grinding. The production of the precise counter-profile, however, causes considerable difficulties in this connection. This holds true in particular when the tool which may for instance be blunted or truncated, has to be resharpened or reground, in which instance changes of the counter-profile within certain tolerances are unavoidable. It is also known to cover correspondingly profiled tools with a, for instance, perforated grinding paper which when becoming dull will be exchanged. However, in view of the specific property of grinding paper, it is impossible to produce properly sharp edges, large profile recesses, small roundings, and similar specific profiles.

It is, therefore, an object of the present invention to provide a method of the above-mentioned general type by means of which it will be possible to grind a profile with high precision and in a simple manner.

It is a further object of this invention to provide a grinding method which will permit the proper grinding of specific profiles, as for instance sharp edges, large recesses, and small roundings.

It is a further object of this invention to provide a grinding method as set forth above which can be practiced at low costs.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawing, in which:

FIG. 1 illustrates in perspective view a pattern for use in connection with the method according to the present invention.

FIGS. 2 to 6 respectively illustrate individual steps or phases of the method according to the invention.

A method for grinding profiles, especially profiled strips of wood, synthetic material, and the like, according to which a raw grinding tool is provided with a counter-profile corresponding to the profile to be shaped, and upon the profile to be made is produced by the thus built-up raw grinding tool, is characterized in that directly upon a profiled pattern, for instance a model or a remaining piece of the profile to be ground, there is applied a grinding or abrasive layer. By means of the thus prepared raw pattern, the raw grinding tool consisting of a less hard synthetic material, as for instance a material known under the trademark Styropor, is by grinding provided with the counter-profile. To the thus produced profiled grinding tool there is applied an abrasive layer, and by means of the thus produced abrasive layer covered tool the final profile to be made is ground. In this way, it will be assured that the grinding tool will in each instance obtain a counter-profile which precisely corresponds to the profile finally to be ground. Inasmuch as the abrasive layer is applied directly to the pattern as well as directly to the counter-profile of the grinding tool, also extreme profiles, such as sharp edges, large profiled recesses, or small roundings, can be ground in a proper and true manner.

The application of the method according to the invention is economical not only with regard to the employed materials for the grinding tool but also with regard to the time required for the machining.

According to a further feature of the present invention, the grinding grains or abrasive layer is connected to the pattern and the tool for instance by an adhesive. In this way a safe and firm connection of the grinding grains will be assured while selectively various sizes of the grinding grains may be employed in conformity with the particular purpose involved.

According to a further development of the present invention, the pattern and the grinding tool may be coated with a preferably water soluble adhesive and may subsequently be sprayed with grinding grains of a desired size. In this way, the thickness of the adhesive layer can in a simple manner be so selected that the grinding grains protrude from the adhesive and are firmly held in and bonded to the adhesive. By employing a water soluble adhesive, it is possible after the grinding grains become dull to remove the same from the pattern and grinding tool by merely washing the pattern and the grinding tool. By means of the washing process, also the adhesive is removed so that the pattern and the grinding tool can again be coated by an adhesive and be sprayed with grinding grains to thereby ready the pattern and tool for further use.

Advantageously, the elasticity of the material of the grinding tool is selected in conformity with the material of the profile to be ground so that in each instance a favorable grinding will be assured.

When a grinding operation is to be carried out during which considerable material has to be ground off, it is advantageous to grind the final profile in immediately succeeding steps so that the profile can be finish ground in one working operation and with one setting. In this instance, the grinding tools advantageously have grinding grains which become progressively finer in the feeding direction of the workpiece to be ground so that the workpiece after a coarse grinding and a smooth grinding will be provided with a fine finish grinding. The granulosity of the grinding grains of the successive tools may in this instance be for instance 80, 100, 150, 200.

It is also possible at the circumference of the profile to be ground, for instance of the strip to be ground, to provide a plurality of tools so that the profile strip will be ground in a single working operation from all sides.

With the method described above, it is possible to employ rotating grinding discs as well as reciprocating grinding tools. The grinding tools may also without difficulties be post-ground according to a pattern in the manner described above. In other words, if the profile by use of the tool has worn off or has been damaged, it can again be machined or sharpened (post-ground) in conformity with the invention set forth above.
Referring now to the drawing in detail, FIG. 1 shows a pattern 1 having a profile 2 corresponding to the profile to be produced. The pattern 1 may be a remaining piece of a finished profiled tool. The pattern 1 is within the range of the profile 2 provided with a thin adhesive layer 3 (FIG. 2) which may for instance be sprayed upon the pattern 1. The thus coated profile 2 is then in conformity with FIG. 3 sprayed with grinding grains 4 which at least partially sink into the adhesive layer 3 and after hardening of said layer 3 be firmly bonded and held to the pattern 1.

A raw grinding tool, for instance in the form of a grinding disc 5, is then rotated about its axis and moved in radial direction as indicated by the arrow 7 toward the pattern 1 prepared in conformity with the steps described in connection with FIGS. 1, 2 and 3. This raw grinding tool may consist for instance of a foamed polysylrol, as it is marketed under the trademark Styropor. While the grinding disc 5 is moved in the direction of the arrow 7 toward the prepared pattern 1 as shown in FIG. 4, at the same time a relative movement between the pattern 1 and the grinding tool 5 in the longitudinal direction of the pattern 1 (see arrow 6 of FIG. 1) is effected. As a result thereof, the grinding tool 5 will be provided with a counter Profile 2a which precisely corresponds to the profile 2 of pattern 1.

Grinding tool 5a is now within the range of the counter profiled tool 5a and with a granular layer 4a of grinding grains which in the manner described above in connection with pattern 1 and FIG. 3 is held on the grinding tool 5 by an adhesive. Consequently, after the adhesive layer 3a with the grinding grains has solidified, the thus created grinding tool 5a (FIG. 6) will then be used for grinding a work 3a which will be firmly bonded in the same with a profile corresponding to the counter-profile 2a. It will be appreciated that the thus created profile in the workpiece 1a will precisely correspond to the profile 2 of pattern 1.

In FIGS. 2 to 6 the thickness of the adhesive layers 3, 3a and of the layers 4, 4a of the grinding grains has been illustrated on a somewhat larger scale than the actual size in order more clearly to show the invention.

It is, of course, to be understood that the present invention is, by no means, limited to the particular method set forth herein but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A method of grinding a profile into workpieces, especially of wood and of synthetic material, which includes the steps of: preparing a pattern profile precisely in conformity with the eventual profile to be ground into a workpiece, applying a layer of grinding grains directly onto the profiled surface of said pattern, pressing an unfinished tool of a hardness less than the hardness of the grinding layer thus applied to said pattern against said applied grinding grain layer while simultaneously effecting a relative movement between said unfinished tool and said pattern for providing said unfinished tool with a counter profile forming a negative of the profile of said grinding grain layer covered pattern, directly applying to the thus created counter profiled surface of said tool a layer of grinding grains, and by means of the thus produced counter profiled tool grinding into the thus profiled surface a profile corresponding to that of said pattern.

2. A method according to claim 1, in which the layer of grinding grains directly applied onto the profiled surface of said pattern is connected thereto by bonding.

3. A method according to claim 1 according to which the layer of grains is directly bonded and directly applied to the created counter profiled surface of the tool is connected thereto by bonding.

4. A method according to claim 1, which includes the steps of: applying a water soluble adhesive directly onto the profiled surface of said pattern, and subsequently spraying grinding grains onto the thus treated profiled surface of said pattern.

5. A method according to claim 1, which includes the steps of: directly applying to the counter profiled surface of the tool a water soluble adhesive, and subsequently spraying grinding grains onto the thus treated counter profiled surface of said tool.

6. A method according to claim 4, in which for replacing the water soluble adhesive with the grinding grains therein by a new layer of a water soluble adhesive with grinding grains, the layer of water soluble adhesive with grinding grains, the layer of water soluble adhesive with grinding grains to be replaced is washed off whereupon a new layer of adhesive is applied to the pattern and new grinding grains are sprayed onto the thus applied adhesive.

7. A method according to claim 5, in which for replacing the water soluble adhesive with the grinding grains therein by a new layer of a water soluble adhesive with grinding grains, the layer of water soluble adhesive with grinding grains to be replaced is washed off whereupon a new layer of adhesive is applied to the tool and new grinding grains are sprayed onto the thus applied adhesive.

8. A method according to claim 1, which includes the step of: selecting the elasticity of the material for the unfinished tool in conformity with the material of the profile to be ground.

9. A method according to claim 1, which includes the step of: effecting the grinding of the workpiece to be provided with a profile corresponding to the pattern in successive operations by means of a plurality of tools when considerable material has to be ground off from the workpiece.

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